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

PHASE II INVESTIGATIONS

Town of Marilla Landfill
Site No. 915093
Town of Marilla, Erie County

July 1991

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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GERALD A. STROBEL
LICENSED PROFESSIONAL ENGINEER

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1. EXECUTIVE SUMMARY

1.1 SITE DESCRIPTION AND BACKGROUND

The 41-acre Town of Marilla Landfill site (Marilla site) in the Town of Marilla, Erie County, New York (see Figure 1-1) is located approximately 1 mile south of Williston Road between Three Rod Road and Eastwood Road. Approximately 10 of the 41 acres were used as a municipal landfill. Access to the site is obtained either off Eastwood Road or by a dirt road leading from the adjacent town recreational park northwest of the landfill. Both entrances have locking gates. Although the area surrounding the landfill is rural and used mainly for agricultural purposes or as undeveloped woodlands, private residences exist immediately to the east and southeast of the Marilla site (see Figure 1-2).

The Marilla site was purchased by the Town of Marilla in 1963 from Oscar Tankesley and was operated under lease to the town by the Tankesley brothers (Oscar and Hubert) for several years thereafter as a sanitary landfill. In September 1973, the Town of Marilla Highway Department assumed control of the site until December 31, 1988, when landfill operations were discontinued. This municipal waste landfill was open on Tuesdays and Saturdays only and required a town permit for site access. There are no records of any hazardous waste disposal at the site. Using both area and trench-and-backfill methods, an estimated 95,000 cubic yards of municipal refuse was disposed of on approximately 10 of the site's 41 acres. Leachate outbreaks, exposed refuse, pooling of surface water, and inadequate vegetative cover were chronic operational problems noted during various site inspections by representatives of the New York State Department of Environmental Conservation (NYSDEC), Department of Health (DOH), Department of Environment and Planning (DEP), and other agencies.

The site has been monitored through groundwater and surface water sampling and testing since July 1981, when, at the request of NYSDEC, five groundwater monitoring wells were installed by Earth Dimensions, Inc. under the supervision of Tallamy, Van Kuren, Gertis, and Associates (TVGA). During 1981, MW-1 was allegedly vandalized when motor oil was dumped into the well. This oil was flushed out, however, and the well regained its functional capability. Both TVGA and Ecology and Environment, Inc. (E & E) sampled and tested all five of these wells between 1981 and 1985. Results of these analyses indicated levels of chloride, phenols, iron, manganese, barium, cadmium, and lead exceeding New York State drinking water standards. In addition, elevated nickel concentrations were detected in downgradient wells compared to upgradient wells. Surface water contained elevated levels of phenols and cyanide. These results were reported to NYSDEC in the Phase I site investigation report submitted by Engineering Science (ES) and Dames and Moore (D&M) in January 1988. At the time of the Phase I site inspection--December 1985--the landfill was still actively accepting municipal waste and operating on Saturdays only. No leachate outbreaks were observed, though reddish-brown leachate was visible in the drainage ditch to the west of the landfill.

Since December 1988, Advanced Environmental Services, Inc. (AES) has been sampling the wells on a quarterly basis. Results of these tests indicated levels of iron, manganese, and phenols exceeding drinking water standards in all of the wells sampled during most of the sampling events. Lead has been detected above drinking water standards in both upgradient and downgradient wells. Barium and chromium exceeded standards in only one of the downgradient wells. Arsenic, selenium, ethylbenzene, benzene, and toluene were also detected in the upgradient bedrock well (MW-4A) in exceedance of drinking water standards. Concentrations of phenols, iron, and manganese also exceeded surface water standards in samples collected from the north and east drainage ditches.

Prior to the Phase I investigation, a July 1983 NYSDEC site inspection revealed an unknown number of leaking waste-oil barrels next to an on-site equipment shed. The oil-saturated soil beneath these drums was removed by the Town of Marilla Highway Department and disposed of in the on-site landfill. A 550-gallon underground storage tank was installed adjacent to the equipment shed, and an oil contractor was retained to pick up the waste-oil barrels (Engineering Science 1988).

In December 1988, landfilling operations ceased at the Marilla site (Pierce 1990). In March 1988, three additional groundwater wells (MW-1A, MW-1B, and MW-4A) were installed by Buffalo Drilling Company under the supervision of TVGA for the Town of Marilla. Just prior to these installations, MW-1 was grouted up because it was dry (Jann 1990). In March 1989, a recycling building was erected along the access road to handle glass and newspapers. In May 1989, the waste-oil tank next to the equipment shed was excavated and moved to a more convenient location adjacent to the recycling building.

Capping of the landfill began in late spring and summer of 1989. The cap consisted of 2 feet of clay followed by 6 inches of sand and gravel, and 6 inches of fertilized and seeded topsoil. In addition, three 300-foot-long horizontal polyvinyl chloride (PVC) vents were installed at a depth of 5 feet with six vertical PVC vents. The horizontal PVC was packed in gravel wrapped with a cloth fiber (Pierce 1990).

E & E performed the Phase II site inspection and geophysical survey in May 1989. Two additional groundwater monitoring wells, MW-1C and MW-4B, were installed in July 1989 by American Auger and Ditching Co., Inc. under the supervision of E & E. During this time, E & E observed the presence of the six new 6-inch inside diameter (ID) PVC landfill vents on the central portion of the landfill which were recently installed by the Town of Marilla. In August 1989, all the wells were sampled, but insufficient water volumes were obtained from MW-4A due to low recharge, and well MW-2 was dry. The missing sample for MW-4A was eventually obtained in September 1989, and all sample locations were surveyed by Om Popli, P.E., under the direction of E & E. At that time, MW-2 was still dry and surface water/sediment sample 1 (SW/SWS-1) could not be collected due to dry conditions.

1.2 PHASE II INVESTIGATION

The Phase II field investigation conducted by E & E in May 1989 included a ground conductivity survey and a total earth magnetic field survey to define the site geological conditions, locate any buried materials, and determine the presence of contaminant plumes. Two groundwater monitoring wells were installed (MW-1C and MW-4B). Subsurface soil, surface soil, groundwater, surface water/sediment, and leachate samples were collected and analyzed. Continuous air monitoring was conducted using an HNu photoionization detector to check for the presence of ambient contaminants and determine whether or not they are migrating off site and potentially impacting human health and/or the environment.

1.3 SITE ASSESSMENT

The geophysical survey indicated the presence of some minor anomalous areas along the boundaries of the standard survey grids. The anomalies, however, appeared to be centered outside the survey grid area, and were therefore of lesser concern for drilling purposes. The apparent undisturbed subsurface stratigraphy surrounding the site as indicated by the soil borings consists of a sequence of approximately 1 foot of silt loam underlying the topsoil (approximately 6 inches), followed by up to 2 feet of slowly permeable fine silt loam or silt clay loam overlying silty clay, which is sometimes gravelly (shale fragments). The overburden increases in thickness from 6.5 feet in the northern portion of the site to 14.5 feet in the southern portion of the site. Overburden water levels measured in August 1989 ranged from 0.82 feet below ground surface in MW-1A in the northern portion of the site to 8.99 feet below ground surface in MW-4B in the southern portion of the site. Contour mapping of the overburden water table indicates that flow is to the northwest. The water in the overburden is believed to be seasonally perched based upon review of the drill logs of four boreholes drilled in July 1989 for this study, review of well logs of existing on-site wells, and water level measurements taken from all of the on-site wells (both new and existing) in August 1989. The overburden on site was either dry or slightly moist in all of the boreholes and the top of bedrock was dry in three of the boreholes drilled in July 1989. A more detailed discussion concerning this matter can be found in Section 4.5.1 of this report. Bedrock consists of a dark gray, soft, fissile shale for approximately 12 feet, followed by a more competent, massive, medium gray shale. An accurate assessment of groundwater flow direction within the bedrock is impossible without groups of three or more bedrock wells screened at similar depths. However, based on water levels from the three bedrock wells MW-1B, MW-1C, and MW-4A flow direction is also believed to be toward the north/northwest. Bedrock water levels measured from wells on the northeast and southwest corners of the site in August 1989 were approximately 12 feet and 58 feet, respectively, below ground surface. Surface water drains from the landfill to the west/northwest toward the adjacent town park and into intermittent tributaries of Little Buffalo Creek.

Eight 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, and pesticides/PCBs. In addition, these samples were analyzed for TCL inorganics, comprised of metals and cyanide. No TCL organic compounds were detected in the drill water or wells MW-1A, MW-3, MW-4, MW-4B, and MW-5; however, eight such compounds were detected in a supposed upgradient bedrock well (MW-4A). Eight metals were detected in the drill water sample, seventeen were detected in the bedrock wells (MW-1B, MW-1C, and MW-4A), and eighteen were detected in shallow wells (MW-1A, MW-3, MW-4, MW-4B, and MW-5). Non-filtered samples contained elevated quantities of arsenic, chromium, and lead that were not detected in filtered samples. Concentrations of acetone, benzene, phenols, barium, iron, and manganese exceeded New York State Class GA Groundwater Standards, and toluene, ethylbenzene, and xylenes exceeded United States Environmental Protection Agency (EPA) proposed maximum contaminant limits in one or more samples.

Four of the five proposed surface water samples were collected from the Marilla site. One of the samples (SW-1/SWS-1) was not collected due to dry conditions. These samples were also analyzed for TCL organics and inorganics. No organic compounds were detected above the quantifiable detection limit. Sixteen metals were detected in the surface water samples. Downgradient sample concentrations of aluminum in SW-2, SW-4, and SW-5 were over four times the concentration in upgradient sample SW-3, chromium and cobalt were only detected in downgradient sample SW-4; copper in downgradient samples SW-2 and SW-4 was over four times the concentration in upgradient sample SW-3; iron in downgradient samples SW-2, SW-4, and SW-5 was over 10 times the concentration in upgradient sample SW-3. Lead, nickel, and vanadium were only detected in downgradient samples SW-2 and SW-4, and manganese and zinc in downgradient samples SW-2, SW-4, and SW-5 were over five times the concentration in upgradient sample SW-3. The downgradient concentrations of the above-mentioned metals all exceeded limits for Class AA surface water for human consumption and/or aquatic life. These results suggest recent off-site releases into adjacent intermittent tributaries that flow into Little Buffalo Creek.

Four of the five proposed sediment samples were collected at the same locations as the surface water samples and analyzed for the same parameters listed above. Three polynuclear aromatic hydrocarbons (PAH) (fluoranthene, pyrene, and benzo(k)fluoranthene) were detected in one of the downgradient samples (SWS-5) at low levels. Seventeen metals were detected in all sediments. None were detected in downgradient samples at concentrations exceeding published naturally occurring ranges for metals in soils of the eastern United States.

Three soil samples were collected from surficial soils and three from subsurface soil borings conducted on the Marilla site. These samples were analyzed for the same TCL organics and inorganics as mentioned above. No TCL organic compounds were detected above quantifiable detection limits in the surface and subsurface soil samples. Eighteen metals were detected in the surface soil and nineteen in the subsurface soil samples at levels below the maximum value of the common range of metals in soils of the eastern United States.

Three leachate samples were collected at the Marilla site. Two were liquid samples (mostly water), and one was a wet soil sample (due to low liquid volume). Five organic compounds were detected in the leachate-stained soil sample. Seventeen metals were detected in the soil sample and fifteen in the water samples. While the metals found in the soil samples were below the maximum values in the common ranges for metals in soils in the eastern United States, six metals in the liquid samples, if compared to Class AA surface water standards, were noticeably high in concentration.

Continuous air monitoring using a portable HNu photoionization detector detected organic vapor concentrations above background levels from leachate seeps along the west side of the landfill, in four of the seven existing groundwater wells, and during the drilling of the new boreholes.

In general, the types and concentrations of organic and inorganic compounds detected are consistent with the Marilla site's former use as a municipal landfill and indicate potential contamination problems in both the groundwater and surface water on and off site.

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.

Under the HRS, three numerical scores are computed to express the site's relative risk or damage to the population and the environment. The three scores are described below:

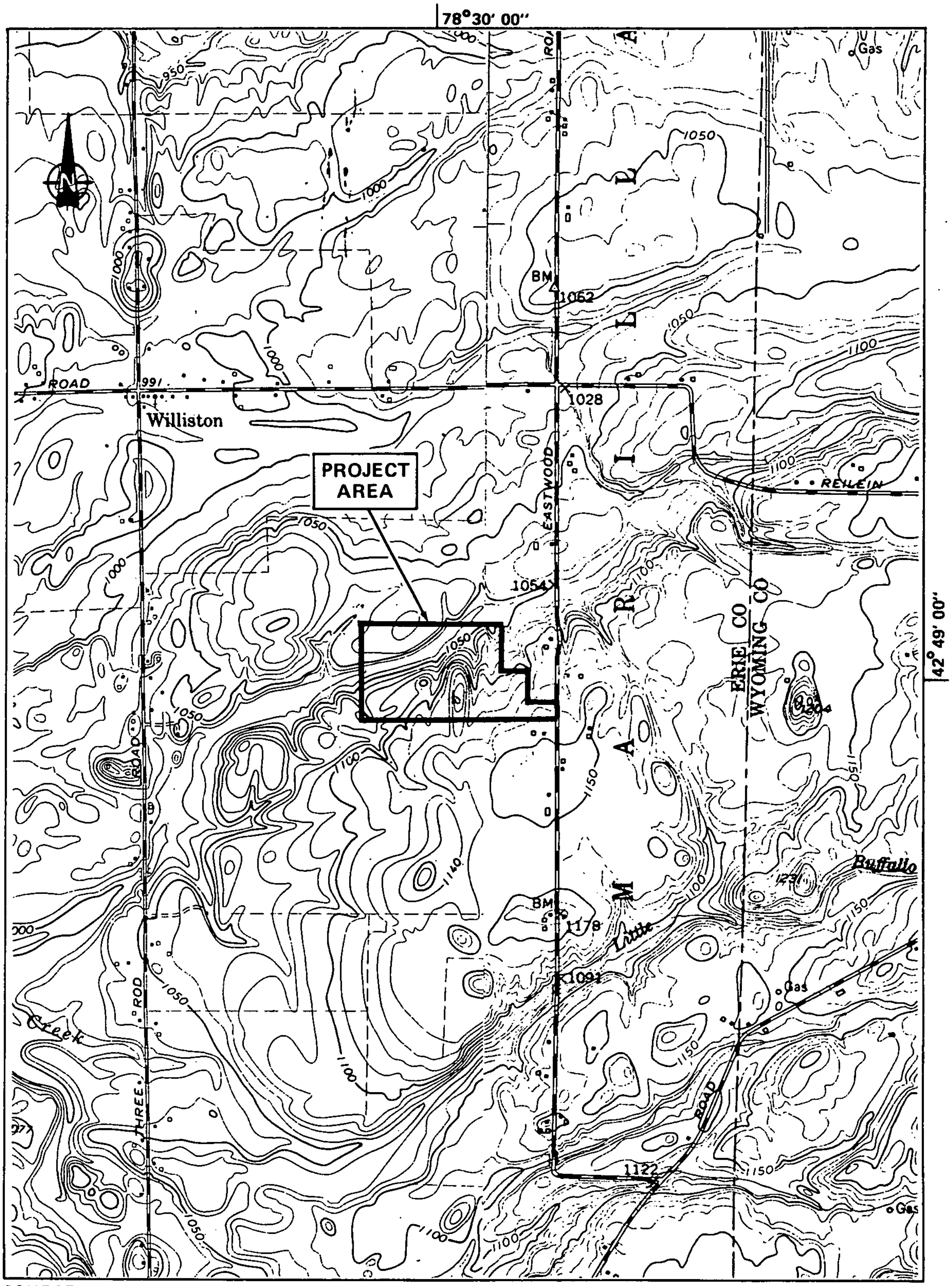
- S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility via groundwater, surface water, or air. It is a composite of separate scores for each of the three routes (S_{gw} = groundwater route score, S_{sw} = surface water route score, and S_a = air route score).
- S_{FE} reflects the potential for harm from substances that can explode or cause fires.
- 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 Marilla site have been calculated as follows:

S_M = 38.43 (S_{gw} = 65.62; S_{sw} = 10.63; S_a = 0)

S_{FE} = Not scored

S_{DC} = 25.0



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles; East Aurora, N.Y. 1965; Cowlesville, N.Y. 1949.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 1—1
LOCATION MAP: TOWN OF MARILLA LANDFILL

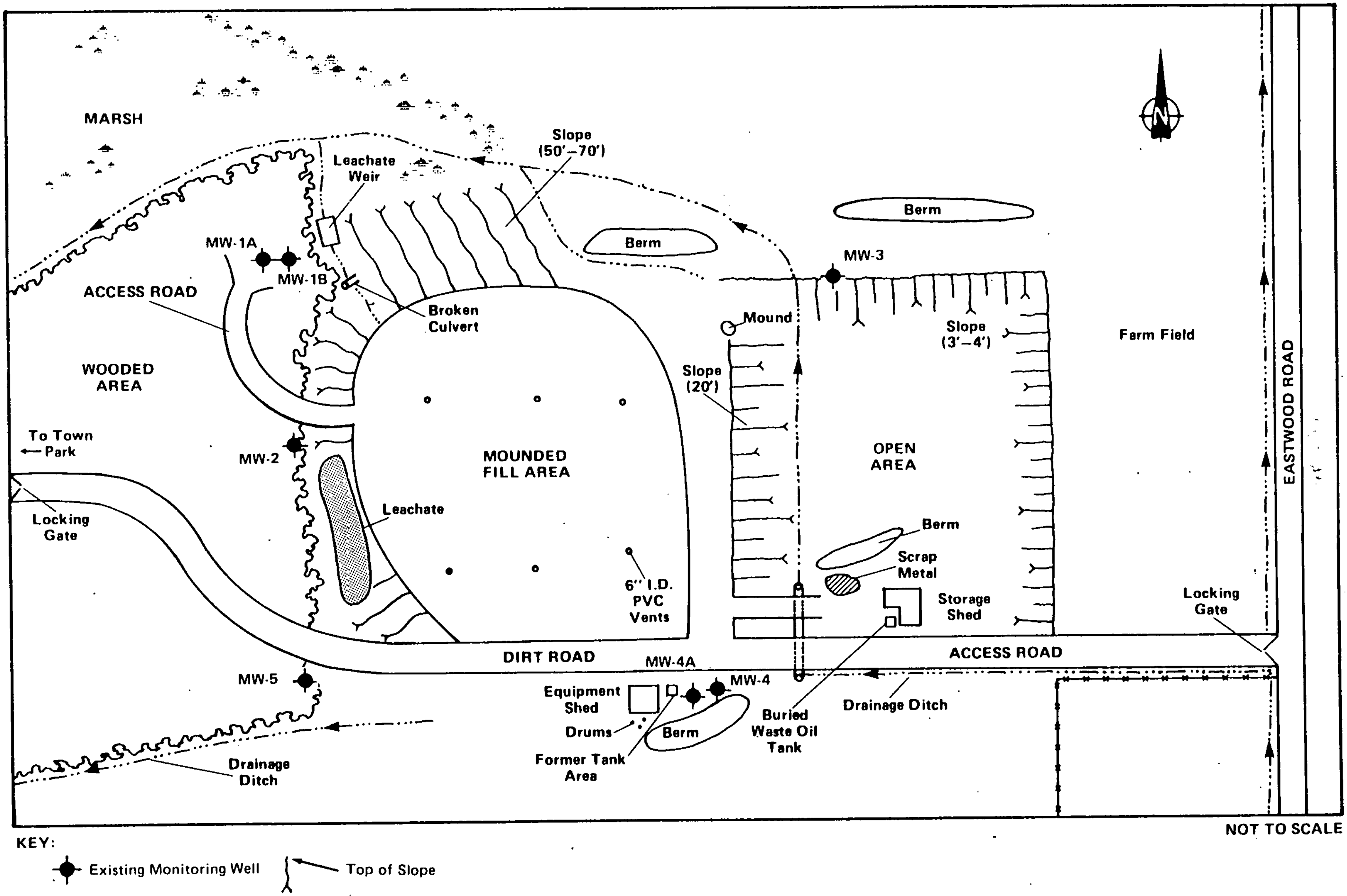


Figure 1–2
SITE SKETCH: TOWN OF MARILLA LANDFILL

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
Town of Marilla Landfill	915093	Marilla	Erie

5. Region	6. Classification	7. Activity
9	Current 2a /Proposed D	[ ] Add [ ] Reclassify [x] Delist [ ] Modify ____

8a. Describe location of site (attach USGS topographic map showing site location).
The site is located on the west side of Eastwood Road, approximately 1 mile south of Williston Road. The area is moderately hilly and rural. Figure 1-1 of the Phase II Investigation Report shows the site location.
b. Quadrangle East Aurora, 1965 Cowlesville, 1949 c. Site latitude 42°49'00" Longitude 78°30'00" d. Tax Map Number 149.00-4-1

9a. Briefly describe the site (attach site plan showing disposal/sampling locations)
The site is the former Town of Marilla municipal landfill. There are no records of hazardous waste disposal. Only 10 of the 41 acres was used as a landfill. There is approximately 100 feet of relief from north to south across the site (see Figure 3-2 of the Phase II Investigation Report).
b. Area 41 acres c. EPA ID number ________ d. PA/SI [X] Yes [ ] No

e. Completed: [X] Phase I [ ] 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.

Approximately 95,000 cubic yards of municipal refuse was disposed at the site between 1963 and 1988.

11a. Summarized sampling data attached

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

b. List contravened parameters and values (in $\mu g/L$)
Groundwater: Acetone (110-250); Benzene (77); Toluene (160); Ethylbenzene (22-24); Total xylene (200-230); Total Phenols (7); Chrysene (63)
Leachate: 2-Butanone (2,900-3,200); 2-Hexanone (420-460); 4-Methylphenol (8,400-10,000); Benzoic Acid (7,600-8,200); Hexadecanoic Acid (770)

12. Site impact data

a. Nearest surface water: Distance <500 ft. Direction North Classification C (T)

b. Nearest groundwater: Depth <1 ft. Flow direction Northwest [ ] Sole source [X] Primary [ ] Principal

c. Nearest water supply: Distance <1,000 ft. Direction East Active [X] Yes [ ] No

d. Nearest building: Distance <1,000 ft. Direction East 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 [ ] No

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

l. For Class 2: Priority category ____

m. HRS Score Sm = 38.43

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

13. Site owner's name	14. Address	15. Telephone Number
Town of Marilla	11550 Webster Lane, Marilla, NY 14102	(716) 652-7311 652-5497

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

12/20/90
Date

Gene Florentino
Signature

17. Approved

Name, title, and organization

Date

Signature

02[UZ]YN1080:D2825/5542

2

2. OBJECTIVE

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 migrating from the Town of Marilla Landfill 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 ES and D&M in 1988 have shown chloride, phenol, iron, manganese, barium, cadmium, and lead in groundwater at levels exceeding New York State drinking water standards. In addition, elevated nickel concentrations were detected in downgradient wells with respect to upgradient wells. Sampling conducted by AES from December 1988 to the present has also confirmed the presence of phenols, iron, manganese, lead, barium, and chromium in groundwater at levels exceeding drinking water standards. Phenols, iron, manganese, and lead were detected both upgradient and downgradient, while barium and chromium were only detected in downgradient samples. Arsenic, selenium, ethylbenzene, benzene, and toluene were also detected in the upgradient bedrock well. Finally, phenols, iron, and maganese were detected in surface water samples.

3

3. SCOPE OF WORK

3.1 INTRODUCTION

Field work for the Phase II investigation at the Marilla site began in May 1989 and was completed by September 1989. A site-specific health and safety plan (HSP) was submitted to NYSDEC for review, and a quality assurance project plan (QAPP) was submitted to NYSDEC for their approval prior to the start of field work. The Phase II work plan was written by NYSDEC. The original plan included the installation of two groundwater monitoring wells and the securing of nine groundwater samples from a combination of the new and existing site wells. Based on the findings of the geophysical survey, proposed well locations remained unchanged due to the lack of any significant electrical or magnetic anomalies within the survey areas.

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 1988. 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:

- Identify access problems;

- Identify tentative locations for borings, wells, and surficial soil, surface water/sediment, and leachate samples;

- Determine if underground or above ground utilities may impact drilling by visually inspecting well locations, and contacting utilities;

- Identify water supply for drilling purposes;

- Conduct a limited air monitoring study using an HNu photoionization detector; and

- Photo-document present site conditions (see Appendix G).

The air monitoring survey indicated elevated organic vapor readings of 28 ppm above background at ground surface from a leachate seep on the west side of the landfill, 13 ppm inside the well casing of MW-2, 4.2 ppm inside MW-3, 2.5 ppm inside MW-4, and 21 ppm inside MW-5. Monitoring wells 1A, 1B, and 4A were not initially tested because access was limited by locked steel protective casings. A key for these wells was obtained from the Town of Marilla, and the wells were screened prior to sampling in August 1989. No HNu readings above background were detected from the locked wells. Monitoring wells 2, 3, 4, and 5 were constructed of unlocked and unprotected 2-inch ID PVC with steel screw-on caps. No on-site ambient air readings indicated organic vapors above background levels in the breathing zone.

Several discrepancies were noted between present site conditions and features indicated on the site map in the Phase II work plan. The following changes have been incorporated into Figure 1-2 from the field logbook:

- The intermittent stream along the west side of the landfill did not exist; therefore, the surface water/sediment sample (SW/SWS-1) could not be obtained;

- Drainage ditches existed along the access road in the eastern portion of the site. Sample SW/SWS-1 was later proposed for this location, but the ditches were dry during sampling activities and samples could not be obtained;

- A new recycling building was erected on the north side of the access road, east of the landfill. The buried waste-oil tank was moved from its site adjacent to the equipment shed to a new site adjacent to the new building;

- The access road continues westward past the equipment shed, through the wooded area to the west of the landfill, and into the town park to the northwest. The town park contains a small pond;

- The culvert to the northwest of the landfill appeared to be non-functional. Remains of a broken concrete pipe were noted without any visible signs of where it was previously connected;

- The leachate weir was actually further west, near the broken culvert at the base of the northwest corner of the landfill;

- The scrap metal pile near the northeast corner of the landfill was removed; however, a scrap metal pile noted to the west of the new building may have been the same scrap materials relocated;

- A major leachate seep was noted along the west slope of the landfill; and

- The inactive area to the east of the landfill extended further east.

Upon completion of the site reconnaissance, all surface soil, four of five surface water/sediment samples (except SW/SWS-1), and two of the three leachate samples (not including L-3) were collected. Sample SW/SWS-1 was not collected because the intermittent stream indicated on the Phase II site map did not exist. After consultation with NYSDEC, a new location was proposed. Unfortunately, the new location was dry at the time of resampling. Sample L-3 was collected in August 1989 because it was an addition to the original scope of work, and NYSDEC approval was needed prior to proceeding with a changed scope of work.

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 contaminants found on site, routes of exposure, the route to the hospital, location of the nearest phone, and the use of the air monitoring instruments. Also, a general plan of the site activities for the day was discussed. Each person on site was requested to sign the attendance sheet from these meetings. A site specific HSP was available to all personnel at all times (see Appendix A).

3.2.3 Geophysical Survey

A geophysical survey utilizing an EM31 ground conductivity meter and proton precession magnetometer was performed at the Marilla site on May 24, 1989. These surveys were conducted at two locations within and around the perimeter of the site (see Figure 3-1). The results were used to determine site geological conditions, locate buried materials, verify proposed monitoring well locations, and identify any conductive subsurface plumes. Analysis of the EM31 and magnetometer data indicated that grids 1 and 2 were free from subsurface metallic debris. The geophysical survey methods and a more detailed discussion of results are presented in Appendix B.

3.2.4 Monitoring Well Installation

One shallow overburden well and one deep bedrock monitoring well were installed on the Marilla site between July 11 and July 14, 1989 by American Auger and Ditching Co., Inc. under the supervision of E & E. The wells were installed both up- and downgradient of the site (see Figure 3-1 and Table 3-2). The upgradient well, MW-4B, monitors perched groundwater while the downgradient well, MW-1C, monitors groundwater in the shallow bedrock. In addition to these wells, two soil borings were drilled in an attempt to find a more suitable location for an upgradient monitoring well. These boreholes (MW-6 and MW-6A) were drilled at the request of the NYSDEC on-site representative because organic vapors in the range of 30 to 100 ppm were detected during the drilling of MW-4B. The two borings were subsequently abandoned and grouted at the request of NYSDEC. The approximate locations of these two soil borings are shown in Figure 3-2.

Wells MW-4B and MW-1C were drilled and constructed in accordance with NYSDEC guidelines. Soil samples were collected continuously during construction of MW-1C. Split-spoon samples were taken at 5-foot intervals during construction of MW-4B. Additional samples were taken where major changes in lithology occurred. Four soil samples were analyzed for grain-size characteristics and two for Atterberg limits and moisture content.

The boreholes were advanced using 4.25-inch ID hollow-stem augers until refusal. Drilling through bedrock continued using an HQ (3.98-inch outside diameter) core bit to set the rock socket. A 3-foot rock socket was drilled in borehole MW-4B. It was later decided by E & E and the NYSDEC representative not to set an overburden/bedrock interface well, which would have allowed perched water to mix with groundwater. Therefore, the rock socket was filled with bentonite pellets and capped by one foot of sand.

In MW-4B, seven feet of 2-inch ID PVC 0.010 machine-cut slotted well screen was set above the bentonite and sand plug between a depth of 6 to 13 feet below ground surface. The screen was followed by threaded, flush-joint PVC riser of the same diameter as the well screen to approximately 2 feet above ground surface. The well was completed with a sand pack extending 1 foot above the top of the well screen, followed by 1 foot of bentonite pellets and 4 feet of a bentonite grout. A locking protective steel casing was placed over the PVC, and a concrete pad was poured at the ground surface around the protective casing.

An 8-foot rock socket was set in MW-1C, (from 6 to 14 feet below ground surface) to seal off the upper bedrock weathered zone. A 3-inch ID PVC casing was placed in the borehole from 14 feet to 2 feet above ground surface and grouted in place. A locking protective steel casing was placed around the PVC. After 24 hours, drilling continued using an NX 3-inch outside diameter core bit to a total depth of 28 feet. The well remained as an open-hole completion from 14 to 28 feet.

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

A decontamination pad was constructed on site to steam clean the drill rig, augers, bits, rods, split spoons, casings, etc. 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.

Boring logs are found in Appendix C, and grain-size and Atterberg-limit analyses are included in Appendix F. All field activities were recorded in field logbooks found in Appendix I.

3.2.5 Subsurface Soil Sampling and Analysis

Three subsurface soil samples were collected for chemical analysis during the installation of the two new monitoring wells (MW-1C and MW-4B) and from one of the attempts for the additional upgradient well (MW-6). The samples were collected because of HNu readings of 140 ppm, 50 ppm, and 125 ppm above background, respectively, from the split spoon contents. They were collected at depths of 4 to 6 feet in MW-1C, 8 to 10 feet in MW-4B, and 5 to 7 feet in MW-6. These 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 one matrix spike/matrix spike duplicate (MS/MSD) sample (MW-1CMS/MW-1CMSD) were analyzed for the above-mentioned compounds. Analyses and reporting were performed following the NYSDEC Contract Laboratory Protocol (CLP).

Two subsurface soil samples were collected from MW-4B for grain size and grain size and Atterberg limits, respectively. These samples were chosen because they lie within the screened area of the well. Copies of field logbooks are found in Appendix I.

3.2.6 Groundwater Sampling and Analysis

Groundwater samples were collected from the two newly-installed monitoring wells and seven existing wells on August 15 and 16 and September 7 and 11, 1989 as part of the Phase II investigation of the Marilla site (see Figures 3-1 and 3-2 and Table 3-1). An incomplete sample volume was initially obtained from MW-4A, so additional sampling was performed in September. 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 (MW-4AMS/MW-4AMSD and MW-5MS/MW-5MSD) were analyzed for the above-mentioned compounds.

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

3.2.7 Surface Water/Sediment Sampling and Analysis

One upgradient (SW-3/SWS-3) and three downgradient (SW-2/SWS-2, SW-4/SWS-4, and SW-5/SWS-5) surface water/sediment samples were collected on May 9, 1989 (see Figure 3-2 and Table 3-3). Sample SW/SWS-1 was not collected due to the absence of the intermittent stream indicated on the Phase II work plan site sketch. The samples were analyzed for TCL organics and inorganics. All analyses were performed by E & E's ASC. In addition, QA/QC samples consisting of two duplicates (SW-3D and SWS-3D) and MS/MSD samples (SW-5MS/SW-5MSD and SWS-5MS/ SWS-5MSD) were analyzed for the above-mentioned compounds.

Surface water/sediment samples were collected from the intermittent streams surrounding the site. Field procedures used are described in Appendix D, analytical results are discussed in Section 4.5, and raw data is presented in Appendix E. Actual sample locations are found on the site survey map in Appendix H. Copies of field logbooks are found in Appendix I.

3.2.8 Surface Soil Sampling and Analysis

Three surface soil samples (SS-1, SS-2, and SS-3) were collected along the perimeter of the landfill on its north, west, and south borders on May 9, 1989 (see Table 3-3 and Appendix H and I). Sample SS-3 is a background soil sample. These samples were analyzed for TCL organics and inorganics by E & E's ASC. In addition, a QA/QC sample consisting of one MS/MSD sample (SS-1MS/SS-1MSD) was analyzed for the above-mentioned parameters.

3.2.9 Leachate Sampling and Analysis

Two leachate samples (L-1 and L-2) were collected on May 9 and one (L-3) on August 16, 1989 from the north, northwest, and west sides of the landfill (see Figure 3-2 and Table 3-3). Two of the samples (L-1 and L-2) were liquid (mostly water) and one (L-3) was leachate-stained soil due to a lack of sufficient liquid volumes to fill the appropriate sample containers. The samples were analyzed for TCL organics and inorganics by E & E's ASC. In addition, a QA/QC sample consisting of one MS/MSD sample (L-3MS/L-3MSD) was analyzed for the above-mentioned compounds. The field procedures are described in Appendix D, results are discussed in Section 4.5, and raw data are presented in Appendix E. Actual sample locations are found on the site survey map in Appendix H. Copies of field logbooks are found in Appendix I.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE II INVESTIGATION AT THE TOWN OF MARILLA LANDFILL 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.

United States Department of Agriculture
Soil Conservation Service
Erie County District
21 South Grove Street
East Aurora, New York 14052
Contact: John R. Whitney
Telephone Number: 716/652-8480
Date: March 28-29, 1989
Information Gathered: File search for Erie County DEC Phase II site report preparation.

County of Erie
Department of Environment and Planning
Division of Environmental Control
95 Franklin Street
Buffalo, New York 14202
Contact: Jerome L. Miller
Telephone Number: 716/846-7583
Date: March 28 and April 6, 1989
Information Gathered: Viewed site inspection reports.

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 I sites.

[UZ]YN1080:D2825/2483/21

Table 3-1 (Cont.)

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.

Erie County Water Authority
3030 Union Road
Cheektowaga, New York
Contact: Dana Cosselt
Telephone Number: 716/849-8484
Date: April 28, 1989
Information Gathered: Erie County DEC Phase II sites within Erie County's Water Service.

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.

Erie County Department of Health
5444 Camp Road
Hamburg, New York
Contact: John Kociella
Telephone Number: 716/858-7677
Date: May 10, 1989
Information Gathered: Information about files pertaining to NYSDEC sites.

Town of Marilla Highway Department
11550 Webster Lane
Marilla, New York 14102
Contact: Dave Pierce, Highway Supervisor
Telephone Number: 716/652-7311
Date: January 15, 1990
Information Gathered: Background information on Marilla Landfill.

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

Table 3-1 (Cont.)

Town of Marilla 1740 Two Rod Road Marilla, New York 14102 Contact: Earl Jann, Town Supervisor Telephone Number: 716/652-4830 Date: January 24 and 30, 1990 Information Gathered: Background information on Marilla Landfill.

[UZ]YN1080:D2825/2483/21

Table 3-2

MONITORING WELL LOCATIONS

Well	Location
MW-1A	Downgradient overburden well adjacent to existing well MW-1B and new well MW-1C in the northwest corner of the site.
MW-1B (existing)	Downgradient shallow weathered bedrock well adjacent to existing well MW-1A and new well MW-1C.
MW-1C (new)	Downgradient deeper bedrock well (in competent rock) adjacent to existing wells MW-1A and MW-1B in the northwest corner of the site.
MW-2	Downgradient overburden well along the western border of the site.
MW-3	Downgradient overburden well in the east-central portion of the site.
MW-4	Background overburden well adjacent to wells MW-4A and MW-4B along the south-central border of the site.
MW-4B (new)	Background shallow overburden well adja-cent to existing wells MW-4 and MW-4A along the south-central border of the site.
MW-5	Downgradient overburden well along the western border of the site.

[UZ]YN1080:D2825/2336/32

Table 3-3

SURFACE WATER/SEDIMENT, SURFACE SOIL, AND LEACHATE SAMPLING LOCATIONS

Sample	Location
SW/SWS-1 (not sampled)	Proposed upgradient in intermittent stream on west side of landfill (not found).
SW/SWS-2	Downgradient in intermittent stream below culvert on west side of landfill.
SW/SWS-3	Upgradient in intermittent stream on east side of landfill.
SW/SWS-4	Downgradient of major leachate seep on north side of landfill in intermittent stream.
SW/SWS-5	Downgradient of landfill drainageways to the northwest; upgradient of the town park.
SS-1	West side of landfill near culvert pipe.
SS-2	North slope of landfill.
SS-3 (background)	Southeast of landfill in field south of access road, adjacent to horse corral fence.
L-1	At base of northwest slope of landfill near culvert pipe and leachate weir arrangement.
L-2	North slope of landfill.
L-3	West slope of landfill; from major leachate seep.

[UZ]YN1080:D2825/2337/33

Note: SW = surface water
SWS = surface water sediment
SS = surface soil
L = leachate

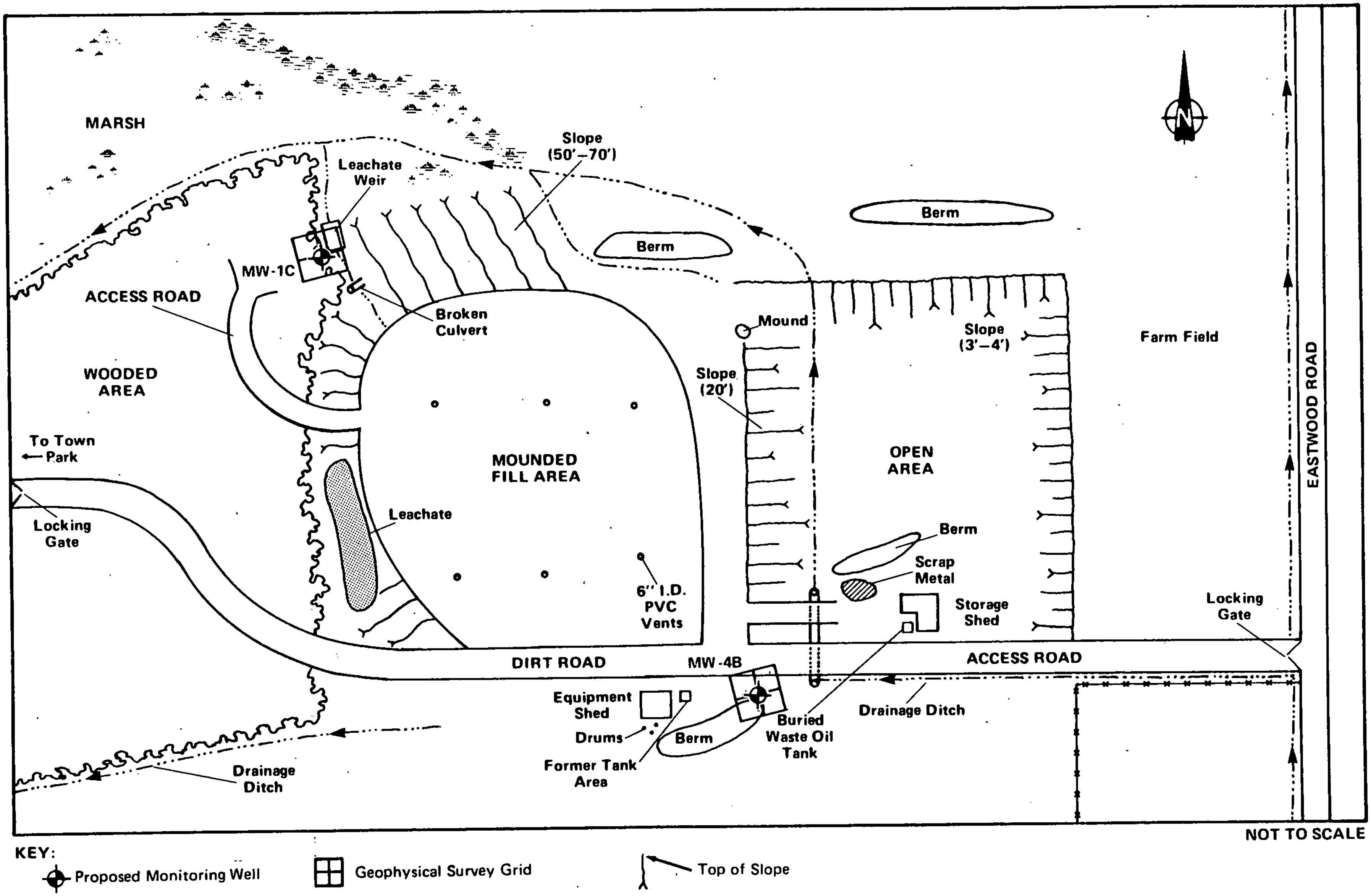


Figure 3–1
GEOPHYSICAL SURVEY AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

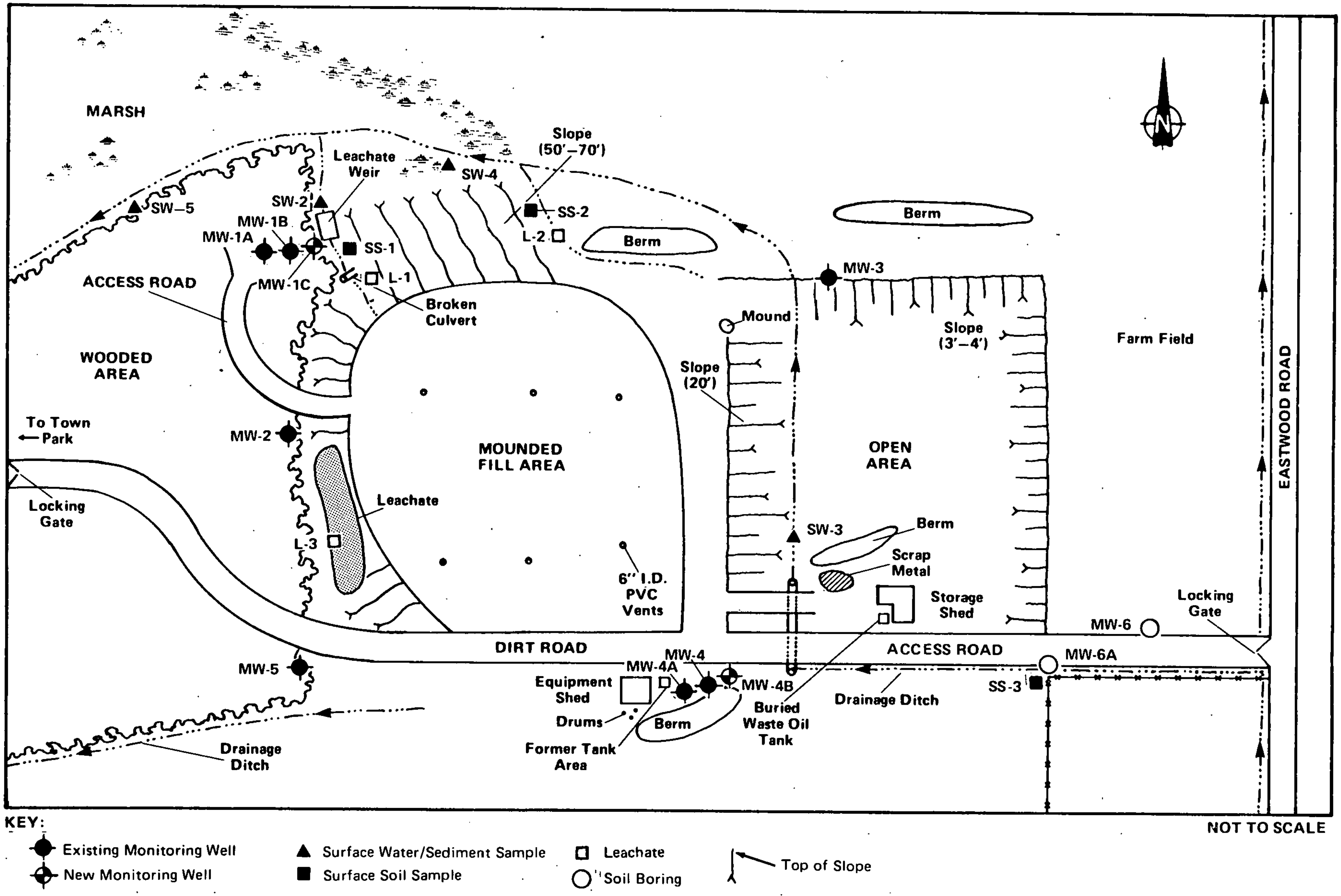


Figure 3–2
MONITORING WELL, SURFACE WATER, SEDIMENT, SURFACE SOIL, AND LEACHATE SAMPLING LOCATIONS

4

4. SITE ASSESSMENT

4.1 SITE HISTORY

The Marilla site was purchased by the Town of Marilla in 1963 from Oscar Tankesley. Prior to the purchase, the land was primarily open fields sloping north to Little Buffalo Creek. From 1963 to 1973, the site was leased by Oscar and Hubert Tankesley from the Town of Marilla and used as a sanitary landfill. In 1973, the Marilla Town Highway Department took over site operations, and the landfill was open on Tuesdays and Saturdays specifically for use by town residents. The residents were responsible for transporting solid waste to the working face area. Only residential-type debris were accepted. The landfill ceased operations in 1988. No hazardous or liquid wastes were allowed, but there are no records of confirmation.

Approximately 95,000 cubic yards of municipal waste were disposed of on approximately 10 acres of the 41-acre Marilla site. Half of the 10-acre disposal area was filled using the area method and the other half by using the trench-and-backfill method. The area method consists of clearing topsoil and constructing daily cells to contain the solid waste. Each cell contains compacted layers of waste to heights of approximately 10 feet. The daily cell is then covered with approximately 6 inches of compacted cover material. Upon completion of filling a particular area, a minimum of 1.5 feet of compacted cover material is then overlaid to form the final cover. The trench-and-backfill method involves the excavation of soil and subsequent filling from the top of the trench. The material is then spread and compacted at the bottom of the trench, and 6 inches of soil is added at the end of each day. Final cover is added in the same manner as the area method when the trench is completely full.

Several site inspections from various state agencies (e.g., NYSDEC, DOH, DEP, etc.) noted chronic operational problems with exposed daily refuse, inadequate vegetative cover, pooling of surface water, and leachate outbreaks. In 1981, at the request of NYSDEC, five groundwater monitoring wells (MW-1 through MW-5) were installed by Earth Dimensions, Inc. under the supervision of TVGA around the perimeter of the landfill. In 1981, MW-1 was allegedly vandalized by having motor oil poured into it. The oil was flushed out, and the well remained functionable. These wells were sampled by TVGA and E & E between 1981 and 1985. On December 31, 1988, landfill operations ceased. Since then, three additional wells (MW-1A, MW-1B, and MW-4A) were installed by Buffalo Drilling Co. under the supervision of TVGA for the Town of Marilla. Prior to this, one of the original five wells (MW-1) was grouted closed because it was dry. From 1986 to the present, all wells have been monitored and sampled quarterly by Advanced Environmental Services, Inc. (AES) for the Town of Marilla.

Typical pH values from the monitoring wells at the site ranged from 6 - 8.7. Analyses indicated depressed pH in wells MW-2 and MW-5; elevated pH values (11.13 - 12.6) in MW-4A. In addition, analyses revealed elevated specific conductance, chlorides, total dissolved solids, and total organic carbon (TOC) in MW-2; chlorides in MW-1; ethylbenzene in MW-1B; and benzene and toluene in MW-4A; low concentrations of phenols were also detected in all of the monitoring wells during the various sampling events from 1988 to 1990 (Town of Marilla Sanitary Landfill Quarterly Monitoring 1990). The following metal concentrations exceeded drinking water standards: iron, lead, and manganese in all of the wells; cadmium in MW-1; barium in MW-1 and MW-1B; arsenic and selenium in MW-4A; and chromium in MW-1, MW-3, and MW-5. In addition, surface water sample results indicated elevated levels of chlorides, specific conductance, iron, and depressed pH at the northwest ravine. Phenols, cyanide, iron, and manganese were also detected above surface water standards in the adjacent stream to the north.

Leaking waste-oil drums were also discovered on site in 1983 during a NYSDEC site inspection. The oil-saturated soils under the drums were removed and landfilled on site, the drums were removed off site, and a

550-gallon underground storage tank was installed for waste oil collection adjacent to the equipment shed. A Phase I investigation was performed by ES and D&M in 1985 and submitted to NYSDEC in 1988 (Tallamy et al. 1978; Engineering Science 1988).

In March 1989, a recycling building to handle glass and newspapers was built along the access road. In May 1989, the waste oil tank next to the equipment shed was excavated and moved adjacent to the recycling building for convenience purposes. Capping of the landfill began in late spring and summer of 1989 (Pierce 1990).

4.2 REGIONAL SETTING

Regional Geology

The site lies within the Erie-Niagara basin and the Erie-Ontario lowland physiographic province. The overburden of Erie County consists mainly of glacial till, which is an unconsolidated, poorly sorted mix of clay, silt, and/or sand. It forms a thin mantle over the bedrock and is of low permeability. The region between the Onondaga Escarpment to the north and the hilly areas to the south also received lacustrine clay and silt deposits from the larger ancestral Great Lakes during the late Pleistocene era. These deposits are generally of very low permeability. As the ancestral lakes retreated, sandy beach sediments were also deposited in this region. These deposits have relatively high permeabilities. The overburden in the site area consists of till and till moraine deposits. The till deposits generally consist of poorly sorted, relatively impermeable sediments of variable texture ranging from 3 to 150 feet thick. Till moraine deposits are generally more variably sorted and more permeable glacial sediments ranging from 30 to 90 feet thick (Cadwell 1988).

The bedrock in the region is exclusively sedimentary. The shale, limestone, and dolomite units dip gently southward approximately 40 feet per mile. Although the bedrock dips southward, the land surface is flat or actually increases in elevation to the south which results in progressively younger units cropping out further south.

Up to 32 distinct bedrock members have been identified in Erie County (see Figure 4-1). The oldest unit, Silurian in age, underlying the northern part of the county is the Camillus Shale. This member, which is 30 to 100 feet thick, contains significant reserves of poor-quality groundwater in cavities formed by the dissolution of gypsum.

Several limestone members also of Silurian age overlie the Camillus Shale. The Bertie Limestone, approximately 50 feet thick, overlies the Camillus Shale and is in turn overlain by the Akron Dolomite, which is about 8 feet thick. Little record of latest Silurian or early Devonian history is preserved in western New York. However, the Middle and Late Devonian record is well preserved beginning with the Onondaga Limestone unconformably overlying the Akron Dolomite. The unit comprises three distinct members that cumulatively are approximately 140 feet thick.

The Marcellus Shale member overlies the limestone units. This dense, black, fissile shale is approximately 30 to 55 feet thick. This shale, unlike the Camillus Shale, is of low permeability. It confines the limestone and Camillus Shale aquifers below.

The Skaneateles Formation overlies the Marcellus Shale. This 60- to 90-foot-thick formation is represented by the Stafford Limestone and Levanna Shale. The black, fissile shale is expected to be relatively impermeable and will therefore confine groundwater found in the lower limestone units.

Overlying the Skaneateles is the Ludlowville Formation represented by the Centerfield Limestone, Ledyard Shale, Wanakah Shale, and Tichenor Limestone members. The shale members contain numerous limestone beds. The Ludlowville Formation is followed by the Moscow Formation represented by the Kashong Shale and Windom Shale. The Moscow Formation is followed by 2,500 feet of upper Devonian rocks in southwestern Erie County (in the vicinity of the Marilla site) consisting of the Genesee, Sonyea, West Falls, Java, Canadaway, Chodakoin, and Cattaraugus formations. These consist almost exclusively of shale members. The Canadaway Formation is by far the thickest (up to 1,000 feet) and underlies the southern third of Erie County. The Marilla site is underlain by the West Falls Formation.

Significant amounts of groundwater occur only in the overburden and in the lower bedrock units. The Camillus Shale contains numerous cavities formed by the dissolution of gypsum and is thus a very productive aquifer. The Onondaga, Akron, and Bertie dolomites and limestones contain water in bedding joints widened by dissolution. Vertical fractures in the limestone provide hydraulic connections among the many bedding planes.

Very little groundwater is found in the formations above the limestone unit. These formations, principally shale, are relatively impermeable. Some water transmission occurs in small fractures in the bedrock, but no wells of significant yield are found in these units. Groundwater in these regions is obtained mainly from glacial overburden deposits (LaSala 1968).

4.3 SITE GEOGRAPHY

4.3.1 Topography

The Marilla site is located within the Erie-Ontario lowland topographic province in the Town of Marilla, New York. The lowlands are characterized by a low, flat-lying topography resulting from pre-glacial erosion of the bedrock and subsequent topographic modification by glaciation. Consequently, the topography exhibits a variety of glacial depositional features as well as localized shoreline deposits (Broughton 1973).

The ground surface over the site varies in slope from 3 to 15% from southeast to northwest, respectively. The maximum elevation difference on site is approximately 100 feet. The southeastern portion of the site is approximately 1,140 feet above mean sea level; the elevation drops to 1,040 feet above mean sea level near the northwest corner of the site.

The site is located primarily in Zone C of the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA). Zone C represents areas of minimal flooding.

A narrow band of Zone B of the FIRM is included in the Marilla site along the intermittent tributary to the north of the landfill. Zone B represents areas between limits of a 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

4.3.2 Soils

Three soil types have been identified surrounding the landfill area within the boundaries of the property. These include the Darien silt loam, Chenango and Palmyra soils, and Schuyler silt loam.

The Darien silt loam occupies the eastern portion of the site and is usually found in areas with slopes between 0 and 8 percent. This soil consists of a surface and subsurface layer of silt loam, followed by a silty clay loam subsoil, and a firm, shaley, silty clay loam substratum. In the winter and spring, this soil has a perched seasonal high water table in the upper part of the subsoil. Permeability is moderately slow in the subsoil and slow in the substratum. Shaley rock fragments make up 5 to 15 percent of the surface layer (Owens, et al. 1986).

The Chenango and Palmyra soils occupy the central portion of the site. These soils are usually found in areas ranging in slope from 25 to 40 percent. These soils consist mainly of gravelly loam to gravelly loamy sand from surface to substratum. Permeability ranges from moderate or moderately rapid near the surface to very rapid with depth. Gravel makes up approximately 15 to 30 percent of the surface layer (Owens, et al. 1986).

The Schuyler silt loam occupies the western portion of the site and is usually found in areas with slopes of from 15 to 25 percent. This soil consists of a silt loam surface layer followed by a shaley silt loam subsoil and a very shaley silt loam substratum. This Schuyler soil has a perched seasonal high water table in the lower part of the subsoil from March through May. Permeability is moderate in the surface layers, moderate to moderately slow in the subsoil, and moderate to slow in the substratum. Shale fragments make up 5 to 15 percent of the surface layer (Owens et al. 1986).

Soil borings at the Marilla site generally indicate a topsoil consisting of a silt loam, sometimes gravelly, followed by a silty clay loam subsoil and shaley silt loam to silty clay loam substratum with occasional large rock fragments. Subsurface soil samples collected from MW-4B (at 10 to 12 feet and 12 to 14 feet) for grain size and grain size and Atterberg Limits, respectively, indicated that these soils were a clayey sand (SC) with a 10 to 13 percent water content. The 12- to 14-foot sample exhibited a liquid limit of 27, plastic limit of 18, and plastic index of 9 (see Appendix F). These soil samples are representative of the screened area of MW-4B.

4.4 SITE HYDROGEOLOGY

The information used to develop the discussion in this subsection includes the Phase II geophysical survey, two 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 F. Actual well locations are found on the site survey map in Appendix H.

4.4.1 Geology

Bedrock underlying the soils at the Marilla site varied in depth from 6 to 14 feet below ground surface from north to south across the site. This is based upon the boring logs of the newly installed wells and the boring logs from the existing wells. The well locations are shown in Figure 3-2. The top of bedrock is a very soft, fissile, thinly bedded, dark gray shale. It appears to be weathered to a thickness of approximately 12 feet (see Appendix F, MW-1C). The weathered zone is followed by a more competent rock--consisting of a thin layer of light gray shale, possibly calcareous--two feet of black shale exhibiting a vertical fracture between a depth of 19.25 and 19.55 feet below ground surface, and massive, bedded, medium to dark gray shale with occasional thinly bedded, soft, fissile zones and a vertical seam (possibly a fracture) between a depth of 20.35 and 20.75 feet in MW-1C. Drill log information is summarized in Table 4-1.

The shale is part of the West Falls Formation--specifically, the Rhinestreet Shale member--representing Upper Devonian rocks of the Seneca Group. The thickness of the West Falls Formation is approximately 400 to 520 feet. It contains black shale, gray shale, light gray siltstone and sandstone as well as many zones of calcareous concretions and nodules. Rhinestreet Shale ranges in thickness from 150 to 195 feet and thins eastward. This member is composed mainly of a fissile to massive black shale, slightly petroliferous, interbedded with medium gray to dark gray shale. There are also some thin gray siltstone and argillaceous limestone beds. Very large septarian concretions and small nodules ranging in thickness from a few inches to 6 feet in diameter can be found in numerous layers throughout this member. These concretions often contain pyrite or marcosite and veins of calcite, dolomite, barite, and siderite. The member also displays prominent jointing (Buehler and Tesmer 1963). The Angola Shale member ranges in thickness between 220 and 340 feet and thickens eastward. It is generally a medium to light gray shale with occasional black shale and thin siltstone beds. Above the Rhinestreet Shale is the Angola Shale member. The Angola Shale member has approximately 50 zones of calcareous concretions and nodules ranging in size from 1 to 12 inches in thickness and 1 to 3 feet in maximum dimensions.

The contact between the Rhinestreet Shale and Angola Shale members of the West Falls Formation runs through approximately the center of the Marilla site. The Rhine Street shale member underlies the north/northwest portion of the site and is known to be petroliferous. The Angola shale underlies the south/southeast portion of the site and is not known to be petroliferous.

4.4.2 Hydrology

Groundwater

Two additional groundwater monitoring wells were installed at the Marilla site as part of the Phase II investigation. These wells were installed to supplement the seven existing wells in order to determine groundwater flow direction in the overburden and to aid in assessing groundwater quality. The well locations are shown in Figure 3-2. New monitoring well construction data are presented in Table 4-2. Appendix C contains boring logs for all the wells, both new and existing. Water level data are shown in Table 4-3, and field measurements of chemical parameters of groundwater compiled during well sampling are shown in Table 4-4.

The wells in the vicinity of MW-4, MW-4A, and MW-4B appear to monitor two different water-bearing units. One appears to be an assumed seasonal perched water zone in the overburden, and the other is the bedrock aquifer. The existence of a perched water zone is suggested by the difference in elevation between the water level in the overburden well and the potentiometric surface in the nearby bedrock well. In addition, review of the seven well logs of the previously installed wells and water level measurements taken from all on-site wells in August 1989 supports the existence of a seasonal perched water zone. Substantial vertical hydraulic head differences were measured in August 1989 in the northern portions (MW-1A, MW-1B, and MW-1C) and in the southern portions (MW-4A and MW-4B) of the site. A difference of 16 feet was measured between the overburden well (MW-1A) and bedrock well (MW-1C). A difference of 51 feet was measured between the overburden wells (MW-4 and MW-4B) and the bedrock well (MW-4A). Wells MW-2 and MW-3 were installed during the summer of 1981 and were dry at completion. Water was not encountered during the drilling of boreholes MW-6 and MW-6A in the summer of 1989. This supports the statement made in Section 4.3.2 that the soils in the western and eastern portions of the site are documented to exhibit a seasonal perched water table. The central portion of the site has been disturbed (i.e., regraded and filled); therefore, as a result of landfilling, a continuous saturated layer in the overburden would not be expected. Also, the 1982 Engineer's Report and Plan of Operation prepared by Tallamy, Vankuren, Gertis and Associates (TVGA) states that bedrock lies at a shallow depth and there is a near surface perched water table. The seasonal perched and bedrock water zones may or may not be interconnected; however, insufficient information currently exists to make a determination. Review of the water level measurements taken by AES for the time period of December 1988 to September 1990 shows significant fluctuations of the water table elevations in MW-4A (bedrock) of 66 feet (see Appendix J). In well MW-4, the water level measurements were consistently found to fluctuate at a lesser amount of approximately 4 feet. Water level elevations in the other existing wells were relatively consistent. The boreholes for overburden wells MW-2, MW-3, and MW-4 drilled in August 1981, and MW-6 and MW-6A drilled in July 1989, were all dry at completion. If the shale is fractured particularly with vertical fractures, the potential for interconnection increases. Inconsistencies in well construction were found to exist in all other previously installed wells (see Table 4-1); therefore, the integrity of the data (i.e., water levels) resulting from these wells is considered questionable. A NYSDEC site visit on March 13, 1987 revealed that the wells were not equipped with protector pipes or locking caps.

Overburden water level data taken on August 15 and 16, 1989 were then contoured in order to determine direction of flow (see Figure 4-2). The contour map indicated a fairly steep gradient to the northwest toward the intermittent tributary to Little Buffalo Creek. The bedrock potentiometric surface was not contoured because information was only available from two on-site bedrock wells.

Surface Water

Surface water bodies located on and in the vicinity of the Marilla site include an east-west drainage ditch along the south side of the access road that turns north along the east side of the landfill, then west along the north side of the landfill before emptying into the intermittent tributary to Little Buffalo Creek. This tributary flows from east to west, north of the landfill. Another drainageway originates at the northwest corner of the landfill and flows north into the tributary, and another originates along the south side of the landfill and flows to the west-southwest. Little Buffalo Creek is a Class C(T) stream from Tributary No. 6 to Tributary No. 16, then it becomes Class C to the source. Class C(T) streams are trout-water streams. Class C streams are suitable for fishing and all other uses, except as sources of drinking, culinary, or food processing waters, or for primary contact recreation. Tributary No. 6 is several miles to the northwest of the site, and Tributary No. 16 is located at the junction of streams east of Three Rod Road and north of Liberia Road, on the East Aurora Quadrangle. Little Buffalo Creek is approximately 1.7 miles to the west of the site. Cayuga Creek, which is approximately 2.85 miles north of the site, is Class B from Tributary No. 6 to its source. Class B streams are suitable for primary contact recreation and any other uses except as sources for drinking, culinary, or food processing water (Evans 1990).

4.5 SITE CONTAMINATION ASSESSMENT

Analytical data for the site contamination assessment are presented in Appendix E. 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 inorganics, 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.

4.5.1 Groundwater

A total of eight groundwater samples were collected from eight of the nine monitoring wells and analyzed for TCL organics and inorganics. MW-2 was not sampled due to lack of groundwater in the well (i.e., dry well). Well MW-4A is considered hydraulically upgradient for the bedrock zone and MW-1B and MW-1C are the downgradient bedrock wells. Wells MW-4 and MW-4B are shallow upgradient wells and monitor the assumed seasonal perched water zone within the overburden, while MW-1A, MW-2, MW-3, and MW-5 are considered downgradient wells for this zone.

An examination of the shallow wells indicates that MW-4 and MW-4B are upgradient and flow is generally to the north-northwest. Benzene, toluene, and xylenes were not found in the shallow wells MW-4 and MW-4B when compared with the adjoining deep bedrock well MW-4A. BTX compounds may be natural constituents of some black shales. The inferred contact between the Rhinestreet shale (petroliferous) and Angola shale (non-petroliferous) members of the West Falls Formation traverses the center of the site (Buehler and Tesmer 1963). The monitoring well MW-4A is most likely completed in the Angola Shale which is known to be petroliferous. However, the monitoring wells located in the northern portion of the site (MW-1B and MW-1C) are most likely completed in the Rhinestreet Shale which is known to be petroliferous. BTX was not detected in these two other bedrock wells. The more probable BTX source is the previous waste oil tank location and the leaking drums adjacent to the equipment shed that is in close proximity to monitoring wells MW-4, MW-4A, and MW-4B, which are considered upgradient. Since limited information is available regarding the nature and extent of stained soils encountered in the general vicinity of the equipment shed during the drum removal and tank relocation, the following possible explanations of the presence of BTX in the bedrock groundwater and the absence of BTX in the groundwater from overburden wells (MW-4 and MW-4B) are presented below.

Since the assumed perched water table is suspected to be seasonal, leakage from the tank and/or leaking drums could have migrated downward through the overburden during a dry period. The tank was relocated and the leaking drums were removed. The stained soils were disposed of in the landfill. It is possible that clean fill was used to replace the excavated soils and any residual contamination (BTX) may have been "flushed out" during frequent seasonal water level fluctuations of both the overburden and the bedrock groundwater. Wells MW-4 and MW-4B are approximately 15 to 20 feet apart, with MW-4B being further east of the equipment shed (see Figure 3-2). Toluene was also detected in MW-4A and ethylbenzene in MW-1B when sampled by AES in June 1988 and March 1988, respectively. Phenols were also found to exist in all of the wells on site including bedrock well MW-4A. Phenols are commonly found in groundwater from monitoring wells at landfills. However, the presence of phenols in both the upgradient and downgradient monitoring wells suggests that monitoring wells MW-4, MW-4A, and MW-4B are situated near a possible suspect, or previously contaminated, area. The source of phenols could involve its use as a selective solvent for refining lubricating oils, dyes, and general disinfectants. Phenolic resins are also used as a fuel oil sludge inhibitor. It was also noted that the pH of the groundwater from MW-4A ranged from 11.34 to 12.60 during AES sampling events from December 1988 to September 1990. High pH values could be due to grout contamination of the well; however, no evidence of such contamination was observed during well sampling.

No TCL organic compounds were detected above the quantifiable detection limits during Phase II sampling in the shallow wells and drill water. Detection limits for the base/neutral and acid extractable fraction of MW-5 should be considered estimates because the sample was analyzed well beyond its standard holding time. Ten organic compounds were detected in the upgradient bedrock well, MW-4A (see Table 4-5). These compounds included acetone, benzene, toluene, ethylbenzene, xylenes (total), phenols (including 2-methylphenol and 2,4-dimethylphenol), benzyl alcohol, and chrysene. Toluene and total xylenes exceeded New York State drinking water standards for Class GA water in MW-4A.

In summary, the presence of these organic compounds in the bedrock well (MW-4A) may be related to the waste oil contamination in the vicinity of the equipment shed in 1983 (NYSDEC 1987) that was able to migrate downward during seasonally dry perched water intervals.

Seventeen metals were detected in the unfiltered bedrock groundwater, and 18 were detected in the shallow overburden groundwater. Three of these total metals from the bedrock wells (barium, iron, and manganese) and five from the shallow wells (arsenic, chromium, iron, lead, and manganese) exceeded maximum concentration limits (MCLs) for Class GA groundwater. Only three of these metals (barium, iron, and manganese), for both shallow and bedrock wells, exceeded MCLs for dissolved concentrations (see Table 4-6). High levels of dissolved iron and manganese were detected in both upgradient and downgradient wells; the drill water sample had high levels of manganese; and barium was only detected in downgradient wells. The source of the drill water was the Town of Marilla Fire Department. These results coincide with previous analyses conducted between 1981 and 1988, where barium, iron, manganese, and occasionally cadmium, chromium, and lead exceeded drinking water standards in the downgradient wells. Barium, iron, manganese, and lead were also detected in the upgradient wells, but in concentrations significantly lower than in the downgradient wells.

High levels of calcium, potassium, and sodium and low levels of beryllium (only in MW-5), cobalt, copper, mercury, nickel, vanadium, zinc, and cyanide (only in MW-4A) were also detected in the groundwater. None of these compounds exceeded applicable regulatory standards (see Table 4-6).

4.5.2 Surface Water/Sediment

Four of the five proposed surface water/sediment samples were collected from the Marilla site. The upgradient sample SW/SWS-1 was not initially collected because the drainageway indicated in the work plan did not exist in the vicinity of the site. The proposed location was moved to the south side of the access road near the entrance on Eastwood Road, but this location was dry during all sampling efforts. Samples SW/SWS-2, SW/SWS-4, and SW/SWS-5 are considered downgradient, while SW/SWS-3 is considered upgradient.

No TCL organic compounds were detected above quantifiable detection limits in the water samples, but three TCL organic compounds were detected in one of the downgradient sediment samples (SWS-5). These compounds included fluoranthene, pyrene, and benzo(k)fluoranthene, all of which are polynuclear aromatic hydrocarbons (PAHs) (see Table 4-5).

Sixteen metals were detected in the surface water samples. Concentrations of aluminum, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium, and zinc in downgradient samples exceeded Class AA surface water standards for human consumption and/or aquatic animals. Class AA surface water is best suited for drinking water and culinary or food-processing purposes (NYSDEC 1986). Only concentrations of aluminum and iron in the upgradient sample (SW-3) exceeded Class AA standards (see Table 4-7). Therefore, the elevated concentrations of the other metals in the downgradient samples may be attributed to contamination from the landfill.

High levels of calcium, potassium, and sodium and low levels of arsenic (only in SW-4), barium, beryllium, vanadium, and zinc were also detected in the surface water samples. None of these levels exceeded applicable regulatory standards.

Seventeen metals were detected in the sediment samples, but none were found at levels above the maximum value of naturally occurring ranges of metals in soils in the eastern United States (Shacklette and Boerngen 1984). Concentration levels of calcium, iron, magnesium, nickel, and zinc were all above the arithmetic mean, and aluminum, barium, beryllium, chromium, and vanadium were all below the arithmetic mean of such soils (see Table 4-7) for both the upgradient and downgradient samples.

4.5.3 Subsurface and Surface Soil

Three subsurface soil samples from the monitoring well borings and three surface soil samples were collected from the Marilla site. No TCL organic compounds were detected above quantifiable detection limits in the surface and subsurface soil samples. Nineteen metals were detected in the subsurface soil samples and 18 in the surface soil samples at levels below the maximum value of the common range of metals in soils for the eastern United States (Shacklette and Boerngen 1984). Concentration levels of calcium, iron, magnesium, nickel, and zinc were all above the arithmetic mean, and aluminum, barium, beryllium, chromium, and vanadium were all below the arithmetic mean for such soils (see Table 4-8). These metals were detected in both upgradient and downgradient samples, except for cadmium, which was found only in SS-2 (downgradient); selenium, which was found only in MW-4B at 8 to 10 feet (upgradient); and mercury, which was found only in MW-1C at 4 to 6 feet (downgradient). Mercury and selenium levels were slightly above the arithmetic mean for soils.

4.5.4 Leachate

Leachate samples were collected from three locations: the northwest corner (L-1), the north slope (L-2), and the west side of the landfill (L-3). Samples L-1 and L-2 were liquid (mostly water) samples, and L-3 was leachate-stained soil (due to the low liquid volume present at the time of sampling).

No TCL organic compounds were detected in quantifiable limits in the two liquid leachate samples, but five organic compounds were detected in the leachate-stained soil. These compounds included 2-butanone, 2-hexanone, 4-methyl phenol, benzoic acid, and hexadecanoic acid (see Table 4-5).

Fifteen metals were detected in the liquid samples and 17 in the leachate-stained soil sample. Six metals in the liquid samples (aluminum, iron, manganese, nickel, vanadium, and zinc) exceeded Class AA surface water standards (see Table 4-7), and all metals in the sediment sample were below the maximum value in the common ranges for metals in soils in the eastern United States (Shacklette and Boerngen 1984). Concentrations of calcium, iron, magnesium, nickel, and zinc were all above the arithmetic mean for such soils, while aluminum, barium, beryllium, chromium, and vanadium were all below it (see Table 4-8).

4.5.5 Contamination Assessment Summary

The groundwater sampled in the overburden did not contain any detectable organic compounds, though elevated levels of dissolved iron and manganese above MCLs were detected in both upgradient and downgradient wells. Therefore, these analytes may be natural constituents of the groundwater in the vicinity of the site. This assumption is also supported by evidence of high manganese in the drill water tested. Drill water was drawn from a municipal water well at the Fire Department in the Town of Marilla. Low levels of beryllium were detected in downgradient well MW-5 only.

Ten organic compounds were detected in the bedrock aquifer, all in a single sample taken from the upgradient bedrock well (MW-4A). This well is located in the vicinity of the equipment shed where oil allegedly spilled from leaking drums in 1983. This is considered to be a potential source of the organic contamination in MW-4A. The bedrock aquifer also exhibited concentrations of dissolved iron and manganese in both upgradient and downgradient wells, while dissolved barium was only detected in the downgradient wells. The presence of barium may be the result of contamination by landfill contents.

The surface water, both upgradient and downgradient, did not contain any detectable organic compounds. PAHs, however, were detected in the sediment sampled furthest downstream, to the northwest of the landfill. This PAH contamination may be attributed to the contents of the landfill. Concentrations of aluminum, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium, and zinc in downgradient water samples exceeded Class AA surface water standards for humans and/or aquatic animals. Only aluminum and iron exceeded these standards in the upgradient sample, and, thus, the elevated concentrations of the other metals may be attributed to the landfill contents. Analytes within the upgradient and downgradient sediment samples were all within the common range for metals in soils of the eastern United States.

The surface and subsurface soils did not contain any detectable organic compounds. Several analyte metals were detected below common ranges of soils in the eastern United States in both upgradient and downgradient samples. However, selenium was detected at 8 to 10 feet in upgradient subsurface soil sample MW-4B, cadmium in downgradient surface soil sample SS-2, and mercury at 4 to 6 feet in downgradient subsurface soil sample MW-1C at levels above the common ranges.

Leachate tested from the Marilla site indicated the presence of the following organic compounds: 2-butanone, 2-hexanone, 4-methylphenol, benzoic acid, and 2-hexadecanoic acid. These compounds were detected in the leachate-stained soil on the west side of the landfill. Leachate samples on the north and northwest slopes of the landfill did not contain any detectable TCL organic compounds. Concentrations of aluminum, iron, manganese, nickel, vanadium, and zinc in the liquid samples exceeded Class AA surface water standards. All metal analytes in the leachate-stained soils were within the common range of metals in soils of the eastern United States.

4.6 RECOMMENDATIONS

The contaminants migrating from the Marilla Landfill may pose a threat to human health and the environment through direct contact with leachate and from surface water entering the intermittent tributary to Little Buffalo Creek. The contaminants detected are consistent with those expected based upon the site's former usage as a municipal solid waste landfill. Considering these facts and in the absence of documented hazardous waste disposal at the site, the site could be referred to the NYSDEC's Division of Solid Waste for appropriate action. The following measures are recommended for consideration to mitigate the risks associated with this site:

- A clay cap covered by topsoils can be installed over the top of the landfill and revegetation undertaken to prevent erosion and further leachate outbreaks. This may have been done since the start of this investigation;
- A leachate collection system could be installed to prevent runoff from entering the adjacent stream;
- Fencing and adequate signs should be installed around the perimeter of the site due to easy public access and close proximity of the adjacent town park to the site; and
- Establishment of a groundwater and surface water monitoring program that targets the contaminants of concern (i.e., BTX compounds and metals) should be implemented. The adjacent town park contains a small pond, and sampling of the surface water/sediment is recommended since it is downgradient to the site.

In summary, proper closure under 6 NYCRR Part 360 including an upgrade in cap/capping and long-term monitoring is recommended. Proper closure would reduce contaminant migration at this site, thus alleviating or eliminating any threat caused by the landfill.

Table 4-1

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*** (feet)	Screened Interval (feet below ground surface)	Date Drilled	Comments
MW-1 (abandoned) Bedrock	7.5	NA	NA	62.7**	--	7/81	Well log has no information about a screen being installed. Construction data shows casing to the bottom of the hole. MW-1 was grouted in 1988 because it was dry.
MW-1A (existing) Overburden	NA	NA	NA	9.30	1.8 - 6.1	3/88	Grout did not extend to 3 feet below ground surface (sand at 0.8 foot, screen at 1.8 feet).
MW-1B (existing) Bedrock	7.5	1,047.88	9.5	18.75	12.0 - 16.6	3/88	The water level at completion was 1 foot above screened interval.
MW-1C (new) Bedrock	6.35	1,045.05	11.85	29.40	8.0 - 14.0 (open hole)	7/89	
MW-2 (existing) Overburden	9.8	1,087.8	NA	10.30	7.5 - 9.5	8/81	No water at completion.
MW-3 (existing) Overburden	7.0	1,102.8	NA	7.75	6.0 7.0	8/81	
MW-4 (existing) Overburden	13.3	1,119.4	NA	12.46	11.3 - 13.3	8/81	

[UZ]YN1080:D2825/2367/2

Table 4-1 (Cont.)

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*** (feet)	Screened Interval (feet below ground surface)	Date Drilled	Comments
MW-4A (existing) Bedrock	12.8	1,118.41	15.2	96.75	90.8 - 95.1	3/88	Screen set below several fracture zones not in well log.
MW-4B (new) Overburden	14.5	1,118.3	NA	14.72	6.0 - 13.0	7/89	
MW-5 (existing) Overburden	12.0	1,106.5	NA	14.10	9.5 - 11.5	8/81	Bottom of screen was installed at the depth where water was encountered during drilling.
MW-6 (abandoned) Overburden	8.6	NA	NA	NA	NA	7/89	No well installed.
MW-6A (abandoned) Overburden	NA	NA	NA	NA	NA	7/89	No well installed.

[UZ]YN1080:D2825/2367/2

*Information based upon newly installed wells, drill logs of existing wells from Phase I Investigation Report, and ground elevations measured during this investigation.
**Information from Drill Logs indicated total depth of borehole from ground surface.
***Total depth of well may not reflect total depth of borehole as indicated on the drill logs because the well may not have been set at the bottom of the initial borehole.
NA = not available

Table 4-2

MONITORING WELL CONSTRUCTION DATA

Well	Opening	Feet of Screen or Open Hole	Feet of Riser	Thickness of Bentonite (feet)	Total Depth of Well (feet)	Stick-up Height (feet)
MW-1C	Open hole	14	16	NA	29.4	2
MW-4B	Screen	7	8	1	14.72	2

[UZ]YN1080:D2825, #2368, PM = 15

NA = not applicable.

Table 4-3

WATER LEVEL DATA

Well	Date Measured	Water Level From T.O.C.* (feet)	Elevations above MSL		
			Elevation at T.O.C.	Grade Elevation	Water Level Elevation
MW-1A	8/15/89	3.8	1,059.88	1,056.9	1,056.08
MW-1B	8/15/89	14.55	1,057.43	1,055.4	1042.88
MW-1C	8/15/89	13.05	1,053.19	1,051.4	1,040.14
MW-2	8/16/89	Dry	1,099.87	1,097.6	Dry
MW-3	8/16/89	6.8	1,111.68	1,109.8	1,104.88
MW-4	8/15/89	10.38	1,134.26	1,132.7	1,123.88
MW-4A	8/15/89	60.48	1,133.61	1,131.4	1,073.13
MW-4B	8/15/89	10.81	1,134.62	1,132.8	1,123.81
MW-5	8/16/89	8.2	1,119.88	1,118.5	1,111.68

[UZ]YN1080:D2825, #2369, PM = 22

*T.O.C. = Top of PVC casing

Note: Elevations are relative to a railroad spike set in the equipment shed by TVGA. Elevation = 1,135.95'.

Table 4-4

FIELD MEASUREMENTS OF GROUNDWATER CHEMICAL PARAMETERS TAKEN DURING WELL SAMPLING

Well	Date	Time	pH	Temperature °F	Conductivity (micromhos)	Nephelometric Turbidity Units (NTU)
MW-1A	8/15/89	1705	5.79	64.9	2,890	190
MW-1B	8/15/89	1700	5.96	63.1	5,100	166
MW-1C	8/15/89	1703	6.33	63.6	3,590	14
MW-2	8/16/89	1000	NA	NA	NA	NA
MW-3	8/16/89	0915	6.98	73.8	1,560	757
MW-4	8/15/89	1415	6.89	72.0	537.0	141
MW-4A	8/15/89	1440	12.31	66.3	778.0	76
MW-4B	8/15/89	1345	7.38	71.2	381.0	404
MW-5	8/16/89	1050	5.15	68.5	880	>1,000

[UZ]YN1080:D2825, #2370, PM = 17

NA = Not available (Dry well)

Table 4-5

ORGANIC ANALYSES SUMMARY

Compound Detected	Concentration	Sample	NYSDEC Class GA Standards[1] Groundwater (µg/L)
Volatile Organics			
Acetone	250 (E) µg/L	MW-4A	
	110 µg/L	MW-4A MS	
	130 µg/L	MW-4A MSD	50
Benzene	77 µg/l	MW-4A[3]	Not detectable
Toluene	160 µg/l	MW-4A[3]	5
Ethylbenzene	24 µg/l	MW-4A	5
	22 µg/l	MW-4A MS, MW-4A MSD	
Xylenes (total)	230 (E) µg/l	MW-4A	15
	200 µg/l	MW-4A MS	
	210 (E) µg/l	MWW-4A MSD	
2-Butanone	2,900 µg/l	L-3	50
	3,700 µg/l	L-3MS	
	3,200 µg/l	L-3MSD	
2-Hexanone	420 (J) µg/kg	L-3	50[2]
	440 (J) µg/kg	L-3 MS	
	460 (J) µg/kg	L-3 MSD	
BNAs			
Total Phenols	7 (J) µg/l	MW-4A	1
Benzyl Alcohol	5 (J) µg/l	MW-4A	50
Chrysene	63 µg/l	MW-4A	50
4-methylphenol	10,000 µg/kg	L-3	50
	9,200 µg/kg	L-3MS	
	8,400 µg/kg	L-3MSD	
Benzoic Acid	7,800 µg/kg	L-3	50
	8,200 µg/kg	L-3MS	
	7,600 µg/kg	L-3MSD	
Hexadecanoic Acid	770 (J) µg/kg	L-3	50
Total PAHs[4]	350 (J) µg/kg	SWS-5	

[UZ]YN1080:D2825/5543/19

[1]Source: NYSDEC New York State Ambient Water Quality Standards and Guidance Values, 1990.
[2]Guidance Value.
[3]Benzene and toluene were not quantified in MS/MSD samples because they are spiking compounds.
[4]PAHs = Total of all polynuclear aromatic hydrocarbon compounds.

E = Concentrations exceeded calibration range of the GC/MS
J = Estimated value for tentatively identified compounds

Table 4-6

GROUNDWATER INORGANIC ANALYSES

Inorganic Detected	Range ($\mu g/l$)	NYSDEC Class GA Groundwater Standards ($\mu g/l$)	Sample Exceeding Standards ($\mu g/l$)		
			Location	Total Metals	Dissolved Metals
Aluminum	ND - 467,000	No Regulatory Limit			
Antimony	ND	No Regulatory Limit			
Arsenic	ND - 223	25	MW-4	49.4	ND
			MW-5	223	ND
Barium	ND - 5420	1,000	MW-1B	5,420	5,330
			MW-1C	3,740	NA
Beryllium	ND - 13.6	No Regulatory Limit			
Cadmium	ND	10			
Calcium	21,100 - 828,000	No Regulatory Limit			
Chromium	ND - 597	50	MW-3	89.9	ND
			MW-4	148	ND
			MW-4B	63.3	ND
			MW-5	597	ND
Cobalt	ND - 371	No Regulatory Limit			
Copper	ND - 897	1,000			
Iron	62 - 1,200,000	300	MW-1A	12,100	262
			MW-1B	46,400	7,890
			MW-1C	7,360	NA
			MW-3	121,000	85
			MW-4	270,000	199
			MW-4A	30,200	62
			MW-5	1,200,000	691
Lead	ND - 649	25	MW-1B	32.8	ND
			MW-3	129	ND
			MW-4	182	ND
			MW-4B	45.6	ND
			MW-5	649	ND

[UZ]YN1080:D2825/2371/23

Table 4-6 (Cont.)

Inorganic Detected	Range (µg/l)	NYSDEC Class GA Groundwater Standards[1] (µg/l)	Sample Exceeding Standards (µg/l)		
			Location	Total Metals	Dissolved Metals
Magnesium	ND - 263,000	No Regulatory Limit			
Manganese	ND - 8,260	300	MW-1A	1,140	927
			MW-1B	3,520	3,150
			MW-1C	1,400	NA
			MW-3	4,250	587
			MW-4	3,540	193
			MW-4A	370	ND
			MW-4B	1,220	167
			MW-5	8,260	934
			Drillwater	180	NA
Mercury	ND - 1.46	2			
Nickel	ND - 1,030	No Regulatory Limit			
Potassium	346 - 19,800	No Regulatory Limit			
Silver	ND	50			
Selenium	ND	20			
Sodium	3,850 - 2,920,000	No Regulatory Limit			
Thallium	ND	No Regulatory Limit			
Vanadium	ND - 568	No Regulatory Limit			
Zinc	ND - 1,910	5,000			
Cyanide	ND - 10	200			

[UZ]YN1080:D2825/2371/23

[1]Source: NYSDEC 1986 Water Quality Regulations

ND = Non-detected
NA = Not available because sample was below 50 NTUs
GA = Water best suited as a potable water supply.

Table 4-7

SURFACE WATER/LEACHATE INORGANIC ANALYSES

Inorganic Detected	Range ($\mu g/l$)	NYSDEC Regulatory Standard for Class AA Surface Water[1] (H/A)[2] ($\mu g/l$)	Samples Exceeding Standard	
			Location	Level $\mu g/l$
Aluminum	1,420 - 51,400	100 (A) NA	L-1	3,450
			L-2	14,100
			SW-2	5,580
			SW-3	1,420
			SW-3D	3,160
			SW-4	51,400
			SW-5	1,730
Arsenic	ND - 10.7	50 (H) 190 (dissolved form) (A)		
Barium	2 - 539	1,000 (H)		
Beryllium	ND - 2.7	11[3] or 1,100[4] (A) NA		
Calcium	8,580 - 30,200	NA		
Chromium	ND - 71.7	50 (H) EXP (0.819 [ln (ppm hardness)] + 1.561) (A)	SW-4	71.7
Cobalt	ND - 41	5 (A)	SW-4	41
Copper	ND - 445	200 (H) EXP (0.8545 [ln (ppm hardness)] - 1.465) (A)	SW-2	445
Iron	2,290 - 94,100	300 (H + A)	L-1	4,840
			L-2	21,800
			SW-2	22,100
			SW-3	2,290
			SW-3D	5,140
			SW-4	94,100
			SW-5	2,630
Lead	ND - 87.7	50 (H) EXP (1.26 [ln (ppm hardness)] - 4.661) (A)	SW-4	87.7

[UZ]YN1080:D2825/2378/20

Table 4-7 (Cont.)

Inorganic Detected	Range (µg/l)	NYSDEC Regulatory Standard for Class AA Surface Water[1] (H/A)[2] (µg/l)	Samples Exceeding Standard	
			Location	Level µg/l
Magnesium	2,180 - 19,900	35,000 (H)		
Manganese	72 - 4,590	300 (H)	L-2 SW-2 SW-4	40 472 4,590
Nickel	ND - 275	EXP (0.76 [ln (ppm hardness)] + 16) (A) NA	L-2 SW-2 SW-4	29.7 275 132
Potassium	1,170 - 7,480	NA		
Sodium	2,050 - 145,000	NA		
Vanadium	ND - 84	14 (A) NA	L-2 SW-4	84.5 84
Zinc	21.5 - 421	300 (H) 30 (A)	L-2 SW-2 SW-4	84.5 102 421

[UZ]YN1080:D2825/2378/18

[1]Source: NYSDEC 1986 Water Quality Regulations (Class AA water)
[2]H = Human
A = Aquatic
[3]When hardness is less than or equal to 75 ppm
[4]When hardness is greater than or equal to 75 ppm

NA = No standard
ND = Non-detected
AA = Water best suited as a potable water supply

Table 4-8

SOIL/SEDIMENT AND LEACHATE-STAINED SOIL INORGANIC ANALYSIS

Inorganics Detected	Range (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	6,030 - 19,700	7,000 - >100,000	57,000	Levels are all below the arithmetic mean		
Antimony	ND	<1 - 8.8	0.76	Not detected		
Arsenic	ND - 9.5	<1.1 - 73	7.4	Levels are close to the arithmetic mean		
Barium	26.7 - 167	10 - 1,500	420	Levels are all below the arithmetic mean		
Beryllium	ND - 1.1	<1 - 7	0.85	Levels are all below the arithmetic mean		
Cadmium	ND - 1.6	No guideline		Only detected in SS-2		
Calcium	1,020 - 19,000	10 - 280,000	630	Levels are all above the arithmetic mean		
Chromium	9.5 - 26.8	1 - 1,000	52	Levels are all below the arithmetic mean		
Cobalt	6 - 17	<0.1 - 70	9.2	Levels are often close to the arithmetic mean		
Copper	17.8 - 36.6	<1 - 700	22	Levels are often close to the arithmetic mean		
Cyanide	ND	No guideline	—	Not detected		
Iron	17,700 - 42,300	10 - >100,000	2,500	Levels are all greater than the arithmetic mean		
Lead	2.2 - 36	<10 - 300	17	Levels are close to the arithmetic mean		
Magnesium	3,150 - 7,640	50 - 50,000	460	Levels are all above the arithmetic mean		
Manganese	195 - 2,060	<2 - 7,000	640	Levels are often below the arithmetic mean		
Mercury	ND - 0.14	0.01 - 3.4	0.12	Only detected in Sample MW-1C (4 - 6 ft); close to the arithmetic mean		

[UZ]YN1080:D2825/2379/4

Table 4-8 (Cont.)

Inorganics Detected	Range (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 - 45.4	<5 - 700	18	Levels are all above the arithmetic mean		
Potassium	976 - 2,320	50 - 3,700	--	Levels are often in the medium range		
Selenium	ND - 1.5	<0.1 - 3.9	0.45	Only detected in MW-4B (8 - 10 ft)		
Silver	ND	No guideline	--	Not detected		
Sodium	67.9 - 1,780	<500 - 50,000	780	Levels are often below the arithmetic mean		
Thallium	ND	2.2 - 23	8.6	Not detected		
Vanadium	14 - 30.5	<7 - 300	66	Levels were all below the arithmetic mean		
Zinc	55.5 - 158	<5 - 2,900	52	Levels were all slightly above the arithmetic mean		

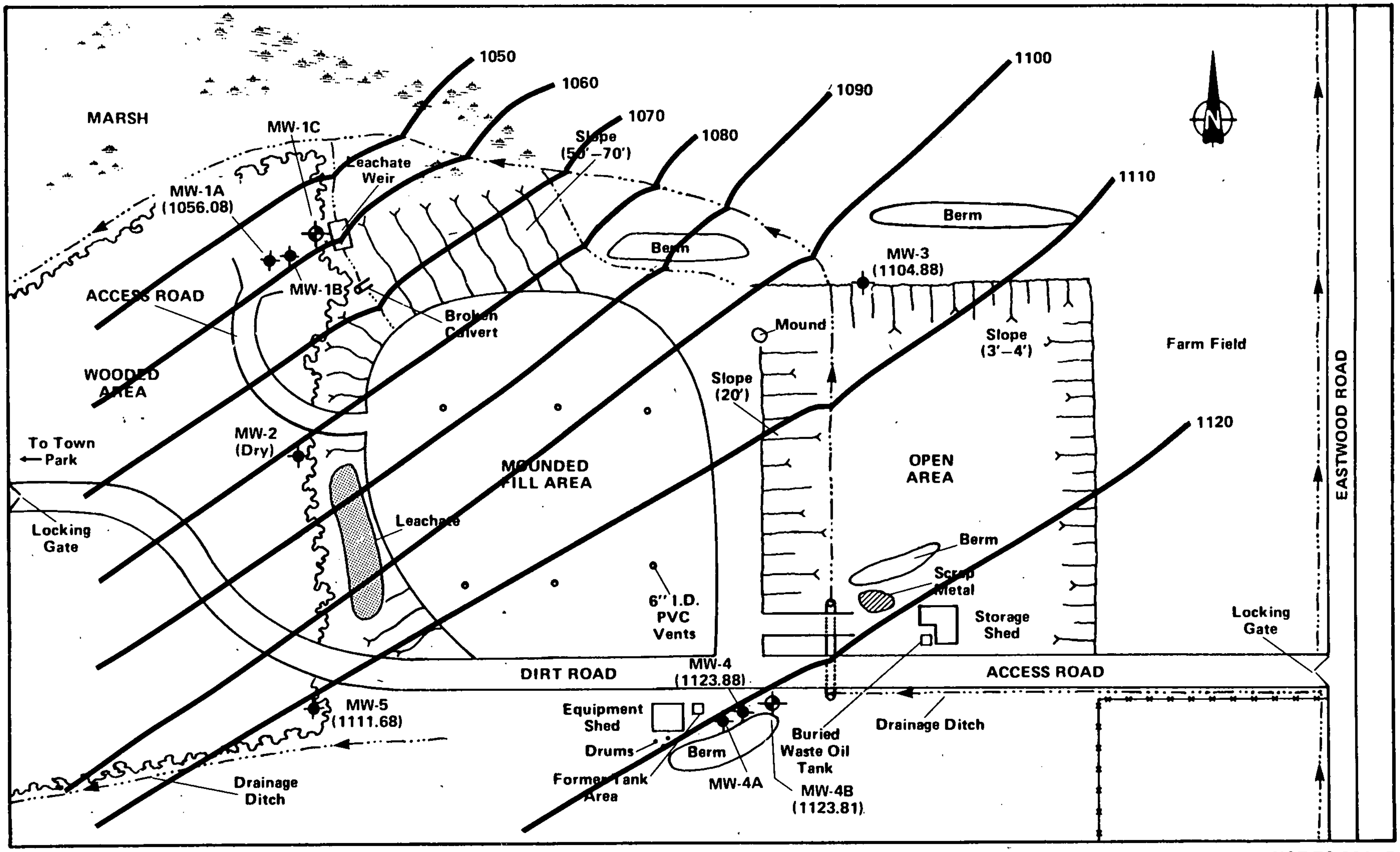
[1]Shacklette and Boerngen 1984.

ND = Non-detected

[UZ]YN1080:D2825/2379/4

System	Series	Group	Formation	Thickness in feet	Section	
Devonian	Upper	Conneaut Group of Cadwick (1934)		500		Shale, siltstone, and fine-grained sandstone. Top is missing in area.
Devonian	Upper	Canadaway Group of Chadwick (1933)	Undivided	600		Gray shale and siltstone, interbedded. (Section broken to save space.)
Devonian	Upper	Canadaway Group of Chadwick (1933)	Perrysburg	400-450		Gray to black shale and gray siltstone containing many zones of calcareous concretions. Lower 100 feet of formation is olive-gray to black shale and interbedded gray shale containing shaley concretions and pyrite.
Devonian	Upper		Java	90-115		Greenish-gray to black shale and some interbedded limestone and zones of calcareous nodules. Small masses of pyrite occur in the lower part.
Devonian	Upper		West Falls	400-520		Black and gray shale and light-gray siltstone and sandstone. The lower part is petroliferous. Throughout the formation are numerous zones of calcareous concretions, some of which contain pyrite and marcasite.
Devonian	Upper		Sonyea	45-85		Olive-gray to black shale.
Devonian	Middle		Genesee	10-20		Dark-gray to black shale and dark-gray limestone. Beds of nodular pyrite are at base.
Devonian	Middle	Hamilton	Moscow Shale	12-55		Gray, soft shale
Devonian	Middle	Hamilton	Ludlowville Shale	65-130		Gray, soft fissile shale and limestone beds at top and bottom.
Devonian	Middle	Hamilton	Skaneateles Shale	60-90		Olive-gray, gray and black, fissile shale, and some calcareous beds and pyrite. Gray limestone, about 10 feet thick is at base.
Devonian	Middle	Hamilton	Marcellus Shale	30-55		Black, dense fissile shale.
Devonian	Middle	Unconformity	Onondaga Limestone	108		Gray, limestone and cherty limestone.
Silurian	Cayuga	Unconformity	Akron Dolomite	8		Greenish-gray and buff fine-grained dolomite.
Silurian	Cayuga	Salina	Bertie Limestone	50-60		Gray and brown dolomite and some interbedded shale.
Silurian	Cayuga	Salina	Camillus Shale	400		Gray, red, and green thin-bedded shale and massive mudstone. Gypsum occurs in beds and lenses as much as 5 feet thick. Subsurface information indicates dolomite (or perhaps, more correctly, magnesium-lime mudrock) is interbedded with the shale (shown schematically in section). South of the outcrop area, at depth, the formation contains thick salt beds.
Silurian	Niagara		Lockport Dolomite	150		Dark-gray to brown, massive to thin-bedded dolomite, locally containing algal reef and gypsum nodules. At the base are light-gray limestone (Gasport Limestone Member) and gray shaley dolomite (DeCew Limestone Member).
Silurian	Niagara	Clinton	Rochester Shale	60		Dark-gray calcareous shale.

Figure 4-1
BEDROCK UNITS OF THE ERIE-NIAGARA BASIN



KEY:

- Groundwater Contour
- Existing Well with Shallow Groundwater Elevation
- New Monitoring Well with Shallow Groundwater Elevation
- Top of Slope

Figure 4–2
SHALLOW GROUNDWATER ELEVATION CONTOUR MAP

5

Narrative

5.1

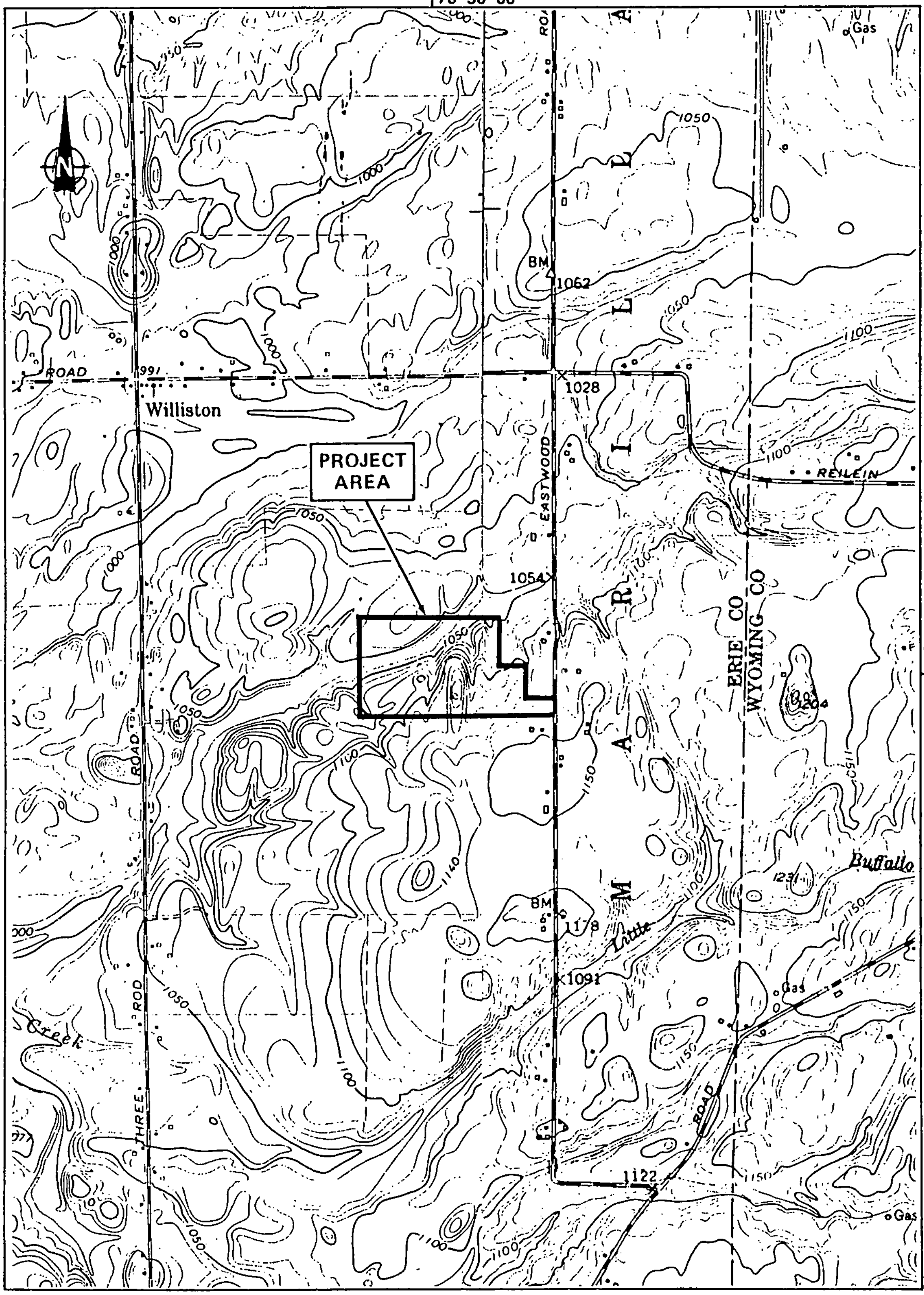
5. FINAL APPLICATION OF HAZARD RANKING SYSTEM

5.1 NARRATIVE SUMMARY

The Town of Marilla Landfill site is situated within a 41-acre parcel located in the Town of Marilla, Erie County, New York (see Figure 5-1). The site is approximately one mile south of Williston Road between Eastwood Road and Three Rod Road, east of the Town of Marilla. The facility was active between 1963 and 1988. The Town of Marilla is the current owner. Oscar Tankesley owned the facility prior to 1963.

Approximately 95,000 cubic yards of municipal waste was disposed of on the site by the Town of Marilla using the area and trench-and-backfill methods on 10 of the 41 acres. According to tests conducted by Ecology and Environment Engineering, P.C., the bedrock aquifer is contaminated with low levels of benzene, toluene, ethylbenzene, xylenes, phenols, chrysene, barium, iron, and manganese; the shallow groundwater is contaminated with iron and manganese; the surface water is contaminated with aluminum, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium, and zinc; the surface water sediment is contaminated with PAHs; the subsurface soil is contaminated with 1,1,2,2-tetrachloroethane; and the surface soil is contaminated with 2-butanone, 2-hexanone, 4-methylphenol, benzoic acid, and hexadecanoic acid. The source of the BTX compounds are currently unknown but are believed to be from the presence of a former underground storage tank adjacent to the equipment shed. Insufficient evidence is available to support this hypothesis due to the absence of the above-mentioned BTX compounds in downgradient wells.

Approximately 382 people are living within a 1-mile radius (NYSDEC 1988) and are potentially affected by direct contact and possible groundwater contamination.



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles; East Aurora, N.Y. 1965; Cowlesville, N.Y. 1949.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 5-1
LOCATION MAP: TOWN OF MARILLA LANDFILL

FIGURE 1

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

Facility Name: Town of Marilla Landfill

Location: Eastwood Road, Town of Marilla, Erie County, New York

EPA Region: II

Person(s) in Charge of Facility: Dave Pierce, Town of Marilla Superintendent of Highways

1740 Two Rod Road

Marilla, New York 14102

Name of Reviewer: Chris Lewicki   Date: 2/2/90

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 Town of Marilla site is an inactive 10-acre municipal landfill. It was in operation from 1965 through December 31, 1988. Capping of the landfill began in the late spring and summer of 1989. Leachate outbreaks have been a continuing problem at the landfill. No hazardous waste is known to have been disposed of on the site. However, benzene and phenol were detected at significant levels in an upgradient monitoring well, and total lead was detected at significant levels in both the upgradient and downgradient wells. Lead, chromium, and manganese were all detected at significant levels in the surface water downgradient of the site.

Scores: S_M = 38.43 (S = 62.2 S = 10.63 S = 0)

S_{FE} = Not scored

S_{DC} = 25

*Alternatiave score based on results of dissolved metals in groundwater, not total metals.

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	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	1	3	
Permeability of the Unsaturated Zone	0 1 2 3	1	2	3	
Physical State	0 1 2 3	1	1	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	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	35	40	
	Total Targets Score		44	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			37,620	57,330	
7 Divide line 6 by 57,330 and multiply by 100	S_{gw} = 65.62				

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1	45	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	2	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	1	3	
	Total Route Characteristics Score		11	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	6	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		8	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			6,840	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} = 10.63			

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			0	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})	65.62	4,305.98
Surface Water Route Score (S_{sw})	10.63	112.99
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		4,418.98
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		66.48
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		38.43

FIGURE 10
WORKSHEET FOR COMPUTING S_M

NOT SCORED

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	15	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	8	20	
Distance to a Critical Habitat	0 1 2 3.	4	0	12	
Total Targets Score			8	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			5,400	21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	25		

FIGURE 12
DIRECT CONTACT WORK SHEET

DOCUMENTATION RECORDS

FOR

HAZARD RANKING SYSTEM

Instructions: As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,320 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: Town of Marilla Landfill

Location: Eastwood Road, Town of Marilla, Erie County, New York

Date Scored: February 2, 1990

Person Scoring: Chris Lewicki

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

NYSDEC Phase I Investigation at the Town of Marilla Landfill, January, 1988
Ecology and Environment Engineering, P.C. Site Inspection Report, May 9, 1989
Ecology and Environment Engineering, P.C. Data Summary Report
DOH Files
ECDEP Files

Factors Not Scored Due to Insufficient Information:

None

Comments or Qualifications:

[UZ]YN1080:D2825, #2509

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (3 maximum):

Barium, chromium, and lead were detected during the Phase II investigation.

Rationale for attributing the contaminants to the facility:

Contaminants were found on site in monitoring wells. Barium and lead were found in both upgradient and downgradient wells; however, the concentration of lead was 3.5 times higher downgradient, chromium was 4 times higher downgradient, and barium was more than 5 times greater downgradient.
Score = 45
Ref. 8

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

Shale bedrock aquifer underlying perched water zone
Ref. 16

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

58 feet
Ref. 16

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

Depth of disposal cells were approximately 10 feet.
Ref. 17
Assigned value = 2

Net Precipitation

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

32 inches
Ref. 13

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

27 inches
Ref. 13

Net precipitation (subtract the above figures):

5 inches
Assigned value = 1

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Silty clay loams

Permeability associated with soil type:

10^{-3} cm/sec to 10^{-5} cm/sec
Ref. 14
Assigned value = 2

Physical State

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

Solid, unconsolidated municipal refuse
Assigned value = 1
Ref. 1

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Landfill: No liner
Assigned value = 3
Ref. 1, 19

Method with highest score:

Same as above.

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Barium, chromium, and lead

Compound with highest score:

Barium score = 18. This is for both total and dissolved metals.

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.):

There were no hazardous waste disposed on site; however, domestic and commercial wastes contain small quantities of hazardous materials. An oil spill occurred in 1983.
Ref. 1, 18

Basis of estimating and/or computing waste quantity:

Quantity is unknown because the site was a municipal landfill; therefore, the score = 1.
Refs. 1, 13

* * *

5. TARGETS

Groundwater Use

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

Aquifer is used as a supply for drinking water, and there is no alternate municipal water source.
Score = 3.
Refs. 1, 3, 4

Distance to Nearest Well

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

The nearest well is on Eastwood Road, directly across from the landfill.
Refs. 5, 6

Distance to above well or building:

Nearest well is less than 2,000 feet from the site.
Assigned value = 4.
Refs. 5, 6

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:

Estimated population of 5,000 to 7,500 served.
Assigned value of 4.
(Engineer's Report and Plan of Operation for Town of Marilla Sanitary Landfill, 1982 and 1980 U.S. Census Bureau, see Ref. 1)

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):

Aquifer is not known to provide irrigation.
Ref. 7

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

Estimated population of 5,000 to 7,500 served.
Ref. 1

1. OBSERVED RELEASE

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

Lead, chromium, and manganese.

Rationale for attributing the contaminants to the facility:

These all were detected downgradient from site and not in upgradient samples.
Score = 45.
Ref. 8

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

0-3%
Assigned value = 2
Refs. 5, 6

Name/description of nearest downslope surface water:

Tributary to Little Buffalo Creek
Refs. 5, 6

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

9%
Refs. 5, 6

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

No
Refs. 5, 6

Is the facility completely surrounded by areas of higher elevation?

No
Refs. 5, 6

1-Year 24-Hour Rainfall in Inches

2.3 inches
Assigned value = 2
Ref. 13

Distance to Nearest Downslope Surface Water

<1,000 feet (tributary to Little Buffalo Creek at the base of the landfill slope)
Assigned value = 3
Refs. 5, 6

Physical State of Waste

Solid, unconsolidated municipal refuse
Assigned value = 1
Ref. 1

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Landfill: No liner
Assigned value = 3
Ref. 6

Method with highest score:

Same as above.

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Lead, chromium, and manganese.

Compound with highest score:

All three of above score 18.
Ref. 2

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.):

There were no hazardous wastes disposed of on site; however, domestic and commercial wastes contain small quantities of hazardous materials

Basis of estimating and/or computing waste quantity:

Quantity is unknown because the site was a municipal landfill; therefore, the score = 1.
Refs. 1, 13

* * *

5. TARGETS

Surface Water Use

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

The streams downgradient are NYSDEC Class B and C within a 3-mile radius. These are recreational classes.
Score = 2.
Refs. 9, 10

Is there tidal influence?

No.
Ref. 5

Distance to a Sensitive Environment

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

None within 2 miles.
Assigned value = 0
Ref. 5

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

3,000 feet to Wetland No. EA-25.
Assigned value = 1
Ref. 7

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

None within 1 mile.
Assigned value = 0
Ref. 11

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:

No surface water intakes within 3 miles of site.
Ref. 4

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

No surface water is used for irrigation.
Ref. 7

Total population served:

NA

Name/description of nearest of above water bodies:

NA

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

NA

1. OBSERVED RELEASE

Contaminants detected:

No analytical data available.
Score = 0.

Date and location of detection of contaminants:

Methods used to detect the contaminants:

Rationale for attributing the contaminants to the site:

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

No reactive compounds on site.
Refs. 1, 8

Most incompatible pair of compounds:

No incompatible compounds on site.
Assigned value = 0
Refs. 1, 8

Toxicity

Most toxic compound:

Phenol
Assigned value = 3

Hazardous Waste Quantity

Total quantity of hazardous waste:

Landfill only accepted municipal waste.
Ref. 1

Basis of estimating and/or computing waste quantity:

Domestic and commercial refuse may contain hazardous substances; however, the quantities are unknown.
Assigned value = 1

* * *

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
	5,000 - 7,500 Ref. 1, 6 Assigned value = 18		

Distance to a Sensitive Environment

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

None within 2 miles.
Ref. 5

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

3,000 feet (Wetland No. EA-25)
Ref. 7
Assigned value = 1

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

None within 1 mile
Ref. 11

Land Use

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

None within 1 mile
Refs. 1, 5

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

Town park approximately 450 feet northwest of the site
Assigned value = 3
Refs. 5, 6

Distance to residential area, if 2 miles or less:

Residential homes adjacent to site.
Refs. 5, 6

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

Adjacent to site to east and south; however, not in use for farming in past 5 years.
Ref. 1

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

None
Ref. 1

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

No
Ref. 1

1. CONTAINMENT

Hazardous substances present:

No fire or explosion hazard.
Ref. 12

Type of containment, if applicable:

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

None

Ignitability

Compound used:

None on site.
Assigned value = 0
Ref. 8

Reactivity

Most reactive compound:

None on site.
Assigned value = 0
Ref. 8

Incompatibility

Most incompatible pair of compounds:

None on site.
Assigned value = 0
Ref. 8

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Landfill accepted only municipal waste.
Ref. 1

Basis of estimating and/or computing waste quantity:

Domestic and commercial refuse contain small quantities of hazardous substances; however, the quantities in the landfill are unknown.
Assigned value = 1

* * *

3. TARGETS

Distance to Nearest Population

From landfill area to adjacent homes to east and south = 500 feet
Assigned value = 3
Refs. 5, 6

Distance to Nearest Building

Two buildings on site are <50 feet.
Assigned value = 3
Ref. 6

Distance to a Sensitive Environment

Distance to wetlands:

3,000 feet (Wetland No. EA-25)
Assigned value = 1
Ref. 7

Distance to critical habitat:

None within 1 mile.
Ref. 11

Land Use

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

None within 1 mile.
Refs. 1, 5

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

Town park approximately 450 feet northwest of site.
Assigned value = 3
Refs. 5, 6

Distance to residential area, if 2 miles or less:

Adjacent to site.
Refs. 5, 6

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

Adjacent to site to east and south; however, not in use for farming in past 5 years.
Ref. 1

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

None
Ref. 1

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

No
Ref. 1

Population Within 2-Mile Radius

2,098 (382: 0-1 mile, Ref. 1; 1,716: 1-2 miles, Ref. 15)
Assigned value = 3

Buildings Within 2-Mile Radius

250
Ref. 5
Assigned value = 2

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No observed incidents.
Ref. 1

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

Locking gate at both entrances. However, site is not surrounded by fence.
Score = 3.
Ref. 6

* * *

3. CONTAINMENT

Type of containment, if applicable:

Leachate outbreaks were observed on site, and drainageways on site are contaminated.
Score = 15.
Ref. 6

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Lead, chromium, manganese

Compound with highest score:

All of the above have toxicity values of 3.
Score = 15.
Ref. 2

* * *

5. TARGETS

Population Within One-Mile Radius

382 persons.
Score = 8.
Ref. 1

Distance to Critical Habitat (of endangered species)

No endangered species present.
Ref. 11

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	New York State Department of Environmental Conservation, January 1988, Engineering Investigations at Inactive Hazardous Waste Sites, Phase I Investigation, Town of Marilla Landfill, Site No. 915093, Town of Marilla, Erie County, prepared by Engineering Science. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
2	Sax, N.I., 1975, Dangerous Properties of Industrial Materials, Van Nostrand Reinhold Company, New York, New York. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
3	Cosselt, D., April 28, 1989, personal communication, Erie County Water Authority. Document location: Ecology and Environment, Inc., Buffalo, New York.
4	New York State Department of Health, New York State Atlas of Community Water System Sources 1982. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
5	United States Geological Survey, 1949 and 1965, 7.5-Minute Series (Topographic) Cowlesville, New York, and East Aurora, New York, Quadrangles. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
6	Ecology and Environment Engineering, P.C., May 9, 1989, Site Inspection Report. Document location: Ecology and Environment, Inc., Buffalo, New York.
7	Whitney, J., April 26, 1989, personal communication, District Conservationist, U.S. Department of Agriculture, Soil Conservation Service. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
8	Ecology and Environment Engineering, P.C., 1989, Data Summary Forms of Phase II Report. location: Ecology and Environment Engineering, P.C., Buffalo, New York.
9	Evans, J., January 24, 1990, personal communication, Fish and Wildlife Division, NYSDEC. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
10	New York State Department of Environmental Conservation, March 31, 1986, Water Quality Regulations: Surface Water and Groundwater Classifications and Standards, New York State Codes, Rules, and Regulations, Title 6, Chapter X, Parts 700-705. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
11	Buffington, B., May 12, 1989, personal communication, Field Technician, Significant Habitat Unit, NYSDEC. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
12	Sowinski, R., February 8, 1990, personal communication, Assistant Fire Chief, Town of Marilla, Marilla, New York. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
13	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.
14	Owens, D.W., W.L. Pittman, J.P. Wulforst, and W.E. Hanna, 1986, Soil Survey of Erie County, New York, United States Department of Agriculture, Soil Conservation Service, Cornell, New York. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.

Reference Number	Description of the Reference
15	General Sciences Corporation, 1986, Graphical Exposure Modeling System (GEMS), Volume 3, Graphics and Geodata Handling, prepared for USEPA Office of Pesticides and Toxic Substances Exposure Evaluation Division. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
16	Ecology and Environment, Inc., 1989, Drill Logs and Water Level Measurements of Phase II Report. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
17	Tallmany, Van Kuren, Gertis, and Thielman, 1978, Town of Marilla Sanitary Landfill, Engineer's Report and Plan of Operation, Orchard Park, New York. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
18	Jahn, E., January 24 and 30, 1990, personal communication, Town Supervisor, Town of Marilla, Marilla, New York. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.
19	Pierce, D., January 15 and August 23, 1990, personal communication, Highway Supervisor, Town of Marilla, Marilla, New York. Document location: Ecology and Environment Engineering, P.C., Buffalo, New York.

REFERENCE 1

15093

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE I INVESTIGATION

Town of Marilla — Site No. 915093

Town of Marilla — Erie County

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, P.E., *Director*

By:

ENGINEERING-SCIENCE

recycled paper — ecology and environment

REFERENCE 2

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:
Benjamin Feiner/Joseph J. Fitzgerald/Thomas J. Haley/Elizabeth K. Weisburger

5-27

VNR VAN NOSTRAND REINHOLD COMPANY
NEW YORK CINCINNATI TORONTO LONDON MELBOURNE
recycled paper ecology and environment

TABLE I

EPA Hazard Ranking System Waste Characteristics Values
(Toxicity/Persistence Matrix)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Acenapthene	9	3
Acetaldehyde	6	6
Acetic Acid	6	6
Acetone	6	6
2-Acetylaminoflourene	18	9
Aldrin	18	9
Ammonia	9	9
Aniline	12	9
Anthracene	15	9
Arsenic	18	9
Arsenic Acid	18	9
Arsenic Trioxide	18	9
Asbestos	15	9
Barium	18	9
Benzene	12	9
Benzidine	18	9
Benzoapyrene	18	9
Benzopyrene, NOS	18	9
Beryllium & Compounds NOS	18	9
Beryllium Dust, NOS	18	9
Bis (2-Chloroethyl) Ether	15	9
Bis (2-Ethylhexyl Phthalate	12	3
Bromodichloromethane	15	6
Bromoform	15	6
Bromomethane	15	9
Cadmium	18	9
Carbon Tetrachloride	18	9
Chlordane	18	9
Chlorobenzene	12	6
Chloroform	18	6
3-Chlorophenol	12	6
4-Chlorophenol	15	9
2-Chlorophenol	12	6
Chromium	18	9
Chromium, Hexavalent (Cr^{+6})	18	9

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Chromium, Trivalent (Cr^{+3})	15	6
Copper & Compounds, NOS	18	9
Creosote	15	6
Cresols	9	6
4-Cresol	12	9
Cupric chloride	18	9
Cyanides (soluble salts), NOS	12	9
Cyclohexane	12	6
DDE	18	9
DDT	18	9
Diaminotoluene	18	6
Dibromochloromethane	15	6
1, 2-Dibromo, 3-chloropropane	18	9
Di-N-Butyl-Phthalate	18	6
1, 4-Dichlorobenzene	15	6
Dichlorobenzene, NOS	18	6
1, 1-Dichloroethane	12	6
1, 2-Dichloroethane	12	9
1, 1-Dichloroethene	15	9
1, 2-cis-Dichloroethylene	12	3
1, 2-trans-Dichloroethylene	12	3
Dichloroethylene, NOS	12	3
2, 4-Dichlorophenol	18	6
2, 4-Dichlorophenoxyacetic Acid	18	9
Dicyclopentadiene	18	9
Dieldrin	18	9
2, 4-Dinitrotoluene	15	9
Dioxin	18	9
Endosulfan	18	9
Endrin	18	9
Ethylbenzene	9	6
Ethylene Dibromide	18	9
Ethylene Glycol	9	6
Ethyl Ether	15	3
Ethylmethacrylate	12	6

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Fluorine	18	9
Formaldehyde	9	9
Formic Acid	9	6
Heptachlor	18	9
Hexachlorobenzene	15	6
Hexachlorobutadiene	18	9
Hexachlorocyclohexane, NOS	18	9
Hexachlorocyclopentadiene	18	9
Hydrochloric Acid	9	6
Hydrogen Sulfide	18	9
Indene	12	6
Iron & Compounds, NOS	18	9
Isophorone	12	6
Isopropyl Ether	9	3
Kelthane	15	6
Kepone	18	9
Lead	18	9
Lindane	18	9
Magnesium & Compounds, NOS	15	6
Manganese & Compounds, NOS	18	9
Mercury	18	9
Mercury Chloride	18	9
Methoxychlor	15	6
4, 4-Methylene-Bis-(2-Chloroaniline)	18	9
Methylene Chloride	12	6
Methyl Ethyl Ketone	6	6
Methyl Isobutyl Ketone	12	6
4-Methyl-2-Nitroaniline	12	9
Methyl Parathion	9	9
2-Methylpyridine	12	6
Mirex	18	9

.able I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Naphthalene	9	6
Nickel & Compounds, NOS	18	9
Nitric Acid	9	9
Nitroaniline, NOS	18	9
Nitrogen Compounds, NOS	12	0
Nitroguanidine	12	9
Nitrophenol, NOS	15	9
m-Nitrophenol	15	
o-Nitrophenol	12	
p-Nitrophenol	15	
Nitrosodiphenylamine	12	6
Parathion	9	9
Pentachlorophenol (PCP)	18	9
Pesticides, NOS	18	9
Phenanthrene	15	9
Phenol	12	9
Phosgene	9	9
Polybrominated Biphenyl (PBB), NOS	18	9
Polychlorinated Biphenyls (PCB), NOS	18	9
Potassium Chromate	18	9
Radium & Compounds, NOS	18	9
Radon & Compounds, NOS	15	9
RDX (Cyclonite)	15	
2, 4-D, Salts & Esters	18	9
Selenium	15	9
Sevin (Carbaryl)	18	9
Sodium Cyanide	12	9
Styrene	9	6
Sulfate	9	0
Sulfuric Acid	9	9
2, 4, 5-T	18	9
1, 1, 2, 2-Tetrachloroethane	18	9
Tetrachloroethane, NOS	18	9
1, 1, 2, 2-Tetrachloroethene	12	6

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Tetraethyl Lead	18	9
Tetrahydrofuran	15	6
Thorium & Compounds, NOS	18	9
Toluene	9	6
TNT	12	
Toxaphene	18	9
Tribromomethane	18	9
1, 2, 4-Trichlorobenzene	15	6
1, 3, 5-Trichlorobenzene	15	6
1, 1, 1-Trichloroethane	12	6
1, 1, 2-Trichloroethane	15	6
Trichloroethane, NOS	15	6
Trichloroethene	12	6
1, 1, 1-Trichloropropane	12	6
1, 1, 2-Trichloropropane	12	6
1, 2, 2-Trichloropropane	12	6
1, 2, 3-Trichloropropane	15	9
Uranium & Compounds, NOS	18	9
Varsol	12	6
Vinyl Chloride	15	9
Xylene	9	6
Zinc & Compounds, NOS	18	9
Zinc Cyanide	18	9

REFERENCES 3

CONTACT REPORT

CONTACT REPORT

Meeting [ ]   Telephone [X]   Other [ ]

AGENCY: Erie County Water Authority

ADDRESS: 3030 Union Road
Cheektowaga, NY

PHONE NO.: (716) 849-8484

PERSON CONTACTED: Dana Cosselt

TO: P. Farrell

FROM: J. Richert

DATE: April 28, 1989

SUBJECT: Erie County Phase II sites within Erie County's water district

CC: Project Managers and Files of YN-1000, YN-7000, YO-1000, YO-2000, YO-3000, YO-4000, YO-5000

Mr. Cosselt informed me that the Erie County Water Authority does not supply water to the towns of Marilla, Evans, Tonawanda, or the City of Buffalo. They do serve the Town of Cheektowaga and, therefore, the Land Reclamation and Old Land Reclamation sites will fall in their service area. Mr. Cosselt also informed me that the Erie County Water Authority has two water intakes, one at Van Dewater on River Road, and a second at Sturgeon Point. Maps of the Authority's service areas/pipelines are available for review at the Union Road office from 8:00 am to 4:00 pm, Monday through Friday.

oio

REFERENCES 4

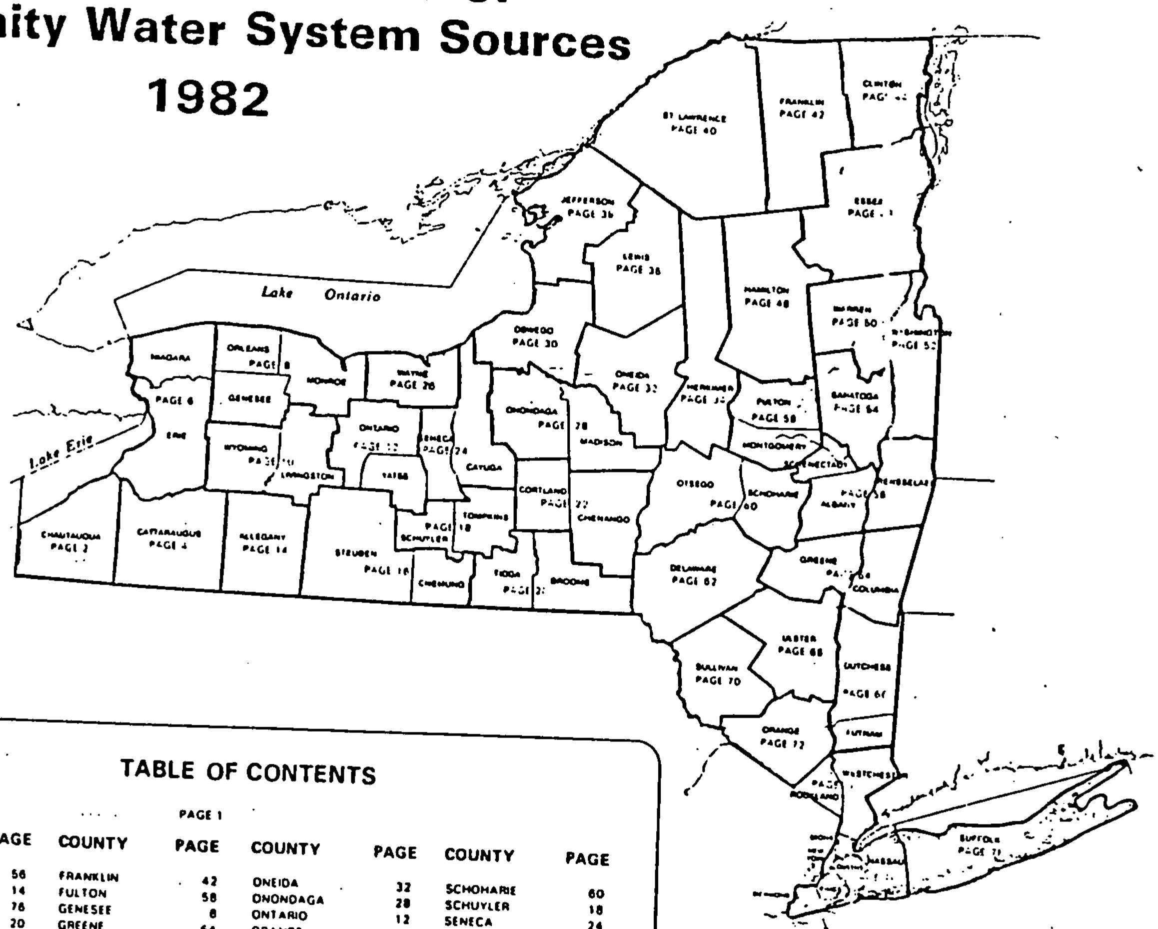
New York State Atlas of Community Water System Sources 1982

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

New York State Atlas of Community Water System Sources 1982

YORK STATE
ARTMENT OF HEALTH

5-37



LEGEND

BOUNDARIES AND PLACES

International
State
County
Town
Indian Reservation
City
Village
Unincorporated Place
Federal Reservation
Built-up Area (Over 25 000 population including any contiguous city or village)

CLASSIFICATION OF POPULATED PLACES

100,000 or more	YONKERS
50,000 to 100 000	Levittown
12,500 to 50 000	Poughkeepsie
2,500 to 12,500	Hampton Bays
250 to 2,500	Boiceville
250 or less	

TRANSPORTATION

Highways
- Divided Highways
  - Full Control of Access
  - Partial or No Control of Access
- Undivided Highway
- Interchange
- Touring Route (State, U S, Interstate) or State Parkway
- Touring Route Markers
  - State U S, Interstate

Railroads
- Operating Line
- Service Discontinued
- Operator
- Owner (If Other than Operator)
- Company Having Trackage Rights

Airports (Open to the Public, Military)
- Runway under 4000'
- Runway over 4000'

Rest Areas
- Food Gas Rest Rooms
- Rest Rooms
- Gas, Rest Rooms
- Parking Only

RECREATION FACILITIES

State or National Recreation Area
State Campground
State Boat Launching Site
State Canal Park
State Fish Hatchery
Other State Recreation Site

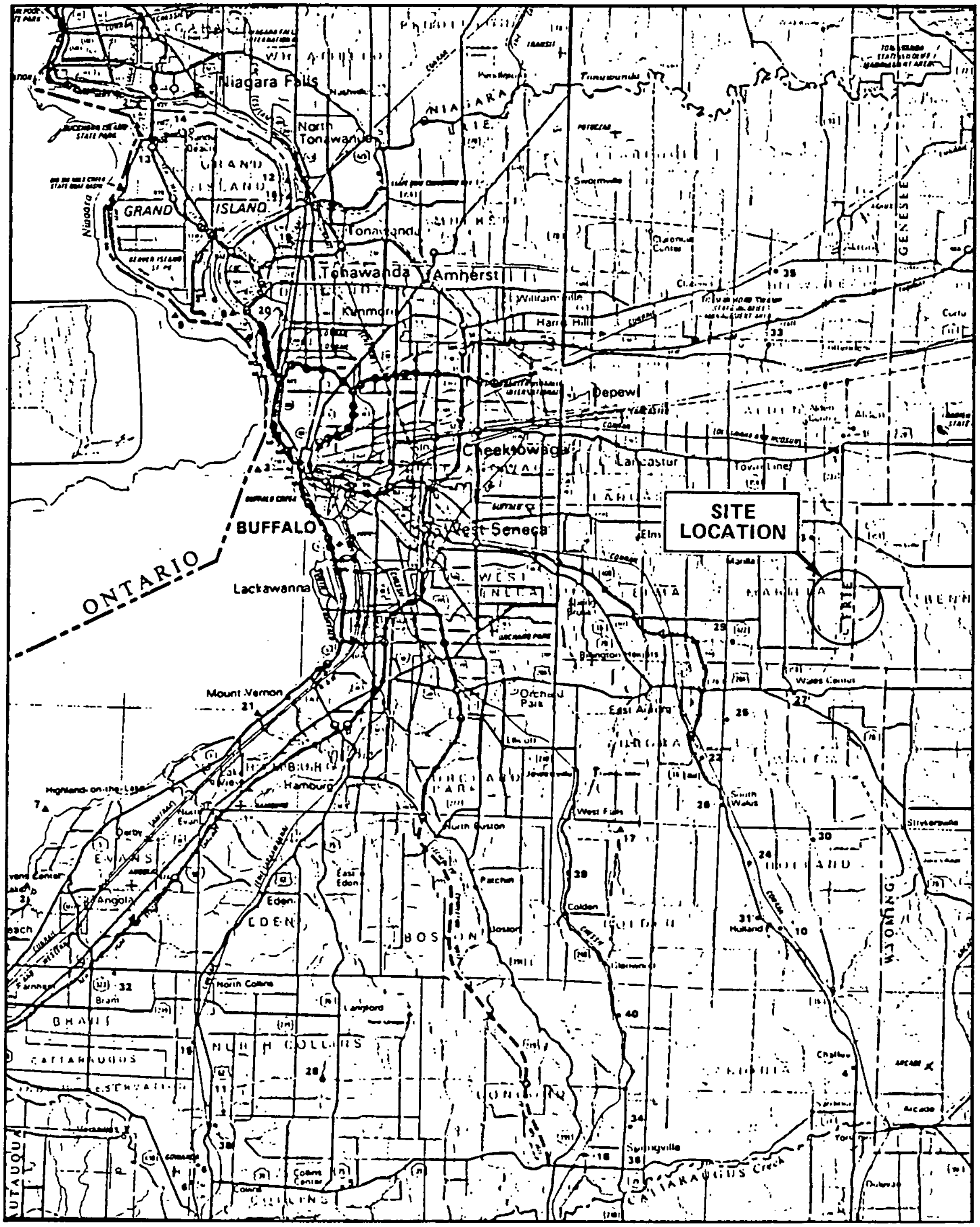
TABLE OF CONTENTS

ERIE COUNTY

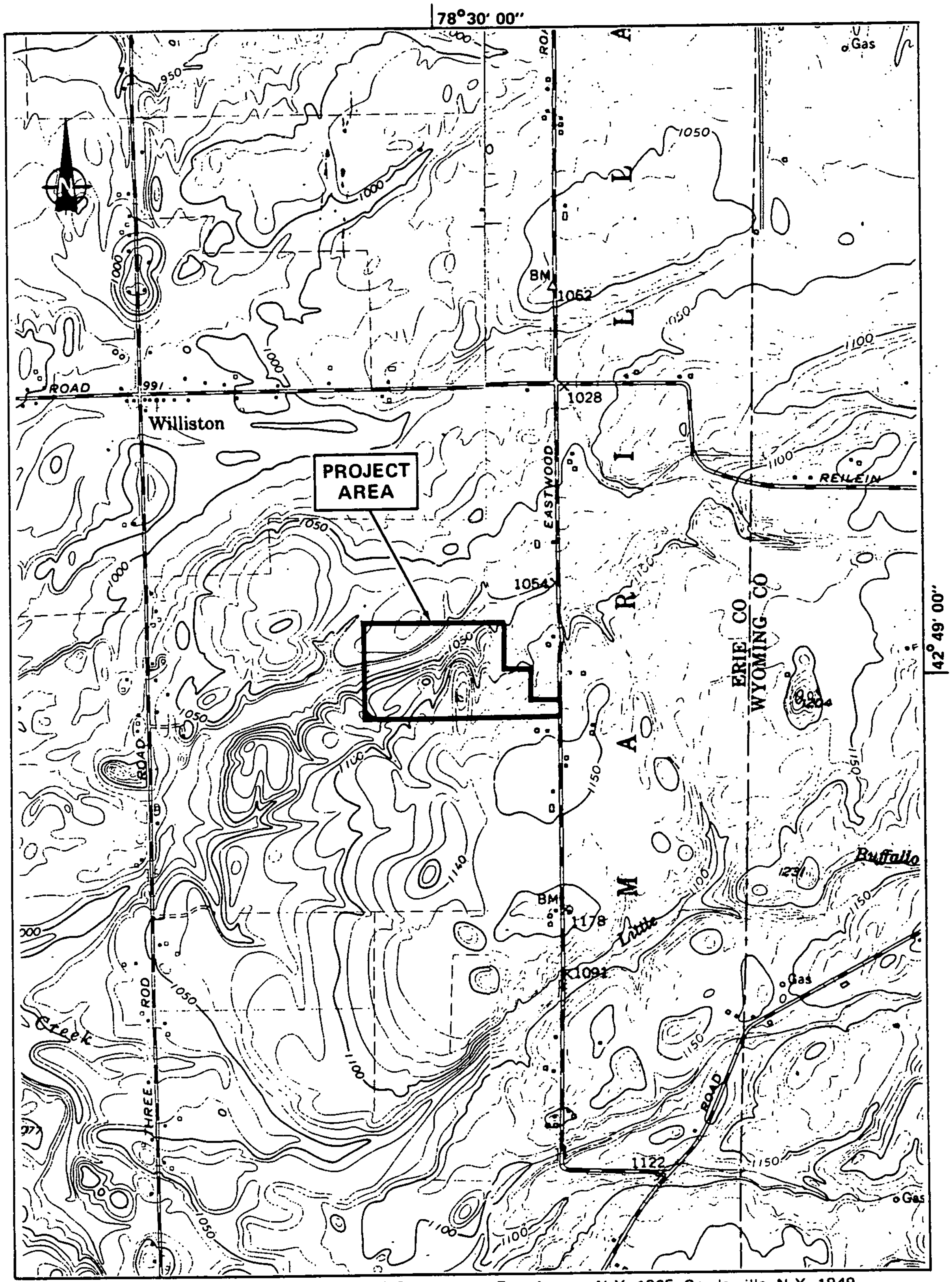
ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
	Akron Village (See No 1 Wyoming Co, Page 10)	3640	
1	Alden Village	3460	Wells
2	Angola Village	8500	Lake Erie
3	Buffalo City Division of Water	357870	Lake Erie
4	Caffee Water Company	210	Wells
5	Collins Water District #3	704	Wells
6	Collins Water Districts #1 and #2	1384	Wells
7	Erie County Water Authority (Sturgeon Point Intake)	375000	Lake Erie
8	Erie County Water Authority (Van DeWater Intake)	NA	Niagara River - East Branch
9	Grand Island Water District #2	9390	Niagara River
10	Holland Water District	1670	Wells
11	Lawtons Water Company	138	Wells
12	Lockport City (Niagara Co)		Niagara River - East Branch
13	Niagara County Water District (Niagara Co)		Niagara River - West Branch
14	Niagara Falls City (Niagara Co)		Niagara River - West Branch
15	North Collins Village	1500	Wells
16	North Tonawanda City (Niagara Co)		Niagara River - West Branch
17	Orchard Park Village	3671	Pipe Creek Reservoir
18	Springville Village	4169	Wells
19	Tonawanda City	18538	Niagara River - East Branch
20	Tonawanda Water District #1	91269	Niagara River
21	Wanakah Water Company	10750	Lake Erie
	Non Municipal Community		
22	Aurora Mobile Park	125	Wells
23	Bush Gardens Mobile Home Park	270	Wells
24	Circle B Trailer Court	50	Wells
25	Circle Court Mobile Park	125	Wells
26	Creekside Mobile Home Park	120	Wells
27	Donnelly's Mobile Home Court	99	Wells
28	Gowanda State Hospital	NA	Clear Lake
29	Hillside Estates	160	Wells
30	Hunters Creek Mobile Home Park	150	Wells
31	Knox Apartments	NA	Wells
32	Maple Grove Trailer Court	72	Wells
33	Millgrove Mobile Park	100	Wells
34	Perkins Trailer Park	75	Wells
35	Quarry Hill Estates	400	Wells
36	Springville Mobile Park	114	Wells
37	Springwood Mobile Village	132	Wells
38	Taylors Grove Trailer Park	39	Wells
39	Valley View Mobile Court	42	Wells
40	Villager Apartments	NA	Wells

NIAGARA COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
	Lockport City (See No 12, Erie Co)	25000	
1	Middleport Village	2000	Wells (Springs)
	Niagara County Water District (See No 13, Erie Co)	48	
2	Niagara Falls City (See also No 14 Erie Co)	77384	Niagara River - East Branch
	North Tonawanda City (See No 16 Erie Co)	36000	
	Non-Municipal Community		
3	Country Estates Mobile Village	28	Wells


SITE LOCATION
BUFFALO
ONTARIO
Niagara Falls
North Tonawanda
GRAND ISLAND
Tonawanda
Amherst
Depew
Cheektowaga
West Seneca
Lackawanna
Mount Vernon
Hamburg
Eden
Angola
Derby
Springville
Colden
Brant
North Collins
Wales Center
South Wales
Holland
East Aurora
Orchard Park
North Boston
Boston
GENESEE
WYOMING
Niagara

REFERENCE 5



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: East Aurora, N.Y. 1965; Cowlesville, N.Y. 1949.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 1—1
LOCATION MAP: TOWN OF MARILLA LANDFILL

REFERENCE 6

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 State	02 Site Number
NY	915093

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No., or Specific Location Identifier
Town of Marilla Landfill	Eastwood Road

03 City	04 State	05 Zip Code	06 County	07 County Code	08 Cong. Dist.
Town of Marilla	NY	14102	Erie	029	

09 Coordinates Latitude	Longitude	10 Type of Ownership (Check One)
42 49 00.0	078 30 00.0	[ ] A. Private [ ] B. Federal [ ] C. State [ ] D. County [X] E. Municipal [ ] F. Other ______ [ ] G. Unknown

III. INSPECTION INFORMATION

01 Date of Inspection	02 Site Status	03 Years of Operation
5 / 9 / 89 (Month Day Year)	[ ] Active [X] Inactive	1965 (Beginning Year) | 1988 (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 & Env., Inc.	(716) 684-8060
09 Other Inspectors	**10 Title**	**11 Organization**	**12 Telephone No.**
J. Richert	Geologist	Ecology & Env., Inc.	(716) 684-8060
			( )
			( )
			( )
			( )

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Dave Pierce	Highway Supervisor	11550 Webster Lane Marilla, NY 14102	(716) 652-7311
Earl Jann	Town Supervisor	1740 Two Rod Road Marilla, NY 14102	(716) 652-4830
			( )
			( )

17 Access Gained by (Check one)	18 Time of Inspection	19 Weather Conditions
Permission	08:35	Sunny, 45° - 50° F

IV. INFORMATION AVAILABLE FROM

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

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
J. Griffes		Ecology & Env., Inc.	(716 684-8060	2 / 1 / 90 (Month Day Year)

5-44

ecology and environment, inc.

International Specialists in the Environment

Job Number YN-1000

Town of Marilla Landfill

ecology and environment, inc.

Recycled Paper/569058

904-487-0886 Sgt. Tayor

MAGNETIC DECLINATION N8W

Brian Merrit
Tom Pearse

recycled paper

TOWN OF MARILLA - 652-7311

Highway supervisor Dave Pierce

7:00AM

PAUL [illegible]

EARL JAHN - 652 4830 Town supervisor

-ADVANCED-
ENVIRONMENTAL SERVICES, INC.

5-45 SCOTT A. MacFARLANE

Box 165
2186 Liberty Drive
Niagara Falls, New York 14304

(716) 283-3120
Bflo. Area: 625-9064

-ADVANCED-
ENVIRONMENTAL SERVICES, INC.

SCOTT A. ABEL

Box 165
2186 Liberty Drive
Niagara Falls, New York 14304

(716) 283-3120
Bflo. Area: 625-9064

ecology and environment

E & E Job Number YW-1000

Telephone Code Number 716-684-8060

Site Name Town of Marilla Landfill

State/City Marilla, NY

TDD

PAN

SSID

Start/Finish Date 5/9/89 /

Book 1 of

E & E Emergency Response Center: (716) 684-8940

Tuesday 5/9/89

Weather: Sunny, warm 45-50°F

0800 E+E Crew departed ASC
G. Florentino - Team leader
J. Richet - Site Safety

Reviewed Safety Plan

Today's Objective: Site Reconnaissance and Surface water, soil, and leachate sampling

0835 Arrived onsite
HNu not working

0845 Crew departed site to pick up another HNu

0900 Solved problem with HNu - loose connection.
Crew heading back to site

0915 Arrived back onsite
Setting up for site Reconnaissance
Calibrating HNu

Background Radiation 10 Counts/min (RAD MINI)

0935 Kodak Fling 35 35mm disposable Camera
400 ASA

Frame ~~24~~ 23 GF View to west of MW-4 (location of MW-4A). Storage shed and truck trailer in background

Gene Florentino 5/9/89

5-46

5/9/89

Proposed well MW-~~4A~~ 4B GF easily accessible

0940 Frame ~~23~~ 22 GF View to east of storage shed

Storage shed appears to be new
- segregated areas on west side which contain glass bottles + jars

UST with sign "Oil Only" located adj. to SW corner of shed

2" PVC Adj to drainage ditch (GW-3)
- 4.2 PPM inside casing (HNu)
- no protective casing, screw on cap

0950 Frame ~~22~~ 21 GF View to South of 2" PVC (GW-3)

1000 Frame ~~21~~ 20 GF View to NW of slope (Approx 50'-70')

1010 Frame ~~20~~ 19 GF View to west of Bflo Creek tributary (marshy area)

1015 Frame ~~19~~ 18 GF View to South of west drainage ditch

1020 Frame ~~18~~ 17 GF View to west of MW-1A,B

1025 Frame ~~17~~ 16 GF View to South of Boxed-in (weir) area of drain ditch. Note broken cement pipe in background
Channel is filled with course gravel.

Gene Florentino 5/9/89

Tuesday 5/9/89

1025 Frame ~~16~~ 15 GF View to south of MW-2
2" PVC without protective casing
- Screw on cap
- 13 PPM (HNu) inside casing

1030 Frame ~~15~~ 14 GF View to west of MW-5
2" PVC with Screw on cap
Dirt road heading west into wooded area
- 21 PPM (HNu) inside PVC

Road to west leads to the town park
There is a locking gate along the road.

There is 2" PVC Approx 15' west of well GW-4 with locking casing
- 2.5 PPM (HNu) inside casing
- screw on cap

1045 Frame ~~14~~ 13 GF
- View to west along so. side of Shed of empty drums

1046 Frame ~~15~~ 12 GF
- View to south of eastside of shed where oil tank should be buried
Note disturbed soil

1110 Soil Sample SS-3 (background)
- location: South side of access road along west side of Horse corral fence (3rd fence post South of access road). Marked with Wood stake

Gene Florentino 5/9/89

5/9/89

Frame ~~14~~ 11 GF location of SS-3

Sample hole filled with water. Soil is gravelly

1135 Frame ~~13~~ 10 GF view to south of SW-3/SWS-3
Surface water/sediment sample location

All soil/sediment will be collected with dedicated hand trowels

All water samples will be collected directly into sample bottles

1225 Took Duplicate sample at SW-3 location (SW-3D/SWS-3D)

1300 Frame ~~12~~ 9 GF View to south of SW-2/SWS-2 location (leachate weir)

SW-2 (surface water/sediment) is located north of boxed in area of drainage ditch

1305 L-1 (leachate) Sample is located at base of slope (south of boxed in area) water is flowing out of the ground
Frame ~~11~~ 8 GF Leachate-1 location (view to south)

1320 Frame ~~10~~ 7 GF View to southeast of SS-1 (soil) location.
Located south of boxed (weir) area

Gene Florentino 5/9/89

Tuesday 5/9/89

1330 Frame ~~9~~ 6 GF

View to west of SW-5/SWS-5

Surface water/sediment along Bflo Creek trib. (downstream)

1350 Frame ~~8~~ 5 GF
View to east of SW-4/SWS-4
located in marshy area along Bflo
Creek trib.

1400 Frame ~~7~~ 4 GF
View to SE of L-2 (leachate)
located on slope of leachate weir
where trees are cut down

5-48

1410 Frame ~~6~~ 3 GF
View to SE of SS-2 (Soil) 1 GF
located approx 20ft north of L-2

1430 Frame ~~5~~ 2 GF
View to north along west side of
leachate
- up to 28 PPM (HNu) at ground sfc

Crew not locate intermittent stream along west side of Landfill, therefore will not sample SW-1

Gene F Lorentz 5/9/89

Tuesday 5/8/89

1440 Crew packaging samples

Front gate was locked

Crew had to depart site from park entrance

1500 Park entrance locked

Had to call Town of Marilla to open gate. Made call from private residence across from entrance on eastward road. Residence has water well in front yard

1520 Crew departed site for Lab

1600 Dropped off samples at Lab
Did not obtain an MS/MSD sample, so the crew will return to the site to re-sample SW-5 and collect an MS/MSD

1655 Arrived on site

1700 Re-sampled SW-5

1715 Departed Site

Arrived at Lab

Gene F Lorentz 5/8/89

REFERENCE 7

ecology and environment, inc.

BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086, TEL. 716/684-8060
International Specialists in the Environment

April 26, 1989

Mr. John Whitney
District Conservationist
U.S. Department of Agriculture
Soil Conservation Service
21 South Grove Street
East Aurora, NY 14052

Dear John:

On 3/28/89 and 3/29/89, Chad Eich and I met with you for the purpose of gathering information in support of seven DEC Phase II investigations to be performed in Erie County, New York by Ecology and Environment, Inc. Attached, in table form, I have outlined the information obtained from your office with your assistance.

Since the DEC requires that all references used in their reports be fully documented, I would ask that you review the information and make any corrections necessary. I would then like you to sign below to indicate that to the best of your knowledge, you agree with the information listed. Finally, please return the signed and dated original to me as soon as possible. If you have any questions or comments, please contact me or Chad at 684-8060.

Thank you again for your assistance.

Sincerely,

James J. Richert

James J. Richert

[illegible]
Signature

[illegible]
Title

[illegible]
Date

PHASE II DATA OBTAINED FROM ERIE COUNTY SOIL SURVEY

SITE NAME	WATER USE	SURFACE WATER	ACTIVE AG. LAND	RESIDENTIAL AREA	INDUSTRIAL AREA	IRRIGATION GROUND WATER	IRRIGATION SURFACE WATER	AG. DISTRICT	WETLANDS
Diarsenol	Drinking	7,000'	NA	Adjacent	<100'	NA	NA	NA	NA
Evans/ Ed Ball	Recreational	Adjacent	Adjacent	1,150'	4,000'	NA	NA	NA	Adjacent to PFOIA
Land Reclamation	"	"	NA	660'	Adjacent	NA	NA	NA	700' from LA-7
La Salle	"	NA	NA	Adjacent	<100'	NA	NA	NA	NA
Old Land Reclamation	"	Adjacent	NA	660'	<2640'	NA	NA	NA	1000' from TE-23
Tonawanda Landfill	Drinking	500'	NA	<1320'	Adjacent	NA	NA	NA	300' from TE-23
Marilla Landfill	Recreational	<2640'	Adjacent	900'	NA	NA	NA	District #5	3000' from EA-25

Definitions:

1) WATER USE - uses of surface water within 3-miles downstream of site.
2) SURFACE WATER - distance to nearest downslope surface water.
3) ACTIVE AG. LAND - distance to agricultural land in production within past 5-years if 1 mile or less from site.
4) RESIDENTIAL AREA - distance to residential area if 2-miles or less from site.
5) INDUSTRIAL AREA - distance to commercial/industrial area if 1 mile or less from site.
6) IRRIGATION GROUNDWATER - land area irrigated by groundwater within 3-miles of site.
7) IRRIGATION SURFACE WATER - land area irrigated by surface water within 3-miles downstream of site.
8) AG. DISTRICT - sites within an Erie County agricultural district.
9) WETLANDS - distance to a 5-acre (minimum) fresh-water wetland, if 1-mile or less from site.

U.S. DEPARTMENT OF AGRICULTURE

REFERENCE SLIP

DATE 4/25/89

TO

James J. Richert
Ecology and Environment, Inc.
Buffalo Corporate Center
368 Pleasantview Drive
Lancaster, N.Y. 14086

- [ ] ACTION
- [ ] APPROVAL
- [x] AS REQUESTED
- [ ] FOR COMMENT
- [x] FOR INFORMATION
- [ ] INITIALS
- [ ] NOTE AND FILE
- [ ] NOTE AND RETURN
- [ ] PER PHONE CALL
- [ ] RECOMMENDATION
- [ ] REPLY FOR SIGNATURE OF
- [ ] RETURNED
- [ ] SEE ME
- [ ] YOUR SIGNATURE

REMARKS While we are not aware of any irrigation within [illegible] of various sites, there is certainly POTENTIAL for irrigation, especially if the current drought cycle continues. It may be appropriate to note the potential in ALL ag. areas.

FROM

John Whitney
District Conservationist

USGPO 1985-526-216 FORM AD-514 (8-64)

REFERENCE 8

Reference 8 is "Raw Analytical Data Summaries," included as Appendix E of this report.

REFERENCE 9

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-1000 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 Marilla Landfill:

Cayuga Creek: From the mouth to tributary No. 6 it is Class C, and from the source to tributary No. 6 it is Class B. Tributary No. 6 is several miles to the northwest of the site (off the Cowlesville and East Aurora quadrangles).

Little Buffalo Creek: From tributary No. 6 to tributary No. 16 it is Class CT (troutwater). From tributary No. 16 to source it is Class C. Tributary No. 16 is located at junction of streams east of Three Rod Road, north of Liberia Road on the East Aurora quadrangle.

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

REFERENCE 10

WATER QUALITY REGULATIONS

SURFACE WATER AND GROUNDWATER CLASSIFICATIONS AND STANDARDS

New York State
Codes, Rules and Regulations
Title 6, Chapter X
Parts 700-705

New York State Department of Environmental Conservation

recycled paper

5-58

REFERENCE 11

New York State Department of Environmental Conservation

Information Services
Wildlife Resources Center
Delmar, New York 12054

May 12, 1989

Thomas C. Jorling
Commissioner

James J. Richert
Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, N.Y. 14086

Dear Mr. Richert:

We have reviewed the Significant Habitat Program and the Natural Heritage Program files with respect to your work with the 15 inactive hazardous waste sites in western and central New York.

We have identified the following concerns:

1. Site YO-1000: Historically had a rare plant, the Tall Tick-Clover, Desmodium glabellum, occurring there. It may still be there if suitable habitat exists. We recommend a thorough search of the area be done at the appropriate time of the year.

2. Site YO-1000: Historically had a rare plant, the Green Gentian, Frasera carolinonsis, occurring there. It may still be there if suitable habitat exists. We recommend a thorough search of the area be done at the appropriate time of the year.

3. Site YO-7000: Contains at the mouth of Cayuga Creek, a rare plant, the Shy Blue Aster, Aster oolentangiensis). This plant is (was) located about 0.8 miles southwest of the waste site.

4. Site YN-1000: Contains part of deer wintering concentration #15-108. We suggest you contact our Region 9 office in Olean, N.Y. for more complete and up-to-date information.

5. Site YN-7000: May contain spawning populations of coldwater anadramous fishes. You should definitely contact the Region 9 fisheries office in Olean for more complete information about these or other fishes of concern.

Our files are continually growing as new habitats and occurrences of rare species and communities are discovered. In most cases, site-specific or comprehensive surveys for plant and animal occurrences have not been conducted. For these reasons, we can only provide data which have been assembled from our files. We cannot provide a definitive statement on the presence or absence of species, habitats or natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

New York Natural Heritage Program is supported in part by The Nature Conservancy

This response applies only to known occurrences of rare animals, plants and natural communities and/or significant wildlife habitats. You should contact our regional offices(s), Division of Regulatory Affairs, at the address(es) enclosed for information regarding any regulated areas or permits that may be required (e.g., regulated wetlands) under State law.

If this project is still active one year from now we recommend that you contact us again so that we may update this response.

If we can be of further assistance please do not hesitate to contact us.

Sincerely,

Burrell Buffington

Burrell Buffington
Field Technician
Significant Habitat Unit

Enc.
cc: Region 9, Wildlife Mgr
Region 9, Fish Mgr
Don Einhouse, Dunkirk

REFERENCE 12

CONTACT REPORT

Telephone (X)   Meeting ( )   Other ( )

AGENCY: Town of Marilla - Assistant Fire Chief

ADDRESS: 1810 Two Rod Road
Marilla, NY 14102

PHONE NO.: 716-937-~~9892~~ 9665

PERSON CONTACTED: Richard Sowinski

TO: YN1000 File

FROM: G. Florentino GF

DATE: 2/7/90

SUBJECT: Verification of Fire Hazard at Marilla Landfill for HRS Scoring

Contacted R. Sowinski (Assistant Fire Chief) to verify if the Town of Marilla Landfill poses any fire threats. Mr. Sowinski stated that the site had a brush fire several years ago, but it currently poses no fire threat.

wj
CR/YN1000

Richard A. Sowinski
Signature of Approval

3rd Asst. Chief
Title

2-21-90
Date

REFERENCE 13

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

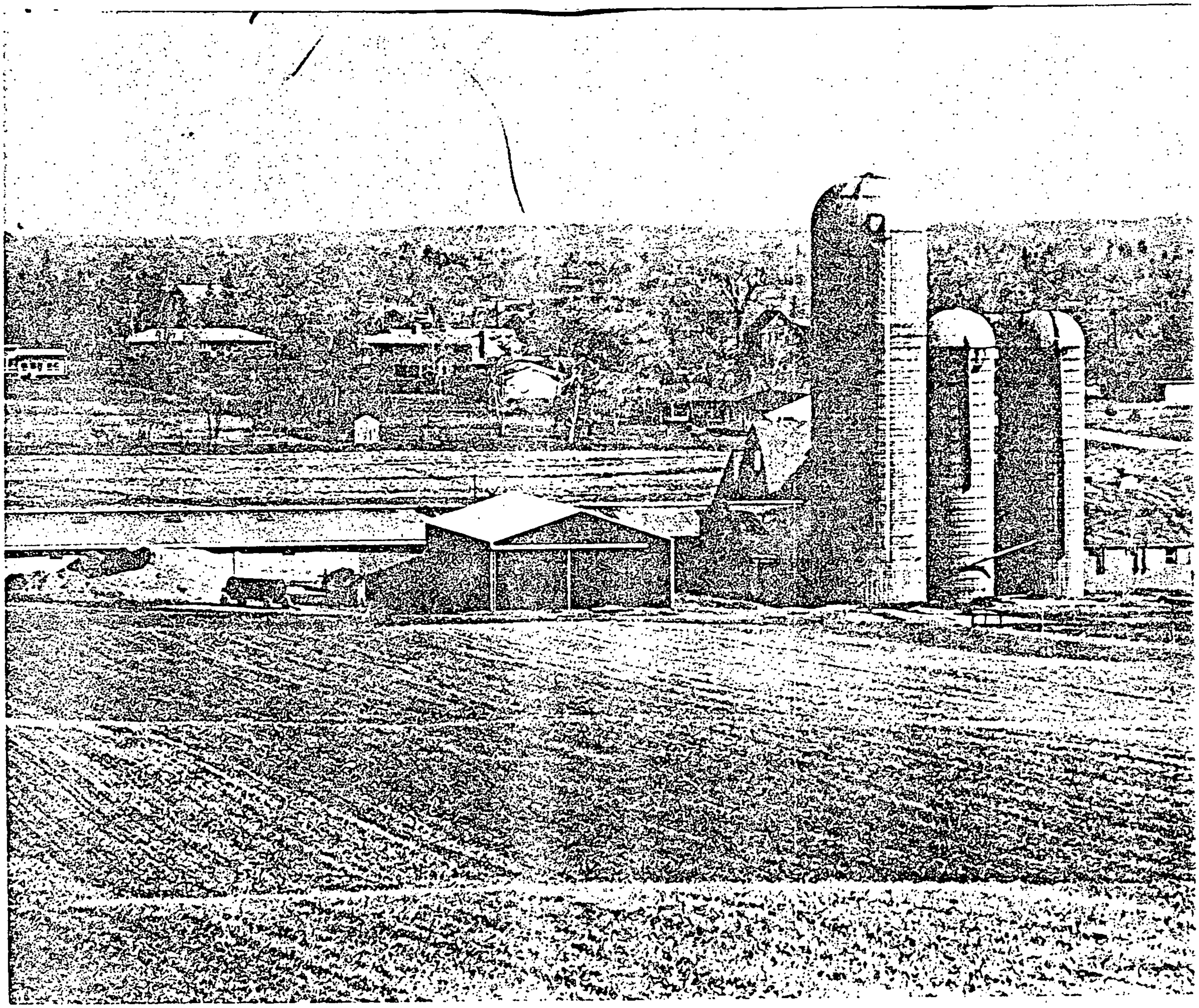
REFERENCE 14

United States
Department of
Agriculture

Soil
Conservation
Service

In Cooperation with
the Cornell University
Agricultural
Experiment Station

Soil Survey of Erie County, New York



REFERENCE 15

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 16

Reference 16 is Table 4-3 and Appendix C of this Report.

REFERENCE 17

TOWN OF MARILLA

SANITARY LANDFILL

#15522

ENGINEER'S REPORT

and

PLAN OF OPERATION

Prepared by:

Tallamy, Van Kuren, Gertis and Thielman
70 Linwood Avenue
Orchard Park, New York 14127

780077 June 1978

REFERENCE 18

CONTACT REPORT

Meeting [ ]   Telephone [X]   Other [ ]

AGENCY: Town of Marilla

ADDRESS:

PHONE NO.: 716-652-4830

PERSON CONTACTED: Earl Jann

TO: YN-1000 File

FROM: G. Florentino GF

DATE: Jan. 30, 1990

SUBJECT: Background Information on Marilla Site

CC:

E. Jann called to clarify and add information to the prior conversation on Jan. 24, 1990, regarding MW-1. The following is a summary of the information he provided:

1981 Contamination took place
- motor oil dumped into well
- well was flushed and used again for sampling
- believed to be closed in March or April 1988 because it was dry

oio
CR-YN1000

Earl Z Jann Jr
Signature of Approval

Supervisor
Title

2/12/90
Date

REFERENCE 19

CONTACT REPORT

Meeting [ ]   Telephone [X]   Other [ ]

AGENCY: Town of Marilla Highway Dept.

ADDRESS: 11550 Webster Lane
Marilla, NY 14102

PHONE NO.: 652-7311

PERSON CONTACTED: Dave Pierce, Highway Supervisor

TO: YN-1000 File

FROM: G. Florentino GF

DATE: Jan. 15, 1990

SUBJECT: Background information on Marilla landfill site

CC:

Asked D. Pierce some general questions regarding the landfill operations. He stated that the landfill stopped accepting waste on Dec. 31, 1988, and capping began in late spring/summer of 1989. The landfill operated on Saturdays only, however, it used to be open on Tuesdays several years ago. Advanced Environmental Services, Inc., is collecting groundwater samples for the town. Earl Jann (town supervisor) can provide additional information (652-4830). The following are approximate dates of recent site activities:

- Oil tank removed from old equipment shed to new recycling building in May 1989.
- Recycling building built in March 1989 for glass and newspaper.
- Scrap metal removed in Nov. 1989.
  Last time -

oio
CR-YN1070

David Pierce
Signature of Approval

Highway Superintendent
Title

2-12-90
Date

TELEPHONE CONVERSATION MEMORANDUM

RECEIVED
SEP
ECOLOGY & E...
BUFFALO

CLIENT	: NYSDEC - Albany	PROJECT NO.	: YN-1080
PROJECT	: Marilla L.F.	DATE	: 8/23/90
CALL TO	: Dave Pierce	TIME	: 1045
PHONE NO.	: 652-7311	REPRESENTING	:

SUMMARY OF CONVERSATION:

Landfill closed on December 31, 1988. Closure completed in August 1989. Closure consisted of 6 inches of clay for daily cover, then three 8-inch clay layers followed by 6 inches of sand and gravel and 6 inches of topsoil which was fertilized and seeded. Three 300 foot long horizontal vent pipes were installed at a depth of 5 feet with 6 vertical vent pipes. The horizontal pipes were gravel packed and wrapped with a cloth filter.

Mr. Pierce was not sure when the town purchased the landfill, or when it became active. He suggested contacting Catherine Hodges - Town Clerk, at 652-5350

COPIES TO: YN-1000 File

BY: G. Florentino

ok: David Pierce
Signature of Approval

Highway Superintendent
Title

8-30-90
Date

wf
YN1080

EPA 2070–13

5.5

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number
NY	915093

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No., or Specific Location Identifier
Town of Marilla Landfill	Eastwood Road

03 City	04 State	05 Zip Code	06 County	07 County Code	08 Cong. Dist.
Town of Marilla	NY	14102	Erie	029	

09 Coordinates
Latitude 4 2 4 9 0 0 . 0
Longitude 0 7 8 3 0 0 0 . 0

10 Type of Ownership (Check One)
[ ] A. Private [ ] B. Federal [ ] C. State
[ ] D. County [X] E. Municipal
[ ] F. Other ________ [ ] G. Unknown

III. INSPECTION INFORMATION

01 Date of Inspection	02 Site Status	03 Years of Operation	
5 / 9 / 89 (Month Day Year)	[ ] Active [X] Inactive	1963 (Beginning Year) | 1988 (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 & Env., Inc.	(716) 684-8060
09 Other Inspectors	**10 Title**	**11 Organization**	**12 Telephone No.**
J. Richert	Geologist	Ecology & Env., Inc.	(716) 684-8060
			( )
			( )
			( )
			( )

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Dave Pierce	Highway Supervisor	11550 Webster Lane Marilla, NY 14102	(716) 652-7311
Earl Jann	Town Supervisor	1740 Two Rod Road Marilla, NY 14102	(716) 652-4830
			( )
			( )

17 Access Gained by (Check one)	18 Time of Inspection	19 Weather Conditions
Permission	08:35	Sunny, 45° - 50° F

IV. INFORMATION AVAILABLE FROM

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

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
J. Griffis		Ecology & Env., Inc.	(716 684-8060	2 / 1 / 90 (Month Day Year)

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 2 - WASTE INFORMATION	I. IDENTIFICATION	
		01 State	02 Site Number
		NY	915093

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 Physical States (Check all that apply)	02 Waste Quantity at Site (Measure of waste quantities must be independent)	03 Waste Characteristics (Check all that apply)	
[ ] A. Solid	Tons ______	[ ] A. Toxic	[ ] H. Ignitable
[ ] B. Powder, Fines	Cubic Yards 95,000	[ ] B. Corrosive	[ ] I. Highly volatile
[ ] C. Sludge	No. of Drums ______	[ ] C. Radioactive	[ ] J. Explosive
[X] D. Other Municipal (Specify)		[ ] D. Persistent	[ ] K. Reactive
[ ] E. Slurry		[ ] E. Soluble	[ ] L. Incompatible
[ ] F. Liquid		[ ] F. Infectious	[X] M. Not applicable
[ ] G. Gas		[ ] G. Flammable	

III. WASTE TYPE: None disposed in landfill

Category	Substance Name	01 Gross Amount	02 Unit of Measure	03 Comments
SLU	Sludge			
OLW	Oily waste			
SOL	Solvents			
PSD	Pesticides			
OCC	Other organic chemicals			
IOC	Inorganic chemicals			
ACD	Acids			
BAS	Bases			
MES	Heavy Metals			

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

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	None		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

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

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT	I. IDENTIFICATION	
EPA PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	01 State NY	02 Site Number 915093

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. Groundwater Contamination 02 [ ] Observed (Date 7/85) [ ] Potential [X] Alleged
03 Population Potentially Affected 5,000-7,500 04 Narrative Description

Groundwater contamination observed in on-site monitoring wells sampled between 1981 and 1985. Drinking water supply is by private groundwater wells.

01 [X] B. Surface Water Contamination 02 [ ] Observed (Date 5/89) [X] Potential [ ] Alleged
03 Population Potentially Affected 382 04 Narrative Description:

Surface water contamination is a potential from surface runoff and leachate flow into an intermittent tributary of Little Buffalo Creek.

01 [X] C. Contamination of Air 02 [ ] Observed (Date 5/87) [X] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

HNu readings indicated 28 ppm above background from leachate outbreak on west side of landfill.

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

None on record.

01 [X] E. Direct Contact 02 [ ] Observed (Date 5/89) [ ] Potential [X] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

Leachate outbreaks were observed during the site inspection in 5/89. HNu readings of 28 ppm were recorded from leachate on the west side of the landfill. Although there are locking gates at the entrances, the site is not enclosed with a fence.

01 [X] F. Contamination of Soil 02 [ ] Observed (Date 5/89) [X] Potential [ ] Alleged
03 Area Potentially Affected 10 acres 04 Narrative Description:

Leachate-stained soils were observed on the northwest and west slopes of the landfill.

01 [X] G. Drinking Water Contamination 02 [ ] Observed (Date 7/85) [X] Potential [ ] Alleged
03 Population Potentially Affected 5,000-7,500 04 Narrative Description:

Groundwater contamination was observed on site by testing on-site wells between 1981 and 1985. Private wells exist adjacent to the landfill; therefore, there is a potential for drinking water contamination.

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

None on record.

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

None on record.

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT	I. IDENTIFICATION	
EPA PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)	01 State NY	02 Site Number 915093

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

01 [X] J. Damage to Flora 02 [X] Observed (Date 12/85) [ ] Potential [X] Alleged
04 Narrative Description:

Slight damage to vegetation on north ditch of landfill recorded on 12/10/85 during the site inspection for the NYSDEC Phase I investigation.

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

None on record.

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

None on record.

01 [X] M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums) 02 [ ] Observed (Date 5/89) [X] Potential [ ] Alleged
03 [ ] Population Potentially Affected ______ 04 Narrative Description:

Leachate outbreaks observed on north and west sides of landfill.

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

None on record.

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

Not applicable.

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

None on record.

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

None.

III. TOTAL POPULATION POTENTIALLY AFFECTED 5,000 to 7,000 people within 3 miles of the site

IV. COMMENTS

Landfill capping was in progress during the site inspection; therefore, the leachate outbreaks may be contained.

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

NYSDEC Phase I investigation on Town of Marilla Landfill, January 1988.

Site inspection by Ecology and Environment, Inc. on 5/9/89.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 4 - PERMIT AND DESCRIPTIVE INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915093

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				
[X] G. State (Specify)	15522	3-6-84	11-31-86	
[ ] 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)
[ ] A. Surface Impoundment			[ ] A. Incineration
[ ] B. Piles			[ ] B. Underground Injection
[ ] C. Drums, Above Ground			[ ] C. Chemical/Physical
[ ] D. Tank, Above Ground			[ ] D. Biological
[X] E. Tank, Below Ground	500	gal	[ ] E. Waste Oil Processing
[X] F. Landfill	95,000	cubic yards	[ ] F. Solvent Recovery
[ ] G. Landfarm			[ ] G. Other Recycling Recovery
[ ] H. Open dump			[ ] H. Other ______ (specify)
[ ] I. Other ______ (Specify)			

05 Other

[X] A. Buildings On Site

Equipment Shed

Recycling Building

06 Area of Site

41 Acres (10 acres landfill)

07 Comments
The landfill was active from 1965 to December 31, 1988. It received municipal waste from residents of the Town of Marilla. The refuse was disposed by area and trench methods. Additional capping began in 5/89.

IV. CONTAINMENT

01 Containment of Wastes (Check one)

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

02 Description of Drums, Diking, Liners, Barriers, etc. The landfill has no liner. It is capped with clay. Leachate outbreaks were observed on the north and west sides. There is a leachate weir downslope on the northwest corner of the landfill. No fence exists; however, the access roads have locking gates.

V. ACCESSIBILITY

01 Waste Easily Accessible: [X] Yes [ ] No
02 Comments: There are leachate outbreaks and no fence exists around the landfill. The locking gates at the entrances only keep vehicles out. Children were observed walking and riding bicycles across the site.

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

NYSDEC Phase I Investigation on the Town of Marilla Landfill, January 1988.
E & E site inspection on 5/89.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 State	02 Site Number
NY	915093

II. DRINKING WATER SUPPLY

01 Type of Drinking Supply (Check as applicable)

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

02 Status

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

03 Distance to Site

A ______ (mi)

B <0.25 (mi)

III. GROUNDWATER

01 Groundwater Use in Vicinity (Check one)

[X] A. Only Source for Drinking

[ ] B. Drinking (Other sources available) Commercial, industrial, irrigation (No other water sources available)

[ ] C. Commercial, industrial, irrigation (Limited other sources available)

[ ] D. Not Used, Unusable

02 Population Served by Groundwater 5,000-7,500

03 Distance to Nearest Drinking Water Well <0.25 (mi)

04 Depth to Groundwater 11-58 (ft)

05 Direction of Groundwater Flow northwest

06 Depth to Aquifer of Concern 11-58 (ft)

07 Potential Yield of Aquifer 300-400 (gpd)

08 Sole Source Aquifer Unknown [X] Yes [ ] No

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

Private wells. Depth varies from <30 to 775 feet. Aquifer is shale bedroocck. Closest well is <0.25 mile.

10 Recharge Area

[X] Yes

[ ] No

Comments: The south and east portions of the site.

11 Discharge Area

[X] Yes

[ ] No

Comments: The north and west portion of the site, downslope from the landfill in the low-lying areas containing the tributaries to Little Buffalo Creek.

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
Little Buffalo Creek	[ ]	1.7 (mi)
	[ ]	(mi)
	[ ]	(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. 382	B. 2,098	C. 5,000-7,500
No. of Persons	No. of Persons	No. of Persons

02 Distance to Nearest Population <0.25 (mi)

03 Number of Buildings Within Two (2) Miles of Site Approximately 250

04 Distance to Nearest Off-Site Home <0.25 (mi)

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

Rural population, primarily agricultural/residential area of very low density.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA (Cont.)

I. IDENTIFICATION	
01 State	02 Site Number
NY	915093

VI. ENVIRONMENTAL INFORMATION

01 Permeability of Unsaturated Zone (Check one)

[ ] A. 10^{-6} - 10^{-8} cm/sec [X] 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: 7-13.3 (ft)

04 Depth of Contaminated Soil Zone: Unknown

05 Soil pH: 3.6-7.3

06 Net Precipitation: 5 (in)

07 One Year 24-Hour Rainfall: 2.3 (in)

08 Site Slope: 0-3 %

Direction of Site Slope: N-NW

Terrain Average Slope: 0-10 %

09 Flood Potential

Site is in 500 Year Floodplain

10 [ ] Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway

11 Distance to Wetlands (5 acre minimum)

ESTUARINE NA OTHER

A. ____ (mi) B. 1.0 (mi)

12 Distance to Critical Habitat (of endangered species)

____ (mi)

Endangered Species: None

13 Land Use in Vicinity

Distance to:

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

14 Description of Site in Relation to Surrounding Topography

Site is located in an area with gently rolling hills. The site is relatively flat and open (except for the mounded fill area). The land slopes to the north and west of the landfill and becomes heavily wooded. The change in elevation from the top of the landfill to the tributary is approximately 100 feet.

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

GEMS 1986

NYSDEC Phase I Investigation of the Town of Marilla Landfill Site, January 1988.

Site Inspection by Ecology and Environment, Inc. on 5/9/89.

USGS Topographic Quadrangles: Cowlesville (1949) and E. Aurora (1965).

USDA SCS Soils of Erie County, 1979.

US Climatic Atlas, USDOC.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 6 - SAMPLE AND FIELD INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915093

II. SAMPLES TAKEN - No samples taken during S.I.

Sample Type	01 Number of Samples Taken	02 Samples Sent to	03 Estimated Date Results Available
Groundwater			
Surface Water	4	Ecology and Environment, Inc. ASC	12/89
Waste	2	Ecology and Environment, Inc. ASC	12/89
Air			
Runoff			
Spill			
Soil	3	Ecology and Environment, Inc. ASC	12/89
Vegetation			
Other Sediment	4	Ecology and Environment, Inc. ASC	12/89

III. FIELD MEASUREMENTS TAKEN

01 Type	02 Comments
Air	Continuous air monitoring with HNu. All samples at background levels except for 28 ppm
	above background from leachate on west side of landfill.

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 logbook at Ecology and Environment, Inc.

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

Three surface soil samples collected (one is background and two are downgradient).

Four surface water/sediment samples collected (one upgradient and three downgradient).

All sample locations are photo documented.

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

Site Inspection by Ecology and Environment, Inc. on 5/9/89.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915093

II. CURRENT OWNER(S)

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code
Town of Marilla		1740 Two rod Road		Marilla	NY	14102

PARENT COMPANY (if applicable)

08 Name	09 D+B Number	10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	12 City	13 State	14 Zip Code

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

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code
Osca Tankusley						

IV. REALTY OWNER(S) (if applicable, most recent first)

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code

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

NYSDEC Phase I Investigation of Town of Marilla Landfill, January 1988.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 8 - OPERATOR INFORMATION - NA	I. IDENTIFICATION 01 State: NY 02 Site Number: 915093

II. CURRENT OPERATOR (if different from Owner)

01 Name	02 D+B Number
Town of Marilla	
03 Street Address (P.O. Box, RFD #, etc.)	**04 SIC Code**
1740 Two Rod Road	

05 City	06 State	07 Zip Code
Marilla	NY	14102

08 Years of Operation	09 Name of Owner

OPERATOR'S PARENT COMPANY (if applicable)

10 Name	11 D+B Number
12 Street Address (P.O. Box, RFD #, etc.)	**13 SIC Code**

14 City	15 State	16 Zip Code

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

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code	08 Years of Operation	09 Name of Owner During This Period
Oscar Tankusley							1965-1970	Town of Marilla

PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)

10 Name	11 D+B Number	12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code	14 City	15 State	16 Zip Code

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

NYSDEC Phase I Investigaton of Town of Marilla Landfill, January 1988.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 9 - GENERATOR/TRANSPORTER INFORMATION	I. IDENTIFICATION	
		01 State	02 Site Number
		NY	915093

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)

NYSDEC Phase I Investigation of Town of Marilla Landfill, January 1988.

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 10 - PAST RESPONSE ACTIVITIES	I. IDENTIFICATION	
	01 State NY	02 Site Number 915093

II. PAST RESPONSE ACTIVITIES

01 [ ] A. Water Supply Closed 02 Date ______ 03 Agency ______
04 Description:

01 [ ] B. Temporary Water Supply Provided 02 Date ______ 03 Agency ______
04 Description:

01 [ ] C. Permanent Water Supply Provided 02 Date ______ 03 Agency ______
04 Description:

01 [X] D. Spilled Material Removed 02 Date 1983 03 Agency NYSDEC
04 Description:
Leaking waste oil drums in vicinity of equipment shed were removed.

01 [X] E. Contaminated Soil Removed 02 Date ______ 03 Agency NYSDEC
04 Description:
Leaking waste oil drums in vicinity of equipment shed. Soil removed and landfilled on site.

01 [ ] F. Waste Repackaged 02 Date ______ 03 Agency ______
04 Description:

01 [ ] G. Waste Disposed Elsewhere 02 Date ______ 03 Agency ______
04 Description:

01 [X] H. On-Site Burial 02 Date 1983 03 Agency NYSDEC
04 Description:
Contaminated soil from leaking waste oil drums landfilled on site.

01 [ ] I. In Situ Chemical Treatment 02 Date ______ 03 Agency ______
04 Description:

01 [ ] J. In Situ Biological Treatment 02 Date ______ 03 Agency ______
04 Description:

01 [ ] K. In Situ Physical Treament 02 Date ______ 03 Agency ______
04 Description:

01 [ ] L. Encapsulation 02 Date ______ 03 Agency ______
04 Description:

01 [ ] M. Emergency Waste Treatment 02 Date ______ 03 Agency ______
04 Description:

01 [ ] N. Cutoff Walls 02 Date ______ 03 Agency ______
04 Description:

01 [ ] O. Emergency Diking/Surface Water Diversion 02 Date ______ 03 Agency ______
04 Description:

01 [X] P. Cutoff Trenches/Sump 02 Date Unknown 03 Agency ______
04 Description:
There is a leachate weir at the base of the northwest corner of the landfill.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 10 - PAST RESPONSE ACTIVITIES (Cont.)	I. IDENTIFICATION 01 State: NY 02 Site Number: 915093

II. PAST RESPONSE ACTIVITIES (Cont.)

01 [ ] Q. Subsurface Cutoff Wall 04 Description:	02 Date ______	03 Agency ______
01 [ ] R. Barrier Walls Constructed 04 Description:	02 Date ______	03 Agency ______
01 [X] S. Capping/Covering 04 Description: Capping in progress in May 1989.	02 Date 1989	03 Agency Town of Marilla
01 [ ] T. Bulk Tankage Repaired 04 Description:	02 Date ______	03 Agency ______
01 [ ] U. Grout Curtain Constructed 04 Description:	02 Date ______	03 Agency ______
01 [ ] V. Bottom Sealed 04 Description:	02 Date ______	03 Agency ______
01 [X] W. Gas Control 04 Description: Gas venting structures.	02 Date 3/82	03 Agency NYSDEC - Region 9
01 [X] X. Fire Control 04 Description: Contingency plans.	02 Date 3/82	03 Agency NYSDEC - Region 9
01 [ ] Y. Leachate Treatment 04 Description:	02 Date ______	03 Agency ______
01 [ ] Z. Area Evacuated 04 Description:	02 Date ______	03 Agency ______
01 [X] 1. Access to Site Restricted 04 Description: Operating procedures: limited access/use of landfill.	02 Date 3/82	03 Agency NYSDEC - Region 9
01 [ ] 2. Population Relocated 04 Description:	02 Date ______	03 Agency ______
01 [ ] 3. Other Remedial Activities 04 Description:	02 Date ______	03 Agency ______

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

NYSDEC Phase I Investigation of Town of Marilla Landfill, January 1988.

Site Inspection by Ecology and Environment, Inc. on 5/9/89.

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT	I. IDENTIFICATION	
EPA PART 11 - ENFORCEMENT INFORMATION	01 State NY	02 Site Number 915093

II. ENFORCEMENT INFORMATION

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

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

On several occasions during site vists by NYSDEC, DOH, DEP, etc., chronic operational problems were noted. These problems included: poor daily cover, pooling of surface water, inadequate vegetation, leachate outbreaks, and wind-blown refuse. NYSDEC required the Town of Marilla to perform water quality sampling through the installation of five groundwater monitoring wells in 1981. A Phase I investigation was performed in 1985 by Engineering Science and Dames and Moore under contract with NYSDEC.

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

NYSDEC Phase I Investigation of Town of Marilla Landfill, January 1988.

6. REFERENCES

Advanced Environmental Services, Town of Marilla Sanitary Landfill Quarterly Monitoring, 1990, Analytical Results from December 8, 1988 to September 10, 1990.

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Ecology and Environment, Inc., May 9, 1989, Site Inspection Report.

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General Sciences Corporation, 1986, Graphical Exposure Modeling System (GEMS), Volume 3, Graphics and Geodata Handling, prepared for USEPA Office of Pesticides and Toxic Substances Exposure Evaluation Division.

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New York State Department of Environmental Conservation, 1986, Water Quality Regulations, New York State Codes, Rules, and Regulations, Title 6, Chapter X, Parts 700-705, Albany, New York.

__________, 1987, Memorandum from Ms. Mary McIntosh to Mr. Robert Mitrey, March 16, 1987.

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Sax, N.I., 1975, Dangerous Properties of Industrial Materials, Van Nostrand Reinhold Company, New York, New York.

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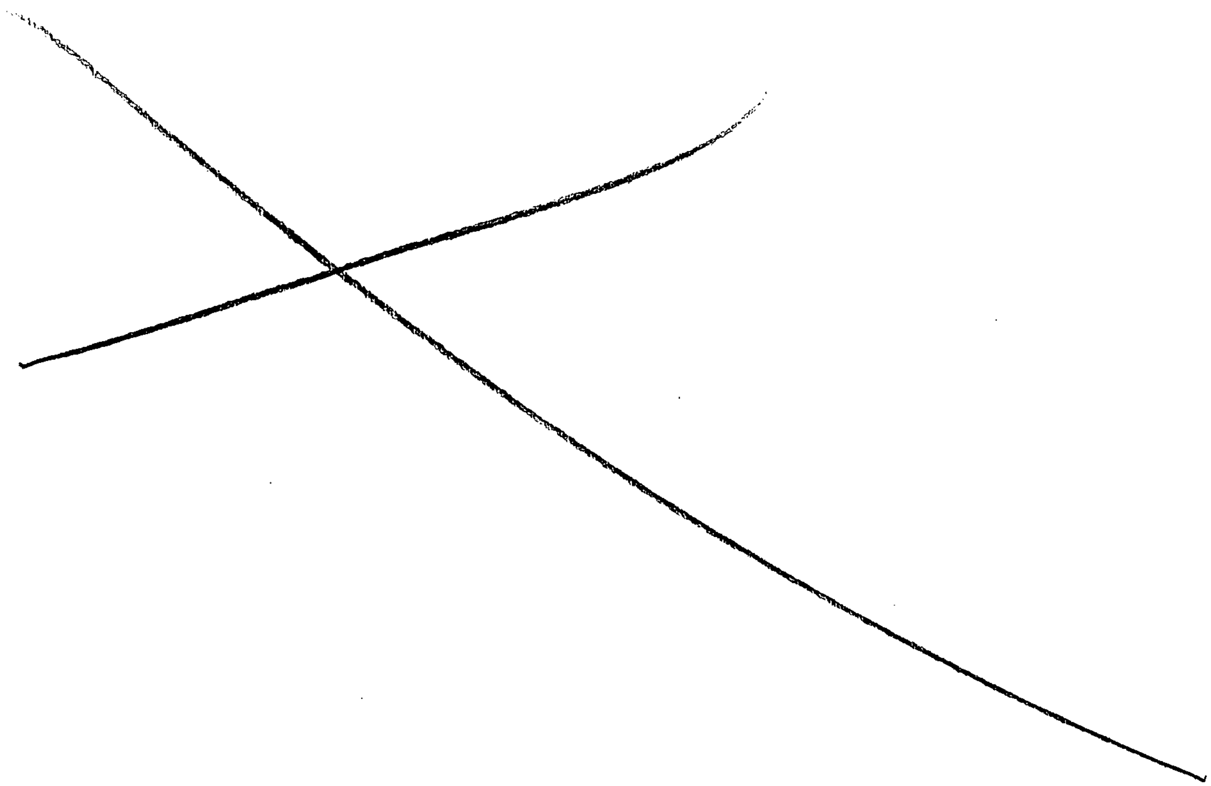


APPENDIX A

SITE-SPECIFIC SAFETY PLAN AND
DRILLING SITE SAFETY CHECKLIST

ecology and environment, inc.

SITE SAFETY PLAN

Version 988

A. GENERAL INFORMATION

Project Title: Marilla Landfill Phase II

Project No.: YN1020

TDD/Pan No.:

Project Manager: Gene Florentino

Project Dir.: J. Griffis

Location(s): Eastwood Road, Town of Marilla

Prepared by: Bob Meyers

Date Prepared: 4/11/89

Approval by: [signature] Corp H/S group

Date Approved: 4/14/89

Site Safety Officer Review:

Date Reviewed:

Scope/Objective of Work: Site reconnaissance and geophysical survey with some limited surface water, sediment, surface soil, and leachate sampling.

Proposed Date of Field Activities: April - May 1989

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

Other: Municipal wastes from the Town of Marilla

Physical Hazards:

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

*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): Municipal landfill has been capped but continues to have leachate problems and groundwater contamination. One well is located in a wooded area.

Locations of Chemicals/Wastes:

Estimated Volume of Chemicals/Wastes: Unknown

Site 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)

Physical Hazard Evaluation: 1) Site reconnaissance, 2) geophysical, 3) environmental sampling, 4) creek sampling.

Chemical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Lead	0.15 mg/m cu	Inhalation/ ingestion	Digestive and nervous system distress	--	--
Cadmium	0.5 mg/m cu	Inhalation/ ingestion	Mucous membrane irritation, nausea	--	--
PCBs	1.0 μg/m cu	Inhalation/ ingestion	Eye irritation, nausea, vomiting	--	Mild hydrocarbon
Phenols	5 ppm	Rapid skin adsorption; inhalation/ ingestion	CNS Distress	0.5 ppm	Phenolic
Cyanide	10 ppm	Inhalation/ dermal	Blue lips	Various	Almond

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? [Y]

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

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

(Expand if necessary)

Modifications: Level C available as backup, except for leachate sampling which requires its use.

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: monitox 4 ppm or at alarm. Radiation - Alarm at 0.1 mR/hr.
- 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	Area	Mini-Rad	Continuous
Flammables	Area	Explosimeter	Continuous
Cyanide	Area	Monitox	Continuous

*OVA screening (if used instead of Hnu) should include methane screening.

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

1) Scrub with brushes in trisodium phosphate solution, 2) Rinse with deionized water, 10% nitric acid rinse. 3) Rinse with hexane, 4) Rinse with acetone, 5) Triple rinse with deionized water, 6) Air dry.

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

Personnel Decon Protocol: Following disposal of expendables, crew will wash hands/face ASAP, water, pump soap, paper towels to be available at hotline.

Decon Solution Monitoring Procedures, if Applicable: N/A

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

Site Entry Procedures and Special Considerations: Deep vegetation presents hazards including physical hazards, snakes, etc. Dry conditions will require mini-ram dust monitor to be used.

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

Daylight, no working during thunderstorms. Waterway (creek) sampling to be done at shore only, with "buddy" in close proximity.

General Spill Control, if applicable: N/A

Investigation-Derived Material Disposal (i.e., expendables, decon waste, cuttings):

To be determined; solid materials to be double-bagged; liquids to be containerized. E & E must obtain written authorization to leave IDM on scene after fieldwork, or provide appropriate plans for off-site disposal.

Sample Handling Procedures Including Protective Wear:

Rubber booties and gloves; Tyvek coveralls, safety shoes and hard hat for site entry. Wear face shield when sampling liquids. Surgical gloves for handling samples during documentation, labeling, and packing for shipment.

Team Member*	Responsibility
To be determined.	Team Leader
	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 S-3669 Southwestern Boulevard, 662-0500 (or dial 911)

Hospital Emergency Room Deaconess Hospital, 1001 Humboldt Parkway, Buffalo, NY (716) 886-4400

Poison Control Center Phone 878-7654, 219 Bryant Street, Buffalo, NY

Police (include local, county sheriff, state) Erie County Sheriffs Department, Phone 662-5554 (or dial 911)

Fire Department Phone 652-6260 (or dial 911)

Airport Buffalo International Airport

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

Local Laboratory E & E lab

UPS/Fed. Express

Client/EPA Contact

Site Contact

SITE RESOURCES

Site Emergency Evacuation Alarm Method Car horn, continuous blast

Water Supply Source Highway department

Telephone Location, Number Highway department

Cellular Phone, if available

Radio

Other

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 .... ____________ (home)
   ____________ (office)
4. FITOM, TATOM, or Office Manager .... ____________ (home)

MEDTOX HOTLINE

1. 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.

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

3. 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) Eastwood to Bowles, turn left, take Bowles to Rt. 400, turn right, 400 to Seneca Street, turn right, Seneca to Fillmore Avenue, turn right, Fillmore to Best Street, turn left, Best to Wohlers, turn right, Deaconess Hospital is on the right side.

Emergency Egress Routes to Get Off-Site TBD prior to entry.

14208
14211
14212
14203
14204
14206
BUFFALO
UTICA
LAUREL
RILEY
EATON
NORTHAMPTON
SOUTHAMPTON
DODGE
EDNA
BEST
NORTH
HIGH
GOODRICH
CARLTON
VIRGINIA
GENERAL HOSP.
ROSWELL PK MEMORIAL INST.
HUMBOLDT PARK
M. LUTHER KING JR. PK.
FILLMORE
GENESEE
WALDEN
BROADWAY
SYCAMORE
WILLIAM
CLINTON
J.F.K. RECREATION CTR.
ELLICOTT MALL
TALBERT MALL
EXCHANGE
SENECA
PERRY
FULTON
MIAMI
MACKINAW
ELK
MEMORIAL DR.
PENN CENTRAL YARDS
AMTRAK STA.
POST OFFICE
MONS VALENTE DR.
BUD-MILL DR
CENTRAL
BAILEY AV.
E. L. R.R. YARDS
LACKAWANNA
DINGENS
GRISWOLD
HOUGHTON PARK
CASIMIR
SEWARD
PADEREWSKI
PECKHAM
JEFFERSON
MICHIGAN
MAIN
STRAUSS
WILSON
GUILFORD
HERMAN
JOHNSON
GREY
STANISLAUS
LOVEJOY
BOGARDUS ST.
HENNEPIN ST.
LUDINGTON
DEMPSTER ST.
STANLEY ST.
REGENT ST.
MORELAND ST.
VANDERBILT
REIMANN
STONE ST.
PENN
ERIE
130
33B
354
62
190
N1
N3
N4

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)	X
CARTRIDGES (Type GMC-H)	X	5-MINUTE ESCAPE MASK (Available)	
5-MINUTE ESCAPE MASK		PROTECTIVE COVERALL (Type Tyvek)	X
PROTECTIVE COVERALL (Type Tyvek)	X	RAIN SUIT	
RAIN SUIT		NEOPRENE SAFETY BOOTS	
BUTYL APRON		BOOTIES	X
SURGICAL GLOVES	X	WORK GLOVES	X
GLOVES (Type Scorpio)	X	HARD HAT WITH FACE SHIELD	X
OUTER WORK GLOVES	X	SAFETY GLASSES	
NEOPRENE SAFETY BOOTS			
HARD HAT WITH FACE SHIELD	X		
BOOTIES	X		
HARDHAT	X		

INSTRUMENTATION	No.	DECON EQUIPMENT	No.
OVA	X	WASH TUBS	X
THERMAL DESORBER		BUCKETS	
O2/EXPLOSIMETER W/CAL. KIT	1	SCRUB BRUSHES	X
PHOTOVAC TIP		PRESSURIZED SPRAYER (spray bottle)	X
HNu (Probe 10.2 eV)	X	DETERGENT (Type TSP soap)	X
MAGNETOMETER	X	SOLVENT (Type acetone, hexane)	X
PIPE LOCATOR		PLASTIC SHEETING	X
WEATHER STATION		TARPS AND POLES	
DRAEGER PUMP, TUBES ______		TRASH BAGS	X
BRUNTON COMPASS		TRASH CANS	
MONITOX CYANIDE	X	MASKING TAPE	
HEAT STRESS MONITOR		DUCT TAPE	X
NOISE EQUIPMENT ______		PAPER TOWELS	X
PERSONAL SAMPLING PUMPS		FACE MASK	
		FACE MASK SANITIZER	
		FOLDING CHAIRS	
		STEP LADDERS	
RADIATION EQUIPMENT (TLD badges)	X	DISTILLED WATER	X
DOCUMENTATION FORMS			
PORTABLE RATEMETER			
SCALER/RATEMETER		**SAMPLING EQUIPMENT**	
NaI Probe		8 OZ. BOTTLES	X
ZnS Probe		HALF-GALLON BOTTLES	X
GM Pancake Probe		VOA BOTTLES	X
GM Side Window Probe		STRING	
MICRO R METER		HAND BAILERS	
ION CHAMBER		THIEVING RODS WITH BULBS	
ALERT DOSIMETER		SPOONS	X
POCKET DOSIMETER		KNIVES	X
MINI-RAD	X	FILTER PAPER	
FIRST AID EQUIPMENT		PERSONAL SAMPLING PUMP SUPPLIES	
FIRST AID KIT	1		
OXYGEN ADMINISTRATOR			
STRETCHER			
PORTABLE EYE WASH	X		
BLOOD PRESSURE MONITOR			
FIRE EXTINGUISHER			

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

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

Chemical Name Lead Date

DOT Classification Job Number

CAS Number 7439-92-1

REFERENCES CONSULTED (circle; also include MSDS if approprate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol.III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other: Sittig

CHEMICAL PROPERTIES:(Synonyms:White lead, plumbum)
Chemical Formula Pb MW 207 Ionization Potential N/A
Physical State Variable Boiling Point 3164° F Freezing Point
Flash Point Incombust. Flammable Limits Incombus Vapor Pressure variable
Specific Gravity/Density 11.3 @61° FOdor/ Odor Threshold None
Solubility-water: Insoluble Solubility-other:
Incompatabilities & Reactivity: Strong oxidizers,perioxides,active metals

TOXICOLOGICAL PROPERTIES:
Exposure Limits: TLV-TWA (ACGIH) .15 mg/m³ PEL (OSHA) 50ug/m³
STEL None est. Ceiling Limits None est. IDLH Variable
Toxicity Data: (Indicate duration of study)
Human; IHL Dermal Oral Td10 450mg/kg/6Y
Rat/Mouse; IHL Dermal Oral Tdlo 790mg/kg
Aquatic: Unknown Other: Toxicity varies with lead cpds.
Carcinogen Indef. Mutagen Indef Reproductive Toxin exp.teratogen
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: 5mg/m3 high efficiency particulate respirator, other concentrations - SCBA.
Protective Clothing: Avoid skin and eye contact
Special Equipment: None

DISPOSAL,FIRE and SPILLS:(Use numbered codes;see attached sheets for explanation.)
Disposal P Fire 13 Leaks&Spills 7,8,10
Decomposition Products: Toxic fumes of lead

FIRST AID:
ING: Give water, induce vomiting, medical attention immed.
IHL: Move to fresh air, artifical resp. if necessary, medical attent.
Eye/Skin: Irrigate/wash with water. Wash skin thoroughly with soap & water.

SYMPTOMS:
acute(immediate) exposure effects: Cumulative neurotoxin-commonly occurs from prolonged exposure.Symptoms include stomach distress,vomiting, diarrhea,black stools, anemia, nervous system effects.
chronic(long term) exposure effects: 3 clinical types:a-ailmentary-abominal pain,discomfort,constipation or diarrhea,metallic taste,lead line on gum headache. b-nueromuscular, muscle weakness,joint/muscle pain,dizziness, insomnia,paralysis c-encephalic:brain involvement,stupor,coma,death,rare.
reproductive effects: Human epid. studies have concluded that lead is a poison to male & female germ cells;increased incidence of miscarriages, stillbirths, sterility in females;sperm depression & decreased motiltiy in

Chemical Name Cadmium Date

DOT Classification Job Number

CAS Number 7440-43-9

REFERENCES CONSULTED (circle; also include MSDS if approprate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol.III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other: Casarett & Doull's Toxicology, Niosh Occupational Heathguides

CHEMICAL PROPERTIES: (Synonyms: C.I 77180)
Chemical Formula Cd MW112.4 Ionization Potential N/A
Physical State Crystals Boiling Point 1412° F Freezing Point 609° F
Flash Point N/A Flammable Limits N/A Vapor Pressure
Specific Gravity/Density 8.642 Odor/Odor Threshold None

Solubility-water: Insoluble Solubility-other:
Incompatabilities & Reactivity: Strong oxidizers, sulfur, selenium, zinc, ammoni

TOXICOLOGICAL PROPERTIES: (dust) (Fume)
Exposure Limits: TLV-TWA (ACGIH) .05mg/m^3 PEL (OSHA) .2mg/m^3 .1mg/m^3
STEL None est. Ceiling Limits .6mg/m^3 / .3mg/m^3 IDLH 40 mg/m^3
Toxicity Data: (Indicate duration of study)
Human; IHL Tclo 39mg/m^3/20M Dermal Oral
Rat/Mouse; IHL Dermal Oral LD50 225mg/kg
Aquatic: N/A Other:
Carcinogen animal-pos Mutagen exp. Reproductive Toxin exper. teratogen
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: > any detectable air concentraton - use SCBA
Protective Clothing: Chemical resistant gloves & boots.
Special Equipment: None

DISPOSAL, FIRE and SPILLS: (Use numbered codes; see attached sheets for explanation.)
Disposal P Fire 13 Leaks&Spills 7.10
Decomposition Products: Toxic Cd fumes

FIRST AID:
INL: Large quantities of water, inducevomiting, medical attent.
IHG: Remove to fresh air, art. resp. if necessary, med. attent. immed.
Eye/Skin: Irrigate/wash with water for at least 15 min.

SYMPTOMS:
acute(immediate) exposure effects: IHL: irritation of nose & throat, 2-hour delay before symptoms of cough, chest pain, nausea, vomiting, dizziness, chills, stomach distress. ING Nausea, vomiting, diarrhea, abominal cramps

chronic(long term) exposure effects: loss of smell, ulceration of nose, shortness of breath, liver damage, kidney damage (most affected), mild anemia, emphysema, linked to cancer & hypertension.

reproductive effects: Possibly cuases prostate cancer, teratogenic in in lab animals
12/86

ecology and environment, inc.

HAZARD EVALUATION OF CHEMICALS

Chemical Name PCBs Date 4/13/89

DOT Name/U.N. No. UN 2315 Job No. YN-1000

CAS Number 1336-36-3

References Consulted (circle):

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

Toxic and Hazardous Safety Manual ACGIH Other: chemtox data,

Chemical Properties: (Synonyms: AROCLOR 1254, 1221, 1232, 1242, 1245, ect.

Chemical Formula $C_{12}H_5C_{13}$ (APPROX) Molecular Weight 326

Physical State liquid Solubility (H_2O) Insoluble Boiling Point 617° to 691°F

Flash Point 431.3°F Vapor Pressure/Density .001 mm Freezing Point -2°F

Specific Gravity 1.3-1.8 Odor/Odor Threshold ______ Flammable Limits ______

Incompatabilities strong oxidizers

Biological Properties:

TLV-TWA 1.0 UG/m^3 PEL 0.5 mg/m^3 Odor Characteristic Mild Hydrocarbon odor

IDLH 5 mg/m^3 Human ______ Aquatic ______ Rat/Mouse ______

Route of Exposure ______

Carcinogen ✓ Teratogen ______ Mutagen ______

Handling Recommendations: (Personal protective measures) Impermiable clothing, gloves, face sheilds. use - Neoprene, Butyt rubber, saranex.

Monitoring Recommendations:

Disposal/Waste Treatment:
store contaminated clothing in closed container until discarded or Laundered.

Health Hazards and First Aid:
skin or eye contact - flush with water for at least 15 minutes

Symptoms: Acute: Irritate eyes, skin, Jaundice, Dark Urine, Chloracne, nausea, vomiting

Chronic: Liver damage

375103
(12/83,OLD)

Chemical Name Phenol Date

DOT Classification Job Number

CAS Number 108-95-2

REFERENCES CONSULTED (circle; also include MSDS if approprate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other:

CHEMICAL PROPERTIES:(Synonyms: carbolic acid, phenic acid, phenyl hydroxide)
Chemical Formula C_6H_5OH MW 94 Ionization Potential 8.5ev
Physical State solid, thick liq. Boiling Point 359°F Freezing Point 106°F
Flash Point 185°F Flammable Limits 1.7-8.6% Vapor Pressure .36mm
Specific Gravity/Density 1.058@41°F Odor/Odor Threshold .05ppm
Solubility-water: soluble Solubility-other: miscible-alcohol, ether
Incompatabilities & Reactivity: strongoxidizers, bases, calcium hypochlorite

TOXICOLOGICAL PROPERTIES:
Exposure Limits: TLV-TWA (ACGIH) 5ppm(skin) PEL (OSHA) 5ppm
STEL none est. Ceiling Limits 15.6ppm IDLH 100ppm
Toxicity Data: (Indicate duration of study)
Human; IHL Dermal Oral LDlo 140mg/kg
Rat/Mouse; IHL Dermal LD50 669mg/kg Oral LD50 414mg/kg
Aquatic: Tlm 96:100-10ppm Other: strong poison, ingestion of 1gram
Carcinogen exper. Mutagen exper. Reproductive Toxin exper. teratogen
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other rapid skin absorption

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: 50ppm-APR w/organic filter; 100ppm-SCBA
Protective Clothing: excel-viton: good-butyl, vinyl, neoprene; poor-nitrile.
Special Equipment: Prevent skin/eye contact.

DISPOSAL, FIRE and SPILLS: (Use numbered codes; see attached sheets for explanation.)
Disposal A Fire 3.7 Leaks&Spills 4,6,9,11
Decomposition Products: fumes of carbon monoxide, carbon dioxide

FIRST AID:
ING: Do not induce vomiting; give milk, eggwhites, water, medical attent. immed.
IHL: remove to fresh air, artificial resp. if necessary, medical attent.
Eye/Skin: irrigate/flush with water for at least 15minutes. After complete rinsing of skin w/water, wash with soap. Medical attent immed.
SYMPTOMS:
acute(immediate) exposure effects: main effect on CNS, symptoms develop quickly(15-20)minutes), headache, muscular weakness, dimness of vision, ringing in ears, rapid breathing, weak pulse, collapse, possible death. Severe skin burns.

chronic(long term) exposure effects: Rarely reported but symptoms include vomiting, difficulty in swallowing, diarrhea, lack of appetite, headache, fainting, dizziness, mental disturbances, skin rash, liver & kidney damage. Ingestion of 1gram may be fatal.

reproductive effects: None specified for humans. Experimental teratogen in animals.

12/86

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

Chemical Name Hydrogen Cyanide Date

DOT Classification Job Number

CAS Number 74-90-8

REFERENCES CONSULTED (circle; also include MSDS if appropriate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol.III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other: Cassarett & Doull's Toxicology, Sittig.

CHEMICAL PROPERTIES: (Synonyms: Hydrocyanic acid, Prussic acid, formonitrile)
Chemical Formula HCN MW 27 Ionization Potential 13.91
Physical State Gas, liquid Boiling Point 79° F Freezing Point 7° F
Flash Point 0° F Flammable Limits 5.6-40% Vapor Pressure 0.95
Specific Gravity/Density 0.689@20° C Odor/Odor Threshold 1ppm*
Solubility-water: Miscible Solubility-other: Miscible-alcohol, ether
Incompatabilities & Reactivity: Bases, caustics, O_2, Peroxides, plastic, acids
*Odor not adequate warning property since effects occur rapidly.
TOXICOLOGICAL PROPERTIES:
Exposure Limits: TLV-TWA (ACGIH) 10ppm(skin) PEL (OSHA) 10ppm(skin)
STEL None est. Ceiling Limits 5mg/m³/10min. IDLH 50ppm
Toxicity Data: (Indicate duration of study)
Human; IHLLclo 200mg/m³/10min Dermal Oral LDlo 570ug/kg
Rat/Mouse; IHLLc50 484ppm/4H Dermal Oral LDlo 10mg/kg
Aquatic: N/A Other:
Carcinogen N/A Mutagen N/A Reproductive Toxin N/A
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other Quicly abesorbed thru skin.

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: Supplied air with escape SCBA, SCBA with full face piece.
Protective Clothing: Avoid skin contact.
Special Equipment: None

DISPOSAL, FIRE and SPILLS: (Use numbered codes; see attached sheets for explanation.)
Disposal C Fire 7 Leaks&Spills
Decomposition Products: Toxic fumes of CN

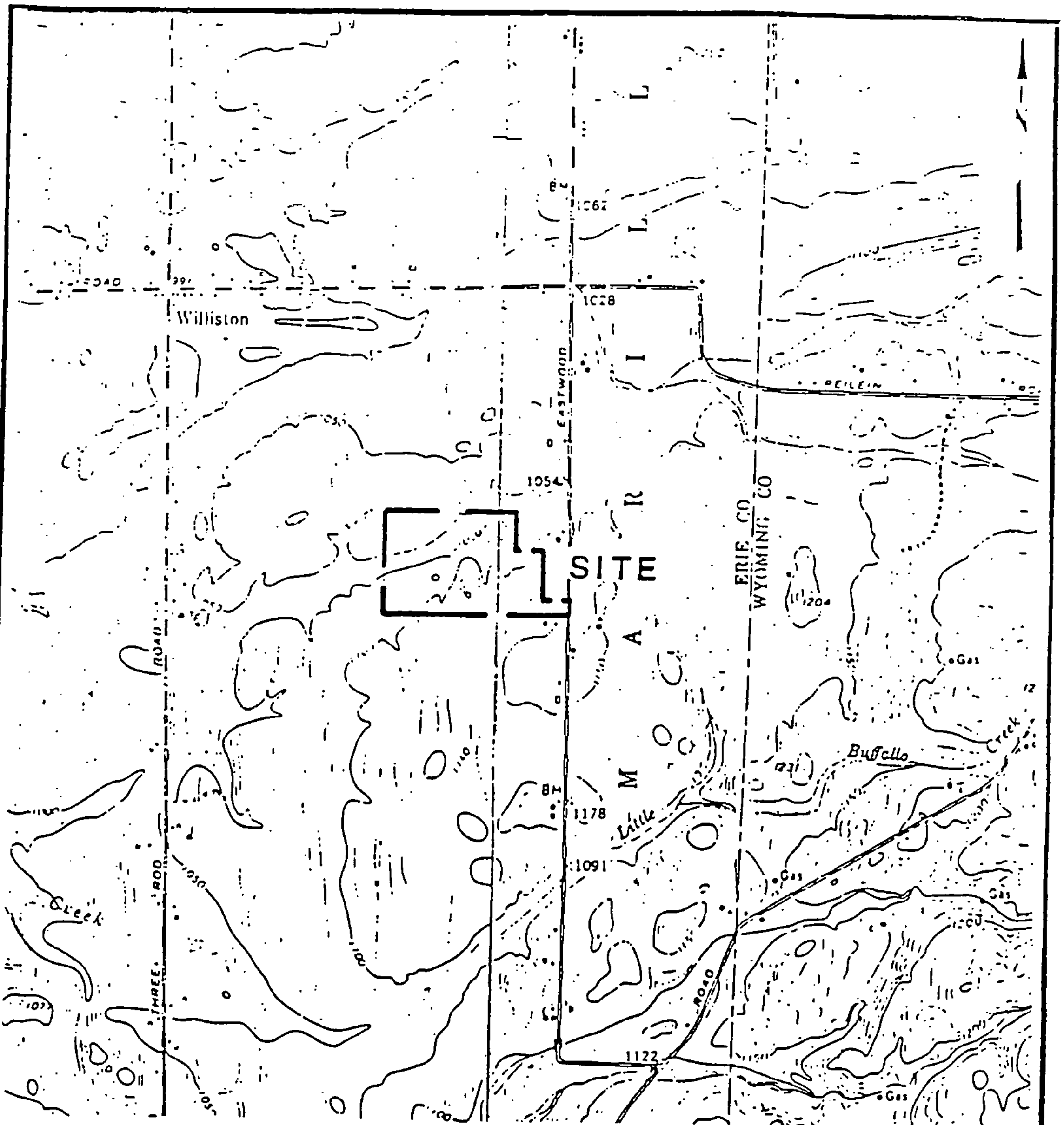
FIRST AID:
ING: Give large quantities of milk or water, induce vomiting, medical atten.
IHL: Move to fresh air, give artifical resp. if necessary, medical atten.
Eye/Skin: Irrigate/rinse with large amounts of water for at least 15 min.

SYMPTOMS:
acute(immediate) exposure effects: Chemicial asphyxiant, rapid hypotension, convulsions, collapse, unconsciousness, coma, decreased respiration. Lower doses cause vomiting, headache, weakness, nausea.

chronic(long term) exposure effects: Little data avail. Reported symptoms: dizziness, weakness, lung congestion, hoarseness, conjunctivitis, loss of appetite, weight loss, dermatitis

reproductive effects: None specified for humans.

12/86



LATITUDE: 42°48'58" N
LONGITUDE: 78°30'05" W

SCALE
0 1000 2000 3000 4000 FEET

REFERENCE: U.S.G.S. 7.5' Topographic Map East Aurora, NY (1965) and Cowlesville, NY (1949) Quadrangles

SITE LOCATION MAP
TOWN OF MARILLA

FIGURE 1

DRILLING SITE SAFETY CHECKLIST

- o All E&E drilling personnel will have read and understood the terms of E&E drilling SOP.
- o Daily inspection of rig and components - obvious or questionable safety conditions will be cause for work interruption.
- o 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.
- o Continuous O_2/explosimeter monitoring at borehole using remote sampling hose.
- o 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.
- o Fire extinguisher(s) will be staged next to rig before drilling/refueling operations.
- o Welding/cutting activities will only be performed at a distance from ignition sources approved as safe by the Site Safety Officer (SSO), Team Leader.
- o 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.
- o Outrigger stabilizers must be in place before drilling commences. The rig must also be leveled.
- o Drill rig boom must be horizontal during movement of rig. It will not be erected within 25 feet of overhead lines.
- o Electrical storms within earshot of the job site will be cause for work termination until deemed safe by the SSO and Team Leader.
- o 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.
- o 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:

- Only trained, experienced staff will operate the cathead. Personnel must be knowledgeable in safe good practive procedures for cathead use.
- 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.
- Climbing on vertical boom is not permitted by E&E staff.

APPENDIX B

GEOPHYSICAL SURVEY

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATIONS

GEOPHYSICAL SURVEY

TOWN OF MARILLA LANDFILL
SITE NUMBER 915093
TOWN OF MARILLA, ERIE COUNTY

June 1989

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.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

This geophysical investigation report for the Town of Marilla Landfill site (I.D. No. 915093) in Erie County, New York, was prepared by Ecology and Environment Engineering, P.C. (E & E), under contract to the New York State Department of Environmental Conservation (NYSDEC). The geophysical investigation consisted of an EM31 (electromagnetic terrain conductivity) survey and portable proton magnetometer (total earth field magnetics) survey. This report includes field data (Appendix A) and contour maps (Appendix B) for the geophysical surveys performed at this site on May 24, 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 Town of Marilla Landfill was designed to achieve several general goals. The main objectives of the geophysical methods used were to optimize the locations of the 2 proposed on-site groundwater monitoring wells; reduce the risks associated with drilling into unknown terrain and wastes; reduce overall project time and cost; improve the accuracy and confidence of the investigation; identify the existence of buried waste and its vertical and horizontal boundaries; and determine vertical and horizontal anomalies.

3. METHODS

Two 40′ x 40′ grids were set up at each of the prospective well locations. The X and Y axes of each grid were oriented approximately east-west and north-south, respectively. Precise compass orientations were then obtained for each of the survey grid axes. Survey grid coordinate 0,0 is located in the southwest corner of each contour map. Semi-permanent wooden stakes mark the proposed well locations for reference during drilling.

Both horizontal and vertical dipole readings in north-south/east-west orientations were recorded at each node while performing the electromagnetic ground conductivity survey using a Geonics, Ltd. EM31 ground conductivity meter. The effective depths of penetration provided by the EM31 in the vertical and horizontal dipole modes is $\leq$18 feet and $\leq$9 feet, respectively. These depths were considered adequate to delineate any buried materials which may be encountered during drilling. Magnetometer readings were also recorded at each node in both north-south and east-west orientations using an EG+G UniMag II Portable Proton Precession Magnetometer.

All geophysical field data were initially recorded in two logbooks dedicated to this site investigation. Magnetometer data were reduced by averaging station readings for north-south and east-west orientations and correcting these values for diurnal variation based on background station readings. EM31 conductivity data were averaged for north-south and east-west orientations for both vertical and horizontal dipole positions. The reduced geophysical data (See Appendix A) were then plotted and contoured for each survey (see Appendix B).

4. DATA INTERPRETATION

The purpose of interpreting the results of the magnetometer and EM31 surveys is to provide a probable explanation for anomalous geophysical contours. The presence of buried utilities, metal objects, wastes, and contaminant plumes are often manifest as relatively elevated or decreased station readings and gradient values. The following interpretations are based on the contour maps generated for magnetometer and EM31 data at the two survey grid locations, using the data listed in Tables A-1 and A-2 in Appendix A. The grids coincide with groundwater monitoring well locations GW-1C and GW-4B as proposed by NYSDEC in the Phase II Investigation Work Plan for the site (see Figure 4-1).

The following discussion provides details of each of the two Survey Grids:

Survey Grid Area No. 1. A review of magnetometer data contours at the No. 1 grid location indicates that this 1,600-square-foot area contains some minor geomagnetic anomalies. The apparent anomalous areas adjacent to the proposed well location may have been caused by interference from the protective steel casings of existing monitoring wells in the vicinity. The risk of drilling into any shallow ferrous material within this grid area is expected to be minimal.

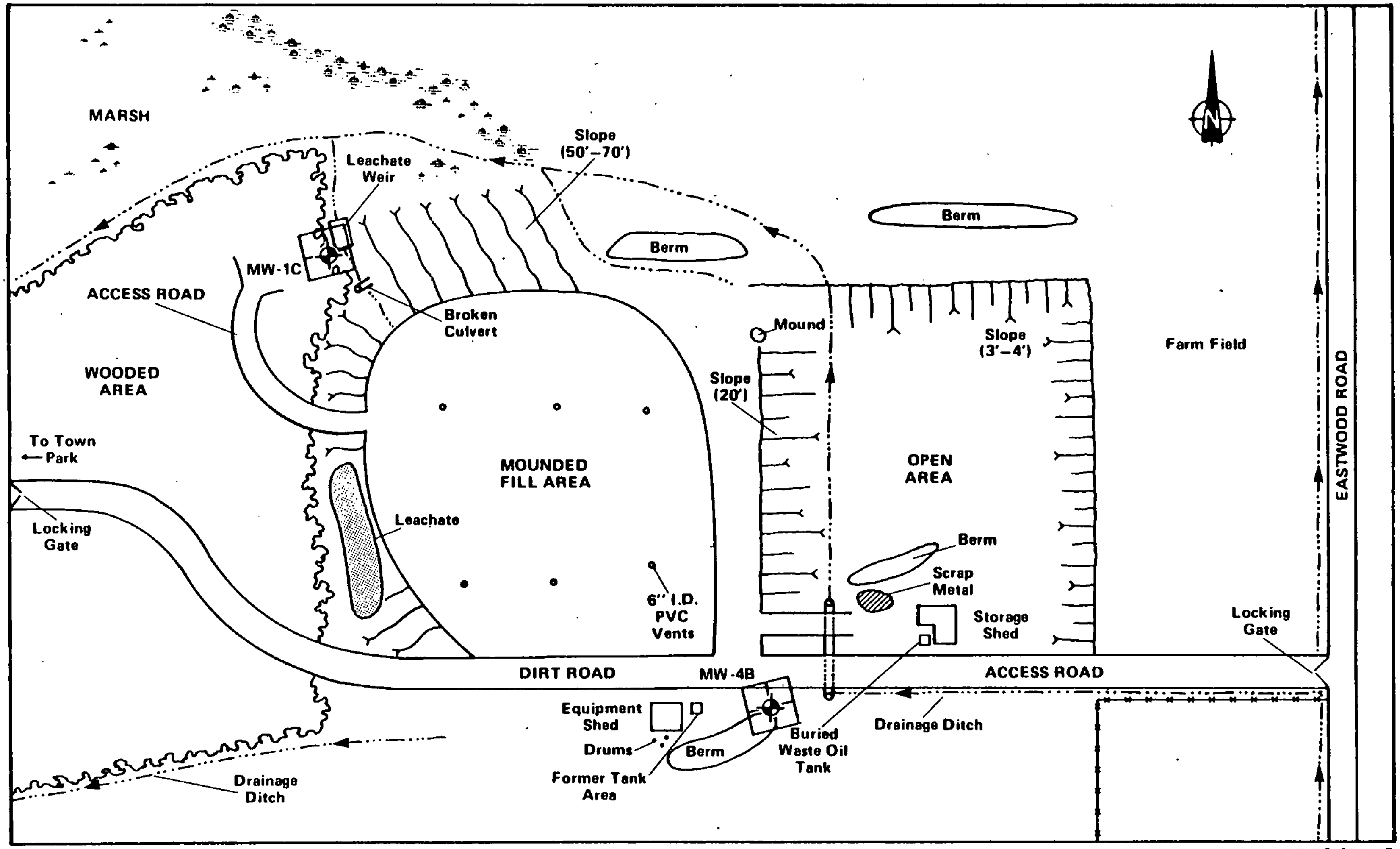
Low electromagnetic conductivity values (5.0 to 11.0 millimhos/m) were observed in both vertical and horizontal dipole modes. The low readings in this survey grid indicate the absence of near-surface metal debris.

The installation of the proposed monitoring well GW-1C at the location indicated on the contour map is satisfactory. The location may also be moved to any area within the survey grid area if required to facilitate rig access.

recycled paper

4-2

B-9



KEY:

Proposed Monitoring Well | Geophysical Survey Grid | Top of Slope

Figure 4–1
GEOPHYSICAL SURVEY AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

Survey Grid Area No. 2. A review of magnetometer data contours at the No. 2 grid location indicates that this 1,600-square-foot area contains some minor geomagnetic anomalies. All apparent anomalous areas appear to be located outside the survey area. The risk of drilling into any shallow ferrous material within this grid area is expected to be minimal.

Low electromagnetic conductivity values (3 to 11.5 millimhos/m) were observed in both vertical and horizontal dipole modes. Conductivity increased from south to north; however, the low readings indicate the absence of near-surface metal debris.

The installation of the proposed monitoring well GW-4B at the location indicated on the contour map is satisfactory. The location may also be moved to any area within the survey grid area if necessary to facilitate rig access.

5. CONCLUSIONS AND RECOMMENDATIONS

Based upon the interpretations discussed in Section 4, the proposed well locations appear to be satisfactory to safely and efficiently install the groundwater monitoring wells. Prior to drilling, the underground-utility locating service should be contacted to indicate possible public utilities in the vicinity of the drill sites.

All proposed well locations should be confirmed with a NYSDEC representative prior to commencement of drilling.

APPENDIX A

MAGNETOMETER AND EM31 SURVEY DATA

Table A-1

MAGNETOMETER READINGS

TOWN OF MARILLA LANDFILL

Grid 1

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	56,247	56,247
0,10	56,209	56,208
0,20	56,318	56,317
0,30	56,254	56,252
0,40	56,241	56,238
10,0	56,420	56,416
10,10	56,253	56,249
10,20	56,043	56,038
10,30	56,497	56,491
10,40	56,282	56,275
20,0	56,304	56,297
20,10	56,252	56,244
20,20	56,210	56,201
20,30	56,541	56,531
20,40	56,221	56,221
30,0	56,281	56,270
30,10	56,174	56,162
30,20	56,228	56,217
30,30	56,336	56,323
30,40	56,208	56,196
40,0	56,274	56,259
40,10	56,267	56,250
40,20	56,351	56,335
40,30	55,268	56,251
40,40	56,283	56,266

*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an onsite base station.

Table A-1

MAGNETOMETER READINGS

TOWN OF MARILLA LANDFILL

Grid 2

Station #	Average N-S/E-W (Gammas)*
0,0	56,154
0,10	56,464
0,20	56,031
0,30	56,161
0,40	56,148
10,0	56,256
10,10	56,300
10,20	56,142
10,30	56,191
10,40	56,331
20,0	56,667
20,10	56,199
20,20	56,298
20,30	56,187
20,40	56,234
30,0	56,231
30,10	56,205
30,20	56,056
30,30	56,265
30,40	56,095
40,0	55,925
40,10	55,867
40,20	55,924
40,30	56,261
40,40	56,328

*Data is usually corrected for natural magnetic fluctuations (i.e., drift); however, due to the short time span of the survey grid, drift was negligible.

Table A-2

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

TOWN OF MARILLA LANDFILL

Grid No. 1

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	9.5	7.5
0,10	11.0	8.0
0,20	8.5	7.5
0,30	8.0	7.5
0,40	7.5	6.0
10,0	8.5	7.5
10,10	11.0	9.5
10,20	11.0	5.0
10,30	8.0	7.0
10,40	8.0	7.0
20,0	8.5	6.5
20,10	10.5	8.5
20,20	10.0	7.5
20,30	9.5	6.5
20,40	9.0	7.0
30,0	9.0	7.0
30,10	10.0	7.5
30,20	10.0	7.5
30,30	9.5	7.5
30,40	9.0	6.5
40,0	10.0	7.5
40,10	9.5	7.0
40,20	8.5	6.0
40,30	8.0	5.0
40,40	8.0	5.5

Table A-2

AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

TOWN OF MARILLA LANDFILL

Grid No. 2

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	4.0	3.0
0,10	4.0	3.0
0,20	6.0	3.5
0,30	7.5	4.5
0,40	7.0	8.0
10,0	5.0	3.0
10,10	5.0	3.0
10,20	7.5	4.5
10,30	3.5	10.0
10,40	9.0	6.5
20,0	5.0	4.0
20,10	5.0	4.0
20,20	8.0	5.0
20,30	4.5	5.5
20,40	9.0	7.0
30,0	5.5	4.0
30,10	7.0	4.0
30,20	7.5	11.5
30,30	9.5	9.0
30,40	9.0	7.5
40,0	5.5	4.5
40,10	10.0	4.5
40,20	5.0	5.5
40,30	9.0	8.0
40,40	9.0	8.0

APPENDIX B

MAGNETOMETER
AND
EM31 SURVEY CONTOUR MAPS

B-1

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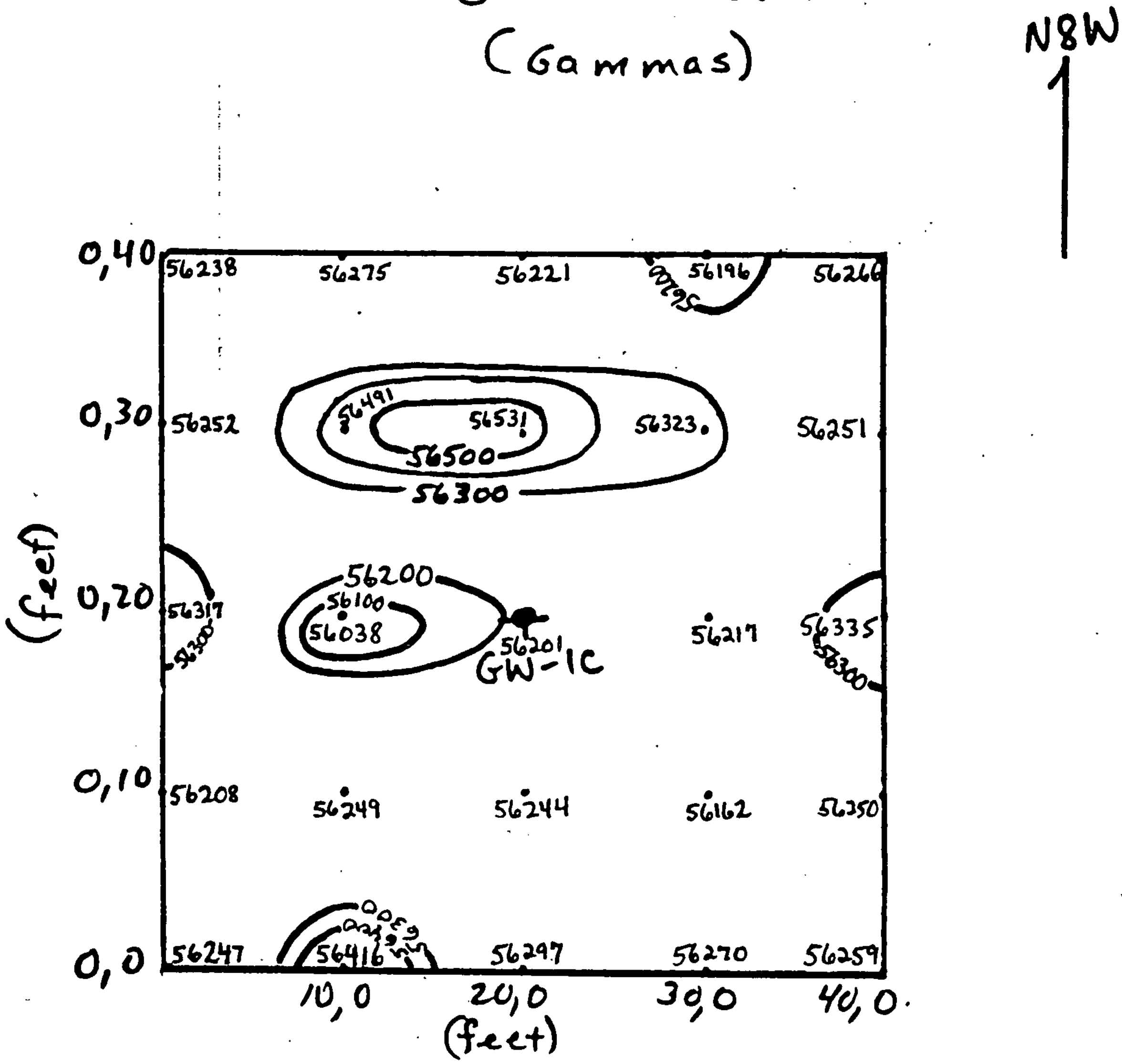
TOWN OF MARILLA LANDFILL
Site No. 915093

MAGNETOMETER SURVEY

GRID NO. 1
(Gammas)

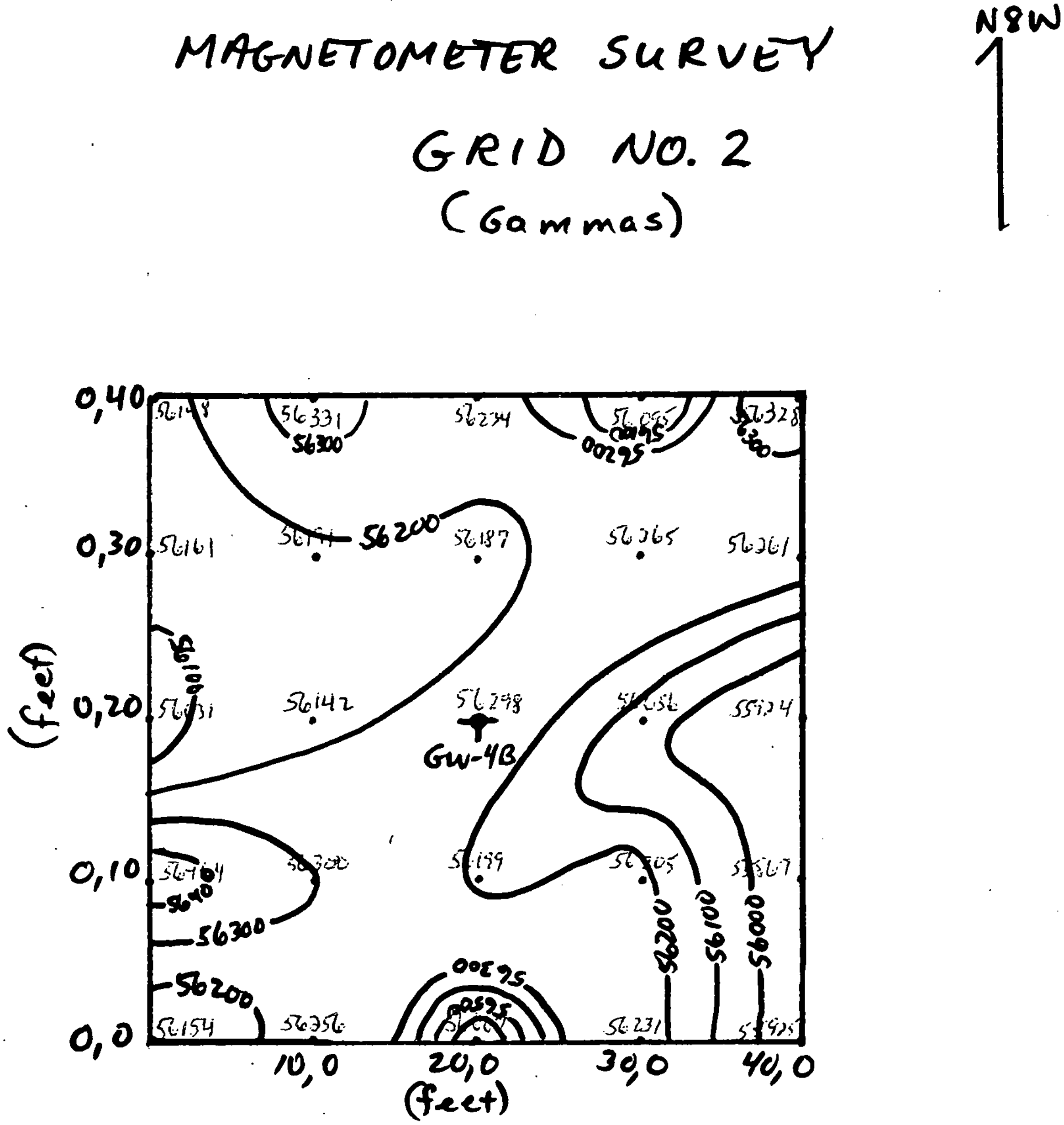


C.I. = 100 gammas
= Proposed well location

TOWN OF MARILLA LANDFILL
Site No. 915093

MAGNETOMETER SURVEY

GRID NO. 2
(Gammas)



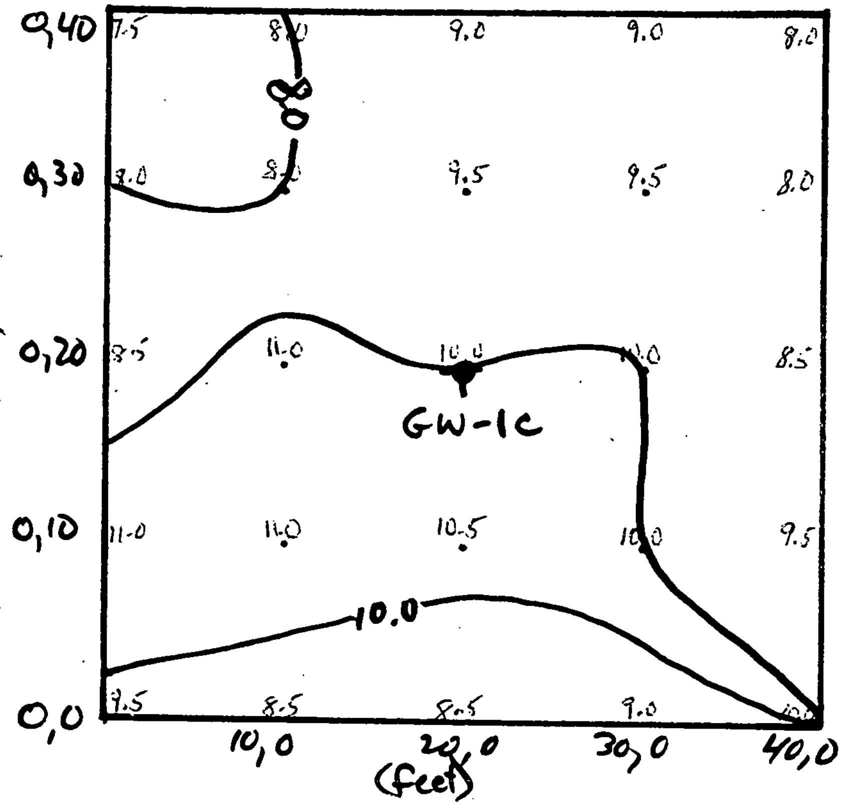
C.I. = 100 gammas
= Proposed well location

TOWN OF MARILLA LANDFILL
Site NO. 915093

EM31 SURVEY GRID No. 1

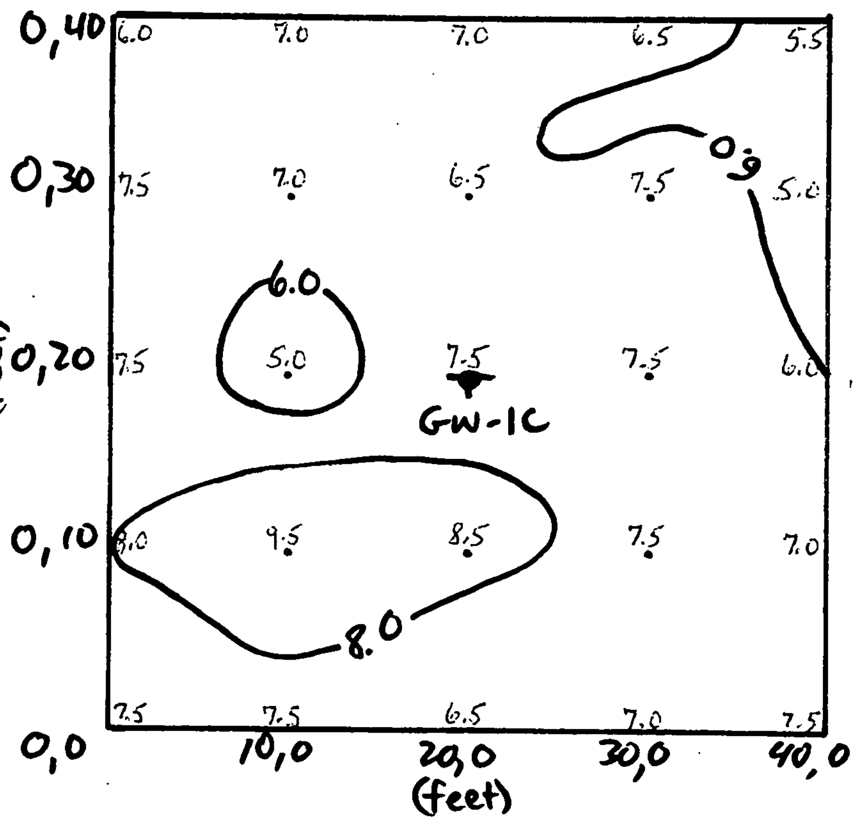
N 8°W

Vertical Dipole (millimhos/m)



C.I. = 2 millimhos/m
= Proposed well location

HORIZONTAL DIPOLE (millimhos/m)



TOWN OF MARILLA LANDFILL
Site NO. 915093

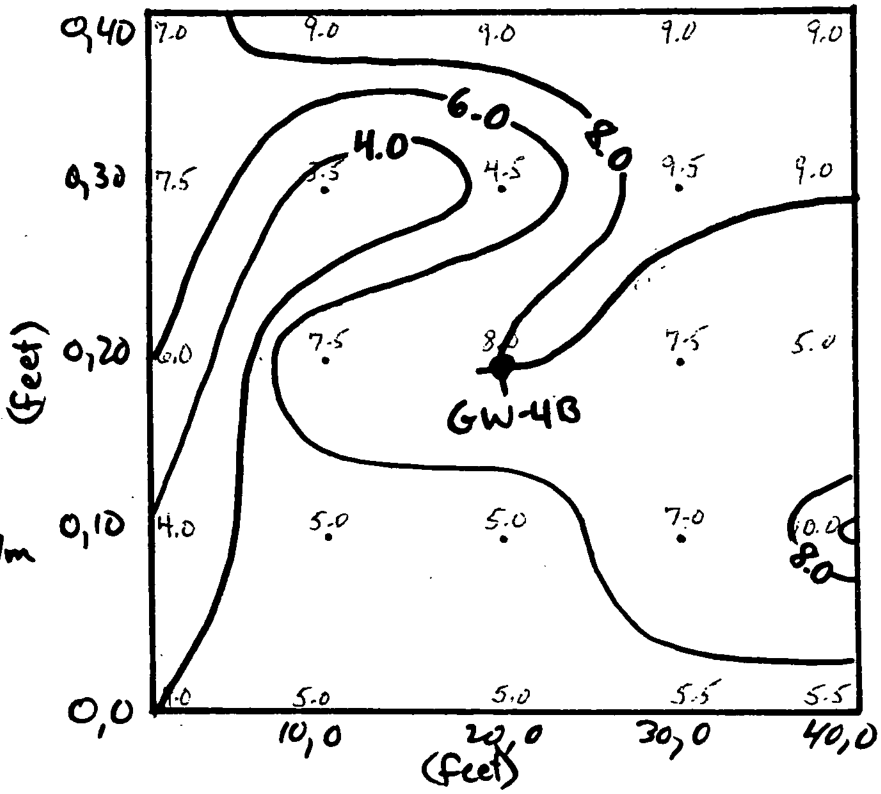
N8°W

EM31 SURVEY GRID NO. 2

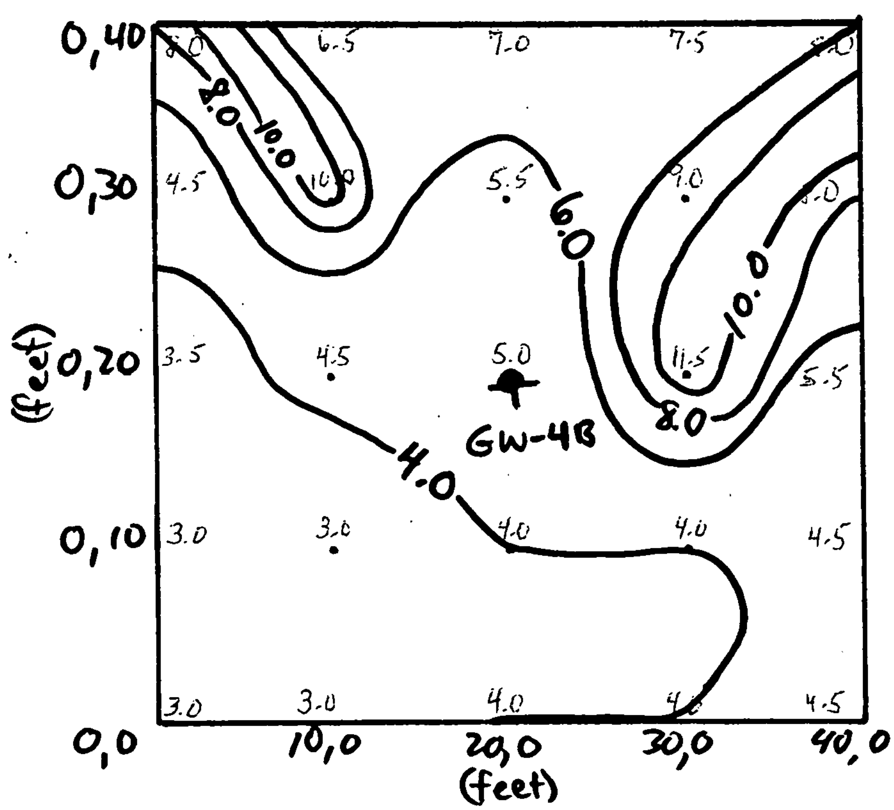
Vertical Dipole (millimhos/m)

C.I. = 2 millimhos/m

= Proposed Well location



HORIZONTAL DIPOLE (millimhos/m)



B-5

B-21

APPENDIX C

DRILLING AND CORING LOGS FOR NEW GROUNDWATER MONITORING WELLS AND EXISTING MONITORING WELLS

... INC.
Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL

HOLE NO. 1 SURF. ELEV. ______

'81 PROJECT Landfill Investigation
Town of Marilla Sanitary Landfill

LOCATION Northwest of landfill

CLIENT Town of Marilla, New York

DATE STARTED 7/22/81 COMPLETED 7/24/

DEPTH Feet	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	1	1	2	9	10	11
	2	10	10	14	19	24
	3	4	7	14	21	21
5						
	4	13	21	30	67	51
10		10.0'				
	Run 1		100% recovery			
15						

DESCRIPTION & CLASSIFICATION

Moist faintly mottled black silt loam (CLAYEY-SILT), firm, blocky soil structure

- - - clear transition to - - 1.0

Moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT) with 10 to 15% mostly black shale fragments, very firm

- - - clear transition to - - 5.5

Moist faintly mottled gray silty clay loam (CLAYEY-SILT), extremely firm, thinly bedded

- - - clear transition to - - 7.5

Moist black shale bedrock, soft, thinly bedded, bedrock can easily be crushed between fingers to a (CLAYEY-SILT) soil material

8.5

Gray shale bedrock, core separated in 1/8 to 2 inch lengths, moderately hard shale bedrock can be etched with a knife

- - - clear transition to - 13.9

Dark gray shale bedrock, core separated in 1/8 to 4 inch lengths, moderately hard to hard, shale bedrock can be etched with knife but with some effort

WELL #1

2" diameter PVC well pipe

Cement bentonite plug

7.5

#4 size sand pack

WATER TABLE & REMARKS

Thin mantle of dense silty glacial till or residual to 5.5 feet over silty residual over soft shale bedr becoming harder with depth.

Diameter of monitoring well back fill 9 inches at 10.0 feet, 3 in below.

Advanced augers to 10.0 feet, bedrock cored with NX diamond bit to 62.7 fee

continued on she

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

C=2

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MONITORING WELL

HOLE NO. 1 continued

SURF ELEV

PROJECT Landfill Investigation
Town of Marilla Sanitary Landfill

LOCATION Northwest of landfill

CLIENT Town of Marilla, New York

DATE STARTED 7/22/81 COMPLETED 7/24

DEPTH feet	SAMPLE NO	BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
		Run 1 RQD 0.3'	See previous sheet - - - clear transition to - - - 17.7	Two inch PVC well pipe; #4 size sand pack	
20		19.6	Dark gray shale bedrock, core separated into 3 to 18 inch lengths, moderately hard to hard, shale bedrock can be etched with a knife but with some effort - - - clear transition to - - - 20.5		
25	Run #2	Recovered 9.9' RQD 7.3'	Dark gray shale bedrock, core separated into 1/8 to 1½ inch lengths with one (1) ½ inch soft silty interbed at 20.9 foot depth, moderately hard to hard, shale bedrock can be etched with a knife but with some effort 22.0		
30	Run #3	29.6 Recovered 9.4' RQD 8.6'	Dark gray shale bedrock, core separated into 3 to 20 inch lengths with two (2) ½ inch soft silty interbeds at 21.3 and 21.7 foot depths, moderately hard to hard, shale bedrock can be etched with a knife but with some effort		
35					continued on sheet

N = NUMBER OF BLOWS TO DRIVE 2" SPOON 12" WITH 140 lb. WT FALLING 30" PER BLOW

C-3

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EARTH DIMENSIONS, INC.

Test Borings and Logs

797 Center Street • East Aurora, New York 14052 • (716) [illegible]

MONITORING WELL

HOLE NO. 1 continued

SURF ELEV

381 PROJECT Landfill Investigation
Town of Marilla Sanitary Landfill

LOCATION Northwest of landfill

CLIENT Town of Marilla, New York

DATE STARTED 7/22/81 COMPLETED 7/24

DEPTH Feet	SAMPLE NO.	BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION		WATER TABLE & REMARKS
	Run #3		Dark gray shale bedrock, core separated into 3 to 20 inch lengths with two (2) ½ inch soft silty interbeds at 21.3 and 21.7 foot depths, moderately hard to hard, shale bedrock can be etched with a knife but with some effort		
		38.9			
			------clear transition to --39.3		
40	Run	Recovery 3.3'	Dark gray shale bedrock, core separated into 1/8 to 6 inch lengths with numerous soft silt lenses, moderately hard to hard, shale bedrock can be etched with a knife but with some effort	Two inch PVC well pipe	
		RQD 1.5'			
			------clear transition to --44.0		
45		RUN 5 Core 9.4' Recovery 9.4'		#4 size sand pack	
	Run #5	RQD 9.4'	Dark gray shale bedrock, core separated into 2 to 20 inch lengths, bedrock is distinctly more massive, moderately hard to hard, shale bedrock can be etched with a knife but with some effort		
50					

C-4

continued on sheet 4..

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb WT FALLING 30 " PER BLOW

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SHEET 3 OF 4

MONITORING WELL

HOLE NO. 1 continued SURF. ELEV

PROJECT Landfill Investigation, Town of Marilla Sanitary Landfill

LOCATION Northwest of landfill

CLIENT Town of Marilla, New York

DATE STARTED 7/22/81 COMPLETED 7/24/

DEPTH	SAMPLE NO	BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WBU	WATER TABLE & REMARKS
55	Run #6	Cored 10.0' Recovered 9.7' RDQ 3.8'	Dark gray shale bedrock, core separated into 3 to 20 inch lengths, bedrock becomes more massive with one unbroken length 4.9 feet long.	Two inch PVC well pipe; #4 size sand pack	60.7
60					62.7
			Coring completed at 62.7'		Water table at 3.9 feet below surface after coring.
65					

C-5

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

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FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
955 Niagara Street
Buffalo, New York 14213

Client: Tallamy, Van Kuren, Gertis & Assoc.
Project: Marilla Landfill Well Installation
File No. 88-141   Boring No. 1A

Driller: Keith Danser
Type of Drill Rig: Diedrich D-50
Sampling Method: ASTM D1586
Size and Type of Bit: 4-¼ inch ID augers

Surface Elevation: 1056.73 ft.
Datum: as provided by engineer
Location: refer to boring location plan
Date Started: 3/15/88   Completed: 3/15/88

Overburden Samples: Disturbed 4   Undist.
Total Depth of Hole: 7.4 ft.
Depth Drilled into Rock: 0 ft.

Top of Rock Elevation:
Bottom of Hole Elevation: 1049.33 ft.
Ground Water Depth: 7.2 ft. at completion

Depth (ft.)	Blows per .5 ft.		Sample No.	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
1	4	5	S-1	12	60	Brown, stiff, SILT, little Clay, tr. f/c Sand, mod. plasticity, moist (Till)	S-1: 0-2'
	7	9					
	3	4	S-2	11	50	same as S-1	S-2: 2-4'
	7	9					
5	6	15	S-3	39	60	Brown, hard, SILT, little f/c Sand, little Weathered Shale, tr Clay, non-plastic, dry (Till)	S-3: 4-6'
	24	26					
	20	47	S-4	147+	70	same as S-3	S-4: 6-7.4'
	100/5"						
						Bottom of Hole 7.4 ft.	
10							
15							
20							

Notes:

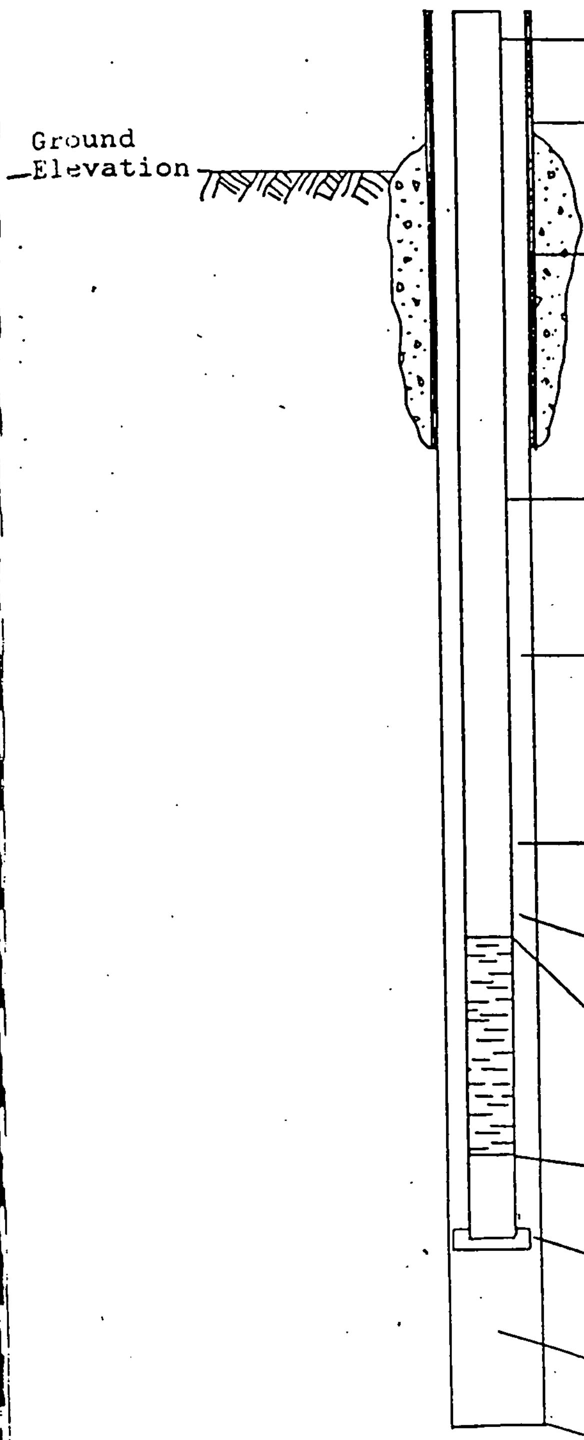
Sheet No 1 of 1

SUMMARY OF WELL INSTALLATION

BUFFALO DRILLING COMPANY, INC.
955 Niagara Street
Buffalo, New York 14213

CLIENT: Tallamy, Van Kuren, Gurtis
PROJECT: Marilla Landfill Exploration
FILE NO: 88-141

BORING NO: 1A
DATE STARTED: 3/15/88
DATE COMPLETED: 3/15/88



Height of riser pipe above ground surface. 2.9 ft.

Height of protective casing above ground surface. 3.0 ft.

I.D. of protective casing. 4 in.
Type of protective casing: steel pipe with locking cap

I.D. of riser pipe. 2 in.
Type of riser pipe: sch. 40 PVC

Type of backfill: cement/bentonite grout

Depth of top of seal. .3 ft.
Type of seal: bentonite pellets
Depth of bottom of seal. .8 ft.

Type of sand pack: No. 2 Q-rok
Depth of top of sand pack. .8 ft.

Depth of top of well screen. 1.8 ft.
Type of well screen. .01 inch slotted PVC
I.D. of well screen. 2 inch

Depth of bottom of well screen. 6.1 ft.

Depth of tip of well. 6.5 ft.

Type of backfill below well: bentonite pellets

C-7

Depth of borehole. 7.4 ft.

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
955 Niagara Street
Buffalo, New York 14213

Client: Tallamy, Van Kuren, Gertis & Assoc.
Project: Marilla Landfill Well Installation
File No. 88-141 Boring No. 1B

Driller: Keith Danser
Type of Drill Rig: Diedrich D-50
Sampling Method: ASTM D1586
Size and Type of Bit: 4-¼ inch ID augers

Surface Elevation: 1055.38 ft.
Datum: as provided by engineer
Location: refer to boring location plan
Date Started: 3/15/88 Completed: 3/15/88

Overburden Samples: Disturbed 1 Undist.
Total Depth of Hole: 17.0 ft.
Depth Drilled into Rock: 9.5 ft. (Note 1)

Top of Rock Elevation: 1047.88 ft.
Bottom of Hole Elevation: 1038.38 ft.
Ground Water Depth: 11.0 ft. at completion

Depth (ft.)	Blows per .5 ft.		Sample No.	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
1							
5	7	9	S-1	25	50	Brown, v. stiff, SILT, little weathered Shale, non-plastic, dry (Till)	S-1: 5-7'
	16	45					
10						Dark grey, very fine crystalline, fractured SHALE, moderate to severe weathering, soft	
15							
20						Bottom of Hole 17.0 ft.	

Notes: 1.) Rock drilled using 4-¼ inch ID augers.

Sheet No 1 of 1

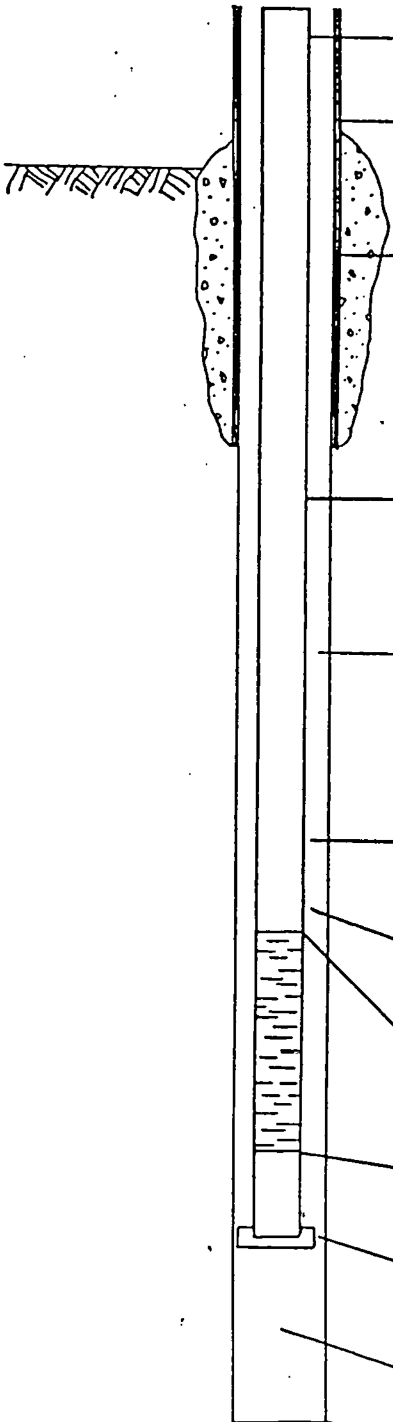
SUMMARY OF WELL INSTALLATION

BUFFALO DRILLING COMPANY, INC.
955 Niagara Street
Buffalo, New York 14213

CLIENT: Tallamy, Van Kuren, Gurtis
PROJECT: Marilla Landfill Exploration
FILE NO.: 88-141

BORING NO: 1B
DATE STARTED: 3/15/88
DATE COMPLETED: 3/15/88

Ground Elevation



Height of riser pipe above ground surface. 1.9 ft.

Height of protective casing above ground surface. 2.4 ft.

I.D. of protective casing. 4 in.
Type of protective casing: steel pipe with locking cap

I.D. of riser pipe. 2 in.
Type of riser pipe: SCH 40 PVC

Type of backfill: cement/bentonite grout

Depth of top of seal. 8.3 ft.
Type of seal: bentonite
Depth of bottom of seal. 10.3 ft.

Type of sand pack: No. 2 Q-rok
Depth of top of sand pack. 10.3 ft.

Depth of top of well screen. 12.3 ft.
Type of well screen. .01 inch slotted PVC
I.D. of well screen. 2 in.

Depth of bottom of well screen. 16.6 ft.

Depth of tip of well. 17.0 ft.

Type of backfill below well: ____

Depth of borehole. 17.0 ft.

DATE
STARTED 7-12-89
FINISHED 7-14-89
SHEET 1 OF 4

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER 1-C
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT MARILLA LAND FILL PHASE II
LOCATION MARILLA NEW YORK

DEPTH – FT	WELL DIAGRAM	HNU PPM	SAMPLE NO.	BLOWS ON SAMPLER 0-6 / 12-18	BLOWS ON SAMPLER 6-12 / 18-24	PROFILE (Cl Sl Sd Gr)	FIELD IDENTIFICATION OF SOILS	NOTES
0–2	OVERBURDEN	4.8	1	3, 6	4, 6		SS-1 0-2' 0-.35 GRAY CLAY - DAMP, PLASTIC .35-2.0' - LIGHT BROWN-RED SILTY CLAY	RECOVERED 2'
2–4	OVERBURDEN	2	2	1, 5	2, 7		SS-2 2-4' 2.0-2.6 - SAME AS ABOVE 2.6-3.5' - MED GRAY SILTY CLAY DAMP - TRACE OF GRAY SHALE. MODERATELY PLASTIC	RECOVERED 1.5'
4–6	OVERBURDEN, 3" PVC, GROUT	140	3	7, 8	7, 10		SS-3 4-6' 4-4.35 = BACKFILL FROM ABOVE BRN, REDDISH SILTY CLAY 4.35'-5' = LIGHT BROWN GRAY CLAYEY SILT DRY NON-PLASTIC, TRACES OF DARK GRAY SHALE + METAMORPHICS 5'-6' - MED GRAY SILTY CLAY DAMP MODERATELY PLASTIC. TRACES OF GRAY SHALE	RECOVERED 2'
6–6.35				11		BEDROCK 6.35'	SS-4 6-6.35' MED. GRAY CLAY AS ABOVE	2' OF RECOVERY (INTO ROCK)
6.35–9	BEDROCK	10	4	51	30, 51	SHALE	6.35'-8' - MEDIUM GRAY SHALE VERY BRITTLE + SOFT DRY HNU READ 10 PPM FROM BEDROCK SHALE	

C-10

540088

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ecology and environment

DATE
STARTED 7-12-89
FINISHED 7-14-89
SHEET 2 OF 4

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER 1-C
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT MARILLA LANDFILL PHASE II
LOCATION MARILLA NEW YORK

DEPTH – FT	WELL DIAGRAM	HNU PPM	SAMPLE NO.	BLOWS ON SAMPLER 0-6 / 6-12 / 12-18 / 18-24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
9–14	3" PVC, GROUTE, BEDROCK	0	RUN 1		BED ROCK	RUN #1 9'-14' 9'-11.3' DARK GRAY SHALE, HARD, BREAKS ALONG HORIZONTAL BEDDING PLANES EVERY 1/2" TO 2" 11.3' TO 14.0' MED. GRAY SHALE, SOFTER SAME CLEAVAGE SEPERATION AS ABOVE.	RECOVERED 5' (100%) ON 7-13-89 GROUTED 3"OD PVC TO 14' IN A 5' DEEP ROCK SOCKET. 7-14-89 CHANGED CORE BIT FROM HQ (4"OD) TO NX (3"OD) + BEGAN CORING AT 14' AT 0930
14–18						RUN #2 14-18' (A 4-FOOT RUN) MAY HAVE LEFT SOME CORE IN THE HOLE ROCK IS SAME AS ABOVE - SLIGHTLY MORE FISSILE	RECOVERED 3.4-FEET

Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18

C-11

640088

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DATE
STARTED 7-12-89
FINISHED 7-14-89
SHEET 3 OF 4

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER 1-C
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT MARILLA LANDFILL PHASE II
LOCATION MARILLA NEW YORK

DEPTH – FT	WELL DIAGRAM	PPM	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
19 – 23		0	RUN #3		BEDROCK	RUN #3 18-23' 18.0-18.2 SAME AS ABOVE 18.2-18.35 LT. GRAY COMPETANT SHALE ROUGH CORE SURFACE, POSSIBLY CALCARIOUS 18.35-20.25 BLACK SHALE, MASSIVE LONGEST PIECE = 6" - 5 HORIZONTAL BREAKS, VERTICLE FRACTURE FROM 19.25-19.55 20.25-23.0' MED. GRAY SHALE MASSIVE, 7 CORE PIECES, AVE. 3'-4' LONG. ROCK IS SAME AS 18.2-18.35' VERTICLE SEAM (NOT SEPERATED) FROM 20.35 TO 20.75	RECOVERED 5.2' .2' PROBABLY FROM PREVIOUS RUN WELL MAKING WATER AFTER RUN #3
23 – 27		0	RUN #4			RUN #4 23-28' ROCK SAME AS ABOVE MD + DARK GRAY SHALE. CORE SECTIONS MOSTLY .3' TO 1.3' LONG SOFT / FISSILE ZONES FROM 24.05-24.2 AND 24.85-25.0' REST IS COMPETANT SHALE	RECOVERED 5.0' (100%)

C-12

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CLASSIFICATION/BY

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DATE STARTED 7-12-89 FINISHED 7-14-89 SHEET 4 OF 4	E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER 1C SURFACE ELEVATION GROUNDWATER DEPTH ( )

PROJECT MARILLA LANDFILL PHASE II   LOCATION MARILLA NEW YORK

DEPTH – FT	WELL DIAGRAM	HNU PPM	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
28			↓		BEDROCK	SEE PAGE #3 FOR DESCRIPTION TOTAL DEPTH IS 28.0'	TD ON 7-14-89 AT 1150
29							
30							
31							
32							
33							
34							
35							
36							

C-13

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CLASSIFICATION/BY

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recycled paper   ecology and environment

..., P. C.

Test Borings and Logs

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(1)

MONITORING WELL #2

SURF. ELEV

381a PROJECT Monitoring well installation Town of Marilla Sanitary Landfill

LOCATION West side of landfill

CLIENT Town of Marilla

DATE STARTED 8/25/81 COMPLETED 8/25/

DEPTH	SAMPLE NO.	BLOWS ON SAMPLER				
	1	1	3	6	13	9
	2	16	26	37	61	63
	3	29	34	43	70	77
5						
	4	23	43	100/5.5"		
	5	61	100/5.0"			
	6	37	91	100/3"		
10						

DESCRIPTION & CLASSIFICATION

Moist black silt loam (CLAYEY-SILT) topsoil with 5 to 10% mostly black shale fragments, very friable — 0.6

Moist distinctly mottled brown silt loam (CLAYEY-SILT) with 5 to 15% mostly shale gravel and occasional cobble, very firm, blocky soil structure

- - - clear transition to - - - 4.0

Moist highly mottled olive brown shaly silt loam (CLAYEY-SILT) with 15-30% shale gravel, extremely firm, weak platy soil structure

- - - clear transition to - - - 6.0

Moist olive gray very soft shale bedrock, thinly bedded, bedrock can be easily crushed between fingers to a (CLAYEY-SILT)

- - - clear transition to - - - 8.0

Moist distinctly mottled dark gray shale bedrock, thinly bedded, moderately hard, bedrock can be easily etched with a knife — 9.8

Refusal at 9.8 feet

WELL

Two inch diameter PVC well pipe; Bentonite seal (to 2.0); Number 4 size sand pack (2.0 – 9.8); (1) 7.5 – 9.5; 9.8

WATER TABLE & REMARKS

Dense silty glacial till 4.0 feet ove[r] silty residu[al] soil materia[l] to 6.0 feet over shale bedrock to refusal.

(1) Number 15 slotted 2 inch diameter PVC well screen

No water at completion

C-14

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON [illegible] " WITH 140 lb. WT. FALLING 30 " PER BLOW

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SHEET 1 OF 1

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MONITORING WELL #3

SURF ELEV. ______

81a PROJECT Monitoring well installation
Town of Marilla Sanitary Landfill

LOCATION Northeast of landfill

CLIENT Town of Marilla, New York

DATE STARTED 8/24/81 COMPLETED 8/24

DEPTH Feet	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	1	6	7	18	23	25
	2	13	11	13	15	24
5	3	3	9	12	13	21
	4	10	100			
10						
15						

DESCRIPTION & CLASSIFICATION

Moist black silt loam (CLAYEY-SILT) topsoil with 5 to 15% mostly shale gravel, very friable — 0.6

Moist faintly mottled brown silt loam (SANDY-SILT) with 5 to 15% mostly shale gravel, very friable — 1.2

Moist distinctly mottled olive brown shaly silty clay loam (CLAYEY-SILT) with 15 to 25% mostly black shale gravel

- - - clear transition to - - - 2.0

Moist distinctly mottled olive brown very shaly silt loam (CLAYEY-SILT) with 40 to 60% mostly shale gravel, loose when disturbed

- - - clear transition to - - - 3.5

Moist distinctly mottled olive gray shaly silt loam (CLAYEY-SILT) with 15 to 25% mostly black shale gravel, very firm

- - - clear transition to - - - 4.5

Moist gray shaly silty clay loam (CLAYEY-SILT) with 20 to 40% shale gravel and occasional cobble, massive soil structure

- - - clear transition to - - - 6.5

Moist gray shale bedrock, thinly bedded, very soft, shale bedrock can easily be crushed into a CLAYEY-SILT between fingers — 7.0

Refusal at 7.0 feet

WELL

2" diameter PVC well pipe; Bentonite seal (to 2.0); Number 4 size sand pack (2.0 to 7.0); 6.0; (1) 7.0

WATER TABLE & REMARKS

Water sort and deposi mostly sil clay and s gravel in ing amount 3.5 feet o dense silt glacial ti to 6.5 fee very soft to refusal.

(1) Number 15 slotte PVC well screen.

No water at completi

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens/Soil Scientist

SHEET 1 OF 1

(1)

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MONITORING WELL #4

SURF. ELEV ____________

1a PROJECT Monitoring well installation
Town of Marilla Sanitary Landfill

LOCATION Southeast corner of landfill

CLIENT Town of Marilla, New York

DATE STARTED 8/24/81 COMPLETED 8/24/8?

DEPTH	SAMPLE NO	BLOWS ON SAMPLER				
	1	6	6	10	18	16
	2	14	19	18	21	37
	3	9	10	12	14	22
5	3					
	4	9	11	14	12	25
	5	6	10	20	38	30
10	5					
	6	9	15	22	25	37
	7	14	23	100/3"		
15						

DESCRIPTION & CLASSIFICATION	Depth
Moist dark brown gray silt loam (CLAYEY-SILT) topsoil with 15 to 30% gravel, friable	0.3
Moist brown silty clay loam (CLAYEY-SILT) with 10-15% mostly black shale gravel, firm, blocky soil structure --- clear transition to ---	0.9
Moist faintly mottled sandy loam (SILTY-SAND) thinly bedded, non-plastic --- clear transition to ---	4.5
Moist distinctly mottled brown silty clay loam (CLAYEY-SILT) with 10-15% mostly black shale gravel, firm --- grades downward to ---	6.0
Moist olive brown shaly silty clay loam (CLAYEY-SILT) with 15 to 25% mostly shale gravel, very firm, massive soil structure --- clear transition to ---	8.5
Extremely moist distinctly mottled brown shaly loam (SAND-SILT-CLAY), loose	9.5
Moist distinctly mottled olive brown shaly silt loam (CLAYEY-SILT) with 15-25% mostly black shale gravel and occasional cobble, very firm, massive soil structure --- clear transition to ---	10.5
Moist dark gray shaly silt loam (CLAYEY-SILT) with 20-40% black shale gravel and occasional cobble, very firm, massive soil structure	11.5

WELL: Bentonite seal (to 2.0); Two inch diameter PVC well pipe; Number 4 size sand pack; 11.3; (1); 13.3

WATER TABLE & REMARKS

Water sorted and deposited silt, clay, sand and shaly gravel in varying amounts to 9.5 feet over dense silty glacial till to refusal.

(1) Number 15 slotted PVC well screen

Refusal likely shale bedrock.

No water at completion.

see description on next page

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

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SHEET 1A OF 1B

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MONITORING WELL #4 continued

SURF. ELEV ________

PROJECT Monitoring well installation
Town of Marilla Sanitary Landfill

LOCATION Southeast corner of landfill

CLIENT Town of Marilla, New York

DATE STARTED 8/24/81 COMPLETED 8/24/8

DEPTH Feet	SAMPLE NO	BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
			See sheet 1A	
5				
10			- - - - clear transition to - - - - 11.5	
			Extremely moist dark gray shaly silt loam (CLAYEY-SILT) with 20 to 40% black shale gravel and occasional cobble, very firm, massive soil structure 13.3	
15			Refusal at 13.3 feet	

C-17

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb WT FALLING 30 " PER BLOW

brl LOGGED BY Donald W. Owens/Soil Scientist

SHEET 1B OF 1B

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
955 Niagara Street
Buffalo, New York 14213

Client Tallamy, Van Kuren, Gertis & Assoc.
Project Marilla Landfill Well Installation
File No. 88-141 Boring No. 4A

Driller Keith Danser	Surface Elevation 1131.41 ft.
Type of Drill Rig Diedrich D-50	Datum as provided by engineer
Sampling Method ASTM D1586	Location refer to boring location plan
Size and Type of Bit 3-3/4 inch ID augers	Date Started 3/16/88 Completed 3/17/88
Overburden Samples: Disturbed 7 Undist.	Top of Rock Elevation 1118.41 ft.
Total Depth of Hole 96.0 ft.	Bottom of Hole Elevation 1035.41 ft.
Depth Drilled into Rock 83.0 ft.	Ground Water Depth note 1

Depth (ft.)	Blows per .5 ft.		Sample No.	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
	2	4					
1	4	4	S-1	8	50	Brown, stiff, Silt, little Clay, tr. f/c Sand, sl. plasticity, moist (Fill)	S-1: 0-2'
	5	11					
	15	17	S-2	26	90	Brown, v. stiff, SILT, little Clay, tr. f/c Sand, tr. Gravel, sl. plasticity, moist (Till)	S-2: 2-4'
5	5	10					
	15	10	S-3	25	90	same as S-2	S-3: 4-6'
	6	10					
	8	13	S-4	18	90	same as S-2	S-4: 6-8'
	8	16					
	21	26	S-5	37	100	...grade: little Gravel	S-5: 8-10'
10	15	28					
	21	24	S-6	49	90	Grey, hard, SILT, tr. f/c Sand, tr. Clay, tr. Gravel, non-plastic, moist to dry (Till)	S-6: 10-12'
	50	100/4"	S-7	100+	40	...grade: weathered Shale	S-7: 12-12.8'
15			C-1		84.7 (0)	Dark grey, very fine crystalline, fractured SHALE, mod. to severe weathering, soft	NX CORE C-1: 13-19' Pieces > 1": 18 Pieces > 4": 0 Longest Piece: 2" Left 12" Note 2
20							

Notes: 1.) Groundwater depth 5.5 ft. at completion of overburden drilling.
2.) Advanced augers to 19 ft. and installed 3 inch casing.

Sheet No 1 of 4

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
1965 Sheridan Drive
Kenmore, New York 14223

Client Tallamy, Van Kuren, Gertis & Assoc.
Project Marilla Landfill Well Installation
File No. 88-141 Boring No. 4A

Depth (ft.)	Blows per .5 ft.		Sample No.	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
21						Dark grey, very fine crystalline fractured SHALE, mod. to severe weathering, soft	NX CORE C-2: 19-28' Pieces > 1": 35 Pieces > 4": 0 Longest Piece: 3"
25			C-2		86.1 (0)	Clay Seam	
30						Dark grey, very fine crystalline, thin bedded, SHALE, mod. weathering, soft.	NX CORE C-3: 28-38' Pieces > 1": 33 Pieces > 4": 6 Longest Piece:12"
			C-3		91.7 (31.7)		
35							
40						Dark grey, very fine crystalline, thin to med. bedded SHALE, sl. to mod. weathering, soft	NX CORE C-4: 38-47.5' Pieces > 1": 29 Pieces > 4": 7 Longest Piece:14" Gain 5"
			C-4		100 (54.3)		
45						clay seam clay seam	
49							

Notes:

Sheet No 2 of 4

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
1965 Sheridan Drive
Kenmore, New York 14223

Client: Tallamy, Van Kuren, Gertis & Assoc.
Project: Marilla Landfill Well Installation
File No. 88-141   Boring No. 4A

Depth (ft.)	Blows per .5 ft.	Sample No.	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
50					45° angle fracture	NX CORE
		C-5		96.8 (73.8)	verticle fracture — Dark grey, very fine crystalline, med. bedded, SHALE, sl. weathering, soft	C-5: 47.5-58' Pieces > 1": 23 Pieces > 4": 13 Longest Piece: 12"
55						
					verticle fracture	
60					verticle fracture — Dark grey, very fine crystalline, med. bedded, SHALE, sl. weathering, soft	NX CORE C-6: 58-68' Pieces > 1": 18 Pieces > 4": 9 Longest Piece: 30" Gain: 1"
		C-6		100 (80.8)		
65					massive bed	
70						NX CORE C-7: 68-78' Pieces > 1": 15 Pieces > 4": 11 Longest Piece: 21"
		C-7		90.8 (82.5)	Dark grey, very fine crystalline, med. to thick bedded SHALE, sl. weathering, soft	
75						
78						

Notes:

Sheet No 3 of 4

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
1965 Sheridan Drive
Kenmore, New York 14223

Client Tallamy, Van Kuren, Gertis & Assoc.
Project Marilla Landfill Well Installation
File No. 88-141 Boring No. 4A

Depth (ft.)	Blows per .5 ft.	Sample No.	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
80 85		C-8		99.2 (88.3)	fractured zone Dark grey, very fine crystalline, med. to thick bedded SHALE, sl. to severe weathering, soft	NX CORE C-8: 78-88' Pieces > 1": 16 Pieces > 4": 11 Longest Piece: 23"
90 95		C-9		100 (86.4)	Dark grey, very fine crystalline, med to thick bedded SHALE, sl. weathering, soft	NX CORE C-9: 88-96' Pieces > 1": 13 Pieces > 4": 7 Longest Piece: 19"
100					Bottom of Hole 96.0 ft.	

Notes:

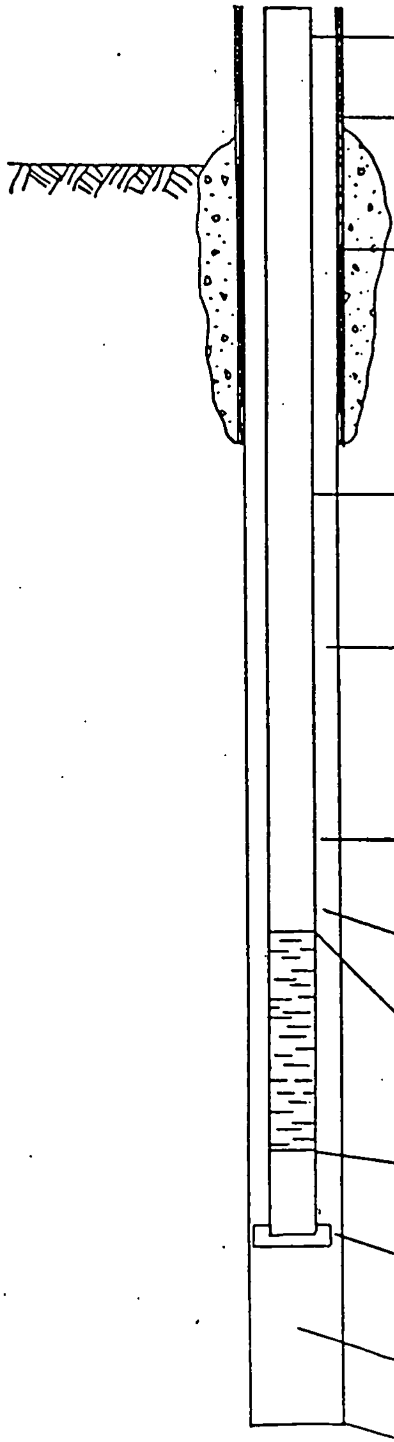
Sheet No 4 of 4

SUMMARY OF WELL INSTALLATION

BUFFALO DRILLING COMPANY, INC.
955 Niagara Street
Buffalo, New York 14213

CLIENT: Tallamy, Van Kuren, Gurtis
PROJECT: Marilla Landfill Exploration
FILE NO. 88-141

BORING NO: 4A
DATE STARTED: 3/16/88
DATE COMPLETED: 3/17/88



Height of riser pipe above ground surface. 2.2 ft.

Height of protective casing above ground surface. 2.8 ft.

I.D. of protective casing. 4 in.
Type of protective casing: steel pipe with locking cap

I.D. of riser pipe. 2 in.
Type of riser pipe: sch 40 PVC

Type of backfill: cement/bentonite grout

Depth of top of seal. 83.8 ft.
Type of seal: Bentonite pellets
Depth of bottom of seal. 85.8 ft.

Type of sand pack: No. 2 Q-rok
Depth of top of sand pack. 85.8 ft.

Depth of top of well screen. 90.8 ft.
Type of well screen. .01 inch slotted PVC
I.D. of well screen. 2 in.

Depth of bottom of well screen. 95.1 ft.

Depth of tip of well. 95.5 ft.

Type of backfill below well:

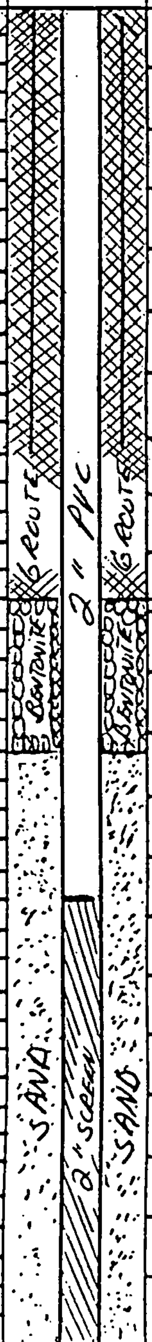
Depth of borehole. 96.0 ft.

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

DATE
STARTED 7-11-89
FINISHED 7-11-89
SHEET 1 OF 2

HOLE NUMBER 4B
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT MARILLA LANDFILL PHASE II
YN-1040
LOCATION MARILLA NEW YORK



DEPTH – FT	HNU PPM	SAMPLE NO.	BLOWS ON SAMPLER 0/6 · 12/18	BLOWS ON SAMPLER 6/12 · 18/24	PROFILE (Cl Si Sd Gr)	FIELD IDENTIFICATION OF SOILS	NOTES
0–2	0	1	5, 8	8, 8		SS-1 = 0-2' 0-.6 = LOOSE SILTY GRAVEL .6-1.' SILTY CLAY (CL) - ORANGE DRY LOW PLASTICITY, TRACE OF SHALE FRAGMENTS	RECOVERED 1.8'
3							DRILLER REPORTED TIGHT DRILLING AT 3 FT
5–7	0	2	9, 19	13, 34	ROCK	SS-2 = 5'-7' 5.0-5.3' ROCK FRAGMENTS GLACIAL BOULDER RECOVERED 3" FROM SS-1 AN .6' FROM SS-2 5.3-6.9 - CLAYEY SILT - BROWN VERY FINE GRAINED	DAMP AT 8.6'
8–9			24, 14	14, 10	8.6' DAMP	SS-3 = 8-10' 8.0-8.5 GRAY GRAVEL, TRC. DARK GRAY SHALE 8.5-8.6 - GLACIAL COBBLE - METAMORPHIC	RECOVERED 1.5' OF 2'

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E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

DATE
STARTED 7-11-89
FINISHED 7-11-89
SHEET 2 OF 2

HOLE NUMBER 4B
SURFACE ELEVATION ____
GROUNDWATER DEPTH ____ ( )

PROJECT MARILLA LANDFILL PHASE II
#YN-1040
LOCATION MARILLA NEW YORK

DEPTH – FT	WELL DIAGRAM	HNU PPM	SAMPLE NO.	BLOWS ON SAMPLER (0-6 / 6-12 / 12-18 / 18-24)	PROFILE (Cl Si Sd Gr)	FIELD IDENTIFICATION OF SOILS	NOTES
9–10	SAND / 2" SCREEN / SAND	50	3			SS-3 CONTINUED 8.6-9.5 - SAND FINE GRAINED, BROWN VERY WELL SORTED - HOMOGENEOUS -	HIGH HNU READINGS FROM TOP OF SAND
10–12		200	4	4 / 6 / 7 / 7		SS-4 - 10-12' 10-10.5' SILTY GRAVEL MODERATELY ROUNDED; GLACIAL (GM) 10.5-10.7 - SHALE - BLACK, ORGANIC PLATEY, IRON STAINING. 10.7-11.8 - CLAYEY GRAVEL; POORLY SORTED (BRN, CLAY) MOD. ROUNDED DAMP SATURATION AT 12 FEET	RECOV. 1.8' HIGH HNU READINGS FROM 8.6-10.7 POSS. FROM BLACK SHALE
12–14	#3 SAND	0	5	9 / 6 / 4 / 7	WATER AT 12'	SS-5 12-14' 12.0-13.3' SILTY + SANDY CLAY TRACES OF GRAVEL AND SHALE FRAGMENTS COLOR = GRAY WITH BROWN LAYERS	RECOVERED 1.3'
14–14.5	BENTONITE PELLETS	30	6		BEDROCK 14.5' SHALE	SS-6 14-14.5 14.0-14.5' CLAY - BROWN WET HNU READ 30 PPM FROM SHALE	RECOVERED .5' OR 100% BEDROCK REFUSAL AT 14.5'
14.5–17.25					17.25' TOTAL DEPTH	CORED BEDROCK FROM 14.5' TO 17.25' 14.5-14.9 - SILTSTONE BOULDER LT. GRAY FINE GRAINED MASSIVE 14.9-17.25' DARK GRAY SHALE - SOFT + FISSILE - SEPERATES ALONG BEDDING PLANES EVERY 1/4" TO 1.5" NO VERTICLE FRACTURES OR VOID SPACES	RIG USED HQ BIT (4" OD) 300 RPM ≈ 225 PSI RATE = 18 MIN/FT WATER USE = 300 GAL/HR TOTAL RECOVERY WAS 2.75' OR 100%

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MONITORING WELL #5

SURF. ELEV ______

PROJECT Monitoring well installation
Town of Marilla Sanitary Landfill

LOCATION near southwest corner of lan[...]

CLIENT Town of Marilla, New York

DATE STARTED 8/24/81 COMPLETED 8/24

Depth Feet	Sample No.	0/6	6/12	12/18	18/24	N
	1	4	6	10	17	16
	2	10	13	17	17	30
	3	7	7	10	17	17
5						
	4	9	12	14	13	26
	5	7	13	23	33	36
10						
	6	22	31	100/2.5"		
	7	100				
15						

DESCRIPTION & CLASSIFICATION

Moist black shaly silt loam (CLAYEY-SILT) topsoil with 15 to 25% mostly shale gravel, very friable 0.5

Moist distinctly mottled brown shaly silt loam (CLAYEY-SILT) with 15 to 25% mostly shale gravel, very firm, blocky soil structure

---- clear transition to ---- 2.0

Moist distinctly mottled olive brown very shaly silt loam (CLAYEY-SILT) with 40 to 60% mostly fine size shale gravel, very firm in place, loose when disturbed

---- clear transition to ---- 2.5

Moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT) with 5 to 15% mostly black shale gravel, very firm, blocky soil structure

---- clear transition to ---- 3.0

Extremely moist distinctly mottled olive brown very shaly silt loam (CLAYEY-SILT) with 40 to 70% mostly shale gravel, loose when disturbed

---- clear transition to ---- 4.3

Moist distinctly mottled shaly silt clay loam (CLAYEY-SILT) with 15 to 20% mostly shale gravel, very firm, massive soil structure

---- clear transition to ---- 5.0

Extremely moist distinctly mottled olive brown very shaly silt loam (CLAYEY-SILT) with 40 to 70% mostly shale gravel, loose when disturbed

WELL

Bentonite seal 2.0

2" diameter PVC well pipe

Number 4 size sand pack

(1)

9.5

11.5

12.0

WATER TABLE & REMARKS

Water sorte[...] deposited s[...] clay and sh[...] gravel in v[...] ing amounts 7.5 feet ov[...] dense silty glacial til[...] 11.5 feet o[...] soft shale bedrock to refusal.

(1) Number 1[...] slotted PVC w[...] screen.

continued on next shee[...]

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

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MONITORING WELL #5 continued

SURF. ELEV ________

G81a PROJECT Monitoring well installation Town of Marilla Sanitary Landfill

LOCATION near southwest corner of lanc

CLIENT Town of Marilla, New York

DATE STARTED 8/24/81 COMPLETED 8/24/8

DEPTH Feet	SAMPLE NO.	BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
			See sheet 1A of 1B	
5				
			- - - -grades downward to - - - 7.5	
			Moist gray shaly silty clay loam (CLAYEY-SILT) with 15% to 25% mostly shale gravel and occasional cobble, extremely firm, massive soil structure	
10			- - - -clear transition to - - 11.5	
			Wet gray shale bedrock, thinly bedded, very soft, shale, bedrock can easily be crushed into a CLAYEY-SILT between fingers	12.0
			Refusal at 12.0 feet	Water table at 11.5 feet below surface prior to installing well.
15				

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLO

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b1 LOGGED BY Donald W. Owens/Soil Scientist

SHEET 1B OF 1B

DATE	E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER 6
STARTED 7-12-89		SURFACE ELEVATION
FINISHED 7-12 89		GROUNDWATER DEPTH
SHEET 1 OF 2		

PROJECT Marilla Landfill Phase II LOCATION Marilla New York

#N-1040

DEPTH – FT	WELL DIAGRAM	HNu PPM	SAMPLE NO.	BLOWS ON SAMPLER 0/6, 12/18	BLOWS ON SAMPLER 6/12, 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
0–2		7	1	2, 6	3, 8		SS-1 0-2' 0-1' Topsoil Brown Silty, organic, Dry (OL) 1-1.6 Red-Brown, silty clay, Trace of organics (ie. roots), Low Plasticity (CL)	Recovered 1.6ft
5–7		125	2	4, 7	5, 12		SS-2 5-7' Brownish-gray, clayey silt, Low Plasticity, Dry, Fryable, Trace of Shale + gravel	Recovered 2.0 ft
8–10		380	3	8, 50	34, 58	Bed Rock 8.6ft	SS-3 8-10' 8-8.6ft same as above 8.6-10 ft Light Gray Shale, thinnly bedded, fissile soft, dry (12 PPM)	Recovered 2.0 ft

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DATE
STARTED 7/12/89
FINISHED 7/12/89
SHEET 2 OF 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER 6
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT Marilla Landfill Phase II
YN-1040
LOCATION Marilla New York

DEPTH – FT	WELL DIAGRAM	HNu PPM	SAMPLE NO.	BLOWS ON SAMPLER (0-6 / 6-12 / 12-18 / 18-24)	PROFILE (Cl Sl Sd Gr)	FIELD IDENTIFICATION OF SOILS	NOTES
10				13 / 38 / 100	Shale	SS-4 10-11.4 ft Shale, fractured, soft, med-gray	100 Blows from 11-11.4 Recovered 1.4 ft
11						Split Spoon Refusal 11.4 ft	
12						Borehole Terminated Well Abandoned AND Grouted due to High HNu Readings for a background well.	
13							
14							
15							
16							
17							
18							

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DATE		
STARTED 7-12-89	**E + E DRILLING AND TESTING CO., INC.**	HOLE NUMBER 6A
FINISHED 7-12-89	**SUBSURFACE LOG**	SURFACE ELEVATION
SHEET 1 OF		GROUNDWATER DEPTH ( )

PROJECT Marilla Landfill Phase II — LOCATION Marilla New York

YN-1040

DEPTH – FT	WELL DIAGRAM	HNu PPM	SAMPLE NO.	BLOWS ON SAMPLER 0/6, 6/12, 12/18, 18/24	PROFILE (Cl Si Sd Gr)	FIELD IDENTIFICATION OF SOILS	NOTES
0–2		6.8	1			SS-1 0--2' — 0-1' Topsoil Medium Brown, silty, organic material, dry (OL) 1'-2' Red-Brown, silty clay, organic material, low plasticity (CL)	Recovered 2.0ft; 30 to 40 PPM in Auger
2–5							
5–7		13.8	2			SS-2 5-7' Brownish-gray, clayey silt, Low plasticity, dry, friable, Some shale + gravel	Recovered 2.0ft; 500 PPM in Auger. 0 PPM in Breathing Zone
7–9						Borehole Terminated well abandoned and grouted due to high HNu Readings	

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APPENDIX D

SUBSURFACE SOIL, GROUNDWATER, SURFACE SOIL, SURFACE WATER/SEDIMENT, AND LEACHATE SAMPLING PROCEDURES

Subsurface Soil Sampling

Three subsurface soil samples were collected during drilling. One sample from each well drilled was collected for chemical analysis from the soil horizon exhibiting the highest degree of contamination (i.e., HNu readings, color, etc.). 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 HNu 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

Eight groundwater samples were obtained from each of the nine 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 containing sample water for volatile organic compound analysis. 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. 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.

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

Three 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 a pre-cleaned stainless steel spoon 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.

Surface Water/Sediment Sampling

Five points were delineated in the work plan as locations at which both a surface water and sediment (SW/SWS) sample would be obtained. The field locations were matched as closely as possible to the locations described in the work plan. SW/SWS-1 was not obtained because the stream indicated in the work plan did not exist, and the location SW/SWS-1 was moved to was dry at the time of sampling.

Sediment samples were obtained by using a pre-cleaned stainless steel spoon to fill an 8-ounce pre-cleaned, acid-rinsed jar equipped with a Teflon-lined lid. This volume served for total metals, base/neutrals and acid extractables, PCB/pesticide, and cyanide analyses. In addition to the eight-ounce jar, two 40-ml glass vials, each equipped with a Teflon septum, were filled with sediment for volatile organics analysis.

Leachate

Three leachate samples were collected at the Marilla site. Two were in liquid form, and one consisted of leachate-stained soil due to insufficient liquid content. The liquid samples were collected by direct immersion of the appropriate sample bottles (see Section 4.4.2).

The soil samples were collected using the same procedures as the surface soil and sediment samples.

APPENDIX E

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 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.

ORGANICS SUMMARY SHEETS OF ANALYTICAL DATA FOR

SUBSURFACE SOIL SAMPLES

GROUNDWATER SAMPLES

DRILL WATER SAMPLE

SURFACE SOIL SAMPLES

SURFACE WATER/SEDIMENT SAMPLES

LEACHATE SAMPLES

VOLATILES

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

WATER SAMPLES (ug/L)

Site Name: Town of Marilla Landfill Site

Case #: YW1060 825-005 **Sampling Date(s):** 8/15&16/89

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

CRQL	COMPOUND	MW-1A		MW-1B		MW-1C		MW-3		MW-4		MW-4A		MW-4B		MW-5		Field Water	
	Dilution Factor																		
	Location																		
10	Chloromethane																		
10	Bromomethane																		
10	*Vinyl Chloride																		
10	Chloroethane																		
5	*Methylene Chloride							11.0								16.0		1.0	BJ
10	Acetone											250	E						
5	Carbon Disulfide																		
5	*1,1-Dichloroethene																		
5	1,1-Dichloroethane																		
5	*Total-1,2-Dichloroethene																		
5	Chloroform																		
5	*1,2-Dichloroethane																		
10	*2-Butanone																		
5	*1,1,1-Trichloroethane																		
5	*Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

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

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DATA SUMMARY FORM: VOLATILES 1

Site Name: Town of Marilla Landfill Site

WATER SAMPLES (ug/L)

Case #: YN1060 Sampling Date(s): 8/15 & 16/89

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

CRQL	Sample No.	MW-4AMS	MW-4AMSD	MW-5MS	MW-5MSD	VBLKW1	VBLKW2	VBLKW1		
	Dilution Factor									
	Location					mw-1A	mw-1n	mw-4B		
CRQL	COMPOUND									
10	Chloromethane									
10	Bromomethane									
10	*Vinyl Chloride									
10	Chloroethane									
5	*Methylene Chloride			16.0	13.0			21		
10	Acetone	110.0	130.0					11		
5	Carbon Disulfide									
5	*1,1-Dichloroethene									
5	1,1-Dichloroethane									
5	*Total-1,2-Dichloroethene									
5	Chloroform									
5	*1,2-Dichloroethane									
10	*2-Butanone									
5	*1,1,1-Trichloroethane									
5	*Carbon Tetrachloride									
10	Vinyl Acetate									
5	Bromodichloromethane									

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

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

Site Name: Town of Marilla Landfill Site

WATER SAMPLES (ug/L)

Case #: YN1060 Sampling Date(s): 8/15&16/89

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND (mcl's) mg/l	MW-1A	MW-1B	MW-1C	MW-3	MW-4	MW-4A	MW-4B	MW-5	Dull Water
5	*1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	*Benzene not detectable						77.0			
5	Trans-1,3 Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	*Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	*Toluene 2.0 (proposed mcl)						160.0			
5	*Chlorobenzene									
5	*Ethylbenzene 0.7 (proposed mcl)						24.0			
5	*Styrene									
5	*Total Xylenes 10.0 (proposed mcl)						230.0 E			

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

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

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill Site

Case #: YN1060 Sampling Date(s): 8/15&16/89

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND (MCL's) mg/l	MW-4A MS	MW-4A MSD	MW-5 MS	MW-5 MSD	VBLKW1	VBLKW2	VBLKW1		
5	*1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	*Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	*Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	*Toluene									
5	*Chlorobenzene									
5	*Ethylbenzene 0.7 (proposed mcl)	22.0	22.0							
5	*Styrene									
5	*Total Xylenes 10 (proposed mcl)	200	210 E							

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

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DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

Site Name: Town of Marilla Landfill Site

WATER SAMPLES (ug/L)

Case #: YN1060 Sampling Date: 8/15&16/89

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	MW-1A		MW-1B		MW-1C		MW-3		MW-4		MW-4A		MW-4B		MW-5		Drill Water	
	CAS # 60297 ethyl ether (SCI)	7.0	J																

CRQL = Contract Required Quantitation Limit

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

Site Name: Town of Marilla Landfill Site

Case #: YN1060 Sampling Date(s): 5/9/89

WATER SAMPLES
(ug/L)

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

CRQL	Sample No.	SW-2		SW-3		SW-3D		SW-4		SW-5		SW-5MS		SW-5MSD		L-1		L-2	
	Dilution Factor																		
	Location																		
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	*Vinyl Chloride																		
10	Chloroethane																		
5	*Methylene Chloride			1.0	J					1.0	J								
10	Acetone									4.0	BJ					6.0	BJ	4.0	BJ
5	Carbon Disulfide																		
5	*1,1-Dichloroethene																		
5	1,1-Dichloroethane																		
5	*Total-1,2-Dichloroethene																		
5	Chloroform																		
5	*1,2-Dichloroethane																		
10	*2-Butanone																		
5	*1,1,1-Trichloroethane																		
5	*Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

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

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

WATER SAMPLES (ug/L)

Site Name: Town of Manlius Landfill Site

Case #: YN1060 Sampling Date(s): 5/9/89

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	SW-2	SW-3	SW-3D	SW-4	SW-5	SW-5MS	SW-5MSD	L-1	L-2
5	*1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	*Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	*Tetrachloroethene									
[illegible]	1,1,2,2-Tetrachloroethane									
[illegible]	*Toluene									
[illegible]	*Chlorobenzene									
5	*Ethylbenzene									
5	*Styrene									
5	*Total Xylenes									

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

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DATA SUMMARY FORM: VOLATILES 1

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill Site

Case #: 825-005 Sampling Date(s): ______

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

E-14

	Sample No.	VBLKW1		VBLKW1		VBLKW2													
	Dilution Factor																		
	Location	L-1		L-1		L-1													
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	*Vinyl Chloride																		
10	Chloroethane																		
5	*Methylene Chloride																		
10	Acetone	8	J	3	J	9	J												
5	Carbon Disulfide																		
5	*1,1-Dichloroethene																		
5	1,1-Dichloroethane																		
5	*Total-1,2-Dichloroethene																		
5	Chloroform																		
5	*1,2-Dichloroethane																		
10	*2-Butanone																		
5	*1,1,1-Trichloroethane																		
5	*Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

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

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

WATER SAMPLES (ug/L)

Site Name: Town of Marilla Landfill Site

Case #: 825-005 Sampling Date(s): ______

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

CRQL	COMPOUND	Sample No. / Dilution Factor / Location: VBLKW1	VBLKW1	VBLKW2						
5	*1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	*Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	*Tetrachloroethene									
[illegible]	1,1,2,2-Tetrachloroethane									
[illegible]	*Toluene									
[illegible]	*Chlorobenzene									
5	*Ethylbenzene									
5	*Styrene									
5	*Total Xylenes									

CRDL = Contract Required Detection Limit

*Action Level Exists

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E-15

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

Site Name: Town of Marilla Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YN-1060 Sampling Date(s): 5/9/89

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

CRQL	Sample No.	SWS-2		SWS-3		SWS-3D		SWS-4		SWS-5		SWS-5MS		SWS-5MSD					
	Dilution Factor																		
	% Moisture	31		22		33		48		53		53		53					
	Location																		
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride													1.0	J				
10	Acetone	21.0	B	10.0	J	49.0	B	38.0	B	40.0	B	3.0	BJ	3.0	BJ				
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

CRDL = Contract Required Detection Limit

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

SOIL SAMPLES
(ug/Kg)

Site Name: Town of Manila Landfill Site

Case #: YN1060 Sampling Date(s): 5/9/89

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

CRQL	Sample No.	SWS-2	SWS-3	SWS-3D	SWS-4	SWS-5	SWS-5MS	SWS-5MSD		
	Dilution Factor									
	% Moisture	31	22	33	48	53	53	53		
	Location									
CRQL	COMPOUND									
5	1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	Toluene									
5	Chlorobenzene									
5	Ethylbenzene									
5	Styrene									
5	Total Xylenes									

CRQL = Contract Required Quantitation Limit

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

Site Name: Town of Marilla Landfill Site

SOIL SAMPLES
(ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11 & 12/89
5/9/89 & 8/16/89

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

	Sample No.	SS-1		SS-2		SS-3		L-3		L-3MS		L-3MSD		MW-1C		MW-4B		MW-6	
	Dilution Factor																		
	% Moisture	34		53		43		26		26		26		14		14		11	
	Location													4-6 ft		8-10 ft		5-7 ft	
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride									530.0	BJ	3900.0	BJ	9.0		12.0		7.0	
10	Acetone	9.0	J	19.0		34.0	B	2100.0	B	3500.0	B	6000.0	B	61.0	B	63.0	B	24.0	B
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone							2900.0		3700.0		3200.0							
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	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

Site Name: Town of Manilla Landfill Site

SOIL SAMPLES
(ug/Kg)

Case #: YN10160 Sampling Date(s): 7/11&12/89 5/9/89 8/16/89

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

CRQL	Sample No.	MW-1CMS		MW-1CMSD		SS-1MS		SS-1MSD		VBLKM1		VBLKS1		VBLKS1		VBLKS3		VBLKS4	
	Dilution Factor																		
	% Moisture	14		14		34		34		—		—		—		—		—	
	Location	4-6ft		4-6ft								MW-1C		MW4B		L-1		L-1	
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride																		
10	Acetone	7.0		10.0		5.0	J			140	J	9	J	9	T			12	
5	Carbon Disulfide	70.0	B	630	B	26.0		56.0	B	1600									
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1 Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	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 2

Site Name: Town of Manila Landfill Site **SOIL SAMPLES** (ug/Kg)

Case #: YN 1060 Sampling Date(s): 7/11&12/89 5/9/89 8/16/89

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

CRQL	COMPOUND	SS-1	SS-2	SS-3	L-3	L-3MS	L-3MSD	MW-1C	MW-4B	MW-6
	Dilution Factor									
	% Moisture	34	53	43	26	26	26	14	14	11
	Location							4-6 ft	8-10 ft	5-7 ft
5	1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone				420.0 J	440.0 J	460.0 J			
5	Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	Toluene									1.0 J
5	Chlorobenzene									
5	Ethylbenzene									
5	Styrene									
5	Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES 2

Site Name: Town of Manilla Landfill

SOIL SAMPLES (ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11&12/89 5/9/89 & 8/16/89

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

CRQL	Sample No.	mw-1CMS	mw-1CMSD	SS-1MS	SS-1MSD	VBLKM1	VBLKS1	VBLKS1	VBLKS3	VBLKS4
	Dilution Factor									
	% Moisture	14	14	34	34	—	—			
	Location	4-6ft	4-6ft				MW-1C	MW-4B	L-1	L-1
CRQL	COMPOUND									
5	1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									2 J
5	Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	Toluene									
5	Chlorobenzene									
5	Ethylbenzene									
5	Styrene									
5	Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

Site Name: Town of Marilla Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YN1060 Sampling Date: 7/11 8/2/89 5/9/89 & 8/16/89

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

CRQL	Sample No.	SS-1	SS-2	SS-3	L-3	L-3MS	L-3MSD	MW-1C	MW-4B	MW-6
	Dilution Factor									
	% Moisture	34	53	43	26	26	26	14	14	11
	Location							4-6 ft	8-10 ft	5-7 ft
	COMPOUND									
	CAS # 76131 1,1,2-trichloro-1,2 ethane							7.9 BJ	16.0 BJ	9.9 BJ
	CAS # 5989275 D-Limonene		150.0 J							

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

Site Name: Town of Marcella Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YN1060 Sampling Date: 7/11&12/89 5/9/89 8/16/89

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

CRQL	COMPOUND																		
	Sample No.	VBLKS1		VBLKS1															
	Dilution Factor																		
	% Moisture	—		—															
	Location	mw-1C		mw-4B															
	CAS # 76131 Ethane, 1,1,2-trichloro-1,2	4.4	J	4.0	J														

CRQL = Contract Required Quantitation Limit

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ecology and environment

DATA SUMMARY FORM: B N A S 1

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill Site

Case #: YN-1060 Sampling Date(s): 8/15&16/85
9/11/89 (GW-4B)

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	MW-1A	MW-1B	MW-1C	MW-3	MW-4	MW-4A	MW-4B	MW-5	Drill wate
10	Phenol						3.0 J			
10	bis(2-Chloroethyl)ether									
10	2-Chlorophenol									
10	*1,3-Dichlorobenzene									
10	*1,4-Dichlorobenzene									
10	Benzyl Alcohol						5.0 J			
10	1,2-Dichlorobenzene									
10	2-Methylphenol						3.0 J			
10	bis(2-Chloroisopropyl)ether									
10	4-Methylphenol *									
10	N-Nitroso-di-n-propylamine									
10	Hexachloroethane *									
10	Nitrobenzene									
10	Isophorone									
10	2-Nitrophenol									
10	2,4-Dimethylphenol									
50	Benzoic Acid						1.0 J			
10	bis(2-Chloroethoxy)methane						2.0 J			
10	2,4-Dichlorophenol									
10	1,2,4-Trichlorobenzene									
10	Naphthalene									
10	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 1

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill Site

Case #: YN1060 Sampling Date(s): 8/15&16/89

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

CRQL	Sample No.	mw-4AMS	mw-4AMSD	mw-5MS	mw-5MSD	SBLKW1	SBLKW1	SBLKW2	SBLKW1	
	Dilution Factor									
	Location					mw-4A	mw-1A	mw-1A	mw-4B	
CRQL	COMPOUND									
10	Phenol									
10	bis(2-Chloroethyl)ether									
10	2-Chlorophenol									
10	*1,3-Dichlorobenzene									
10	*1,4-Dichlorobenzene									
10	Benzyl Alcohol									
10	1,2-Dichlorobenzene									
10	2-Methylphenol									
10	bis(2-Chloroisopropyl)ether									
10	4-Methylphenol									
10	N-Nitroso-di-n-propylamine									
10	Hexachloroethane									
10	Nitrobenzene									
10	Isophorone									
10	2-Nitrophenol									
10	2,4-Dimethylphenol									
50	Benzoic Acid									
10	bis(2-Chloroethoxy)methane									
10	2,4-Dichlorophenol									
10	1,2,4-Trichlorobenzene									
10	Naphthalene									
10	4-Chloroaniline									

CRQL = 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: Town of Manilla Landfill Site

Case #: YN1060 Sampling Date(s): 8/15&16/89 9/11/89 (MW-4B)

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	MW-1A		MW-1B		MW-1C		MW-3		MW-4		MW-4A		MW-4B		MW-5		Drill water	
10	Hexachlorobutadiene																		
10	4-Chloro-3-methylphenol																		
10	2-Methylnaphthalene											1.0	J						
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																		
50	2,4-Dinitrophenol																		
50	4-Nitrophenol																		
10	Dibenzofuran																		
10	2,4-Dinitrotoluene																		
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

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DATA SUMMARY FORM: B N A S 2

WATER SAMPLES
(ug/L)

Site Name: Town of Manila Landfill

Case #: YN 1060 Sampling Date(s): 8/15 8/16/89

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	mw-4AMS	mw-4AMSD	mw-5MS	mw-5MSD	SBLKW1	SBLKW1	SBLKW2	SBLKW1	
	Location					MW-4A	MW-1A	MW-1A	MW-4B	
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									
50	2,4-Dinitrophenol									
50	4-Nitrophenol									
10	Dibenzofuran									
10	2,4-Dinitrotoluene									
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

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DATA SUMMARY FORM: B N A S - 3

Site Name: Town of Manilla Landfill Site

WATER SAMPLES
(ug/L)

Case #: YN1060 Sampling Date(s): 8/15&16/89
9/11/89 (MW-4B)

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

CRDL	COMPOUND	MW-1A		MW-1B		MW1C		MW-3		MW-4		MW-4A		MW-4B		MW-5		Drill water	
	Dilution Factor																		
	Location																		
10	N Nitrosodiphenylamine																		
10	4-Bromophenyl-phenylether																		
10	***Hexachlorobenzene**																		
50	***Pentachlorophenol**																		
10	Phenanthrene																		
10	Anthracene																		
10	Di n butylphthalate 770ug/l			20.0	BJ														
10	Fluoranthene																		
10	Pyrene																		
10	Butylbenzylphthalate									1.0	J								
20	3,3 Dichlorobenzidine																		
10	Benzo(a)anthracene																		
10	Chrysene											63.0							
10	bis(2 Ethylhexyl)phthalate	2	BJ	200.0	B	2.0	BJ	4.0	J	2.0	BJ			2.0	BJ	7.0	BJ	3	J
10	Di-n-octylphthalate																		
10	Benzo(b)fluoranthene																		
10	Benzo(k)fluoranthene																		
10	Benzo(a)pyrene																		
10	Indeno(1,2,3-cd)pyrene																		
10	Dibenz(a,h)anthracene																		
10	Benzo(g,h,i)perylene																		

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

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DATA SUMMARY FORM: B N A S 3

WATER SAMPLES
(ug/L)

Site Name: Town of Marcella Landfill Site

Case #: YW1060 Sampling Date(s): 8/15 8/16/89

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

CRDL	Sample No. / Dilution Factor / Location / COMPOUND	MW-4AMS	MW-4AMSD	MW-5MS	MW-5MSD	SBLKW1	SBLKW1	SBLKW2	SBLKW1	
	Dilution Factor									
	Location					MW-4A	MW-1A	MW-1A	MW-4B	
10	N Nitrosodiphenylamine									
10	4-Bromophenyl-phenylether									
10	*Hexachlorobenzene									
50	*Pentachlorophenol									
10	Phenanthrene									
10	Anthracene									
10	Di-n-butylphthalate							2 J		
10	Fluoranthene									
10	Pyrene									
10	Butylbenzylphthalate									
20	3,3-Dichlorobenzidine									
10	Benzo(a)anthracene									
10	Chrysene									
10	bis(2 Ethylhexyl)phthalate						2 J	6 J		
10	Di-n-octylphthalate									
10	Benzo(b)fluoranthene									
10	Benzo(k)fluoranthene									
10	Benzo(a)pyrene									
10	Indeno(1,2,3-cd)pyrene									
10	Dibenz(a,h)anthracene									
10	Benzo(g,h,i)perylene									

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

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DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

WATER SAMPLES
(ug/L)

Site Name: Town of Manila Landfill

Case #: YN1060 Sampling Date: 8/15&16/89
9/11/89 (MW-4B)

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	MW-1A	MW-1B	MW-1C	MW-3	MW-4	MW-4A	MW-4B	MW-5	Well water
	CAS # 105408 1,1,2,2-tetrachloro ethane									16.0 BJ
	CAS # 128370 2,6-bis(1,1-dimethyl phenol)	10.0 BJ				12.0 BJ		11.0 BJ		
	CAS # 2196498 1,1,3-tetradecadiene		24.0 J							

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

WATER SAMPLES (ug/L)

Site Name: Town of Manella Landfill

Case #: YNR600 Sampling Date: __________

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

CRQL	COMPOUND	Sample No. SBLKW1		SBLKW2															
	Dilution Factor																		
	Location	MW-1A		MW-1A															
	CAS# 128370 Phenol, 2,6-bis(1,1-dimethyl)	13	J																
	CAS# 791286 Phosphine oxide, triphenyl			6	J														

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Town of Marilla Landfill

Case #: YN 1060 Sampling Date(s): 5/9/89

WATER SAMPLES
(ug/L)

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	SW-2	SW-3	SW-3D	SW-4	SW-5	SW-5MS	SW-5MSD	L-1	L-2
10	Phenol									
10	bis(2-Chloroethyl)ether									
10	2-Chlorophenol									
10	*1,3-Dichlorobenzene									
10	*1,4-Dichlorobenzene									
10	Benzyl Alcohol									
10	1,2-Dichlorobenzene									
10	2-Methylphenol									
10	bis(2-Chloroisopropyl)ether									
10	4-Methylphenol									
10	N-Nitroso-di-n-propylamine									
10	Hexachloroethane									
10	Nitrobenzene									
10	Isophorone									
10	2-Nitrophenol									
10	2,4-Dimethylphenol									
50	Benzoic Acid									
10	bis(2-Chloroethoxy)methane									
10	2,4-Dichlorophenol									
10	1,2,4-Trichlorobenzene									
10	Naphthalene									
10	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: Town of Marilla Landfill Site

Case #: YN1060 Sampling Date(s): 5/9/89

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

	Sample No.	SW-2	SW-3	SW-3D	SW-4	SW-5	SW-5MS	SW-5MSD	L-1	L-2
	Dilution Factor									
	Location									
CRQL	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									
50	2,4-Dinitrophenol									
50	4-Nitrophenol									
10	Dibenzofuran									
10	2,4-Dinitrotoluene									
10	Diethylphthalate					50 J				
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

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DATA SUMMARY FORM: B N A S 3

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill Site

Case #: YN1060 Sampling Date(s): 5/9/89

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

CRDL	COMPOUND	SW-2	SW-3	SW-3D	SW-4	SW-5	SW-5MS	SW-5MSD	L-1	L-2
	Dilution Factor									
	Location									
10	N Nitrosodiphenylamine									
10	4-Bromophenyl-phenylether									
10	***Hexachlorobenzene**									
50	***Pentachlorophenol**									
10	Phenanthrene									
10	Anthracene									
10	Di-n-butylphthalate									
10	Fluoranthene									
10	Pyrene									
10	Butylbenzylphthalate									
20	3,3-Dichlorobenzidine									
10	Benzo(a)anthracene									
10	Chrysene									
10	bis(2-Ethylhexyl)phthalate		1.0 J		4.0 J	1.0 J				1.0 J
10	Di-n-octylphthalate									
10	Benzo(b)fluoranthene									
10	Benzo(k)fluoranthene									
10	Benzo(a)pyrene									
10	Indeno(1,2,3-cd)pyrene									
10	Dibenz(a,h)anthracene									
10	Benzo(g,h,i)perylene									

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

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ecology and environment

DATA SUMMARY FORM: B N A S 1

Site Name: Town of Marilla Landfill

WATER SAMPLES
(ug/L)

Case #: 825-605 Sampling Date(s): ______

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

	Sample No.	SBLKW1		SBLKW2		SBLKW1		SBLKW1										
	Dilution Factor																		
	Location	L-1		2-1		L-1 (5/12/89)		L-1 (5/19/89)											
CRQL	COMPOUND																		
10	Phenol																		
10	bis(2-Chloroethyl)ether																		
10	2-Chlorophenol																		
10	*1,3-Dichlorobenzene																		
10	*1,4-Dichlorobenzene																		
10	Benzyl Alcohol																		
10	1,2-Dichlorobenzene																		
10	2-Methylphenol																		
10	bis(2-Chloroisopropyl)ether																		
10	4-Methylphenol																		
10	N-Nitroso-di-n-propylamine																		
10	Hexachloroethane																		
10	Nitrobenzene																		
10	Isophorone																		
10	2-Nitrophenol																		
10	2,4-Dimethylphenol																		
50	Benzoic Acid																		
10	bis(2-Chloroethoxy)methane																		
10	2,4-Dichlorophenol																		
10	1,2,4-Trichlorobenzene																		
10	Naphthalene																		
10	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 2

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill

Case #: 825-005 Sampling Date(s): ________

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

	Sample No.	SBLKW1	SBLKW2	SBLKW1	SBLKW1					
	Dilution Factor									
	Location	L-1	L-1	L-1 (5/17/89)	L-1 (5/19/89					
CRQL	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									
50	2,4-Dinitrophenol									
50	4-Nitrophenol									
10	Dibenzofuran									
10	2,4-Dinitrotoluene									
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 3

Site Name: Town of Marilla Landfill

Case #: 825-005 Sampling Date(s): ______

WATER SAMPLES
(ug/L)

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

CRDL	COMPOUND									
	Sample No.	SBLKW1	SBLKW2	SBLKW1	SBLKW1					
	Dilution Factor									
	Location	L-1	L-1	L-1 (5/12/89)	L-1 (5/12/89					
10	N Nitrosodiphenylamine									
10	4-Bromophenyl phenylether									
10	***Hexachlorobenzene**									
50	***Pentachlorophenol**									
10	Phenanthrene									
10	Anthracene									
10	Di n butylphthalate									
10	Fluoranthene									
10	Pyrene									
10	Butylbenzylphthalate									
20	3,3 Dichlorobenzidine									
10	Benzo(a)anthracene									
10	Chrysene									
10	bis(2 Ethylhexyl)phthalate	4 J	3 J		250 J					
10	Di-n-octylphthalate									
10	Benzo(b)fluoranthene									
10	Benzo(k)fluoranthene									
10	Benzo(a)pyrene									
10	Indeno(1,2,3-cd)pyrene									
10	Dibenz(a,h)anthracene									
10	Benzo(g,h,i)perylene									

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

Site Name: Town of Manila Landfill Site

Case #: YN1060 Sampling Date: 5/9/85

WATER SAMPLES (ug/L)

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

	Sample No.	SW-2		SW-3		SW-3D		SW-4		SW-5		SW-5MS		SW-5MSD		L-1		L-2	
	Dilution Factor																		
	Location																		
CRQL	COMPOUND																		
	CAS # 79128C									11.0	J								

CRQL = Contract Required Quantitation Limit

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recycled paper

ecology and environment

DATA SUMMARY FORM: B N A S 1

Site Name: Town of Marcella Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YNWX60 Sampling Date(s): 5/9/89

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

CRQL	COMPOUND									
	Sample No.	SWS-2	SWS-3	SWS-3D	SWS-4	SWS-5	SWS-5MS	SWS-5MSD		
	Dilution Factor									
	% Moisture	31	22	33	48	53	53	53		
	Location									
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: Town of Marilla Landfill

SOIL SAMPLES
(ug/Kg)

Case #: YN1060 Sampling Date(s): 5/9/89

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

CRQL	COMPOUND									
	Sample No.	SWS-2	SWS-3	SWS-3D	SWS-4	SWS-5	SWS-5MS	SWS-5MSD		
	Dilution Factor									
	% Moisture	31	22	33	48	53	53	53		
	Location									
330	Hexachlorobutadiene									
330	4-Chloro-3-methylphenol									
330	2-Methylnaphthalene									
330	Hexachlorocyclopentadiene									
330	2,4,6-Trichlorophenol									
1600	2,4,5-Trichlorophenol									
330	2-Chloronaphthalene									
1600	2-Nitroaniline									
330	Dimethylphthalate									
330	Acenaphthylene									
330	2,6-Dinitrotoluene									
1600	3-Nitroaniline									
330	Acenaphthene									
1600	2,4-Dinitrophenol									
1600	4-Nitrophenol									
330	Dibenzofuran									
330	2,4-Dinitrotoluene									
330	Diethylphthalate									
330	4-Chlorophenyl-phenylether									
330	Fluorene									
1600	4-Nitroaniline									
1600	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 3

Site Name: Town of Mamakating Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YN1060 **Sampling Date(s):** 5/19/89

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

	Sample No.	SWS-2		SWS-3		SWS-3D		SWS-4		SWS-5		SWS-5MS		SWS-5MSD		—			
	Dilution Factor																		
	% Moisture	31		22		33		48		53		53		53					
	Location																		
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene																		
330	Anthracene																		
330	Di-n-butylphthalate																		
330	Fluoranthene									120	J								
330	Pyrene									94	J								
330	Butylbenzylphthalate																		
1600	3,3-Dichlorobenzidine																		
330	Benzo(a)anthracene																		
330	Chrysene																		
330	bis(2-Ethylhexyl)phthalate	640	B	590	B	290	BJ	520	BJ	820	B	4	J	2	J				
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene																		
330	Benzo(k)fluoranthene									140	J								
330	Benzo(a)pyrene																		
330	Indeno(1,2,3-cd)pyrene																		
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene																		

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 1

Site Name: Town of Manilla Landfill

SOIL SAMPLES (ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11 & 12/89 5/9/89 8/16/89

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

CRQL	COMPOUND	SS-1	SS-2	SS-3	L-3	L-3MS	L-3MSD	MW-1C	MW-4B	MW-6
	Dilution Factor									
	% Moisture	34	53	43	26	26	26	14	14	11
	Location									
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				10,000	9200	8400			
330	N-Nitroso di-n-propylamine									
330	Hexachloroethane									
330	Nitrobenzene									
330	Isophorone									
330	2-Nitrophenol									
330	2,4-Dimethylphenol									
1600	Benzoic Acid				7800	8200	7600			
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 1

Site Name: Town of Marilla Landfill Site **SOIL SAMPLES** (ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11 8/2/89 5/9/89 8/16/89

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

CRQL	Sample No.	mw-1CMS	mw-1CMSD	SS-1MS	SS-1MSD	SBLK(S)	SBLK(S)	SBLK(S)		
	Dilution Factor									
	% Moisture	14	14	34	34	—		—		
	Location	4-6 ft	4-6 ft			mw-4B	mw-1C	L-1		
CRQL	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									

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CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 2

Site Name: Town of Marilla Landfill Site

SOIL SAMPLES
(ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11 & 12/89 5/9/89 8/16/89

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

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CRQL	Sample No.	SS-1	SS-2	SS-3	L-3	L-3MS	L-3MSD	MW-1C	MW-4B	MW-6
	Dilution Factor									
	% Moisture	34	53	43	26	26	26	14	14	11
	Location									
CRQL	COMPOUND									
330	Hexachlorobutadiene									
330	4-Chloro-3-methylphenol									
330	2-Methylnaphthalene									
330	Hexachlorocyclopentadiene									
330	2,4,6-Trichlorophenol									
1600	2,4,5-Trichlorophenol									
330	2-Chloronaphthalene									
1600	2-Nitroaniline									
330	Dimethylphthalate									
330	Acenaphthylene									
330	2,6-Dinitrotoluene									
1600	3-Nitroaniline									
330	Acenaphthene									
1600	2,4-Dinitrophenol									
1600	4-Nitrophenol									
330	Dibenzofuran									
330	2,4-Dinitrotoluene									
330	Diethylphthalate									
330	4-Chlorophenyl-phenylether									
330	Fluorene									
1600	4-Nitroaniline									
1600	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: Town of Marcellus Landfill

Case #: YN1060 Sampling Date(s): 7/11 8/2/89 5/9/89 8/16/89

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

	Sample No.	mw-1CMS	mw-1CMSD	SS-1MS	SS-1MSD	SBLKS1	SBLKS1	SBLKS1		
	Dilution Factor									
	% Moisture	14	14	34	34	—	—	—		
	Location	4-6 ft	4-6 ft			mw-4B	mw 1e	L-1		
CRQL	COMPOUND									
330	Hexachlorobutadiene									
330	4-Chloro-3-methylphenol									
330	2-Methylnaphthalene									
330	Hexachlorocyclopentadiene									
330	2,4,6-Trichlorophenol									
1600	2,4,5-Trichlorophenol									
330	2-Chloronaphthalene									
1600	2-Nitroaniline									
330	Dimethylphthalate									
330	Acenaphthylene									
330	2,6-Dinitrotoluene									
1600	3-Nitroaniline									
330	Acenaphthene									
1600	2,4-Dinitrophenol									
1600	4-Nitrophenol									
330	Dibenzofuran									
330	2,4-Dinitrotoluene									
330	Diethylphthalate									
330	4-Chlorophenyl-phenylether									
330	Fluorene									
1600	4-Nitroaniline									
1600	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 3

Site Name: Town of Manilla Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11 8/2/89 5/9/89 8/16/89

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

CRQL	COMPOUND																		
	Sample No.	SS-1		SS-2		SS-3		L-3		L-3MS		L-3MSD		MW-1C		MW-4B		MW-6	
	Dilution Factor																		
	% Moisture	34		53		43		26		26		26		14		14		11	
	Location																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene																		
330	Anthracene																		
330	Di-n-butylphthalate																		
330	Fluoranthene																		
330	Pyrene																		
330	Butylbenzylphthalate																		
1600	3,3-Dichlorobenzidine																		
330	Benzo(a)anthracene																		
330	Chrysene																		
330	bis(2-Ethylhexyl)phthalate	740	B	960	B	960	B	500	BJ	530	BJ	550	BJ	170	BJ	200	BJ		
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene																		
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene																		
330	Indeno(1,2,3-cd)pyrene																		
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene																		

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

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DATA SUMMARY FORM: B N A S 3

Site Name: Town of Marcella Landfill Site SOIL SAMPLES (ug/Kg)

Case #: YN1060 Sampling Date(s): 7/11 8/2/89 5/9 8/89 8/16/89

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

CRQL	COMPOUND									
	Sample No.	MW-1CMS	MW-1CMSD	SS-1MS	SS-1MSD	SBLKS1	SBLKS1	SBLKS1		
	Dilution Factor		2.0							
	% Moisture	19	19	34	34	—	—	—		
	Location	4-6ft	4-6ft			MW-4B	MW-1C	L-1		
330	N-Nitrosodiphenylamine									
330	4-Bromophenyl-phenylether									
330	Hexachlorobenzene									
1600	Pentachlorophenol									
330	Phenanthrene									
330	Anthracene									
330	Di-n-butylphthalate									
330	Fluoranthene									
330	Pyrene									
330	Butylbenzylphthalate									
1600	3,3-Dichlorobenzidine									
330	Benzo(a)anthracene									
330	Chrysene									
330	bis(2-Ethylhexyl)phthalate		240 BJ			120 J	120 J	240 J		
330	Di-n-octylphthalate									
330	Benzo(b)fluoranthene									
330	Benzo(k)fluoranthene									
330	Benzo(a)pyrene									
330	Indeno(1,2,3-cd)pyrene									
330	Dibenz(a,h)anthracene									
330	Benzo(g,h,i)perylene									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

Site Name: Town of Marcella Landfill

SOIL SAMPLES
(ug/Kg)

Case #: YN1060 Sampling Date: 7/11 8/2/89
5/9/89 8/16/89

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

CRQL	Sample No.	SS-1	SS-2	SS-3	L-3	L-3MS	L-3MSD	MW-1C	MW-4B	MW-6
	Dilution Factor									
	% Moisture	34	53	43	26	26	26	14	14	11
	Location									
	COMPOUND									
	CAS# 57103 Hexadecanoic Acid				7700 J					

CRQL = Contract Required Quantitation Limit

recycled paper

E-49

ecology and environment

PESTICIDES AND PCBs

recycled paper

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

Site Name: Town of Manilla Landfill

WATER SAMPLES
(ug/L)

Case #: YN1060 Sampling Date(s): 8/15&16/89
9/7/89 (MW 4B)

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

	Sample No.	MW-1A	MW-1B	MW-1C	MW-3	MW-4	MW-4A	MW 4B	MW-5	Drill Water
	Dilution Factor									
	Location									
CRQL	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

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ecology and environment

DATA SUMMARY FORM: PESTICIDES AND PCBS

WATER SAMPLES
(ug/L)

Site Name: Town of Marulk Landfill Site

Case #: YW1060 Sampling Date(s): 8/15&16/89

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

	Sample No.	MW-4AMS	MW-4AMSD	MW-5MS	MW-5MSD	PBLKW5	PBLKW1	PBLKW2		
	Dilution Factor									
	Location					MW-4B	MW-1A			
CRQL	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: P E S T I C I D E S A N D P C B S

WATER SAMPLES
(ug/L)

Site Name: Town of Marilla Landfill

Case #: YN1060 Sampling Date(s): 5/9/89

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

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	SW-2	SW-3	SW-3D	SW-4	SW-5	SW-5MS	SW-5MSD	L-1	L-2
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: P E S T I C I D E S AND P C B S

Site Name: Town of Marilla Landfill

WATER SAMPLES
(ug/L)

Case #: 825.NDS Sampling Date(s): ________

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

	Sample No.	PBLKW1	PBLKW2		PBLK02					
	Dilution Factor									
	Location	L-1	L-1 (8/18/89)		L-1 (5/25/89)					
CRQL	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

SOIL SAMPLES
(ug/Kg)

Site Name: Town of Marilla Landfill Site

Case #: YN 1060 Sampling Date(s): 5/9/89

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

Sample No.		SWS-2	SWS-3	SWS-3D	SWS-4	SWS-5	SWS-5MS	SWS-5MSD		
Dilution Factor										
% Moisture		31	22	33	48	53	53	53		
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: P E S T I C I D E S A N D P C B S

Site Name: Town of Marietta Landfill Site

SOIL SAMPLES (ug/Kg)

Case #: YN 1060 Sampling Date(s): 7/11 & 12/87 5/9/89 8/16/89

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

CRQL	Sample No.	SS-1	SS-2	SS-3	L-3	L-3MS	L-3MSD	MW-1C	MW-4B	MW-6
	Dilution Factor									
	% Moisture	34	53	43	26	26	26	14	14	11
	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: P E S T I C I D E S   A N D   P C B S

Site Name: Town of Marilla Landfill

SOIL SAMPLES
(ug/Kg)

Case #: YN-1060   Sampling Date(s): 7/11 8/12/89
5/9/89 8/16/89

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

	Sample No.	MW-1CMS	MW-1CMSD	SS-1MS	SS-1MSD	PBLKS1	PBLKS4	PBLKS2	PBLKS1	PBLKS4
	Dilution Factor									
	% Moisture	14	14	34	34	—	—	—	—	
	Location	4-6ft	4-6ft			L-1 (8/22/89)	MW-1C	L-1	L-1 (5/15/89)	MW-4B
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

METALS AND CYANIDE

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
MW-1A

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46888.07

Level (low/med): LOW Date Received: 8/15/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6470			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	230			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	202000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	13.4	B		P
7440-50-8	Copper	12.6	B		P
7439-89-6	Iron	12100			P
7439-92-1	Lead	5.0	U	W	F
7439-95-4	Magnesium	78300			P
7439-96-5	Manganese	1140			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	39.8	B		P
7440-09-7	Potassium	2740	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	252000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	47.8			P
	Cyanide	10.0	U		C

Color Before: YELLOW Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
MW-1A

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46888.06

Level (low/med): LOW Date Received: 8/15/89

% 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	5.0	U		F
7440-39-3	Barium	174	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	177000			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	262			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	66300			P
7439-96-5	Manganese	927			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	27.9	B		P
7440-09-7	Potassium	1470	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	230000			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	31.5			P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments: DISSOLVED METALS

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: MW-1B

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46887.07

Level (low/med): LOW Date Received: 8/15/89

% 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	16400			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	11.1			F
7440-39-3	Barium	5420			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	461000			P
7440-47-3	Chromium	26.7			P
7440-48-4	Cobalt	15.4	B		P
7440-50-8	Copper	38.0			P
7439-89-6	Iron	46400			P
7439-92-1	Lead	32.8			F
7439-95-4	Magnesium	97600			P
7439-96-5	Manganese	3520			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	50.1			P
7440-09-7	Potassium	8440			P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	528000			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	32.5	B		P
7440-66-6	Zinc	124			P
	Cyanide	10.0	U		C

Color Before: GREEN Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

recycled paper
ecology and environment

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: MW-1B

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46887.06

Level (low/med): LOW Date Received: 8/15/89

% 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	5.0	U		F
7440-39-3	Barium	5330			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	429000			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	7890			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	86800			P
7439-96-5	Manganese	3150			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	6140			P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	526000			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	16.8	B		P
	Cyanide				NR

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments: DISSOLVED METALS

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-1C

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46889

Level (low/med): LOW Date Received: 8/15/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	102			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	3740			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	299000			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	7360			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	52100			P
7439-96-5	Manganese	1400			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	3770	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	375000			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	14.9	B		P
	Cyanide	10.0	U		C

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

recycled paper ecology and environment

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-3

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.006 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 46925.07

Level (low/med): LOW Date Received: 8/16/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	48000		E	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	22.7			F
7440-39-3	Barium	419			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	82800		E	P
7440-47-3	Chromium	89.9			P
7440-48-4	Cobalt	40.7	B		P
7440-50-8	Copper	119			P
7439-89-6	Iron	121000		E	P
7439-92-1	Lead	129			P
7439-95-4	Magnesium	43500			P
7439-96-5	Manganese	4250		E	P
7439-97-6	Mercury	0.64			CV
7440-02-0	Nickel	115			P
7440-09-7	Potassium	5210		E	P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	3850	B		P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	75.6			P
7440-66-6	Zinc	583			P
	Cyanide	10.0	U		C

Color Before: GREEN Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-3

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.005 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 46925.06

Level (low/med): LOW Date Received: 8/16/89

% 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	E	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	110	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	67400		E	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	E	P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	16200			P
7439-96-5	Manganese	587		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	620	B	E	P
7782-49-2	Selenium	5.0	U	W	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	4340	B		P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	15.5	B		P
	Cyanide				NR

Color Before: Clear Clarity Before: Clear Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments: Dissolved Metals

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-4

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: ______ SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46886.07

Level (low/med): LOW Date Received: 8/15/89

% 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	94400			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	49.4			F
7440-39-3	Barium	440			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	123000			P
7440-47-3	Chromium	148			P
7440-48-4	Cobalt	96.1			P
7440-50-8	Copper	295			P
7439-89-6	Iron	270000			P
7439-92-1	Lead	182			F
7439-95-4	Magnesium	79000			P
7439-96-5	Manganese	3540			P
7439-97-6	Mercury	1.46			CV
7440-02-0	Nickel	267			P
7440-09-7	Potassium	7780			P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	14400			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	161			P
7440-66-6	Zinc	1150			P
	Cyanide	10.0	U		C

Color Before: GREEN Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

E-66

FORM I - IN

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: MW-4

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46886.06

Level (low/med): LOW Date Received: 8/15/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	104			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	53.8	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	80000			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	199			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	23700			P
7439-96-5	Manganese	193			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	346	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	14700			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	24.8			P
	Cyanide				NR

Color Before: Clear Clarity Before: Clear Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments: Dissolved Metals

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-4A

Lab Name: Ecology & Environment Inc.   Contract: D001549

Lab Code: ______   Case No.: 825.004   SAS No.: YN-1060   SDG No.: MW-1A

Matrix (soil/water): WATER   Lab Sample ID: 46890

Level (low/med): LOW   Date Received: 8/15/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	495			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	260			P
7440-41-7	Beryllium	3.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	347000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	29.8			P
7439-89-6	Iron	62.0			P
7439-92-1	Lead	5.0	U	W	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	23.8	B		P
7440-09-7	Potassium	13200			P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	2920000			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: ______   Clarity After: ______   Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-4A

Lab Name: ECOLOGY & ENVIRONMENT INC Contract: D001549

Lab Code: ______ Case No.: 825.005 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 46927

Level (low/med): LOW Date Received: 8/16/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14200		E	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	13.2			F
7440-39-3	Barium	380			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	247000		E	P
7440-47-3	Chromium	21.5			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	59.5			P
7439-89-6	Iron	30200		E	P
7439-92-1	Lead	15.6			F
7439-95-4	Magnesium	8790			P
7439-96-5	Manganese	370		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	53.7			P
7440-09-7	Potassium	13700		E	P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	2540000			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	32.2	B		P
7440-66-6	Zinc	131			P
	Cyanide	10.0			C

Color Before: GREEN Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

recycled paper

ecology and environment

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-4B

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46885.07

Level (low/med): LOW Date Received: 8/15/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40700			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	18.2			F
7440-39-3	Barium	262			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	89200			P
7440-47-3	Chromium	63.3			P
7440-48-4	Cobalt	40.6	B		P
7440-50-8	Copper	94.3			P
7439-89-6	Iron	97100			P
7439-92-1	Lead	45.6			F
7439-95-4	Magnesium	35800			P
7439-96-5	Manganese	1220			P
7439-97-6	Mercury	0.22			CV
7440-02-0	Nickel	121			P
7440-09-7	Potassium	7690			P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	7010			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	65.4			P
7440-66-6	Zinc	293			P
	Cyanide	10.0	U		C

Color Before: GREEN Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

ecology and environment
recycled paper

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-4B

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.004 SAS No.: YN-1060 SDG No.: MW-1A

Matrix (soil/water): WATER Lab Sample ID: 46885.06

Level (low/med): LOW Date Received: 8/15/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	139			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	41.0	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	60900			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	105			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	16000			P
7439-96-5	Manganese	167			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	2480	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	7340			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: ______ Clarity After: ______ Artifacts: ______

Comments: DISSOLVED METALS

recycled paper ecology and environment

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-5

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.005 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 4626.07

Level (low/med): LOW Date Received: 8/16/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	467000		E	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	223			F
7440-39-3	Barium	862			P
7440-41-7	Beryllium	13.6			P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	179000		E	P
7440-47-3	Chromium	597			P
7440-48-4	Cobalt	371			P
7440-50-8	Copper	897			P
7439-89-6	Iron	1200000		E	P
7439-92-1	Lead	649			P
7439-95-4	Magnesium	263000			P
7439-96-5	Manganese	8260		E	P
7439-97-6	Mercury	0.46			CV
7440-02-0	Nickel	1030			P
7440-09-7	Potassium	19800		E	P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	26700			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	568			P
7440-66-6	Zinc	1910			P
	Cyanide	10.0	U		C

Color Before: GREEN Clarity Before: CLOUDY Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-5

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.005 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 46926.06

Level (low/med): LOW Date Received: 8/16/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	262		E	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	35.0	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	21100		E	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	691		E	P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	5020			P
7439-96-5	Manganese	934		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	890	B	E	P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	27400			P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	29.4			P
	Cyanide				NR

Color Before: Clear Clarity Before: Clear Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments: Dissolved Metals

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

DRILL WATER

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.002 SAS No.: YN-1040 SDG No.: MW-4B

Matrix (soil/water): WATER Lab Sample ID: 43128

Level (low/med): LOW Date Received: 7/11/89

% 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	100.0	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	70.3	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	223000			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	176			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	15100			P
7439-96-5	Manganese	180			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	5190			P
7782-49-2	Selenium	5.0	U	W	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	63600			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	60.4			P
	Cyanide	10.0	U		C

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-1

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39728

Level (low/med): LOW Date Received: 05/09/89

% Solids: 65.7

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

CAS No.	Analyte	Concentration	C	~~Q~~	~~M~~ M
7429-90-5	Aluminum	12800			P
7440-36-0	Antimony	18.3	U	N	P
7440-38-2	Arsenic	4.5			F
7440-39-3	Barium	84.4			P
7440-41-7	Beryllium	0.75	B	N	P
7440-43-9	Cadmium	1.6			P
7440-70-2	Calcium	3400		*	P
7440-47-3	Chromium	18.5			P
7440-48-4	Cobalt	14.1	B		P
7440-50-8	Copper	29.6			P
7439-89-6	Iron	30200			P
7439-92-1	Lead	9.0		*	F
7439-95-4	Magnesium	4260			P
7439-96-5	Manganese	523		N	P
7439-97-6	Mercury	0.15	U		CV
7440-02-0	Nickel	35.0			P
7440-09-7	Potassium	1250	B		P
7782-49-2	Selenium	1.5	U	W N	F
7440-22-4	Silver	3.0	U	N	P
7440-23-5	Sodium	800	B		P
7440-28-0	Thallium	1.5	U	W N	F
7440-62-2	Vanadium	24.0			P
7440-66-6	Zinc	75.4			P
	Cyanide	1.5	U		C

GH 6/26/89

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

FORM I - IN

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: SS-2

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39729

Level (low/med): LOW Date Received: 05/09/89

% Solids: 47.4

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

BJK 6/26/89

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15100			P
7440-36-0	Antimony	25.3	U	N	P
7440-38-2	Arsenic	5.0			F
7440-39-3	Barium	102			P
7440-41-7	Beryllium	0.96	B	N	P
7440-43-9	Cadmium	2.1	U		P
7440-70-2	Calcium	4140		*	P
7440-47-3	Chromium	25.9			P
7440-48-4	Cobalt	8.6	B		P
7440-50-8	Copper	17.8			P
7439-89-6	Iron	22100			P
7439-92-1	Lead	26.5		*	F
7439-95-4	Magnesium	3630			P
7439-96-5	Manganese	750		N	P
7439-97-6	Mercury	0.21	U		CV
7440-02-0	Nickel	38.6			P
7440-09-7	Potassium	1600	B		P
7782-49-2	Selenium	2.1	U	WN	F
7440-22-4	Silver	4.2	U	N	P
7440-23-5	Sodium	1780	B		P
7440-28-0	Thallium	2.1	U	WN	F
7440-62-2	Vanadium	23.7			P
7440-66-6	Zinc	93.6			P
	Cyanide	2.1	U		C

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SS-3

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39730

Level (low/med): LOW Date Received: 05/09/89

% Solids: 56.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15500			P
7440-36-0	Antimony	21.1	U	N	P
7440-38-2	Arsenic	5.3			F
7440-39-3	Barium	87.4			P
7440-41-7	Beryllium	0.85	B	N	P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	2030		*	P
7440-47-3	Chromium	18.8			P
7440-48-4	Cobalt	9.3	B		P
7440-50-8	Copper	18.2			P
7439-89-6	Iron	24600			P
7439-92-1	Lead	36.0		*	P
7439-95-4	Magnesium	3150			P
7439-96-5	Manganese	832		N	P
7439-97-6	Mercury	0.18	U		CV
7440-02-0	Nickel	24.0			P
7440-09-7	Potassium	1530	B		P
7782-49-2	Selenium	1.8	U	WN	F
7440-22-4	Silver	3.5	U	N	P
7440-23-5	Sodium	102	B		P
7440-28-0	Thallium	1.8	U	N	F
7440-62-2	Vanadium	29.6			P
7440-66-6	Zinc	143			P
	Cyanide	1.8	U		C

BJM 6/26/89

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

FORM I - IN

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

MW-1C 4-6 ft

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.003 SAS No.: YN-1040 SDG No.: MW-1C

Matrix (soil/water): SOIL Lab Sample ID: 43251

Level (low/med): LOW Date Received: 7/12/89

% Solids: 85.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	18700			P
7440-36-0	Antimony	14.0	U	N	P
7440-38-2	Arsenic	3.5		N	F
7440-39-3	Barium	101			P
7440-41-7	Beryllium	0.55	B		P
7440-43-9	Cadmium	1.2	U		P
7440-70-2	Calcium	1110	B	*	P
7440-47-3	Chromium	25.4			P
7440-48-4	Cobalt	9.1	B		P
7440-50-8	Copper	35.8			P
7439-89-6	Iron	27200			P
7439-92-1	Lead	13.6			F
7439-95-4	Magnesium	6210			P
7439-96-5	Manganese	195		*	P
7439-97-6	Mercury	0.14			CV
7440-02-0	Nickel	40.8			P
7440-09-7	Potassium	2320			P
7782-49-2	Selenium	1.2	U	WN	F
7440-22-4	Silver	2.3	U		P
7440-23-5	Sodium	112	B		P
7440-28-0	Thallium	1.2	U		F
7440-62-2	Vanadium	27.2			P
7440-66-6	Zinc	152			P
	Cyanide	1.2	U		C

Color Before: ______ Clarity Before: ______ Texture: GRANULAR

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: MW-4B 8-10 ft

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.002 SAS No.: YN-1040 SDG No.: MW-4B

Matrix (soil/water): SOIL Lab Sample ID: 43127

Level (low/med): LOW Date Received: 7/11/89

% Solids: 86.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6030			P
7440-36-0	Antimony	13.9	U	N	P
7440-38-2	Arsenic	3.7		N	F
7440-39-3	Barium	26.7	B		P
7440-41-7	Beryllium	0.46	U		P
7440-43-9	Cadmium	1.2	U		P
7440-70-2	Calcium	19000			P
7440-47-3	Chromium	9.5			P
7440-48-4	Cobalt	6.0	B		P
7440-50-8	Copper	23.0			P
7439-89-6	Iron	17700			P
7439-92-1	Lead	2.2		S *	F
7439-95-4	Magnesium	7100			P
7439-96-5	Manganese	198		N	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	1.5		N	F
7440-22-4	Silver	2.3	U		P
7440-23-5	Sodium	88.4	B		P
7440-28-0	Thallium	1.2	U		F
7440-62-2	Vanadium	14.0			P
7440-66-6	Zinc	68.4			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.
MW-6
5-7 ft

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.003 SAS No.: YN-1040 SDG No.: MW-1C

Matrix (soil/water): SOIL Lab Sample ID: 43250

Level (low/med): LOW Date Received: 7/12/89

% Solids: 88.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19700			P
7440-36-0	Antimony	13.5	U	N	P
7440-38-2	Arsenic	5.0		N	F
7440-39-3	Barium	48.8			P
7440-41-7	Beryllium	0.64	B		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	12100		*	P
7440-47-3	Chromium	26.8			P
7440-48-4	Cobalt	13.2			P
7440-50-8	Copper	36.6			P
7439-89-6	Iron	39600			P
7439-92-1	Lead	7.7			F
7439-95-4	Magnesium	7640			P
7439-96-5	Manganese	507		*	P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	39.4			P
7440-09-7	Potassium	1620			P
7782-49-2	Selenium	1.1	U	WN	F
7440-22-4	Silver	2.3	U		P
7440-23-5	Sodium	81.2	B		P
7440-28-0	Thallium	1.1	U		F
7440-62-2	Vanadium	22.8			P
7440-66-6	Zinc	80.5			P
	Cyanide	1.1	U		C

Color Before: ______ Clarity Before: ______ Texture: GRANULAR

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: SW-2

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39736

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5580		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	119	B		P
7440-41-7	Beryllium	2.1	B		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	30200			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	445			P
7439-89-6	Iron	22100		N *	P
7439-92-1	Lead	9.0		S	F
7439-95-4	Magnesium	7510			P
7439-96-5	Manganese	472		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	275			P
7440-09-7	Potassium	7480			P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	145000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	12.7	B		P
7440-66-6	Zinc	102		*	P
	Cyanide	10.0	U		C

BM 6/26/89

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
SW-3

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39737

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1420		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	22.4	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	11800			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	18.1	B		P
7439-89-6	Iron	2290		N*	P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	2220	B		P
7439-96-5	Manganese	99.3		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	2500	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	6430			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	21.5		*	P
	Cyanide	10.0	U		C

EM 6/26/89

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SW-3D

Lab Name: ECOLOGY & ENVIRONMENT INC Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39738

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3160		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	40.2	B		P
7440-41-7	Beryllium	2.0	B		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	8580			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	5140		N*	P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	2370	B		P
7439-96-5	Manganese	214		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	2040	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	2050	B		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	10.0	U		C

BJK 6/26/89

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SW-4

Lab Name: Ecology & Environment Inc Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39739

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	51400		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	10.7			F
7440-39-3	Barium	539			P
7440-41-7	Beryllium	2.7	B		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	21700			P
7440-47-3	Chromium	71.7			P
7440-48-4	Cobalt	41.0	B		P
7440-50-8	Copper	78.8			P
7439-89-6	Iron	94100		N*	P
7439-92-1	Lead	87.7		+	F
7439-95-4	Magnesium	19900			P
7439-96-5	Manganese	4590		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	132			P
7440-09-7	Potassium	5590			P
7782-49-2	Selenium	5.0	U	N	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	2440	B		P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	84.0			P
7440-66-6	Zinc	421		*	P
	Cyanide	10.0	U		C

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SW-5

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39741

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	M	Q
7429-90-5	Aluminum	1730		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	32.0	B		P
7440-41-7	Beryllium	2.0	B		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	13100			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	2630		N*	P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	3090	B		P
7439-96-5	Manganese	84.3		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	1940	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	3730	B		P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	23.3		*	P
	Cyanide	10.0	U		C

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

FORM I - IN

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: SWS-2

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39731

Level (low/med): LOW Date Received: 05/09/89

% Solids: 69.5

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

BM 6/26/89

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16000			P
7440-36-0	Antimony	17.3	U	N	P
7440-38-2	Arsenic	3.8			F
7440-39-3	Barium	124			P
7440-41-7	Beryllium	0.76	B	N	P
7440-43-9	Cadmium	1.4	U		P
7440-70-2	Calcium	5250		*	P
7440-47-3	Chromium	20.8			P
7440-48-4	Cobalt	10.0	B		P
7440-50-8	Copper	24.3			P
7439-89-6	Iron	35400			P
7439-92-1	Lead	6.3		*	F
7439-95-4	Magnesium	5270			P
7439-96-5	Manganese	403		N	P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	27.9			P
7440-09-7	Potassium	1460			P
7782-49-2	Selenium	1.4	U	WN	F
7440-22-4	Silver	2.9	U	N	P
7440-23-5	Sodium	175	B		P
7440-28-0	Thallium	1.4	U	N	F
7440-62-2	Vanadium	24.9			P
7440-66-6	Zinc	68.8			P
	Cyanide	1.4	U		C

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SWS-3

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39732

Level (low/med): LOW Date Received: 05/09/89

% Solids: 78.4

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

BH 6/26/89

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17500			P
7440-36-0	Antimony	15.3	U	N	P
7440-38-2	Arsenic	1.3	U	W	F
7440-39-3	Barium	77.1			P
7440-41-7	Beryllium	0.73	B	N	P
7440-43-9	Cadmium	1.3	U		P
7440-70-2	Calcium	1230	B	*	P
7440-47-3	Chromium	25.0			P
7440-48-4	Cobalt	14.7			P
7440-50-8	Copper	28.1			P
7439-89-6	Iron	42300			P
7439-92-1	Lead	20.5		*	P
7439-95-4	Magnesium	6430			P
7439-96-5	Manganese	594		N	P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	35.4			P
7440-09-7	Potassium	1370			P
7782-49-2	Selenium	1.3	U	WN	F
7440-22-4	Silver	2.6	U	N	P
7440-23-5	Sodium	75.2	B		P
7440-28-0	Thallium	1.3	U	N	F
7440-62-2	Vanadium	25.0			P
7440-66-6	Zinc	60.8			P
	Cyanide	1.3	U		C

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.: SWS-3D

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39733

Level (low/med): LOW Date Received: 05/09/89

% Solids: 67.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17200			P
7440-36-0	Antimony	17.8	U	N	P
7440-38-2	Arsenic	1.5	U	W	F
7440-39-3	Barium	71.5			P
7440-41-7	Beryllium	0.80	B	N	P
7440-43-9	Cadmium	1.5	U		P
7440-70-2	Calcium	1020	B	*	P
7440-47-3	Chromium	23.5			P
7440-48-4	Cobalt	11.3			P
7440-50-8	Copper	25.4			P
7439-89-6	Iron	36000			P
7439-92-1	Lead	2.3		*	F
7439-95-4	Magnesium	6290			P
7439-96-5	Manganese	459		N	P
7439-97-6	Mercury	0.15	U		CV
7440-02-0	Nickel	32.0			P
7440-09-7	Potassium	1260			P
7782-49-2	Selenium	1.5	U	W N	F
7440-22-4	Silver	3.0	U	N	P
7440-23-5	Sodium	67.9	B		P
7440-28-0	Thallium	1.5	U	N	F
7440-62-2	Vanadium	23.8			P
7440-66-6	Zinc	55.5			P
	Cyanide	1.5	U		C

Bjh 6/26/89

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.
SWS-4

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39734

Level (low/med): LOW Date Received: 06/09/89

% Solids: 51.7

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	23.2	U	N	P
7440-38-2	Arsenic	1.9	U	W	F
7440-39-3	Barium	106			P
7440-41-7	Beryllium	0.94	B	N	P
7440-43-9	Cadmium	1.9	U		P
7440-70-2	Calcium	2980		*	P
7440-47-3	Chromium	15.4			P
7440-48-4	Cobalt	9.7			P
7440-50-8	Copper	20.1			P
7439-89-6	Iron	21600			P
7439-92-1	Lead	28.9		*	P
7439-95-4	Magnesium	3610			P
7439-96-5	Manganese	1080		N	P
7439-97-6	Mercury	0.19	U		CV
7440-02-0	Nickel	26.4			P
7440-09-7	Potassium	1600	B		P
7782-49-2	Selenium	1.9	U	W N	F
7440-22-4	Silver	3.9	U	N	P
7440-23-5	Sodium	106	B		P
7440-28-0	Thallium	1.9	U	N	F
7440-62-2	Vanadium	20.9			P
7440-66-6	Zinc	81.1			P
	Cyanide	1.9	U		C

BJK 6/26/89

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SWS-5

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 39735

Level (low/med): LOW Date Received: 05/09/89

% Solids: 46.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	18000			P
7440-36-0	Antimony	25.6	U	N	P
7440-38-2	Arsenic	2.3	B		F
7440-39-3	Barium	167			P
7440-41-7	Beryllium	1.1	B	N	P
7440-43-9	Cadmium	2.1	U		P
7440-70-2	Calcium	3530		*	P
7440-47-3	Chromium	22.7			P
7440-48-4	Cobalt	17.0			P
7440-50-8	Copper	29.4			P
7439-89-6	Iron	33300			P
7439-92-1	Lead	4.1		*	F
7439-95-4	Magnesium	5360			P
7439-96-5	Manganese	2060		N	P
7439-97-6	Mercury	0.21	U		CV
7440-02-0	Nickel	45.4			P
7440-09-7	Potassium	2110	B		P
7782-49-2	Selenium	2.1	U	W N	F
7440-22-4	Silver	4.3	U	N	P
7440-23-5	Sodium	129	B		P
7440-28-0	Thallium	2.1	U	N	F
7440-62-2	Vanadium	30.5			P
7440-66-6	Zinc	178			P
	Cyanide	2.1	U		C

BJM 6/26/89

Color Before: BROWN Clarity Before: ______ Texture: CLAY

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

ecology and environment recycled paper

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

L-1

Lab Name: Ecology & Environment Inc Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39742

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3450		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	38.1	B		P
7440-41-7	Beryllium	2.1	B		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	11300			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	4840		N *	P
7439-92-1	Lead	6.5			F
7439-95-4	Magnesium	2180	B		P
7439-96-5	Manganese	72.0		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	1770	B		P
7782-49-2	Selenium	5.0	U	WN	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	28500			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	28.3		*	P
	Cyanide	10.0	U		C

BM 4/24/89

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NC

L-2

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.001 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): WATER Lab Sample ID: 39743

Level (low/med): LOW Date Received: 05/09/89

% Solids: 0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14100		N	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	117	B		P
7440-41-7	Beryllium	2.2	B		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	27900			P
7440-47-3	Chromium	16.9			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	22.6	B		P
7439-89-6	Iron	21800		N *	P
7439-92-1	Lead	10.8			F
7439-95-4	Magnesium	8580			P
7439-96-5	Manganese	402		*	P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	29.7	B		P
7440-09-7	Potassium	3290	B		P
7782-49-2	Selenium	5.0	U	N	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	7890			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	26.1	B		P
7440-66-6	Zinc	84.5		*	P
	Cyanide	10.0	U		C

BMc 6/26/89

Color Before: BROWN Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

FORM I - IN

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

~~L-1~~ L-3

Lab Name: Ecology & Environment Inc. Contract: D001549

Lab Code: ______ Case No.: 825.005 SAS No.: YN-1060 SDG No.: L-1

Matrix (soil/water): SOIL Lab Sample ID: 46928

Level (low/med): LOW Date Received: 8/16/89

% Solids: 73.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13400			P
7440-36-0	Antimony	16.2	U		P
7440-38-2	Arsenic	9.5			F
7440-39-3	Barium	82.9			P
7440-41-7	Beryllium	0.58			P
7440-43-9	Cadmium	1.4	U		P
7440-70-2	Calcium	7270			P
7440-47-3	Chromium	18.6			P
7440-48-4	Cobalt	16.2			P
7440-50-8	Copper	33.5			P
7439-89-6	Iron	36700			P
7439-92-1	Lead	16.9			F
7439-95-4	Magnesium	5090			P
7439-96-5	Manganese	555			P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	42.8			P
7440-09-7	Potassium	976	B		P
7782-49-2	Selenium	1.4	U	W	F
7440-22-4	Silver	2.7	U		P
7440-23-5	Sodium	287	B		P
7440-28-0	Thallium	1.4	U	W	F
7440-62-2	Vanadium	24.6			P
7440-66-6	Zinc	104			P
	Cyanide	1.4	U		C

Color Before: ______ Clarity Before: ______ Texture: Homogeneous

Color After: ______ Clarity After: ______ Artifacts: Rocks

Comments:

E-93

FORM I - IN

1-15-90 SLD

recycled paper

ecology and environment

APPENDIX F

GEOTECHNICAL ANALYSES

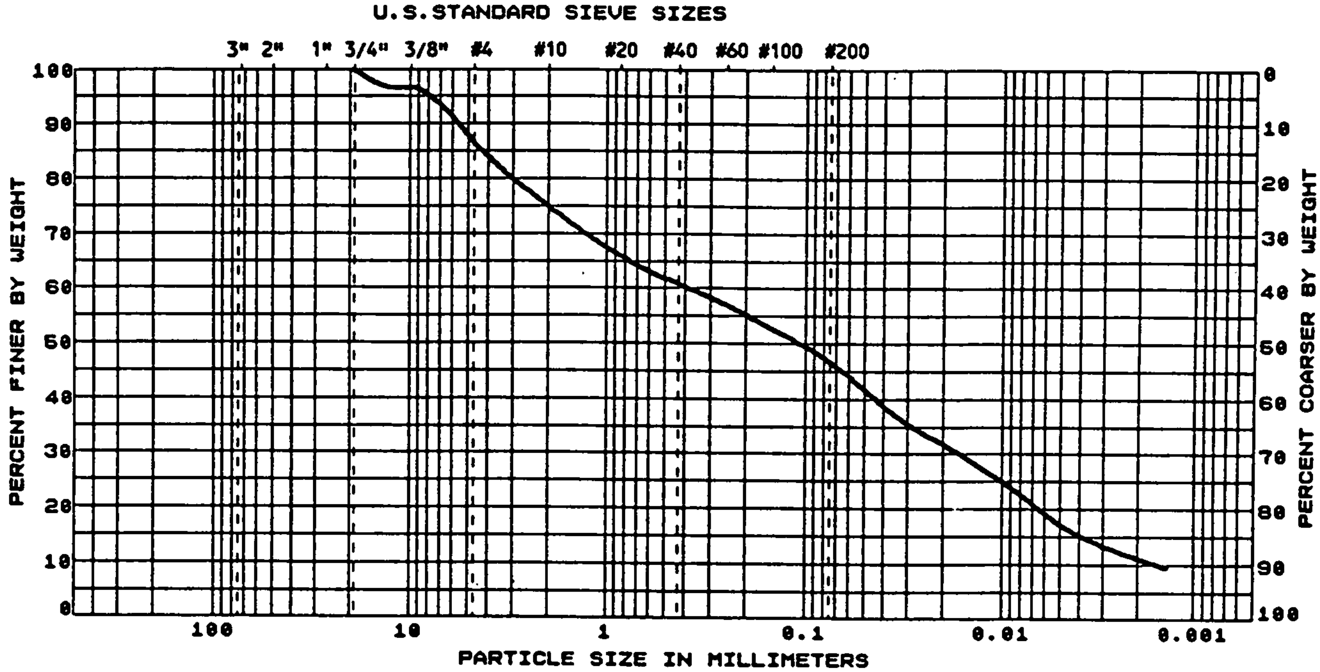
925.005

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. 41-8905.09　DATE September 7, 1989
LAB NO. 9384　PAGE 1
PROJECT E & E P.O.#47214
SAMPLE ID 43256.01MW48 12.0'-14.0'



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		31.8	0.020
1-1/2"	37.5		17.2	0.005
1"	25		11.3	0.002
3/4"	19	100.0		0.001
1/2"	12.5	96.7		
3/8"	9.5	96.7		
#4	4.75	86.8		
#10	2.00	75.0		
#20	0.850	66.0		
#40	0.425	60.7		
#60	0.250	57.0		
#100	0.150	52.9		
#200	0.075	46.7		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 27
PLASTIC LIMIT 18
PLASTICITY INDEX 9
CLASSIFICATION CLAYEY SAND (SC)

WATER CONTENT (%) 13.0
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D4318, D2216, D4287; CORPS OF ENGRS EM-1110-2-1906

LAW ENVIRONMENTAL, INC.
M.A. O'Kelley
ecology and environment

recycled paper

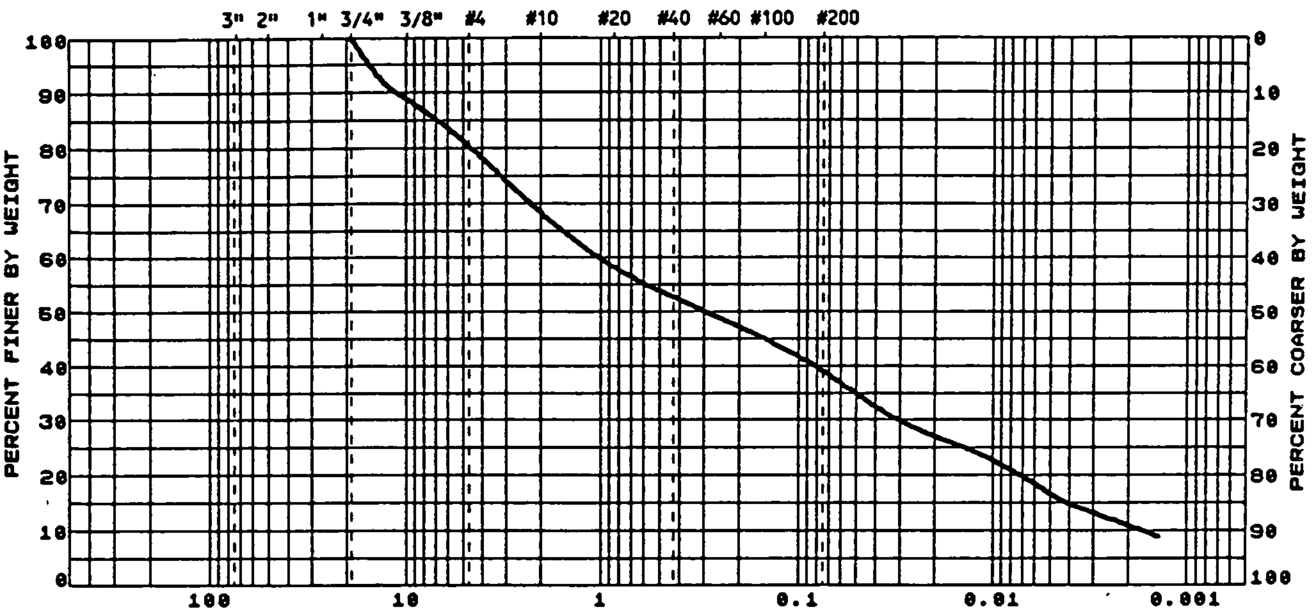
825.003

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. 41-8985.09 DATE September 7, 1989
LAB NO. 9385 PAGE 2
PROJECT E & E P.O.#47214
SAMPLE ID 43257.01 +.02MW4B 10.0'-12.0'



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"	76			0.050
2"	50		27.1	0.020
1-1/2"	37.5		16.6	0.005
1"	25		10.9	0.002
3/4"	19	100.0		0.001
1/2"	12.5	91.4		
3/8"	9.5	88.5		
#4	4.75	80.5		
#10	2.00	68.3		
#20	0.850	58.3		
#40	0.425	52.7		
#60	0.250	48.8		
#100	0.150	45.1		
#200	0.075	39.1		

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

WATER CONTENT (%) 10.0
DRY DENSITY (PCF)
SPECIFIC GRAVITY
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D4318, D2216, D4287; CORPS OF ENGRS EM-1110-2-1906

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

12

APPENDIX G

PHOTOGRAPHIC LOG

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

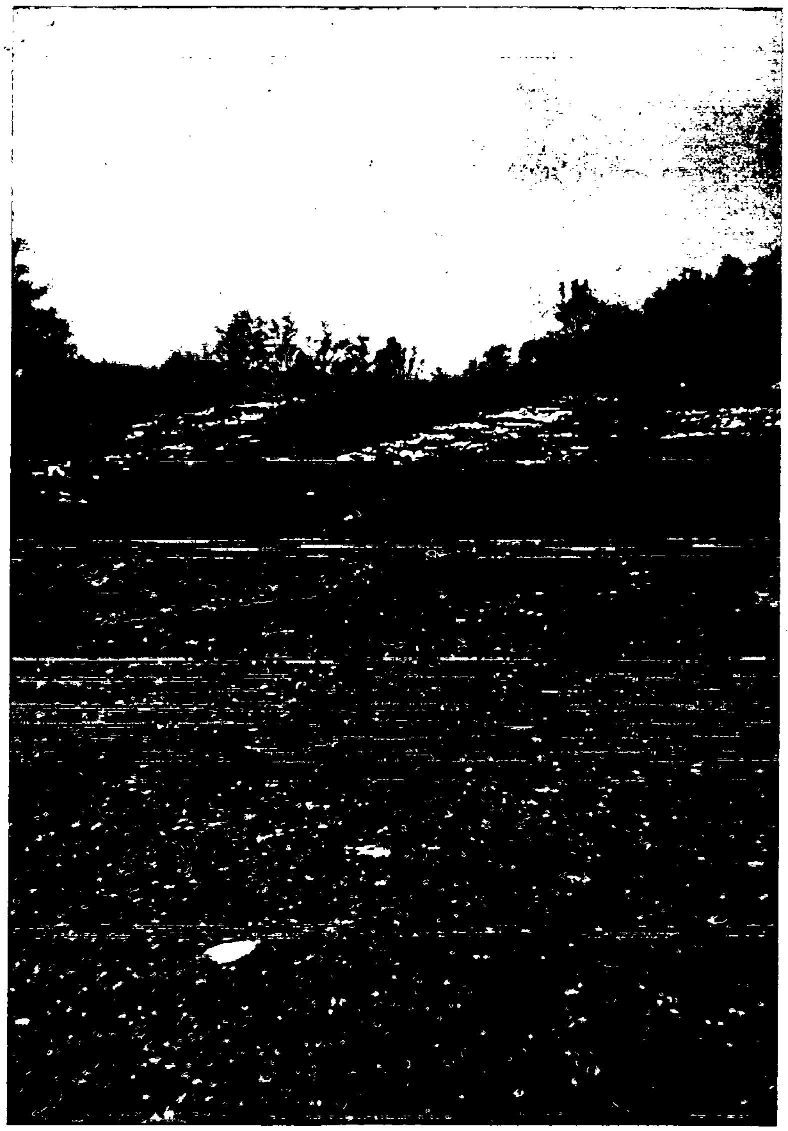
Date/Time: 5/9/89 / 1430

Lens: Type N/A

SN: N/A

Frame No.: 2

Comments: View to north along the west side of the landfill. Note excessive leachate outbreaks.



578

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

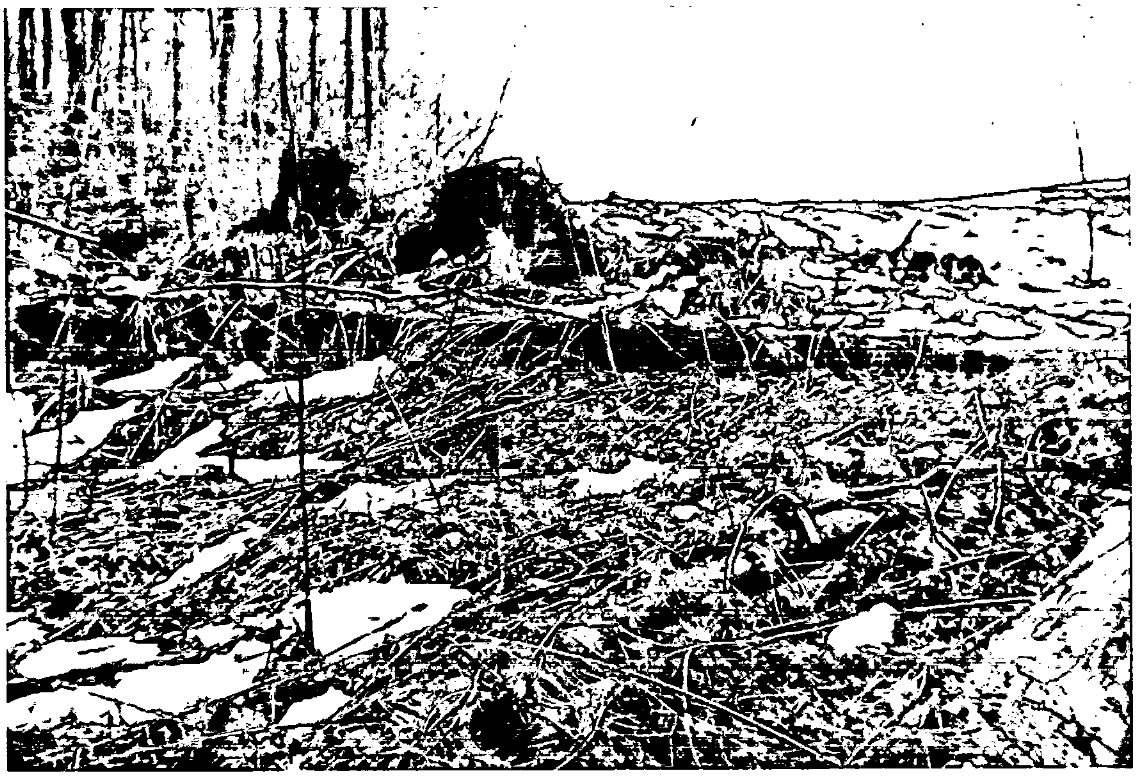
Date/Time: 5/9/89 / 1410

Lens: Type N/A

SN: N/A

Frame No.: 3

Comments: View to southeast of SS-2 sample location (wood stake) located approximately 20 feet north of sample L-2 on the north slope of the landfill.



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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera SN: N/A

Photographer: G. Florentino Date/Time: 5/9/89 / 1400

Lens: Type N/A SN: N/A Frame No.: 4

Comments: View to southeast of L-2 sample location (wood stake) located on the north slope of the landfill in an area of cut trees.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 7/12/89 / 1710

Lens: Type N/A

SN: N/A

Frame No.: 4

Comments: View to northwest of drilling location of GW-1C.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1350

Lens: Type N/A

SN: N/A

Frame No.: 5

Comments: View to east of SW/SWS-4 sample location (wood stake) located in the marshy area along the Little Buffalo Creek intermittent tributary. Landfill is located to the right of photograph.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1330

Lens: Type N/A

SN: N/A

Frame No.: 6

Comments: View to west of SW/SWS-5 sample location (wood stake) from downstream of landfill in the intermittent tributary to Little Buffalo Creek.

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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

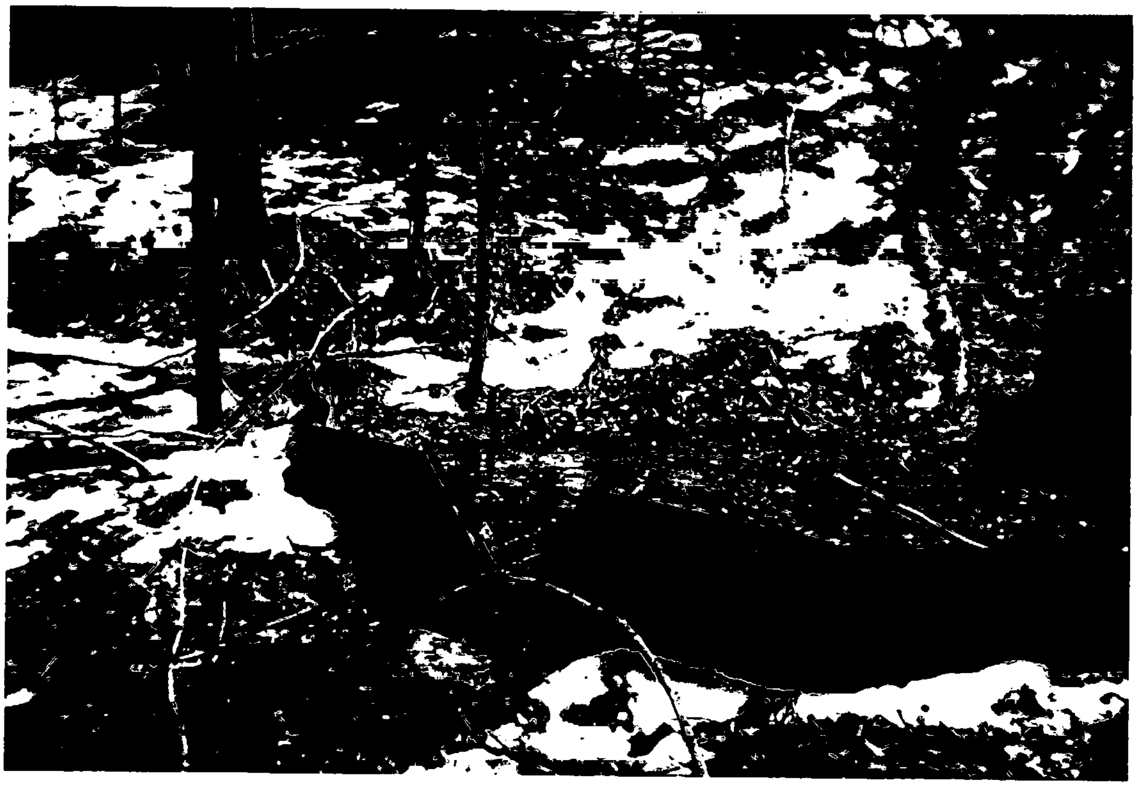
Date/Time: 5/9/89 / 1320

Lens: Type N/A

SN: N/A

Frame No.: 7

Comments: View to southeast of SS-1 sample location (wood stake) located to the southeast of the leachate weir at base of the tree in the center of the photograph.



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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1305

Lens: Type N/A

SN: N/A

Frame No.: 8

Comments: View to south of L-1 sample location adjacent to tree in center of photograph. Note south side of leachate weir in foreground, broken concrete culvert pipe, and landfill slope in background.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1300

Lens: Type N/A

SN: N/A

Frame No.: 9

Comments: View to south of SW/SWS-2 sample location, immediately downstream of the leachate weir. Note the broken culvert and landfill slope in background.

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

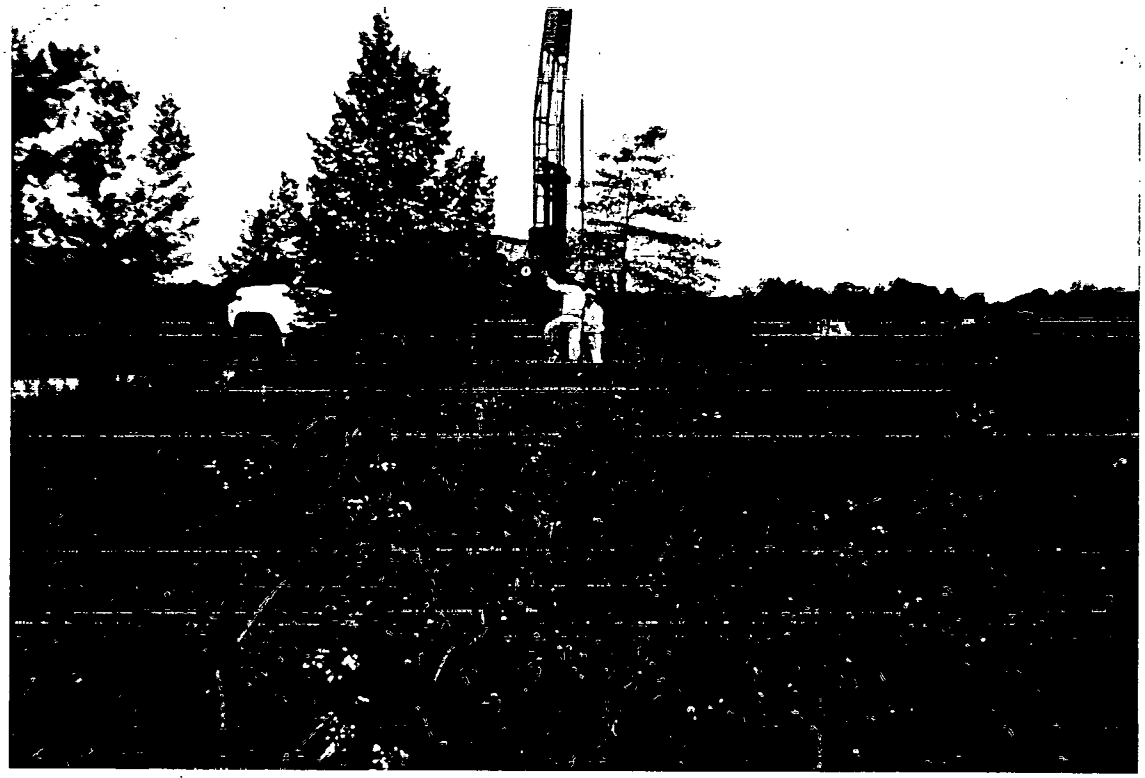
Client: NYSDEC | E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera | SN: N/A

Photographer: G. Florentino | Date/Time: 7/12/89 / 0935

Lens: Type N/A | SN: N/A | Frame No.: 9

Comments: View to west of new location of the attempted additional upgradient well (GW-6) 30 ft. north of the access road along the Town of Marilla right-of-way, 100 ft. west of Eastwood Road.



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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1135

Lens: Type N/A

SN: N/A

Frame No.: 10

Comments: View to south of SW/SWS-3 sample location (wood stake) from drainage ditch adjacent to the east side of the landfill. Landfill located to the right of the photograph.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1110

Lens: Type N/A

SN: N/A

Frame No.: 11

Comments: View to east of SS-3 sample location (wood stake) on south side of access road, along west side of horse corral fence (third post south from corner of fence).

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1046

Lens: Type N/A

SN: N/A

Frame No.: 12

Comments: View to southwest along the south side of the equipment shed, the former location of the 550-gallon underground oil storage tank. Note disturbed soil and snow in depression

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

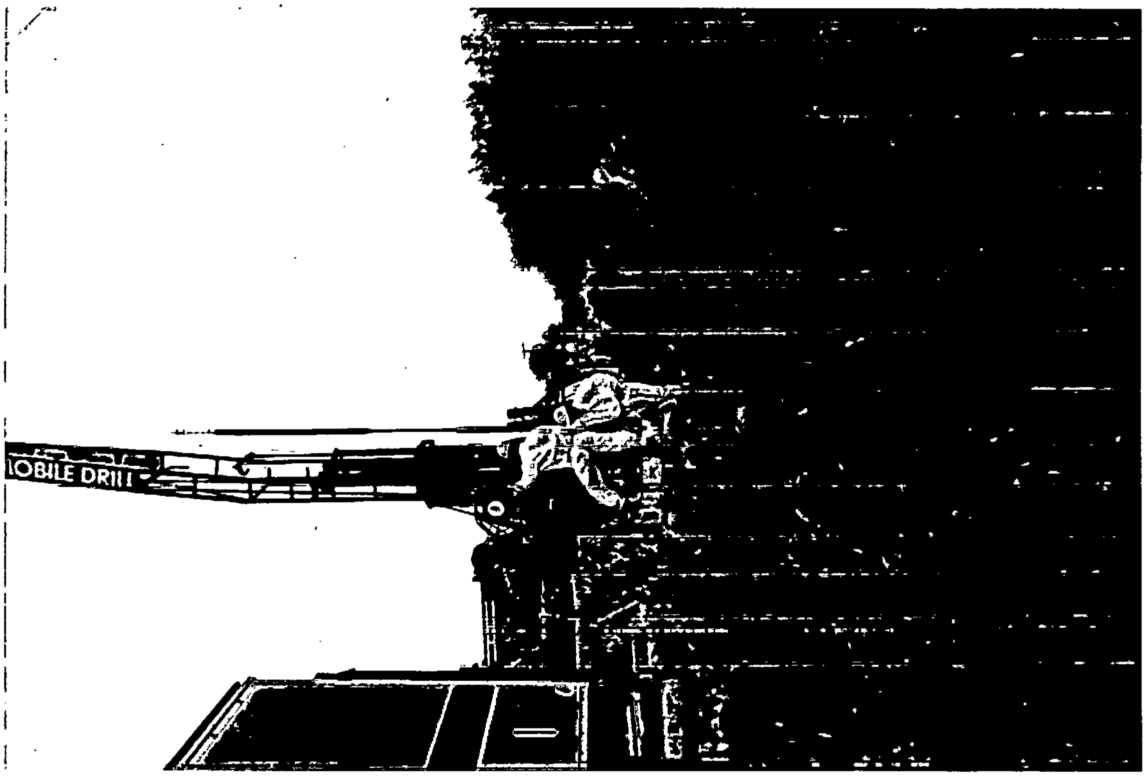
Date/Time: 7/12/89 / 0838

Lens: Type N/A

SN: N/A

Frame No.: 12

Comments: View to east of additional upgradient well location (GW-6) attempted on south side of access road near end of horse corral fence.



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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

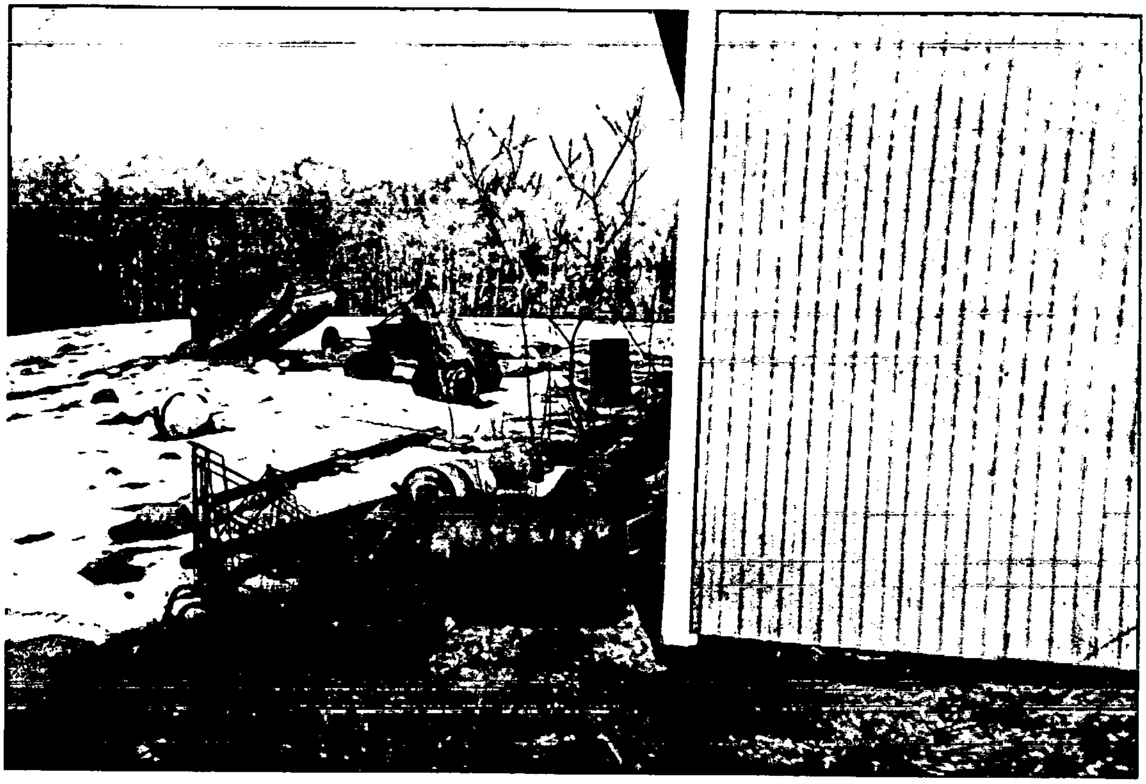
Date/Time: 5/9/89 / 1045

Lens: Type N/A

SN: N/A

Frame No.: 13

Comments: View to west of empty drums and metal debris behind the equipment shed.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

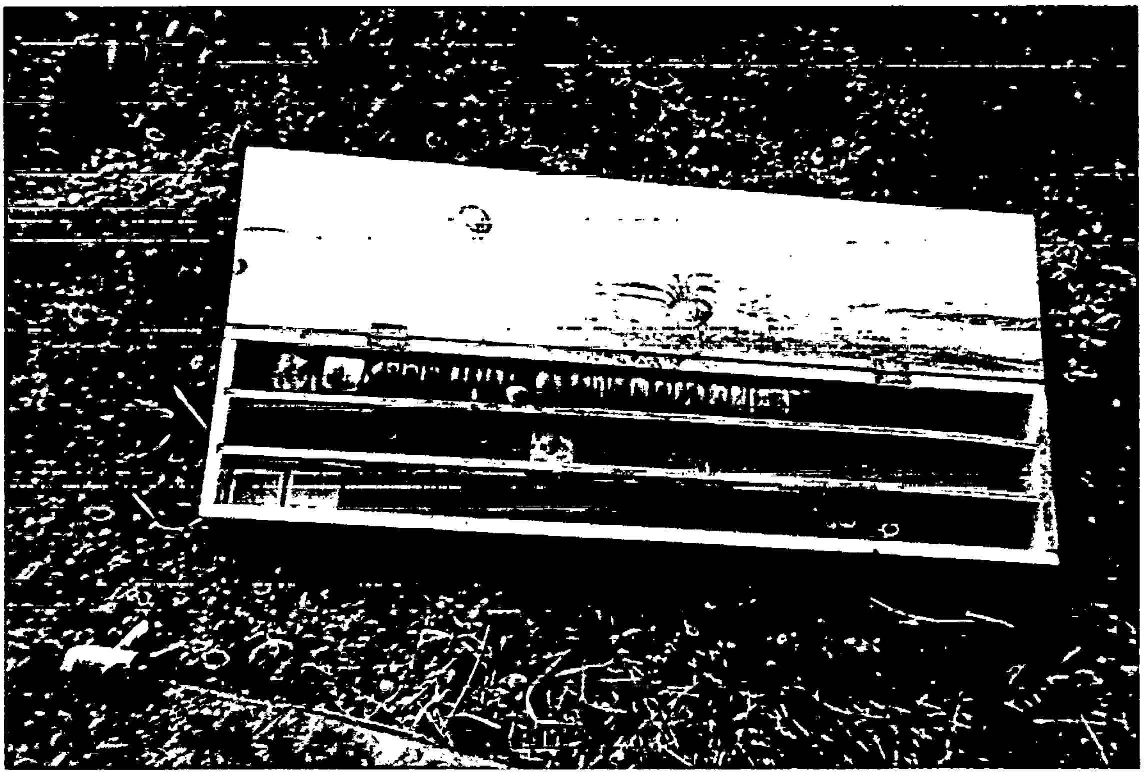
Client: NYSDEC E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera SN: N/A

Photographer: G. Florentino Date/Time: 7/11/89 / 1350

Lens: Type N/A SN: N/A Frame No.: 13

Comments: Top 3 ft. of rock core (depth of core 14.5-17.5') from GW-4B.



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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera | SN: N/A

Photographer: G. Florentino | Date/Time: 5/9/89 / 1030

Lens: Type N/A | SN: N/A | Frame No.: 14

Comments: View to west of GW-5 (2" ID PVC). There is a dirt road exiting the landfill area to the right of the well which leads to the town park.

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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1025

Lens: Type N/A

SN: N/A

Frame No.: 15

Comments: View to south of GW-2 (2" ID PVC) located in the center of the open space between the single tree on the left and the two trees to the right of the center of the photograph. The landfill is located to the left of the photograph.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1025

Lens: Type N/A

SN: N/A

Frame No.: 16

Comments: View to south of leachate weir in west drainage ditch at base of slope. Channel is filled with coarse gravel. Broken concrete culvert pipe is located behind the weir, and the landfill is located at the top of the slope to the left of the photograph.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1020

Lens: Type N/A

SN: N/A

Frame No.: 17

Comments: View to west of GW-1B (foreground) and GW-1A (background). Proposed site for GW-1C.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera SN: N/A

Photographer: G. Florentino Date/Time: 7/11/89 / 1113

Lens: Type N/A SN: N/A Frame No.: 18

Comments: View to east of drilling of GW-4B.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1015

Lens: Type N/A

SN: N/A

Frame No.: 18

Comments: View to south of west drainage ditch. Landfill is located on top of slope to the left of the picture. Leachate weir located at base of slope.

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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 1010

Lens: Type N/A

SN: N/A

Frame No.: 19

Comments: View to west of tributary to Little Buffalo Creek located to the north of the landfill.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera SN: N/A

Photographer: G. Florentino Date/Time: 5/9/89 / 1000

Lens: Type N/A SN: N/A Frame No.: 20

Comments: View to northwest from top of landfill (approx. 50-70 ft. change in elevation).

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 0950

Lens: Type N/A

SN: N/A

Frame No.: 21

Comments: View to south of GW-3. Landfill slope to the right of the photograph.

ecology and environment, inc.

P H O T O G R A P H I C   R E C O R D

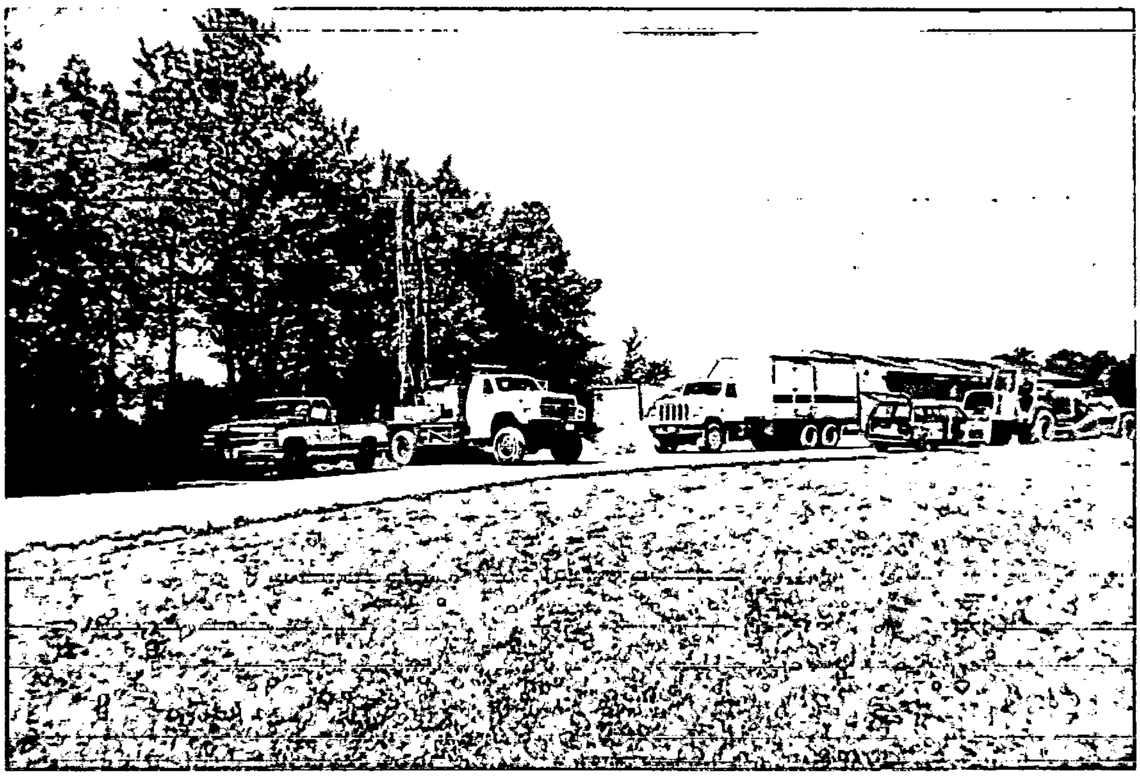
Client: NYSDEC E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera SN: N/A

Photographer: G. Florentino Date/Time: 7/11/89 / 1024

Lens: Type N/A SN: N/A Frame No.: 22

Comments: View to southwest of GW-4B drilling location.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 0940

Lens: Type N/A

SN: N/A

Frame No.: 22

Comments: View to east of new waste recycling building along the north side of the access road.

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.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 7/11/89 / 0830

Lens: Type N/A

SN: N/A

Frame No.: 23

Comments: View to southwest of top of landfill, showing three of six newly-installed landfill vents (6" ID PVC).

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YN-1000

Camera: Make Kodak Fling 35mm disposable Camera

SN: N/A

Photographer: G. Florentino

Date/Time: 5/9/89 / 0935

Lens: Type N/A

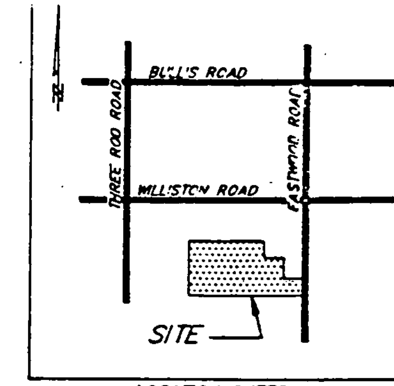
SN: N/A

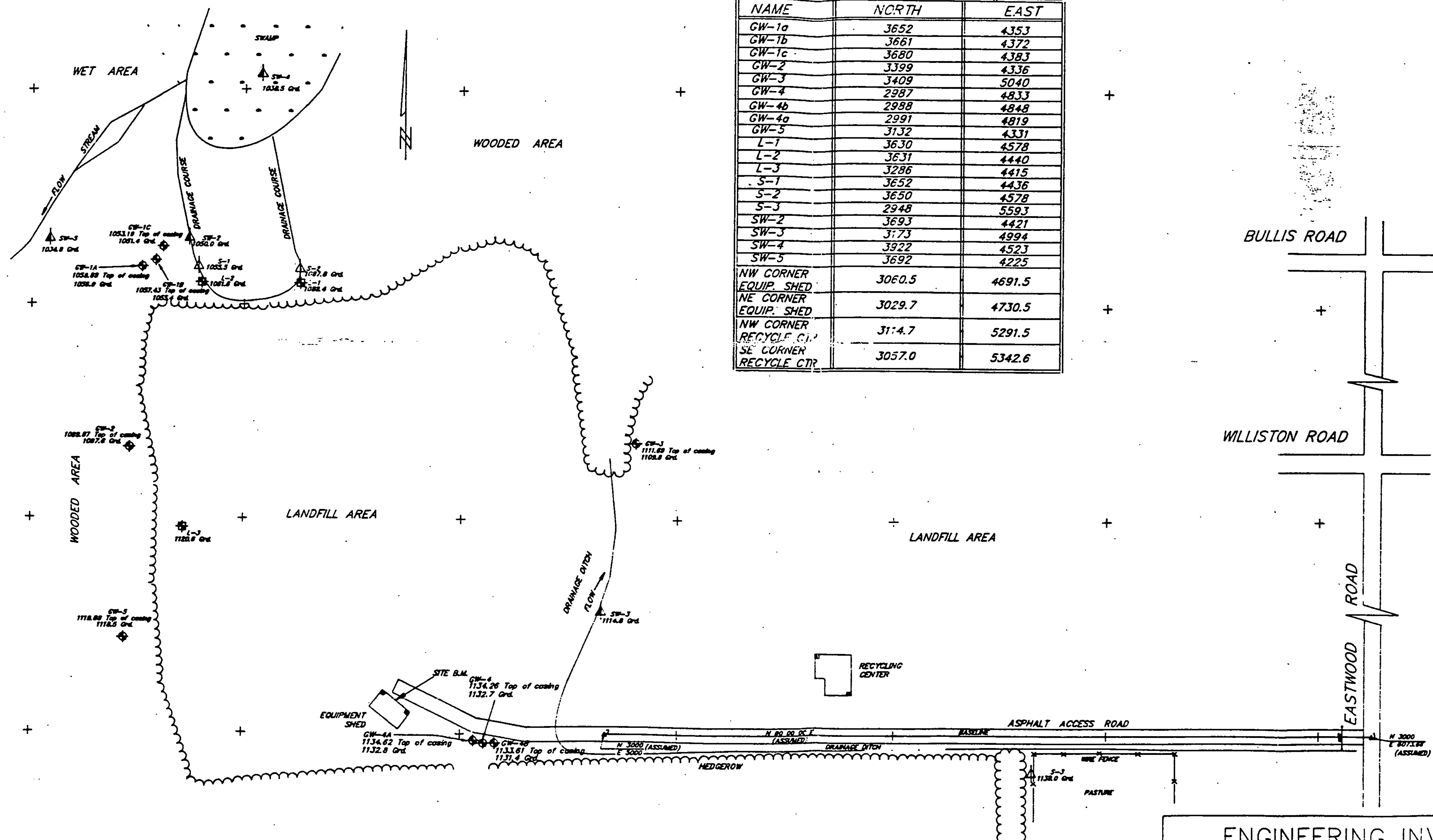
Frame No.: 23

Comments: View to west of GW-4A (with protective casing), GW-4 (2" ID PVC behind GW-4A, adjacent to stake), with truck trailer and equipment shed in background. Proposed site for GW-4B.

APPENDIX H

SITE SURVEY MAP





COORDINATE LIST

NAME	NORTH	EAST
GW-1a	3652	4353
GW-1b	3661	4372
GW-1c	3680	4383
GW-2	3399	4336
GW-3	3409	5040
GW-4	2987	4833
GW-4b	2988	4848
GW-4a	2991	4819
GW-5	3132	4331
L-1	3630	4578
L-2	3631	4440
L-3	3286	4415
S-1	3652	4436
S-2	3650	4578
S-3	2948	5593
SW-2	3693	4421
SW-3	3173	4994
SW-4	3922	4523
SW-5	3692	4225
NW CORNER EQUIP. SHED	3060.5	4691.5
NE CORNER EQUIP. SHED	3029.7	4730.5
NW CORNER RECYCLE CTR	3114.7	5291.5
SE CORNER RECYCLE CTR	3057.0	5342.6

NOTE: Elevations are related to BM established by TVGA of Orchard Park in 1987 at the equipment shed elev.= 1135.95

Baseline points 1 & 2 are PK nails set in the pavement

Coordinate system is assumed.

All well elevations are to the top of the PVC riser.

LEGEND

- MONITORING WELL
- SURFACE SOIL SAMPLE
- SURFACE WATER/SEDIMENT SAMPLE LOCATION
- LEACHATE SAMPLE LOCATION

Revised 6/19/90 Minor text changes
Revised 3/26/90 symbol changes, labels gw-4a, gw-4b
REVISED 1/23/90 ADDED GROUND ELEVATIONS

ENGINEERING INVESTIGATIONS AT MARILLA LANDFILL Site No. 915093

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. 716-442-6942

DATE	SCALE	SHEET
11/29/89	1"=150'	

APPENDIX I

SITE LOG BOOKS

I-2

ecology and environment, inc.

Recycled Paper/569058

904-487-0886 Sgt. Tayon

ecology and environment, inc.

International Specialists in the Environment

Job Number YN-1000

Town of Marilla Landfill

Site Recon
Geophysical Surveys
Drilling site safety
Sampling
Surveying

MAGNETIC DECLINATION N8W

Brian Merrit
Tom Pearse

TOWN OF MARILLA - 652-7311

Highway supervisor Dave Pierce -
7:00AM

Pierce [illegible]

EARL JAHN - 652 4830 Town supervisor

ADVANCED
ENVIRONMENTAL SERVICES, INC.

SCOTT A. MacFARLANE

Box 165
2186 Liberty Drive
Niagara Falls, New York 14304

(716) 283-3120
Bflo. Area: 625-9064

Dawn

ADVANCED
ENVIRONMENTAL SERVICES, INC.

SCOTT A. ABEL

Box 165
2186 Liberty Drive
Niagara Falls, New York 14304

(716) 283-3120
Bflo. Area: 625-9064

I-3

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ecology and environment

E & E Job Number YN-1000

Telephone Code Number 716-684-8060

Site Name Town of Marilla Landfill

State/City Marilla, NY

TDD

PAN

SSID

Start/Finish Date 5/9/89 /

Book 1 of

E & E Emergency Response Center: (716) 684-8940

Tuesday 5/9/89

Weather: Sunny, warm 45-50°F

0800 ETE Crew departed ASC
G. Florentino - Team leader
J. Richert - Site Safety

Reviewed Safety Plan

Today's Objective: Site Reconnaissance and surface water, soil, and leachate sampling

0835 Arrived onsite
HNu not working

0845 Crew departed site to pick up another HNu

0900 Solved problem with HNu - loose connection.
Crew heading back to site.

0915 Arrived back onsite
Setting up for site Reconnaissance
Calibrating HNu

Background Radiation 10 Counts/min (RAD MINI)

0935 Kodak Fling 35 35mm disposable Camera
400 ASA

Frame ~~24~~ 23 GF View to west of MW-4 (location of MW-4A). Storage shed and truck trailer in background

Gene Florentino 5/9/89

5/9/89

Proposed well MW-~~4A~~ 4B GF easily accessible

0940 Frame ~~23~~ 22 GF View to east of storage shed

Storage shed appears to be new
- Segregated areas on west side which contain glass bottles + jars

UST with sign "Oil Only" located adj. to SW corner of shed

2" PVC Adj to drainage ditch (GW-3)
- 4.2 PPM inside casing (HNu)
- no protective casing, screw on cap

0950 Frame ~~22~~ 21 GF View to south of 2" PVC (GW-3)

1000 Frame ~~21~~ 20 GF View to NW of slope (Approx 50°-70°).

1010 Frame ~~20~~ 19 GF View to west of Bflo Creek tributary (marshy area)

1015 Frame ~~19~~ 18 GF View to south of west drainage ditch

1020 Frame ~~18~~ 17 GF View to west of MW-1A, B

1025 Frame ~~17~~ 16 GF View to South of Boxed in (main) area of drain ditch. Note broken cement pipe in background. Channel is filled with coarse gravel.

Gene Florentino 5/9/89

Tuesday 5/9/89

1025 Frame ~~16~~ 15 GF View to south of MW-2
2" PVC without protective casing
- Screw on cap
- 13 PPM (HNu) inside casing

1030 Frame ~~15~~ 14 GF View to west of MW-5
2" PVC with Screw on cap
Dirt road heading west into wooded area
- 21 PPM (HNu) inside PVC

Road to west leads to the town park
There is a locking gate along the road.

There is 2" PVC Approx. 15' west of well (4"?) with locking casing
- 2.5 PPM (HNu) inside casing (MW-4)
- screw on cap

1045 Frame ~~14~~ 13 GF
- View to west along so. side of shed of empty drums

1046 Frame ~~15~~ 12 GF
- View to south of eastside of shed where oil tank should be buried
Note disturbed soil

1110 Soil sample SS-3 (background)
- location: South side of access road along west side of Horse corral fence (3rd fence past South of access road). Marked with Wood stake

Gene Florentine 5/9/89

5/9/89

Frame ~~14~~ 11 GF location of SS-3

Sample hole filled with water Soil is gravelly

1135 Frame ~~13~~ 10 GF view to south of SW-3/SWS-3
Surface water/sediment sample location

All Soil/Sediment will be collected with dedicated hand trowels

All water samples will be collected directly into sample bottles

1225 Took Duplicate sample at SW-3 location (SW-3D/SWS-3D)

1300 Frame ~~12~~ 9 GF View to south of SW-2/SWS-2 location (leachate weir)

SW-2 (surface water/sediment) is located north of boxed in area of drainage ditch

1305 L-1 (leachate) Sample is located at base of slope (south of boxed in area) water is flowing out of the ground

Frame ~~4~~ 8 GF Leachate-1 location (view to south)

1320 Frame ~~10~~ 7 GF View to southeast of SS-1 (soil) location.

Located south of boxed (weir) area

Gene Florentine 5/9/89

Tuesday 5/9/89

1330 Frame 9 6GF
View to west of SW-5/SWS-5
Surface water/sediment along Bflo Creek trib.
(downstream)

1350 Frame 8 5GF
View to east of SW-4/SWS-4
located in marshy area along Bflo
Creek trib.

1400 Frame 7 4GF
View to SE of L-2 (leachate)
located on slope of leachate wen
where trees are cut down

1410 Frame 6 3GF
View to SE of SS-2 (Soil) 1/GF
located approx 20ft north of L-2

1430 Frame 5 2GF
View to north along west side of
leachate
- up to 28 PPM (HNu) at ground sfc

Crew not locate intermittent stream along west
side of Landfill, therefore will not sample
SW-1

Gene F Florentino 5/9/89

Tuesday 5/9/89

1440 Crew packaging samples

Front gate was locked
Crew had to depart site from park
entrance

1500 Park entrance locked

Had to call Town of Marilla to open gate. Made
call from private residence across from entrance on eastward road. Residence has water well in front yard.
1520 Crew departed site for Lab

1600 Dropped off samples at Lab
Did not obtain an MS/MSD sample, so the
crew will return to the site to re-sample
SW-5 and collect an MS/MSD

1655 Arrived on site

1700 Re-sampled SW-5

1715 Departed site

Arrived at Lab

Gene Florentino 5/9/89

Wednesday 5/24/89

Weather: Overcast, 58°F

0800 Loading equipment
G. Florentine
J. Raner

0900 Arrived onsite
Setting up Grid 4
location of GW-4B
South side of access road, east of storage shed, 15 ft west of PVC (uncased) well

Grid orientation
N-S/E-W (without declination correction)

I-Z
GF
S4

Background station located on farm field South of site

Zeroed EM 31
Background Readings

	N-S	E-W
VERT	8	8
HORIZ	6	6

0930 MAGNETOMETER

	N-S	E-W
BACKGROUND	56245	56268
	56239	56267
	56241	56255

Gene Florentine 5/24/89

Wednesday 5/24/89

0933 MAGNETOMETER SURVEY
GRID ~~4~~ 2 GF

Sta	N-S	E-W	Comments
0,0	56140	56167	SW Corner, on farm field
10,0	56372	56240	edge of farm field / edge of
20,0	56968	56366	" " " "
30,0	56231	56231	" " " "
40,0	55981	55869	" " " "
40,10	55590	55344	Approx 8 ft west of cased well
30,10	56232	56177	5' South of PVC well
20,10	56192	56206	On mound
10,10	56438	56161	" "
0,10	56556	56341	" "
0,20	56078	55983	on slope
10,20	56168	56116	" "
20,20	56328	56267	well 4B location, base of slope
30,20	56066	56045	" " "
40,20	55932	55916	So. edge of access road
40,30	56241	56281	on road
30,30	56311	56219	" "
20,30	56263	56170	" "
10,30	56202	56180	" "
0,30	56162	56159	" "
0,40	56157	56140	" "
10,40	56336	56325	" "
20,40	56223	56245	" "
30,40	56110	56080	" "
40,40	56325	56330	" "

END SURVEY 0944

Gene Florentine 5/24/89

Wednesday 5/24/89
Background (MAG)

	N-S	E-W
0945	56227	56234
	56214	56235
	56337	56257

0947 EM31 SURVEY GRID 2 GF

Sta	VERT N-S	VERT E-W	HORIZ N-S	HORIZ N-S - E-W	Comments
0,0	4	4	3	3	see page 9
10,0	5	5	3	3	" " "
20,0	5	5	4	4	" " "
30,0	5	6	4	4	" " "
40,0	6	5	4	5	" " "
40,10	10	10	4	5	" " "
30,10	7	7	4	4	" " "
20,10	5	5	4	4	" " "
10,10	5	5	3	3	" " "
0,10	4	4	3	3	" " "
0,20	6	6	3	4	" " "
10,20	8	7	4	5	" " "
20,20	7	~~8~~ 9	5	5	Well location
30,20	4	10	5	6	See page 9
40,20	4	6	5	18	" " "
40,30	9	9	5	6	" " "
30,30	9	10	7	9	" " "
20,30	~~[illegible]~~ 3	6	6	12	" " "
10,30	2	~~[illegible]~~ 5	5	15	" " "
0,30	~~[illegible]~~ 5	10	4	5	" " "
0,40	4	10	6	10	" " "
10,40	9	9	6	7	" " "
20,40	9	9	7	7	" " "
30,40	9	9	7	8	
40,40	9	9	8	8	

I-8

Wednesday 5/24/89

1005 END of survey
Setting up GRID 1 - Well C is 15 feet east of well B
well location GW-1C
1015 Orientation N-S/E-W (without declination correction)
MAGNETOMETER SURVEY

Sta	N-S	E-W	Comments
0,0	56223	56271	SW corner of Grid - on slope
10,0	56398	56441	on slope
20,0	56514	56093	" "
30,0	56346	56216	" "
40,0	56237	56260	" "
40,10	56334	56199	" "
30,10	56179	56168	" "
20,10	56265	56239	" "
10,10	56229	56278	" "
0,10	56201	56217	
0,20	56521	56215	
10,20	56051	56034	
20,20	56198	56218	Well location
30,20	56232	56224	
40,20	56318	56384	
40,30	56358	56177	
30,30	56333	56338	
20,30	56699	56382	
10,30	56542	56457	
0,30	56267	56241	
0,40	56176	56309	
10,40	56304	56259	
20,40	56198	56243	
30,40	56209	56207	
40,40	56301	56264	

1028 5/24/89

Wednesday 5/24/89

1030 EM31 Survey GRID 1

Sta	VERT N-S	VERT E-W	HORIZ N-S	HORIZ E+W	Comments
0,0	GF ~~5~~ 9	10	7	8	SW corner of Grid ON slope
10,0	8	9	6	9	" "
20,0	8	9 ~~8~~ GF	GF ~~8~~ 6	7	" "
30,0	9	9	7	7	" "
40,0	10	10 ~~X~~ GF	7	8	" "
40,10	9	10	7	7	" "
30,10	10	10	7	8	" "
20,10	10	11	8	9	" "
10,10	10	12	9	10	10' S. of 1B*
0,10	11	11	8	8	~~5'~~ GF
0,20	9	8	7	8	5' W of 1B*
10,20	10	12	7	3	5' E of 1B*
20,20	10	10	7	8	OW-1C location
30,20	10	10	7	8	
40,20	9	8	6	6	
40,30	8	8	5	5	* 1B
30,30	9	10	6	9	has steel
20,30	9	10	6	7	Protective
10,30	8	8	7	7	Casing
0,30	8	8	7	8	
0,40	8	7	6	6	
10,40	8	8	7	7	
20,40	9	9	6	8	
30,40	9	9	6	7	
40,40	8	8	5	6	
1045	END	SURVEY			

Gene Florentino 5/24/89

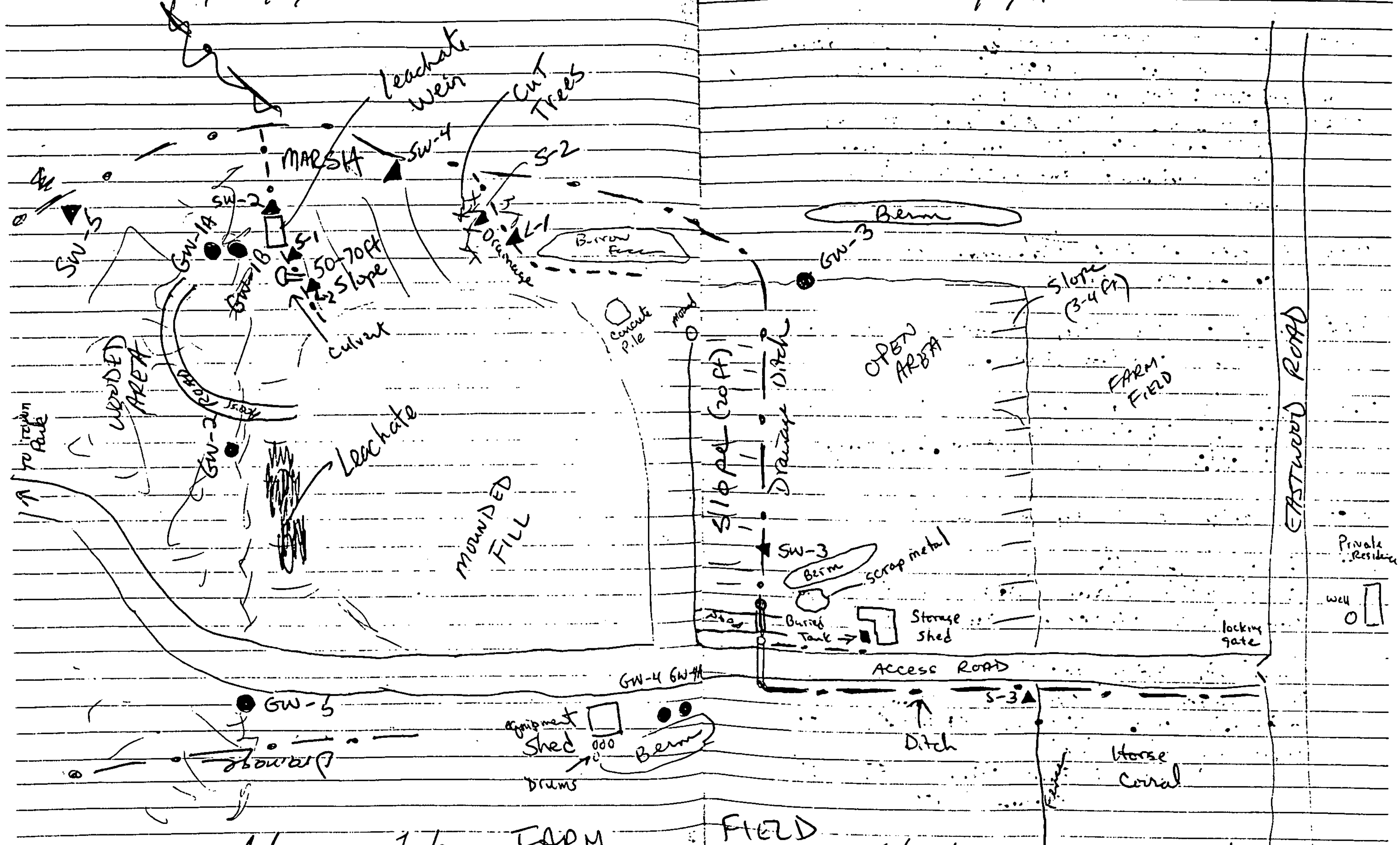
Wednesday 5/24/89

Background	N-S	E-W	
1055	56250	56288	MAG
	56266	56347	
	56221	56321	

1100 Crew departed site

Gene Florentino 5/24/89

Wednesday 5/24/89 Site Sketch 5/24/89



Gene Florentine 5/24/89

Gene Florentine 5/24/89

Monday 7/10/89

Weather: Hot, 80°F windy, winds from west at 10-15mph, overcast.
Today's objective: set up drill rig.
0830 G. Florentino & J. Richert met at E+E's ASC to pick up van and load equipment and pick up field supplies
1015 Arrived at E+E headquarters waiting for drillers
1045 Spoke to American Auger. Drillers will be leaving shortly
1930 Met drillers at E+E's ASC
John Pietruck } American Auger
Kevin Welnel }
1500 Departed for Manlla Landfill
1600 Arrived on site
Met with Jane Thapa NYSDEC (Albany) and Dave Pierce (Manlla Hwy Dept.)

Asked for water access
Permission to draw water from adjacent park garden spiquet. Also suggested fire hall
Contact: Fire Chief 652-6986
Howard Beats

Gene Florentino 7/10/89

7/10/89

1615 Walked site with drillers to discuss access
American Auger Equipment.
DRILL RIG: Mobile Drill B-57
Support Truck /w water Tank - 10 wheel
Caterpillar Bulldozer w/Trailer

1650 Calibrated HNu
Drillers are setting up to decon entire crew
1715 Departed site
- Drillers have to call for 2" PVC
- E+E will check with Fire Chief for water use

1740 Called Howard Beats about obtaining water. No problem. Can fill up tomorrow morning.

1745 G. Florentino and J. Richert Depart for Day. Drillers are waiting for phone call
Will meet at site tomorrow at 0730

Gene Florentino GF 7/10/89

Tuesday 7/11/89

0650 Weather: Sunny, hot, 80°F, light wind from north west

G. Florentino + J. Richert departed for Marilla Landfill

0730 Arrived onsite

Dave Pierce (Marilla Hwy Dept) unlocked the gate, and gave E+E a key.

Drillers arrived onsite

0750 ~~0850~~ GF Jane Thaju arrived onsite

0805 Drillers departed site to obtain water for drilling.

G. Florentino and J. Richert will screen vents on landfill with HNu, and take water level from MW-~~4A~~ GF

I-12

TODAY'S OBJECTIVE:

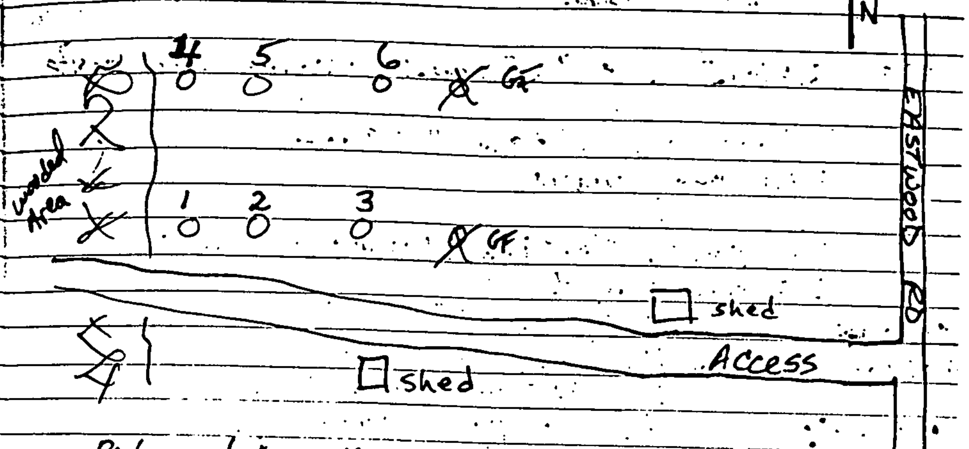
Drill and install MW-4B, decon and start MW-1C

There are 6 newly installed landfill vents at top of landfill. The vents are 6" I.D. PVC with elbows on top, 5 feet above grade. (Vent No. 6 is 8 ft above grade) The vents have been numbered and screened with the HNu (see sketch on next page)

0820 HNu calibrated

Gene Florentino

7/11/89



Background HNu 4 PPM on 0-200 scale (was on 0-20 scale)

0830 Vent No. 1 : 0 PPM above background

" " 4 : 0 PPM " "

5 : 0 PPM " "

6 : 0 PPM " "

3 : 0 PPM " "

2 : 0 PPM " "

Frame ~~1~~ 23 GF : View to SW of top of L.F. w/vents

0840 CAMERA:

Kodak Fling 35 35mm disposable camera 400 ASA

0845 MW-~~4A~~ GF 1 or 4? (Open PVC (unlocked) well

- 0 PPM with HNu
- water level 9.6 ft to Top of PVC
- Total Depth of well 12'10"

0900 Drillers arrived back onsite, setting up to decon. G. Florentino & J. Richert departed site to phone E+E and pick up supplies.

Gene Florentino 7/11/89

7/11/89 Tuesday

0930 G. Florentino + J. Richert arrived back onsite

Drillers are steam cleaning
Rig and augers

1015 Site safety Meeting conducted by
G. Florentino GF to:
Background Mini Rad 22 counts/min
J. Richert E+E J.R.
J. Thapa NYSDEC
J. Pietruck (Amer.)
MW-4B K. Welne (Auger)

1024 Split spoon No. 1 0-2 ft
0 PPM
O2/Explosimeter Model 2145 Gastech for Place on back of rig
MW-4B is located approx. 2.5 ft
north of the stake used for the
geophysical Survey.

Driller: J. Pietruck
Helper: K. Welner
Geologist: J. Richert
SSO: G. Florentino
NYSDEC: J. Thapa
Rig: Mobile Drill Model B-57
Hollow stem auger 4.5" I.D.

FRAME 22: View of MW-4B
Drill site to the SW

FRAME ~~2~~ 21 GF: SS No. 1

Gene Florentino 7/11/89

7/11/89

1051 Auger 0-5 ft 0 PPM

1056 Split spoon No 2 5-7 ft 0 PPM
only 2% Recovery due to rock stuck
in shoe

Frame ~~4~~ 20 GF: SS No. 2

1100 SS No. 2A 5-7 ft 0 PPM
30% recovery

Frame ~~8~~ 19 GF: SS No. 2A

1113 Frame ~~4~~ 18 GF. Drilling of MW-4B

1124 Auger 0-8 ft 0 PPM

SS No. 3 8-10 ft 50 PPM

Auger Checked again 100 PPM
0 PPM in breathing Zone
Sample collected

Frame ~~7~~ 17 GF: SS No. 3 Sample

Frame ~~8~~ 16 GF: SS No. 4

1145 Auger 0-10 ft 0 PPM

SS No. 4 10-12 ft 200 PPM
Did not sample due to small volume in spoon with high reading
Gene Florentino 7/11/89

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ecology and environment

Tuesday 7/11/89

1209 Auger 0-12 ~~14~~ GF ft OPPM

1210 SS No 5 OPPM

Auger ~~#4~~ 15GF GF 0-14 ft OPPM

SS No. 6 30 PPM

Frame GF 14 9 15GF : SS No. 6

1230 Auger refusal at 14.6" ft

Jane will call DEC office to decide where to set screen

1300 Crew depart site for lunch

1400 G. Florentino + J. Richert returned to site

1430 J. Thorpe returned to site After consulting w/ NYSDEC in Albany, Jane wants American Auger to core into the top of bedrock to determine if it is Competent, then set a well.

Another upgradient well is being requested by the NYSDEC.

Gene Florentino 7/11/89

7/11/89

Borehole terminated at top of bedrock. No water in auger when measured at 1230

1430 Water level measured in borehole is now at approx 8 ft depth

1500 Began coring

Battery on Rental Explosimeter went dead

1350 Completed 3 ft core

3 PPM

GF 13 14 GF Frame 10: Top 3' of bedrock

1630 GF ~~1430~~ Began setting well

1845 GF ~~1645~~ Well completed

Drillers setting up to decon

1930 Crew Departed site for Day

Gene Florentino 7/11/89

Wednesday 7/12/89

Weather: overcast, chance of rain, cool 60°F
Temp. expected to reach 80°F

0650 G. Florentino & J. Richert met at E&E's ASC.

Stopped to get gas & pick up a new spare tire for van due to flat tire on monday.

0745 Arrived onsite. Drillers waiting

Setting up rig to drill new (MW-6A) GF upgradient well. This is an addition to the original scope of work due to the contamination detected in the upgradient well drilled yesterday (MW-4B) This change in scope is based upon instruction by Jane Thapa CNYSDEC - Albany

Jane C. Thapa
7-12-89

as contingency item

Today's objective: Drill and install new upgradient well, set up and begin drilling MW-1C.

0810 J. Thapa arrived on site

Crew setting up to drill new monitoring well MW-6A
Gene Florentino 7/12/89

7/12/89

Air Monitoring Equipment
HNu
Gastechtor Model 1214S O2/explosimeter
Radiation Alert

0830 Site safety Meeting Conducted by Gene Florentino.
Present:
J. Richert JR
J. Thapa JCT
J. PieTrucle J.P.
K. Welne KW

Calibrated HNu

MW-6A GF (new upgradient located on south side of access road near end of fence (Horse coral)

0838 SS No. 1 0-2 ft 6.8 PPM

FRAME ~~13~~ 12 GF: View to east of well location

FRAME ~~12~~ 11 GF: SS No. 1

SS No. 2 5-7 ft 13.8 PPM

Auger 0-5 ft 500 PPM

0 PPM in breathing Zone

Frame ~~13~~ 10 GF: SS No. 2

Wednesday 7/12/89

0930 MW-6A location abandoned due to high HNu readings

Drillers are steaming augers & spoons

Screened several areas upgradient, and background site soil readings ranged from 4-10 PPM. (4 PPM on east side of eastwood road in wooded area).

Will try drilling MW-6 on north side of access road along right-of-way approx. 30 ft north of access road and 100 ft west of eastwood road. between the 3rd & 4th trees

0955 Drillers are setting up
GF 9 ~~10~~ GF
FRAME ~~14~~ New location of MW-6
View to West

1000 SS No. 1 0-2 ft. 7 PPM
8 GF
Frame ~~8~~ : SS NO. 1

1025 SS No. 2 5-7ft 125 PPM
Auger 0-5ft 100 PPM
Breathing Zone 0 PPM
GF 7 ~~8~~ GF
Frame ~~16~~ : SS No. 2

Gene Florentino 7/12/89

7/12/89

1040 SS NO. 3 380 PPM soil
GF 6 ~~7~~ GF 12 PPM Bedrock
Frame ~~16~~ : SS NO. 3 (Soil + Rock)

Auger 0-8ft 16 PPM

Breathing Zone 0 PPM

1115 SS NO. 4 110 PPM
GF 5 ~~6~~ GF
Frame ~~17~~ : SS NO. 4 (ROCK)

Auger 0-10ft 17 PPM

Breathing Zone 0 PPM

Auger Refusal at 12 ft

Setting up to Core

1140 Jane departed site to make phone call

1200 Jane returned. ~~ETC~~ GF NYSDEC decided not to pursue the upgradient well. The borehole will not be used, however, the Sample will be analyzed. The borehole will be ~~~ted

1215 G. Florentino, J. Richert, & J. Thayer depart site for lunch and to call ETC headquarters

Gene Florentino 7/12/89

7/12/89 Wednesday

1330 E&E crew arrived back onsite
Drillers completed grouting of MW-6 borehole and steam cleaning.
Drill crew break for lunch

1340 Jane returned to site.

1400 Drill Crew moving drill equipment down hill to set up for MW-1C.

Access road needed to be bulldozed

1645 Equipment in place setting up to drill ~~Frame~~ GF 4 ~~View to west of drillsite~~

1630 J. Thaxa departed site to use phone

1710 MW-1C

SS No. 1 0-2 ft 4.8 PPM

4GF ~~3~~ 3GF
Frame 18: View to NW of MW-1C

GF 3 4GF
Frame 19: SS No. 1

1724 SS No. 2 2-4 ft 2.0 PPM

Gene Florentine 7/12/89

7/12/89

GF 2 3GF
1725 Frame 20: SS No. 2

Auger 1.4 PPM 0-2 ft
Breathing Zone 0 PPM

1735 SS NO. 3 140 PPM Sampled for Chem Analysis

Auger 8 PPM 2-4 ft
Breathing Zone 0 PPM

1 2GF
Frame 21: SS NO. 3

1745 SS No. 4 10 PPM (ROCK)

Auger 3.2 PPM 0-6 ft
Breathing Zone 0 PPM

Drillers will Auger until refusal, then core.

1806 Refusal = 9.0 ft 14 PPM

0 PPM in breathing zone

1817 Began Coring

1858 Finished Coring 5 ft

Auger 3.5 PPM 0-14 ft

Gene Florentine 7/12/89

recycled paper

I-17

ecology and environment

Wednesday 7/12/89

CF O' XGF
FRAME 30 - core 9-14 ft

5 PPM from core

1920 Drillers setting up to set socket

2000 Crew departs site for day
Decided to set socket tomorrow

Gene Florentino 7/12/89

I-18

Thursday 7/13/89

Weather: Sunny, warm 70-75°F

0730 G. Florentino + J. Richert departed BFlo.

0800 Arrived onsite
Drillers + J. Thayer were onsite
Setting up to set socket on MW-1C

0845 G. Florentino + J. Richert departed site to call E+E lab for pH/cond./temp meter.
- The lab did not have a conductivity meter

0900 Arrived back onsite
Jane said it was ok to develop the well with a turbidity meter, ph, and temp. if cond. is not available, no problem.

0915 HNu calibrated

0925 O PPM in Auger

Approx water level is 7ft. Maybe core-water from yesterday.

Drillers steamed PVC and are getting ready to grout

Gene Florentino 7/13/89

Thursday 7/13/89

1015 PVC grouted in place and Protective Casing placed on well

Crew will clean up equipment decon augers, and fill up water tank with water.

1025 G. Florentino] departed site to pick
J. Richert] up ph/temp meter and a bailer to use for development

1230 Returned to site

Setting up to develop MW-4B

Drillers steamed augers and coring equipment.

1300 Began well development with PVC Bailer 2" ID (3')

1500 Completed Development
Turbidity 338 NTU after 2 hours

1515 Crew departed site for day
Drillers went to fill up water tank

Gene Florentino 7/13/89

recycled paper

ecology and environment

Friday 7/14/89

Weather: Sunny, warm; high expected in the 70's

0720 or 0700: G. Florentino & J. Richert depart Buffalo for Manilla.

0800 Arrived onsite
J. Thapa]
J. Pietruck] Present
K. Wehne]

Drillers couldn't obtain water yesterday afternoon, therefore they are meeting the Fire Chief today at 0800 for water.

0845 Crew returned back to site with drill water. Setting up to continue coring MW-1C

Today's objective: Continue coring MW-1C until water is encountered, and develop the well and demobilize

0930 Site Safety Meeting: Present:
G. Florentino
J. Richert
J. Thapa
J. Pietruck
K. Wehne

Gene Florentino 7/14/89

7/14/89

0935 Began Coring from 14.0 ft

4Nu calibrated
Mini Ram and O_2/explosmeter placed on back of rig

0957 Cored 4 ft
Borehole 0PPM 0-18 ft
Core 0PPM

1016 Began Coring

1034 Finished 5' Core

Bore hole 0-23 ft 0PPM
Core 0PPM

Drillers will pump out borehole to Check for formation water

1133 7.2 ft of water in borehole, and still rising. Drillers will Core another 5 ft

Began Coring

1155 Finished Coring 5 ft

Borehole 0-28 ft 0PPM
Core 1PPM

Gene Florentin 7/14/89

I-20

7/14/89 Friday

1217 Began developing (Air Surging)

1420 Stopped development

pH = const, turbidity stabilized at 78-80 NTU's

Drillers are cleaning up and preparing to move rig

1440 Drillers are placing Cement apron around MW-1C

G. Florentin + J. Richert packed equipment into Van

1500 G. Florentin & J. Richert Depart site for lunch & phone calls to E&E Headquarters
1545 J. Thapa met E&E at phone. She is not returning to site
1630 Returned to site

Drillers placed apron on MW-4B

Drillers are deconning equipment they will leave equipment on site for the weekend

1615 G. Florentin & J. Richert depart site for day

Gene Florentin 7/14/89

Thursday 9/7/89

Weather: Hazy, hot, humid, 80°F, light
breeze from SW

1230 G. Florentino & J. Richert departed
ETE Headquarters for ETE ASC to
pick up sampling equipment.

1305 Departed ASC for site

~~1450~~ 1350 GF arrived onsite

Today's objective: Sample MW-4A
for BNA's/PCBs/PEST because
insufficient volume was initially
collected due to poor recharge.

Will purge 1 well volume prior to
sampled as discussed with J. Thapa
(NYSDEC - Albany).

Depth to water table 95.75'
(From top of PVC)

Total Depth 97.3'

1 well vol. = 0.26 gal

1415 PH = 11.83
TEMP = 72.8°F
1416 COND = 1,210
BAILED 1 VOLUME TO PERG THEN BAILED
≈ 30 OZ BEFORE WELL WENT DRY
J. Richert

recycled paper

I-21

ecology and environment

THURS 9-7-89

1420 waiting for well to recharge

Landfill worker notified ETE that
another company, "Advance", working for
the town sampled the well's yesterday.

The person to contact is Earl Jann - Town
Supervisor to find out who sampled
the wells.

1500 Obtained approx. 1/2 of an 80 OZ
bottle. Will test for BNA's and
come back tomorrow to try and
obtain a sample for PCB/PEST.

1505 ~~Depa~~ GF

Met with Scott Abel and Scott MacFarlane
of Advanced Environmental Services Inc.
They were sampling the old onsite wells
for the Town of Marcellus. They had purged
all the wells yesterday (approx. 2 gal from
MW-4A). Told them ETE will be out on
monday to finish sampling MW-4A

1520 Departed site for LAB

1605 Arrived at lab. G. Hahn said it would be
better to test for PCB/PEST with the sample
volume collected. The BNA sample will be
collected on 9/11 or 9/12

Gene Florentino 9/7/89

Monday 9/11/89

Weather: Overcast hazy, hot, humid, temp 75°F

0700 G. Floreti departed ETE headquarters for Marville CT stopped at ASC to pick up sample bottle

1000 Arrived onsite

Today's objective: show surveyors from Om Popli ~~where~~ sample locations; sample MW-4A for BNA's

Met with Brian Merril } Om Popli
Tom Pearse }

Could not find stakes for SS-3 and SW-4, put flagging in general area

1100 Began sampling MW-4A very slow recharge. Obtain ½ of 80 oz bottle for BNA's

1140 G. Floretine departed site for lab

Gene Floretine 9/11/89

recycled paper

ecology and environment, inc.

International Specialists in the Environment

Job Number YN - 1040

Marilla L.F.

DRILL LOG

Sampling

ecology and environment, inc.

Recycled Paper/569058

1-23

ecology and environment

E & E Job Number YN-1040

Telephone Code Number

Site Name MARILLA LANDFILL

State/City MARILLA New YORK

TDD

PAN

SSID

Start/Finish Date 7-11-83 /

Book 1 of

E & E Emergency Response Center: (716) 684-8940

7-11-89 TUES

AFTER DECON + SITE SAFETY MEETING
BEGAN DRILLING WELL 4B AT 1025
TOOK 1'ST SOIL SAMPLE 0-2' NO HNU READINGS

DRILLING CO. = AMERICAN AUGER
RIG IS MOBILE DRILL B-57
DRILLER IS: JOHN PIETRUCK
RIG HAND IS: KEVEN WEINE
GENE FLORENTINO → SITE SAFETY OFFICER } E+E
JIM RICHERT → SITE GEOLOGIST
JANE THAPA - DEC REP.

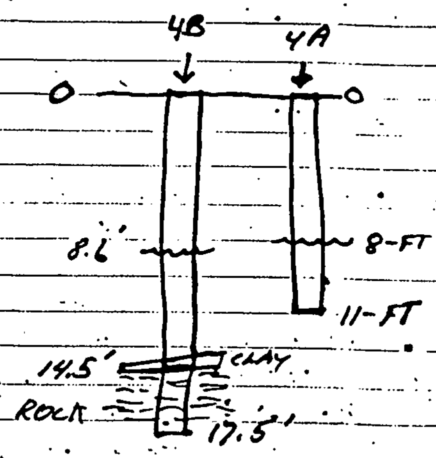
1024 - 1st split spoon
will take sample every 5-feet
in unsaturated zone IE 0-2, 5-7, 10-12
water level of 4A was 9.6-feet from
PVC (1.6' + 1.7' ABOVE GROUND)
DRILLER REPORTED TIGHT DRILLING AT 3.0 feet

NOTE THAT ACTUAL WELL LOCATION
is 3.0 feet NORTH OF STAKE BECAUSE OF
A GRAVEL PILE TOO CLOSE TO STAKE.
1051 1'ST AUGER IS DOWN 5.0
1056 2nd split spoon attempt 5-7' recovered only 3/10
of 1.0 must be pushing a rock down
TRYED A 2ND SPLIT SPOON + RECOVED 6/10-ft
of 3.0
1125 driller said hole got damp at 8.0
will split spoon 8-10.

7-11-89

1208 out w/ SS-5 12-14'
water in spoon
1225 SPLIT SPOON 14-16 Refusal at 14.5'
BLOWCOUNTS 34+50 FOR 2 INCHES OF ROCK
BEDROCK AT 14.5' LIGHT GRAY SHALE

1245 DISCUSSING IF WE SHOULD CORE FURTHER
+ WHERE TO SCREEN



1300 THAPA, FLORENTINO, + RICHERT LEAVE SITE
TO CALL ALBANY FOR ADVICE + TO GET LUNCH

ALBANY TOLD JANE THAPA TO CORE UNTILL
WE FEEL SHURE THAT WE ARE IN COMPETANT ROCK
- ALSO WE WILL DRILL A THIRD WELL UPGRADIENT
BECAUSE THIS WELL MAY BE INTERCEPTING WASTE OIL FROM A SINCE REMOVED
TANK THAT WAS LOCATED ADJACENT TO THE
NE CORNER OF THE GREEN STORAGE BARN
LOCATED ≈ ~~X~~ 100-feet DUE WEST + UP GRADIANT
OF 4B WELL. Jim Richert

7-11-89

~~1500 BEGI~~

1430 - Re-checked water level in WELL 4B was water at 8' from ground + slowly rising.

1445 - Rocky Day of American Auger leaves site to return to Syracuse.

1300 Drillers Begin coring at 14.5 feet using HQ bit = 3.98" OD

DRILLERS ARE drilling with an RPM of 300 + a weight on bit of ≈ 225 LBS

1536 cored two feet so far ∴ Rate is 18 min/FT.

1600 DONE CORING AT 17.5'

WELL IS 17'3" since the hole had dry bedrock top under a clay cap + then wet overburden above. we could either screen the bedrock only from 17.3 to 14 ft. this would give us a different zone than 4A. but probably no water would be in there. Or we could duplicate 4A + screen only overburden from 14 UP. THE ADVANTAGE WOULD BE THAT THIS WELL IS SURELY UN-TAMPERED WITH (4A IS NOT LOCKABLE) + WE KNOW FOR SURE WHERE THE SCREEN IS.

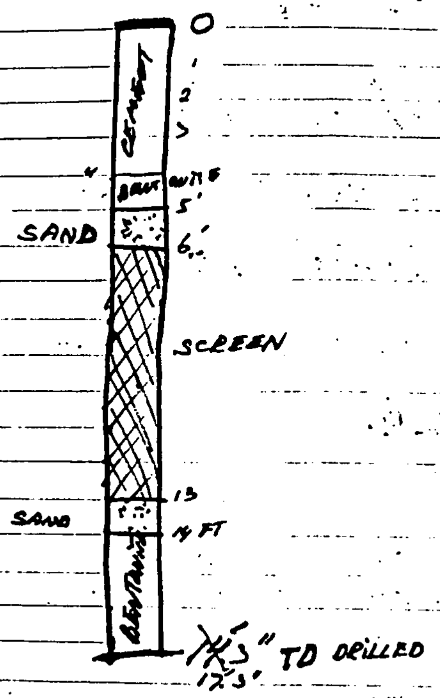
USED ROUGHLY 300 GAL. OF WATER TO CORE THE 3' of well IN 60 MIN. ∴ pumped water at a rate of 5 GAL/MIN. GOT GOOD WATER RETURN THROUGHOUT.

- Jim Richat.

7-11-89

The decision was made to fill the bottom of the well w/ bentonite to seal off the bedrock

1640 BEGIN WELL COMPLETION



1845 drillers are finish constructing WELL # 4B

1850 " deconing augers + split spoons

1930 LEAVE SITE FOR THE DAY will meet A 730 TOMARROW

Jim Richat

7-12-89 WED

07:00 MET GENE FLORENTINO AT LAB

0705 DROVE TO BUDGET CAR GARAGE TO HAVE THE PREPARE A SPARE TIRE FOR US TO PICK UP TONIGHT.

0715 - GOT GAS FOR THE VAN

0745 - ARIVE AT L.F. GATE - DRILLERS ARE WAITING TO GET IN JANE THAPA OF DEC NOT YET HERE

WEATHER: 60°F CLOUDY V. LITE SPRINKLE
FORECAST IS SUN+CLOUDS HIGH OF 80°
RAIN TONIGHT.

GOALS FOR THE DAY: ① DRILL NEW UPGRADIANT WELL + COMPLETE IT.
② BEGIN DRILLING WELL 1C DOWNGRADIANT

0800 drillers setting up Rig over new upGRADIANT well

0810 JANE THAPA ARRIVES on SITE
WE WILL CALL THIS WELL MW-6A

0835 Begin drilling well MW-6A on SOUTH SHOULDER OF THE ROAD
1'st split spoon 0-2' got 6.8 PPM ON HNU
POSSIBLE CONTAMINATION FROM ROAD SURFACE RUN OFF?
HOLE IS MAKING SOME STEAM WHICH READS 30 TO 40 PPM ON HNU

0910 TAKING 2'ND SPLIT SPOON 5-7'

0925 BECAUSE OF THE HNU READINGS WE WILL ABANDON THIS LOCATION + LOOK FOR A BETTER UPGRADIANT LOCATION
tested several other possible upGRADIANT LOCATIONS ALL HAD SOME HNU READINGS.
EVEN IN THE WOODS ACROSS THE ROAD

Jim Richart

7-12-89

We decided to RE-LOCATE MW-6 IN THE LANDFILL RIGHT OF WAY NORTH OF THE ACCESS ROAD SHOULDER IN THE YOUNG TREE LINE BETWEEN 3'RD + 4'TH TREE FROM THE MAIN ROAD (EASTWOOD ROAD) ~ 20' from Pavement of the access Road.

0950 RIG SETTING UP OVER MW-6

1000 BEGAN DRILLING MW6 1'ST SPLIT SPOON 0-2'

1020 TAKE 2'ND SPLIT SPOON 5-7' SILTY CLAY
HNU READ 125 PPM OFF SAMPLE.

1040 TOOK 3'RD SPLIT SPOON 8-10
GOT 380 PPM ON HNU BOREHOLE 16 PPM
BEDROCK AT 8.6' = LIGHT GRAY SHALE
FRACTURED UP SMALL FRAGMENTS + POWDER

1114 OUT w/ split spoon 10-11.4' ALL GRAY SHALE AS ABOVE. REFUSAL AT 11.4' BLOWS 13, 38, 100/.4'
HNU 110 PPM FROM SAMPLE 17 PPM FROM BOREHOLE

1130 since we hit Bedrock BUT NO WATER, NEEDED TO ~~drill a~~ determine if I have far to continue drilling. Jane Thapa of DEC went to call ALBANY FOR DIRECTION.

1145 THAPA RETURNS + SAID TO GROUT-UP THE HOLE

1150 Richart + FLORENTINO LEAVE TO PHONE LUNCH
DRILLERS STAY TO GROUT. THAPA LEFT TO ALDEN TO BY A FRIEND A GIFT.

1250 FLORENTINO CALLS Jim GRIFFIS FOR AN UPDATE.

Jim Richart

7-12-89 WED

1335 RETURN TO LAND FILL

LAND OWNER ACROSS FROM LANDFILL ROAD IS G. BECKENDORF JR. WE MAY NEED TO SAMPLE THEIR WATER AS AN UP GRADIANT WELL

drillers are finished plugging MW-6

1400 drilling crew begins moving Rig to next LOCATION USING BULL DOZER

1630 Jome Thapa departed site to make a phone Call.

1645 drillers Have Rig in Place & water truck approx location at edge of landfill.

1710 BEGIN DRILLING MW1C

1750 HIT BEDROCK - FRACTURED SOFT SHALE - AT 6.35-feet

WILL AUGER AS FAR AS POSSIBLE

1806 GOT REFUSAL AT 9.0-feet

HNU 14PPM AT 9.0 feet TOP of COMPETANT HARD ROCK

1817 BEGIN CORING WITH A HQ BIT (4" OD)

THE NEW BIT IS DRILLING AT A RATE OF 8 MIN PER FOOT

1837 AT 11-feet

1845 AT 12-feet

1852 AT 13-feet

driller said he is turning at 300 RPM's + WAS USING ≅ 450 PSI ON THE BIT

GETTING 100% WATER RETURNS Jim Richart

7-12-89 WED

1858 - drilled down all 5-feet of core run. NOW AT 14-feet.

2010 Everyone leave the site

2045 ARRIVE AT ASC TO deliver soil samples + pick up more tyvek + bottles.

2055 Richart + Florentino arrive a Budget car rental to pick up spare tire.

2115 Leave Budget.

2130 Richart is dropped off at home by Florentino. (14.5 HR DAY)

FLORENTINO WILL PICK UP RICHART TOMORROW AT 0730.

Jim Richart

recycled paper

7-13-89 THURS.

0730 Richert is picked up By Florentino

0800 RICHERT + FLORENTINO meet DRILLERS + JANE THAAS at SITE - GATE WAS UNLOCKED BY THE TOWN.

WHEATHER is MOSTLY SUNNY LIGHT BREEZE ≈65°F HIGH 75°F

GOALS FOR TODAY: ① SET 3" PVC CASING INTO SOCKET OF MW-1C + GROUT IT.

② DEVELOPE MW-4B

0830 FLORENTINO + Richert leave site to ASC to pick up a PH, TEMP, COND. meter. Drillers still setting up + then will stem clean.

0845 We decide to 1st call the lab to see if they have the meter. Pete Fleegmacher said he has a PH meter, but no Conductivity meter. He may get one in the mail today at ~ 0930.

0900 We return to site to explain situation to DEC Rep. Jane Thaas. She said we should get what we can get.

0930 we all stay on site to witness drillers grout the surface casing of MW-1C

drillers checked water level at 7' this morning.

— Jim Richert

7-13-89 THURS

GROUT MIXTURE is HURON BRAND PORTLAND CEMENT and BENSEAL BENTONITE GRANULES.

0935 drillers Begin Mixing GROUT

0943 finished Mixing grout

0946 20' CASING IS IN. + CEMENTED

USED 2 FULL BAGS 94# EACH of Cement and ½ BAG (25#) of Bentonite)

Had seen grout as the PVC riser lowered. Grout up JR came out of well.

0955 PULLING out AUGERS

1010 drillers set Protective casing

1020 FLORENTINO + RICHERT LEAVES SITE TO ASC FOR PH, TEMP. CONDUCTIVITY + A BAILER.

1100 ARIVE AT LAB (ASC) + GET 2" PVC BAILER + PH METER

1130 GO TO office to Pick up Richerts TLD BADGE + our Pay checks.

1210 LEAVE office

1230 ARIVE ON SITE, drillers finishing decoming augers etc.

1300 Begin Developing well MW-4B

ecology and environment

12

7-13-89 THURSDAY

WELL DEVELOPEMENT TABLE

TIME	TEMP	PH	TURBIDITY	COMMENTS
1300	11°C	6.70	780	
1314	13°C	6.70	>1000	
1330	13°C	6.75	90	reads 760 after settle?
1349	13°C	6.75	929	LARGE PARTICLES MAY
~~1355~~				HAVE EFFECTED THE
1402	14°C	6.75	582	3'RD SAMPLE
1416	14°C	6.90	376	
1430	14°C	6.85	666	
1445	13°C	6.85	711	
1500	14°C	7.00	338	

1500 finished developing well after 2 hrs. did not get ≤ 50 NTU's but temp + pH are rather stable

1515 all [illegible] site
1550 arrive at lab TO drop off + order equipt.
1630 Arrive at Home

Jim Richart

13

7-14-89 FRIDAY

~~0930~~ MET G. FLORENTINO AT THE ASC
0715
0800 ARRIVE ON SITE drillers leave to get water
0900 DRILLERS HAVE WATER + ON SITE
0915 RICHART + FLORENTINO DON PROTECTIVE clothing

WEATHER: MOSTLY SUNNY 70°F CALM
FORCAST: " " HIGH 93°

GOALS FOR THE DAY..
① drill MW-1C (CORING IN SHALE) until we HIT WATER
② develop the well.

0935 AFTER A BRIEF SAFETY MEETING drilling began using an NX (3" OD, core BIT. STARTING AT 14'
0957 core down at 18' rate is 5 MIN/FOOT 4' Run
1016 BEGIN 3'RD CORE RUN 18-23'
1031 CORE DOWN 23' RATE is 3 MIN/FOOT
1045 pump out drilling water to see if we have hit any ground water. we are getting ground water.

1122 have 5.5' of water from bottom
1125 have 6' of water
1128 have 6.5' of water
1131 have 7.0' of water
decided to not see where the water level stabilizes. will go ahead and drill 1 More 5' core run to increase the volume of the well for future sampling.

— Jim Richart

recycled paper

7-14-89 FRIDAY

1135 driller connecting drill Rods.

1138 Begin coring 4th core Run from 23' to 28'

1150 DONE WITH CORE RUN #4 23-28'. RATE WAS 2.5 MIN/FOOT

1217 drillers begin developing well MW-1C (AIR SURGING FROM THE BOTTOM TO LIFT THE WATER OUT.)

1240 PH METER CALIBERATED TO 4.0 & 7.0 STANDARDS

WELL DEVELOPMENT READINGS

TIME	TEMP °C	PH	TURBIDITY IN NTU'S	COMMENTS
1250	16	7.3	151	AFTER ★
1255	19	7.85	122	★
1325	19	7.95	107	★
1340	19	7.70	126	★
1348	19	7.75	118	★
1350	19	7.75	94	★

note: ★ means that the water sample was taken downstream from the rig water pump. this may effect temp.

well is making gas? & reads 0 PPM can hear bubbling

CONTINUED ON NEXT PAGE.

Jim Richert

I-31

7-14-89 FRIDAY

PART 2 of well development chart.

TIME	TEMP °C	PH	Turbidity in NTU'S	Comments
1350	19	7.75	78.8	all samples taken after rig pump.
1353	19°c	7.75	80.6	
1356	19	7.75	80.6	
1400	19	7.70	80.2	
1405	19	7.65	78.1	
1410	19	7.75	81.5	
1413	19	7.75	81.5	

1420 stopped developing well could not stabilize turbidity below 78 NTU'S

1440 Richert & Florentino carry cores up to VAN & PACK UP. drillers are securing well apron on MW-1C

1500 depart site for lunch

1530 FLORENTINO CALLS BUFFALO OFFICE

1600 JANE THAPA AT PHONE BOOTH - will DEPART TO AIRPORT.

1610 Give drillers key to gate of LF they will mobilize Monday for tuesday at Lasalle Site. - Jim Richert

ecology and environment

7-14-89

1615 Florentino + Richart Depart site

1645 arrive at ASC

Jim Richart

8-15-89 TUES.

0800 Richart arrives at EYE HQ + MEETS w/ D. JOHNSON + J. GRIFFIS TO DISCUSS DAYS ACTIVITIES

0915 C. EICH + J. RICHERT ARRIVE AT ASC TO LOAD VAN w/EQUIPT + BOTTLES.

0945 DEPART ASC. RICHERT + EICH D. JOHNSON will MEET US ON SITE LATE MORNING.

1015 STOP AT MARINA GEN. STORE TO BUY ICE + DRINKS FOR DAY

1030 ARRIVE AT LANDFILL - MEET DAVE PIERCE - TOWN HIGHWAY SUPER. HE GAVE ME TWO KEYS (DIFFERENT) FOR THE OLDER WELLS.

1045 BEGIN A CONFIRMATION (or CONDEMNATION) SURVEY w/ OVA + HNU OF THE LANDFILL BACKGROUND AREA'S THAT PREVIOUS HNU READINGS WERE RECORDED

1050 SURVEY 1'ST ATTEMPTED ~~BA~~ JR. UPGRADIENT WELL LOCATED ON SOUTH SHOULDER OF LANDFILL ENTRANCE ROAD ≈ 20' EAST OF CORNER OF FARMERS FENCE.
BOTH OVA + HNU YIELDED NO READINGS ABOVE BACKGROUND

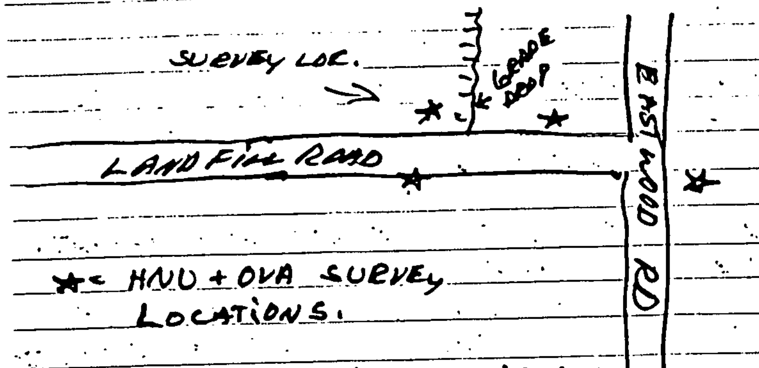
J. Richart

8-15-89 TUES.

1055 SURVEYED 2'ND ATTEMPTED UPGRADIENT WELL LOCATION ON NORTH SIDE OF LF ROAD AT THE EDGE OF HAY FIELD BETWEEN THE 3'RD + 4'TH TREE. BOTH HNU + OVA YIELDED NO READINGS ABOVE BACKGROUND.

1100 SURVEYED BACKGROUND LOCATION IN THE WOODS ACROSS EASTWOOD RD. NO HNU OR OVA READINGS.

1105 SURVEYED SW CORNER OF LF. WHERE SOIL WAS APPARENTLY SCRAPED FOR CAPPING AT N. SIDE OF LF ROAD. (SEE MAP) NO READINGS.



COMPLETED AIR MONITORING SURVEY CONDENSED. THE RELIABILITY OF PREVIOUS HNU READINGS.

J. Richart

8-14-89 TUES

1115 ARRIVE AT LEACHATE SEAP ON WESTERN SLOPE OF LANDFILL

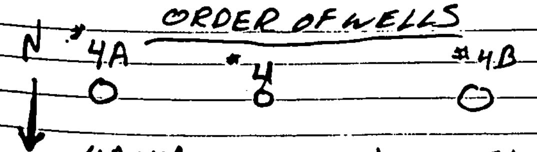
Seep is orange in color + NOT FLOWING.

DECONNED A SHOVEL + DOUG Jr. A 12" DEEP HOLE TO ALOW ANY ASS. LIQUID TO FILL UP. + ALOW US TO GET A TRUE LEACHATE SAMPLE. HNU READ < 1 PPM WILL RETURN TO HOLE LATER IN DAY TO COLLECT A SAMPLE - HOPEFULLY FLUID

1120 ARRIVE AT LOCATION OF 3 WELLS ALONG SIDE OF LF ROAD

WELL #	INITIAL HNU	WATER LEVEL (PVC)	TOTAL DEPTH	H_2O COLUMN	EVACUATION VOLUME
4A	0	60.48'	96.75'	36.27'	~~39.95~~ 17.76 GAL. JR
~~4A~~ JR	0	10.38'	12.46'	2.08'	1.02 GALLONS
4B	0	10.81'	14.72	3.91'	1.9 GALLONS

ORDER OF WELLS



4A + 4B HAVE PROTECTIVE STEEL CASINGS W/LOCKS

J. Richart

recycled paper

8-15-89 TUES

1135 C. EICH Begins Bailing #4B

1140 J. RICHERT Begins Bailing #4A

1215 C. EICH BAILED MW-4A DRY AFTER a TOTAL of 8.5 GALLONS.

MW-4 + MW-4B YIELDED 3 volumes

~~1230 Begin sampling MW-4B~~ JR

1240 Eich + Richert Depart for lunch.
1325 " " " arrive back on site.

SAMPLE #	TIME	°F TEMP	PH	COND	NTU'S	COMMENTS
MW-4B	1345	71.2	7.38	381.0	404	will FILTER
MW-4	1415	72.0	6.89	537.0	141	" "
MW-4A	1440	66.3	12.31	778.0	76	" "

I-84

8-15-89 TUES

1530 leave location of MW 4, 4A + 4B
4 + 4B are completely sampled
4A is recharging very slowly
could only get filtered metals + 2 VOA's
will Return later.

1535 Move to MW-1, 1A, 1B

INT. HNU Reading = max. 0 PPM around 3 wells

INITIAL LEVELS + VOLUMES

Well #	WATER LEVEL (PVC)	TOTAL DEPTH	WATER column	will EVACUATE
1A	3.8'	9.3'	5.5'	0.9 GAL
1B	14.55'	18.75'	4.2'	2.1 GAL
1C	13.05'	29.4'	16.35	18.0 GAL

WELL	TIME	°F TEMP	PH	COND	NTU	COMMENTS
1A	1705	64.9	5.79	2890	190	will FILTER
1B	1700	63.1	5.96	5100	166	" "
1C	1703	63.6	6.33	3590	14	NO NEED TO FILTER

1745 J. RICHERT, D. JOHNSON + C. EICH DEPART SITE.

1815 J. RICHERT + C. EICH arrive at ASC TO deliver samples.

1830 Depart ASC FOR HOME

J. Richert

8-16-89 WED

0730 C. EICH, J. RICHERT + D. JOHNSON MEET AT ASC. LOAD EQUIPT. + BOTTLES

0830 ALL 3 ABOVE ARRIVE ON SITE

0835 RICHERT CALIBRATES HNU.

WELL #	WATER LEVEL (PVC)	DEPTH	WATER COL	WILL EVACUATE
3	6.8	7.75'	.95'	.47 GAL
2 ~~3~~ JR	NO WATER	— 10.3'	—	— NO SAMPLE
5	8.2	14.1'	5.9	2.9 GAL

WELL #	TIME	TEMP	PH	COND.	NTU	COMMENTS
3	0915	73.8	6.98	1560	757	will FILTER
2	NO	SAMPLE				
5	1050	68.5	5.15	880	>1,000	WILL FILTER

0935 Depart MW-3 to allow it to recharge more - Have 2 VOA'S 3 1 LITER Poly's STILL need 2 80 oz AMBERS

0940 arrive at MW-5 HNU - Read 0 PPM From well head

1020 J. RICHERT COLLECTED SEDIMENT HSL SAMPLE FROM LEACHATE SEEP

1050 finished sampling MW-5

J. Richert

8-16-89 WED

1100 Walk to MW-2 LOCATION HNU yields NO READING FROM well HEAD.

"NO WATER IN THE WELL"

TOTAL DEPTH IS 10.3' from TOP OF PVC.

WE HUNG A NEW-DECONNED PVC BAILER IN THE WELL + LEFT IT.

1115 ARRIVE BACK TO MW-4A TO TRY TO EXTRACT REST OF SAMPLE, after ≈18 HRS of Recharge we only were able to get ≈ 50 OZ of water still need 2 80 oz AMBERS + 2 1 liter Poly's.

1125 leave MW-4A TO MW-3 - Bailed 80 oz. + left to allow to recharge.

1140 depart to LUNCH - will Allow MW-3 + MW-4A TO RECHARGE

1240 RETURN FROM LUNCH + sample rest of MW-3.

1300 D. Johnson + J. Richert return to van at MW-4A after allowing MW-4A to recharge overnight it yielded only a total of ≈ 40 oz. will depart site after filling in the

J. Richert

recycled paper

I-35

ecology and environment

8-16-83 WED

0 hole which was dug for the leachate sampler

c 315 D. Johnson filled in seep hole.

c 1330 all depart site

1900 J. RICHERT + D. JOHNSON ARRIVE AT ABC

6 TO Retrieve sampler

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4

I-36

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APPENDIX J

QUARTERLY GROUNDWATER MONITORING DATA

TOWN OF MARILLA SANITARY LANDFILL
QUARTERLY MONITORING

WELL # 1A

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/7/89	12/6/89	3/7/90	6/5/90	9/10/90
ELEVATION BEFORE PURGING			1056.81	1056.7	1056.96	1054.02	1054.02	**	1054.39	1055.47
pH		STANDARD UNITS	5.72	5.74	5.35	5.9	5.95	**	6.12	6.04
SPECIFIC CONDUCTIVITY		MICROHMOS	4,200	2,400	2,010	1,800	2,500	**	2,010	1,750
TEMPERATURE		DEGREES CELCIUS			15	15.8	5.8	**		
Eh		MILLIVOLTS			-5	120	66	**		
CHLORIDE	250	mg/1	1,190	936	825	944	1,100	**	730	1,850
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	[redacted]	BQL	BQL	**	BQL	[redacted]
TOTAL DISSOLVED SOLIDS		mg/1	2,420	2,850	2,420	2,330	2,880	**	2,220	2,650
TOTAL ORGANIC CARBON		mg/1	79.1	62.2	9.4	91	76.2	**	6.10	43.5
TOTAL BARIUM (Ba)	1.0	mg/1	BQL	BQL				**		
TOTAL CADMIUM (Cd)	0.01	mg/1		0.0014	BQL	0.0014	0.0056	**	0.0025	BQL
TOTAL CALCIUM (Ca)	NS	mg/1			203	208	112	**	187	180
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				**		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				**		
TOTAL IRON (Fe)	0.3	mg/1	BQL	1.26	1.68	5.22	0.59	**	4.80	5.31
TOTAL LEAD (Pb)	0.025	mg/1		0.014	0.008	0.016	0.011	**	0.013	0.012
TOTAL MANGANESE (Mn)	0.3	mg/1	1.38	0.97	0.69	1.04	1.75	**	0.93	1.64
TOTAL MERCURY (Hg)	0.002	mg/1		BQL				**		
TOTAL NICKEL (Ni)		mg/1		BQL				**		
TOTAL SODIUM (Na)	NS	mg/1			234	246	309	**	281	284
TOTAL ZINC (Zn)	5.0	mg/1		0.09				**		
ALKALINITY		mg/1			175	190	220	**	175	200
AMMONIA (as N)		mg/1			0.09	0.3	0.05	**	0.42	0.05
CHEMICAL OXYGEN DEMAND		mg/1			23.9	7.3	2.6	**	17.2	17.8
COLOR, TRUE		COLOR UNITS			BQL	BQL	< 5	**	BQL	35
HARDNESS		mg/1			740	960	280	**	770	790
NITRATE	10.0	mg/1			3.5	0.14	0.09	**	0.06	0.02
ODOR					Odorless	Odorless	Odorless	**	Odorless	Odorless
SULFATES	250	mg/1			45.5	46.0	34.0	**	35	40

TOWN OF MARILLA SANITARY LANDFILL   WELL # 1B
QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/7/89	12/6/89	3/7/90	6/5/90	9/10/90
ELEVATION BEFORE PURGING			1043.59	1043.31	1043.97	1042.44	1042.45	1042.76	1043.38	1042.76
pH		STANDARD UNITS	6.19	6.32	5.9	6.4	6.44	5.97	6.58	6.60
SPECIFIC CONDUCTIVITY		MICROMHOS	5,800	3,750	3,900	2,250	2,100	3,750	3,500	2,500
TEMPERATURE		DEGREES CELCIUS			11	13.3	9.0	**		
Eh		MILLIVOLTS			12	61	-20	25		
CHLORIDE	250	mg/1	1350	1360	1370	1440	1200	1200	1290	1350
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	[redacted]	[redacted]	BQL		[redacted]	[redacted]
TOTAL DISSOLVED SOLIDS		mg/1	3150	3050	3540	3530	2910	2680	3910	3960
TOTAL ORGANIC CARBON		mg/1	64	77	25.8	33	151	18.4	9.65	38.7
TOTAL BARIUM (Ba)	1.0	mg/1	4.77	5.71				5.99		
TOTAL CADMIUM (Cd)	0.01	mg/1		BQL	BQL	BQL	BQL	BQL	BQL	BQL
TOTAL CALCIUM (Ca)	NS	mg/1			454	317	140	413	419	368
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				BQL		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				BQL		
TOTAL IRON (Fe)	0.3	mg/1	20.2	13.4	13.4	2.88	15.4	6.02	13.8	16.1
TOTAL LEAD (Pb)	0.025	mg/1		0.005	0.01	0.013	0.010	0.057	0.028	0.027
TOTAL MANGANESE (Mn)	0.3	mg/1	4.68	6.44	3.5	2.52	4.24	3.18	2.59	3.52
TOTAL MERCURY (Hg)	0.002	mg/1		0.001				BQL		
TOTAL NICKEL (Ni)		mg/1		BQL						
TOTAL SODIUM (Na)	NS	mg/1			434	451	386	448	518	504
TOTAL ZINC (Zn)	5.0	mg/1		BQL				0.09		
ALKALINITY		mg/1			545	570	520	555	580	635
AMMONIA (as N)		mg/1			0.89	2.58	1.04		1.67	2.15
CHEMICAL OXYGEN DEMAND		mg/1			19.3	21	12	18	72.8	36.4
COLOR, TRUE		COLOR UNITS			70	BQL	100	35	250	40
HARDNESS		mg/1			1380	1140	270	1500	1320	1340
NITRATE	10.0	mg/1			BQL	0.02	0.02		BQL	0.04
ODOR					Odorless	Odorless	Odorless	Odorless	Odorless	Odorless
SULFATES	250	mg/1			BQL	6.5	BQL	4.2	BQL	BQL

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TOWN OF MARILLA SANITARY LANDFILL WELL # 2

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/6/90	9/11/90
ELEVATION BEFORE PURGING			1093.37	1092.56	1092.15	1091.27	1092.58	1091.77	1092.28	1091.56
pH		STANDARD UNITS	6.12	6.37	5.86	**	6.13	6.15	6.08	6.37
SPECIFIC CONDUCTIVITY		MICROMHOS	350	340	225	**	450	300	325	600
TEMPERATURE		DEGREES CELCIUS			13	**	9.7	6.0		
Eh		MILLIVOLTS			50	**	-10	-80		
CHLORIDE	250	mg/1	5	35.6	32.2		28	12	15	32.5
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	[redacted]		N/R***	+	[redacted]	
TOTAL DISSOLVED SOLIDS		mg/1	283	233	226		268	N/R	238	446
TOTAL ORGANIC CARBON		mg/1	33	27.5	17.6			N/R	19.7	N/R
TOTAL BARIUM (Ba)	1.0	mg/1	BQL	BQL				+		
TOTAL CADMIUM (Cd)	0.01	mg/1		0.0013	0.0007		0.0007	+	0.0008	BQL
TOTAL CALCIUM (Ca)	NS	mg/1			5		45.1	+	18.5	50.2
TOTAL CHROMIUM (Cr)	0.05	mg/1		[redacted]				N/R		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				+		
TOTAL IRON (Fe)	0.3	mg/1	[redacted]	[redacted]	[redacted]		[redacted]	+	[redacted]	[redacted]
TOTAL LEAD (Pb)	0.025	mg/1		0.013	0.02		0.022	+	[redacted]	BQL
TOTAL MANGANESE (Mn)	0.3	mg/1	[redacted]	[redacted]	[redacted]		[redacted]	+	[redacted]	[redacted]
TOTAL MERCURY (Hg)	0.002	mg/1		0.001				+		
TOTAL NICKEL (Ni)		mg/1		BQL						
TOTAL SODIUM (Na)	NS	mg/1			24.9		21.5	+	14.0	39.6
TOTAL ZINC (Zn)	5.0	mg/1		0.52				+		
ALKALINITY		mg/1			80		90	75.0	120	305
AMMONIA (as N)		mg/1			0.73		0.80	+	0.66	N/R
CHEMICAL OXYGEN DEMAND		mg/1			45		54	BQL	57.3	N/R
COLOR, TRUE		COLOR UNITS			140		125	N/R	350	45
HARDNESS		mg/1			60		48	N/R	80	200
NITRATE	10.0	mg/1			0.04		BQL	+	0.68	BQL
ODOR					Odorless		Slight Sulfur	N/R	Odorless	N/R
SULFATES	250	mg/1			35		58	N/R	30	44

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TOWN OF MARILLA SANITARY LANDFILL WELL # 3

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/7/89	12/6/89	3/7/90	6/6/90	9/11/90
ELEVATION BEFORE PURGING			1106.64	1105.68	1105.42	1104.65	1104.75	1105.15	1105.30	1104.76
pH		STANDARD UNITS	8.73	7.91	6.64	7.23	6.72	7.10	6.98	7.09
SPECIFIC CONDUCTIVITY		MICROMHOS	370	295	350	300	440	325	400	375
TEMPERATURE		DEGREES CELCIUS			13	17.3	8.4	**		
Eh		MILLIVOLTS			166	126	65	40		
CHLORIDE	250	mg/l	1.5	BQL	BQL	BQL	BQL	BQL	2.00	2.50
TOTAL REC. PHENOLS	0.001	mg/l	BQL*	BQL	BQL	[redacted]	BQL	+	[redacted]	[redacted]
TOTAL DISSOLVED SOLIDS		mg/l	184	215	325	241	241	300	261	260
TOTAL ORGANIC CARBON		mg/l	11.3	2.4	12.8	4.8	23.3	8.74	1.03	3.60
TOTAL BARIUM (Ba)	1.0	mg/l	BQL	BQL				BQL		
TOTAL CADMIUM (Cd)	0.01	mg/l		0.0011	BQL	BQL	BQL	BQL	BQL	BQL
TOTAL CALCIUM (Ca)	NS	mg/l			66.4	73.4	. 187	68.2	68.2	63.5
TOTAL CHROMIUM (Cr)	0.05	mg/l		BQL				BQL		
TOTAL COPPER (Cu)	1.0	mg/l		BQL				BQL		
TOTAL IRON (Fe)	0.3	mg/l	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL LEAD (Pb)	0.025	mg/l		BQL	0.01	[redacted]	0.010	0.005	0.005	BQL
TOTAL MANGANESE (Mn)	0.3	mg/l	BQL	0.16	[redacted]	[redacted]	BQL	0.15	0.16	0.16
TOTAL MERCURY (Hg)	0.002	mg/l		BQL				BQL		
TOTAL NICKEL (Ni)		mg/l		BQL						
TOTAL SODIUM (Na)	NS	mg/l			5.4	5.5	4.50	5.80	5.9	5.2
TOTAL ZINC (Zn)	5.0	mg/l		BQL				BQL		
ALKALINITY		mg/l			210	230	190	155	190	230
AMMONIA (as N)		mg/l			0.14	0.07	0.06	+	BQL	BQL
CHEMICAL OXYGEN DEMAND		mg/l			4.6	3.0	BQL	BQL	6.11	11.7
COLOR, TRUE		COLOR UNITS			10	5	10	BQL	BQL	20
HARDNESS		mg/l			250	160	130	145	198	190
NITRATE	10.0	mg/l			BQL	0.08	0.02	+	BQL	BQL
ODOR					Odorless	Sulfide	Odorless	Odorless	Odorless	Odorless
SULFATES	250	mg/l			23	21.0	30	28	22	32

TOWN OF MARILLA SANITARY LANDFILL WELL # 4

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/7/89	12/6/89	3/7/90	6/5/90	9/10/90
ELEVATION BEFORE PURGING			1125.94	1126.91	1127.1	1123.53	1124.6	1126.01	1126.15	1124.12
pH		STANDARD UNITS	7.26	7.12	6.29	7.10	6.95	6.95	6.72	6.89
SPECIFIC CONDUCTIVITY		MICROMHOS	370	250	300	350	645	300	350	525
TEMPERATURE		DEGREES CELCIUS			10	15.1	5.7	6.0		
Eh		MILLIVOLTS			67	115	94	52		
CHLORIDE	250	mg/1	25.5	10.5	8.1	14.3	17	6.2	4.5	9.5
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	BQL	[redacted]	BQL	+	[redacted]	[redacted]
TOTAL DISSOLVED SOLIDS		mg/1	268	167	126	12	342	272	258	414
TOTAL ORGANIC CARBON	-	mg/1	5.61	8.4	11.1	24	28.9	8.94	5.39	16.9
TOTAL BARIUM (Ba)	1.0	mg/1	BQL	BQL				BQL		
TOTAL CADMIUM (Cd)	0.01	mg/1		BQL	0.0008	0.0015	0.0007	0.0011	BQL	BQL
TOTAL CALCIUM (Ca)	NS	mg/1			45.4	72.0	47.2	51.2	54.7	96.8
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				BQL		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				BQL		
TOTAL IRON (Fe)	0.3	mg/1	BQL	BQL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL LEAD (Pb)	0.025	mg/1		BQL	0.007	0.013	0.023	BQL	BQL	BQL
TOTAL MANGANESE (Mn)	0.3	mg/1	BQL	BQL	BQL	0.30	0.30	0.10	BQL	BQL
TOTAL MERCURY (Hg)	0.002	mg/1		BQL				BQL		
TOTAL NICKEL (Ni)		mg/1		BQL						
TOTAL SODIUM (Na)	NS	mg/1			11.9	14.5	13.9	5.30	11.7	14.0
TOTAL ZINC (Zn)	5.0	mg/1		BQL				0.10		
ALKALINITY		mg/1			130	260	230	105	175	320
AMMONIA (as N)		mg/1			0.09	0.10	0.06	+	0.01	0.19
CHEMICAL OXYGEN DEMAND		mg/1			14.4	940	BQL	BQL	4.81	23.5
COLOR, TRUE		COLOR UNITS			10	BQL	< 5	BQL	BQL	20
HARDNESS		mg/1			170	230	190	70.0	145	300
NITRATE	10.0	mg/1			0.02	0.04	0.04	+	0.02	0.04
ODOR					Odorless	Odorless	Odorless	Odorless	Odorless	Odorless
SULFATES	250	mg/1			30.5	35.3	46	25	29	44

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TOWN OF MARILLA SANITARY LANDFILL WELL # 4A
QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/6/90	9/11/90
ELEVATION BEFORE PURGING			1090.08	1082.55	1109.57	1043.86	1053.63	1075.01	1046.56	1056.46
pH		STANDARD UNITS	12.52	12.21	11.81	12.21	12.60	11.50	11.34	11.54
SPECIFIC CONDUCTIVITY		MICROMHOS	13000	9500	4500	7000	9100	7750	7000	6100
TEMPERATURE		DEGREES CELCIUS			11	16.1	8.7	7.5		
Eh		MILLIVOLTS			-7	-56	-59	110		
CHLORIDE	250	mg/1	2.3	2690	2110		2200	1300	2910	2950
TOTAL REC. PHENOLS	0.001	mg/1	[redacted]	[redacted]	[redacted]		[redacted]	N/R	N/R	
TOTAL DISSOLVED SOLIDS		mg/1	5260	4710	3110		5200	6230	4600	4810
TOTAL ORGANIC CARBON		mg/1	22.1	23.9	16		8.99	11.5	9.99	12.3
TOTAL BARIUM (Ba)	1.0	mg/1	BQL*	BQL				BQL		
TOTAL CADMIUM (Cd)	0.01	mg/1		0.0068	0.0015		BQL	0.0022	BQL	0.0007
TOTAL CALCIUM (Ca)	NS	mg/1			194		242	319	175	200
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				BQL		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				BQL		
TOTAL IRON (Fe)	0.3	mg/1	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]
TOTAL LEAD (Pb)	0.025	mg/1		[redacted]	[redacted]		0.023	[redacted]	[redacted]	[redacted]
TOTAL MANGANESE (Mn)	0.3	mg/1	BQL	0.25	0.1		BQL	0.28	BQL	0.25
TOTAL MERCURY (Hg)	0.002	mg/1		BQL				BQL		
TOTAL NICKEL (Ni)		mg/1		BQL						
TOTAL SODIUM (Na)	NS	mg/1			1230		1400	1790	1910	1740
TOTAL ZINC (Zn)	5.0	mg/1		0.07				0.85		
ALKALINITY		mg/1			560		1400	690	480	460
AMMONIA (as N)		mg/1			18.4		23.5	17.0	20.3	18.6
CHEMICAL OXYGEN DEMAND		mg/1			144		50	3.6	140	73.5
COLOR, TRUE		COLOR UNITS			10		< 5	BQL	BQL	15
HARDNESS		mg/1			500		260	690	440	380
NITRATE	10.0	mg/1			0.15		0.20	0.22	0.34	0.23
ODOR					Odor Present		Slight Petroleum Product	Sweet	Odorless	

TOWN OF MARILLA SANITARY LANDFILL WELL # 4A
QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/6/90	9/11/90
							Small			
SULFATES	250	mg/l			54		32	85	77	73
TOTAL CYANIDE	0.004	mg/l						N/R**		
TOTAL ANTIMONY (Sb)	1.00	mg/l						BQL		
TOTAL ARSENIC (As)	0.005	mg/l						[redacted]		
TOTAL BERYLLIUM (Be)	0.05	mg/l						BQL		
TOTAL SELENIUM (Se)	0.005	mg/l						[redacted]		
TOTAL SILVER (Ag)	0.001	mg/l						BQL		
TOTAL THALLIUM (Tl)	1.00	mg/l						BQL		
CHLOROMETHANE	10	mg/l						[redacted]		
VINYL CHLORIDE	10	mg/l						BQL		
CHLOROETHANE	10	mg/l						BQL		
BROMOMETHANE	10	mg/l						BQL		
2-CHLOROETHYLVINYLETHER	10	mg/l						BQL		
ETHYLBENZENE	5.0	mg/l						[redacted]		
METHYLENE CHLORIDE	10	mg/l						BQL		
CHLOROBENZENE	5.0	mg/l						BQL		
1,1-DICHLOROETHYLENE	5.0	mg/l						BQL		
1,1-DICHLOROETHANE	5.0	mg/l						BQL		
trans-1,2-DICHLOROETHYLENE	5.0	mg/l						BQL		
CHLOROFORM	5.0	mg/l						BQL		
1,2-DICHLOROETHANE	5.0	mg/l						BQL		
1,1,1-TRICHLOROETHANE	5.0	mg/l						BQL		
CARBON TETRACHLORIDE	5.0	mg/l						BQL		
BROMODICHLOROMETHANE	5.0	mg/l						BQL		
1,2-DICHLOROPROPANE	5.0	mg/l						BQL		
trans-1,3-DICHLOROPROPENE	5.0	mg/l						BQL		
TRICHLOROETHYLENE	5.0	mg/l						BQL		
BENZENE	5.0	mg/l						[redacted]		

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TOWN OF MARILLA SANITARY LANDFILL WELL # 4A

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/6/90	9/11/90
cis-1,3-DICHLOROPROPENE	5.0	mg/l						BQL		
1,1,2-TRICHLOROETHANE	5.0	mg/l						BQL		
DIBROMOCHLOROMETHANE	5.0	mg/l						BQL		
BROMOFORM	5.0	mg/l						BQL		
TETRACHLOROETHYLENE	5.0	mg/l						BQL		
1,1,2,2-TETRACHLOROETHANE	5.0	mg/l						BQL		
TOLUENE	5.0	mg/l						[redacted]		

* BELOW QUANTIFIABLE LIMITS

** NOT REQUIRED

TOWN OF MARILLA SANITARY LANDFILL WELL # 5

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/7/89	12/6/89	3/7/90	6/5/90	9/10/90
ELEVATION BEFORE PURGING			1115.62	1116.36	1115.7	1112.5	1112.19	1114.94	1114.65	1112.3
pH		STANDARD UNITS	5.31	5.35	5.4	5.86	5.96	5.25	5.9	5.81
SPECIFIC CONDUCTIVITY		MICROMHOS	680	300	190	250	500	260	225	250
TEMPERATURE		DEGREES CELCIUS			12	14.5	10.5	5.0		
Eh		MILLIVOLTS			164	66	130	60		
CHLORIDE	250	mg/1	130.5	66.3	30.6	47.4	43	21	15	18.5
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	BQL	BQL	BQL	[redacted]	[redacted]	[redacted]
TOTAL DISSOLVED SOLIDS		mg/1	419	176	111	188	309	508	158	228
TOTAL ORGANIC CARBON		mg/1	14.1	2.8	14.4	12	63.9	32.4	2.59	6.4
TOTAL BARIUM (Ba)	1.0	mg/1	BQL	BQL				BQL		
TOTAL CADMIUM (Cd)	0.01	mg/1		BQL	BQL	0.0007	BQL	BQL	BQL	BQL
TOTAL CALCIUM (Ca)	NS	mg/1			12.6	19.6	98.8	34.4	16.6	17.2
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				BQL		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				BQL		
TOTAL IRON (Fe)	0.3	mg/1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL LEAD (Pb)	0.025	mg/1		BQL	BQL	0.011	0.009	BQL	[redacted]	BQL
TOTAL MANGANESE (Mn)	0.3	mg/1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TOTAL MERCURY (Hg)	0.002	mg/1		BQL				BQL		
TOTAL NICKEL (Ni)		mg/1		BQL						
TOTAL SODIUM (Na)	NS	mg/1			29.7	28.0	34.6	24.5	33	30.5
TOTAL ZINC (Zn)	5.0	mg/1		BQL				0.06		
ALKALINITY		mg/1			40	80	120	80.0	60	85
AMMONIA (as N)		mg/1			0.13	0.05	0.07	0.02	0.04	0.05
CHEMICAL OXYGEN DEMAND		mg/1			12	3.0	BQL	15	2.33	14.2
COLOR, TRUE		COLOR UNITS			BQL	BQL	10	5	10	10
HARDNESS		mg/1			58	114	80	64.0	62	60
NITRATE	10.0	mg/1			BQL	0.05	BQL	BQL	0.03	0.03
ODOR					Odorless	Odorless	Odorless	Odorless	Odorless	Odorless
SULFATES	250	mg/1			41.5	52.5	44	46	39	39

TOWN OF MARILLA SANITARY LANDFILL　　WELL # EAST DITCH

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/5/90	9/11/90
ELEVATION BEFORE PURGING										
pH		STANDARD UNITS	8.03	7.83	7.04	**	7.31	7.10	7.67	8.00
SPECIFIC CONDUCTIVITY		MICROMHOS	350	320	366	**	325	375	425	440
TEMPERATURE		DEGREES CELCIUS			20	**	6.8	***		
Eh		MILLIVOLTS			137	**	68	10		
CHLORIDE	250	mg/l	14	35.6	20.6		13	18	18	22.0
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	[redacted]		BQL	[redacted]	[redacted]	[redacted]
TOTAL DISSOLVED SOLIDS		mg/l	250	253	276		160	270	258	304
TOTAL ORGANIC CARBON		mg/1	10.1	68.4	9.5			18.5	5.3	22.6
TOTAL BARIUM (Ba)	1.0	mg/1	BQL	BQL				BQL		
TOTAL CADMIUM (Cd)	0.01	mg/1		BQL	BQL		BQL	BQL	BQL	BQL
TOTAL CALCIUM (Ca)	NS	mg/1			58.3		186	74.0	59.4	70.6
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				BQL		
TOTAL COPPER (Cu)	1.0	mg/1		BQL				BQL		
TOTAL IRON (Fe)	0.3	mg/1	BQL	[redacted]	0.19		[redacted]	[redacted]	[redacted]	[redacted]
TOTAL LEAD (Pb)	0.025	mg/1		BQL	BQL		BQL	0.007	0.011	BQL
TOTAL MANGANESE (Mn)	0.3	mg/1	0.17	0.28	BQL		0.13	0.14	BQL	0.14
TOTAL MERCURY (Hg)	0.002	mg/1		BQL				BQL		
TOTAL NICKEL (Ni)		mg/1		BQL						
TOTAL SODIUM (Na)	NS	mg/1			13.5		5.9	12.7	14.6	19.5
TOTAL ZINC (Zn)	5.0	mg/1		BQL				0.06		
ALKALINITY		mg/1			150		120	155	190	220
AMMONIA (as N)		mg/1			0.16		0.17	0.06	0.07	BQL
CHEMICAL OXYGEN DEMAND		mg/1			19.3		17	7.0	12.2	21.0
COLOR, TRUE		COLOR UNITS			BQL		20	BQL	20	20
HARDNESS		mg/1			186		58	125	202	190
NITRATE	10.0	mg/1			4.75		0.12	0.18	0.11	BQL
ODOR					Odorless		Odorless	Odorless	Odorless	Odorless
SULFATES	250	mg/1			16		23	20	14	28

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TOWN OF MARILLA SANITARY LANDFILL   WELL # EAST DITCH

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/5/90	9/11/90
DIBROMOCHLOROMETHANE	5.0	mg/l						BQL		
BROMOFORM	5.0	mg/l						BQL		
TETRACHLOROETHYLENE	5.0	mg/l						BQL		
1,1,2,2-TETRACHLOROETHANE	5.0	mg/l						BQL		
TOLUENE	5.0	mg/l						BQL		

* BELOW QUANTIFIABLE LIMITS

** DRY, NO SAMPLES COLLECTED

*** CRACKED THERMOMETER, TEMPERATURES UNATTAINABLE

TOWN OF MARILLA SANITARY LANDFILL   WELL # NORTH DITCH

QUARTERLY MONITORING

PROCEDURE	LIMIT OF CLASS GA WATERS	UNIT	12/8/88	3/28/89	6/7/89	9/15/89	12/6/89	3/7/90	6/5/90	9/10/90
ELEVATION BEFORE PURGING										
pH		STANDARD UNITS	7.09	6.63	6.74	**	7.09	6.49	7.37	**
SPECIFIC CONDUCTIVITY		MICROMHOS	3200	2100	1850	**	2250	2100	1970	**
TEMPERATURE		DEGREES CELCIUS			22	**	6.1	***		**
Eh		MILLIVOLTS			88	**	6	-10		**
CHLORIDE	250	mg/1	800	645	560		680	580	450	**
TOTAL REC. PHENOLS	0.001	mg/1	BQL*	BQL	BQL		BQL	[redacted]	[redacted]	**
TOTAL DISSOLVED SOLIDS		mg/1	1770	1390	1240		1620	1440	1180	**
TOTAL ORGANIC CARBON		mg/1	15.4	12.3	22.2		53.3	40.5	7.21	**
TOTAL BARIUM (Ba)	1.0	mg/1	BQL	BQL				BQL		**
TOTAL CADMIUM (Cd)	0.01	mg/1		BQL	BQL		BQL	BQL	BQL	**
TOTAL CALCIUM (Ca)	NS	mg/1			90.6		51.2	165	91.2	**
TOTAL CHROMIUM (Cr)	0.05	mg/1		BQL				BQL		**
TOTAL COPPER (Cu)	1.0	mg/1		BQL				BQL		**
TOTAL IRON (Fe)	0.3	mg/1	BQL	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	**
TOTAL LEAD (Pb)	0.025	mg/1		BQL	BQL		0.007	0.010	0.013	**
TOTAL MANGANESE (Mn)	0.3	mg/1	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	**
TOTAL MERCURY (Hg)	0.002	mg/1		BQL				BQL		**
TOTAL NICKEL (Ni)		mg/1		BQL						**
TOTAL SODIUM (Na)	NS	mg/1			354		446	309	366	**
TOTAL ZINC (Zn)	5.0	mg/1		BQL				0.11		**
ALKALINITY		mg/1			385		390	445	375	**
AMMONIA (as N)		mg/1			0.86		0.31	2.20	0.37	**
CHEMICAL OXYGEN DEMAND		mg/1			32.9		15	34	12.2	**
COLOR, TRUE		COLOR UNITS			BQL		15	25	25	**
HARDNESS		mg/1			400		290	460	300	**
NITRATE	10.0	mg/1			0.21		0.32	2.20	0.33	**
ODOR					Odorless		Odorless	Odorless	Odorless	**
SULFATES	250	mg/1			58.5		60	40	51	**