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SUPPLEMENTAL SOLID WASTE MANAGEMENT FACILITY INVESTIGATION PROGRAM

MARILLA STREET LANDFILL

LTV STEEL COMPANY
CLEVELAND, OHIO

AUGUST 1995

MALCOLM PIRNIE, INC.

S-3515 Abbott Road
P. O. Box 1938
Buffalo, New York 14219

0848-256-104

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1.0 INTRODUCTION

1.1 GENERAL

The Marilla Street Landfill (the site) is approximately 80 acres in size and is located on approximately 100 acres of land along Marilla and Hopkins Streets in the City of Buffalo, New York. The site is owned by the LTV Steel Company. The New York State Department of Environmental Conservation (NYSDEC) has determined that the Marilla Street landfill is an inactive hazardous waste site, as that term is defined in ECL Section 27-1301(2). Consequently the site has been listed in the Registry of Inactive Hazardous Waste Sites of New York as Site No. 915047 and the NYSDEC has classified the site as "2a". The NYSDEC defines a 2a classification as a site that may pose a threat to the public health and the environment; however, insufficient data exists to make a final determination.

1.2 SITE DESCRIPTION

The 100-acre parcel is bordered on the south by the South Park Recreational Facility operated by Erie County, on the west by railroad tracks, and on the north and east by railroad tracks and Hopkins Street. Approximately 20 acres of the site is comprised of open water and wetland, which is part of NYSDEC regulated wetland BU-1 (see Figure 1-1). Wetland BU-1 is considered one of the three largest wetlands in the City of Buffalo. As such, and considering the developed and industrial nature of surrounding lands, these wetlands provide valuable habitat for wildlife in the vicinity of the site.

The only sources of waste material disposed of at the Marilla Street Landfill are from the iron and steel operations at the Buffalo Plant of the LTV Steel Company (previously Republic Steel Corporation). A variety of wastes were disposed of at the site including: blast furnace and basic oxygen furnace (BOF) slag, blast furnace and BOF precipitator dust, clarifier sludge, bricks, tool scale, scrap wood, railroad ties, and construction debris. The construction of a landfill cover system and site landscaping was completed in 1993.

SOURCE: NY STATE FRESHWATER WETLANDS MAP, 1975.
BUFFALO SE QUAD

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LTV STEEL COMPANY
BUFFALO, NEW YORK
MARILLA STREET LANDFILL

NEW YORK STATE WETLANDS MAP

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FIGURE 1-1

1.3 BACKGROUND

A Solid Waste Management Facility Investigation Program was conducted at the Marilla Street Landfill during the period of January 1993 to July 1993 (the 1993 SWMFIP). The SWMFIP report, submitted to the NYSDEC in November 1993, presented a physical and chemical characterization of the site based on a groundwater, surface water, sediment, and waste/fill sampling program. The SWMFIP also fulfilled requirements of a closure investigation that will support preparation of a post-closure monitoring plan as defined in 6NYCRR Part 360-2.15.

The results of the SWMFIP indicated that waste/fill constituents have been released by dissolution of waste/fill material present in sediment and by the advection of landfill leachate via shallow groundwater flow. Low to moderate potential risks to fish and wildlife were identified as being associated with exposure to waste/fill constituents in surface water, pore water, and sediment of the wetland environment adjacent to the landfill.

The flow of shallow groundwater that is impacted by waste/fill constituents is intercepted by a discharge zone in the wetland directly contiguous to the landfill. However, shallow groundwater discharge is presently minimized by the landfill cover system which has reduced hydraulic gradients along the groundwater flow path. Estimated groundwater discharge to the wetland is minor compared to runoff from the landfill surface.

1.4 PURPOSE AND OBJECTIVES

This document presents the results of supplemental field investigations conducted within Wetland BU-1 in the vicinity of the Marilla Street Landfill in Section 2.0. The information which has been collected will be used, in addition to the findings of the 1993 SWMFIP, to develop a wetland remediation/restoration program, if necessary.

A feasibility Study will be conducted to select a wetland remediation/restoration program, if necessary, which meets applicable New York State standards, criteria, and guidance in order to be protective of the environment. The proposed Feasibility Study is described in Section 3.0

2.0 WETLAND INVESTIGATION

2.1 WETLAND DELINEATION

Because Wetland BU-1 meets the NYSDEC and the US Army Corps of Engineers (ACOE) criteria for wetlands, a wetland delineation using both state and federal guidelines was conducted. Tasks conducted for both a NYS and ACOE Wetland Delineation are presented below.

Preliminary Data Collection: Prior to conducting the survey, the following information was reviewed to identify soil series, wetland classifications, and the extent/ hydrology:

- National Wetland Inventory (NWI) maps;
- NYSDEC wetland mapping;
- Soil Survey of Erie County; and
- Available hydrologic (FEMA) mapping.

ACOE Wetland Delineation Procedures: In compliance with ACOE guidelines, the wetland delineation was conducted using the 1987 Corps of Engineers Wetland Delineation Manual, and the 1992 Memorandum on "Clarification and Interpretation of the 1987 Manual". Based on a review of site photographs, the wetland appeared to have little vegetation diversity, therefore the Routine On-Site Determination Method with the Plant Community Assessment Procedure was applied to determine the presence of wetland/hydrophytic vegetation, hydric soils, and hydrology. Data collected were entered on the appropriate field data forms as required by federal guidelines. Plant species were classified using the National List of Plant Species That Occur In Wetlands (Region 1), 1988.

Wetland boundaries were identified with sequentially numbered flagging, and identified on a site base map. Sampling locations were flagged, numbered, keyed to a site base map, and photographed for documentation. Upon completion of the wetland delineation, a survey was conducted and the surveyed points mapped. The field data and mapping information were compiled into a Wetland Delineation Report (see Attachment A) for submittal to the NYSDEC and ACOE for a jurisdictional determination.

NYS Wetland Delineation Procedures: In compliance with NYS regulations as stated in Article 24 of the NY Environmental Conservation Law, a wetlands inventory was conducted and the boundary of wetland vegetation flagged. Following the completion of the site survey, NYSDEC Freshwater Wetland staff were notified through the NYSDEC Division of Hazardous Waste Remediation. The NYSDEC declined to issue a jurisdictional determination of the wetland boundary.

2.2 WET ASSESSMENT

The ACOE's Wetland Evaluation Technique, Version 2.0 (WET) was applied to wetland systems identified on-site for the purpose of evaluating the baseline physical, chemical, and biological functions of the wetlands (see Attachment B). WET evaluates functions in terms of social significance, opportunity, and effectiveness.

Using available site data relative to wetland classification, soils and hydrology, and data collected on-site during the wetland delineation, the WET program was run to generate qualitative scores for each of eleven wetland functions. The WET scores can be used to develop mitigation plans for on-site areas that provide functions and values equal to or greater than existing functions and values. The WET program may be applied to a proposed mitigation plan, if necessary, to compare scores for the proposed wetland with scores for existing wetlands.

2.3 SOIL SEDIMENT/SAMPLING

A sediment and subsurface soil sampling program was conducted at the LTV Marilla Street Landfill wetlands area during the period of October 4 to 18, 1994. Samples collected during the drilling investigation were analyzed to quantify the areal and vertical extent of contamination present in wetlands areas adjacent to the landfill. Soil samples were collected for chemical analysis and physical characterization. Soil/sediment sampling activities included the completion of 26 borings, and survey of all sampled boreholes. A detailed discussion of these activities is provided in the following subsections.

2.3.1 Sampling Locations

Boreholes were advanced at twenty-four locations in the ponds and ditches that border the landfill. Two additional boreholes were advanced in the pond located east of the North pond and situated between two railroad right-of-ways immediately south of the Tifft Street bridge.

The study area was divided into five sampling areas as described in Table 2-1 and illustrated on Sheet 1 of 5 in Attachment C. Soil/sediment samples were collected at 2 to 8 locations in each sampling area as listed in Table 2-1. Each sampling area is either physically separate from other areas or has different soil/sediment characteristics. For example, the south pond is separated from the west ditch by an area of sediment accumulation beneath the railroad bridge. The north pond is distinguished from the west ditch by the presence of a thick peat unit, which is absent in the west ditch. The borehole locations are shown on Sheet 1 of 5 in Attachment C.

2.3.2 Sampling Procedures

Prior to drilling, water depths were measured at each borehole location. These depths were referenced to the nearest surveyed staff gauge to determine surface water and bottom sediment elevations. Drilling and sampling were conducted from a boat mounted tripod drilling apparatus at nineteen (19) locations in the ponds and West ditch. At locations inaccessible to the boat, boreholes were advanced using a modified tripod drilling apparatus (SS-9, SS-25 and SS-26) (SS-1, SS-23 and SS-24) or were advanced manually.

The upper 6 inches of bottom sediment were collected at each borehole location using a ponar dredge sampler. Many of these samples contained over 50% moisture. The dredge samples were described on borehole logs and split into separate sample jars for organic, inorganic and headspace analyses.

Below the dredge sample interval, a standard 3-inch split-spoon or a large 5-foot overburden sampler was utilized in conjunction with a 140 lb. geotechnical sampling hammer. Soil/sediment samples were described on borehole logs with particular attention focused on the waste/fill material and the fill/native soil contact. Selected borings were sampled continuously below the 5-foot reach of the overburden sampler to physically characterize the soil underlying the wetland sediment. In order to advance borings below 5-feet with minimal downhole contamination, a 4-inch PVC, Schedule 80 temporary casing

TABLE 2-1

LTV STEEL COMPANY
MARILLA STREET LANDFILL
SUPPLEMENTAL SWMFIP

WETLAND SAMPLING AREAS

Sampling Area	Description	Sampling Locations
South Pond	Wetland area adjacent to the southern edge of the landfill extending westward to the railroad bridge	SS-01 to SS-08
West Ditch	Wetland area adjacent to the west edge of the landfill from the railroad bridge to sample location SS-15	SS-09 to SS-13 and SS-15
North Pond	Wetland area adjacent to the north edge of the landfill extending north to the Tifft Street bridge	SS-14 and SS-16 to SS-22
North Ditch	Drainage ditch adjacent to the north/ northeast edge of the landfill	SS-25 and SS-26
Northeast Pond	Ponded area located east of the North Pond and situated between two railroad right-of-ways	SS-23 and SS-24

was inserted and advanced to the base of the previously sampled interval. The temporary casing was advanced with the 140 lb. geotechnical hammer and flushed out to the next sample interval using a centrifugal pump and tremie pipe.

Soil samples were described on borehole logs by an on-site geologist and placed in labeled 1-quart glass sample jars for total organic vapor analysis and archiving purposes. The total volatile organic vapor content of the samples was determined using a photoionization detector (HNu) with a 10.2 eV lamp. To obtain these readings, a representative portion of each sampled interval was placed in the glass sample jars and allowed to warm. Readings were obtained from the headspace of each sample jar and recorded on the field borehole logs attached in Attachment D.

Native sediment, which underlies surficial fill material, was collected for organic and inorganic analyses from three boreholes each in the South Pond (SS-2, SS-3, SS-7), the West Ditch (SS-9, SS-10, SS-11), and the North Pond (SS-16, SS-20, SS-21), and one borehole each in the Northeast Pond (SS-23) and the North Ditch (SS-25). Soil samples were composited at borings SS-9 and SS-23 due to poor sample recovery in the silty-sand unit. At borehole SS-9, silty-sand from 5.0′ - 5.5′ was composited with clayey silt recovered from 7.0′-7.5′. The silty-sand and layered vegetation at the 1.0′ - 2.0′ and 2.0′ - 2.4′ intervals were composited at SS-23.

At the borehole SS-8 located in the South Pond adjacent to the West Ditch, an unusual buff-yellow colored chalky waste/fill material was sampled for organics and inorganics 2.5′ below the top of sediment. While collecting the dredge sample at the SS-15 location, an iridescent sheen rose to the surface of the North Pond within a 10-foot radius of the drilling rig. A second confirmatory sample identified as SS-15A was collected from the 0.0-0.5′ interval.

Soil samples from selected boreholes were collected and submitted for Total Organic Carbon, TKN and total phosphorus. The wetland parameters were selected from boreholes SS-6, SS-10, SS-21, SS-24. The wetland characterization results are discussed in Section 2.3.4.

2.3.3 Subsurface Conditions

As described in the October 1993 SWMFIP Report, the sequence of geologic units underlying the landfill site includes:

- Waste/fill
- Glaciolacustrine Deposits
- Glacial Till
- Bedrock

Geologic units encountered in the wetland areas during the Supplemental SWMFIP are summarized on Table 2-2. Cross-sections illustrating subsurface conditions beneath the North Pond, the West Ditch, and the South Pond are presented on Sheets 2, 3 and 4, and 5, respectively in Attachment C. Boring logs are provided in Attachment D. A discussion of the wetland boring data is presented below.

Waste/Fill and Loose Sediment - The uppermost material observed at each sampling location was a thin watery organic silt, which graded downward into various types of fill material. The dredge samples were comprised of mixtures of the loose sediment and fill with moisture contents of greater than 50%. Observed fill material included crushed stone without slag, mixed soil and slag, red silt, fine chalky silt, and layers of black carbonaceous material. Fill was encountered at all locations except the easternmost sampling location in the South Pond (SS-1), which is an area of dense aquatic vegetation. The fill thickness is commonly 1 to 2 feet, but increases to four feet at SS-8 and SS-9 near the railroad bridge, and at the north end of the North Pond near SS-22.

Glaciolacustrine Deposits - Glaciolacustrine deposits included a sandy silt and a stratified peat and soil, which overlies a glaciolacustrine clayey silt unit. The depth to the clayey silt unit was determined at one or more locations in each sampling area.

Stratified peat and soil (termed layered vegetation on the cross-sections) underlies the fill at most locations in the North and Northeast Ponds, in the densely vegetated area of the South Pond, and at one location in the North Ditch. The unit is comprised of fibrous organic material mixed with clay, silt and very fine sand, and is interlayered with non-organic fine sand and silt. The organic soils area commonly one foot thick, but thicken to 5 to 8 feet in the vicinity of SS-16, SS-17, and SS-18 in the North Pond.

Underlying the fill and the organic soils is silt and very fine sand with traces of clay and occasional thin fine sand lenses. The thickness of the sandy silt is highly variable across the wetland area (see Table 2-2).

Clayey silt occurs at relatively shallow depths of 1 to 4 feet below the top of sediment in portions of the South pond and the central part of the West Ditch (see cross-

TABLE 2-2

LTV STEEL COMPANY
MARILLA STREET LANDFILL
SUPPLEMENTAL SWMFIP

STRATIGRAPHIC SUMMARY[(1)]

	Fill & Loose Sediment		Layered Vegetation		Lacustrine Sandy Silt		Lacustrine Clayey Silt		Till		Bedrock	
Sample* Location	Elevation	Thickness	Elevation	Thickness	Elevation	Thickness	Elevation	Thickness	Elevation	Thickness	Elevations	Borehole Depth Elevation
South Pond:												
SS-1	579.9	0.0	577.9	0.8	–	–	–	–	579.1	>0.7	–	576.1
SS-2	578.8	1.7	577.1	0.8	576.3	1.5	574.8	>0.8	–	–	–	573.8
SS-3	578.5	1.3	–	–	577.2	0.7	576.5	>2.8	–	–	–	573.5
SS-4	578.45	1.8	–	–	576.65	0.2	576.45	2.2	574.25	>0.4	–	573.45
SS-5	577.35	2.2	–	–	575.15	0.8	574.35	>1.6	–	–	–	572.35
SS-6	577.45	2.3*	–	–	575.15	0.8	574.35	>3.5	–	–	–	570.45
SS-7	577.95	3.0*	–	–	574.95	>1.6	–	–	–	–	–	572.95
West Ditch:												
SS-8	579.55	4.1	–	–	575.45	>0.5	–	–	–	–	–	574.55
SS-9	580.26	5.0*	–	–	575.26	2.1	573.16	>1.1	–	–	–	571.26
SS-10	579.16	0.8	–	–	578.36	0.7*	577.66	>0.3	–	–	–	574.16
SS-11	579.38	0.9	–	–	578.48	>1.9	–	–	–	–	–	574.38
SS-12	578.13	2.0*	–	–	576.13	4.0*	572.13	2.1	570.03	>0.9	–	569.13
SS-13	577.83	2.0*	–	–	575.83	>5.5	–	–	–	–	–	570.33

Notes:
(–) *Interval not sampled or unit absent.*
(1) *All elevations are in feet and were referenced to surveyed staff gauges and were determined from the measured depth of water to the top of bottom sediment.*
(*) *Estimated based on observations, generally +/- 1.0 ft.*

TABLE 2-2

LTV STEEL COMPANY
MARILLA STREET LANDFILL
SUPPLEMENTAL SWMFIP

STRATIGRAPHIC SUMMARY[1]

	Fill & Loose Sediment		Layered Vegetation		Lacustrine Sandy Silt		Lacustrine Clayey Silt		Till		Bedrock	
Sample* Location	Elevation	Thickness	Elevation	Thickness	Elevation	Thickness	Elevation	Thickness	Elevation	Thickness	Elevations	Borehole Depth Elevation
North Pond:												
SS-14	577.83	4.0*	–	–	573.83	>1.3	–	–	–	–	–	571.83
SS-15	577.74	2.0	575.74	1.8	573.94	>2.2	–	–	–	–	–	571.74
SS-16	577.61	1.5*	576.11	5.0	571.11	3.5	567.61	>1.9	–	–	–	565.61
SS-17	577.51	1.0	576.51	8.7	567.81	>1.2	–	–	–	–	–	565.51
SS-18	577.36	1.0	576.36	4.9	571.46	0.4	571.06	0.7	–	–	–	570.36
SS-19	577.46	1.3	576.16	0.3	575.86	>4.6	–	–	–	–	–	571.46
SS-20	576.86	2.0	574.86	0.5	574.36	>3.5	–	–	–	–	–	570.86
SS-21	577.66	1.5	576.16	0.5	575.66	12.9	562.76	>0.6	–	–	–	561.16
SS-22	577.06	4.2*	–	–	572.86	>0.7	–	–	–	–	–	571.06
Northeast Pond:												
SS-23	577.53	1.0*	576.53	1.0*	575.53	>0.4	–	–	–	–	–	574.53
SS-24	576.88	0.5*	576.38	>1.3*	–	–	–	–	–	–	–	573.88
North Ditch:												
SS-25	580.35	2.4	577.95	0.7*	577.25	3.9*	–	–	573.35	2.1	571.25	571.25
SS-26	580.63	1.0	–	–	579.63	6.0*	573.63	>1.3	–	–	–	571.63

Notes:
- *(-) Interval not sampled or unit absent.*
- *(1) All elevations are in feet and were referenced to surveyed staff gauges and were determined from the measured depth of water to the top of bottom sediment.*
- *(*) Estimated based on observations, generally +/- 1.0 ft.*

cross-sections B-B' and A-A' on Sheets 2, 3 and 5). Elsewhere, the top of the clayey silt is 6 to 15 feet below the top of sediment.

Glacial Till - Glacial till directly underlies organic soils in the area of dense aquatic vegetation in the eastern portion of the South Pond (at SS-1). Till was encountered below clayey silt at a thickness of >0.7 feet.

Bedrock - Split-spoon refusal was encountered at a relatively shallow depth of 9.1 feet at SS-25 in the north end of the North Ditch. This is consistent with the generally shallow depth to bedrock observed in the nearest previously completed monitoring well borings.

2.3.4 Sediment Sampling Results

This section discusses the results of soil/sediment analyses performed during the wetland investigation program. The section is divided into discussions of specific sampling areas for clarity. Analytical results for the TCL compounds detected in sediment samples collected from the South Pond, the West Ditch, the North Pond, the Northeast Pond, and the North Ditch are summarized on Tables 2-3 to 2-7, respectively. Also included are the analytical results for sediment sampling conducted for the 1993 SWMFIP. A data validation report for the Supplemental SWMFIP analyses is presented in Attachment E.

TCL parameters that were found to be widespread constituents of the waste/fill during the 1993 SWMFIP included polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), phenolic compounds, phthalate compounds, and nine inorganic parameters. Five other inorganics were detected at elevated concentrations only locally. The distributions of these same groups of organic compounds and metals that were detected in wetland sediment are illustrated on Sheets 2 through 5 in Attachment C.

2.3.4.1 South Pond

TCL Organics - Surficial sediments collected from the South Pond are characterized mainly by total PAHs ranging in concentration from not detected to 6,070 ug/kg. The highest concentrations of total PAHs were detected in the northwest corner of the South Pond.

Samples collected from the native sandy silt underlying the fill exhibited moderate concentrations of total PAHs (not detected to 1715 ug/kg). Approximately four feet of a

TABLE 2-3
LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE SOUTH POND SEDIMENT

Parameter(3) Detected (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)													
	SS-1 0.0'-0.5'	SS-2 0.0'-0.5'	SS-2 2.5'	SS-3 0.0'-0.5'	SS-3 1.5'-2.0'	SS-4 0.0'-0.5'	SS-5 0.0'-0.5'	SS-6 0.0'-0.5'	SS-6(1)(2) 2.3'-2.4'	SS-7 0.0'-0.5'	SS-7 3.0'-3.3'	SS-8 0.0'-0.5'	SS-8 2.5'	SD-1(4) 0.0'-0.5'
Semi-Volatiles:														
Phenol													2200	160J
4-Methylphenol						170J								
2,4-Dichlorophenol														
Bis-(2-ethylhexyl)phthalate						330J	260J			250J	66J	130J	66J	
Di-n-butylphthalate														
Naphthalene			72J			300J				310J				1200
2-Methylnaphthalene						200J								160J
Acenaphthylene														
Acenaphthene													59J	140J
Fluorene													98J	210J
Phenanthrene		160J	84J			320J	160J	330J		310J		520J	590	960J
Anthracene												110J	140J	200J
Fluoranthene	270J	230J	100J		230J	520J	300J	670J		930J		700J	750	1100J
Pyrene	200J	220J	85J		180J	470J	270J	630J		900J		570J	580	720J
Benzo(a)anthracene						260J		350J		580J		380J	340J	260J
Chrysene	200J	220J	74J			420J	250J	600J		980J		420J	390J	400J
Benzo(a)pyrene			1300J			200J				460J		170J	120J	
Benzo(b)fluoranthene						310J	170J	420J		760J		230J	180J	
Benzo(k)fluoranthene						230J	160J	370J		560J		200J	160J	
Indeno(1,2,3-cd)pyrene										280J		100J	71J	
Benzo(g,h,i)perylene														
Dibenz(a,h)anthracene														
Dibenzofuran														160J
Volatiles:														
Methylene Chloride						88J	87J	18J		130J		24J	29J	
Acetone	42J	15J	44	47J	57	230J	400J	47J				46J	140	
2-Butanone			9J	10J	14J									
Benzene														
Toluene														
Ethylbenzene								22J						
Xylene														

Notes: *(1) Not analyzed for semi-volatiles. (2) Not analyzed for volatiles. (3) Only parameters detected at one or more sample locations are listed. (4) Sampled May 1993.* *J = Estimated value.*

TABLE 2-3 (Continued)
LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE SOUTH POND SEDIMENT

Parameter[2] Detected (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)													
	SS-1 0.0'-0.5'	SS-2 0.0'-0.5'	SS-2 2.5'-2.6'	SS-3 0.0'-0.5'	SS-3 1.5'-2.0'	SS-4 0.0'-0.5'	SS-5 0.0'-0.5'	SS-6 0.0'-0.5'	SS-6 ** 2.3'-2.4'	SS-7 0.0'-0.5'	SS-7 3.0'-3.3'	SS-8 0.0'-0.5'	SS-8 2.5'	SD-1[1] 0.0-0.5
Inorganics:														
Aluminum	13100	17500	8820	11500	13400	5860	4280	4690		9010	8440	1840	1090	10,000
Antimony														
Arsenic	8.7J	5.5J	2.6J	6.6J	11.9J	18.4	8.0J	13.2		9.8	1.7J	1.7J	2.0J	2.8J
Barium	92.0	102	92.7	82.0	141	189J	226	238		178J	69.8	57.0J	183	218
Cadmium	2.0J		1.3J	1.7J		6.4								
Calcium	37300J	22500J	5900J	18900J	12500J	172000	261000	278000		187000	2550	52900	323000	233,000
Chromium	32.6J	28.5J	9.3J	21.2J	15.1J	34.2	17.9	25.1		30.1	11.3	10.1	5.9	28.7J
Copper	30.9	28.0	11.7	23.5	18.7	39.8	16.2J	27.4		34.5	2.7J	10.9	16.1	18.8
Iron	32600	33300	14400	27400	28000	35100	17900	26100		28700	12100	12000	3070	20,200J
Lead	124J	28.7J	20.4J	54.6J	73.6J	265	92.7	156		129	9.3	86.3	45.9	85.7J
Magnesium	7050	8150	1590J	6240	2110J	4620J	4770	5290		5720	2160	1440J	14300	10,200
Manganese	538J	435J	165J	359J	296J	1380	2340	2440		1380	83.9	426	576	1090J
Mercury														
Nickel	33.5	47.7		34.5	15.9J	18.5J					10.3			17.0
Potassium	1950J	3120	810J	1910J	1210J	189J	514J			1470J	278J	194J	152J	1.240J
Sodium	523J	337J	303J	313J	443J	951J	890J	913J		824J	116J	286J	777J	647J
Vanadium	37.9	38.8	16.3J	29.4	28.3	33.3J	21.6J	23.9J		40.4J	23.1	10.1J	7.7J	27.0J
Zinc	374J	150J	108J	189J	278J	968	290	515		397	44.2	287	30.2	161J
Cyanide														
TOC	–	–	–	–	–	–	–	–	71,520	–	–	–	–	119,479
TKN	–	–	–	–	–	–	–	–	830	–	–	–	–	–
Total P	–	–	–	–	–	–	–	–	304	–	–	–	–	–0

Notes: ** *Not analyzed for metals*

(1) Sampled May 1993

(2) Only parameters detected at one or more sample locations are listed. J = Estimated Value

– Not analyzed.

TABLE 2-4
LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE WEST DITCH SEDIMENT

Parameter$^{(3)}$ Detected (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)										
	SS-9 0.0′-0.5′	SS-9$^{(1)}$ 5.0′-5.5′	SS-9$^{(2)}$ 5.0-5.5′ 7.0′-7.5′	SS-10 0.0′-0.5′	SS-10 0.8′-1.0′	SS-11 0.0′-0.5′	SS-11 0.9′-1.3′	SS-12 0.0′-0.5′	SS-13 0.0′-0.5′	SD-2$^{(4)}$ 0.0′-0.5′	SD-3$^{(4)}$ 0.0′-0.5′
Semi-Volatiles:											
Phenol										110J	
4-Methylphenol											55J
2,4-Dichlorophenol											
Bis-(2-ethylhexyl)phthalate	53J		53J	170J		170J	51J				
Di-n-butylphthalate			48J								
Naphthalene				150J				69J	140J	280J	
2-Methylnaphthalene				160J							
Acenaphthylene											
Acenaphthene				190J							
Fluorene				340J							59J
Phenanthrene	150J			1700		99J		100	120J		440J
Anthracene	170J			380J							67J
Fluoranthene	590			1600	140J	200J		140J	140J	140J	650
Pyrene	450J			1900	190J	180J		150J	140J		500J
Benzo(a)anthracene	250J			840J	180J	120J		78J	60J		280J
Chrysene	330J			1100J	270J	200J		140J	110J		390J
Benzo(a)pyrene	140J			860J	210J	92J		68J	64J		
Benzo(b)fluoranthene	140J			900J	200J	130J		94J	74J		310J
Benzo(k)fluoranthene	140J			560J	160J	110J		79J	71J		250J
Indeno(1,2,3-cd)pyrene	52J			350J	61J	67J					
Benzo(g,h,i)perylene	48J			360J	61J						
Dibenz(a,h)anthracene	470J										
Dibenzofuran				200J							
Volatiles:											
Methylene Chloride	21J	16J		29J	22J	50J					
Acetone	15	13		41	26				9J	110J	
2-Butanone										15J	
Benzene											
Toluene									2J		
Ethylbenzene											
Xylene											

Notes: *(1) Not analyzed for semi-volatiles. (2) Not analyzed for volatiles. (3) Only parameters detected at one or more sample locations are listed. J = Estimated value (4) Sampled May 1993*

TABLE 2-4 (Continued)
LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL INORGANIC COMPOUNDS DETECTED IN THE WEST DITCH SEDIMENT

Parameter[2] Detected (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)										
	SS-9 0.0'-0.5'	SS-9 ** 5.0'-5.5'	SS-9 5.0'-5.5' 7.0'-7.5'	SS-10 0.0'-0.5'	SS-10 0.8'-1.0'	SS-11 0.0'-0.5'	SS-11 0.9'-1.3'	SS-12 0.0'-0.5'	SS-13 0.0'-0.5'	SD-2 0.0'-0.5'	SD-3[1] 0.0'-0.5'
Inorganics:											
Aluminum	963		11600	7220	10900	12100	5310	18100J	18700J	15,900	12,000J
Antimony											
Arsenic	1.9J		6.4J	7.1J	1.7J	6.0		8.5J	8.9J	3.8J	8.7J
Barium	159		86.5	112	115	67.8	11.1J	125	83.3	130	87.0
Cadmium			1.7J	1.3J							
Calcium	268000J		4770J	116000J	3730J	30500	1660	30900	15900	130,000	9,300
Chromium	15.1J		18.4J	77.3J	9.9J	21.0		27.9J	27.5J	23.8J	19.7J
Copper	3.9J		28.4	57.7	4.3J	19.0	7.3	27.1J	26.6J	23.5	25.6
Iron	3890		48500	37000	7840	22700	4710	35100	31500	22,500J	43,600J
Lead	115J		12.8J	371J	12.0	37.3	6.9	30.1J	107J	35.2J	59.9J
Magnesium	3500		5680	9360	1140J	5730	1220	8500J	5400J	8310	3380
Manganese	709J		731J	2120J	100J	488	61.2	506J	489J	722J	778J
Mercury											
Nickel			43.1	18.1	9.1J	19.1	10.1	36.1	30.4	21.6	23.6
Potassium			620J	927J	592J	1630	385J	2350J	2770J	3380	1,300J
Sodium	456J			414J	3580	232J		327J	309J	486J	
Vanadium	5.1J		32.5	38.8	10.3J	29.1	8.4J	39.0J	48.1J	32.6	28.6
Zinc	77.9J		80.5J	184J	31.8J	97.7	36.1	114J	154J	83.1J	103J
Cyanide											
Total Organic Carbon	–		–	–	83,785	–	–	–	–	62,574	38,412
Total Kjeldahl Nitrogen	–		–	–	736	–	–	–	–	–	–
Total Phosphorous as P	–		–	–	1,190	–	–	–	–	–	–

Notes: ** *Not analyzed for metals* *J = Estimated Value* *(1) Sampled May 1993* *(2) Only parameters detected at one or more sampling locations are listed.*
– *Not analyzed.*

TABLE 2-5

LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP
TCL COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

Parameter[1] Detected (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)							
	SS-14[2] 0.0′-0.5′	SS-15[2] 0.0′-0.5′	SS-15A 0.0′-0.5′	SS-16[2] 0.0′-0.5′	SS-16[2] 2.0′-4.0′	SS-17[2] 0.0′-0.5′	SS-18[2] 0.0′-0.5′	SS-19 0.0′-0.5′
Semi-Volatiles:								
Phenol								
4-Methylphenol								
2,4-Dichlorophenol								
Bis-(2-ethylhexyl)phthalate		120J				140J		
Di-n-butylphthalate								
Naphthalene		110J			1200J			
2-Methylnaphthalene		160J						120J
Acenaphthylene					270J			
Acenaphthene					100J			
Fluorene	79J	110J			210J			
Phenanthrene	88J	200J		320J	860J			200J
Anthracene	61J				110J			
Fluoranthene	79J	320J	100J	310J	480J	160J		310J
Pyrene	88J	460J	100J	360J	650J	170J		340J
Benzo(a)anthracene		130J		180J	140J			150J
Chrysene	61J	250J		270J	160J	130J		250J
Benzo(a)pyrene		110J		200J	150J			150J
Benzo(b)fluoranthene	61J	160J		260J	110J	130J		220J
Benzo(k)fluoranthene		130J		170J	110J			180J
Indeno(1,2,3-cd)pyrene				110J				120J
Benzo(g,h,i)perylene				130J	120J			
Dibenz(a,h)anthracene								
Dibenzofuran								
Volatiles:								
Methylene Chloride		61J						
Acetone		220J	89J	64J	66J	160J	310J	45J
2-Butanone							59J	
Benzene			4J					
Toluene		2J		6J		45J	36J	
Ethylbenzene					7J	15J	13J	
Xylene				9J	6J	100J	80J	

Notes: *(1) Only parameters detected at one or more sample locations are listed.*
(2) Estimated to be one-third of actual value due to laboratory error.
See Data Validation Report in Appendix E.
J =Estimated value

TABLE 2-5 (Continued)

LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

Parameter(1) Detected (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)							
	SS-20 0.0′-0.5′	SS-20 2.0′-2.5′	SS-21 0.0′-0.5′	SS-21 1.9′-2.5′	SS-22 0.0′-0.5′		SD-6 0.0′-0.5′	SD-7 0.0′-0.5′
Semi-Volatiles:								
Phenol								
4-Methylphenol					93J			
2,4-Dichlorophenol			170J					
Bis-(2-ethylhexyl)phthalate								
Di-n-butylphthalate								
Naphthalene	150J	240J	250J	170J	370J			330J
2-Methylnaphthalene	170J	230J	250J	220J	360J			
Acenaphthylene					110J			
Acenaphthene					190J			
Fluorene				82J	240J			
Phenanthrene	300J	400J	400J	320J	540J			590J
Anthracene					170J			
Fluoranthene	450J	500J	670J	360J	970		53J	1100J
Pyrene	470J	490J	680J	360J	1000			1000J
Benzo(a)anthracene	220J		290J	120J	360J		45J	300J
Chrysene	350J	240J	470J	180J	550J		72J	590J
Benzo(a)pyrene	210J		260J	90J	260J			
Benzo(b)fluoranthene	280J	170J	410J	140J	360J			320J
Benzo(k)fluoranthene	260J		310J	130J	350J			350J
Indeno(1,2,3-cd)pyrene	170J		200J	82J	210J			
Benzo(g,h,i)perylene					170J			
Dibenz(a,h)anthracene								
Dibenzofuran				88J	200J			
Volatiles:								
Methylene Chloride								
Acetone	62J	150J	310J	60J	13J			
2-Butanone	18J	26J	85J	13J				
Benzene								
Toluene								
Ethylbenzene								
Xylene								

Notes: *(1) Only parameters detected at one or more sample locations are listed.*
(2) Estimated to be one-third of actual value due to laboratory error.
See Data Validation Report in Appendix E.
J = Estimated value

TABLE 2-5 (Continued)
LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

Parameter$^{(2)}$ Detected (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)														
	SS-14 0.0'-0.5'	SS-15 0.0'-0.5'	SS-15A 0.0'-0.5'	SS-16 0.0'-0.5'	SS-16 2.0'-4.0'	SS-17 0.0'-0.5'	SS-18 0.0'-0.5'	SS-19 0.0'-0.5'	SS-20 0.0'-0.5'	SS-20 2.0'-2.5'	SS-21 0.0'-0.5'	SS-21 1.9'-2.5'	SS-22 0.0'-0.5'	SD-6$^{(1)}$ 0.0'-0.5'	SD-7$^{(1)}$ 0.0'0.5'
Inorganics:															
Aluminum	5980	3470	4110	4540	11700	7650	5770	6280J	8040J	4490J	3610J	6550J	6550J	7060J	3150J
Antimony			20.4J	22.2J			24.3J								
Arsenic	7.8	35.5	21.4	24.5	22.0	31.8	31.8	36.8J	46.4J	67.3J	41.5	22.7J	29.3J	4.5J	25.0
Barium	48.2J	87.5J	109	101J	139	114J	114J	94.9J	101J	61.9J	118J	94.4	82.2J	33.5J	69.8J
Cadmium	1.8J	8.0	8.4	10.9	3.6J	10	11.6	11.4J	14.3J	10.8J	8.8J	6.4J	1.9J		
Calcium	29600	60400	151000	83600	21900	75900	96600	36700	30800	5110	7280	30400	6720	30200	6870
Chromium	38.3	192	146	182	33.6	168	209	195J	224J	255J	266J	83.6J	122J	18.4J	355J
Copper	25.2	73.7	42.8	58.6	43.1	51.9	58.8	57.9J	64.3J	214J	73.4J	201J	181J	21.8	142
Iron	55600	260000	217000	275000	69100	267000	342000	359000	412000	294000	486000	215000	166000	21500J	455000J
Lead	162	251	232	340	79.6	282	358	287J	377J	75.1J	435J	104J	122J	44.6J	383J
Magnesium	2310	1320J	2480	2260J	2560J	3300J	2680J	2250J	2890J	616J	1320J	751J	1560J	4610	
Manganese	591	1720	1650	1530	446	1580	1690	1610J	2010J	151J	1160J	2060J	638J	403J	809J
Mercury	53.7										0.47	0.51			1.5
Nickel	24.9	63.4	41.2	31.6	26.8	24.2J	32.2	33.8	30.1	96.5	6.4J	62.5	70.4	21.6	
Potassium	564J		561J	579J	942J	1120J	623J	1370J	1880J					1020J	
Sodium	196J	394J	363J	382J	408J	478J	395J	455J	519J	437J	539J	198J	325J		
Vanadium	31.0	70.8	63.4	88.1	40.2	99.1	111	109J	128J	104J	129J	64.6J	57.3J	17.2	
Zinc	130	520	236	325	194	272	307	263J	258J	291J	194J	278J	244J	69.6J	357J
Cyanide		1.8													5.6
TOC	–	–	–	–	–	–	–	–	–	–	–	68,531	–	29,073	175,964
TKN	–	–	–	–	–	–	–	–	–	–	–	304	–	–	–
Total P	–	–	–	–	–	–	–	–	–	–	–	1,760	–	–	–

Notes: *(1) Sampled May 1993*
(2) Only parameters detected at one or more sampling locations are listed.
J = Estimated Value
– Not analyzed.

TABLE 2-6

LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE NORTHEAST POND SEDIMENT

Parameter[3] Detected (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)			
	SS-23 0.0'-0.5'	SS-23[1] 1.0'-2.0'	SS-23[2] 1.0'-2.0' 2.0'-2.4'	SS-24 0.0'-0.5'
Semi-Volatiles:				
Phenol				
4-Methylphenol				
2,4-Dichlorophenol	450J			
Bis-(2-ethylhexyl)phthalate	3200			1200J
Di-n-butylphthalate				
Naphthalene			99J	
2-Methylnaphthalene				
Acenaphthylene				
Acenaphthene				
Fluorene				
Phenanthrene	260J		170J	1300J
Anthracene				
Fluoranthene	520J		160J	2300J
Pyrene	430J		110J	1600J
Benzo(a)anthracene	180J			850J
Chrysene	350J		130J	1300J
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(k)fluoranthene				
Indeno(1,2,3-cd)pyrene				
Benzo(g,h,i)perylene				
Dibenz(a,h)anthracene				
Dibenzofuran				
Volatiles:				
Methylene Chloride				
Acetone	160J	280J		86J
2-Butanone	48J	120J		29J
Benzene				
Toluene				
Ethylbenzene				
Xylene				

Notes:
(1) Not analyzed for semi-volatiles.
(2) Not analyzed for volatiles.
(3) Only parameters detected at one or more sample locations are listed.
J = Estimated value

TABLE 2-6 (Continued)

LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE NORTHEAST POND SEDIMENT

Parameter Detected (mg/kg)(1)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)			
	SS-23 0.0'-0.5'	SS-23 ** 1.0'-2.0'	SS-23 1.0'-2.0' 2.0'-2.4'	SS-24 0.0'-0.5'
Inorganics:				
Aluminum	642		12800	361
Antimony	72.8			
Arsenic	27.0		9.7	57.0
Barium	69.3J		125	80.9J
Cadmium	14.1			11.0
Calcium	1400J		2730	964J
Chromium	317J		35.6J	218J
Copper	63.1		59.5	38.1
Iron	466000		40,400	327000
Lead	504		64.2	505
Magnesium			1770J	
Manganese	75.6J		105J	87.9J
Mercury	0.47			
Nickel			172	
Potassium	4890		1590J	2200J
Sodium	751J		308J	506J
Vanadium	147		23.8J	112
Zinc	114		192	96.1
Cyanide	11.4			
Total Organic Carbon	–		–	150,332
Total Kjeldahl Nitrogen	–		–	1,450
Total Phosphorous as P	–		–	5,740

Notes: *(1) Only parameters detected at one or more sampling locations are listed.*
*** Not analyzed for metals*
J = Estimated Value
– Not analyzed.

TABLE 2-7
LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE NORTH DITCH SEDIMENT

Parameter$^{(3)}$ Detected (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)					
	SS-25 0.0'-0.5'	SS-25$^{(1)}$ 5.5'-6.2' *	SS-25$^{(2)}$ 7.0-7.5'	SS-26 0.0'-0.5'	SS-26 0.9'-1.0'	SD-4 0.0'-0.5'
Semi-Volatiles:						
Phenol					140J	
4-Methylphenol					69J	
2,4-Dichlorophenol						
Bis-(2-ethylhexyl)phthalate						
Di-n-butylphthalate						
Naphthalene			70J	74J		200J
2-Methylnaphthalene						
Acenaphthylene						150J
Acenaphthene						
Fluorene				85J		230J
Phenanthrene			44J	370J	99J	1400
Anthracene				81J		410J
Fluoranthene	320J				96J	1700
Pyrene	280J			320J	78J	1700
Benzo(a)anthracene				170J		840J
Chrysene	270J			230J	56J	1000J
Benzo(a)pyrene				110J		
Benzo(b)fluoranthene				120J		560J
Benzo(k)fluoranthene				130J		590J
Indeno(1,2,3-cd)pyrene						
Benzo(g,h,i)perylene						
Dibenz(a,h)anthracene						
Dibenzofuran						130J
Volatiles:						
Methylene Chloride						
Acetone	56J	8J		23J	26	
2-Butanone						
Benzene						
Toluene	2J					
Ethylbenzene	3J					
Xylene	2J					

Notes: *(1) Not analyzed for semi-volatiles.*
(2) Not analyzed for volatiles.
(3) Only parameters detected at one or more sample locations are listed.
J = Estimated value

TABLE 2-7 (Continued)

LTV STEEL COMPANY - MARILLA STREET LANDFILL - SUPPLEMENTAL SWMFIP

TCL COMPOUNDS DETECTED IN THE NORTH DITCH SEDIMENT

Parameter$^{(2)}$ Detected (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)					
	SS-25 0.0′-0.5′	SS-25 ** 5.5′-6.2′	SS-25 7.0′-7.5′	SS-26 0.0′-0.5′	SS-26 0.9′-1.0′	SD-4$^{(1)}$ 0.0′-0.5′
Inorganics:						
Aluminum	11900		7480	14000	4550	25,000J
Antimony						
Arsenic	9.5		4.7	23.4		38.3
Barium	65.5J		690	98.2	34.4J	207
Cadmium						
Calcium	37000		44900	32500	114000	91,700
Chromium	53.7		159	55.0	8.0	47.4J
Copper	27.2		13.7	39.5	6.2J	50.6
Iron	37600		21800	78900	7030	77,400J
Lead	16.9		93.9	146	4.9	166J
Magnesium	14300		6580	6450	22400	8,920
Manganese	1930		2680	1980	261	2,690J
Mercury	0.22					0.40
Nickel	22.3		16.4	36.0	9.6J	35.9
Potassium	1540J		1580	2410		3,570
Sodium	181J		149J	209J	179J	565J
Vanadium	44.5		53.9	61.1	14.7	38.9
Zinc	101		464	379	41.1	464J
Cyanide			–	–	–	0.63
Total Organic Carbon	–					86,045

Notes:

(1) *Sampled May 1993.*

(2) *Only parameters detected at one or more sampling locations are listed.*

J = *Estimated Value.*

– *Not analyzed.*

chalky white silt was observed below the surficial sediment at location SS-8. This material exhibited moderate concentrations of total PAHs (3478 ug/kg).

Total phenolics were detected at only two locations at 170 ppb and 2200 ppb. Volatile organic contamination consisted of only common laboratory contaminants, methylene chloride, acetone and 2-butanone with the exception of a trace amount of ethylbenzene (22 ppb).

TCL Inorganics - Very high percent levels of calcium (17 to 32%) were detected in 6 of 13 sediment samples collected from the South Pond. Iron concentrations ranged from 0.3% to 3.5%, which is similar to the background levels of iron detected at SD-5 during the SWMFIP. The high concentrations of calcium suggest that the chalky textured white silt is primarily a calcium carbonate precipitate. Lead, manganese and zinc were detected at concentrations greater than five times background .

2.3.4.2 West Ditch

TCL Organics - Surficial sediment in the West Ditch contains low to moderate concentrations of total PAHs (918 to 3001 ug/kg) at 6 of 7 surficial sediment sampling locations. However, 11,390 ug/kg total PAHs was detected in sample SS-10, which was collected from an area of sediment accumulation and dense wetland vegetation. PAHs were not detected at depth in those samples collected from native sediment.

Only low concentrations (<50 ppb) of methylene chloride and acetone, common laboratory contaminants, were detected in samples from this area. Some phthalate esters (also common contaminants) were detected at concentrations ranging from 53 ug/kg to 170 ug/kg. Phenolic compounds were detected infrequently and at low concentrations, which is similar to the detection of phenolics in the waste/fill.

TCL Inorganics - Inorganics detected in the West Ditch area include percent levels of calcium and elevated concentrations of lead and manganese. Location SS-10 generally exhibited the highest concentration of inorganics; lead, copper, chromium and zinc were detected at concentrations elevated above background at this location. The highly elevated iron concentrations and observations of BOF dust were absent in fill samples collected in the West Ditch.

2.3.4.3 North Pond

TCL Organics - Surficial sediment (0.0 - 0.5 feet) collected from the North Pond area is characterized predominantly by total PAHs and, to a lesser extent, VOCs. Total PAH concentrations ranged from none detected to 6210 ug/kg.

Dibenzofuran was detected in surficial North Pond sediment at 200 ppb (SS-22). Dibenzofuran was also detected (88 ppb) at location SS-21 (1.9 feet - 2.5 feet).

Volatile organics detected in North Pond surficial sediments consisted predominately of methylene chloride, acetone and 2-butanone which are common laboratory contaminants. However, samples collected from SS-17 and SS-18 exhibited concentrations of toluene, ethylbenzene, and xylenes. The highest concentration of total VOCs detected in North Pond sediment was 498 ppb.

Total phenolics were detected at only two locations at concentrations of 170 and 93 ug/kg. During the previous sampling program (May 1993), only PAHs were detected in surficial sediment collected from the North Pond.

As discussed in the data validation report (see Attachment E), the laboratory indicated a potential error due to problems during the semi-volatile clean-up procedures utilized for samples SS-16, SS-17 and SS-18. Therefore, the laboratory report indicated that the analytical results for the affected samples may be approximately 1/3 less than the "true" value. If the laboratory's estimate of the magnitude of the error is correct, sample SS-16 would exhibit the highest concentration of total PAHs in the North Pond. However, the impact on the analytical results for SS-17 and SS-18 would be minor.

At depth, (2.0 feet - 4.0 feet) samples exhibited mainly PAHs at concentrations ranging from 2254 to 4670 ug/kg. The concentrations of PAHs detected at depth are comparable with the concentration levels detected in the surficial sediments. Again, acetone and 2-butanone (common laboratory contaminants) were detected at depth. Only trace concentrations of ethylbenzene and toluene were detected at depth.

TCL Inorganics - Inorganics detected in the North Pond area include percent levels of iron ranging from 16.6 % to 48.6% in 12 of 15 samples. Additionally, many samples exhibited elevated concentrations of cadmium, chromium, lead, manganese and zinc. The SS-20 and SS-21 locations exhibited arsenic concentrations (46.4 ppm and 41.5 ppm). which were nearly 10 times greater than the background sediment sample concentration of 4.8 ppm.

Mercury was detected at four locations, with the highest concentration of mercury (53.7 ppm) detected at location SS-14. Because this was substantially higher (36 times) than the next highest concentration detected in wetland sediment and waste/fill, the laboratory was requested to check for potential transcription or calculation errors that would not be identified during data validation. No problems were identified.

2.3.4.4 North Ditch

TCL Organics - Three surficial and two subsurface samples have been collected from the North Ditch. These are characterized by relatively low concentrations of total PAHs (870 to 1690 ug/kg). The levels of total PAHs decreased with depth. Phenolics were detected at low concentrations (209 ug/kg) at only one location. Volatile organics detected in the North Ditch include only acetone, a common laboratory contaminant, and trace concentrations (<5 ppb) of toluene, ethylbenzene, and xylene. No phthalate compounds were detected.

TCL Inorganics - Inorganics in the North Ditch consist predominantly of low percent levels of calcium and iron. Concentrations of manganese, chromium., and zinc were detected substantially above background. Mercury was detected at two locations at 0.22 to 0.40 ug/kg.

2.3.4.5 Northeast Pond

TCL Organics - The shallow fill material collected in the Northeast Pond is characterized by relatively low to moderate concentrations of total PAHs ranging from 1740 to 7350 ug/kg. The concentrations of total PAHs decreased with depth in the native sandy silt. The common laboratory contaminants, acetone and 2-butanone, were detected at relatively low concentrations. The surficial sediment sample collected from SS-23 exhibited phenolic compounds (450 ppb) and both locations exhibited low-level concentrations of phthalates.

TCL Inorganics - Inorganics detected in the Northeast Pond include high percent levels of iron in surficial sediment (46.6% to 32.7%). Additionally, elevated concentrations of arsenic, antimony, lead, cadmium and chromium above background were detected in this area. Low concentrations of mercury (0.47 mg/kg) and cyanide (11.4 mg/kg) were also detected. Substantially lower concentrations of inorganics were detected in native sediment.

2.3.5 Evaluation of Sediment Sampling Results

An assessment of the probable environmental risks posed by TCL parameters detected in wetland sediment was presented in the 1993 SWMFIP report. The assessment compared the sediment sampling results from six sediment sampling location to results from the background sediment sampling location and various sediment criteria, including NOAA Effects Range-Low, NOAA Effects Range-Medium from Long and Morgan (1991), and NYSDEC Fish and Wildlife Division sediment criteria (NYSDEC, 1989). A short list of six metals and three PAH compounds were identified as compounds of potential interest based on frequency of detection, frequency and magnitude of criteria exceedance, and other properties of the compounds that may effect exposure and toxicity. Of the compounds of potential interest arsenic, chromium, mercury, and zinc were identified as posing a low potential risk to the environment. Iron, lead, benzo(a)anthracene, fluorene, and pyrene were identified as posing a probable risk to the environment.

A comparison of the sampling results from 45 samples analyzed during the Supplemental SWMFIP to the seven analyses performed during the 1993 SWMFIP indicates:

- Eight new TCL parameters were detected during the Supplemental SWMFIP that were not previously detected in sediment including one phenolic compound (2,4-dichlorophenol), four PAHs (benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, and dibenzo(a,h)anthracene), cadmium, and antimony.

- Four organic compounds, including phenol, 4-methylphenol, naphthalene, and benzo(b)fluoranthene were detected at concentrations 50% or more greater than the previously detected maximum concentration. The maximum detected phenol concentration increased by over an order of magnitude, but the frequency of detection is low in all sampling areas.

- Eight inorganics including arsenic, barium, magnesium, mercury, nickel, vanadium, zinc, and cyanide were detected at concentrations 50% or more greater than the previously detected maximum. The maximum detected concentration of mercury increased by over an order of magnitude, but the frequency of detection is low in all sampling areas.

Cadmium dibenzo(a,h)anthracene, 2-butanone, and xylene are the only TCL parameters that were detected in wetland sediments, but not in waste/fill samples.

2.4 pH INVESTIGATION

Field measurements of pH at the Marilla Street Landfill made during the SWMFIP field investigation indicated that the shallow ground water is highly alkaline. The literature indicates that both slag and BOF dust, which are abundant waste materials at the site, have a high pH; and may be the source of the alkaline ground water. Because some of the pH values documented in sampling reports exceed the regulatory definition of a corrosive waste (12.5 standard units [S.U.]), a program was conducted during the Supplemental SWMFIP to assess the potential contribution of analytical errors to pH measurements.

Two potential analytical errors have been identified. pH is a measure of the hydrogen ion activity in solution. A glass electrode measures pH by sensing the electrical potential which develops on the surface of the glass electrode as a result of an ion exchange process at the glass surface. Hydrogen ions selectively exchange at the glass surface, the charge is transported through the glass, and the potential difference between the internal reference hydrogen ion activity and the test solution hydrogen ion activity is measured. At normal temperatures (i.e., between 0°C and 30°C) the response of a typical glass pH electrode is unimpaired between a pH ranging from 1.0 to 9.5 S.U. At pH greater than 9.5 S.U., errors due to sodium, lithium and potassium ions become pronounced, with the sodium causing the most severe error (Bates, 1964). At high pH values, the hydrogen ion activity is low. With few hydrogen ions in solution, sodium and other alkali metal ions are encouraged to bind to the glass electrode surface. The sodium and other alkali metal ions are perceived as hydrogen ions, making the observed hydrogen ion concentration artificially high resulting in an erroneously low pH reading (Bates, 1964).

The second potential analytical error relates to the calibration range of the pH meter. Calibration of the pH meter against buffer solutions of known pH establishes a relationship between electrical potential sensed by the pH electrode and pH. The response is linear within the range of pH values bracketed by the standard buffer solutions. Typically, field pH meters are calibrated with 7.0 and 10.0 pH buffer solutions for measuring alkaline groundwaters, and a linear response cannot be expected outside this pH range. Thus, the second potential pH error is the non-linear instrument response when measuring pH above 10 S.U.

In addition to potential analytical errors, leakage through the bentonite seal of groundwater which has contacted the cement-bentonite grout is also a potential source of the observed high pH values. A portion of the Supplemental SWMFIP focused on determining the validity of this theory.

The methodologies, results and conclusions of the field pH investigation are discussed in this section.

2.4.1 Methodology

To determine if analytical errors contribute to the high pH readings observed in the shallow overburden groundwater, field pH measurements were made on shallow groundwater from five monitoring wells and seven well points previously observed to have high pH using three different pH measurement methods. The first method used a standard glass electrode (Cole Parmer Part No. G-05992-20) calibrated with buffer solutions at 7.0 and 10.0 S.U. This method has historically been used at the site and represents the base condition. The second method used the same standard glass electrode calibrated with buffer solutions at 10.0 and 12.45 S.U. The 12.45 S.U. pH buffer was formulated using a calcium hydroxide buffer powder (Beckman Instruments, Inc. Part No. 3010). The second method was intended to illustrate the effects, if any, of non-linear calibration at high pH with a standard glass electrode. The third method employed a glass electrode designed for use in high pH and high sodium solutions to reduce sodium error. An amber glass double-junction electrode (Cole-Palmer Part No. G-05994-23) was selected. This electrode was calibrated with buffer solutions at 10.0 and 12.45 pH units. The objective of the third method was to measure the potential effect of sodium interference. All pH measurements were obtained using a digital field pH meter with automatic temperature compensation (Cole Parmer Part No. G-5669-00).

Shallow groundwater samples were collected from monitoring wells MW-2B, MW-3B, MW-12B, MW-16B, MW-17B and MW-10B, and well points P-1 through P-7. All pH meters were calibrated in the field and the selected wells and well points were purged prior to sample collection. The pH of a split sample from each well or well point was measured using the three methods.

To determine if cement-bentonite grout is impacting the pH of groundwater collected from the shallow overburden wells, an ungrouted well point (P-8) was driven adjacent to MW-16B. The well point was purged and a groundwater sample was collected for pH analysis using a standard glass electrode calibrated using 7.0 and 10.0 S.U. buffers. Groundwater from MW-16B was also collected and analyzed by the same method for comparison.

2.4.2 Results

The pH of samples from the 12 monitoring wells and well points measured by the three alternative methods are presented in Table 2-8. Variations of the pH measured by the standard glass electrode calibrated at 7.0 and 10.0 S.U. compared to pH measured by the standard glass electrode calibrated at 10.0 and 12.45 S.U., and the variation of the pH measured by the standard glass electrode calibrated at 10.0 and 12.45 S.U. compared to the low sodium error electrode calibrated at 10.0 and 12.45 S.U. are also presented. Sample pH was measured to be above 9.5 S.U. in eight out of 12 samples. Since sodium error is not pronounced below 9.5 S.U., and instrument calibration is expected to be linear between 7.0 S.U. and 10.0 S.U., only samples which had measured pH values exceeding 9.5 S.U. are discussed.

2.4.2.1 Effect of Calibration Range

pH was measured using standard glass electrodes calibrated using 7.0 and 10.0 S.U. buffers and 10.0 and 12.45 S.U. buffers. The readings obtained from the electrode calibrated using 10.0 and 12.45 S.U. buffers were expected to be more accurate since the response of the standard glass electrode calibrated using 7.0 and 10.0 S.U. buffers could potentially be non-linear outside of the calibration range. However, a consistent trend between the readings obtained with the two different calibration ranges was not observed. Four of the readings obtained using the standard glass electrode calibrated with 7.0 and 10.0 S.U. buffers were 1.1 to 4.8 percent higher than those obtained using the standard glass electrode calibrated with 10.0 and 12.45 S.U. buffers, while four were 1.3 to 3.7 percent lower.

2.4.2.2 Effect of Low Sodium Error Electrode

pH measured using a standard glass electrode calibrated with 10.0 and 12.45 S.U. buffers was compared to pH measured using a low sodium error glass electrode calibrated

TABLE 2-8

LTV STEEL
SUPPLEMENTAL SWMFIP

pH INVESTIGATION RESULTS

Sample Location	Standard Electrode			Low Sodium Error Electrode	
	Calib. Range 7.0-10.0 S.U.	Calib. Range 10.0-12.45 S.U.	Percent Deviation(1)	Calib. Range 10.0-12.45 S.U.	Percent Deviation(2)
Monitoring Wells:					
MW-14BR	12.47	11.90	+4.8	11.77	+1.7
MW-3B	12.32	12.48	-1.3	12.36	+1.0
MW-7B	12.33	12.78	-3.5	12.68	+0.8
MW-16B	12.05	11.92	+1.1	12.05	-1.1
MW-17B	11.07	10.86	+1.9	10.92	-0.5
Well Points:					
WP-1	11.56	11.21	+3.1	11.36	-1.3
WP-2	7.52	7.53	(3)	7.51	(3)
WP-3	7.52	7.37	(3)	7.66	(3)
WP-4	9.78	10.16	-3.7	10.08	+0.8
WP-5	11.68	12.13	-3.7	11.61	+4.5
WP-6	7.12	7.46	(3)	(4)	(4)
WP-7	6.85	7.02	(3)	6.73	(3)

Notes: (1) Percent Deviation =

$$\frac{\text{[Reading @ 7-10 Calibration] - [Reading @ 10-12.45 Calibration]}}{\text{[Reading at 10-12.45 Calibration]}} * 100\%$$

(2) Percent Deviation =

$$\frac{\text{Stnd. Elect. @ 10-12.45 Calib.] - [Low Na Elect. @ 10-12.45 calib.]}}{\text{[Low Na Elect. @ 10-12.45 calib.]}} * 100\%$$

(3) Percent Deviation was not calculated since only samples having pH>9.5 were considered subject to non-linear response and/or sodium error.

(4) Reading was not obtained using the low Na error electrode.

with 10.0 and 12.45 S.U. buffers. The low sodium error electrode was expected to provide more accurate pH readings since this electrode is designed to minimize the effect of sodium ions on pH measurement at high pH values (sodium ions are sensed as hydrogen ions by a standard glass electrode, thus yielding a falsely low pH reading). A consistent trend between the readings obtained with the standard glass electrode and the low sodium error electrode was not observed. Five out of eight readings obtained with the standard glass electrode were higher than readings obtained using the low sodium error electrode (0.8 to 4.5 percent higher), and three readings were lower (0.5 to 1.3 percent). However, the percent deviations between the low sodium error electrode and the standard electrode calibrated over the 10.0 to 12.45 range in general were lower than the percent deviations between the standard electrode calibrated over the 7.0 to 10.0 range and the standard electrode calibrated over the 10.0 to 12.45 range, indicating that the calibration range has a greater effect on pH measurement than electrode type.

The historical sodium content of groundwater from the five wells included in the eight sample points was examined to determine if a tendency toward positive or negative pH deviation existed as a function of sodium content. Again, no clear trend was observed, as wells with higher sodium concentrations (e.g., over 200 mg/l) exhibited both positive and negative pH deviations.

2.4.2.3 Effect of Grout

The pH of a sample collected from well point WP-8 installed cross-gradient from MW-16B was measured using a standard glass electrode calibrated with 7.0 and 10.0 S.U. buffers and compared to the pH of MW-16B measured in the same manner. To determine if the high pH of the groundwater collected from shallow monitoring wells and well points could be due to leakage of groundwater which has contacted the alkaline cement-bentonite grout through the bentonite seal, cement-bentonite grout was not used in the construction of WP-8. The pH of the WP-8 sample was measured to be 12.21 S.U., and the pH of groundwater from MW-16B was measured to be 12.05. Thus, the cement-bentonite grout does not appear to cause the elevated pH observed in the shallow groundwater samples.

2.4.3 Conclusions

The comparison of pH readings obtained using the standard glass electrode calibrated using 7.0 and 10.0 S.U. buffers and the other two methods did not reveal trends in the readings which would indicated that either of the alternative methods provided more accurate pH measurement than the standard glass electrode typically used for field pH measurement at the Marilla Street Landfill. Of the two factors anticipated to affect accuracy (viz., calibration range and electrode type), calibration range appears to have a greater impact. Thus, use of a standard glass electrode calibrated over the 10.0 to 12.45 S.U. range is recommended for all future field pH measurements at the Marilla Street landfill at monitoring locations historically known to have pH levels exceeding 9.5 S.U.

As demonstrated by this investigation, field pH measurements are inherently variable due to the lower sophistication level of field instruments and the inability to closely control field conditions. Thus, field pH measurements in the vicinity of 12.5 S.U. (e.g., ± 1.0 S.U.) should be confirmed by a laboratory pH measurement to provide the highest level of accuracy available.

The elevated pH of groundwater samples collected from shallow monitoring wells and well points does not appear to be caused by the alkaline cement-bentonite grout, given that the pH of groundwater from well point WP-8 was not significantly lower than the pH of groundwater collected from adjacent monitoring well MW-16B.

3.0 WETLANDS REMEDIATION FEASIBILITY STUDY WORK PLAN

3.1 FEASIBILITY STUDY GUIDANCE

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) was enacted in 1980 to provide the framework for identifying and remediating inactive hazardous waste sites. Within this framework, the engineering Feasibility Study (FS) serves as the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. While the Superfund Amendments and Reauthorization Act (SARA) of 1986 modified the requirements of CERCLA, the basic objectives and structure of the CERCLA process remain the same. The National Contingency Plan (NCP, 40 CFR Part 300, revised March 1990) is the vehicle through which the response powers of CERCLA are applied to a site.

This work plan describes the elements of the Feasibility Study process which will be performed for the wetlands adjacent to the Marilla Street Landfill site. The FS will be performed in accordance with the requirements of the NCP and CERCLA as amended by SARA as presented in the USEPA guidance document entitled "Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA" and other appropriate technical and administrative guidelines.

3.2 DEVELOPMENT OF PROPOSED RESPONSE

The Feasibility Study (FS) process for this site will utilize data obtained during the Solid Waste Management Facility Investigation Program (SWMFIP), Supplemental SWMFIP, and remedial investigations (conducted by others) for adjacent landfills as the basis for identifying, selecting and evaluating remedial action alternatives for consideration at this site. These information sources point to the following media to be addressed:

- Shallow groundwater discharging to nearby wetlands and
- Wetland sediment

General Response Actions will be identified based on the site conditions and characteristics identified in the SWMFIPs to address these media. The General Response Actions which are to be considered will include the "no action" alternative as a baseline against which other remedial measures, if necessary, can be compared. Examples of General Response Actions which are anticipated to address known site constituents and migration pathways are listed in Table 3-1.

3.3 IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

To assure that any recommended remedial alternatives comply with applicable or relevant and appropriate requirements (ARARs), all applicable or relevant and appropriate New York State Standards, Criteria and Guidelines (SCGs) will be identified. The New York State SCGs include any federal standards which are more stringent than state SCGs. Action-specific, location-specific, and chemical-specific ARARs will be identified for each media requiring remediation.

3.4 REMEDIAL TECHNOLOGY IDENTIFICATION AND SCREENING

A master list of potentially feasible remedial technologies will be developed concurrently. The remedial technology alternative decision logic will follow and include all the alternatives that are specified in the EPA guidelines for risk assessment and that are appropriate for the specific media identified at the site. For each General Response Alternative identified under Section 3.2, specific technologies will be identified. This identification process will be revised and updated during the Supplemental SWMFIP and data assessment tasks to ensure that all data required to define these technologies are available for the FS process. Wherever possible, proven alternative and innovative technologies will be included in the master list.

The technologies which are identified as potentially applicable for remediation of the site will then undergo a preliminary screening process based upon site conditions, waste characteristics and technical requirements. Specific considerations which will form the basis of this screening process will include the following:

TABLE 3-1

LTV STEEL COMPANY - MARILLA STREET LANDFILL
SUPPLEMENTAL SWMFIP

GENERAL RESPONSE ACTIONS IDENTIFIED FOR WETLANDS REMEDIATION

General Response Actions		Remedial Technologies
1.	No Action	None
2.	Minimal Action	Site Monitoring
3.	Removal	Excavation/dredging of all or some of the wetland sediments related to the site which present a significant environmental threat.
4.	Disposal	Disposal of excavated sediments on- or off-site.
5.	Containment	Capping and/or barrier walls to prevent or minimize constituent migration off-site.
6.	Diversion	Construction of cutoff walls or trenches to control groundwater in contact with hazardous constituents.
7.	Collection	Groundwater collection and pumping systems to collect groundwater for treatment.
8.	In Situ Treatment	Physical, chemical or biological treatment technologies suitable for groundwater or sediment treatment of the constituents without soil or waste disturbance.
9.	Direct Treatment	Physical/Chemical treatment processes which may include clarification, filtration, and pH adjustment to remediate groundwater for discharge from the site.
10.	Mitigation	Replace wetlands in-kind/in-place, elsewhere on-site or off-site, or with a different functional value.

- Technologies that would be extremely difficult to implement, that will not achieve remedial goals within a reasonable time frame, or that rely upon unproven technology will be eliminated from consideration;
- Technologies which are obviously limited by adverse waste characteristics (e.g., solubility, persistence, toxicity, material incompatibility) or adverse site conditions (e.g., high water table, slope) will be eliminated from consideration;
- Technologies for which performance records or inherent construction, operational or maintenance constraints are deemed unacceptable will be modified or eliminated from consideration; and
- Technologies that may influence the feasibility or effectiveness of other technologies will be modified or eliminated from consideration.

Wherever necessary, modifications to a specific technology will be considered before it is eliminated from consideration altogether.

3.5 DEVELOPMENT OF REMEDIAL ALTERNATIVES

The initial emphasis of this task will be to establish site-specific response goals which reflect the environmental concerns and applicable regulatory environmental criteria (standards, guidance, and advisories). Goals for source control measures will assure the minimization of constituent migration, if any, from the site, while the goals for migration management measures will assure that the impact of constituents, if any, that have migrated from the site are minimized or eliminated.

After certain conceptual technologies have passed the preliminary screening process, a limited number of remedial alternatives which appear to both adequately address potential site impacts of concern and achieve response goals will be considered. Each alternative may consist of one or more technologies which are combined to effectively address response criteria.

If a technology passes the preliminary screening procedure and is not used in the alternative identification process, or if one or more of the alternative categories described above is not considered applicable, justification of the reasoning will be provided.

3.6 SCREENING OF ALTERNATIVES

The alternatives identified in the preceding section will be screened to eliminate those that are clearly inappropriate for the site, thereby narrowing the list of potential alternatives for the detailed analysis. Three broad criteria will be used in the initial screening of alternatives, including:

- **Effectiveness.** Alternatives will be evaluated as to the degree of protection to the environment they afford; how significantly and permanently they reduce the toxicity, mobility, or volume of hazardous constituents, if any; or how they are effective in meeting medium-specific remedial action objectives.
- **Implementability.** Alternatives will be evaluated as to the technical feasibility and availability of the technologies each alternative would employ; the technical and institutional ability to monitor, maintain, and replace technologies over time; and the administrative feasibility of implementing the alternative.
- **Cost Effectiveness.** The costs of construction and any long-term costs to operate and maintain the alternatives will be established.

In addition, the following considerations will apply:

- Innovative alternative technologies will be carried through the screening process if there is a reasonable belief that they will offer the potential for better treatment performance or implementability; fewer or lesser adverse impacts to other available approaches; or lower costs for similar levels of performance than demonstrated alternative treatment technologies.
- The no-action alternative will be carried through the initial screening process to the detailed analysis.

3.7 DETAILED ANALYSIS OF ALTERNATIVES

Each remedial alternative which passes the preliminary screening process will be evaluated in detail regarding its technical, environmental, institutional, and cost effectiveness. The detailed evaluation will be conducted on the limited number of alternatives that remain after the completion of the alternative screening and NYSDEC review. Each potential alternative will be evaluated with respect to the following response goals:

- Short-term impacts and effectiveness
- Long-term effectiveness and performance

- Reduction of toxicity, mobility, or volume
- Implementability
- Compliance with standards, criteria, and guidelines;
- Overall protection of the environment
- Cost effectiveness
- State and community acceptance

Once all of the alternatives are evaluated according to the factors listed above, each alternative will be compared to the others using the above-listed factors and any other factors deemed appropriate for the site. Among the key comparisons will be an evaluation of the relationship between the degree of protection achieved and the estimated costs.

3.8 RECOMMENDED REMEDIAL ALTERNATIVE

Based on the engineering analysis presented in the FS, a remedial approach for the media requiring remediation will be recommended. This section of the FS report will present the conceptual design of the recommended remedial alternative and the cost associated with the approach.

3.9 FEASIBILITY STUDY REPORT

A draft report will be prepared to summarize the activities performed and to present the results and conclusions of the engineering analysis performed in the FS. Table 3-2 identifies the proposed outline of this Wetlands Remediation Feasibility Study Report. After review of the draft FS report by the NYSDEC, technical considerations and comments presented by the NYSDEC will be incorporated into the text and a final FS report will be prepared.

TABLE 3-2

MARILLA STREET LANDFILL
PROPOSED WETLANDS REMEDIATION FEASIBILITY STUDY
REPORT OUTLINE

EXECUTIVE SUMMARY

1.0 INTRODUCTION
  1.1 Purpose and Organization of Report
  1.2 Background Information (Summarize from SWMFIP Report)
    1.2.1 Site Location and Description
    1.2.2 Site History
    1.2.3 Nature and Extent of Contamination
    1.2.4 Contaminant Fate and Transport
    1.2.5 Public Health and Environmental Risk Assessment
  1.3 Identification of ARARs

2.0 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS
  2.1 Development of Remedial Action Objectives
  2.2 Development of General Response Actions

3.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES (if required)
  3.1 Identification and Screening of Technologies
    3.1.1 Medium #1
    3.1.1.1 Technology #1
    3.1.1.2 Technology #2
    3.1.2 Medium #2
    3.1.2.1 Technology #1
    3.1.2.2 Technology #2

4.0 DEVELOPMENT AND SCREENING OF ALTERNATIVES (if required)
  4.1 Development and Screening of Alternatives
    4.1.1 Alternative #1
    4.1.1.1 Alternative #1
      - Description
      - Effectiveness
      - Implementability
      - Cost
    4.1.1.2 Alternative #2
    4.1.2 Medium #2
    4.1.2.1 Alternative #1
    4.1.2.2 Alternative #2

TABLE 3-2 (Continued)

MARILLA STREET LANDFILL
PROPOSED WETLANDS REMEDIATION FEASIBILITY STUDY
REPORT OUTLINE

5.0 DETAILED ANALYSIS OF ALTERNATIVES (if required)
- 5.1 Introduction
- 5.2 Detailed Analysis of Alternatives
  - 5.2.1 Medium #1
  - 5.2.1.1 Alternative #1
    - 5.2.1.1.1 Description
    - 5.2.1.1.2 Assessment
      - Short-term impacts and effectiveness
      - Long-term effectiveness and performance
      - Reduction of toxicity, mobility, or volume
      - Implementability
      - Compliance with SCGs
      - Overall protection of human health and the environment
      - Cost
  - 5.2.1.2 Alternative #2
    - 5.2.1.2.1 Description
    - 5.2.1.2.2 Assessment
  - 5.2.2 Medium #2
  - 5.2.2.1 Alternative #1
  - 5.2.2.2 Alternative #2
- 5.3 Comparison of Alternatives
  - 5.3.1 Medium #1
    - Short-term impacts and effectiveness
    - Long-term effectiveness and performance
    - Reduction of toxicity, mobility, or volume
    - Implementability
    - Compliance with SCGs
    - Overall protection of human health and the environment
    - Cost
  - 5.3.2 Medium #2
- 5.4 Summary of Detailed Analysis
  - 5.4.1 Medium #1
  - 5.4.2 Medium #2

6.0 RECOMMENDED REMEDIAL ALTERNATIVES
- 6.1 Recommendations
- 6.2 Conceptual Design
- 6.3 Costs

MALCOLM PIRNIE

ATTACHMENT A

WETLAND DELINEATION REPORT

Wetland Delineation Report

Marilla Street Landfill
Buffalo, New York

LTV Steel Company
Cleveland, Ohio

Prepared by:

Malcolm Pirnie, Inc.
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January 1995
Project: 0848-256

WETLAND DELINEATION REPORT

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1.0 INTRODUCTION

The LTV Steel Company completed the construction of a final cover on the Marilla Street Landfill in 1993, and is now determining the potential impacts to adjacent wetlands. LTV Steel has retained Malcolm Pirnie, Inc. (MPI) to delineate affected wetlands and to evaluate the need for a wetlands mitigation plan. This report addresses the wetland delineation and evaluates existing conditions necessary for the development of a mitigation plan, if necessary.

The purpose of the wetlands delineation, as conducted by Malcolm Pirnie, Inc. (MPI) biologists on September 13 and 14, 1994 was to define and map the limits of onsite jurisdictional wetlands as determined by application of US Army Corps of Engineers (ACOE) methodology. Following the jurisdictional determination by the ACOE, the New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetland Division will review the federal wetland delineation boundary in order to compare it with NYS mapping. NYSDEC comments if any, will be included on the final wetland map.

It is the intent of this document to provide sufficient information to the regulatory branches of the NYSDEC and the Buffalo District of the ACOE to enable respective jurisdictional determinations concerning the delineated wetland boundaries. Information concerning the extent of regulated wetlands will be utilized using the ACOE's Wetland Evaluation Technique, Version 2.0 (WET) to evaluate and mitigate wetlands impacts.

2.0 SITE DESCRIPTION

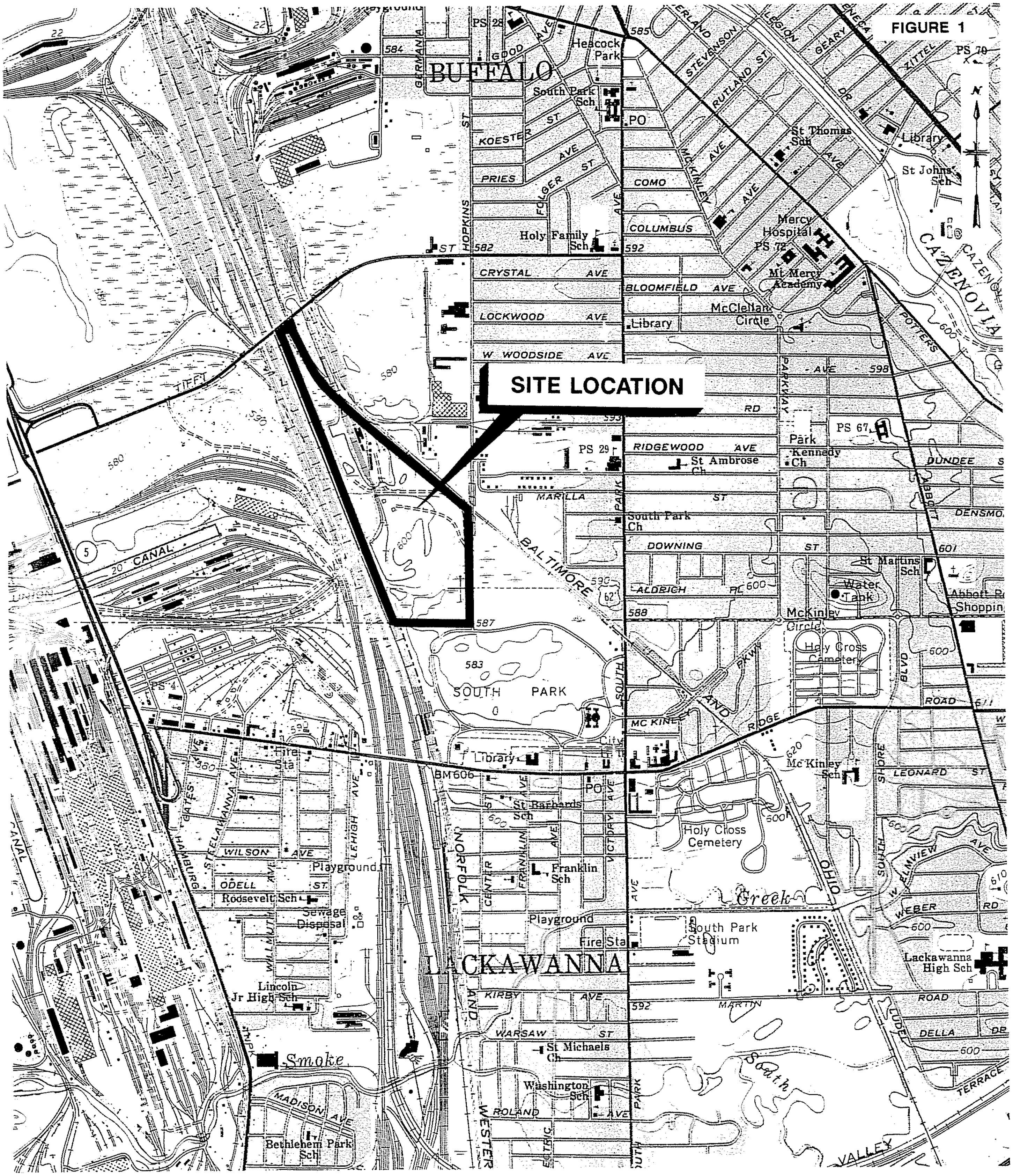
The Marilla Street Landfill (the landfill) is approximately 80 acres in size and is located on approximately 100 acres of land along Marilla and Hopkins Streets in the City of Buffalo, New York, (Figure 1). The site is owned by the LTV Steel Company. The NYSDEC has determined that the landfill is an inactive hazardous waste site.

The 100 acre-parcel is bordered to the south by the South Park Recreational Facility operated by Erie County, the west by active railroad tracks, and the north and east by inactive railroad tracks and Hopkins Street. The sources of waste material at the landfill are from the iron and steel operations at the Buffalo Plant of the LTV Steel Company, formerly known as Republic Steel Corporation. A variety of wastes have been disposed of at the site including blast furnace and basic oxygen furnace (BOF) slag, blast furnace and BOF precipitator dust, clarifier sludge, blast furnace bricks, tool scale, scrap wood, brick and construction debris. The construction of a landfill cover system and site landscaping was completed in 1993.

Except for the eastern portion bordered by Hopkins Street, the toe of slope for the remainder of the landfill is surrounded by either unnamed open water areas or drainage ditches filled with standing water, (Plate 1). For ease of reference to identified wetlands, the drainage ditches and open water areas shown on Plate 1 were designated by MPI according to their location based upon geographic orientation. These areas adjacent to the landfill represent the majority of wetlands found on-site. Two additional wetland areas beyond the landfill's perimeter exist on both sides of the railroad tracks to the north of the landfill.

A Solid Waste Management Facility Investigation Program (SWMFIP) was conducted at the landfill during the six-month period from January to July 1993. The SWMFIP report, submitted to NYSDEC in November 1993, presented a physical and chemical characterization of the site based on a groundwater, surface water, sediment, and waste/fill sampling program. The results indicated that waste/fill constituents are present in sediment and shallow groundwater. Shallow groundwater flow is intercepted by the open water areas. However, shallow groundwater discharge is presently minimized due to the ability of the landfill cover system to reduce hydraulic gradients along the groundwater flow path. Therefore, it is estimated that groundwater discharge to the wetlands is minor as compared

FIGURE 1



SOURCE: USGS, BUFFALO SE,NY. QUADRANGLE, 1965

LTV STEEL COMPANY - BUFFALO, N.Y.

MARILLA STREET LANDFILL

SITE LOCATION MAP

SCALE : 1"= 2000'

MALCOLM PIRNIE

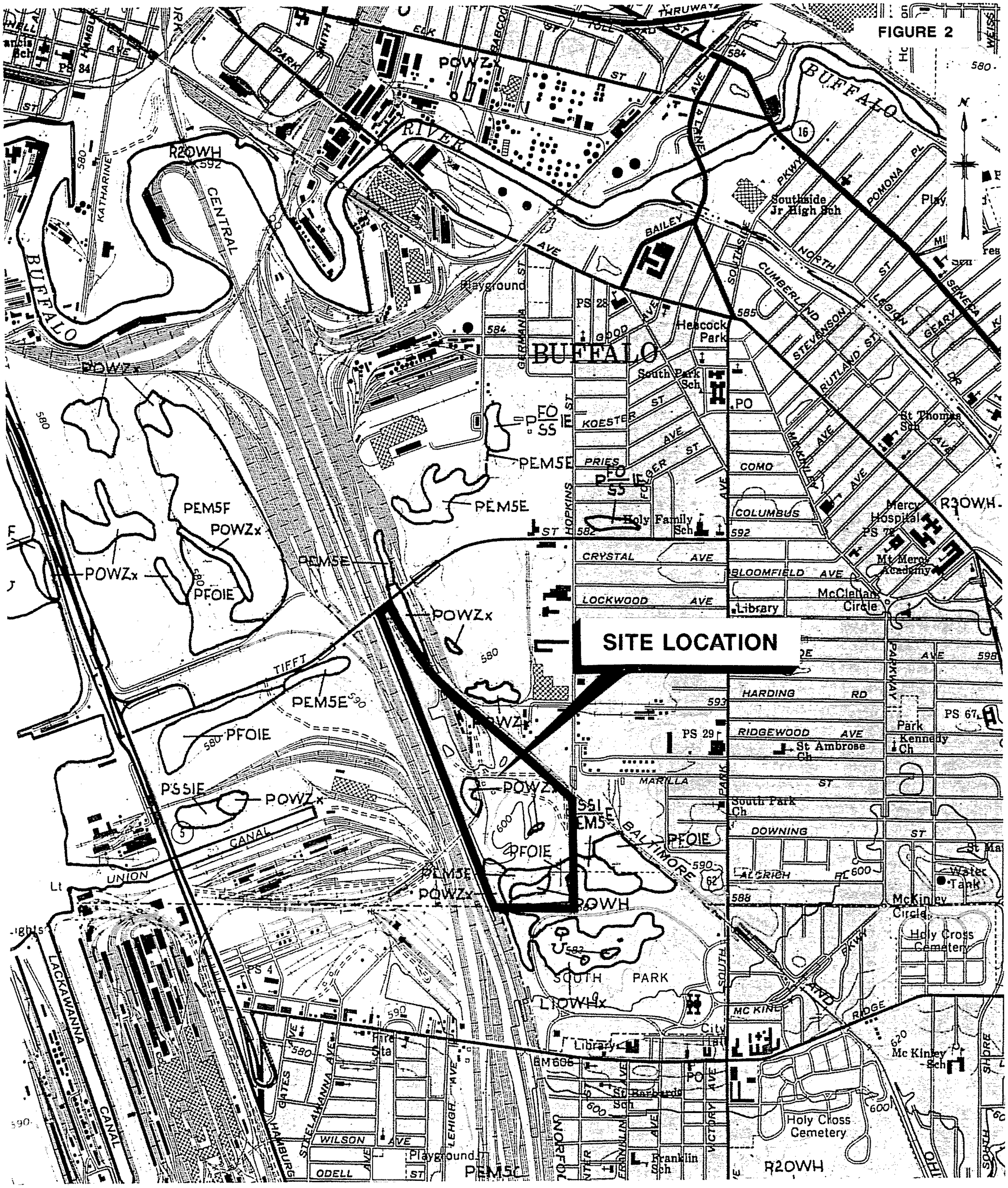
to runoff that collects from the landfill surface. Sampling investigations are continuing as part of the supplemental SWMFIP, prepared in July 1994.

Vegetation in the wetland areas included a predominance of Phragmites australis (Common Reed) and Lythrum salicaria (Purple Loosestrife). Vegetation in the undisturbed non-wetland areas primarily included Solidago canadensis (Canadian Goldenrod) and Leonurus cardiaca (Motherwort). The landfill itself was primarily part of a mowed landscaped cover that included species of the Gramineae (grass) family and Melilotus (clover) species. Plant community types are discussed further in Section 3.0, Steps 4-9.

Three types of wetlands are classified on the USFWS National Wetland Inventory (NWI) mapping within the delineated site boundary, (Figure 2). As shown on Plate 1, Wetlands D and portions of wetlands E and F are classified as POWZx which is Palustrine Open Water Intermittently Exposed/Permanent Excavated. The remainder of wetland F and a portion of G are classified as PEM5E which is Palustrine Emergent Narrow-leaved Persistent Seasonal Saturated. The classification for the remainder of wetland G is PFO1E which is Palustrine Forested Broad-leaved Deciduous Seasonal Saturated. Additional wetlands not mapped or classified that were found on-site included wetland A in the North Ditch along the eastern portion of the landfill, and wetland B and C on the fringe of North Pond West located to the north of the landfill's narrow toe-of-slope.

Due to the nature of prior and existing use of the property, it was often difficult to retrieve an 12-18" soil profile because of the resistance imposed by the crushed stone adjacent to the railroad tracks and the heavy clay used as capping material. On-site soils are discussed further in Section 3.0, Steps 12-15.

FIGURE 2



SOURCE: NWI, BUFFALO SE,NY. QUADRANGLE, 1978

LEGEND:

POWZx = PALUSTRINE OPEN WATER INTERMITTENTLY EXPOSED/PERMANENT EXCAVATED

PEM5E = PALUSTRINE EMERGENT NARROW-LEAVED PERSISTENT SEASONAL SATURATED

PFO1E = PALUSTRINE FORESTED BROAD-LEAVED DECIDUOUS SEASONAL SATURATED

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MARILLA STREET LANDFILL

NATIONAL WETLANDS INVENTORY MAP

SCALE : 1"= 2000'

3.0 METHODOLOGY

Malcolm Pirnie wetlands biologists identified wetland-nonwetland boundaries using the Corps of Engineers Wetlands Delineation Manual (Dept. of the Army, 1987) and the Memorandum on "Clarification and Interpretation of the 1987 Manual" (Dept. of the Army, March 1992). The routine determinations method was applied for the collection of data, since wetland areas delineated were small and had little vegetation diversity. Application of this procedure required identification of plant community types and characterization of vegetation, soils and hydrology using established criteria. Data were collected at the sampling stations noted on the forms in Appendix A and shown on Plate 1.

Within sample quadrants and along transects, dominant plant species for each vegetative stratum were classified using the National List of Plant Species That Occur in Wetlands: (Region 1) (US Fish and Wildlife Service, 1988). On-site soil series were identified from mapping provided in the Soil Survey of Erie County (USDA Soil Conservation Service, 1978). Soil bore holes along transects were attempted to a depth of 12 to 18 inches and observed for hydric soil characteristics and surficial ground water levels. Soils sampled at these locations were characterized for hydric indicators using Munsell Soil Color Charts (Munsell Color, 1990). Wetland hydrology was determined by the presence of saturated soils, and the depth to water as observed in a limited number of unlined, hand-augered bore holes.

The following is an outline of the steps taken to determine the presence of wetlands in accordance with the 1987 federal guidelines for a routine determination with onsite inspection.

Steps 1-3: Locate the Project Area. Determine Whether an Atypical Situation Exists. Determine the Field Characterization Approach to be Used.

The wetland areas on-site are located around the perimeter of most of the landfill and to the north of the landfills narrow toe-of-slope on both sides of the railroad tracks, as shown on Plate 1. Human induced alteration of the site has occurred only on the landfill portion, consequently atypical environmental conditions were not observed in the wetland areas on the project site. The field characterization approach used to delineate the wetlands was chosen as a result of the limited, linear nature of the wetland areas and their relative homogeneity with respect to vegetation, soils, and/or hydrologic regime.

Steps 4-9: Determine Whether Normal Environmental Conditions are Present. Characterize Plant Community Types. Classify Dominant Vegetation Species. Determine the Presence of Hydrophytic Vegetation.

Normal environmental conditions were present within the wetland plant communities. Problem areas were not observed. Non-wetland vegetation consisted primarily of landscaped grass and clover species with early successional herbaceous plants. The dominant species that comprise the plant communities, wetland and nonwetland, are listed and classified on the data forms in Appendix A. Data forms were completed for each of the wetland areas identified, and short transects of sampling points were run across the wetland-nonwetland boundaries in order to establish the wetland line. The wetland areas are labeled for reference (A through G) and shown on Plate 1.

Table 1 presents the dominant plant communities in the seven (A-G) wetland areas along with their indicator status:

Table 1

Dominant Plant Communities In On-Site Wetlands

Plant Species	Wetland Area Present	Indicator Status
Phragmites australis (Common Reed)	A, C, D, E, G	FACW
Lythrum salicaria (Purple Loosestrife)	A, B, F	FACW
Typha latifolia (Broad-Leaf Cattail)	A, E, G	OBL
Impatiens capensis (Touch-Me-Not, Spotted)	C, D, G	FACW

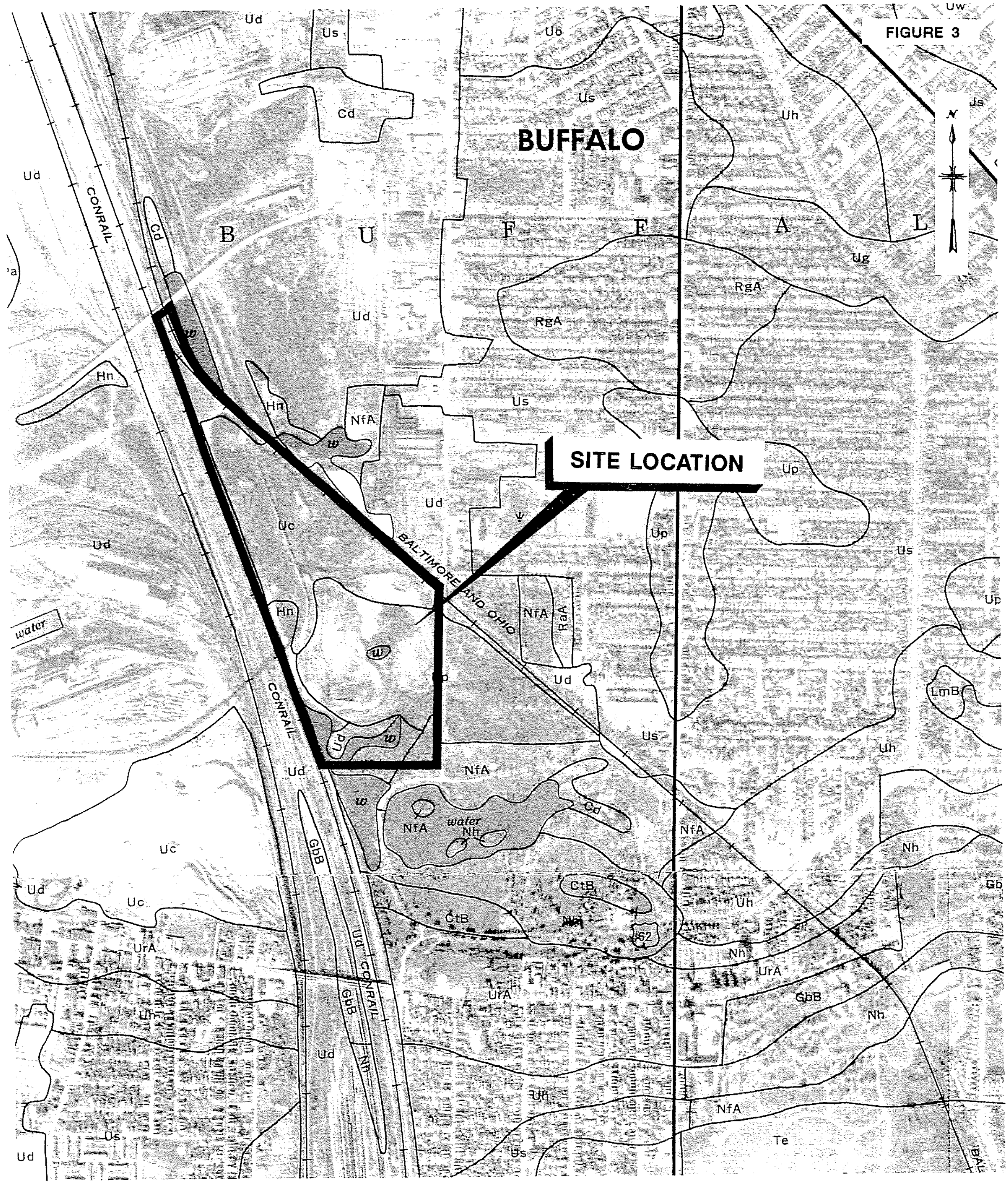
The dominant species in all seven of these communities are 100% facultative wetland (FACW) and/or obligate (OBL) plants, which fulfills the hydrophytic vegetation criterion for the federal methodology. The plant community types in nonwetland areas consisted of Solidago canadensis (Canadian Goldenrod), a facultative upland species (FACU), Leonurus cardiaca (Motherwort), a non-indicator species (NI) and landscaped cover vegetation on the landfill which included species of the Gramineae (grass) family and Melilotus (clover) species. These areas contained less than 50 percent OBL, FACW and/or facultative (FAC) plants, and did not fulfill the hydrophytic vegetation criterion.

Steps 10-11: Apply Wetland Hydrologic Indicators. Determine the Presence of Wetland Hydrology.

Positive wetland hydrology indicators for the federal methodology were present in each of the wetland areas on-site. The main wetland hydrologic indicators were saturated soils in the upper twelve inches and standing water in the sample bore hole at less than twelve inches from the surface. The federal hydrology criteria was met since both of these positive wetland hydrology indicators were present.

Steps 12-15: Characterize Wetland Soils. Apply Hydric Soil Indicators. Determine the Presence of Hydric Soils.

Using the federal methodology, hydric soils at the seven wetland sampling stations exhibited hydric characteristics that meet the federal criteria, (Figure 3). The Erie County SCS soils report classifies the soil at the site as Dumps (Dp), Urban Land (Ud) and Udorthents, Smoothed (Uc). The MPI field investigation revealed upland soils to be disturbed cover material which were characteristically non-hydric silty loams or silty clays sometimes with stones and pebbles over a predominantly clay layer. Most samples examined consisted of only the top three to nine inches due to augering resistance from the stones and heavy clay. In wetland locations where hydric characteristics were not obvious, soils were examined to a depth of 18 inches (or refusal) to determine whether positive hydric soil indicators were present. The two mapped wetland soils are classified as Haplaquolls, ponded (Hn) that form in natural and/or disturbed areas (i.e. manmade depressions) and Niagara silt loam (NfA) that is nearly level and somewhat poorly drained. The physical composition of the wetland soils were comparable to the upland soils with the exception of the hydric characteristics which included low chroma, organic streaking and the moisture content of soil. In addition to the mapped hydric soil areas, additional wetlands were found in areas



SOURCE: SCS, SOIL SURVEY OF ERIE COUNTY, 1978

LEGEND:

W = WATER
Dp = DUMPS
Ud = URBAN LAND
Uc = UDORTHENTS, SMOOTHED
Hn = HAPLAQUOLLS, PONDED
NFA = NIAGARA SILT LOAM

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MARILLA STREET LANDFILL

SOIL CONSERVATION SERVICE GENERAL SOILS MAP

SCALE : 1"= 1320'

that did not have mapped hydric soils. Table 2 lists the wetland/nonwetland soil sampling points and Munsell soil color notations.

Table 2
Munsell Soil Color Notations

Sampling Location	Hydric Soil	Non-Hydric Soil
A-1	0-3" 2.5Y 3/0	0-5" 10YR 3/2
A-5	0-4" 2.5Y 3/0	0-2" 2.5Y 5/4 2-8" 2.5Y 4/0
B-1	0-3" 2.5Y 3/2 3-12" 5YR 3/2	0-8" 10YR 4/4 8-15" 2.5Y 5/2
C-1	0-3" 10YR 5/3 3-15" 10YR 2/1	0-3" 7.5YR 4/3
D-1	0-5" 7.5YR 2/0	0-5" 7.5YR 3/2
E-1	0-4" 2.5Y 5/3 4-18" 2.5Y 5/0	0-2" 10YR 3/3
E-7	0-10" 2.5Y 4/0 10-15" 2.5Y 4/2	0-7" 10YR 4/6 7-9" 2.5Y 3/2
F-1	0-6" 2.5Y 5/2 6-15" 2.5Y 4/2	0-3" 2.5Y 5/4 3-12" 2.5Y 5/2
G-1	0-4" 2.5Y 4/2 4-16" 7.5YR 2/0 16-17" 2.5Y 5/2	0-1" 10YR 4/3 1-5" 2.5Y 5/3

Positive hydric soil indicators for wetlands A-D included low-chroma and an aquic moisture regime. Wetlands E, F and G had identical positive indicators with the addition of decomposing black organic material and organic streaking below 4-6". Detailed descriptions of soil conditions are found on the field data forms in Appendix A.

Step 16: Make Wetland Determination.

The wetland areas as shown on Plate 1 support the federal criteria for hydrophytic vegetation, wetland hydrology and hydric soils. Since wetland indicators for the ACOE methodology were present during the September 13th and 14th field investigation, the areas delineated meet the multiparameter criteria established for determination of ACOE jurisdictional wetlands. Photographs of the wetland systems are presented in Appendix B.

4.0 RESULTS AND CONCLUSION

Based on field investigations of vegetation, soils and hydrology, and the data recorded on forms in Appendix A, the wetland systems identified as A through G meet the federal criteria for wetland designation based on the application of the Corps of Engineers Wetland Delineation Manual (Dept. of the Army, 1987). The area of each of the wetlands and the total wetland acreage in the project area is shown in Table 3:

Table 3

Marilla Street Landfill Wetland Acreage

Wetland Area	Size In Acres
A	1.03
B	0.0082
C	0.37
D	0.50
E	2.22
F	0.09
G	0.62
Total Wetland Acreage	4.84

Plate 1 depicts the delineated boundaries between the onsite wetlands and upland areas. The wetland acreage was determined by using AUTOCADD software to calculate the area within the surveyed lines identifying Wetland A. Wetland areas B through G were determined by calculating the wetland area between the surveyed line and the wetland/open water interface. The distance between the surveyed line and the wetland/open water interface was measured in the field.

Freshwater wetlands are waters of the United States pursuant to Section 404 of the Clean Water Act and are under the jurisdiction of the ACOE. If impacts to the wetlands occur as a result of future site activities, those activities would be regulated under the Clean Water Act (33 CFR 323) and would have to comply with rules promulgated through the Nationwide Permit Program (NWP) (33 CFR 330), NWP #38 "Cleanup of Hazardous and Toxic Sites". In addition to the federal regulations, impacts to freshwater wetlands that are regulated by NYSDEC (6NYCRR Part 663) would require a state freshwater wetlands permit.

APPENDIX A
DATA FORMS

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	A-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Phragmites australis	H	FACW
2. Lythrum salicaria	H	FACW
3. Cornus amomum	S	FACW
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 3"

Depth of Saturated Soil: Surface"

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

__X__ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

__X__ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches

_____ Water-stained Leaves

_____ Local Soil Data

_____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Udorthents, smoothed

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-3"	A	2.5Y 3/0		Clayey silt

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

_____ Reducing Conditions

_X_ Gleyed or Low-Chroma

_____ Concretions

_____ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: Refusal at 3" due to large stones and fill material. Hydric soil criteria met.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York
Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	A-5

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Salix babylonica	T	FACW
2. Typha latifolia	H	OBL
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: 2"
Depth to Water in Pit: _____
Depth of Saturated Soil: _____

Wetland Hydrology Indicators

Primary Indicators:

_X_ Inundation
_X_ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Udorthents, smoothed

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-4	A	2.5Y 3/0		Gray clay

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
_____ Reducing Conditions
__X__ Gleyed or Low-Chroma

_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Refusal at 4" due to large quantity of rocks and small stones. Hydric soil criteria met.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	F-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Gramineae Family	H	FACU
2. Melilotus sp.	H	FACU
3. Festuca rubra	H	FACU
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 0%

(Excluding FAC)

Comments: Upland is part of the landscaped landfill cover that is mowed and maintained as a lawn. Vegetation criteria not met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: _____
Depth of Saturated Soil: _____

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
_____ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Udorthents, smoothed

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm
Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-3"	A	2.5Y 5/4		Loamy clay
3-12"	B	2.5Y 5/2		Gray clay

Hydric Soil Indicators

____ Histosol
____ Histic Epipedon
____ Sulfide Odor
____ Aquic Moisture Reg.
____ Reducing Conditions
____ Gleyed or Low-Chroma

____ Concretions
____ High Organic Content on Surface Layer
____ Organic Streaking in Sandy Soil
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain Below)

Remarks: Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York
Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	B-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Lythrum salicaria	H	FACW
2. Juncus effusus	H	FACW
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: 12"
Depth of Saturated Soil: Surface

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
__X__ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Udorthents, smoothed	Drainage Class:
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-3"	A	2.5Y 3/2	5YR 6/8	Clay with some sand
3-12"	B	5YR 3/2		Sand with stones

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
__X__ Aquic Moisture Reg.
_____ Reducing Conditions
_____ Gleyed or Low-Chroma

_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Refusal at 12" due to small stones.
Hydric soil criteria met..

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	C-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Phragmites australis	H	FACW
2. Impatiens capensis	H	FACW
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: _____
Depth of Saturated Soil: 3"

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
__X__ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Udorthents, smoothed

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-3"	A	10YR 5/3		Clay loam
3-15"	B	10YR 2/1		Sandy silt

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
_____ Reducing Conditions
__X__ Gleyed or Low-Chroma

_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Hydric soil criteria met.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	D-8

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Phragmites australis	H	FACW
2. Impatiens capensis	H	FACW
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: 1"
Depth of Saturated Soil: Surface

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
_X_ Saturated in upper 12 inches
_X_ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Urban Land

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-5"	A	7.5YR 2/0		Sandy silt with small stones

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

_____ Reducing Conditions

_X_ Gleyed or Low-Chroma

_____ Concretions

_____ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: Refusal at 5" due to large quantity of small stones. Hydric soil criteria met.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	E-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Phragmites australis	H	FACW
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Represents the vegetation community between E-1 and E-14. Vegetation criteria met.

HYDROLOGY

Recorded Data:

____ Tide Gauge
____ Aerial Photos
____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____
Depth to Water in Pit: 10"
Depth of Saturated Soil: 4"

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation
__X__ Saturated in upper 12 inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

____ Oxidized Root Channels in upper 12 inches
____ Water-stained Leaves
____ Local Soil Data
____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Haplaquolls, ponded

Drainage Class: Very Poor

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-4"	A	2.5Y 5/3		Sandy clay
4-18"	B	2.5Y 5/0		Clay

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
_____ Reducing Conditions
__X__ Gleyed or Low-Chroma

_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Hydric soil criteria met.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	E-7

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL
2. Lythrum salicaria	H	FACW
3. Juncus effusus	H	FACW
4. Panicum virgatum	H	FAC
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Represents the vegetation community between E-2 through E-13. Vegetation criteria met.

HYDROLOGY

Recorded Data:

____ Tide Gauge

____ Aerial Photos

____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____

Depth to Water in Pit: 10"

Depth of Saturated Soil: Surface

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation

_X_ Saturated in upper 12 inches

____ Water Marks

____ Drift Lines

____ Sediment Deposits

____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_X_ Oxidized Root Channels in upper 12 inches

____ Water-stained Leaves

____ Local Soil Data

____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Haplaquolls, ponded

Drainage Class: Very Poor

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-10"	A	2.5Y 4/0		Clay with some sand
10-15"	B	2.5Y 4/2		Clay

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

__X__ Reducing Conditions

__X__ Gleyed or Low-Chroma

_____ Concretions

_____ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: Oxidized rhizospheres were present in the upper 10" while black streaking was present below 10" due to decaying organic material . Hydric soil criteria met.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	F-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Lythrum salicaria	H	FACW
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

____ Tide Gauge
____ Aerial Photos
____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____
Depth to Water in Pit: 11"
Depth of Saturated Soil: 4"

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation
_X_ Saturated in upper 12 inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_X_ Oxidized Root Channels in upper 12 inches
____ Water-stained Leaves
____ Local Soil Data
____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Haplaquolls, ponded

Drainage Class: Very Poor

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-6"	A	2.5Y 5/2		Clay with silt
6-15"	A_1	2.5Y 4/2		Clay with sand
15-16"		NA		Pebbles and small stones

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

__X__ Reducing Conditions

_____ Gleyed or Low-Chroma

_____ Concretions

__X__ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: 0-4" had a high fibrous organic content.
6-15" had black streaking where decaying organic material was present. Hydric soils present.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York
Do normal conditions exist on site?	Yes	Community ID:	Wetland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	G-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Phragmites australis	H	FACW
2. Typha latifolia	H	OBL
3. Impatiens capensis	H	FACW
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 100%

(Excluding FAC)

Comments: Vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: 14"
Depth of Saturated Soil: 4"

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
__X__ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

__X__ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Haplaquolls, ponded

Drainage Class: Very Poor

Taxonomy (Subgroup):

Field Observations Confirm
Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-4"	A	2.5Y 4/2		Clay with some sand
4-16"	B	7.5YR 2/0		Clay with sand
16-17"	C	2.5Y 5/2		Clay

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
__X__ Reducing Conditions
__X__ Gleyed or Low-Chroma

_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: 0-4" had a high fibrous organic content.
4-17" had black streaking where decaying organic material
was present.

Wetland Determination

Hydrophytic Vegetation Present	Yes
Wetland Hydrology Present	Yes
Hydric Soils Present	Yes
Is this sampling point within a wetland?	Yes

Remarks: All three wetland parameters were present. A wetland determination was made.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York
Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	Yes	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	A-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Populus deltoides	S	FAC
2. Solidago canadensis	H	FACU
3. Artemisia vulgaris	H	FACU
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 33%

(Excluding FAC)

Comments: Vegetation criteria not present.

HYDROLOGY

Recorded Data:

____ Tide Gauge
____ Aerial Photos
____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____
Depth to Water in Pit: ____
Depth of Saturated Soil: ____

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation
____ Saturated in upper 12 inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

____ Oxidized Root Channels in upper 12 inches
____ Water-stained Leaves
____ Local Soil Data
____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Udorthents, smoothed

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	**Horizon**	**Matrix Color**	**Mottle Color**	**Soil Description**
0-5"		10YR 3/2		Dark loam

Hydric Soil Indicators

- _____ Histosol
- _____ Histic Epipedon
- _____ Sulfide Odor
- _____ Aquic Moisture Reg.
- _____ Reducing Conditions
- _____ Gleyed or Low-Chroma
- _____ Concretions
- _____ High Organic Content on Surface Layer
- _____ Organic Streaking in Sandy Soil
- _____ Listed on Local Hydric Soils List
- _____ Listed on National Hydric Soils List
- _____ Other (Explain Below)

Remarks: Refusal at 5" due to rock fragments and stones below soil surface. Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: Marilla Street Landfill

Applicant: LTV Steel Company

Investigator: Dennis Corelli

Date: 9/13/94

Municipality: Buffalo

State: New York

Do normal conditions exist on site? Yes

Is the site significantly disturbed? Yes

Is the area potential Problem Area? No

Community ID: Upland

Transect ID:

Plot ID: A-5

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Populus deltoides	S	FAC
2. Solidago canadensis	H	FACU
3. Leonurus cardiaca	H	NI
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 33%

(Excluding FAC)

Comments: Vegetation criteria not present.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches

_____ Water-stained Leaves

_____ Local Soil Data

_____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps	Drainage Class:
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
_____ Reducing Conditions
_____ Gleyed or Low-Chroma
_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	B-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Gramineae Family	H	FACU
2. Melilotus sp.	H	FACU
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 0%

(Excluding FAC)

Comments: Upland is part of the landscaped landfill cover that is mowed and maintained as a lawn. Vegetation criteria not met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: _____
Depth of Saturated Soil: _____

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
_____ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps	Drainage Class:
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

_____ Reducing Conditions

_____ Gleyed or Low-Chroma

_____ Concretions

_____ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	D-8

VEGETATION

Dominant Plant Species	Stratum	Indicator
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 0%

(Excluding FAC)

Comments: Upland vegetation not present. Upland portion includes the railroad right-of-way lined with crushed stone as well as piles of construction debris and soil adjacent to the bridge supports underneath Tift Street.

HYDROLOGY

Recorded Data:

_____ Tide Gauge
_____ Aerial Photos
_____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____
Depth to Water in Pit: _____
Depth of Saturated Soil: _____

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation
_____ Saturated in upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

_____ Oxidized Root Channels in upper 12 inches
_____ Water-stained Leaves
_____ Local Soil Data
_____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps	Drainage Class:
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

_____ Reducing Conditions

_____ Gleyed or Low-Chroma

_____ Concretions

_____ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/13/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York

Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	C-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Solidago canadensis	H	FACU
2. Cornus amomum	S	FACW
3. Leonurus cardiaca	H	NI
4. Gramineae Family	H	FACU
5. Melilotus sp.	H	FACU
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 20%

(Excluding FAC)

Comments: Upland is part of the landscaped landfill cover that is mowed and maintained as a lawn. Vegetation criteria not met.

HYDROLOGY

Recorded Data:

____ Tide Gauge
____ Aerial Photos
____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____
Depth to Water in Pit: ____
Depth of Saturated Soil: ____

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation
____ Saturated in upper 12 inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

____ Oxidized Root Channels in upper 12 inches
____ Water-stained Leaves
____ Local Soil Data
____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
_____ Reducing Conditions
_____ Gleyed or Low-Chroma
_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: Marilla Street Landfill	Date: 9/14/94
Applicant: LTV Steel Company	Municipality: Buffalo
Investigator: Dennis Corelli	State: New York
Do normal conditions exist on site? Yes	Community ID: Upland
Is the site significantly disturbed? Yes	Transect ID:
Is the area potential Problem Area? No	Plot ID: E-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Lonicera tatarica	S	FACU
2. Solidago canadensis	H	FACU
3. Artemisia vulgaris	H	FACU
4. Daucus carota	H	NI
5. Vicia sativa	H	FACU
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 0%

(Excluding FAC)

Comments: Vegetation criteria not present.

HYDROLOGY

Recorded Data:

____ Tide Gauge
____ Aerial Photos
____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____
Depth to Water in Pit: ____
Depth of Saturated Soil: ____

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation
____ Saturated in upper 12 inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

____ Oxidized Root Channels in upper 12 inches
____ Water-stained Leaves
____ Local Soil Data
____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

- _____ Histosol
- _____ Histic Epipedon
- _____ Sulfide Odor
- _____ Aquic Moisture Reg.
- _____ Reducing Conditions
- _____ Gleyed or Low-Chroma
- _____ Concretions
- _____ High Organic Content on Surface Layer
- _____ Organic Streaking in Sandy Soil
- _____ Listed on Local Hydric Soils List
- _____ Listed on National Hydric Soils List
- _____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York
Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	E-7

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Gramineae Family	H	FACU
2. Melilotus sp.	H	FACU
3. Daucus carota	H	NI
4. Euthamia graminifolia	H	NI
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 0%

(Excluding FAC)

Comments: Upland is part of the landscaped landfill cover that is mowed and maintained as a lawn. Vegetation criteria not met.

HYDROLOGY

Recorded Data:

- _____ Tide Gauge
- _____ Aerial Photos
- _____ Other

_____ No Recorded Data

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

Wetland Hydrology Indicators

Primary Indicators:

- _____ Inundation
- _____ Saturated in upper 12 inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- _____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

- _____ Oxidized Root Channels in upper 12 inches
- _____ Water-stained Leaves
- _____ Local Soil Data
- _____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps	Drainage Class:
Taxonomy (Subgroup):	Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfide Odor
_____ Aquic Moisture Reg.
_____ Reducing Conditions
_____ Gleyed or Low-Chroma

_____ Concretions
_____ High Organic Content on Surface Layer
_____ Organic Streaking in Sandy Soil
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:	Marilla Street Landfill	Date:	9/14/94
Applicant:	LTV Steel Company	Municipality:	Buffalo
Investigator:	Dennis Corelli	State:	New York
Do normal conditions exist on site?	Yes	Community ID:	Upland
Is the site significantly disturbed?	No	Transect ID:	
Is the area potential Problem Area?	No	Plot ID:	G-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Gramineae Family	H	FACU
2. Melilotus sp.	H	FACU
3. Leonurus cardiaca	H	NI
4.		
5.		
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 0%

(Excluding FAC)

Comments: Upland is part of the landscaped landfill cover that is mowed and maintained as a lawn.
Vegetation criteria not met.

HYDROLOGY

Recorded Data:

____ Tide Gauge
____ Aerial Photos
____ Other

____ No Recorded Data

Field Characteristics

Depth of Surface Water: ____
Depth to Water in Pit: ____
Depth of Saturated Soil: ____

Wetland Hydrology Indicators

Primary Indicators:

____ Inundation
____ Saturated in upper 12 inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators: (2 required)

____ Oxidized Root Channels in upper 12 inches
____ Water-stained Leaves
____ Local Soil Data
____ FAC-neutral Test

Remarks: Hydrology not present.

SOILS

Series and Phase: Dumps

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0-1"		10YR 4/3		Clayey silt
1-5"		2.5Y 5/3		Clay

Hydric Soil Indicators

_____ Histosol

_____ Histic Epipedon

_____ Sulfide Odor

_____ Aquic Moisture Reg.

_____ Reducing Conditions

_____ Gleyed or Low-Chroma

_____ Concretions

_____ High Organic Content on Surface Layer

_____ Organic Streaking in Sandy Soil

_____ Listed on Local Hydric Soils List

_____ Listed on National Hydric Soils List

_____ Other (Explain Below)

Remarks: Refusal at 5" due to heavy clay on landfill.
Hydric soil criteria not met.

Wetland Determination

Hydrophytic Vegetation Present	No
Wetland Hydrology Present	No
Hydric Soils Present	No
Is this sampling point within a wetland?	No

Remarks: Wetland parameters not present.

APPENDIX B
PHOTOLOG

PHOTO #1
Wetland delineation flag A-1.
View is from Marilla Street looking east into North Ditch.

PHOTO #2
Both A-5 wetland delineation flags.
View is to the northeast from the landfill toe-of-slope into North Ditch.

PHOTO #3
Wetland delineation flag B-1.
View is from the landfill toe-of-slope looking into North Pond West.

PHOTO #4
Panoramic view of wetlands B and C.
Looking left to right, view of wetland B is from northwest
to northeast into North Pond West from the landfill toe-of-slope.
The strip of Wetland C is shown to the right on the
eastern shore of North Pond West.

PHOTO #5
Wetland delineation flags B-4 and C-1.
View is from the landfill toe-of-slope looking north at
wetland C adjacent to North Pond West.

PHOTO #6
Wetland delineation flag C-1.
View is from the landfill toe-of-slope looking north into wetland.

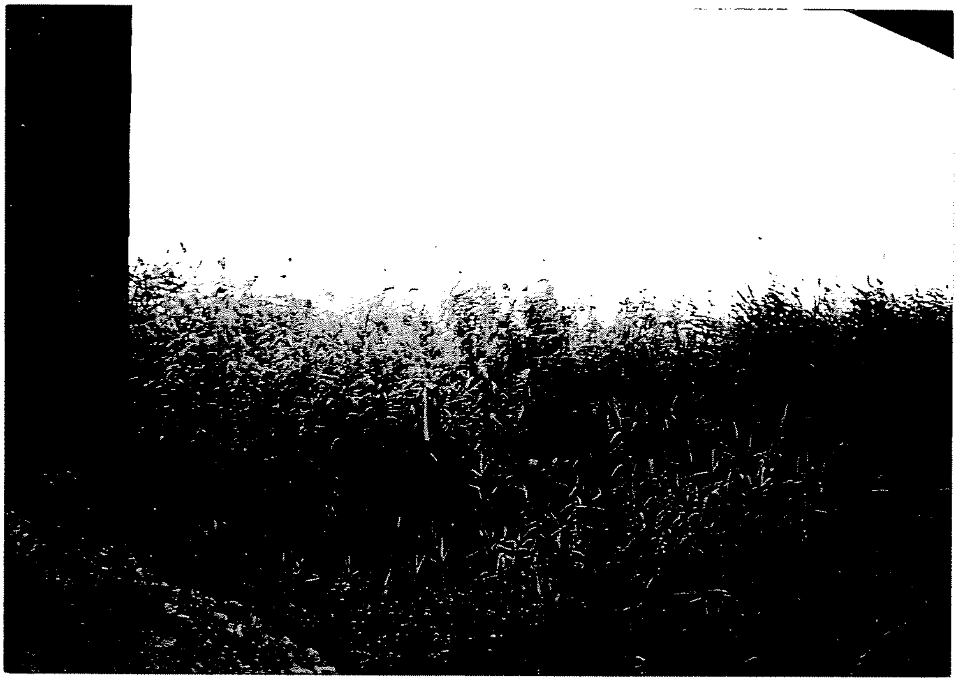

PHOTO #7
Wetland delineation flag D-8.
View is from underneath Tift Street looking southeast toward
North Pond East.

PHOTO #8
Wetland delineation flag E-1.
View is from the landfill toe-of-slope looking west into West Ditch.

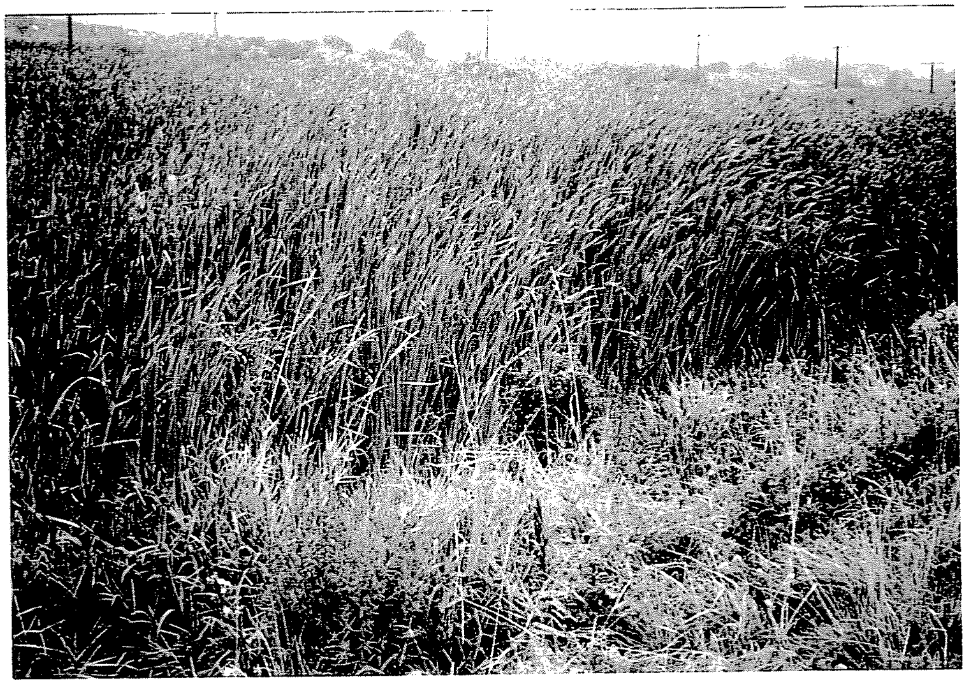

PHOTO #9
Wetland delineation flag E-7.
View is from the landfill toe-of-slope looking west into West Ditch.

PHOTO #10
Wetland delineation flags E-13 and B-2.
View is from the landfill toe-of-slope looking northwest into North Pond West.

PHOTO #11
Wetland delineation flag F-1.
View is from the landfill toe-of-slope looking west into West Ditch.

PHOTO #12
Wetland delineation flag G-1.
View is from the landfill toe-of-slope looking southwest into South Pond.

APPENDIX C
RESUMES AND CERIFICATIONS

ANTHONY M. RUSSO
Associate

EDUCATION

BS (Biology) 1978; Fordham University
MS (Environmental Biology and Ecology) 1980; Fordham University
Louis Calder Conservation and Ecology Study Center of Fordham University
Specialized Training: OSHA Health and Safety Operations Training and Supervisor Training for Hazardous Materials Sites
Wetland Training Institute – Federal Wetland Delineation Certification

REGISTRATION

Certified Ecologist
U.S. Fish and Wildlife Service Certified HEP Biologist

SOCIETIES

American Fisheries Society
American Society of Limnology and Oceanography
Ecological Society of America
Society of Wetlands Scientists

SUMMARY OF EXPERIENCE

As Senior Scientist and Manager of the Environmental Assessment and Planning Group, Mr. Russo specializes in wetlands, environmental impact studies, permitting, property transfer audits, biological and water quality studies, and landfill and hazardous waste site investigations. He has conducted Remedial Investigation/Feasibility Study (RI/FS) hazardous waste site investigations under Superfund and environmental studies under various regulations such as Section 404 of the Clean Water Act, National Environmental Policy Act (NEPA), and the New York State Environmental Quality Review Act (SEQRA). With a background in both hazardous waste site assessment and field ecology, Mr. Russo is uniquely qualified to perform ecological risk assessments in support of both state and federal Superfund sites. His background in aquatic biology and water quality studies encompasses freshwater, estuarine and marine habitats. This experience includes the evaluation of benthic, fish, and plankton communities as well as water quality sampling and analysis, field survey organization, fish entrainment and impingement studies, wetlands delineation, mitigation, assessment and regulatory interface. His project experience in environmental analysis and planning includes air quality, noise, solid waste, land use changes and socioeconomic issues.

DETAILED EXPERIENCE

1984 to Date	Malcolm Pirnie, Inc.

As Senior Scientist and Associate:

- Responsible for managing a multidisciplinary team of scientists in the delineation of wetlands throughout New York, New Jersey, Connecticut, Alabama, Mississippi, Ohio, Minnesota, and Puer-

(continued)

DETAILED EXPERIENCE (Continued)

1984 to Date Malcolm Pirnie, Inc. (continued)

to Rico, using techniques developed by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. Special studies include jurisdictional determinations and dredge and fill permit application pursuant to Section 404 of the Clean Water Act; nationwide permit determinations and application; wetland functional and value assessment using the computer-based Wetland Evaluation Technique (WET); and development of mitigation plans to replace or enhance wetland functional and habitat value.

- Responsible for preparing and managing both Phase I and Phase II property transfer audits for several major banks and real estate mortgage companies. Site uses include residential, commercial, and industrial, and range in size from 1 to 300 acres.

- Responsible for preparing and managing an RI/FS at a New York State Department of Environmental Conservation (NYSDEC) Class 2 hazardous waste site in the Village of Mamaroneck NY. The $1.6 million budget included an investigation of soils, ground water, surface water, and soil gas. Specialized studies included geophysical surveys to delineate drum burial areas and implementation of interim mitigating measures to control site drainage and reduce potential exposure routes to indigenous biota and the local population.

- Responsible for organizing and managing ecological risk assessment studies at state and federal Superfund sites throughout New York, New Jersey, and Minnesota. Techniques employed focus on assessing ecological values and characteristics on species, population and community levels. Sensitive habitats and species are identified, field measurements collected, results compared to published standards, and risks assessed both qualitatively and quantitatively.

- Responsible for preparing and managing a NEPA/Environmental Quality Board (EQB) environmental impact statement (EIS) for the Puerto Rico Aqueduct and Sewer Authority (PRASA). This unique project involves construction of a new 6,300-meter land and deep ocean outfall for the Ponce Regional Wastewater Treatment Plant (WWTP) under a 301(h) waiver application. Special studies to support permitting and engineering design included terrestrial ecology, wetlands, archaeology, aquatic biology, and oceanography.

- Responsible for preparing and managing the preparation of a long-term dredged material management plan for the New York District Corps of Engineers pursuant to a Congressional mandate under Section 412(b) of the Water Resources Development Act. Plan objectives were to reduce dredged material contamination, maximize beneficial reuse potential, and reduce the need for ocean disposal.

- Responsible for managing the mitigation, design and assessment of a 15-acre tidal freshwater marsh contaminated with cadmium at the Marathon Battery Superfund site. The final marsh design integrated dredging to remove highly contaminated sediments, clay encapsulation, soil placement and replanting to restore wetland functional benefits, enhance wildlife value and increase human use potential. This project won several prestigious awards in 1992, including the Grand Prize from the Academy of Environmental Engineers.

(continued)

DETAILED EXPERIENCE (Continued)

1984 to Date	Malcolm Pirnie, Inc. (continued)

- Responsible for managing the mitigation, design and assessment of 5.5 acres of riparian floodplain wetlands in Nyack NY for both habitat replacement and flood control. The final wetlands creation plan involved excavation of construction and demolition materials, soil replacement, grading, and selected plantings. Project goal was to restore a former floodplain wetland and provide flood storage area and assorted habitat opportunities for wetland-dependent fauna impacted by construction of a regional shopping mall.

- Responsible for managing the mitigation, design, and assessment of wetlands impacted by creation of an inland disposal site in Ft. Edward NY for encapsulation of dredged Hudson River PCB-contaminated sediments. The final plan was designed to create 35 acres of diversified wetlands with higher functional values than those on-site. The Corps' WET procedure was utilized to prioritize wetlands values in the design and achieve an interagency consensus of no net loss.

- Responsible for managing the mitigation and design of 2.5 acres of wetlands impacted by hazardous waste remedial efforts at the Newsom Bros. site in Columbia MS. The mitigation concept included design of a two-stage open water/emergency system to abate local flooding problems, replace and enhance lost wetland functional values, and create diversified habitat opportunities for aquatic biota. The final design plan achieved interagency consensus of no net loss in value.

- Responsible for managing a multidisciplinary evaluation of a 250-acre site selected for development as a major league baseball stadium and hotel complex. Conducted a hazardous waste site investigation of abandoned landfill areas to assess soil, soil gas and surface water contamination. Delineated wetlands to determine USCOE jurisdictional authority and performed subsequent quality analyses (WET) to assess degree of project impact. Performed and managed a year-long biological study of the project site including bird surveys, mammal trapping, fish and estuarine invertebrate collection and endangered species identification. Results of the various studies were then incorporated into Draft EIS, U.S. Corps of Engineers (USCOE) 404(b)(1) and New Jersey Department of Environmental Protection and Energy (NJDEPE) landfill investigation work plan reports.

- Responsible for preparing and managing a SEQRA EIS for remediation and expansion of a fireman's training center on Long Island. Site constraints at this NYSDEC Class 2 hazardous waste site included extensive ground water contamination, methane gas from an adjacent landfill, air emissions, and wetlands.

- Responsible for preparing and managing an extensive zone change SEQRA Draft and Final EIS for an 875,000-sf regional shopping center in West Nyack NY. Involved with follow-up reports investigating a broad range of socioeconomic and environmental issues. Performed a hazardous waste site investigation study for two 12-acre landfills included in the project site and listed on New York State Registry of Inactive Hazardous Waste Sites. Prepared an RI/FS report and an HRS model to facilitate the NYSDEC review of the site's hazard potential. Prepared a wetlands delineation report, wetlands mitigation plan, and 401 water quality certification information for submittal to state and federal agencies.

(continued)

DETAILED EXPERIENCE (Continued)

1984 to Date Malcolm Pirnie, Inc. (continued)

- Responsible for organizing and managing an ecological study to determine the impacts of discharging up to 100 mgd of chlorinated water into a New York City reservoir. Study included an evaluation of impacts to fish and benthos, as well as sediment chemistry and water quality. As a concurrent study, entrainment and impingement impacts to fish species at a Hudson River pumping station were evaluated in order to gauge the potential reductions to indicator species population levels.

As Project Environmental Scientist:

- Responsible for preparing and managing a zone change SEQRA EIS for a 525,000-sf regional shopping center in Yonkers NY. Supervised detailed noise modeling and carbon monoxide modeling analyses to assess project development impacts on adjacent residential neighborhoods.

- Responsible for preparing a Draft EIS for the Saratoga County NY Solid Waste Management Agency. The study involved evaluating existing environmental conditions at several prospective sites, waste stream characteristics, resource recovery technologies and alternatives analysis.

- Conducted fisheries and biological impact evaluations of reactivating the Chelsea Pumping Station on New York's Hudson River for the New York City Department of Environmental Conservation. This study included a detailed evaluation of fish entrainment and impingement impacts as well as chlorine toxicity effects throughout the reservoir system.

- Evaluated fishery resources of the New York State Barge Canal as part of a 10-year management plan developed by the New York State Department of Transportation (NYSDOT) identifying dredge reaches and disposal sites. Responsibility included a characterization of the fish community throughout the canal, delineation of habitat types and sensitive areas, and an assessment of the dredging effects on the canal's benthic community.

4/84-9/84 NUS Corporation

As Environmental Scientist: Conducted field investigations, preliminary assessments, and prepared remedial investigations for uncontrolled hazardous waste sites under Superfund throughout the New York-New Jersey area. Data gathered was then utilized to rank sites under the EPA Hazardous Ranking System and prepare feasibility studies.

1980-1984 Hazen and Sawyer, P.C.

As Biologist: Responsible for the field collection and analysis of water quality, effluent, and biological data relating to the effects of less than secondary treated effluent on the local biological community for the following WPCP facilities in support of 301(h) waiver applications: Newtown Creek, Red Hook, Hunts Point and Bowery Bay, North River, all in New York City, and the Town of Mamaroneck NY. Studies focused on water quality, hydrodynamics, sediment quality, and estuarine ecology of indicator species and populations. Biological study components included fish, benthos, phytoplankton, zooplankton, periphyton, and epibenthic macrofauna. (continued)

DETAILED EXPERIENCE (Continued)

1978-1980 Fordham University
Louis Calder Conservation and Ecology Study Center at Armonk NY

As Research Scientist: Participated in an evaluation of the lower food chain kinetics of PCBs in the Hudson River, assessment of the plankton community and primary productivity in New York Harbor, and data analysis of a joint U.S.-U.S.S.R. investigation of the Bering Sea. This latter joint venture included an evaluation of water quality, nutrient cycling, and micronutrient levels as they related to seasonal pulses in zooplankton and phytoplankton community shifts and densities.

1983-1986 Mercy College, New York

As Adjunct Professor: Taught courses in Environmental Biology, General Biology and Human Anatomy and Physiology.

1981-1984 Our Lady of Victory Academy, New York

As Department Chairman and Instructor: Responsible for maintaining academic standards and achievements of students in a diversified science curriculum. Taught advance placement courses in biology, ecology, and human physiology.

Wetland Training Institute

This certifies that

ANTHONY RUSSO

has completed the Wetland Training Institute, Inc.
Course entitled:

BASIC WETLAND DELINEATION

Given at Chincoteague, Va.

On 13 – 16 August 1991

Robert J. Pierce
Course Coordinator

U.S. FISH AND WILDLIFE SERVICE

U.S.
FISH & WILDLIFE
SERVICE
DEPARTMENT OF THE INTERIOR

This is to certify that

ANTHONY RUSSO

has successfully completed the requirements

of the course in

Habitat Evaluation Procedures

Given at TAMPA, FLORIDA On MAY 18-22, 1987

Chuck Solomon

Instructor

Regional Director, Region 8

The Ecological Society of America

Founded 1915

The Ecological Society of America,
upon the recommendation of the Board of
Professional Certification, hereby certifies that

Anthony Russo

meets the requirements as a certified

Ecologist

and is governed by the Society's Code of Ethics.

Certified by the Ecological Society of America
this 1st day of June 1991.

Arthur W. Cooper

JOAN M. HANSEN
Project Environmental Scientist

EDUCATION

BS (Environmental Science) 1987; Rutgers University, Cook College
Certification: Health and Safety Operations at Hazardous Materials Sites
Attended Conference on "Wetlands: Perspectives of the 80's" in St. Michael's, Maryland, October 2-4, 1987.
Attended short course on "Planning for New Jersey's Freshwater Wetlands: Ecology and Regulations," Rutgers University, New Brunswick NJ, January 7, 1988.
Completed U.S. Army Corps of Engineers Wetland Evaluation Technique, Version 2.0
Completed U.S. Fish and Wildlife Service course in Habitat Evaluation Procedures, March 1989.
Completed Course on Methodology of Delineating Wetlands, June 5-6, 1991.
Completed Course on Freshwater Wetland Construction, July 7-9, 1992.

REGISTRATION

Certified HEP Biologist
Federal Wetlands Delineation

SOCIETIES

The Torrey Botanical Club
Society of Wetland Scientists

SUMMARY OF EXPERIENCE

Ms. Hansen specializes in wetland delineations and permitting, biological assessments, hazardous waste site investigations, mitigation plans to replace or enhance wetland values, and landfill reclamation plans to create wildlife habitat. She has field experience which includes specialization in the identification and classification of flora and avifauna, freshwater and salt marsh ecology and environmental studies. She has lectured and taught on the subject areas of wetland vegetation, avifauna and estuarine ecology. Her recent post-graduate training includes further study in wetlands mitigation and hazardous material handling.

DETAILED EXPERIENCE

1987 to Date Malcolm Pirnie, Inc.

- As a member of a multidisciplinary team, responsible for wetland delineations in New York, New Jersey, Connecticut, Virginia, Ohio, Mississippi, Wisconsin and the Commonwealth of Puerto Rico, using, as necessary, methodologies approved by federal and/or state agencies; development of mitigation and monitoring plans to replace or enhance wetlands habitat and functional values; generation of landfill reclamation plans to create wildlife habitat; preparation of fill permit applications subject to Section 404 of the Clean Water Act; use of the Wetland Evaluation Technique (WET) and the Habitat Evaluation Procedures (HEP); and preparation of Environmental Impact Statements under SEQR and NEPA.

(continued)

DETAILED EXPERIENCE (Continued)

1987 to Date Malcolm Pirnie, Inc. (continued)

- Responsible for managing field tasks and permit preparation associated with closure of a 40-acre landfill in Norwalk Ct. Tasks required for federal and state permits included a wetland delineation, vegetation and wildlife inventories, threatened and endangered species survey.
- Responsible for conducting and managing wetland delineation, vegetation and wildlife inventories, environmental sampling, and wetland report preparation for a superfund site in Manitowac County Wisconsin. Prepared sampling programs to collect baseline data on water quality, benthos, and threatened and endangered species in a freshwater riverine system.
- As project leader, responsible for conducting wetland delineation, preparation of wetland delineation report, developing site mitigation plan and bid specifications for superfund site in Columbia MS.
- Responsible for managing field team to conduct wetland delineation and water, sediment and soil, and fish sampling on superfund site in Sidney NY.
- Assisted in initial site reconnaissance for PRASA to assess environmental conditions for construction of new ocean outfall for Ponce (PR) Wastewater Treatment Plant. Responsible for conducting wetland delineation, vegetation and wildlife inventories, and managing wetland delineation report preparation for federal permit application under Section 404 of Clean Water Act. Assisted in preparation of NEPA/EIS and 301(h) waiver applications.
- Conducted environmental assessment for international bridge project in Pharr TX - Reynosa Mexico.
- Prepared mitigation plan for habitat creation for New York State endangered species, and assisted in vegetation mapping of Albany Pine Bush for permit application in conjunction with proposed interim landfill construction by the City of Albany.
- Performed 1-year biological assessment of Premium River in Larchmont/New Rochelle NY, and prepared enhancement plans for estuarine complex.
- Responsible for conducting biological survey and wetland delineation for Health Impact Statement related to landfill expansion for Middlesex County Utilities Authority, East Brunswick NJ. Conducted survey for Federal Endangered Plant Species and prepared mitigation plan and bid specifications for terrestrial buffer zone.
- Responsible for conducting vegetation sampling and assisting in the preparation of mitigation plan and bid specifications for superfund site in Cold Spring NY.

(continued)

DETAILED EXPERIENCE (Continued)

1987 to Date Malcolm Pirnie, Inc. (continued)

- Responsible for managing field team to conduct wetland delineation on 250-acre site in Ft. Edward NY. Co-developed wetland mitigation and monitoring plan for Hudson River PCB reclamation project. Conducted biological survey for project areas along the upper Hudson River and on 250-acre site. Coordinated preparation of ACOE 404 permit and assisted in preparation of SEQR EIS.

- Performed wetland delineations and prepared wetland delineation reports required by federal and state agencies to permit projects that included solid waste landfills, resource recovery facilities, wastewater treatment facilities, fire training center, and superfund sites in a number of states including, New York, New Jersey, Connecticut, Virginia, Mississippi, Ohio, Wisconsin and the Commonwealth of Puerto Rico.

- Conducted environmental surveys to collect data on wetlands, vegetation communities, wildlife and threatened and endangered species for Environmental Impact Statements and Environmental Assessments on project sites in New Jersey, New York, Columbus OH, Penn Beaver PA, Fort Lee VA, Pharr TX, Jackson NC, Manitowac County WI and Ponce Puerto Rico.

- Assisted in the preparation of EIS under SEQR for planned development in Quoque, Long Island, landfill construction in Albany NY, Hudson River PCB reclamation, Fort Edwards NY, and firemen's training center in Long Island NY.

1985-1987 Hackensack Meadowlands Environment Center

As Teaching Intern: Responsible for teaching classes in estuary ecology and field ecology; conducting a field research project and preparing a paper on diversity of salt marsh vegetation; and developing and implementing weekend programs.

PRESENTATIONS

Conducted continuing education workshop for teachers on Wetland Vegetation for Alliance for New Jersey Environmental Education (ANJEE), at Ocean County Community College, Toms River NJ.

Prepared and presented lecture/slide program on flora and avifauna of Hackensack Meadowlands to Rutgers University's Forestry and Wildlife Club, New Brunswick NJ.

Presented slide program on Hackensack Meadowlands and lectured on history and medicinal uses of native wildflowers as invitee to Mohonk Mountain House, New Paltz NY.

Presented an in-house lecture and slide program on identifying wetland vegetation.

Hansen, J.M., 1989. "Translocation of Heavy Metals in Freshwater Marsh Plants in Cadmium-Contaminated Marsh," presented to Society of Wetland Scientists, June.

(continued)

PRESENTATIONS (Continued)

Hansen, J.M., 1990. "Avoidance of Wetland Impacts/Use of Nationwide Permits," presented at Seminar on Wetlands (*The Changing Regulatory Environment*) in Syracuse NY, December.

Hansen, J.M., 1992. "A Wetlands Mitigation/Creation Case Study – The Albany County Landfill," presented at Seminar on Wetlands (*Recent Changes in the Regulation of State and Federal Wetlands*), in Albany and Buffalo NY, February.

Hansen, J.M., 1992. "Wetlands Restoration and Creation – A Case Study," Marathon Battery Site presentation at Malcolm Pirnie Technical Symposium, November 2 and 3.

CERTIFICATE

This certifies that

JOAN HANSEN

has successfully completed a course in the use of the

Federal Manual for Identifying and Delineating Jurisdictional Wetlands

Rutgers University

June 1991

R. W. Tiner, Jr.
R. W. Tiner, Jr.

Veneman
P. L. M. Veneman

US Army Corps of Engineers

U.S. ARMY CORP OF ENGINEERS

WATERWAYS EXPERIMENT STATION

THIS IS TO CERTIFY THAT

Joan Hansen

HAS COMPLETED A TRAINING COURSE IN THE

WETLAND EVALUATION TECHNIQUE
VERSION 2.0

JUNE 20-24, 1988 WALTHAM, MA

Ellis J. Clairain, Jr. R. Daniel Smith Lawrence P.

Ellis J. Clairain, Jr. R. Daniel Smith Lawrence P. Rozas

ENVIRONMENTAL LABORATORY

The Ecological Society of America

Founded 1915

The Ecological Society of America,
upon the recommendation of the Board of
Professional Certification, hereby certifies that

Joan M. Hansen

meets the requirements as a certified

Ecologist

and is governed by the Society's Code of Ethics.

Certified by the Ecological Society of America
this 1st day of May 19 93 .

Chairman, Board of
Professional Certification

Jane Lubchenco
President

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DENNIS N. CORELLI
Environmental Scientist

EDUCATION

BS (Environmental Science) 1988; Marist College
OSHA (Hazardous Waste Health & Safety Training Course) 1993
OSHA (Supervisory Training) 1993
USEPA Region II (Organic Data Validation) 1989
Wetland Training Institute (Training Based For The Wetland Delineator Certification Program) 1994

SUMMARY OF EXPERIENCE

Mr. Corelli has been involved with environmental projects ranging from site quality assurance (QA) and health and safety to preparation of environmental documents and permits. He has worked on proposed and active projects in the states of New York, New Jersey, Connecticut, Pennsylvania, Wisconsin, Florida and Puerto Rico. For the United States Environmental Protection Agency (USEPA) Alternative Remedial Control Strategies (ARCS) program and the United States Army Corps of Engineers (USCOE), his extensive field experience and related activities has included the interpretation of data, as well as sample management duties, trip reports, QA audits, permit applications and Remedial Investigation (RI) reports. In addition to federal work, Mr. Corelli has also been involved in the preparation of Environmental Health and Impact Statements (EIS), Ecological Risk Assessments (ERA), Biological Assessments and Permit Applications for all state environmental agencies where he has worked on projects.

DETAILED EXPERIENCE

1988 to Date	Malcolm Pirnie, Inc.

- Performed a wetland delineation on the City of Norwalk's closed sanitary landfill in Norwalk CT.
- Prepared the Natural Resources Assessment (ERA) for the Old Bath Landfill, NYSDEC Superfund site in Old Bath NY.
- Validated all Level III organic and inorganic data taken at the Plattsburgh (NY) Air Force Base, Fort Drum Army Base, and Vineland Chemical Plant site investigations for the USCOE, Kansas City District.
- Prepared sections of the draft environmental impact statement (DEIS) and 301(h) Waiver Application for the Ponce Wastewater Treatment Plant in Ponce PR. Also performed benthic macroinvertebrate sampling from the Bahia de Ponce and the Caribbean Sea.
- Supervised the field testing and remediation of soil contaminated with petroleum hydrocarbons at the United States Federal Courthouse construction project for BPT Properties, New York NY.
- Performed benthic macroinvertebrate sampling in the Branch River for the USEPA Lemberger Landfill Superfund project in Manitowoc WI.
- Performed audits of EIS and associated public hearing comments regarding the Davids Island Development project for the Towns of Mamaroneck, Larchmont, and Pelham NY.

(continued)

DETAILED EXPERIENCE (Continued)

1988 to Date Malcolm Pirnie, Inc. (continued)

- Conducted extensive surface water and sediment sampling at the Taylor Lane Leaf Compost Superfund site RI for the Town of Mamaroneck.
- Conducted sediment sampling and processing of aluminum core tube samples taken from the Hudson River at the USCOE Marathon Battery Superfund site in Cold Spring NY.
- Prepared the document "An Overview of Ecological Risk Assessment Requirements." This document provides a broad overview and quick understanding of the ecological risk assessment guidelines for managers of USEPA hazardous waste sites.
- Researched and prepared report concerning endangered species within and surrounding Lake Purdy and the Locust Fork for the City of Birmingham AL Waterworks and Sewer Board.
- Performed noise survey for the proposed expansion of the Nassau County Fireman's Training Center and proposed construction of the Ellis Island/Liberty Island bridge for the National Park Service (NPS).
- Conducted sample management and data validation for USEPA Region II ARCS projects, including Preferred Plating and Action Anodizing Superfund sites.
- Served as site Quality Assurance Coordinator for Preferred Plating Superfund site.
- Performed water, sediment, and electrofishing sampling from several off-site ponds for the Sidney Landfill Superfund Project's Ecological Risk Assessment, Sidney NY.
- Conducted perimeter soil sampling and subsequent data validation for the Marathon Battery Superfund site.
- Site Health and Safety officer for groundwater well and piezometer installation at the Taylor Lane Leaf Compost Superfund site for the Town of Mamaroneck NY.
- Responsible for updating and preparing the Fish Monitoring Program as part of the Hudson River Long-Term Monitoring PCB Project for the New York State Department of Environmental Conservation (NYSDEC).
- Performed field sampling and processing of water, sediment, and macroinvertebrate samples from discharge ponds for the Federal Paper Board, Inc., Ecological Risk Assessment, Sprague CT.
- Observed environmental noise and dust testing for the York County PA resource recovery facility to ensure validity according to protocol.
- Involved with reopening the Chelsea pumping station during the drought emergency in New York City. Coordinated and performed total residual chlorine analysis of reservoir water; surveyed and sampled fish, reservoir sediment, benthic macroinvertebrates, and water quality.

(continued)

DETAILED EXPERIENCE (Continued)

1988 to Date	Malcolm Pirnie, Inc. (continued)

- Responsible for tracking and updating permits for solid waste projects in New Jersey, Pennsylvania and Florida.
- Expedited permitting procedures for landfills and resource recovery facilities in New York, New Jersey, Pennsylvania and Florida. Researched Long Island well and groundwater permits for North Hempstead NY resource recovery facility. Involved in preparation of an EIS for Edgeboro NJ landfill expansion.

Fall 1987	Poughkeepsie Water Purification Plant

Performed regulated state and federal procedures on the biological, chemical and physical properties of water.

Wetland Training Institute

This certifies that

DENNIS CORELLI

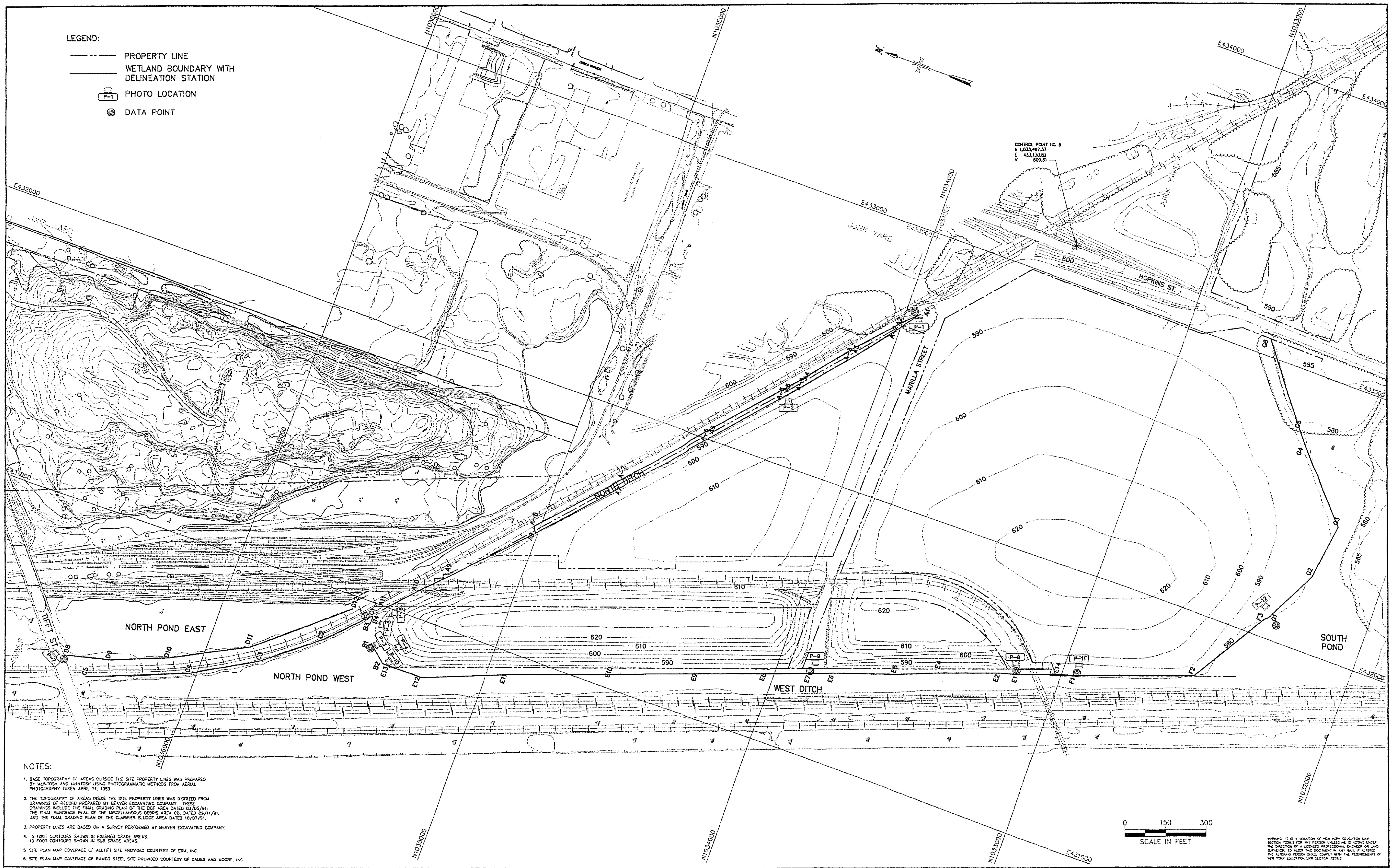
has completed training based in part on the U.S. Army Corps of Engineers Wetland Delineation Manual Technical Report Y-87-1 (1987 Manual), as provided for in the training materials developed in conjunction with Section 307(e) of the Water Resources Development Act of 1990 for the Wetland Delineator Certification Program

Given at Frederick, Maryland

On 6 - 10 June , 1994

Robert J. Pierce

Course Coordinator



LEGEND:

— - - —	PROPERTY LINE
———	WETLAND BOUNDARY WITH DELINEATION STATION
P-1	PHOTO LOCATION
◎	DATA POINT

NOTES:

1. BASE TOPOGRAPHY OF AREAS OUTSIDE THE SITE PROPERTY LINES WAS PREPARED BY McINTOSH AND McINTOSH USING PHOTOGRAMMATIC METHODS FROM AERIAL PHOTOGRAPHY TAKEN APRIL 14, 1989.
2. THE TOPOGRAPHY OF AREAS INSIDE THE SITE PROPERTY LINES WAS DIGITIZED FROM DRAWINGS OF RECORD PREPARED BY BEAVER EXCAVATING COMPANY. THESE DRAWINGS INCLUDE THE FINAL GRADING PLAN OF THE BOF AREA DATED 03/05/91; THE FINAL SUBGRADE PLAN OF THE MISCELLANEOUS DEBRIS AREA CO. DATED 09/11/91; AND THE FINAL GRADING PLAN OF THE CLARIFIER SLUDGE AREA DATED 10/07/91.
3. PROPERTY LINES ARE BASED ON A SURVEY PERFORMED BY BEAVER EXCAVATING COMPANY.
4. 5 FOOT CONTOURS SHOWN IN FINISHED GRADE AREAS. 10 FOOT CONTOURS SHOWN IN SUB GRADE AREAS.
5. SITE PLAN MAP COVERAGE OF ALLTIFT SITE PROVIDED COURTESY OF ERM, INC.
6. SITE PLAN MAP COVERAGE OF RAMCO STEEL SITE PROVIDED COURTESY OF DAMES AND MOORE, INC.

WARNING: IT IS A VIOLATION OF NEW YORK EDUCATION LAW SECTION 7209.2 FOR ANY PERSON UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR, TO ALTER THIS DOCUMENT IN ANY WAY. IF ALTERED THE ALTERING PERSON SHALL COMPLY WITH THE REQUIREMENTS OF NEW YORK EDUCATION LAW SECTION 7209.2

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES D.C.
DWN K.L.
CKD

LTV STEEL COMPANY
BUFFALO, NEW YORK

MARILLA STREET LANDFILL
WETLAND DELINEATION
PLATE 1
SCALE: AS NOTED

MALCOLM PIRNIE, INC.
DATE SEPTEMBER 1994
SHEET 1 OF 1
DWG. NO. $LTV25

3576 0848256200 I:\ACAD\PROJ\08482562\$LTV25 Scale: 1:1 Date: 01/04/1995 Time 15:41

ATTACHMENT B

ASSESSMENT OF BASELINE WETLAND FUNCTIONAL VALUES

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APPENDIX

MALCOLM
PIRNIE

ASSESSMENT OF BASELINE WETLAND FUNCTIONAL VALUES MARILLA STREET LANDFILL

April 1995

MALCOLM PIRNIE, INC.

One International Boulevard
Mahwah, New Jersey 07495

0848-256

1.0 PURPOSE AND OBJECTIVES OF WET APPLICATION

The Army of Corps of Engineers Wetland Evaluation Technique (Version 2.0), also known as WET, was applied to wetlands on the Marilla Landfill site to identify existing wetland functions and values. In the event on-site wetlands are affected during future site activities, the WET data can be used in the development of wetland mitigation plans, if needed. The data will provide guidance for the development of plans to restore or enhance existing wetland functions and values. The WET assessment generates a qualitative summary of wetland functions and values. Functions are defined as the physical, chemical, and biological processes or characteristics of a wetland, and values as the wetland processes or characteristics that are valuable or benefit society. For the evaluation presented in this report, WET was applied to the most extensive level for each of the model's parameters: social significance, effectiveness and opportunity.

- Social Significance, Levels 1 and 2 - WET assesses the value of a wetland to society with regard to its natural features, economic value, uniqueness and strategic location, i.e. flood control, threatened or endangered species habitat, recreation.
- Effectiveness and Opportunity, Levels 1, 2, and 3 - Effectiveness assesses the wetland functions based on chemical, physical or biological characteristics. Opportunity assesses the ability of a wetland to perform a function to its level of capability.

Of the three WET parameters, only the effectiveness scores rate a wetland for its probability to perform specific functions. The functions evaluated by WET include the following:

- Groundwater Recharge
- Floodflow Alteration
- Sediment/Toxicant Retention
- Production Export
- Wildlife D/A Breeding
- Wildlife D/A Wintering
- Uniqueness/Heritage
- Groundwater Discharge
- Sediment Stabilization
- Nutrient Removal/Transformation
- Wildlife Diversity/Abundance
- Wildlife D/A Migration
- Aquatic Diversity/Abundance
- Recreation

These wetland functions are evaluated using a series of questions (predictors) relating to the characteristics of the wetland. The answers to the questions are then evaluated by wetland function keys which score each wetland function with a rating of "high," "moderate," or "low". The questions/predictors used by WET describe the specific wetland characteristics which identify the functions and determine their effectiveness. As shown in Table 1 and Appendix A, WET does not score all wetland functions for the Social Significance and Opportunity parameters.

To initiate WET, the program requires identification of an assessment area, (AA) and an Input Area (IA). As shown on Figure 1, the AA is the area encompassing the wetland system which includes the North and South Ponds and the North and West Ditches. This wetland system is hydrologically linked by intermittent flow from South Pond northward. The input zone which is an area extending 300 feet outward from the AA, influences the functions and values of the AA.

The goal of this WET assessment is to generate data on existing wetland functional values that can serve as baseline information for developing a wetlands mitigation plan, if required. The WET data can serve as a guide to develop a mitigation plan that attempts to restore wetlands with equal or greater functional values than existing wetlands. Typically, replacement of in-kind wetlands is required by regulatory agencies. For the Marilla Street Landfill, depending on the area that may be affected by potential remediation, wetland replacement is likely to require restoration of emergent marsh and/or open water habitat.

2.0 SITE HISTORY

In 1993, the LTV Steel Company completed the construction of a final cover system at their Marilla Street Landfill site in the City of Buffalo, New York. The landfill occupies approximately 80 acres of the 100-acre site located between Marilla and Hopkins Streets in the City of Buffalo, New York. The New York State Department of Environmental Conservation (DEC) has listed the landfill as an inactive hazardous waste site. As part of the site evaluation process, wetlands adjacent to the landfill were delineated and existing conditions assessed. The data collected will be utilized for the potential development of a wetlands mitigation plan, if required. Because site evaluation work is on-going, specific site remediation requirements have not been identified. Furthermore, impacts to wetlands

TABLE 1

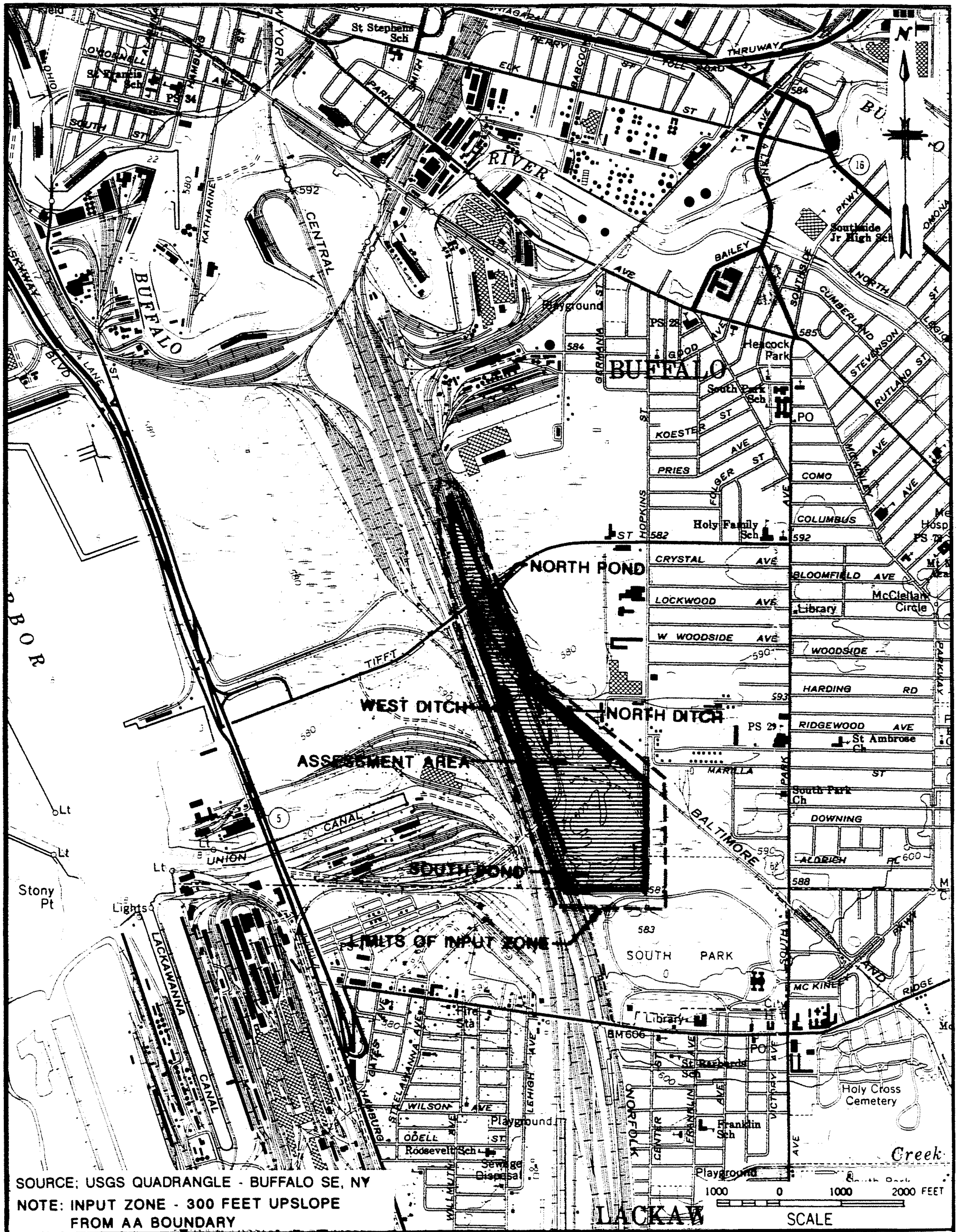
Summary of WET Evaluation Results for Wetlands on Marilla Street Landfill Site

Functional Value	Social Significance	Effectiveness	Opportunity
Ground Water Recharge	L	U	* (1)
Ground Water Discharge	L	H(2)	*
Floodflow Alteration	L	H	H
Sediment Stabilization	L	H	*
Sediment/Toxicant Retention	M	H	H
Nutrient Removal/Transformation	L	H	M
Production Export	*	M	*
Wildlife Diversity/Abundance	H(3)	*	*
Wildlife D/A Breeding	*	L	*
Wildlife D/A Migration	*	L	*
Wildlife D/A Wintering	*	L	*
Aquatic Diversity/Abundance	L	L	*
Uniqueness/Heritage	L	*	
Recreation	L	*	

Note: (1) - * WET does not evaluate the function for this parameter.

(2) - A site water balance determined that groundwater discharges to the wetlands on-site.

(3) - The high score reflects the USFWS designation of the area as a significant waterfowl use area.



SOURCE: USGS QUADRANGLE - BUFFALO SE, NY

NOTE: INPUT ZONE - 300 FEET UPSLOPE
FROM AA BOUNDARY

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LTV STEEL COMPANY
BUFFALO, NEW YORK
MARILLA STREET LANDFILL
EVALUATION SITE

MALCOLM PIRNIE, INC

FIGURE 1

resulting from site remediation have not been identified, therefore the WET (Version 2.0) assessment values discussed in this report reflect existing, pre-remedial site conditions.

Data collected on the landfill during the Solid Waste Management Facility Investigation Program indicate that there are a number of site conditions that potentially affect the functional values of surrounding wetlands. Analyses of groundwater, surface water, sediment pore water and sediment samples show that chemical constituents of the waste have migrated to surrounding wetlands. Groundwater flows to the site from the east and discharges to surface waters along its north, west, and south boundaries into adjoining wetlands. Hydrogeological studies indicated that the landfill is underlain by lacustrine silty sands with thin organic silt layers and a confining unit below comprised of poorly permeable lacustrine silty clay. Below the clay layer is a sandy reworked till underlain by fractured shale and limestone. A site water balance performed for the landfill shows that water infiltrating the landfill cover is discharged primarily to surface waters that surround the site.

The shallow groundwater that discharges to surface waters exhibits an alkaline pH that exceeds the values of 6NYCRR Part 703 Class GA Groundwater Quality Standards (GWQS) of 6.5 to 8.5 units. Several inorganics (antimony, iron, lead, manganese, sodium, and cyanide) detected in the groundwater exceeded the GWQS. The concentrations of volatile and semi-volatile organic compounds detected in groundwater samples were low to moderate and locally exceeded NYS standards.

Analyses of surface waters show that total iron and cyanide exceeded the NYS Class "D" surface water standards. Sediment samples indicate that waste/fill material is present in the upper one to five feet of sediment on-site. Sediments sampled from the North Pond contained high iron concentrations (16.6% to 48.6%), and moderate concentrations of several heavy metals. These data from the various sampling events conducted on the site and its immediate surroundings, were referenced to complete the WET model. The data input is reflected in the scores generated for specific wetland functional values such as those relating to toxicant retention, nutrient removal, and wildlife utilization.

3.0 OVERVIEW OF WET RESULTS

The WET assessment requires site specific information to respond to the question/predictors for on-site wetlands. The materials referenced included available data from state and federal sources, site specific information from the Wetlands Delineation Report (MPI, 1995), the Solid Waste Management Facility Investigation Program (SWMFIP, MPI 1993), and on-site observations. The SWMFIP report included an ecological risk assessment. The evaluation results, as determined by WET, are presented in Appendix A and include the following forms:

Form A - Site Documentation
Form B - Evaluation Answer Sheet
Form C - Supplementary Observations
Form D - Evaluation Summary

The results of the WET evaluation of existing wetland conditions are presented below.

3.1 Social Significance (Levels 1, 2)

The social significance parameter evaluates wetland conditions within the AA and its surroundings to determine whether a wetland is beneficial to society because of its natural features, potential economic value, official designation or status, or its specific location. Determination of a wetland's uniqueness and heritage value is based on its comparison to other mapped wetlands in a geographic area specified by the WET program.

For the AA and vicinity, the social significance scores for the Groundwater Recharge, Groundwater Discharge, Floodflow Alteration, and Sediment Stabilization scored low primarily because the wetland is not a unique system in the region and it represents a small percentage of similar wetlands in the watershed.

Sediment/Toxicant Retention and Nutrient Removal/Transformation scored moderate. Although these functions are provided by the wetlands in the AA, these values scored moderate because other wetlands in the AA watershed also preform these functions; consequently, the function is not unique to the AA wetlands.

The functional values associated with Wildlife Diversity/Abundance scored high for social significance because the site is located in an area defined by the U.S. Fish and Wildlife Service (USFWS) as "a waterfowl use region of major concern". A section of the waterfowl area identified by USFWS is located along the Lake Erie shoreline in the western section of the state and encompasses the wetlands on the landfill site. Although waterfowl species may use on-site wetlands, because the wetlands encompass a small area (<5.0 acres) which is affected by point-source contamination, the wetlands do not provide high value habitat for waterfowl use. Therefore, if the WET assessment evaluated on-site wetlands exclusively for their waterfowl/wildlife functional values, it is likely that the wildlife function would score low.

Aquatic Diversity/Abundance for the wetlands scored low. The low score is attributed to the residual waste constituents detected in wetland sediments. The WET assessment interprets the presence of wastes as a negative feature that adversely affects the use of surface waters and wetlands by aquatic organisms.

Uniqueness/Heritage scored low because the AA represents only a small percentage (0.001%) of the total wetland acreage within its watershed. Recreation also scored Low because the AA is surrounded on two sides by railroad lines and is adjacent to the Marilla Street landfill, which is fenced. Therefore, it is neither available nor readily accessible to the public for recreational use. A summary of the WET evaluation results for Social Significance is presented in Table 1.

3.2 Effectiveness (Levels 1, 2, 3)

Effectiveness measures the probability that a wetland has the capability to perform a particular function due to its physical, chemical, and biological features. As an example, a wetland located at the base of an eroding embankment has a high probability of scoring high for its sediment retention function. The following discussion provides a comparative assessment of the effectiveness of existing wetland values on the Marilla Street site.

The WET assessment scored Groundwater Recharge as uncertain for the AA primarily because the model does not have the sensitivity to determine if the rate of recharge is greater than the rate of groundwater discharge based on the information modelled. Groundwater Recharge conditions exist when infiltration and percolation to underlying materials or groundwater exceed the rate of groundwater discharge on an annual basis. A water balance prepared for the Marilla Street Landfill to partition quantities of water which factor into the recharge/discharge relationship showed that the landfill cover system substantially reduces infiltration, and that water infiltrating the cover is primarily discharged to the surface waters and wetlands surrounding the site. Therefore, the probability for groundwater recharge is limited or low. (For the purpose of performing the water balance, recharge was defined as all water entering the landfill by infiltration resulting from precipitation, or as groundwater inflow to the landfill.)

The WET model did score the Groundwater Discharge function high which agrees with the conclusions of the site water balance analysis.

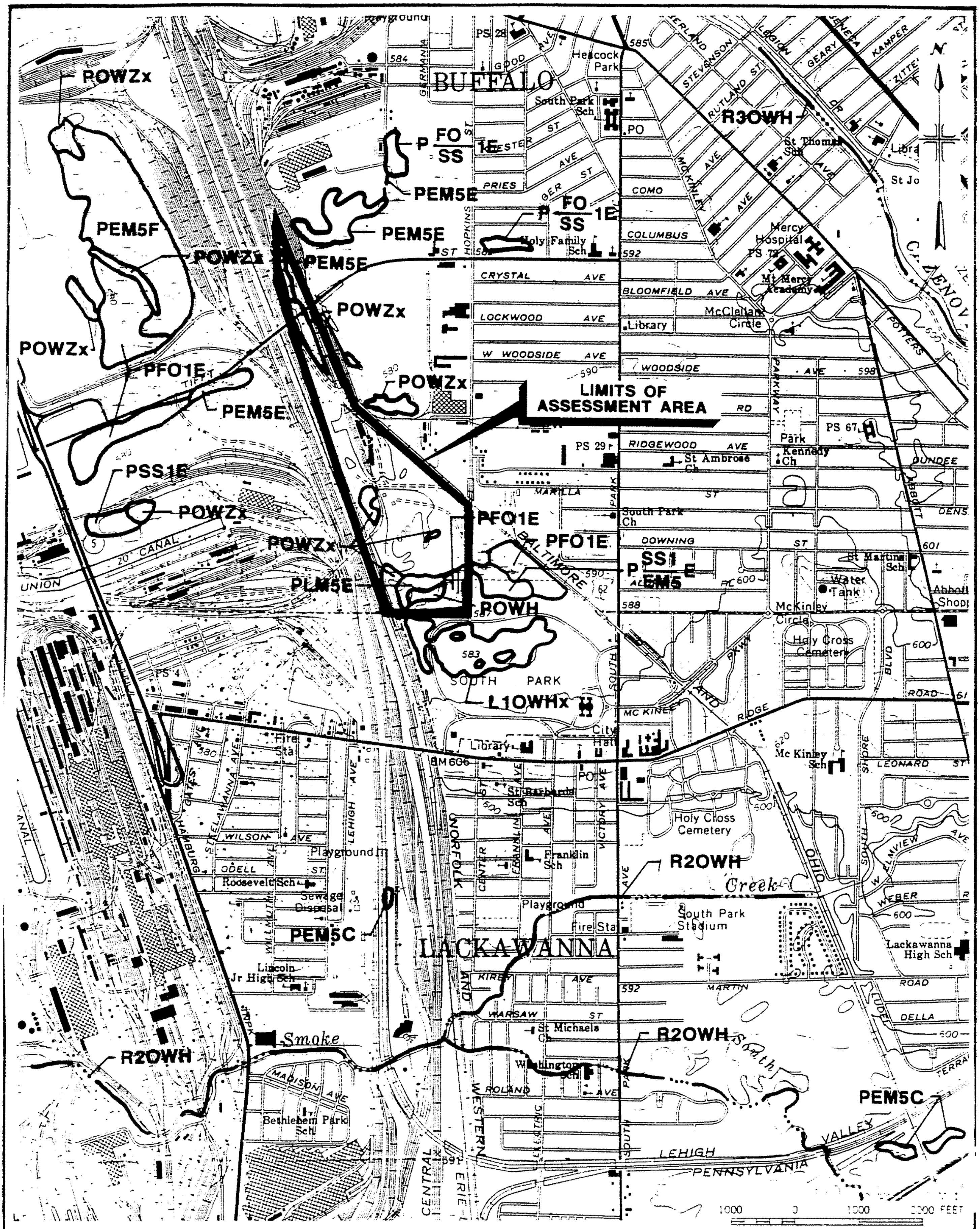
The predominant wetland system adjoining the landfill is classified by USFWS on NWI mapping as palustrine, open water wetlands, as shown on Figure 2. Wetlands shown on NWI mapping that are also under the jurisdiction of New York State are shown on Figure 3. Site observations of the wetlands indicate that the open water areas are fringed with persistent wetland vegetation such as cattail and common reed. The ratio of standing vegetation zones to open water in these wetlands, and the physical characteristics of the wetlands' inlet and outlet structures, make the system highly effective in providing Floodflow Alteration, Sediment Stabilization, Sediment/Toxicant Retention, and Nutrient Removal/Transformation. WET scored high for each of these functional values.

Because of the ratio of the wetland vegetation zone (>20 feet) to open water, the limited ratio of interspersion of water to vegetation along the channels, and the density of the persistent wetland plant species, Production Export scored moderate. The overall small size of the watershed, and the presence of waste constituents in substrate also affected the probability of this function from scoring high.

For the Wildlife Diversity/Abundance (D/A), Breeding, Migration, and Wintering functions, the wetland scored low. The primary reason for the low score for Wildlife D/A and Breeding is the small size of the AA wetlands (<5.0 acres) and the discharge of contaminated groundwater to surrounding surface waters and wetlands. Wildlife Wintering scored low because the WET model generates a low score for wetlands that freeze for at least one month of the year such as the waters in the Buffalo, New York region. A summary of the WET evaluation results for effectiveness is presented in Table 1.

3.3 Opportunity (Levels 1, 2, 3)

Opportunity assesses the chance a wetland has to perform a function. Although a wetland may have the physical attributes required to perform a specific function, the opportunity may not be present under certain environmental conditions. Floodflow Alteration, Sediment/Toxicant Retention, and Nutrient Removal/Transformation are the only functions evaluated for the opportunity parameter under WET.



SOURCE: USFWS BUFFALO SE QUAD NWI, 1978

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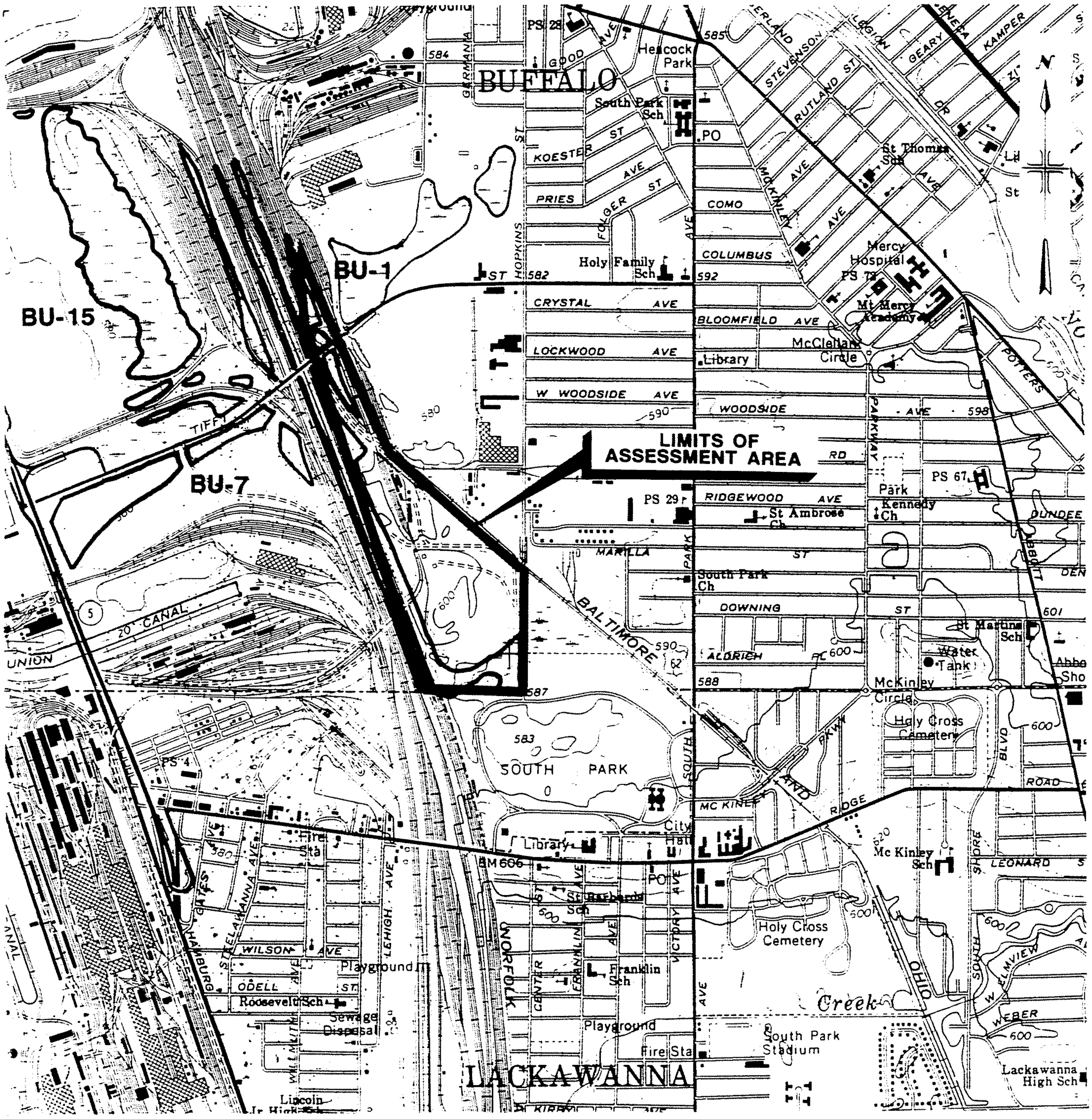
LTV STEEL COMPANY
BUFFALO, NEW YORK
MARILLA STREET LANDFILL

NATIONAL WETLANDS INVENTORY MAP

MALCOLM PIRNIE, INC.

FIGURE 2



SOURCE: NY STATE FRESHWATER WETLANDS MAP, 1975.
BUFFALO SE QUAD

MALCOLM PIRNIE

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BUFFALO, NEW YORK
MARILLA STREET LANDFILL

NEW YORK STATE WETLANDS MAP

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FIGURE 3

Wetlands considered to have the greatest opportunity for Floodflow Alteration are those which are not tidal, have large watersheds relative to their size, or those within watersheds that are relatively impervious with few upstream storage areas. Although the AA is not located within a large watershed, the wetlands are located in a predominantly urban area with few other upstream storage areas. In addition, flow from the North Pond ultimately discharges to Lake Erie through a series of culverts (constricted outlet) which impacts the discharge rate from upstream waters and wetlands. As a result the wetlands have a greater opportunity to function as a local flood storage area. For these reasons WET scored the Floodflow Alteration function high.

The wetlands opportunity for Sediment/Toxicant Retention also scored high. Wetlands with a high opportunity include those with several potential nonpoint or point sources of sediments or toxicants such as those which currently exist in the AA.

Wetlands with a high opportunity for Nutrient Removal/Transformation are those with potential point or nonpoint nutrient sources (e.g. septic systems, agricultural land). WET rated the opportunity for this function as moderate. The score is based on the absence of significant nutrient input from the landfill and surrounding lands, and the extent of the persistent emergent vegetation zone in the wetlands.

A summary of the WET evaluation results for Opportunity is presented in Table 1.

4.0 CONCLUSIONS

Based on WET scores, the existing on-site wetlands have a high probability for effectively performing a number of functions. Although the features of the North and West Ditches were engineered, their extensive vegetative cover and the wetland features of the North and South Ponds provide some local floodflow control, stabilize sediments, and remove nutrients and waste constituents. The wetlands, however, provide minimal value for wildlife utilization for several reasons: the small size of the wetlands, the presence of waste constituents in groundwater discharging to surface waters, and the presence of waste material/rubble in the wetland sediments.

Historically, these wetlands have been disturbed by landfill operations and surrounding rail lines, and as a result they are generally low quality wetlands. The functions they provide can be restored and enhanced on-site or elsewhere within the watershed. If required, future wetland mitigation should not only include features to restore existing wetland functional values, but the plan should also strive to enhance or create wildlife habitat for both aquatic and terrestrial biota. Site remediation efforts that would eliminate the migration of waste constituents discharging to surface waters and isolate waste material from the wetland environment would increase the effectiveness of the wetland functional values relative to wildlife utilization of the AA.

In the event remediation of the Marilla Street Landfill impacts adjacent wetlands, mitigation plans should incorporate the features of the existing wetlands that would enable the system to limit sedimentation and export nutrients and toxicants, and to whatever extent practicable, provide floodflow/storm water abatement. Site remediation efforts that isolate waste constituents from the surface waters and wetlands will enhance wildlife habitat and increase the opportunity for wildlife utilization. Site features can be further enhanced by introduction of native plant species to attract wildlife.

Although the small size of the wetlands are a factor, aquatic habitat can be improved with removal of debris and placement of a suitable substrate material. Additionally, by creating the proper elevations and grades, revegetation of emergent wetlands would occur and provide enhanced wildlife habitat.

APPENDIX A

WET EVALUATION ANSWER FORMS

```
      *******************************************************

             Summary of Evaluation Results for "ltv"

      *******************************************************

                              Social
                           Significance  Effectiveness  Opportunity

Ground Water Recharge            L             U             *
Ground Water Discharge           L             H             *
Floodflow Alteration             L             H             H
Sediment Stabilization           L             H             *
Sediment/Toxicant Retention      M             H             H
Nutrient Removal/Transformation  L             H             M
Production Export                *             M             *
Wildlife Diversity/Abundance     H             *             *
Wildlife D/A Breeding            *             L             *
Wildlife D/A Migration           *             L             *
Wildlife D/A Wintering           *             L             *
Aquatic Diversity/Abundance      L             L             *
Uniqueness/Heritage              L             *             *
Recreation                       L             *             *

Note:  "H" = High, "M" = Moderate, "L" = Low, "U" = Uncertain, and
"*"'s identify conditions where functions and values are not evaluated
```

FORM A: SITE DOCUMENTATION (Page 1 of 2)

Part 1 - Background Information

Evaluation Site: MARILLA ST. LANDFILL Date: 3/27/95

Site Location (Section, Range, and Township): 78° 52' 30" LG 42° 50' 00" LAT

Has the evaluator taken a training course in WET Version 2.0? YES

Agencies/Experts Contacted:

Circle the assessment levels to be completed? [✓ SS-1 SS-2 E/O-1&2 E/O-3 HS]

Is the wetland tidal or nontidal? If the wetland is nontidal, indicate the month(s) that represent wet, dry, and average conditions, or if only average annual condition will be used, give rationale. Also, indicate if the previous 12 months of precipitation has been above, below, or near normal.
NON-TIDAL / AVERAGE ANNUAL CONDITIONS - WATER LEVELS ARE PRIMARILY DEPENDENT ON PRECIPITATION: NOV-MAY (W) / JUNE-OCT (D). PRECIPITATION ABOVE NORMAL LAST 12 MONTHS

Is this evaluation an estimate of past conditions or a prediction of future conditions? (If answer is yes, explain nature and source of predictive data.)
EVALUATION OF PRESENT CONDITIONS

Will alternative ratings be used to evaluate any of the functions or values (if yes, explain)? NO

Part 2 - Identification and Delineation of Evaluation Areas

Sketch a map on the following page, or attach a suitable map (photocopy of topgraphic map) that shows the following information:

- -- Boundaries of the AA, IA, and IZ, and the location of service areas.
- -- Watershed boundaries of AA, and service areas.
- -- Extent of surface water in the AA during the wet and dry seasons.
- -- Open water (channels and pools) within and adjacent to the AA.
- -- Normal direction of channel or tidal flow
- -- Normal direction of wind-driven waves or current.
- -- Impact area(s).
- -- Scale of distance and north compass direction.

Explain the procedures used to identify or delineate the AA, IA, IZ, service areas, and the watersheds of these areas if they differed from the guidelines outlined in Section 2.7. NWI, NYS WETLAND MAPPING, USGS TOPO, SITE SURVEYS.

-- Continued --

FORM A: SITE DOCUMENTATION (Page 2 of 2)

Part 2 (Cont.)

Estimate the extent of the following areas:

Assessment Area = 4.34 acres
Impact Area = _______ acres (only if applicable)
Watershed of AA = 500 acres/ 0.8 miles^2 (acres x 0.0016 = miles)
Wetlands in AA = 3.3 acres
Wetlands in the watershed of closest service area = +265 acres
Wetlands and deepwater in the watershed of closest service area = 265 acres WETLANDS
LK. ERIE = DEEPWATER HABITAT

How were locality and region defined for this evaluation?
LOCALITY: CITY OF BUFFALO
REGION: ERIE COUNTY
WATERSHED: LAKE ERIE

Sketch of Evaluation Areas (or attach map):

FORM B: EVALUATION ANSWER SHEET

Evaluation Site: MARILLA STREET LANDFILL

SOCIAL SIGNIFICANCE EVALUATION - LEVEL 1

3.1.1 "Red Flags"

Comments/Assumptions

s1. Y [✓ N] U - NATURAL HERITAGE REPORTS LEAST TERN USE IN VICINITY OF SITE, NOT ONSITE.
s2. Y [✓ N] U
s3. Y [✓ N] U
s4. Y [✓ N] U - GEOLOGY TYPICAL OF AREA; NO UNIQUE NATURAL RESOURCES
s5. Y [✓ N] U - A SIMILAR WETLAND SYSTEM EXISTS NORTH AND WEST OF SITE ≈ 265 ac.
s6. Y [✓ N] U - SITE IS SURROUNDED BY RAILROAD TRACKS; NOT ACCESSIBLE FOR PUBLIC USE.

3.1.2 On-site Social Significance

Comments/Assumptions

s7. Y [✓ N] U I
s8. [✓ Y] N U I - RAIL LINES, LANDFILL BOUNDARY

3.1.3 Off-site Social Significance

Comments

(1) s9. Y [✓ N] U I - NO FLOODPLAIN ASSO.
s10. [✓ Y] N U BUFFALO OUTER HARBOR
s11. Y [✓ N] U
s12. Y [✓ N] U
s13. Y [✓ N] U
s14. Y [✓ N] U
s15. Y [✓ N] U I - LEAST TERN - OPEN WATER DEPENDENT
s16. Y [✓ N] U I
s17. Y [✓ N] U I - LK ERIE ~1.0 mi W. OF SITE
s18. Y [✓ N] U I
s19. Y [✓ N] U
s20. Y [✓ N] U NO USFWS LISTED SPECIES IN AA/IA
LAKE TROUT LISTED FOR GRT. LAKES (>1.0 mi from site)

Comments

s21. Y [✓ N] U - NO STATE OR FEDERAL SPECIES
s22. [✓ Y] N U I · SITE ~1.0 OF LK. ERIE
s23. Y [✓ N] U
s24. Y [✓ N] U WETLAND ON-SITE 4.8 ac (<5.0).
s25. Y [✓ N] U
s26. Y [✓ N] U
s27. Y [✓ N] U
s28. Y [✓ N] U
s29. Y [✓ N] U
s30. Y [✓ N] U - NYS LOSS RATE - 0.35%
s31. Y [✓ N] U - LOSS RATE = 1.2% 3.3 ac/265 ac

(1) NYS AND/OR USEPA AWQC WERE NOT EXCEEDED IN SURFACE WATERS SAMPLED.

SOCIAL SIGNIFICANCE EVALUATION - LEVEL 2

Context Region (Circle one)
[✓ Standard Density Circle]
Locality
Hydrologic Unit

Question #		Comments/Assumptions
1	Y [✓ N]	
2	Y [✓ N]	
3	Y [✓ N]	
4	Y [✓ N]	

Evaluation Site: MARILLA STREET LANDFILL

EFFECTIVENESS/OPPORTUNITY EVALUATION - LEVEL 1 (OFFICE)

Q.#	WETLAND CONDITION $\bar{X}$	W	D	COMMENTS/ASSUMPTIONS
1.1	Y [✓ N]			
1.2	Y [✓ N]			
1.3	[✓ Y] N			
2.1.1	Y [✓ N]			
2.1.2	[✓ Y] N			
2.1.3	[✓ Y] N			
2.2.1	Y [✓ N] I			
2.2.2	Y [✓ N] I			
3.1	[✓ Y] N			
3.2	[✓ Y] N			PFO1 > 16.0 ac/mi²
3.3	Y [✓ N]			PFO1 > 2.7 ac/mi²
4.1	[✓ Y] N			WATERSHED = 0.8 mi²
4.2A	Y [✓ N]			
4.2B	Y [✓ N]			
4.2C	Y [✓ N]			
4.2D	Y [✓ N]			
5.1.1		[✓ Y] N		
5.1.2		Y [✓ N]		AA ac/AA WATERSHED = <1%
5.2		Y [✓ N]		L10WHx SOUTH OF AA = 28 ac. or <1% of WATERSHED (265 ac)
6.1	Y [✓ N]			
6.2	[✓ Y] N			
7	Y [✓ N] I			W. DITCH = 584.8' − 581.5 ÷ 3,000' = 0.0011' GRADIENT (0.0008') (DENSE CATTAIL COVER; MEAN DEPTH OF DITCH ~4-6'
8.1	[✓ Y] N			– PERMANENT WATER
8.2	Y [✓ N]			
8.3	[✓ Y] N			
8.4	Y [✓ N]			
9.1		Y [✓ N]		– CHANNEL FLOW INTERMITTENT; OUTLET IS WIDER THAN CHANNEL WIDTH. FLOW ENTERS NORTH POND.
9.2		[✓ Y] N I		
9.3		[✓ Y] N I		
10A	Y [✓ N]			
10B	[✓ Y] N			
10C	Y [✓ N]			
10D	Y [✓ N]			
10E	Y [✓ N]			
10F	Y [✓ N]			

FORM B (Cont.)

Evaluation Site: MARILLA STREET LANDFILL

WETLAND CONDITION

Q.#	X̄	W	D
11	[✓ Y] N	[✓ Y] N	[✓ Y] N
12A	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Aa	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Ab	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Ac	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Ad	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Ae	Y [✓ N]	Y [✓ N]	Y [✓ N]
12B	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Ba	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Bb	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Bc	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Bd	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Be	Y [✓ N]	Y [✓ N]	Y [✓ N]
12C	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Ca	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Cb	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Cc	Y [✓ N]	Y [✓ N]	Y [✓ N]
12Cd	Y [✓ N]	Y [✓ N]	Y [✓ N]
12D	[✓ Y] N	[✓ Y] N	[✓ Y] N
12Da	[✓ Y] N	[✓ Y] N	[✓ Y] N
12Db	Y [✓ N]	Y [✓ N]	Y [✓ N]
12E	Y [✓ N]	Y [✓ N]	Y [✓ N]
13A	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Aa	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Ab	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Ac	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Ad	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Ae	Y [✓ N]	Y [✓ N]	Y [✓ N]
13B	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Ba	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Bb	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Bc	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Bd	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Be	Y [✓ N]	Y [✓ N]	Y [✓ N]
13C	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Ca	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Cb	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Cc	Y [✓ N]	Y [✓ N]	Y [✓ N]
13Cd	Y [✓ N]	Y [✓ N]	Y [✓ N]
13D	[✓ Y] N	[✓ Y] N	[✓ Y] N
13Da	[✓ Y] N	[✓ Y] N	[✓ Y] N
13Db	Y [✓ N]	Y [✓ N]	Y [✓ N]
13E	Y [✓ N]	Y [✓ N]	Y [✓ N]

COMMENTS/ASSUMPTIONS

Vegetation is dominated by persistent emergent species, i.e. Phragmites, Purple Loosestrife, Cattail

FORM B (Cont.)

Evaluation Site: MACILLA STREET LANDFILL

WETLAND CONDITION

Q.#	$\bar{X}$	W	D	COMMENTS/ASSUMPTIONS
14.1	Y [✓ N]	Y [✓ N]	Y [✓ N]	
14.2	Y [✓ N]	Y [✓ N]	Y [✓ N]	
15.1A	[✓ Y] N I			
15.1B	Y [✓ N] I			
15.1C	Y [✓ N] I			
15.2	Y [✓ N] I			
16A	[✓ Y] N	[✓ Y] N	[✓ Y] N	
16B	Y [✓ N]	Y [✓ N]	Y [✓ N]	
16C	Y [✓ N]	Y [✓ N]	Y [✓ N]	
17	Y [✓ N]			
18	Y [✓ N] I			
19.1A	[✓ Y] N I			fetch less than 100' for most of AA.
19.1B	Y N [✓ I]			AA consists mainly of channels that connect 2 small ponded areas, (SOUTH POND TO NORTH POND).
19.2	Y [✓ N] I			
19.3	Y [✓ N] I			
20.1	[✓ Y] N I			
20.2	Y N [✓ I]			
21A	Y [✓ N]			
21B	[✓ Y] N			- MOST OF AA WATERSHED COVERED BY IMPERVIOUS SURFACES.
21C	Y [✓ N]			
21D	Y [✓ N]			
21E	Y [✓ N]			
22.1.1	[✓ Y] N			- AA CONTAINS 2 CHANNELS
22.1.2	Y [✓ N] I			- CHANNELS HAVE NO MEANDERS. - THEY WERE DITCHED AND RIPRAPPED.
22.2	Y [✓ N]			
22.3	Y N [✓ I]			
23	Y [✓ N]			W DITCH IS A HYDROLOGIC LINK BETWEEN SOUTH & NORTH PONDS. IT DOES NOT ACCELERATE SITE DRAINAGE. - IT IS RANGES FROM 40'-60' W.
24.1	Y [✓ N] I			- ALUMINUM LEVELS IN SURFACE AND PORE WATER EXCEEDED NYS CRITERION (NYS AWQC). SEDIMENT LEVELS WERE W/IN NYS GUIDELINES.
24.2	Y N [✓ I]			
24.3	Y [✓ N] I			
24.4	[✓ Y] N I			
24.5	Y [✓ N]			
25.1	[✓ Y] N			SEDIMENT DEPOSITION IS PRIMARILY A RESULT OF OVERLAND FLOW.
25.2A	[✓ Y] N I			
25.2B	Y [✓ N] I			
25.3	[✓ Y] N			

FORM B (Cont.) **Page 5 of 9**

Evaluation Site: MARILLA STREET LANDFILL

	WETLAND CONDITION			COMMENTS/ASSUMPTIONS
Q.#	$\bar{X}$	W	D	
26.1	Y [✓ N]			No sources of nutrient loading or signs of eutrophication were observed or recorded.
26.2	Y N [✓ I]			
26.3	Y N [✓ I]			
27.1	[✓ Y] N			- CONTAMINATED GROUNDWATER DISCHARGES TO SURFACE WATERS AND IS A SOURCE OF SURFACE WATER CONTAMINATION
27.2	Y [✓ N] I			
27.3	Y [✓ N] I			

EFFECTIVENESS/OPPORTUNITY EVALUATION - LEVEL 2 (FIELD)

	WETLAND CONDITION			COMMENTS/ASSUMPTIONS
Q.#	$\bar{X}$	W	D	
28	[✓ Y] N			- SITE IS DISTURBED BY ON-GOING REMEDIATION.
29.1	Y [✓ N]			- upland boundary formed by rail lines, limited vegetation at upland/wetland interface
29.2	[✓ Y] N			-
30.	Y [✓ N]	Y [✓ N]	Y [✓ N]	Much of surrounding lands in input zone have little or no topographic relief. site access limited by rail lines
31.1	Y [✓ N]	Y [✓ N]	Y [✓ N]	- open water area larger than veg. zones.
31.2	[✓ Y] N	[✓ Y] N	[✓ Y] N	
31.3	[✓ Y] N	[✓ Y] N	[✓ Y] N	- Zone A limited by rail lines
31.4	Y N [✓ I]	Y N [✓ I]	Y N [✓ I]	
31.5	Y [✓ N]	Y [✓ N]	Y [✓ N]	
31.6A	Y [✓ N]	Y [✓ N]	Y [✓ N]	
31.6B	[✓ Y] N	[✓ Y] N	[✓ Y] N	
31.6C	Y [✓ N]	Y [✓ N]	Y [✓ N]	
31.6D	Y [✓ N]	Y [✓ N]	Y [✓ N]	
31.6E	Y [✓ N]	Y [✓ N]	Y [✓ N]	
32A	[✓ Y] N			Dominant wetland system is POW with permanent flow (EXCEPTION DURING WINTER SEASON WHEN WATERS ARE FROZEN.)
32B	Y [✓ N]			
32C	Y [✓ N]			
32D	Y [✓ N]			
32E	Y [✓ N]			
32F	Y [✓ N]			
32G	Y [✓ N]			
32H	Y [✓ N]			
32I	Y [✓ N]			
32J	Y [✓ N]			
32K	Y [✓ N]			

FORM B (Cont.)

Evaluation Site: MARILLA STREET LANDFILL

		WETLAND CONDITION		COMMENTS/ASSUMPTIONS
Q.#	$\bar{X}$	W	D	
33A	[✓ Y] N			AA HYDROPERIOD IS PERMANENTLY FLOODED FOR THE GREATEST PERIOD OF A YEAR.
33B	Y [✓ N]			
33C	Y [✓ N]			
33D	Y [✓ N]			
33E	Y [✓ N]			
33F	Y [✓ N]			
33G	Y [✓ N]			
33H	Y [✓ N]			
33I	Y [✓ N]			
33J	Y [✓ N]			
33K	Y [✓ N]			
34.1	Y [✓ N]			WATER IN AA/IA FLOWS SOUTH TO NORTH THROUGH A SERIES OF CULVERTS AND CONSTRUCTED CHANNELS. THERE ARE NO CONTROL STRUCTURES. HOWEVER, DURING DRY PERIODS WATER IS IMPOUNDED WHEN LEVELS FALL BELOW CULVERT INVERT ELEVATIONS.
34.2	Y [✓ N]			
34.3.1	Y [✓ N]			
34.3.2	Y N [✓ I]			
35.1	Y [✓ N] I			
35.2	[✓ Y] N I			
36.1.1	Y [✓ N]	Y [✓ N]	Y [✓ N]	PERSISTANT VEGETATION EXISTS PRIMARILY IN NARROW BANDS IN ZONE B.
36.1.2	Y [✓ N]	Y [✓ N]	Y [✓ N]	
36.2.1	Y [✓ N]	Y [✓ N]	Y [✓ N]	
36.2.2	[✓ Y] N	[✓ Y] N	[✓ Y] N	
36.2.3	Y [✓ N]	Y [✓ N]	Y [✓ N]	
37	Y [✓ N]			
38.1	Y [✓ N]			–
38.2	[✓ Y] N			
38.3	Y [✓ N]			– ALTERNATIVE WETLAND SYSTEM DOES NOT EXIT, (MARINE, ESTUARINE).
38.4	Y [✓ N]			
38.5	Y [✓ N]			
38.6	Y [✓ N]			
38.7	Y [✓ N]			
38.8	Y N [✓ I]			
39	Y [✓ N]			
40.1	Y [✓ N] I			
40.2	[✓ Y] N I			
41.1		Y N [✓ I]		} ques. #7 answered
41.2		Y N [✓ I]		

FORM B (Cont.)

Evaluation Site: MARILLA STREET LANDFILL

	WETLAND CONDITION			COMMENTS/ASSUMPTIONS
Q.#	$\bar{X}$	W	D	
42.1.1	[✓ Y] N I	Y [✓ N] I	[✓ Y] N I	
42.1.2	Y [✓ N] I	[✓ Y] N I	Y [✓ N] I	
42.1.3	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
42.2.1	Y N [✓ I]	Y N [✓ I]	Y N [✓ I]	
42.2.2	Y N [✓ I]	Y N [✓ I]	Y N [✓ I]	
42.2.3	Y N [✓ I]	Y N [✓ I]	Y N [✓ I]	
43A	Y [✓ N]	Y [✓ N]	Y [✓ N]	
43B	Y [✓ N]	Y [✓ N]	Y [✓ N]	
43C	Y [✓ N]	Y [✓ N]	[✓ Y] N	
43D	[✓ Y] N	[✓ Y] N	Y [✓ N]	
43E	Y [✓ N]	Y [✓ N]	Y [✓ N]	
43F	Y [✓ N]	Y [✓ N]	Y [✓ N]	
43G	Y [✓ N]	Y [✓ N]	Y [✓ N]	
43H	Y [✓ N]	Y [✓ N]	Y [✓ N]	
43I	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44A	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44B	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44C	Y [✓ N]	Y [✓ N]	[✓ Y] N	
44D	[✓ Y] N	[✓ Y] N	Y [✓ N]	
44E	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44F	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44G	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44H	Y [✓ N]	Y [✓ N]	Y [✓ N]	
44I	Y [✓ N]	Y [✓ N]	Y [✓ N]	
45A	Y [✓ N]			
45B	Y [✓ N]			
45C	Y [✓ N]			
45D	Y [✓ N]			
45E	Y [✓ N]			
45F	[✓ Y] N			– BOTTOM SEDIMENTS ARE COVERED W/SLAG AND LANDFILL WASTE MATERIALS,
45G	Y [✓ N]			
46A	[✓ Y] N	[✓ Y] N	[✓ Y] N	
46B	Y [✓ N]	Y [✓ N]	Y [✓ N]	
46C	[✓ Y] N	[✓ Y] N	[✓ Y] N	
47A	Y [✓ N]			GROUNDWATER VALUES EXCEEDED 6NYCRR PART 703 GROUNDWATER QUALITY STDS. OF 6.5 TO 8.5. UNITS. AN ALKALINE pH HAS A PERSISTANT, EXTENSIVE IMPACT ON SHALLOW GROUNDWATER.
47B	Y [✓ N]			
47C	[✓ Y] N			

Evaluation Site: MARILLA STREET LANDFILL

WETLAND CONDITION

Q.#	$\bar{X}$	W	D	COMMENTS/ASSUMPTIONS
48A	[✓ Y] N I	[✓ Y] N I	[✓ Y] N I	
48B	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
48C	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
48D	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
48E	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
48F	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
49.1.1	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
49.1.2	Y [✓ N] I	Y [✓ N] I	Y [✓ N] I	
49.2	[✓ Y] N I	[✓ Y] N I	[✓ Y] N I	
49.3	[✓ Y] N I	[✓ Y] N I	[✓ Y] N I	
50.	Y [✓ N]	Y [✓ N]	Y [✓ N]	

EFFECTIVENESS/OPPORTUNITY EVALUATION - LEVEL 3 (DETAILED DATA)

WETLAND CONDITION

Q.#	$\bar{X}$	W	D	COMMENTS/ASSUMPTIONS
51.1	Y N [✓ U]			STANDING CROP NOT MEASURED.
51.2	Y [✓ N] U			
52.1	Y [✓ N] I U			BENTHIC SURVEY NOT CONDUCTED.
52.2	Y N I [✓ U]			
53.1	Y N [✓ I] U			
53.2	Y N [✓ I] U			
54	Y [✓ N] U	Y [✓ N] U	Y [✓ N] U	
55.1	Y N [✓ U]			
55.2	Y N [✓ U]			
55.3	Y N [✓ U]			
55.4	Y N [✓ U]			
56.1	Y [✓ N] I U			
56.2	Y N I [✓ U]			
57.1	Y [✓ N] U			— WATER LEVEL LESS THAN 2 m, (~ 1.0')
57.2	Y N U			
58.	[✓ Y] N U			

FORM B (Cont.)

Evaluation Site: MARILLA STREET LANDFILL

	WETLAND CONDITION			COMMENTS/ASSUMPTIONS
Q.#	$\bar{X}$	W	D	
59.1	[✓ Y] N I U			
59.2	[✓ Y] N I U			
60	Y [✓ N] U			
61	Y [✓ N] I U			
62	Y [✓ N] U			
63.1	Y N I [✓ U]			
63.2	Y N I [✓ U]			
64		Y N I [✓ U]		

WET Answer Dataset for "ltv"

s1 - n
s2 - n
s3 - n
s4 - n
s5 - n
s6 - n
s7 - n
s8 - y
s9 - n
s10 - y
s11 - n
s12 - n
s13 - n
s14 - n
s15 - n
s16 - n
s17 - n
s18 - n
s19 - n
s20 - n
s21 - n
s22 - y
s23 - n
s24 - n
s25 - n
s26 - n
s27 - n
s28 - n
s29 - n
s30 - n
s31 - n
1.1 - n
1.2 - n
1.3 - y
2.1.1 - n
2.1.2 - y
2.1.3 - y
2.2.1 - n
2.2.2 - n
3.1 - y
3.2 - y
3.3 - n
4.1 - y
4.2A - n
4.2B - n
4.2C - n
4.2D - n
5.1.1 - y
5.1.2 - n
5.2 - n
blank - u
6.1 - n
6.2 - y
7 - n
8.1 - y
8.2 - n
8.3 - y
8.4 - n
9.1 - n
9.2 - y
9.3 - y
10A - n
10B - y
10C - n
10D - n
10E - n
10F - n
11(x) - y
11(w) - y
11(d) - y
12A(x) - n
12A(w) - n
12A(d) - n
12Aa(x) - n
12Aa(w) - n
12Aa(d) - n
12Ab(x) - n
12Ab(w) - n
12Ab(d) - n
12Ac(x) - n
12Ac(w) - n
12Ac(d) - n
12Ad(x) - n
12Ad(w) - n
12Ad(d) - n
12Ae(x) - n
12Ae(w) - n
12Ae(d) - n
12B(x) - n
12B(w) - n
12B(d) - n
12Ba(x) - n
12Ba(w) - n
12Ba(d) - n
12Bb(x) - n
12Bb(w) - n
12Bb(d) - n
12Bc(x) - n
12Bc(w) - n
12Bc(d) - n
12Bd(x) - n
12Bd(w) - n
12Bd(d) - n
12Be(x) - n
12Be(w) - n
12Be(d) - n
12C(x) - n
12C(w) - n
12C(d) - n
12Ca(x) - n
12Ca(w) - n
12Ca(d) - n
12Cb(x) - n
12Cb(w) - n
12Cb(d) - n
12Cc(x) - n
12Cc(w) - n
12Cc(d) - n
12Cd(x) - n
12Cd(w) - n
12Cd(d) - n
12D(x) - y
12D(w) - y
12D(d) - y
12Da(x) - y
12Da(w) - y
12Da(d) - y
12Db(x) - n
12Db(w) - n
12Db(d) - n
12E(x) - n
12E(w) - n
12E(d) - n
13A(x) - n
13A(w) - n
13A(d) - n
13Aa(x) - n
13Aa(w) - n
13Aa(d) - n
13Ab(x) - n
13Ab(w) - n
13Ab(d) - n
13Ac(x) - n
13Ac(w) - n
13Ac(d) - n
13Ad(x) - n
13Ad(w) - n
13Ad(d) - n
13Ae(x) - n
13Ae(w) - n
13Ae(d) - n
13B(x) - n
13B(w) - n
13B(d) - n
13Ba(x) - n
13Ba(w) - n
13Ba(d) - n
13Bb(x) - n
13Bb(w) - n
13Bb(d) - n
13Bc(x) - n
13Bc(w) - n
13Bc(d) - n
13Bd(x) - n
13Bd(w) - n
13Bd(d) - n
13Be(x) - n
13Be(w) - n
13Be(d) - n
13C(x) - n
13C(w) - n
13C(d) - n
13Ca(x) - n
13Ca(w) - n
13Ca(d) - n
13Cb(x) - n
13Cb(w) - n
13Cb(d) - n
13Cc(x) - n
13Cc(w) - n
13Cc(d) - n
13Cd(x) - n
13Cd(w) - n
13Cd(d) - n
13D(x) - y
13D(w) - y
13D(d) - y
13Da(x) - y
13Da(w) - y
13Da(d) - y
13Db(x) - n
13Db(w) - n
13Db(d) - n
13E(x) - n
13E(w) - n
13E(d) - n
14.1(x) - n
14.1(w) - n
14.1(d) - n
14.2(x) - n
14.2(w) - n
14.2(d) - n
15.1A - y
15.1B - n
15.1C - n
15.2 - n
16A(x) - y
16A(w) - y

WET Answer Dataset for "ltv"

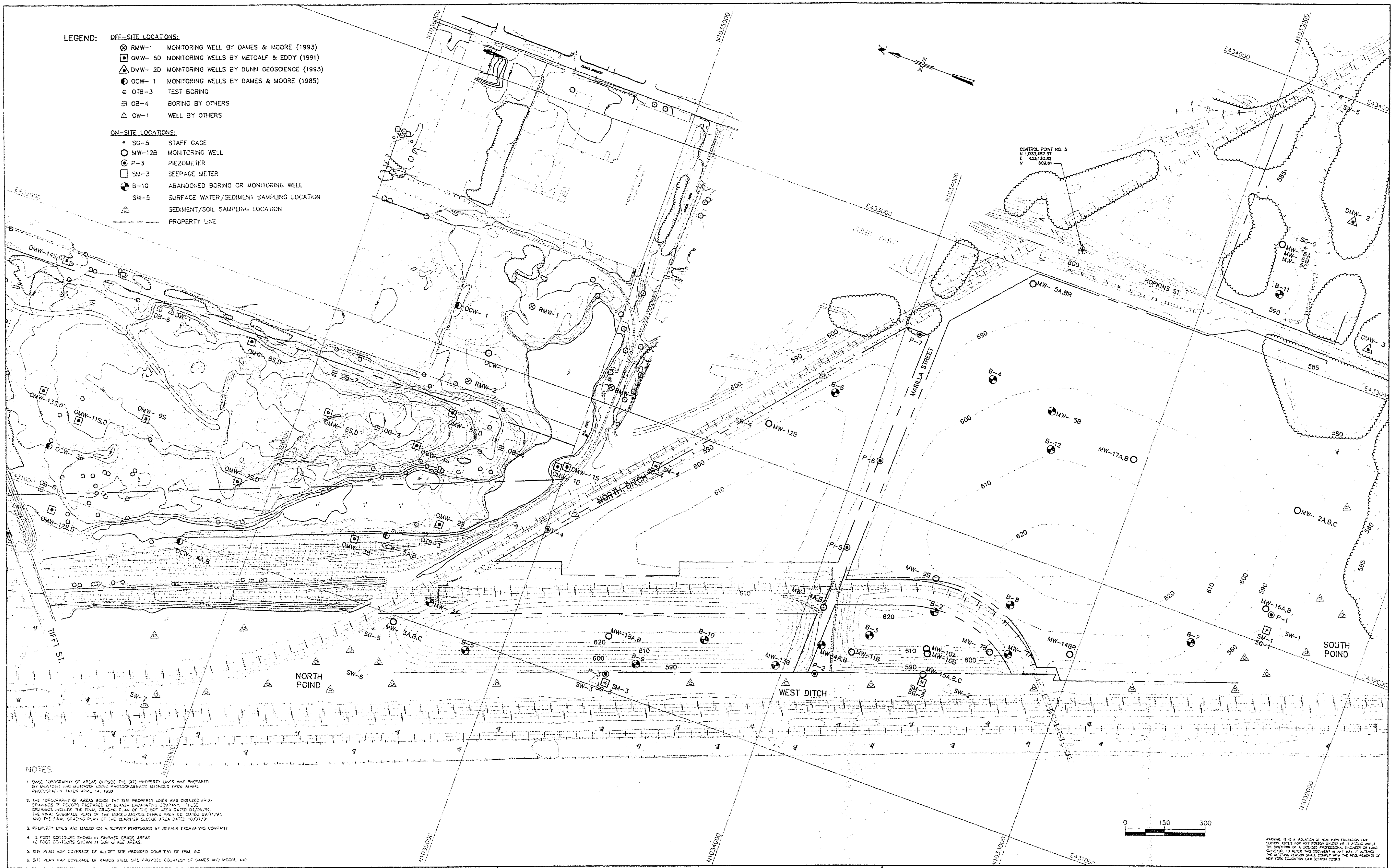
16A(d) - y
16B(x) - n
16B(w) - n
16B(d) - n
16C(x) - n
16C(w) - n
16C(d) - n
17 - n
18 - n
19.1A - y
19.1B - i
19.2 - n
19.3 - n
20.1 - y
20.2 - i
21A - n
21B - y
21C - n
21D - n
21E - n
22.1.1 - y
22.1.2 - n
22.2 - n
22.3 - i
23 - n
24.1 - n
24.2 - i
24.3 - n
24.4 - y
24.5 - n
25.1 - y
25.2A - y
25.2B - n
25.3 - y
26.1 - n
26.2 - i
26.3 - i
27.1 - y
27.2 - n
27.3 - n
28 - y
29.1 - n
29.2 - y
30(x) - n
30(w) - n
30(d) - n
31.1(x) - n
31.1(w) - n
31.1(d) - n
31.2(x) - y
31.2(w) - y
31.2(d) - y
31.3(x) - y
31.3(w) - y
31.3(d) - y
31.4(x) - i
31.4(w) - i
31.4(d) - i
31.5(x) - n
31.5(w) - n
31.5(d) - n
31.6A(x) - n
31.6A(w) - n
31.6A(d) - n
31.6B(x) - y
31.6B(w) - y
31.6B(d) - y
31.6C(x) - n
31.6C(w) - n
31.6C(d) - n
31.6D(x) - n
31.6D(w) - n
31.6D(d) - n
31.6E(x) - n
31.6E(w) - n
31.6E(d) - n
32A - y
32B - n
32C - n
32D - n
32E - n
32F - n
32G - n
32H - n
32I - n
32J - n
32K - n
33A - Y
33B - n
33C - n
33D - n
33E - n
33F - n
33G - n
33H - n
33I - n
33J - n
33K - n
34.1 - n
34.2 - n
34.3.1 - n
34.3.2 - i
35.1 - n
35.2 - y
36.1.1(x) - n
36.1.1(w) - n
36.1.1(d) - n
36.1.2(x) - n
36.1.2(w) - n
36.1.2(d) - n
36.2.1(x) - n
36.2.1(w) - n
36.2.1(d) - n
36.2.2(x) - y
36.2.2(w) - y
36.2.2(d) - y
36.2.3(x) - n
36.2.3(w) - n
36.2.3(d) - n
37 - n
38.1 - n
38.2 - y
38.3 - n
38.4 - n
38.5 - n
38.6 - n
38.7 - n
38.8 - i
39 - n
40.1 - n
40.2 - y
41.1 - n
41.2 - y
42.1.1(x) - i
42.1.1(w) - i
42.1.1(d) - y
42.1.2(x) - n
42.1.2(w) - y
42.1.2(d) - n
42.1.3(x) - y
42.1.3(w) - n
42.1.3(d) - n
42.2.1(x) - n
42.2.1(w) - n
42.2.1(d) - i
42.2.2(x) - i
42.2.2(w) - i
42.2.2(d) - i
42.2.3(x) - i
42.2.3(w) - i
42.2.3(d) - i
43A(x) - n
43A(w) - n
43A(d) - n
43B(x) - n
43B(w) - n
43B(d) - n
43C(x) - n
43C(w) - n
43C(d) - y
43D(x) - y
43D(w) - y
43D(d) - n
43E(x) - n
43E(w) - n
43E(d) - n
43F(x) - n
43F(w) - n
43F(d) - n
43G(x) - n
43G(w) - n
43G(d) - n
43H(x) - n
43H(w) - n
43H(d) - n
43I(x) - n
43I(w) - n
43I(d) - n
44A(x) - n
44A(w) - n
44A(d) - n
44B(x) - n
44B(w) - n
44B(d) - n
44C(x) - n
44C(w) - n
44C(d) - n
44D(x) - y
44D(w) - y
44D(d) - y
44E(x) - n
44E(w) - n
44E(d) - n
44F(x) - n
44F(w) - n
44F(d) - n
44G(x) - n
44G(w) - n
44G(d) - n
44H(x) - n
44H(w) - n
44H(d) - n
44I(x) - n
44I(w) - n
44I(d) - n
45A - n
45B - n
45C - n

WET Answer Dataset for "ltv"

45D - n
45E - n
45F - Y
45G - n
46A(x) - y
46A(w) - y
46A(d) - y
46B(x) - n
46B(w) - n
46B(d) - n
46C(x) - y
46C(w) - y
46C(d) - y
47A - n
47B - n
47C - y
48A(x) - y
48A(w) - y
48A(d) - i
48B(x) - n
48B(w) - n
48B(d) - i
48C(x) - n
48C(w) - n
48C(d) - n
48D(x) - n
48D(w) - n
48D(d) - n
48E(x) - n
48E(w) - n
48E(d) - n
48F(x) - n
48F(w) - n
48F(d) - n
49.1.1(x) - n
49.1.1(w) - n
49.1.1(d) - n
49.1.2(x) - n
49.1.2(w) - n
49.1.2(d) - n
49.2(x) - y
49.2(w) - y
49.2(d) - y
49.3(x) - y
49.3(w) - y
49.3(d) - y
50(x) - n
50(w) - n
50(d) - n
51.1 - u
51.2 - n
52.1 - n
52.2 - u
53.1 - i
53.2 - i
54(x) - n
54(w) - n
54(d) - n
55.1 - u
55.2 - u
55.3 - u
55.4 - u
56.1 - n
56.2 - u
57.1 - n
57.2 - u
58 - y
59.1 - y
59.2 - y
60 - n
61 - n
62 - n
63.1 - u
63.2 - u
64 - u
CR - 1
1 - m
2 - n
3 - n
4 - n

ATTACHMENT C

SAMPLING LOCATIONS AND CROSS-SECTIONS



LEGEND:

OFF-SITE LOCATIONS:

⊗	RMW-1	MONITORING WELL BY DAMES & MOORE (1993)
⊡	OMW- 5D	MONITORING WELLS BY METCALF & EDDY (1991)
▲	DMW- 2D	MONITORING WELLS BY DUNN GEOSCIENCE (1993)
◐	OCW- 1	MONITORING WELLS BY DAMES & MOORE (1985)
⊖	OTB-3	TEST BORING
⊞	OB-4	BORING BY OTHERS
△	OW-1	WELL BY OTHERS

ON-SITE LOCATIONS:

*	SG-5	STAFF GAGE
○	MW-12B	MONITORING WELL
◉	P-3	PIEZOMETER
□	SM-3	SEEPAGE METER
◕	B-10	ABANDONED BORING OR MONITORING WELL
	SW-5	SURFACE WATER/SEDIMENT SAMPLING LOCATION
△		SEDIMENT/SOIL SAMPLING LOCATION
— — —		PROPERTY LINE

NOTES:

1. BASE TOPOGRAPHY OF AREAS OUTSIDE THE SITE PROPERTY LINES WAS PREPARED BY McINTOSH AND McINTOSH USING PHOTOGRAMMATIC METHODS FROM AERIAL PHOTOGRAPHY TAKEN APRIL 14, 1989
2. THE TOPOGRAPHY OF AREAS INSIDE THE SITE PROPERTY LINES WAS DIGITIZED FROM DRAWINGS OF RECORD PREPARED BY BEAVER EXCAVATING COMPANY. THESE DRAWINGS INCLUDE THE FINAL GRADING PLAN OF THE BOF AREA DATED 03/06/91, THE FINAL SUBGRADE PLAN OF THE MISCELLANEOUS DEBRIS AREA CC DATED 09/11/91, AND THE FINAL GRADING PLAN OF THE CLARIFIER SLUDGE AREA DATED 10/07/91.
3. PROPERTY LINES ARE BASED ON A SURVEY PERFORMED BY BEAVER EXCAVATING COMPANY
4. .5 FOOT CONTOURS SHOWN IN FINISHED GRADE AREAS
10 FOOT CONTOURS SHOWN IN SUB GRADE AREAS.
5. SITE PLAN MAP COVERAGE OF ALLTIFT SITE PROVIDED COURTESY OF ERM, INC.
6. SITE PLAN MAP COVERAGE OF RAMCO STEEL SITE PROVIDED COURTESY OF DAMES AND MOORE, INC.

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES ______
DWN ______
CKD ______

LTV STEEL COMPANY
BUFFALO, NEW YORK

SUPPLEMENTAL SOLID WASTE MANAGEMENT FACILITY INVESTIGATION PROGRAM

MARILLA STREET LANDFILL

SITE PLAN w/ SEDIMENT SAMPLING LOCATIONS

SCALE: 1:150

MALCOLM PIRNIE, INC.
REVISED JULY 1994
DATE MARCH 1994
SHEET 1 OF 1
DWG. NO. LTV25SIT
XREF: ALTIFT

Borehole I.D. SD-7
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	435 J
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	4,580 J
Inorganics (mg/kg)	
Sb	–
Ba	69.8 J
Ca	6,870
Cr	355 J
Fe	455,000
Pb	383 J
Mn	809 J
V	–
Zn	357 J
Other Metals: (mg/kg)	
Cd	ND
Cyanide	5.5

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-21
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	395
Total Phthalates	–
Total Phenolic Compounds	170
Total PAHs	4,190
Inorganics (mg/kg)	
Sb	–
Ba	118 J
Ca	7,280
Cr	266 J
Fe	486,000
Pb	435 J
Mn	1,160 J
V	129 J
Zn	194 J
Other Metals: (mg/kg)	
As	41.5
Hg	0.47
Cu	73.4
Cd	8.8 J

J = Estimated Value

Borehole I.D. SS-20
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	79
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	3,030
Inorganics (mg/kg)	
Sb	–
Ba	101 J
Ca	30,800
Cr	224 J
Fe	412,000
Pb	377 J
Mn	2,010 J
V	128 J
Zn	258 J
Other Metals: (mg/kg)	
As	46.4 J
Cu	64.3
Cd	14.3 J

J = Estimated Value

Borehole I.D. SS-16
Sample Interval: 2.0 – 4.0

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	79
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	4,570
Inorganics (mg/kg)	
Sb	–
Ba	139
Ca	21,900
Cr	33.5
Fe	59,100
Pb	79.6
Mn	446
V	40.2
Zn	194
Other Metals: (mg/kg)	
As	22
Cu	58.6
Cd	3.6 J

J = Estimated Value

Borehole I.D. SS-22
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	13
Total Phthalates	–
Total Phenolic Compounds	93
Total PAHs	6,210
Dibenzofuran	200
Inorganics (mg/kg)	
Sb	–
Ba	82.2 J
Ca	6,720
Cr	122 J
Fe	166,000
Pb	122 J
Mn	638 J
V	57.3 J
Zn	244 J
Other Metals: (mg/kg)	
As	29.3 J
Cu	181 J
Ni	70.4
Cd	1.9 J

J = Estimated Value

Borehole I.D. SS-21
Sample Interval: 1.9 – 2.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	73
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	2,254
Dibenzofuran	88
Inorganics (mg/kg)	
Sb	–
Ba	94.4
Ca	30,400
Cr	83.6 J
Fe	215,000
Pb	104 J
Mn	2,060 J
V	64.6 J
Zn	278 J
Other Metals: (mg/kg)	
As	22.7 J
Ni	62.5
Hg	0.51
Cu	201 J
Cd	6.4 J

J = Estimated Value

Borehole I.D. SS-20
Sample Interval: 2.0 – 2.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	176
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	2,270
Inorganics (mg/kg)	
Sb	–
Ba	61.9 J
Ca	5,110
Cr	255 J
Fe	294,000
Pb	75.1 J
Mn	151 J
V	104 J
Zn	291 J
Other Metals: (mg/kg)	
As	67.3
Cu	214 J
Ni	96.5
Cd	10.8 J

J = Estimated Value

Borehole I.D. SS-19
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	45
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	2,040
Inorganics (mg/kg)	
Sb	–
Ba	94.9 J
Ca	35,700
Cr	195 J
Fe	359,000
Pb	287 J
Mn	1,610 J
V	109 J
Zn	263 J
Other Metals: (mg/kg)	
As	36.8 J
Cu	57.9
Cd	11.4 J

J = Estimated Value

Borehole I.D. SS-18
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	498
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	–
Inorganics (mg/kg)	
Sb	24.3 J
Ba	114 J
Ca	96,600
Cr	209
Fe	342,000
Pb	358
Mn	1,690
V	111
Zn	307
Other Metals: (mg/kg)	
As	31.8
Cu	58.8
Cd	11.6

J = Estimated Value

Borehole I.D. SS-16
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	79
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	2,310
Inorganics (mg/kg)	
Sb	22.2 J
Ba	101 J
Ca	83,600
Cr	182
Fe	275,000
Pb	340
Mn	1,530
V	88.1
Zn	325
Other Metals: (mg/kg)	
As	24.5
Cd	10.9

J = Estimated Value

Borehole I.D. SS-14
Sample Interval: 0.0 – 0.5

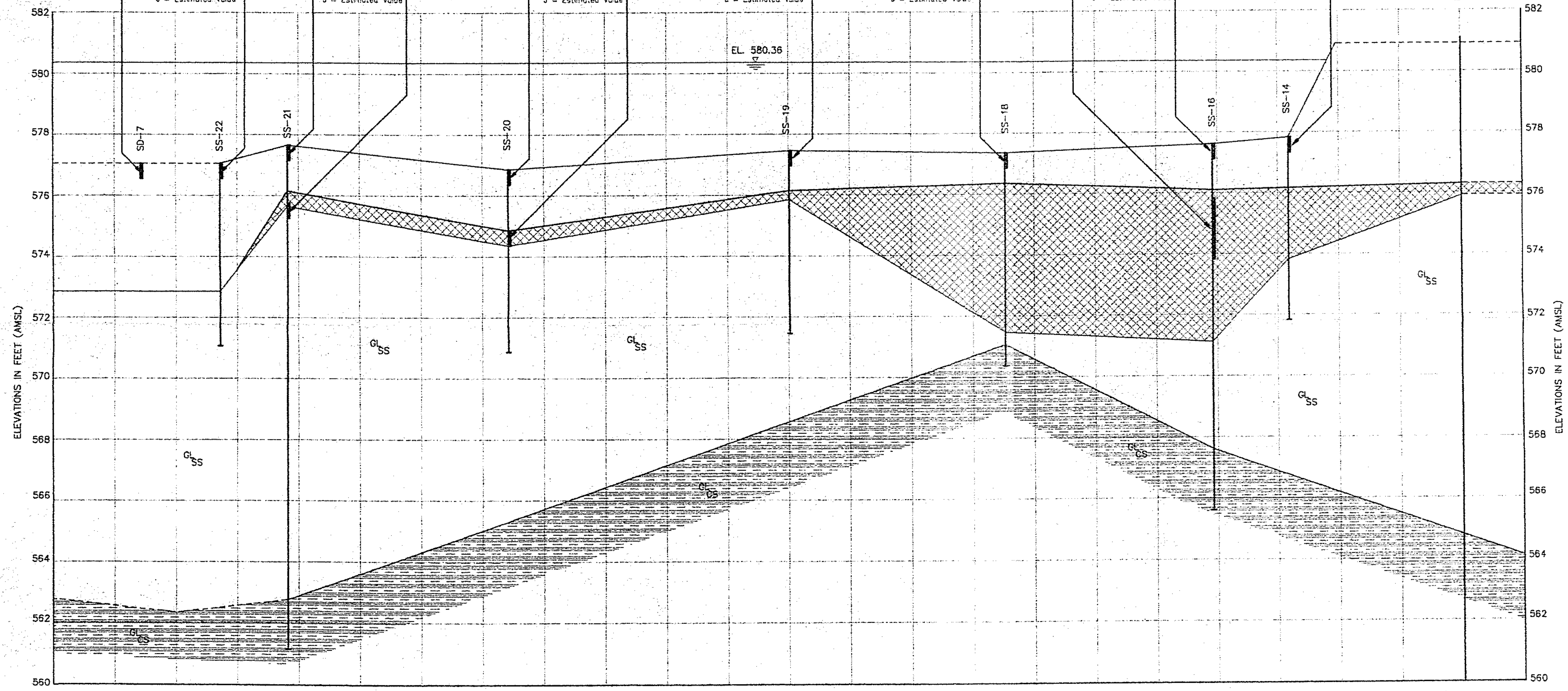
Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	–
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	289,80
Inorganics (mg/kg)	
Sb	–
Ba	48.2 J
Ca	29,600
Cr	38.3
Fe	55,600
Pb	162
Mn	591
V	31.0
Zn	130
Other Metals: (mg/kg)	
Hg	53.7
Cd	1.8 J

J = Estimated Value

A
NORTH

NOTE:
MW-3C SURFACE
ELEVATION 584.6'

A'
SOUTH



SECTION A–A'

NOTE: MW-3C WELL DEPTH ELEVATION 540.6'

LEGEND

☐	FILL	LOOSE, VARIABLE BOTTOM SEDIMENTS COMPOSED OF THIN BLACK CARBONACEOUS LAYERS, CRUSHED STONE, SILT, BOF DUST AND CHEMICAL PRECIPITATE
▨	PEAT	LAYERED VEGETATION, PEAT WITH SILT, CLAY AND VERY FINE SAND WITHIN MATRIX AND AS PARTINGS.

GLACIO–LACUSTRINE:

☐	GL_{SS}	STRATIFIED SILT AND VERY FINE SAND WITH TRACE CLAY, DISCONTINUOUS FIND SAND LENSES.
▤	GL_{CS}	CLAYEY SILT WITH TRACE TO LITTLE SILT AND VERY FINE SAND LAMINAE, SOME PLASTICITY.

UNDIFFERENTIATED GLACIAL TILL:

○	TILL	POORLY SORTED VERY FINE SAND WITH LITTLE–SOME FINE TO COARSE SUBROUNDED GRAVEL, TRACE SILT, TRACE CLAY WITHIN MATRIX AND AS PARTINGS.

EL. 580.36	SURFACE WATER ELEVATION TAKEN 10/94
SD-1	SOIL SAMPLE LOCATION
SS-1	SEDIMENT SAMPLE BORINGS
0.0–0.5	SAMPLED INTERVAL
	BOREHOLE DEPTH

SYMBOL	PARAMETER
Al	ALUMINUM
Sb	ANTIMONY
As	ARSENIC
Ba	BARIUM
Cd	CADMIUM
Ca	CALCIUM
Cr	CHROMIUM
Cu	COPPER
Cn	CYANIDE
Fe	IRON
Pb	LEAD
Mg	MAGNESIUM
Mn	MANGANESE
Hg	MERCURY
Ni	NICKLE
Va	VANADIUM
Zn	ZINC

4806 : 0848256104\I:\ACAD\PROJ\LTV_0848\LTV256\0848GCS1 SCALE: 1:50l 03/24, 1995 at 09:01

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ______
DWN ______
CKD ______

LTV STEEL COMPANY
BUFFALO, NEW YORK

SUPPLEMENTAL SOLID WASTE MANAGEMENT
FACILITY INVESTIGATION PROGRAM

MARILLA STREET LANDFILL
WETLAND INVESTIGATION
NORTH POND
CROSS SECTION A–A'
SCALE: 1"=50' HORIZONTAL 1"=2' VERTICAL

DATE MARCH 1995
G SHEET 2 OF 5
CAD REF. NO. 0848GCS1

Borehole I.D. SS-12
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	–
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	918
Inorganics (mg/kg)	
Sb	–
Ba	125
Ca	30,900
Cr	27.9 J
Fe	35,100
Pb	30.1
Mn	506 J
V	39.0 J
Zn	114 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-11
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	50
Total Phthalates	170
Total Phenolic Compounds	–
Total PAHs	1,198
Inorganics (mg/kg)	
Sb	–
Ba	67.8
Ca	30,500
Cr	21.0
Fe	22,700
Pb	37.3
Mn	488
V	29.1
Zn	97.7
Other Metals: (mg/kg)	
Cd	ND

ND = Not Detected

Borehole I.D. SS-11
Sample Interval: 0.9 - 1.3

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	–
Total Phthalates	51
Total Phenolic Compounds	–
Total PAHs	–
Inorganics (mg/kg)	
Sb	–
Ba	11.1 J
Ca	1,660
Cr	–
Fe	4,710
Pb	6.9
Mn	61.2
V	8.4
Zn	35.1
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-10
Sample Interval: 0.8 - 1.0

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	46
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	1,472
Inorganics (mg/kg)	
Sb	–
Ba	115
Ca	3,730 J
Cr	9.9 J
Fe	7,840
Pb	12.0
Mn	100 J
V	10.3 J
Zn	31.8 J
Other Metals: (mg/kg)	
Cd	1.3 J

J = Estimated Value

Borehole I.D. SS-10
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	70
Total Phthalates	170
Total Phenolic Compounds	–
Total PAHs	11,390
Dibenzofuran	200
Inorganics (mg/kg)	
Sb	–
Ba	112
Ca	116,000 J
Cr	77.3 J
Fe	37,000
Pb	371 J
Mn	2,120 J
V	38.8
Zn	184 J
Other Metals: (mg/kg)	
Cd	1.3 J

J = Estimated Value

Borehole I.D. SD-2
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	126 J
Total Phthalates	–
Total Phenolic Compounds	1,300
Total PAHs	420 J
Inorganics (mg/kg)	
Sb	–
Ba	130
Ca	130,000
Cr	23.8 J
Fe	22,500 J
Pb	35.2 J
Mn	722 J
V	32.8
Zn	83.1 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-9
Sample Interval: 5.0 - 5.5
Composite 7.0 - 7.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	NA
Total Phthalates	101
Total Phenolic Compounds	–
Total PAHs	–
Inorganics (mg/kg)	
Sb	–
Ba	86.5
Ca	4,770 J
Cr	18.4 J
Fe	48,500
Pb	12.8 J
Mn	731
V	32.5
Zn	80.5 J
Other Metals: (mg/kg)	
Cd	1.7J

J = Estimated Value

Borehole I.D. SS-9
Sample Interval: 0.0 - 0.5

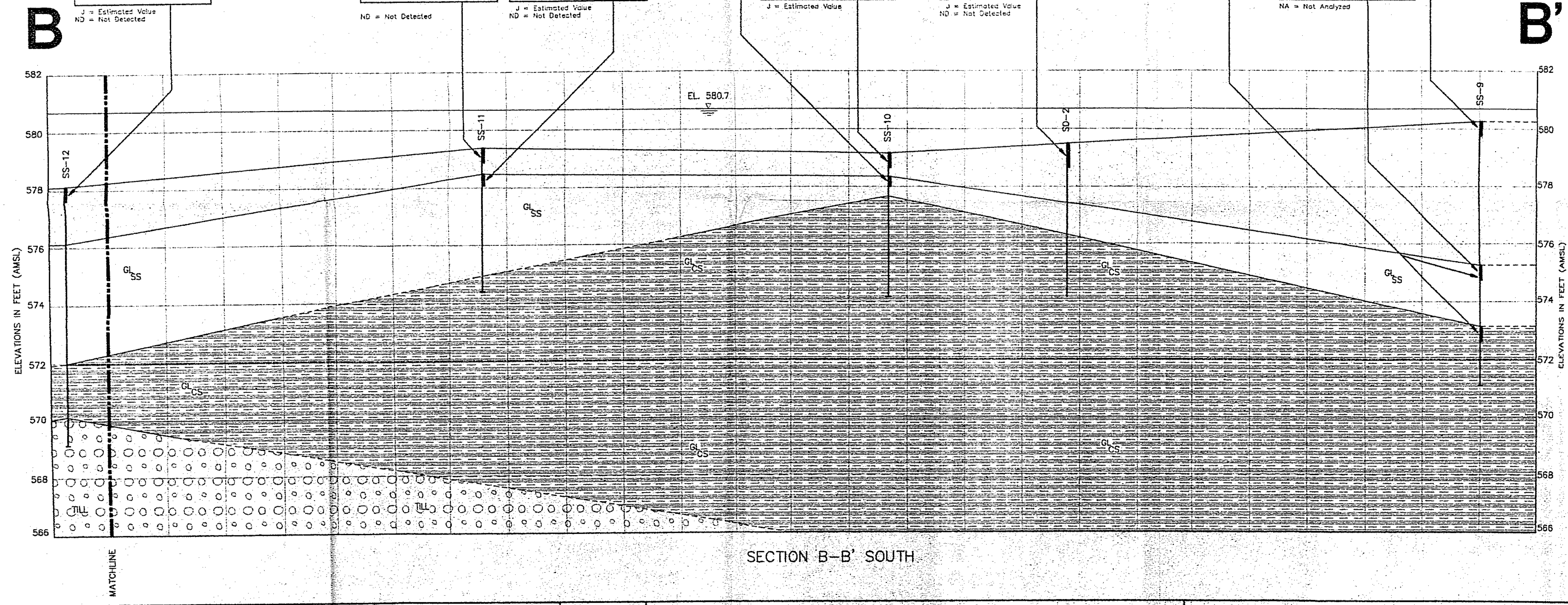
Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	36
Total Phthalates	53
Total Phenolic Compounds	–
Total PAHs	2,930
Inorganics (mg/kg)	
Sb	–
Ba	159
Ca	258,000 J
Cr	15.1 J
Fe	3,890
Pb	115 J
Mn	709 J
V	5.1 J
Zn	77.9 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-9
Sample Interval: 5.0 - 5.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	29
Total Phthalates	NA
Total Phenolic Compounds	NA
Total PAHs	NA
Inorganics (mg/kg)	
Sb	NA
Ba	NA
Ca	NA
Cr	NA
Fe	NA
Pb	NA
Mn	NA
V	NA
Zn	NA
Other Metals: (mg/kg)	
Cd	NA

NA = Not Analyzed



SECTION B-B' SOUTH

LEGEND

☐	FILL	LOOSE, VARIABLE BOTTOM SEDIMENTS COMPOSED OF THIN BLACK CARBONACEOUS LAYERS, CRUSHED STONE, SILT, BOF DUST AND CHEMICAL PRECIPITATE
▨	PEAT	LAYERED VEGETATION, PEAT WITH SILT, CLAY AND VERY FINE SAND WITHIN MATRIX AND AS PARTINGS.

GLACIO-LACUSTRINE:

☐	GL_{SS}	STRATIFIED SILT AND VERY FINE SAND WITH TRACE CLAY, DISCONTINUOUS FIND SAND LENSES.
▤	GL_{CS}	CLAYEY SILT WITH TRACE TO LITTLE SILT AND VERY FINE SAND LAMINAE, SOME PLASTICITY.

UNDIFFERENTIATED GLACIAL TILL:

○	TILL	POORLY SORTED VERY FINE SAND WITH LITTLE-SOME FINE TO COARSE SUBROUNDED GRAVEL, TRACE SILT, TRACE CLAY WITHIN MATRIX AND AS PARTINGS.

▽ EL. 580.36	SURFACE WATER ELEVATION TAKEN 10/94
SD-1	SOIL SAMPLE LOCATION
SS-1	SEDIMENT SAMPLE BORINGS
0.0-0.5	SAMPLED INTERVAL
	BOREHOLE DEPTH

SYMBOL	PARAMETER
Al	ALUMINUM
Sb	ANTIMONY
As	ARSENIC
Ba	BARIUM
Cd	CADMIUM
Ca	CALCIUM
Cr	CHROMIUM
Cu	COPPER
Cn	CYANIDE
Fe	IRON
Pb	LEAD
Mg	MAGNESIUM
Mn	MANGANESE
Hg	MERCURY
Ni	NICKLE
Va	VANADIUM
Zn	ZINC

4806 : 0848256104\I:\ACAD\PROJ\LTV_0848\LTV256\0848GCS4 SCALE: 1:50! 03/24, 1995 at 08:56

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES ______
DWN ______
CKD ______

LTV STEEL COMPANY
BUFFALO, NEW YORK

SUPPLEMENTAL SOLID WASTE MANAGEMENT
FACILITY INVESTIGATION PROGRAM

MARILLA STREET LANDFILL
WETLAND INVESTIGATION
CROSS SECTION B-B' SOUTH
SCALE: 1"=50' HORIZONTAL 1"=2' VERTICAL

DATE MARCH 1995

G SHEET 4 OF 5

CAD REF. NO. 0848GCS4

LEGEND

☐	FILL	LOOSE, VARIABLE BOTTOM SEDIMENTS COMPOSED OF THIN BLACK CARBONACEOUS LAYERS, CRUSHED STONE, SILT, BOF DUST AND CHEMICAL PRECIPITATE
▨	PEAT	LAYERED VEGETATION, PEAT WITH SILT, CLAY AND VERY FINE SAND WITHIN MATRIX AND AS PARTINGS.

GLACIO-LACUSTRINE:

☐	GL_{SS}	STRATIFIED SILT AND VERY FINE SAND WITH TRACE CLAY, DISCONTINUOUS FIND SAND LENSES.
▤	GL_{CS}	CLAYEY SILT WITH TRACE TO LITTLE SILT AND VERY FINE SAND LAMINAE, SOME PLASTICITY.

UNDIFFERENTIATED GLACIAL TILL:

○	TILL	POORLY SORTED VERY FINE SAND WITH LITTLE-SOME FINE TO COARSE SUBROUNDED GRAVEL, TRACE SILT, TRACE CLAY WITHIN MATRIX AND AS PARTINGS.

▽ EL. 580.36	SURFACE WATER ELEVATION TAKEN 10/94
SD-1	SOIL SAMPLE LOCATION
SS-1	SEDIMENT SAMPLE BORINGS
0.0-0.5	SAMPLED INTERVAL
	BOREHOLE DEPTH

SYMBOL	PARAMETER
Al	ALUMINUM
Sb	ANTIMONY
As	ARSENIC
Ba	BARIUM
Cd	CADMIUM
Ca	CALCIUM
Cr	CHROMIUM
Cu	COPPER
Cn	CYANIDE
Fe	IRON
Pb	LEAD
Mg	MAGNESIUM
Mn	MANGANESE
Hg	MERCURY
Ni	NICKLE
Va	VANADIUM
Zn	ZINC

Borehole I.D. SS-17
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	320
Total Phthalates	140
Total Phenolic Compounds	–
Total PAHs	590
Inorganics (mg/kg)	
Sb	–
Ba	114 J
Ca	75,900
Cr	168
Fe	267,000
Pb	282
Mn	1,580
V	99.1
Zn	272
Other Metals: (mg/kg)	
As	31.8
Cd	10.0

J = Estimated Value

Borehole I.D. SD-6
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	–
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	170 J
Inorganics (mg/kg)	
Sb	–
Ba	33.5 J
Ca	30,200
Cr	18.4 J
Fe	21,500 J
Pb	44.6 J
Mn	403 J
V	17.2
Zn	69.6 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-15
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	281
Total Phthalates	120
Total Phenolic Compounds	–
Total PAHs	2,140
Inorganics (mg/kg)	
Sb	–
Ba	87.5 J
Ca	60,400
Cr	192
Fe	260,000
Pb	251
Mn	1,720
V	70.8
Zn	520
Other Metals: (mg/kg)	
As	35.5
Cu	73.7
Cn	1.8
Ni	63.4
Cd	8.0

J = Estimated Value

Borehole I.D. SS-15A
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	93
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	210
Inorganics (mg/kg)	
Sb	20.4 J
Ba	109
Ca	151,000
Cr	146
Fe	217,000
Pb	232
Mn	1,650
V	63.4
Zn	238
Other Metals: (mg/kg)	
As	21.4
Cd	8.4

J = Estimated Value

Borehole I.D. SS-13
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	11
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	919
Inorganics (mg/kg)	
Sb	–
Ba	83.3
Ca	15,900
Cr	27.5 J
Fe	31,500
Pb	107 J
Mn	489 J
V	48.1 J
Zn	154 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SD-3
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	–
Total Phthalates	–
Total Phenolic Compounds	55 J
Total PAHs	3,001 J
Inorganics (mg/kg)	
Sb	–
Ba	87
Ca	9,300
Cr	19.7 J
Fe	43,600 J
Pb	59.9 J
Mn	778 J
V	28.6
Zn	103 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

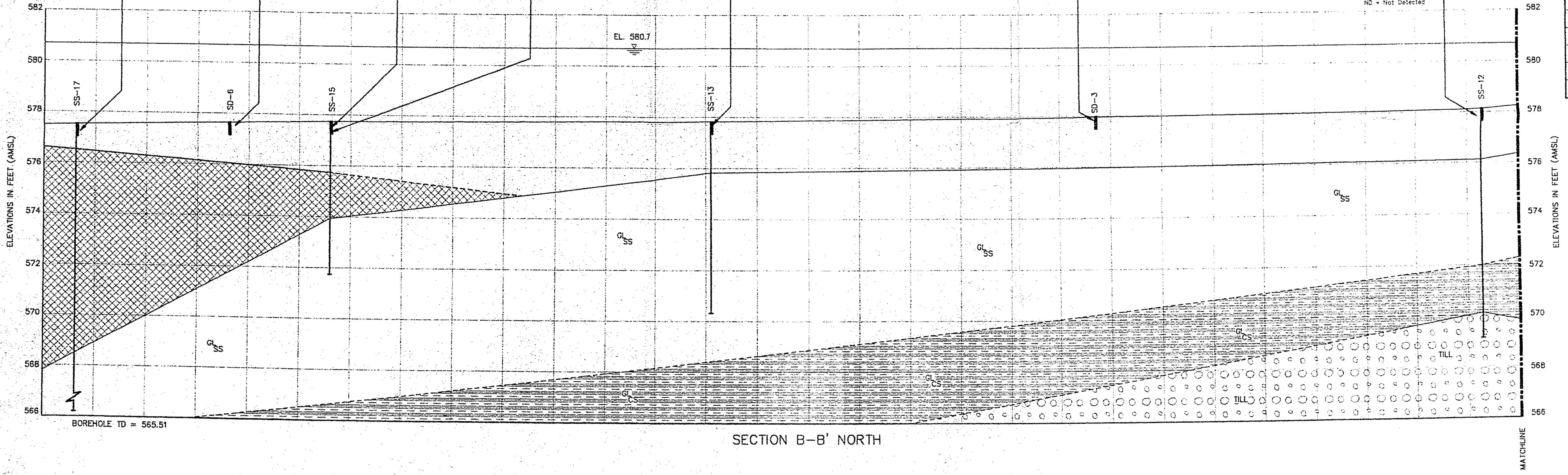
Borehole I.D. SS-12
Sample Interval: 0.0 – 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	–
Total Phthalates	–
Total Phenolic Compounds	–
Total PAHs	918
Inorganics (mg/kg)	
Sb	–
Ba	125
Ca	30,900
Cr	27.3 J
Fe	35,100
Pb	30.1
Mn	506 J
V	39.0 J
Zn	114 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

B

B'



SECTION B-B' NORTH

MALCOLM PIRNIE

NO.	BY	DATE	REVISIONS REMARKS

DES
DWN
CKD

LTV STEEL COMPANY
BUFFALO, NEW YORK

SUPPLEMENTAL SOLID WASTE MANAGEMENT
FACILITY INVESTIGATION PROGRAM

MARILLA STREET LANDFILL
WETLAND INVESTIGATION
CROSS SECTION B-B' NORTH
SCALE: 1"=50' HORIZONTAL 1"=2' VERTICAL

DATE MARCH 1995
G SHEET 3 OF 5
CAD REF. NO. 0848GCS3

4806 : 0848256104\I:\ACAD\PROJ\LTV_0848\LTV256\0848GCS3 SCALE: 1:501 03/24, 1995 at 08:58

Borehole I.D. SS-8
Sample interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	70
Total Phthalates	130
Total Phenolic Compounds	-
Total PAHs	3,400
Inorganics (mg/kg)	
Sb	-
Ba	57.0 J
Ca	52,900
Cr	10.1
Fe	12,000
Pb	85.3
Mn	426
V	10.1 J
Zn	287
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-7
Sample Interval: 3.0 - 3.3

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	-
Total Phthalates	66
Total Phenolic Compounds	-
Total PAHs	-
Inorganics (mg/kg)	
Sb	-
Ba	59.8
Ca	2,550
Cr	11.3
Fe	12,100
Pb	9.3
Mn	83.9
V	23.1
Zn	44.2
Other Metals: (mg/kg)	
Cd	ND

ND = Not Detected

Borehole I.D. SS-6
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	87
Total Phthalates	-
Total Phenolic Compounds	-
Total PAHs	3,370
Inorganics (mg/kg)	
Sb	-
Ba	238
Ca	278,000
Cr	25.1
Fe	26,100
Pb	155
Mn	2,440
V	23.9 J
Zn	515
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-4
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	318
Total Phthalates	330
Total Phenolic Compounds	170
Total PAHs	3,230
Inorganics (mg/kg)	
Sb	-
Ba	189 J
Ca	172,000
Cr	34.2
Fe	35,100
Pb	265
Mn	1,380
V	33.3 J
Zn	968
Other Metals: (mg/kg)	
Cd	6.4

J = Estimated Value

Borehole I.D. SS-3
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	57
Total Phthalates	-
Total Phenolic Compounds	-
Total PAHs	-
Inorganics (mg/kg)	
Sb	-
Ba	82.0
Ca	18,900 J
Cr	21.2 J
Fe	27,400
Pb	54.6 J
Mn	359 J
V	29.4
Zn	189 J
Other Metals: (mg/kg)	
Cd	1.7 J

J = Estimated Value

Borehole I.D. SS-2
Sample Interval: 2.5 - 2.6

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	53
Total Phthalates	-
Total Phenolic Compounds	-
Total PAHs	1,715
Inorganics (mg/kg)	
Sb	-
Ba	92.7
Ca	5,900 J
Cr	9.3 J
Fe	14,400
Pb	20.4 J
Mn	165 J
V	15.3 J
Zn	108 J
Other Metals: (mg/kg)	
Cd	1.3 J

J = Estimated Value

Borehole I.D. SS-8
Sample Interval: 2.5 - 2.6

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	169
Total Phthalates	66
Total Phenolic Compounds	-
Total PAHs	3,478
Inorganics (mg/kg)	
Sb	-
Ba	183
Ca	323,000
Cr	5.9
Fe	3,070
Pb	45.9
Mn	576
V	7.7 J
Zn	30.2
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-7
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	130
Total Phthalates	250
Total Phenolic Compounds	-
Total PAHs	6,070
Inorganics (mg/kg)	
Sb	-
Ba	178 J
Ca	187,000
Cr	30.1
Fe	28,700
Pb	129
Mn	1,380
V	40.4 J
Zn	397
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-5
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	467
Total Phthalates	280
Total Phenolic Compounds	-
Total PAHs	1310
Inorganics (mg/kg)	
Sb	-
Ba	226
Ca	261,000
Cr	17.9
Fe	17,900
Pb	92.7
Mn	2,340
V	21.6
Zn	290
Other Metals: (mg/kg)	
Cd	ND

ND' = Not Detected

Borehole I.D. SD-1
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	-
Total Phthalates	-
Total Phenolic Compounds	150 J
Total PAHs	4,410 J
Dibenzofuran	160 J
Inorganics (mg/kg)	
Sb	-
Ba	218
Ca	233,000
Cr	28.7 J
Fe	20,200 J
Pb	87.7 J
Mn	1,090 J
V	27
Zn	151 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-3
Sample Interval: 1.5 - 2.0

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	71
Total Phthalates	-
Total Phenolic Compounds	-
Total PAHs	410
Inorganics (mg/kg)	
Sb	-
Ba	141
Ca	12,500 J
Cr	15.1 J
Fe	26,000
Pb	73.6 J
Mn	295 J
V	28.3
Zn	276 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-2
Sample Interval: 0.0 - 0.5

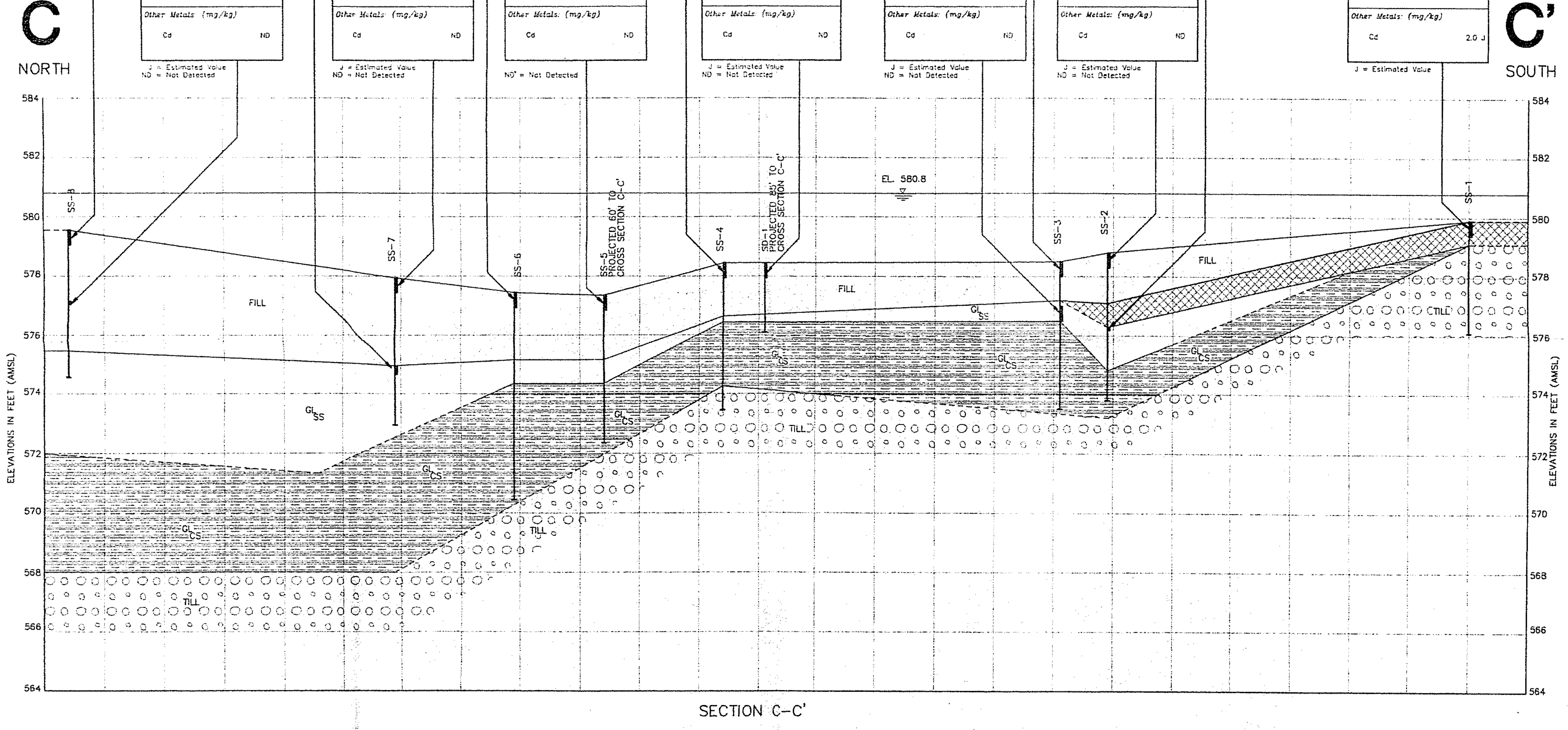
Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	15
Total Phthalates	-
Total Phenolic Compounds	-
Total PAHs	830
Inorganics (mg/kg)	
Sb	
Ba	102
Ca	22,500 J
Cr	28.5 J
Fe	33,300
Pb	28.7 J
Mn	435 J
V	38.8
Zn	150 J
Other Metals: (mg/kg)	
Cd	ND

J = Estimated Value
ND = Not Detected

Borehole I.D. SS-1
Sample Interval: 0.0 - 0.5

Parameter	Result
Organic Compounds (ug/kg)	
Total VOCs	42
Total Phthalates	-
Total Phenolic Compounds	-
Total PAHs	570
Inorganics (mg/kg)	
Sb	-
Ba	92
Ca	37,300 J
Cr	32.6 J
Fe	32,600
Pb	124 J
Mn	538 J
V	37.9
Zn	374 J
Other Metals: (mg/kg)	
Cd	2.0 J

J = Estimated Value



SECTION C-C'

LEGEND

☐	FILL	LOOSE, VARIABLE BOTTOM SEDIMENTS COMPOSED OF THIN BLACK CARBONACEOUS LAYERS, CRUSHED STONE, SILT, BOF DUST AND CHEMICAL PRECIPITATE
▨	PEAT	LAYERED VEGETATION, PEAT WITH SILT, CLAY AND VERY FINE SAND WITHIN MATRIX AND AS PARTINGS.

GLACIO-LACUSTRINE:

☐	GL_{SS}	STRATIFIED SILT AND VERY FINE SAND WITH TRACE CLAY, DISCONTINUOUS FIND SAND LENSES.
▤	GL_{CS}	CLAYEY SILT WITH TRACE TO LITTLE SILT AND VERY FINE SAND LAMINAE, SOME PLASTICITY.

UNDIFFERENTIATED GLACIAL:

○	TILL	POORLY SORTED VERY FINE SAND WITH LITTLE-SOME FINE TO COARSE SUBROUNDED GRAVEL, TRACE SILT, TRACE CLAY WITHIN MATRIX AND AS PARTINGS.

▽ EL. 580.36	SURFACE WATER ELEVATION TAKEN 10/94
SD-1	SOIL SAMPLE LOCATION
SS-1	SEDIMENT SAMPLE BORINGS
0.0-0.5	SAMPLED INTERVAL
	BOREHOLE DEPTH

SYMBOL	PARAMETER
Al	ALUMINUM
Sb	ANTIMONY
As	ARSENIC
Ba	BARIUM
Cd	CADMIUM
Ca	CALCIUM
Cr	CHROMIUM
Cu	COPPER
Cn	CYANIDE
Fe	IRON
Pb	LEAD
Mg	MAGNESIUM
Mn	MANGANESE
Hg	MERCURY
Ni	NICKLE
Va	VANADIUM
Zn	ZINC

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ______
DWN ______
CKD ______

LTV COMPANY
BUFFALO, NEW YORK

SUPPLEMENTAL SOLID WASTE MANAGEMENT
FACILITY INVESTIGATION PROGRAM

MARILLA STREET LANDFILL
WETLAND INVESTIGATION
SOUTH POND
CROSS SECTION C-C'
SCALE: 1"=50' HORIZONTAL 1"=2' VERTICAL

DATE MARCH 1995
G SHEET 5 OF 5
CAD REF. NO. 0848GCS2

7121 : ADMIN V:\ACAD\PROJ\LTV_0848\LTV256\0848GCS2 SCALE: 1:50: 07/25, 1995 at 15:00

ATTACHMENT D

FIELD BOREHOLE LOGS

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS - 2
STARTED 11:00 AM 10/12 19 94
FINISHED 11:45 AM 10/12 19 94
ELEVATIONS: DATUM

Silt Fill
1.7
Silt & Peat
2.5
SD&SL
CL&SL

SAMPLE NO.	ANu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	3.4	0.0 0.5	N/A	— —		Dredge Sand 0.0 - 0.5 Silt Lt-Moderate gray-black, trace vf Sand loose bottom sediment	H2O level @ SG-1 @ 0.95 OSG-1 @ 2.4 Dredge Sand stakes @ 11:00 Depth to Sediment @ 3.0
				3.5			
2	7.2	0 1	WOH WOH WOH WOH	3.5 5.0		1.3 Sample lost, no recovery .4 Silt, fill, dark gray-black, loose bottom sediment, sharp contact .3 Silt and Peat, Black, organic rich, trace vf SAND	
3	3.2	2 3	5 9 15 37	3.5 5.0		.5 Silt and Peat A/A sharp contact w/ .6 SAND and Silt moderate gray, vf-fine grained, grading to .9 Silt Olive-brown, grading to mottled gray-brown, trace-little vf SAND, trace CLAY	
4	2.0	4 5	60 110	3.5 5.0		.8 Silt and CLAY Lt brown-gray, mottled, Fe staining w/ vf SAND as bedded laminae	

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING: SOIL
ROCK

JOB NO. 084B-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-3
STARTED 09:15 AM 10/12 19 94
FINISHED 10:30 AM 10/12 19 94
ELEVATIONS: DATUM

SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TBH NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
		0.0	NA	–		Dredge Sample 0.0-0.5	H2O depth below SG-1 @ 0.95
						Silt Moderate gray-black, loose bottom	@ SG-1 @ 2.4
1	1.6	0.5				sediment, trace CLAY, organic rich with	Dredge Sampl taken @ 09:15
						rootlets	Sediment depth @ 2.3'
		0	WOH	4.2/		0.0-0.7 SAMPLE Lost, NO RECOVERY	MS/MSD 1.5-2.0 @ 10:00
			WOH			.6 Fill, Silt Moderate gray-black, loose bottom Sediment	
2	0.8	1	4	/5.0		.5 Silt, Black-brown, trace-little vf SAND, rootlets, organic rich, sharp contact @ 1.8	
			6			.2 Silt Lt-Moderate gray, w/ little vf SAND grading to	
		2	15	4.2/		.5 CLAY Lt gray-brown, mottled, trace Silt weak plasticity	
3	10.0		36			1.5 Clay and Silt gray-brown, mottled, Fe stained w/	
		3	75	/5.0		trace vf SAND increasing with depth as	
			120			bedded laminae	
		4	150	4.2/		0.8 Clay and Silt A/A w/ vf SAND and Silt	Moist
4	1.0		100			laminae as bedding Fabric	
		5		/5.0			

Silt
Fill
1.0
1.3
Native
Silt
2.0
Clay

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING: SOIL

ROCK

JOB NO. 0848-25-

LOGGED BY JP Hilton

CORE DIA.

BOREHOLE NO. SS-4

STARTED 12:00 PM 10/11 19 94

FINISHED 13:00 PM 10/11 19 94

ELEVATIONS: DATUM

Silt
Fill
1.8
native sed.
2.0
LAC
CLAY
4.2
Till

SAMPLE NO.	TYPE HNu ppm	DEPTH	BLOWS 6"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	5.1	0.0 0.5	NA	-		DREDGE Sample 0.0 - 0.5 Silt, Black, loose, ash-like bottom sediment, trace-little vf SAND, trace clay	H2O level @ SG-1 1.0 OSG-1 2.45 Dredge Smpl @ 12:00 Sediment depth @ 3.3
2	6.4	0 1	WOH WOH WOH WOH	3.3 / 5.0		0.0 - 1.5 sample lost No Recovery .3 Fill, Silt Black, trace-little vf SAND loose .2 Silt Dark-brown gray, organic rich, rootlets	
3	1.0	2 3	WOH WOH 6 9	3.3 / 5.0		1.6 Clay moderate gray, soft, plastic, grading to moderate brown w/ trace-little Silt @ (2.9') .4 Clay and Silt mottled brown, stiff, trace-little Fine-Crs Gravel to 3/4" dia	
4	1.2	4 5	19 19 15	3.3 / 5.0		.2 Clay and Silt A/A w/ increasing vf-fine SAND sharp contact w/ .4 Till SAND Lt Brown, vf-fine, trace-little silt, little fine Gravel	

Sheet No. ___ of ___

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

BOREHOLE NO. SS - 5
STARTED 10:30 AM 10/11 19 94
FINISHED 11:15 M 10/11 19 94
ELEVATIONS: DATUM

Fill
BLACK Silt
2.2
SAND
3.0
CLAY
LAC

SAMPLE NO.	TYPE ANu ppm	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor ,Etc.	NOTES: Boring ,Testing and Sampling Procedures ,Water Loss and Gain Drilling and Testing Equipment ,Etc.
1		0.0	NA	—		DREDGE SMPL 0.0 - 0.5	H2O level @ SG-1 1.0
	0.4	0.5				Silt black, organic rich, loose	OSG - 2.45
						bottom sediment, trace - little CLAY	
				—			Depth to Sediment 3.4'
							DREDGE Smpl @ 10:30
		0	WOH	3.1		0.0 - 1.6 Sample lost Fill as Black Silt	
	0.0		WOH			.4 Silt Black, loose bottom sediment	
		1	WOH				
			WOH	5.0			
		2	WOH	3.1		.2 Silt (Fill) A/A w/ trace vf SAND	
	1.0		10			.3 Silt Dark Brown, trace - little vf SAND, roots,	organic rich, grading to
		3	23			.5 SAND Moderate Gray vf - fine, sharp contact w/	
			50	5.0		1.0 CLAY AND Silt gray-brown, mottled	
		4	80	3.1		.2 Clay and Silt A/A, stiff	
	1.3		25			.4 CLAY gray-red, plastic, stiff, some mottling	
		5		5.0			

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING: SOIL
ROCK

JOB NO. 0848-25-

LOGGED BY JP Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-6
STARTED 09:00 @ 10/11 19 94
FINISHED 10:00 @ 10/11 19 94
ELEVATIONS: DATUM

	SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TBI NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill	1	0.1	0.0	NA	- / -		DREDGE Smpl 0.0-0.5 Silt & Ash-like Material black, loose bottom Sediment trace-little Clay, occasional Cobble ≥2" dia	H2O level @ SG-1 1.0' " " OSG-1 2.45'
↓					/			Depth to Sediment 3.3' DREDGE Sampl @ 09:00 Wetland Sample @ 09:15
	2	0.0	0 1	WOH WOH WOH 1	3.1 / 5.0		0.0-.6 SAMPLE Lost .2 Silt AND Ash-like material, loose sediment w/roots (black) .2 Silt black, little vf-fine SAND, trace fine Gravel	
22.3 silt & SAND	3	0.1	2 3	1 7 9 15	3.1 / 5.0		.3 Silt black w/ SAND: A/A .4 Silt dark gray, little-Some vf-fine SAND .4 SAND Moderate gray grading to brown, vf-fine SAND .9 Silt AND Clay Moderate gray-brown, mottled, stiff	Sieve & Hydrometer Sample taken 2-4'
NATIVE SED'	4	0.2	4 5	36 53 9 10	3.1 / 5.0		.6 Silt AND Clay A/A, trace vf SAND .7 Clay Mottled gray-brown, trace-little Silt grading to 1.3 Silt moderate gray w/ vf SAND and Clay laminae as bedding fabric	Advanced spoon 5-7 recovered 2.0'
3.1 Clay & silt LAC		0.2	6 7	14 19	2.0 / 2.0 (5-7)			
					/			
					/			

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-7
STARTED 15:15 P 10/10 19 94
FINISHED 16:00 P 10/10 19 94
ELEVATIONS: DATUM

SAMPLE NO.	ANu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0.0	NA	-		Dredge Sample 0.0-0.5 Silt black	H2O level @ 1.0 @ SG-1
						loose bottom sediment, trace CLAY and	2.45 @ OSG-1
	0.0	0.5		-		vf SAND, numerous rootlets	
							Depth to Sediment @ 2.8'
		0	WOH	0.0		No Recovery Soft fill & loose bottom sediment	
			WOH			lost to approx 2.5	
		1	WOH				
			WOH	5.0			
		2	WOH	2.2		.5 lost as bottom sediment	
			WOH			.6 Fill/Silt Black, trace-little vf SAND	Sampled 3.0-3.3 @
	0.0	3	WOH			organic rich, sharp contact w/	Fill-Native Sediment contact
			15	5.0		.6 Silt moderate gray, little-some vf SAND	Time @ 16:00
		4	30	2.2		1.0 Silt mottled gray-brown, trace vf SAND and	
	0.2		50			Clay, little Fe staining	
		5		5.0			

3.0'
NATIVE
Silt
&
SAND

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : **SOIL**
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

BOREHOLE NO. SS - 8
STARTED 13:15 PM 10/11 19 94
FINISHED 14:15 PM 10/11 19 94
ELEVATIONS: DATUM

SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	3.6	0.0 0.5	NA	–		0.0-0.5 DREDGE Sample Silt Dark gray, loose bottom Sediment, trace clay	H₂O level @ SG-1 1.0 DSG-1 2.45 Sediment depth 1.2' Dredge Sample taken @ 13:15
2	1.8	0 1	WOH WOH WOH WOH	2.6 / 5.0		0.0-2.1 SAMPLE LOST, soft, loose bottom sediment	
3	4.8	2 3	WOH WOH WOH WOH	2.6 / 5.0		.1 Sample Lost 1.2 Silt, Light cream colored, w/ dark thin laminae, soft, sharp contact w/ .7 SAND and Gravel Dark brown-black vf-fine grained, grading to F-Crs Gravel	* Took sample @ 2.5' of cream colored fill @ 13:45 slight chemical odor
4	1.2	4 5	8 25	2.6 / 5.0		.1 SAND and Gravel A/A, sharp contact w/ .5 Silt DARK-MODERATE gray, trace - little VF SAND, faint bedding, fabric, blocky @ interface	

Silt
Fill
*
cream colored sediment silt
3.4
sd/grvl
4.1
Native
sed.
Silt

Sheet No. ____ **of** ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING : SOIL ______ ROCK ______

JOB NO. 0848-25-

LOGGED BY JP Hilton

CORE DIA. ______

BOREHOLE NO. SS-9

STARTED 08:45 @ 10/13 19 94

FINISHED 11:45 @ 10/13 19 94

ELEVATIONS: DATUM ______

SAMPLE NO.	TYPE HNu ppm	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TBI NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0.0	NA	-		Dredge Smpl Silt Lt Cream-brown, trace-	H2O level @ SG-2 (@ 1.61)
						little fine-med SAND & Cinders, trace-little	
		0.5		-		Clay, stiff, slight chemical ODOR w/in	Depth to Sediment .5'
						sample area, noted white paste-like material	Dredge Smpl taken @ 09:00
2		0	WOH	1.2		.4 Fill Silt Lt Cream-gray, trace-little vf-fine	
			WOH			SAND, trace fine, CLAY, sharp contact	
		1	WOH	5.0		.8 Fill Black Silt and Peat/Plant debris Some	
			WOH			gravel grading downward to Gravel, fine, angular crushed stone	
3		2	6	1.2		No Recovery presumed Gravel Fill	
			10				
		3	5	5.0			
			9				
		4	5			No Recovery presumed Gravel Fill	Note:
			6				1) Oil/Hydrophobic sheen on
							water surface
		5	8	.7		.4 Silt Dark brown, organic rich, trace vf SAND	2) Took Soil Smpl
			2			AND Clay, grading downward to	VOC's 5.0-5.5
		6	2	2.0		.3 Silt and SAND Lt-Moderate gray, SAND as	Semi-VOC's 5.0-5.5 } composite
			10			vf laminae	7.0-7.5
		7	6	1.2		.1 Silt Moderate gray, trace-little SAND (vf) sharp contact	
			18			1.1 CLAY Olive-gray brown mottled w/ Fe staining	
		8	30	2.0		soft, stiff, moderate plasticity, trace vf SAND/Silt	
			24			laminae @ 7.8	
		9					
		10					

5.0
Silt & SAND
7.1
CLAY

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-10
STARTED 14:00 PM 10/13 19 94
FINISHED 15:30 PM 10/13 19 94
ELEVATIONS: DATUM

Fill
.8
SD
≈1.5
clay + silt

SAMPLE NO.	TYPE ANu ppm	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0.0	NA	NA/		Dredge Sample Silt (Fill) Black, soft	H_2O level @ SG-2 @ 1.61'
			-			loose bottom sediment, w/ light cream colored	
		0.5	-	/ -		parting <.1'	Dredge Smpl taken 14:00
			-				Depth to sediment 1.6
							Firm bottom, drillers advance
							spoon by hand to 5', poor
							recovery
2		0	NA	1.8/		.8 Fill SILT AND SAND BLACK Fine-Crs	Blind Dupl #2 taken @ .8-6.0
						Grain, w/ trace Slag / Coke, sharp contact w/	Wetland Sample taken .8-1.0
		1	↓			.7 SAND Brown-black, vf-fine, trace Silt, sharp contact w/	@ 14:25
				/5.0		.3 CLAY AND SILT Dark gray, soft, weak plasticity, w/carbonized	
		2	NA	1.8/		plant fragments.	
						2-4 No Recovery	
		3	↓	/5.0			
		4	NA	1.8/			
		5	↓	/5.0			

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-11
STARTED 08:30 A M 10/10 19 94
FINISHED 10:30 A M 10/10 19 94
ELEVATIONS: DATUM

SAMPLE NO.	ANu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0.0	NA			Dredge Sampl Silt Dark-Moderate Gray,	H2O depth @ SG-3 @ .92
	0.2	0.5				trace-little vf SAND, numerous	SG-5 @
						cattail roots, stay as bottom sediment	Sediment depth @ 1.2'
2		0	WOH	2.8		.1 Silt Moderate gray, soft bottom sediment, trace Clay	below water, Dredge Sample
			WOH			.8 Fill Silt black-brown, little-Some fine SAND,	10:00 Am
	0.2	1	~~18~~			fine-Crs Gravel, ash-like material, sharp	contact w/
			12	5.0		1.1 SAND Gray-black, fine grain, trace Silt	
3		2	38	2.9		0.8 SAND moderate gray grading to Fe stained	Sampled .9-1.3' @ 10:30
			26			lt-mod brown, vf-fine grain, bedding	
	0.1	3	43			laminae < 3mm thick	
			50	5.0			
		4	45				
			60				
		5					

Fill
.9
SAND

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING : SOIL

ROCK

JOB NO. 0848-25-

LOGGED BY JP Hilton

CORE DIA.

BOREHOLE NO. SS-12

STARTED 12:00 PM 10/2 19 94

FINISHED M 10/2 19 94

ELEVATIONS: DATUM

SAMPLE NO.	ANu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0.0	NA	—		Dredge Sapl 0.0-0.5	H2O @ SG-5 @ 0.79
						Silt lt gray-black, loose bottom sediments	Depth to sediment 2.3'
		0.5				w/ CLAY	
							Dredge Sple @ 12:05
2	0.2	0	WOH	.9		.5 Silt gray-black grading downwards to f-crs Gravel	
			WOH			.4 Gravel, angular and Cobbles to > 6" dia, black	
		1	WOH			silt and SAND	
			WOH	5.0			
		2	10	NR		No Recovery	
			8				
		3	13			Flushed silt and sand from borehole	
			13	5.0		in attempt to drive casings	
		4	27	NR			
			23				
		5	24				
				6.0			
3	0.2	5	7	1.2		.2 SAND Olive-brown fine-Med, trace Silt	
			12			.1 Clay Olive-brown trace-little Silt	
		6	20			.9 Clay and Silt lt brown-gray, trace vf SAND as bedded	
			28	2.0		laminae, Clay content increasing w/ depth	
4	0.2	7	11	2.0		1.1 CLAY Moderate Gray-brown, mottled, trace-little	
			12			Silt and vf SAND, sharp contact w/	
		8	15			.9 Till SAND lt brown-gray, fine grain, little	
			17	2.0		fine sub-rnd gravel, trace-little Silt	
		9					

Fill

~2.0'

Native SED.

SAND

6.0'

~7.0'

Clay

8.1

Till.

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

BOREHOLE NO. SS - 23
STARTED 09:45 @ 10/7 19 94
FINISHED 11:30 @ 10/7 19 94
ELEVATIONS: DATUM

Fill & BOF Dust
≥1.0
SAND
No Recovery
SAND & Silt.

SAMPLE NO.	HNu PPM TYPE	DEPTH	BLOWS 6"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0.0	NR	-		0.0 - 0.5 Dredge Smpl	H₂O @ SG-5 @ .79
						Dark gray-black Silt and Clay coarsening	depth to Sediment 2.6'
		0.5		-		downward w/ vf SAND	
							Dredge Smpl @ 09:45
2	0.2	0	WOH	1.6		1.0 Fill, Crs angular gravel and Cobbles (BOF	
			WOH			> 3" dia with Black-brown Silt sharp (DUST)	1) large cobbles prohibit
		1	WOH	4.0		contact w/ Note: Oil Sheen on Sediment	or prevent advancement
			>100			.6 SAND black grading to gray-brown, fine-Med grain	of spoons and casing
		2	>100	-		No Recovery	
			>100				2) Cobbles along ditch
		3	>100			Fill & Cobbles	bottom at approx 1-2'
			>100	4.0			depth below loose sediment
	0.2	4		1.3		Unable to advance casing (PVC), used 5'	
						spoon advanced to 3.5'	
		5				3.5 - 5.5 No Recovery	
3			10	2.0		Sampled 5.5 - 7.5	
	0.2	6	8			.7' (5.5-6.2) SAND Lt Brown-gray, fine-Medium grain	
			4			trace Silt	
		7	3			.6 Silt Lt Brown-gray, trace-little Clay, trace	
						vf SAND as laminae	

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING: SOIL
ROCK

JOB NO. 0848-25-6
LOGGED BY JP Hilton
CORE DIA.

BOREHOLE NO. SS - 14
STARTED 13:00 PM 10/4 19 94
FINISHED 13:30 M 10/4 19 94
ELEVATIONS: DATUM

SAMPLE NO.	HNu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TBI NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0 1	WOH WOH WOH WOH	2.1/5.0		No Recovery Dredge Sample 0.0 - 0.5'	H2O level 1.09' below top of Staff Gauge SG-3
2	0.8	2 3	WOH 2 4 5	2.1/5.0		2.9 - 3.1 (.2) Brown-Olive Fill, Silt, vf Sand organic odor 3.1 - 4.0 (.9) Fill, Gray-brown Silt, trace clay, grading to Peat w/ plant fragments	H2O depth 2.3'
3	0.8	4 5	14 11 NA NA	2.1/5.0	1.3/2.0	4.0 - 5.0 Silt gray-brown, little-some vf Sand, color change to brown-olive w/ trace clay, vf Sand as laminae and partings	
4	0.0	6 7		/	(4) (5)	4.0 - 4.5 (.5') Silt brown, mottled, heavily iron stained, little vf Sand grading to .8 Silt gray-brown, Clayey, trace - vf Sand slight plasticity	Took 2" spoon 4-6' w/o blow counts
5		8 9		/	(6)		Dredge Sample @ 13:45
6		10 11		/			
7		12 13		/			
8		14 15		/			

Fill
±4.0'
Silty SD
Nat. SED

Sheet No. 1 of

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-6
LOGGED BY JP Hilton
CORE DIA.

BOREHOLE NO. SS-15
STARTED 15:00 PM 10/4 19 94
FINISHED 16:45 PM 10/4 19 94
ELEVATIONS: DATUM

Fill
±2.0
≥2.5
Native
Seam

SAMPLE NO.	HNu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.7	0		0.6/5.0		0.0 - 2.0 Poor recovery	H_2O depth @ SS-15
						recovered only Peat & Plant	2.39' to bottom
		1				debris	SG-5 @ [illegible] 1.09
							significant oil &
2	0.8	2	WOH	1.1/5.0		2.0 - 3.5 Peat - poor recovery	petroleum sheen
			WOH			3.5-3.8 Peat, black-brown w/ silt grading to	on H_2O surface
		3	WOH			3.8-4.2 (.4) Silt gray, trace-little Clay	
			4			sharp contact	
3	1.0	4	7	1.3/2.0		4.2 - 4.6 SAND Olive gray-brown, fine grain, trace	took 2" spoon 4-6'
			10			Silt grading downwards to	
		5	~			4.6 - 6.0 (1.4) Silt brown-olive, mottled w/ Fe staining	
			-			little - some Clay as partings < 1/4" thick	
	1.0	6				4-6 w/ 2" spoon	

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING : SOIL

ROCK

JOB NO. 084B-25-6

LOGGED BY JP Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-16

STARTED 09:00 AM 10/5 19 94

FINISHED 11:00 M 10/5 19 94

ELEVATIONS: DATUM

SAMPLE NO.	ANu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.4	0 .5	NA	- / -		Dredge sample taken @ 09:20	H2O level .96 below top of SG-5
2	0.2	0 1	WOH WOH WOH WOH	.5 / 6.0		.5 Peat Brown, plant + wood tissue trace silt (1.5-2.0)	Dredge smpl @ 09:20 depth to sediment 2.65'
3	0.2	2 3	WOH WOH WOH WOH	1.4 / 5.0		1.0 Peat, dark brown w/ silt A/A .4 Silt, moderate gray, little clay, trace little plant fragments	NOTE: 2-4' smpl Soil sample taken 2-4' @ 10:00
4	0.8	4 5	5 2 2 3	.8 / 2.0		.8 Silt and Clay A/A w/ Peat layer	Damp - Wet
5	0.8	6 7	2 3 6 8	1.4 / 2.0		.5 Peat dark brown, wood/plant roots, sharp contact .3 Clay gray-black, little silt as laminae, weak plasticity .6 SAND and Silt, gray, fine grain, fe stained mottling	
6	0.6	8 9	4 4 8 11	1.7 / 2.0		.6 Silt moderate gray-brown, trace little vf SAND grading to .5 SAND Gray-olive brown, vf grained, trace silt, sharp contact w/ .6 Silt light olive-brown, some CLAY, weak plasticity	
7	0.2	10 11	2 8 15 19	1.9 / 2.0		.9 Clay and Silt, light gray-brown, trace vf Sand 1.0 Silt moderate gray with Clay laminae and partings, Silt as lt mod oxidized partings and laminae	
		12		/			

Dredge smpl :1.5

Peat + Clay

S1 SD

3/0

C1 SL

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING: SOIL ______ ROCK ______

JOB NO. 0848-25-6

LOGGED BY JP Hilton

CORE DIA. ______

BOREHOLE NO. SS-17

STARTED 12:45 M 10/5 19 94

FINISHED 14:30 M 10/5 19 94

ELEVATIONS: DATUM ______

SAMPLE NO.	HNu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	1.2	0 0.5	NA	— / —		DREDGE SMPL	H2O depth @ 0.96 below top of SG-5 SS-17 depth to Sediment 2.75'
2	0.6	0 1	WOH WOH WOH WOH	2.5 / 4.0	0.0-1.0 1.0-1.5 1.5	1.0 Silt (bottom Sediment) Yellow-brown, oxidized Fe stained, loose, black layer w/ oil sheen @ 0.6 sharp contact w/ 0.5 Peat, black, stained, woody plant fragments, oily	
3	13.6	2 3	WOH WOH WOH WOH	2.5 / 4.0		1.0 Peat/wood dark brown-gray, woody tissue and plant fragments, log @ 2.2-2.5	
4	7.0	4 5	2 2 4 2	.9 / 2.0		.7 Peat and Silt dark gray brown, roots and woody tissue, trace vf-fine sand, sharp contact .2 Silt moderate gray, trace vf sand	
5	5.4	6 7	1 1 2 3	1.7 / 2.0		1.2 Peat and Silt A/A grading to .4 Silt dark gray black-brown, trace vf sand .1 Sand and clay gray fine grain w/ stiff clay parting	Damp - wet
6	5.2	8 9	2 3 10 13	2.0 / 2.0		1.7 Silt and Peat, dark brown-gray, trace vf sand .05 Sand gray, fine-med grain .25 Silt gray-green w/ little clay, stiff	
7	4.0	10 11	6 6 10 13	.9 / 2.0		(.4) Silt olive gray-brown, trace-little clay, vf sand increasing clay w/ depth	Blows Pushed #1 0.0'-0.5
		12					

Peat
w/ silt
4.7
silt
7.?
Peat
silt
Peat
silt
9.7
silt w/ clay

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-6
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-18
STARTED 1400 PM 10/5 19 94
FINISHED 16.00 PM 10/5 19 94
ELEVATIONS: DATUM

Silt Fill & loose Sed.
1.0
Interbedded Silt & Peat
5.9
SDSL
6.3
Clay

SAMPLE NO.	ANu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.4	0.0	NA	-		Dredge Sample 0.0 - 0.5'	SG-5 @ 0.96
		0.5				Yellow-brown silt as bottom sediment	
							* Staining (black, oily) to
				-			2.5'
2	0.6	0	WOH			.5 Silt Yellow-brown, loose - trace vf Sand @ .5'	(Precipitate & laminae)
			WOH	3.0		.5 Silt black w/ oil-like sheen, metallic-like precipitate	Metallic-like layer w/ black-oil
		1	WOH			trace vf-fine Sand, sharp contact w/	sheen throughout .5-1.1 zone
			WOH	4.0		1.0 Peat, black, staining throughout, woody plant tissue, little silt	
3	0.6	2	1	3.0		1.0 Peat and Silt dark brown, gray roots	
			1			and woody tissue throughout, little vf Sand	
		3	2				
			2	4.0			
4	--	4	—			No Sample 4.0-5.0' flushed out	
			—	1.9		(Peat)	depth to sediment
		5	2			.9 Silt dark brown w/ Peat	2.9'
	0.5		1	2.0			
5	---	6	2			0.3 Sand and Silt gray vf grain grading to	
			4			.7 Clay, gray, stiff, moderate plasticity, trace	
		7				silt	
		8					

Sheet No. ___ of ___

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-19
STARTED 09:30 AM 10/6 19 94
FINISHED 09:30 AM 10/6 19 94
ELEVATIONS: DATUM

BTM SED & Fill 1.3

NAT. soil

SAMPLE NO.	ANu PPM TYPE	DEPTH	BLOWS 6"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.6	0.0	NA	–		Dredge Sample Silt, Yellow brown, loose	H2O @ SS-5 @ 0.86
		0.5				bottom sediment w/ clay	
							Depth to Sediment 2.9'
				2.0			
2	2.8	0	WOH	2.6		0.0 - 1.3 Silt Yellow-black, loose bottom	
			WOH			sediment, trace-little clay becoming	
		1	WOH			denser with depth	
			WOH	2.0		0.3 Peat black-brown grading to Silt .4 Silt brown-black trace little vf SAND	
3	0.7	2	WOH	2.6		.6 Silt brown-gray, trace-little vf SAND,	
			WOH			rootlets throughout	
		3	WOH				
			WOH	2.0		& peat	
4	0.5	4	3	1.2		.4 Silt w/ vf SAND A/A sharp contact	
			3			w/	
		5	7			.8 Silt gray-lt gray, little vf SAND w/in matrix	
			8	2.0		and as partings, trace clay	
		6					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS - 20
STARTED 10:15 AM 10/6 19 94
FINISHED 11:00 M 10/6 19 94
ELEVATIONS: DATUM

SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TBI NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	7.6	0.0 0.5	NA	NA		DREDGE Smpl 0.0 - 0.5 Silt Yellow-brown, loose w/clay	H_2O @ SG-5 @ 0.86 Sediment [illegible] Dredge [illegible] @ 1010
2	2.8	0 1	WOH WOH WOH WOH	3.6 5.0		0.0 - [illegible] Silt yellow-black, loose bottom Sediment w/ trace-little vf SAND, w/ depth black, organic, oily layering as partings <1/2" thick	Took MS/MSD @ 1020 from 2.0 - 2.5'
3	0.4	2 3	WOH WOH WOH WOH	3.6 5.0		2.0 - 2.5 Peat and Silt black, organic rich .4 Silt dark brown-black SAND (vf-fine) w/in matrix, grading to .7 SAND and Silt olive gray-brown, mottled, vf-fine grain	Oily sheen in upper 2.0' as definite partings
		4 5	WOH WOH 9	NR 5.0		N/R	
4	0.2	4 5 6	5 6 6 6	1.1 2.0		1.1 SAND and Silt lt gray-brown vf-fine grain Silt w/in matrix, SAND as partings to .2 thick	

Silt
Fill
w/oily
partings
2.0
Silt blk
2.5
Native
Sed.
SAND
&
Silt

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-21
STARTED 12:30 P 10/6 19 94
FINISHED 15:00 P 10/6 19 94
ELEVATIONS: DATUM

	SAMPLE NO.	HNu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain, Drilling and Testing Equipment, Etc.
Silt Fill	1	0.8	0.0 0.5	NA	—/		Dredge Sampl 0.0 - 0.5 Silt, Yellow-Olive brown, loose w/ clay and vf SAND, black layering	H_2O @ SG-5 @ 0.86 Depth to Sediment 2.7' Dredge sampl @ 12:30
1.5 Peat 2.0	2	0.2	0 1	WOH WOH WOH WOH	2.5/5.0		1.5 Silt yellow-olive, loose bottom sediment w/ clay .5 Peat Black-gray, woody w/ plant tissue some gravel size Nodules (Mo)?	Took Soil Sample 1.9-2.5 " Wetland Characterization 1.9-2. @ 12:30
Silt	3	0.1	2 3	WOH WOH WOH 8	2.5/5.0		.5 Silt lt gray-black, trace-little vf SAND, some roots, plants.	
4.3 SAND	4	0.1	4 5	3 4 4 5	1.6/2.0		.3 Silt lt-Moderate gray, trace-little Clay, trace vf SAND, gradational to 1.3 SAND Moderate gray - lt brown (Fe oxidation) fine grain trace-little Silt mottled	
grading to SD_{SL}	5	2.5	6 7	6 4 4 6	2.0/2.0		.4 SAND vf-fine grain, mottled A/A w/ trace-little Silt .8 SAND lt brown, fine-grain trace Silt .8 SAND and Silt lt brown-gray, vf grain occasional gravel to ½" dia sub-rnd	
8.6 Silt w/ Sl.Cl.	6	2.2	8 9	6 12 15 16	1.8/2.0		.6 SAND and Silt A/A grading downward to 1.2 Silt Moderate gray, trace vf SAND and CLAY	
	7	0.4	10 11	10 12 15 17	1.4/2.0		1.4 Silt Moderate gray, trace vf SAND as parting .1 thick, trace Clay within matrix	
12.0 SAND 12.5 Silt 12.9 SAND	8	1.0	12 13	10 15 22 19	1.2/2.0		.5 SAND lt-mod gray vf grain, trace Silt .4 Silt lt gray, trace-little vf SAND .3 SAND lt-mod gray, vf grain, trace Silt bedding fabric.	

Sheet No. 1 of 2

MALCOLM PIRNIE

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING: SOIL

ROCK

JOB NO. 0848-25-

LOGGED BY JP Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-21

STARTED 12:30 PM 10/6 19 94

FINISHED 15:00 M 10/6 19 94

ELEVATIONS: DATUM

SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
9	2.4	14	15	1.5		.9 Silt lt gray with interbedded Silt and Clay laminae and partings increasing with depth	
			18				
		15	10				
			8	2.0		.6 Clay lt gray-brown, soft, strong plasticity trace silt	
		16					

silt
14.9
Lac.
Clay

Sheet No. 2 of 2

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

BOREHOLE NO. SS - 22
STARTED 15:30 P M 10/6 19 94
FINISHED 16:30 P M 10/6 19 94
ELEVATIONS: DATUM

SAMPLE NO.	ANu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	1.0	0.0	NA	—		Dredge Sample 0.0 - 0.5	H_2O @ SG-5 @ 0.86
						Silt, loose black-gray, bottom sediment	depth to sediment @ 3.3
		0.5				w/ Clay, trace-little gravel, numerous	
						plant fragments	Dredge sample taken @15:30
2	0.5	0	WOH	1.6		.8 Silt green-black, loose bottom sediment w/ fine	gravel
			WOH			grading to	
		1	WOH			.8 Peat / Fill Black, fine-Cs gravel, plant	
			WOH	5.0		fragments	
3		2	WOH	1.6		No Recovery	
			WOH				
		3	7				
			9	5.0			
4	0.1	4	WOH	0.9		.2 Peat / Fill Black w/ Silt, f-crs Sand and	
			WOH			Gravel to ½" dia	
		5	22			.7 SAND Lt gray, mottled (Fe stained) vf-fine	
			9	5.0		w/ trace-little Silt	
~~4~~		6					

Fill & Peat

≈4.0

NAT SED SAND

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV Steel

PROJECT Supplemental SWMFIP

LOCATION Marilla Street LF

CONTRACTOR Buffalo Drlg

METHOD OF BORING: SOIL ____ ROCK ____

JOB NO. 0848-25-

LOGGED BY JP Hilton

CORE DIA. ____

FIELD BOREHOLE LOG

BOREHOLE NO. SS-23

STARTED 10:30 AM 10/18 19 94

FINISHED ____ M ____ 19 94

ELEVATIONS: DATUM ____

	SAMPLE NO.	ANu PPM TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
	1		0.0	NA	—		Dredge Sample 0.0-0.5	H₂O level at SG-7 @1.5'
							Silt and Clay, loose, Yellow-brown, bottom	
			0.5		—		sediment, oxidized Fe staining	Depth to sediment 2.7'
Silt Fill								Dredge sample taken @ 10:30
								Pond water clear, pond
								devoid of vegetation and
≅1.0								aquatic life
Peat	2		0	NA	.6		.6 Peat black grading to Dark brown black	
							with trace-little Silt and vf SAND	
			1		1.5		increasing with depth	VOC sample taken @ 12:15
≅2.0								depth 1.0-2.0
Silt	3		2	NA	.4		.4 Silt Dark gray-brown, trace vf SAND	12:15
							organic rich w/ plant fragments	Composited Metals/VOC's
			3		1.0			1.0-2.0 & 2.0-2.4

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-24
STARTED 11:15 10/18 19 94
FINISHED 11:45 10/18 19 94
ELEVATIONS: DATUM

Fill
0.5
Peat
1.5

SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TEST NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0.0	NA	-		Dredge Sample 0.0-0.5 Silt and Clay	H₂O level @ SG-7 @ 1.5'
						Yellow-brown loose bottom sediment, with	
		0.5		-		black laminae/partings, Fe staining;	Depth to Sediment 3.35
						crust-like precipitate	Dredge Sample taken @ 11:45
2		0	NA	1.3		.2 Sample lost	
			-			.3 Peat Black, with visible oil sheen, trace-little	Oil sheen noted on water
		1	-			Silt, trace SAND	surface as spoon penetrated
			-	1.5		1.0 Peat and Silt Dark Brown, trace-little vf SAND	bottom sediment
3		2	NA			No Sample	
		3					
4		4	NA			No Sample	
		5					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS-25
STARTED 13:10 10/14 19 94
FINISHED 15:15 10/14 19 94
ELEVATIONS: DATUM

	SAMPLE NO.	TYPE HNu ppm	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
	1		0.0 0.5	NA	— /		DREDGE Sample 0.0-0.5 Silt DARK GRAY-Brown, loose bottom Sediment trace fine SAND, Gravel, CLAY, possible BOF Dust as red-brown Silt	H₂O level @ SG-4 @ .66' Depth to Sediment @ .58 Dredge Smpl taken @ 13:10
					/			
Fill	2		0 1	WOH WOH 3 6	2.7/5.0		.5 Silt Lt-Moderate GRAY, trace vf SAND, sharp contact w/ 1.5 SAND AND BOF Dust, black-red fine-med with BOF dust partings to .1' thick, little Peat @ 0.5'	
2.4 Peat w/Grvl BOF Dust	3		2 3	5 6 3 4	2.7/5.0		.4 SAND AND BOF Dust A/A, sharp contact w/ .7 Peat, BLACK, w/ mossy plant fragments, trace SAND GRAVEL No Sample available 3.1-5.5'	
	4		4 5	6 5	2.7/5.0			
SAND w/Silt	Smpl NA		5 6	NA 10 8 6	.7/2.0		Flushed 5.0-5.5' interval from casing .7 SAND Olive GRAY, vf grain, trace-little Silt	14:40 Sampled VOC's 5.5-6.2' Not enough sample for Semi-VOC's
7.0 Till	Smpl NA		7 8	9 9 14 65	1.2/2.0		1.2 Till Lt Brown SAND, vf grain, trace Silt w/ little fine gravel, w/ cobble to >2" dia	Semi-VOCs & Metals 7.0-7.5'
9.1 bedrock ?			9 10	130	/.1			spoon refusal, possibly bedrock

11

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Supplemental SWMFIP
LOCATION Marilla Street LF
CONTRACTOR Buffalo Drlg
METHOD OF BORING : SOIL
ROCK

JOB NO. 0848-25-
LOGGED BY JP Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. SS - 26
STARTED 08:00 AM 10/14 19 94
FINISHED 12:00 AM 10/14 19 94
ELEVATIONS: DATUM

Fill
31.0'
NATive SED SAND
NR
7.0'
CLAY

SAMPLE NO.	HNu ppm TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TBI NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0.0				Dredge Sample 0.0 - 0.5	
						CLAY and Silt Lt brown gray, soft loose	H2O level@ SG-4 @.66
		0.5				few plant roots & fragments, trace vf SAND	
							Dredge Smpl taken @ 08:45
							Sediment depth @ 0.3
2		0	WOH	2.0		0.3 Silt Lt brown-gray, loose	
			2			.7 GRAVEL, slag, crushed Stone, trace-little	
		1	23			Silt & Peat, little vf-fine Sand	Sgl Smpl @ 11:00
			30	5.0			taken .9-1.0'
3		2	50	2.0		1.0 SAND black-brown grading downward to	
			26			olive-gray w/mottled Fe staining, vf-fine,	Wet
		3	21			trace-little silt, faint bedding	
			20	5.0		No Recovery 3-4'	
4		4	NA			4-5 No Recovery	
			NA			Sampled 5-7'	
		5	4	.7 5.0		.7 Silt and CLAY Lt-Moderate brown, mottled	
			5	2.0		grading to clayey silt w/depth	
5		6	7	.7			
			11	2.0 7.0			
		7	8	1.3			
			11	2.0		1.3 CLAY and Silt Lt-Moderate brown, Silt	
		8	14	1.3		As bedded laminae <2mm thick,	
			14			mottled, stiff, weak plasticity	
		9		2.0 9.0			
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

ATTACHMENT E

ANALYTICAL DATA ASSESSMENT

AND

VALIDATION REPORT

1.0 INTRODUCTION

The following discussion details Malcolm Pirnie's analytical data assessment and validation of results reported by NYTEST Environmental, Inc. for a total of 44 soil samples collected at the Marilla Street Landfill Site. Each sample was analyzed for Target Compound List (TCL) volatile organic compounds , TCL semi-volatile organic compounds, and Target Analyte List (TAL) inorganic elements with the exception of beryllium, cobalt, selenium, and silver. The assessment of analytical data included a review of data consistency and data completeness, and adherence to accuracy and precision criteria.

The validation is based on laboratory compliance with Method 91-1, Method 91-2, and the 200-CLP series methods as contained in the 1991 NYSDEC Analytical Services Protocol (ASP). Data were evaluated as indicated in the following table:

Data Type	Criteria
All Data	Holding times Calibrations Blanks Matrix spike/matrix spike duplicate (MS/MSD) recoveries Field duplicate precision Data completeness
Organic Data	Surrogate recoveries Gas chromatograph/mass spectrometer (GC/MS) tuning Matrix spike blank (MSB) recoveries Internal standard performance.
Inorganic Data	Contract-required detection limit (CRDL) standards for ICP and AA Laboratory control sample (LCS) ICP interference check sample (ICS) ICP serial dilution analysis Furnace AA QC analysis

The Functional Guidelines (herein called the "guidelines" for evaluating organic and inorganic data (1991 and 1988 respectively) have been applied.

Data are valid and acceptable; however, those analytes which have been qualified with a "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (non-detects), or "JN" (presumptive evidence for the presence of the material at an estimated value) are estimated values. The analytical results and appropriate data qualifiers are presented in Tables A through H attached. All action is detailed in the discussion which follows.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon. Second, no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves only to increase confidence in data.

1.1 ORGANIC DATA ASSESSMENT

1.1.1 Holding Time

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified method holding time is exceeded the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "UJ", or unusable, "R", if the holding times are grossly exceeded. A review of the analytical data indicated that no analytes were qualified because of holding time exceedance.

1.1.2 Blank Contamination

Quality assurance (QA) blanks; i.e., method, trip, field, or rinse blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of volatile organic compounds during shipment. Field (rinse) blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for the common contaminants), the analytes are qualified as non-detects "U". The following analytes in the samples shown were qualified with "U" for these reasons:

A) Method Blank Contamination:

Login #	Parameter	Affected Samples
22218, 22253, 22267	methylene chloride acetone 2-butanone	SS-14; SS-15A; SS16-0, 16-4; SS17, SS18
	methylene chloride	SS19; SS20-0, 20-2; SS21-0; SS22-0; SS-13
	methylene chloride acetone	SS21-1; SS12
	methylene chloride	SS11-0, 11-0-9; SS15; SS7-0, 7-3
	bis(2-ethylhexyl)phthalate	SS19; SS20-0, 20-2; SS21-0, 21-1; SS22-0; SS13; SS12
22268, 22287, 22301, 22312	methylene chloride	SS2-0, 2-2; SS3-0, 3-1; SS9-0, 9-5; SS10-0; SS11-0
	methylene chloride	SS23 0.0; SS23 1.0; SS24 0.0; SS25 0.5; SS25 5.5; SS26 0.5; SS26 0.9; SS23 1.0RE

B) Trip Blank Contamination:

Login #	Sample I.D.	Analyte	Concentration
22218, 22253, 22267	Trip Blank 10/10	methylene chloride	26B ug/l
22268, 22287, 22301, 22312	Trip Blank 10/12	methylene chloride	20B ug/l
	Trip Blank 10/15	methylene chloride	18B ug/l
	Trip Blank 10/14	methylene chloride	15B ug/l

C) Equipment Blank Contamination:

Login #	Sample I.D.	Analyte	Concentration
22218, 22253, 22267	EQBLK1	methylene chloride trichloroethene tetrachloroethene	3JB ug/l 2J ug/l 1J ug/l
22268, 22287, 22301, 22312	EQBLK2	methylene chloride tetrachloroethene bis(2-ethylhexyl)phthalate	16B ug/l 2J ug/l 1J ug/l

1.1.3 Mass Spectrometer Tuning

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is bromofluorobenzene (BFB) and for semi-volatiles is decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, or missing, all associated data are to be classified as unusable, "R"; however, no samples were qualified due to improper tuning.

1.1.4 Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

A) Response Factor:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the VOA/BNA Target Compound List (TCL) must be ≥ 0.05 in both the initial and continuing calibrations. A value <0.05 indicates a serious detection and quantitation problem (poor sensitivity). If the mean RRF of the initial calibration or the continuing calibration has a response factor <0.05 for any analyte, those analytes detected in environmental samples will be qualified as estimated "J". All non-detects for those compounds will be rejected ("R"). A review of the analytical data indicated that no samples should be qualified due to response factor requirements.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent difference compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent difference is a measure of the instrument's daily performance. Percent RSD must be <30% and % difference must be <25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are to be flagged as estimated, "J", and nondetects are to be flagged "UJ". If %RSD and % difference grossly exceed QC criteria, nondetect data may be qualified "R".

The following analytes in the samples shown were qualified for %RSD and %D:

Login #	Analyte	Affected Samples
22218, 22253, 22267	acetone 2-butanone 2-hexanone	SS15-0; SS7-0, SS7-3; SS14-0; SS15-0; SS16-0; SS16-4; SS17-0; SS18-0; SS19-0; SS20-0; SS20-2; SS21-0; SS21-1; SS22-0; SS13-0; SS12-0; SS11-0, SS11-0.9
	chloroethane 2-butanone bromoform 4-methyl-2-pentanone 2-hexanone 1,1,2,2-tetrachloroethane	SS11-0, 11-0.9; SS15-0; SS7-0, 7-3
	chloroethane vinyl chloride	SS12-0; SS21-1
	hexachlorocyclopentadiene carbazole di-n-octylphthalate benzo(b)fluoranthene	SS14-0; SS15A-0; SS16-4, SS16-0; SS17; SS18-0; SS19-0; SS20-0, 20-2; SS21-0, 21-1; SS22-0; SS13-0; SS12-0; SS11-0, 11-0.9; SS15-0; SS7-0, 7-3
22268, 22287, 22301, 22312	acetone 2-butanone 2-hexanone	SS1-0, SS2-0, 2-2; SS3-0, 3-1; SS9-0, 9-5; SS10-0, 10-0.8; SS6-0; SS5-0; SS4-0; SS8-0, 8-2; SS26-0.5, 26-0.9; SS25-0.5, 25-5.5, 25-7; SS23-0; SS24-0; SS23-1, 23-2
	chloroethane vinyl chloride	SS6-0; SS5-0; SS4-0; SS8-0, 8-2; SS1-0; SS2-0, 2-2; SS3-0, 3-1; SS9-0, 9-5; SS10-0; SS23-0.0, 23-1.0; SS23-1.0RE; SS24-0.0
	hexachlorobutadiene hexchlorocyclopentadiene 2,4-dinitrophenol hexachlorobenzene carbazole benzo(b)fluoranthene 4-nitroaniline	SS23-0; SS24-0; SS23-1; SS6-0; SS5-0; SS4-0; SS8-0, 8-2; SS1-0; SS2-0; SS3-0, 3-1; SS9-0, 9-5; SS10-0; SS25-0.5, 25-7

1.1.5 Surrogates/System Monitoring Compounds (SMC)

All samples are spiked with surrogate/SMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate/SMC concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below. The following analytes for the samples shown were qualified because of surrogate/SMC recovery:

Login #	Parameter	Affected Samples
22218, 22253, 22267	semi-volatiles (BNAs)	SS14-0; SS15-A; SS16-4; SS18-0
22268, 22287, 22301, 22312	base-neutral fraction only	SS-2, SS8-2

The laboratory noted that due to malfunctioning gel permeation chromatography (GPC) units, the surrogate recoveries and semi-volatile compound concentrations reported in those samples listed above (in Login #22218, 22253, 22267) are approximately 1/3 of the true value. Therefore, positive results and non-detects for these samples are estimated (J and UJ," respectively).

1.1.6 Internal Standards Performance

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than ±30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that internal standard are qualified as estimated "J", and all nondetects as "UJ" only if internal standard area is <50%. Non-detects are qualified as "R" if there is a severe loss of sensitivity (<25% of associated IS area counts).

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgement to determine either partial or total rejection of the data for that sample fraction. The following analytes in the samples shown were qualified due to poor internal standards performance:

Login #	Analytes	Affected Samples
22218, 22253, 22267	Base/neutral compounds	SS14-0
22268, 22287, 22301, 22312	Volatile compounds	SS23-1.0

1.1.7 Compound Identification

A) Volatile and Semi-Volatile Fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and ion spectra. For the results to be a positive hit, the sample peak must be within ±0.06 RRT units of the standard compound, and have an ion spectra which has a ratio of the primary and secondary ion intensities within 20% of that in the standard compound. For tentatively identified compounds (TIC), the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. A review of the analytical data indicated that no samples should be qualified due to compound identification.

1.1.8 Matrix Spike/Spike Duplicate, MS/MSD

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for some additional qualification of data.

The following analytes, for the samples shown, were qualified because of MS/MSD criteria:

Login #	Analytes	Affected Samples
22218, 22253, 22267	1,1-dichloroethene trichloroethene benzene toluene chlorobenzene	SS20-2
22268, 22287, 22301, 22312	4-nitrophenol 2,4-dinitrophenol 2-chlorophenol	SS3-1

1.2 INORGANIC DATA ASSESSMENT

1.2.1 Holding Time

According to the ASP, CLP Methodology, the following maximum holding times for soil samples are recommended for the specified analyses:

Analyses	Recommended Holding Time
Mercury	Prepare and analyze within 26 days of VTSR
Cyanide	Prepare and analyze within 14 days of VTSR
Metals	Prepare and analyze within 180 days of VTSR

Comparison of the dates of sample receipt (from the laboratory chain-of-custody forms) to the dates of sample preparation and analysis (from the laboratory preparation logs and Form XIVs) indicated that all samples were prepared/analyzed prior to expiration of the recommended holding time. Therefore, no qualification of the data is necessary due to holding time exceedance.

1.2.2 Instrument Calibration

Initial calibrations of the atomic absorption (AA), inductively coupled plasma (ICP), and mercury cold vapor (CV) systems are accomplished via the analysis of standards at concentrations which define the working range of the particular instrument. To verify the accuracy of the initial calibration for each analyte, an EPA initial calibration verification (ICV) solution must be analyzed at each wavelength that is used for sample analyses. Recoveries of each analyte contained in the ICV solution should be within the control limits established by the EPA. In addition, the correlation coefficient for the initial calibration curve must be >0.995 for AA analyses. To ensure calibration accuracy during each analytical run, a continuing calibration verification (CCV) solution must be analyzed at each wavelength that is used for sample analyses. The CCV solution must be analyzed at a frequency of 10% or every two (2) hours (whichever is more frequent) during an analytical run. The CCV solution must also be analyzed at the beginning of the analytical run and after the last analytical sample. In addition, recoveries of each analyte in the CCV solution should be within the control limits established by the EPA. If the criteria above are not met, calibration cannot be verified; therefore, positive results are to be estimated and qualified with a "J" and nondetects are to be qualified with a "UJ".

As assessment of the calibration data for all inorganic analyses indicated that the proper number of calibration standards were analyzed at the beginning of each analytical run and at the appropriate frequency throughout the analytical run. In addition, the recoveries of each analyte contained in the ICV and CCV solutions were within criteria, and the correlation coefficients for AA data were greater than 0.995.

1.2.3 Contract-Required Detection Limit (CRDL) Standards for ICP and AA

To verify the linearity near the CRDL for ICP analysis, an ICP standard must be analyzed at a concentration of two (2) times the CRDL [or at the CRDL for AA], or two (2) times the instrument detection limit (IDL), whichever is greater. The standard must be analyzed at the beginning and end of each sample analysis run, or a minimum of twice per eight (8) hour shift, whichever is more frequent (but not before the ICV). To verify linearity near the CRDL for AA analysis, an AA standard must be analyzed at the CRDL or the IDL, whichever is greater. The standard must be analyzed at the beginning of each sample analysis run, but not before the ICV. If the criteria above is not met, linearity cannot be verified and results are qualified with either a "J" or "UJ" (nondetects). A review of the analysis run logs (Form XIV) and the raw data indicated that the CRDL standards for both ICP and AA met these criteria.

1.2.4 Blank Contamination

For inorganic analyses, initial calibration blanks, (ICBs), continuing calibration blanks (CCBs), and preparation blanks (PBs), are analyzed to determine the existence and magnitude of any inorganic contamination. Ideally, no contaminants should be detected in any of the blanks and no contaminants should be detected in the preparation blanks or ICBs at concentrations greater than the CRDL. In addition, when more than one blank is associated with a given sample, qualification is based on a comparison with the associated blank having the highest concentration of a contaminant. An assessment of all blank analytical data indicated that no contaminants were detected at concentrations greater than the CRDL. However, the following table summarizes contaminants which were detected in blanks at concentrations greater than the IDL:

Blank	Element	Conc.	Action Level (mg/kg)	CRDL (mg/kg)
Login #22218:				
CCB1	Cd	0.92	4.6	1.0
EQBLK	Fe	12.2	61	20
Login #22253:				
CCB3	Sb	9.2	46	12
CCB2	Cd	0.9	4.5	1.0
CCB2	Cr	1.1	5.5	2.0
CCB3	Fe	12.7	63.4	20
CCB1	Pb	3.86	19.3	0.6
CCB3	Ni	2.4	12.1	8.0
CCB2	K	228.4	1142	1000
CCB1	Zn	1.1	5.5	4.0
Login #22267:				
CCB3	Sb	9.2	46	12
CCB2	Cd	0.9	4.5	1.0
CCB2	Cr	1.1	5.5	2.0
CCB3	Fe	12.7	63.4	20
Login #22268:				
CCB3	Sb	9.2	46	12
CCB2	Cd	0.9	4.5	1.0
CCB2	Cr	1.1	5.5	2.0
CCB3	Fe	12.7	63.4	20
CCB3	Ni	2.4	12.1	8.0
CCB1	Zn	1.1	5.5	4.0
Login #22287:				
CCB2	Cd	0.9	4.5	1.0
CCB1	Fe	21.5	107.5	20
Login #22301:				
CCB2	Cd	0.9	4.5	1.0
CCB2	Cr	1.1	5.5	2.0
CCB3	Fe	12.7	63.4	20
CCB2	K	228.4	1142	1000
CCB1	Zn	1.1	5.5	4.0
Login #22312:				
CCB3	Cd	0.68	3.4	1.0
CCB3	Fe	16.4	82	20
CCB2	Zn	1.6	8.0	4.0

The action levels listed for each analyte are equal to five (5) times the highest concentration of the analyte detected in any blank. According to the guidelines, any positive results for these analytes detected in the sample at a concentration which is greater than the IDL but less than the action level must be qualified as not detected (ND), and the method detection limit (MDL) set equal to the value detected in the sample. The estimated value is then qualified with a "U". Qualification to the appropriate samples has been made and is presented in Tables E through H.

1.2.5 ICP Interference Check Sample (ICS):

To verify inter-element and background correction factors, an ICS is analyzed at the beginning and end of each analytical run (or a minimum of twice per eight-hour work shift). The ICS consists of two solutions, A and AB. Solution A contains the interferents and solution AB contains the analytes mixed with the interferents. The solutions are analyzed consecutively. If the solutions are not analyzed, potential interferences cannot be assessed and the data would be rejected. A review of the ICS analyses results indicated that no analytes were detected in the ICSA solution at concentrations greater than two times (2x) the IDL. In addition, the ICS solutions were analyzed at the proper frequency.

1.2.6 Matrix Spike (MS Analysis)

The analysis of an inorganic matrix spike sample provides the data user with information regarding sample matrix effects on the digestion procedure and analytical methodology. Matrix spike recoveries for inorganic elements must be within the 75% to 125% recovery "window" unless the sample concentration exceeds the spike concentration by a factor of four (4) or more. If the recovery of an analyte does not fall within this "window", a post-digestion spike must be analyzed for each element (except silver) which did not meet criteria. The following analytes, for the samples shown, have been qualified with a "J" (estimated) because of MS/MSD:

Analyte	MS/MSD	Affected Samples
Arsenic Chromium Copper Cyanide	SS20-2	All soil samples in Login #22253
Arsenic Manganese Thallium Zinc	SS3-1	All soil samples in Login #22287

It was noted that post-digestion spikes were analyzed when necessary.

1.2.7 Duplicate Analyses

Laboratory duplicate analysis is an indicator of the precision of sample results and a measure of laboratory performance. A control limit of 20% RPD is used for aqueous and 30% for soil sample results which are greater than five (5) times the CRDL, and a control limit of +/- the CRDL is used for soil sample results which are less than five (5) times the CRDL. If the criteria are not met, poor precision is indicated and any positive results are to be estimated and qualified with a "J"; any "nondetects" are to be qualified with a "UJ".

A review of the laboratory duplicate results indicated the following analytes did not meet duplicate analyses criteria and are qualified as described above.

Analyte	Duplicate Sample	Affected Samples
Aluminum Cadmium Manganese Zinc	SS20-2	All soil samples in Login #22253
Arsenic Cadmium Calcium Chromium Lead Manganese	SS3-1	All soil samples in Login #22287

1.2.8 Laboratory Control Sample (LCS) Analysis

As an additional measure of accuracy, the ASP requires that an aqueous LCS be prepared and analyzed for every group of aqueous and soil samples in a sample delivery group (SDG), or for each batch of samples digested, whichever is more frequent. The percent recovery for analytes contained in the LCS must fall within the control limits established by the EPA. If the % recovery does not meet criteria, the laboratory must take corrective action such as analyzing another LCS after instrumentation adjustment. Review of the LCS data indicated that all criteria were met.

1.2.9 Furnace Atomic Absorption (AA) QC Analyses

All furnace AA analyses (As, Se, Tl and Pb) require duplicate injections. For concentrations greater than the CRDL, the duplicate injection results must agree within 20% RSD. If the results do not agree to within 20% RSD, the sample must be rerun. In addition, analysis of a post-digestion spike is required for each sample. The recovery of the analyte in each post-digestion spike must be within the control limit, (i.e., 85-115%). If the recovery of the analyte is outside of this criteria, the analyte may be quantitated using the Method of Standard Addition (MSA), depending on sample absorbance. If the sample absorbance is >50% of the post-digestion spike absorbance and the spike recovery is outside the 85-115% control limit, the sample result is calculated using MSA. A review of the raw furnace atomic absorption data indicated the following elements/samples did not meet the 85 - 115% criteria, but did not require the MSA for quantitation because the sample absorbance was <50% of the post digestion spike absorbance:

Arsenic	SS11-0.9; SS26-9
Thallium	SS16-4; SS1-0; SS3-1; SS26-5

In addition, the MSA was required to quantitate the following analytes in the samples shown:

Arsenic	SS17-0; 2218-0, SS19-0; SS20-2; SS24-0

It is noted that the MSA exhibited the required >0.995 correlation coefficient for arsenic in the samples listed above and, therefore, qualification of the arsenic data ("J") was not necessary.

1.2.10 Inductively Coupled Plasma (ICP) Serial Dilution Analysis

If the concentration of an analyte in a sample is sufficiently high (a minimum of 50 times the IDL), a five-fold dilution of the sample is analyzed to determine whether significant physical or chemical interferences exist. The results of the dilution must agree to within 10% difference (%D) of the original results.

A review of the ICP serial dilution results indicated that the following did not meet this criteria:

Login #	Analyte	Affected Samples
22253	Lead Magnesium Potassium Vanadium	All soil samples in Login #22253
22312	Chromium Manganese	All soil samples in Login #22312

According to the guidelines, positive results for these elements detected in soil samples are estimated and qualified with a "J". The metals data have been qualified accordingly.

1.3 SUMMARY AND CONCLUSION

Overall, the analyses were compliant with the 1991 NYSDEC ASP. Although compliant, the following login numbers contained duplicate Form 1s due to the reasons given:

Login #	Sample	Reason
22218, 22253 22267	SS24-0.0; SS25-0-5; SS1-0; SS10-0; SS8-0; SS2-0; SS3-0; SS3-1; SS6-0	Dilution runs due to viscous nature of samples
	SS25 0-5	Re-extraction due to poor surrogate recovery
22268, 22287, 22301, 22312	SS23-1.0	Re-extraction due to poor internal standard area response.

Although valid, many samples contained greater than 50% moisture and were analyzed as soils. This is non-compliant with NYS ASP and, therefore, positive results for these particular samples have been estimated ("J") and non-detects also have been estimated ("UJ"). Additionally, the laboratory reported that a malfunctioning Gel Permeation Chromatography (GPC) unit caused low semi-volatile surrogate recoveries, and resulted in semi-volatile concentrations approximately 1/3 of the probable "true" value, in samples SS14-0, SS15-0, SS16-0, SS16-4, SS17-0, and SS18-0. Therefore, semi-volatile results are estimated in these samples ("J") and non-detects also are estimated ("UJ").

Based on the evaluation herein, the analytical data generated for the Marilla Street Landfill Site wetlands investigation are valid (with the qualifications noted herein) and useful for the purposes of completing the investigation.

TABLE A-1
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE SOUTH POND SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-1 0.0'-0.5'	SS-2 0.0'-0.5'	SS-2 2.5'	SS-3 0.0'-0.5'	SS-3 1.5'-2.0'	SS-4 0.0'-0.5'	SS-5 0.0'-0.5'	SS-6 0.0'-0.5'	SS-6 2.3'-2.4'	SS-7 0.0'-0.5'	SS-7 3.0'-3.3'	SS-8 0.0'-0.5'	SS-8 2.5'
Phenol	UJ	UJ		UJ		UJ	UJ	UJ	NOT	UJ			2200
bis(2-Chloroethyl)Ether	UJ	UJ		UJ		UJ	UJ	UJ	ANALYZED	UJ			
2-Chlorophenol	UJ	UJ		UJ		UJ	UJ	UJ	FOR	UJ			
1,3-Dichlorobenzene	UJ	UJ		UJ		UJ	UJ	UJ	TCL	UJ			
1,4-Dichlorobenzene	UJ	UJ		UJ		UJ	UJ	UJ	ORGANIC	UJ			
1,2-Dichlorobenzene	UJ	UJ		UJ		UJ	UJ	UJ	COMPOUNDS	UJ			
2-Methylphenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2,2-oxybis(1-Chloropropane)	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
4-Methylphenol	UJ	UJ		UJ		170J	UJ	UJ		UJ			
N-Nitroso-di-n-propylamine	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Hexachloroethane	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Nitrobenzene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Isophorone	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2-Nitrophenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2,4-Dimethylphenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2,4-Dichlorophenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
1,2,4-Trichlorobenzene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Naphthalene	UJ	UJ	72J	UJ		300J	UJ	UJ		310J			
4-Chloroaniline	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Hexachlorobutadiene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
bis(2-Chloroethoxy)methane	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
4-Chloro-3-Methylphenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2-Methylnaphthalene	UJ	UJ		UJ		200J	UJ	UJ		UJ			
Hexachlorocyclopentadiene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2,4,6-Trichlorophenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2,4,5-Trichlorophenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2-Chloronaphthalene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2-Nitroaniline	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Dimethylphthalate	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Acenaphthylene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
2,6-Dinitrotoluene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
3-Nitroaniline	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Acenaphthene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			59J

TABLE A-2
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE SOUTH POND SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-1 0.0'-0.5'	SS-2 0.0'-0.5'	SS-2 2.5'	SS-3 0.0'-0.5'	SS-3 1.5'-2.0'	SS-4 0.0'-0.5'	SS-5 0.0'-0.5'	SS-6 0.0'-0.5'	SS-6 2.3'-2.4'	SS-7 0.0'-0.5'	SS-7 3.0'-3.3'	SS-8 0.0'-0.5'	SS-8 2.5'
2,4-Dinitrophenol	UJ	UJ		UJ		UJ	UJ	UJ	NOT	UJ			
4-Nitrophenol	UJ	UJ		UJ		UJ	UJ	UJ	ANALYZED	UJ			
Dibenzofuran	UJ	UJ		UJ		UJ	UJ	UJ	FOR	UJ			
2,4-Dinitrotoluene	UJ	UJ		UJ		UJ	UJ	UJ	SEMI-	UJ			
Diethylphthalate	UJ	UJ		UJ		UJ	UJ	UJ	VOLATILE	UJ			
4-Chlorophenyl-phenylether	UJ	UJ		UJ		UJ	UJ	UJ	ORGANIC	UJ			
Fluorene	UJ	UJ		UJ		UJ	UJ	UJ	COMPOUNDS	UJ			98J
4-Nitroaniline	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
4,6-Dinitro-2-methylphenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
N-Nitrosodiphenylamine (1)	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
4-Bromophenyl-phenylether	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Hexachlorobenzene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Pentachlorophenol	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Phenanthrene	UJ	160J	84J	UJ		320J	160J	330J		310J		520J	590
Anthracene	UJ	UJ		UJ		UJ	UJ	UJ		UJ		110J	140J
Carbazole	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Di-n-butylphthalate	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Fluoranthene	270J	230J	100J	UJ	230J	520J	300J	670J		930J		700J	750
Pyrene	200J	220J	85J	UJ	180J	470J	270J	630J		900J		570J	580
Butylbenzylphthalate	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
3,3-Dichlorobenzidine	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Benzo(a)anthracene	UJ	UJ		UJ		260J	UJ	350J		580J		380J	340J
Chrysene	200J	220J	74J	UJ		420J	250J	600J		980J		420J	390J
bis(2-Ethylhexyl)phthalate	UJ	UJ		UJ		330J	260J	UJ		250J	66J	130J	66J
Di-n-octylphthalate	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Benzo(b)fluoranthene	UJ	UJ		UJ		310J	170J	420J		760J		230J	180J
Benzo(k)fluoranthene	UJ	UJ		UJ		230J	160J	370J		560J		200J	160J
Benzo(a)pyrene	UJ	UJ	1300J	UJ		200J	UJ	UJ		460J		170J	120J
Indeno(1,2,3-cd)pyrene	UJ	UJ		UJ		UJ	UJ	UJ		280J		100J	71J
Dibenz(a,h)anthracene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			
Benzo(g,h,i)perylene	UJ	UJ		UJ		UJ	UJ	UJ		UJ			

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TABLE A-5
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
VOLATILE ORGANIC COMPOUNDS DETECTED IN THE SOUTH POND SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-1 0.0'-0.5'	SS-2 0.0'-0.5'	SS-2 2.5'	SS-3 0.0'-0.5'	SS-3 1.5'-2.0'	SS-4 0.0'-0.5'	SS-5 0.0'-0.5'	SS-6 0.0'-0.5'	SS-6 2.3'-2.4'	SS-7 0.0'-0.5'	SS-7 3.0'-3.3'	SS-8 0.0'-0.5'	SS-8 2.5'
Chloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Bromomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Vinyl Chloride	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Chloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Methylene Chloride	26UJ	21UJ	20UJ	21UJ	16UJ	88J	87J	18J	NOT ANALYZED FOR VOLATILE ORGANIC COMPOUNDS	130J	28UJ	24J	29J
Acetone	42J	15J	44	47J	57	230J	400J	47J		UJ		46J	140J
Carbon Disulfide	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,1-Dichloroethene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,1-Dichloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,2-Dichloroethene (total)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Chloroform	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,2-Dichloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
2-Butanone	UJ	UJ	9J	10J	14J	UJ	UJ	UJ		UJ			
1,1,1-Trichloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Carbon Tetrachloride	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Bromodichloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,2-Dichloropropane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
cis-1,3-Dichloropropene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Trichloroethene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Dibromochloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,1,2-Trichloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Benzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
trans-1,3-Dichloropropene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Bromooform	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
4-Methyl-2-Pentanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
2-Hexanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Tetrachloroethene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
1,1,2,2-Tetrachloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Toluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Chlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Ethylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	22J		UJ			
Styrene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			
Xylene (total)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ			

TABLE B-1
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE WEST DITCH SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)										
	SS-9 0.0'-0.5'	SS-9 5.0'-5.5'	SS-9 5.0'-5.5' 7.0'-7.5'	SS-10 0.0'-0.5'	SS-10 0.8'-1.0'	SS-11 0.0'-0.5'	SS-11 0.9'-1.3'	SS-12 0.0'-0.5'	SS-13 0.0'-0.5'	SS-15 0.0'-0.5'	SS-15A 0.0'-0.5'
Phenol		NOT			NOT					UJ	
bis(2-Chloroethyl)Ether		ANALYZED			ANALYZED					UJ	
2-Chlorophenol		FOR			FOR					UJ	
1,3-Dichlorobenzene		TCL			TCL					UJ	
1,4-Dichlorobenzene		ORGANIC			ORGANIC					UJ	
1,2-Dichlorobenzene		COMPOUNDS			COMPOUNDS					UJ	
2-Methylphenol										UJ	
2,2-oxybis(1-Chloropropane)										UJ	
4-Methylphenol										UJ	
N-Nitroso-di-n-propylamine										UJ	
Hexachloroethane										UJ	
Nitrobenzene										UJ	
Isophorone										UJ	
2-Nitrophenol										UJ	
2,4-Dimethylphenol										UJ	
2,4-Dichlorophenol										UJ	
1,2,4-Trichlorobenzene										UJ	
Naphthalene				150J				69J	140J	110J	
4-Chloroaniline										UJ	
Hexachlorobutadiene										UJ	
bis(2-Chloroethoxy)methane										UJ	
4-Chloro-3-Methylphenol										UJ	
2-Methylnaphthalene				160J						160J	
Hexachlorocyclopentadiene										UJ	
2,4,6-Trichlorophenol										UJ	
2,4,5-Trichlorophenol										UJ	
2-Chloronaphthalene										UJ	
2-Nitroaniline										UJ	
Dimethylphthalate										UJ	
Acenaphthylene										UJ	
2,6-Dinitrotoluene										UJ	
3-Nitroaniline										UJ	
Acenaphthene				190J						UJ	

TABLE B-2
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE WEST DITCH SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)										
	SS-9 0.0'-0.5'	SS-9 5.0'-5.5'	SS-9 5.0'-5.5' 7.0'-7.5'	SS-10 0.0'-0.5'	SS-10 0.8'-1.0'	SS-11 0.0'-0.5'	SS-11 0.9'-1.3'	SS-12 0.0'-0.5'	SS-13 0.0'-0.5'	SS-15 0.0'-0.5'	SS-15A 0.0'-0.5'
2,4-Dinitrophenol		NOT			NOT					UJ	
4-Nitrophenol		ANALYZED			ANALYZED					UJ	
Dibenzofuran		FOR		200J	FOR					UJ	
2,4-Dinitrotoluene		SEMI-			SEMI-					UJ	
Diethylphthalate		VOLATILE			VOLATILE					UJ	
4-Chlorophenyl-phenylether		ORGANIC			ORGANIC					UJ	
Fluorene		COMPOUNDS		340J	COMPOUNDS					110J	
4-Nitroaniline										UJ	
4,6-Dinitro-2-methylphenol										UJ	
N-Nitrosodiphenylamine (1)										UJ	
4-Bromophenyl-phenylether										UJ	
Hexachlorobenzene										UJ	
Pentachlorophenol										UJ	
Phenanthrene	150J			1700		99J		100	120J	200J	
Anthracene	170J			380J						UJ	
Carbazole										UJ	
Di-n-butylphthalate			48J							UJ	
Fluoranthene	590			1600		200J		140J	140J	320J	100J
Pyrene	450J			1900		180J		150J	140J	460J	110J
Butylbenzylphthalate										UJ	
3,3-Dichlorobenzidine										UJ	
Benzo(a)anthracene	250J			840J		120J		78J	60J	130J	
Chrysene	330J			1100J		200J		140J	110J	250J	
bis(2-Ethylhexyl)phthalate	53J		53J	170J		170J	51J	640UJ	560UJ	120J	
Di-n-octylphthalate										UJ	
Benzo(b)fluoranthene	140J			900J		130J		94J	74J	160J	
Benzo(k)fluoranthene	140J			560J		110J		79J	71J	130J	
Benzo(a)pyrene	140J			860J		92J		68J	64J	110J	
Indeno(1,2,3-cd)pyrene	52J			350J		67J				UJ	
Dibenz(a,h)anthracene	470J									UJ	
Benzo(g,h,i)perylene	48J			360J						UJ	

TABLE B-3
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP VOLATILE ORGANIC COMPOUNDS DETECTED IN THE WEST DITCH SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)										
	SS-9 0.0'-0.5'	SS-9 5.0'5.5'	SS-9 5.0'5.5' 7.0'-7.5'	SS-10 0.0'-0.5'	SS-10 0.8'-1.0'	SS-11 0.0'-0.5'	SS-11 0.9'-1.3'	SS-12 0.0'-0.5'	SS-13 0.0'-0.5'	SS-15 0.0'-0.5'	SS-15A 0.0'-0.5'
Chloromethane										UJ	
Bromomethane										UJ	
Vinyl Chloride										UJ	
Chloroethane										UJ	
Methylene Chloride	21J	16J	NOT	29J	NOT	50J	12UJ	20UJ	17UJ	61J	26UJ
Acetone	15	13	ANALYZED	41	ANALYZED			30UJ	9J	220J	89J
Carbon Disulfide			FOR		FOR					UJ	
1,1-Dichloroethene			VOLATILE		VOLATILE					UJ	
1,1-Dichloroethane			ORGANIC		ORGANIC					UJ	
1,2-Dichloroethene (total)			COMPOUNDS		COMPOUNDS					UJ	
Chloroform										UJ	
1,2-Dichloroethane										UJ	
2-Butanone										UJ	26UJ
1,1,1-Trichloroethane										UJ	
Carbon Tetrachloride										UJ	
Bromodichloromethane										UJ	
1,2-Dichloropropane										UJ	
cis-1,3-Dichloropropene										UJ	
Trichloroethene										UJ	
Dibromochloromethane										UJ	
1,1,2-Trichloroethane										UJ	
Benzene										UJ	4J
trans-1,3-Dichloropropene										UJ	
Bromooform										UJ	
4-Methyl-2-Pentanone										UJ	
2-Hexanone										UJ	
Tetrachloroethene										UJ	
1,1,2,2-Tetrachloroethane										UJ	
Toluene									2J	UJ	
Chlorobenzene										UJ	
Ethylbenzene										UJ	
Styrene										UJ	
Xylene (total)										UJ	

TABLE C-1
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)														
	SS-14 0.0'-0.5'	SS-16 0.0'-0.5'	SS-16 2.0'-4.0'	SS-17 0.0'-0.5'	SS-18 0.0'-0.5'	SS-19 0.0'-0.5'	SS-20 0.0'-0.5'	SS-20 2.0'-2.5'	SS-21 0.0'-0.5'	SS-21 1.9'-2.5'	SS-22 0.0'-0.5'	SS-23 0.0'-0.5'	SS-23 1.0'-2.0'	SS-23 1.0'-2.0' 2.0'-2.4'	SS-24 0.0'-0.5'
Phenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	NOT	UJ	UJ
bis(2-Chloroethyl)Ether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	ANALYZED	UJ	UJ
2-Chlorophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	FOR	UJ	UJ
1,3-Dichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	TCL	UJ	UJ
1,4-Dichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	ORGANIC	UJ	UJ
1,2-Dichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	COMPOUNDS	UJ	UJ
2-Methylphenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2,2-oxybis(1-Chloropropane)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
4-Methylphenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	93J	UJ		UJ	UJ
N-Nitroso-di-n-propylamine	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Hexachloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Nitrobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Isophorone	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2-Nitrophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2,4-Dimethylphenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2,4-Dichlorophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	170J	UJ	UJ	450J		UJ	UJ
1,2,4-Trichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Naphthalene	UJ	UJ	1200J	UJ	UJ	UJ	150J	240J	250J	170J	370J	UJ		99J	UJ
4-Chloroaniline	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Hexachlorobutadiene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
bis(2-Chloroethoxy)methane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
4-Chloro-3-Methylphenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2-Methylnaphthalene	UJ	UJ	UJ	UJ	UJ	120J	170J	230J	250J	220J	360J	UJ		UJ	UJ
Hexachlorocyclopentadiene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2,4,6-Trichlorophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2,4,5-Trichlorophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2-Chloronaphthalene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
2-Nitroaniline	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Dimethylphthalate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Acenaphthylene	UJ	UJ	270J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	110J	UJ		UJ	UJ
2,6-Dinitrotoluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
3-Nitroaniline	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Acenaphthene	UJ	UJ	100J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	190J	UJ		UJ	UJ

TABLE C-2
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)														
	SS-14 0.0'-0.5'	SS-16 0.0'-0.5'	SS-16 2.0'-4.0'	SS-17 0.0'-0.5'	SS-18 0.0'-0.5'	SS-19 0.0'-0.5'	SS-20 0.0'-0.5'	SS-20 2.0'-2.5'	SS-21 0.0'-0.5'	SS-21 1.9'-2.5'	SS-22 0.0'-0.5'	SS-23 0.0'-0.5'	SS-23 1.0'-2.0'	SS-23 1.0'-2.0' 2.0'-2.4'	SS-24 0.0'-0.5'
2,4-Dinitrophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	NOT	UJ	UJ
4-Nitrophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	ANAL.	UJ	UJ
Dibenzofuran	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	88J	200J	UJ	FOR	UJ	UJ
2,4-Dinitrotoluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	SEMI-	UJ	UJ
Diethylphthalate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	VOLATILE	UJ	UJ
4-Chlorophenyl-phenylether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	ORGANIC	UJ	UJ
Fluorene	UJ	UJ	210J	UJ	UJ	UJ	UJ	UJ	UJ	82J	240J	UJ	CMPDS	UJ	UJ
4-Nitroaniline	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
4,6-Dinitro-2-methylphenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
N-Nitrosodiphenylamine (1)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
4-Bromophenyl-phenylether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Hexachlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Pentachlorophenol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Phenanthrene	UJ	320J	860J	UJ	UJ	200J	300J	400J	400J	320J	540J	260J		170J	1300J
Anthracene	UJ	UJ	110J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	170J	UJ		UJ	UJ
Carbazole	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Di-n-butylphthalate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Fluoranthene	79J	310J	480J	160J	UJ	310J	450J	500J	670J	360J	970	520J		160J	2300J
Pyrene	88J	360J	650J	170J	UJ	340J	470J	490J	680J	360J	1000	430J		110J	1600J
Butylbenzylphthalate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
3,3-Dichlorobenzidine	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Benzo(a)anthracene	UJ	180J	140J	UJ	UJ	150J	220J	UJ	290J	120J	360J	180J		UJ	850J
Chrysene	61J	270J	160J	130J	UJ	250J	350J	240J	470J	180J	550J	350J		130J	1300J
bis(2-Ethylhexyl)phthalate	UJ	UJ	UJ	140J	UJ	1200UJ	1300UJ	1400UJ	1500UJ	760UJ	920UJ	3200		UJ	1200J
Di-n-octylphthalate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Benzo(b)fluoranthene	61J	260J	110J	130J	UJ	220J	280J	170J	410J	140J	360J	UJ		UJ	UJ
Benzo(k)fluoranthene	UJ	170J	110J	UJ	UJ	180J	260J	UJ	310J	130J	350J	UJ		UJ	UJ
Benzo(a)pyrene	UJ	200J	150J	UJ	UJ	150J	210J	UJ	260J	90J	260J	UJ		UJ	UJ
Indeno(1,2,3-cd)pyrene	UJ	110J	UJ	UJ	UJ	120J	170J	UJ	200J	82J	210J	UJ		UJ	UJ
Dibenz(a,h)anthracene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ
Benzo(g,h,i)perylene	UJ	130J	120J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	170J	UJ		UJ	UJ

TABLE C-3
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
VOLATILE ORGANIC COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)													
	SS-14 0.0'-0.5'	SS-16 0.0'-0.5'	SS-16 2.0'-4.0'	SS-17 0.0'-0.5'	SS-18 0.0'-0.5'	SS-19 0.0'-0.5'	SS-20 0.0'-0.5'	SS-20 2.0'-2.5'	SS-21 0.0'-0.5'	SS-21 1.9'-2.5'	SS-22 0.0'-0.5'	SS-23 0.0'-0.5'	SS-23 1.0'-2.0'	SS-23 1.0'-2.0' 2.0'-2.4'	SS-24 0.0'-0.5'
Chloromethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Bromomethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Vinyl Chloride		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Chloroethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Methylene Chloride	17UJ	28UJ	30UJ	34UJ	33UJ	36UJ	40UJ	43UJ	45UJ	23UJ	28UJ	45UJ	30UJ	NOT	37UJ
Acetone	17UJ	64J	66J	160J	310J	45J	61J	150J	310J	60J	13J	160J	280J	ANAL.	86J
Carbon Disulfide		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	FOR	UJ
1,1-Dichloroethene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	VOLATILE	UJ
1,1-Dichloroethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	ORGANIC	UJ
1,2-Dichloroethene (total)		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	CMPDS.	UJ
Chloroform		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
1,2-Dichloroethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
2-Butanone	17UJ	28UJ	30UJ	43UJ	59J	UJ	18J	26J	85J	13J	UJ	48J	120J		29J
1,1,1-Trichloroethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Carbon Tetrachloride		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Bromodichloromethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
1,2-Dichloropropane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
cis-1,3-Dichloropropene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Trichloroethene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Dibromochloromethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
1,1,2-Trichloroethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Benzene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
trans-1,3-Dichloropropene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Bromoform		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
4-Methyl-2-Pentanone		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
2-Hexanone		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Tetrachloroethene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
1,1,2,2-Tetrachloroethane		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Toluene		6J	UJ	45J	36J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Chlorobenzene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Ethylbenzene		UJ	7J	15J	13J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Styrene		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ
Xylene (total)		9J	6J	100J	80J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ

TABLE D-1
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE NORTH DITCH SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-25 0.0'-0.5'	SS-25 0.0'-0.5'	SS-25 2.5'	SS-26 0.0'-0.5'	SS-26 1.5'-2.0'								
Phenol	UJ	NOT		UJ	140J								
bis(2-Chloroethyl)Ether	UJ	ANALYZED		UJ									
2-Chlorophenol	UJ	FOR		UJ									
1,3-Dichlorobenzene	UJ	TCL		UJ									
1,4-Dichlorobenzene	UJ	ORGANIC		UJ									
1,2-Dichlorobenzene	UJ	COMPOUNDS		UJ									
2-Methylphenol	UJ			UJ									
2,2-oxybis(1-Chloropropane)	UJ			UJ									
4-Methylphenol	UJ			UJ	69J								
N-Nitroso-di-n-propylamine	UJ			UJ									
Hexachloroethane	UJ			UJ									
Nitrobenzene	UJ			UJ									
Isophorone	UJ			UJ									
2-Nitrophenol	UJ			UJ									
2,4-Dimethylphenol	UJ			UJ									
2,4-Dichlorophenol	UJ			UJ									
1,2,4-Trichlorobenzene	UJ			UJ									
Naphthalene	UJ		70J	74J									
4-Chloroaniline	UJ			UJ									
Hexachlorobutadiene	UJ			UJ									
bis(2-Chloroethoxy)methane	UJ			UJ									
4-Chloro-3-Methylphenol	UJ			UJ									
2-Methylnaphthalene	UJ			UJ									
Hexachlorocyclopentadiene	UJ			UJ									
2,4,6-Trichlorophenol	UJ			UJ									
2,4,5-Trichlorophenol	UJ			UJ									
2-Chloronaphthalene	UJ			UJ									
2-Nitroaniline	UJ			UJ									
Dimethylphthalate	UJ			UJ									
Acenaphthylene	UJ			UJ									
2,6-Dinitrotoluene	UJ			UJ									
3-Nitroaniline	UJ			UJ									
Acenaphthene	UJ			UJ									

TABLE D-2

MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN THE NORTH DITCH SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-25 0.0'-0.5'	SS-25 5.5'-6.2'	SS-25 7.0'-7.5'	SS-26 0.0'-0.5'	SS-26 0.9'-1.0'								
2,4-Dinitrophenol	UJ	NOT		UJ									
4-Nitrophenol	UJ	ANALYZED		UJ									
Dibenzofuran	UJ	FOR		UJ									
2,4-Dinitrotoluene	UJ	SEMI-		UJ									
Diethylphthalate	UJ	VOLATILE		UJ									
4-Chlorophenyl-phenylether	UJ	ORGANIC		UJ									
Fluorene	UJ	COMPOUNDS		85J									
4-Nitroaniline	UJ			UJ									
4,6-Dinitro-2-methylphenol	UJ			UJ									
N-Nitrosodiphenylamine (1)	UJ			UJ									
4-Bromophenyl-phenylether	UJ			UJ									
Hexachlorobenzene	UJ			UJ									
Pentachlorophenol	UJ			UJ									
Phenanthrene	UJ		44J	370J	99J								
Anthracene	UJ			81J									
Carbazole	UJ			UJ									
Di-n-butylphthalate	UJ			UJ									
Fluoranthene	320J			UJ	96J								
Pyrene	280J			320J	78J								
Butylbenzylphthalate	UJ			UJ									
3,3-Dichlorobenzidine	UJ			UJ									
Benzo(a)anthracene	UJ			170J									
Chrysene	270J			230J	56J								
bis(2-Ethylhexyl)phthalate	UJ			UJ									
Di-n-octylphthalate	UJ			UJ									
Benzo(b)fluoranthene	UJ			120J									
Benzo(k)fluoranthene	UJ			130J									
Benzo(a)pyrene	UJ			110J									
Indeno(1,2,3-cd)pyrene	UJ			UJ									
Dibenz(a,h)anthracene	UJ			UJ									
Benzo(g,h,i)perylene	UJ			UJ									

TABLE D-3
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP VOLATILE ORGANIC COMPOUNDS DETECTED IN THE NORTH DITCH SEDIMENT

PARAMETER DETECTED (ug/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-25 0.0'-0.5'	SS-25 0.0'-0.5'	SS-25 2.5'	SS-26 0.0'-0.5'	SS-26 1.5'-2.0'								
Chloromethane	UJ			UJ									
Bromomethane	UJ			UJ									
Vinyl Chloride	UJ			UJ									
Chloroethane	UJ			UJ									
Methylene Chloride	20UJ	12UJ	NOT	20UJ	13UJ								
Acetone	56J	8J	ANALYZED	23J	26								
Carbon Disulfide	UJ		FOR	UJ									
1,1-Dichloroethene	UJ		VOLATILE	UJ									
1,1-Dichloroethane	UJ		ORGANIC	UJ									
1,2-Dichloroethene (total)	UJ		COMPOUNDS	UJ									
Chloroform	UJ			UJ									
1,2-Dichloroethane	UJ			UJ									
2-Butanone	UJ			10J									
1,1,1-Trichloroethane	UJ			UJ									
Carbon Tetrachloride	UJ			UJ									
Bromodichloromethane	UJ			UJ									
1,2-Dichloropropane	UJ			UJ									
cis-1,3-Dichloropropene	UJ			UJ									
Trichloroethene	UJ			UJ									
Dibromochloromethane	UJ			UJ									
1,1,2-Trichloroethane	UJ			UJ									
Benzene	UJ			UJ									
trans-1,3-Dichloropropene	UJ			UJ									
Bromooform	UJ			UJ									
4-Methyl-2-Pentanone	UJ			UJ									
2-Hexanone	UJ			UJ									
Tetrachloroethene	UJ			UJ									
1,1,2,2-Tetrachloroethane	UJ			UJ									
Toluene	2J			UJ									
Chlorobenzene	UJ			UJ									
Ethylbenzene	3J			UJ									
Styrene	UJ			UJ									
Xylene (total)	2J			UJ									

TABLE E
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL INORGANIC COMPOUNDS DETECTED IN THE SOUTH POND SEDIMENT

PARAMETER DETECTED (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)												
	SS-1 0.0'-0.5'	SS-2 0.0'-0.5'	SS-2 2.5'	SS-3 0.0'-0.5'	SS-3 1.5'-2.0'	SS-4 0.0'-0.5'	SS-5 0.0'-0.5'	SS-6 0.0'-0.5'	SS-6 2.3'-2.4'	SS-7 0.0'-0.5'	SS-7 3.0'-3.3'	SS-8 0.0'-0.5'	SS-8 2.5'
Aluminum	13100	17500	8820	11500	13400	5860	4280	4690		9010	8440	1840	1090
Antimony						46UJ	46UJ	46UJ		39.5UJ	9.4UJ	46UJ	46UJ
Arsenic	8.7J	5.5J	2.6J	6.6J	11.9J	18.4	8.0J	13.2		9.8	1.7J	1.7J	2.0J
Barium	92.0	102	92.7	82.0	141	189J	226	238		178J	69.8	57.0J	183
Beryllium													
Cadmium	2.0J	0.8UJ	1.3J	1.7J	1.0UJ	6.4	4.5UJ	4.5UJ	NOT ANALYZED FOR TCL INORGANIC COMPOUNDS	2.1UJ	0.5UJ	4.5UJ	4.5UJ
Calcium	37300J	22500J	5900J	18900J	12500J	172000	261000	278000		187000	2550	52900	323000
Chromium	32.6	28.5J	9.3J	21.2J	15.1J	34.2	17.9	25.1		30.1	11.3	10.1	5.9
Cobalt													
Copper	30.9	28.0	11.7	23.5	18.7	39.8	16.2J	27.4		34.5	2.7J	10.9	16.1
Iron	32600	33300	14400	27400	28000	35100	17900	26100		28700	12100	12000	3070
Lead	124J	28.7J	20.4J	54.6J	73.6J	265	92.7	156		129	9.3	86.3	45.9
Magnesium	7050	8150	1590J	6240	2110J	4620J	4770	5290		5720	2160	1440J	14300
Manganese	538J	435J	165J	359J	296J	1380	2340	2440		1380	83.9	426	576
Mercury													
Nickel	33.5	47.7		34.5	15.9J	18.5J	12UJ	12UJ			10.3J	12UJ	12UJ
Potassium	1950J	3120	810J	1910J	1210J	189J	514J			1470J	278J	194J	152J
Selenium													
Silver													
Sodium	523J	337J	303J	313J	443J	951J	890J	913J		824J	116J	286J	777J
Thallium	2.5UJ	2.1UJ	1.9UJ	1.7UJ	2.6UJ								
Vanadium	37.9	38.8	16.3J	29.4	28.3	33.3J	21.6J	23.9J		40.4J	23.1	10.1	7.7J
Zinc	374J	150J	108J	189J	278J	968	290	515		397	44.2	287	30.2
Cyanide													

TABLE F
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL INORGANIC COMPOUNDS DETECTED IN THE WEST DITCH SEDIMENT

PARAMETER DETECTED (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)										
	SS-9 0.0’-0.5’	SS-9 5.0’-5.5’	SS-9 5.0’-5.5’ 7.0’-7.5’	SS-10 0.0’-0.5’	SS-10 0.8’-1.0’	SS-11 0.0’-0.5’	SS-11 0.9’-1.3’	SS-12 0.0’-0.5’	SS-13 0.0’-0.5’	SS-15 0.0’-0.5’	SS-15A 0.0’-0.5’
Aluminum	963		11600	7220		12100	5310	18100J	18700J	3470	4110
Antimony						9.5UJ	8.6UJ	46UJ	46UJ	33.0UJ	20.4J
Arsenic	1.9J		6.4J	7.1J		6.0	1.1UJ	8.5J	8.9J	35.5	21.4
Barium	159		86.5	112		67.8	11.1J	125	83.3	87.5J	109
Beryllium											
Cadmium	0.5UJ	NOT	1.7J	1.3J	NOT	0.5UJ	0.5UJ	4.5UJ	4.5UJ	8.0	8.4
Calcium	268000J	ANALYZED	4770J	116000J	ANALYZED	30500	1660	30900	15900	60400	151000
Chromium	15.1J	FOR	18.4J	77.3J	FOR	21.0	5.1UJ	27.9J	27.5J	192	146
Cobalt											
Copper	3.9J	TCL	28.4	57.7	TCL	19.0	7.3	27.1	26.6J	73.7	42.8
Iron	3890	INORGANIC	48500	37000	INORGANIC	22700	4710	35100	31500	260000	217000
Lead	115J	COMPOUNDS	12.8J	371J	COMPOUNDS	37.3	6.9	30.1J	107J	251	232
Magnesium	3500		5680	9360		5730	1220	8500J	5400J	1320J	2480
Manganese	709J		731J	2120J		488	61.2	506J	489J	1720	1650
Mercury											
Nickel			43.1	18.1		19.1	10.1	36.1	30.4	63.4	41.2
Potassium			620J	927J		1630	385J	2350J	2770J		561J
Selenium											
Silver											
Sodium	456J			414J		232J		327J	309J	394J	363J
Thallium	1.2UJ		1.0UJ	1.8UJ							
Vanadium	5.1J		32.5	38.8		29.1	8.4J	39.0J	48.1J	70.8	63.4
Zinc	77.9J		80.5J	184J		97.7	36.1	114J	154J	520	236
Cyanide										1.8	

TABLE G
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL INORGANIC COMPOUNDS DETECTED IN THE NORTH POND SEDIMENT

PARAMETER DETECTED (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)														
	SS-14 0.0'-0.5'	SS-16 0.0'-0.5'	SS-16 2.0'-4.0'	SS-17 0.0'-0.5'	SS-18 0.0'-0.5'	SS-19 0.0'-0.5'	SS-20 0.0'-0.5'	SS-20 2.0'-2.5'	SS-21 0.0'-0.5'	SS-21 1.9'-2.5'	SS-22 0.0'-0.5'	SS-23 0.0'-0.5'	SS-23 1.0'-2.0'	SS-23 1.0'-2.0' 2.0'-2.4'	SS-24 0.0'-0.5'
Aluminum	5980	4540	11700	7650	5770	6280J	8040J	4490J	3610J	6550J	6550J	642		12800	361
Antimony		22.2J			24.3J	46UJ	46UJ	46UJ	46UJ	46UJ	46UJ	72.8			
Arsenic	7.8	24.5	22.0	31.8	31.8	36.8J	46.4J	67.3J	41.5J	22.7J	29.3J	27.0		9.7	57.0
Barium	48.2	101J	139	114J	114J	94.9J	101J	61.9J	118J	94.4	82.2J	69.3J		125	80.9J
Beryllium															
Cadmium	1.8J	10.9	3.6J	10	11.6	11.4J	14.3J	10.8J	8.8J	6.4J	1.9J	14.1	NOT		11.0
Calcium	29600	83600	21900	75900	96600	36700	30800	5110	7280	30400	6720	1400J	ANALYZED	2730	964J
Chromium	38.3	182	33.6	168	209	195J	224J	255J	266J	83.6J	122J	317J	FOR	35.6J	218J
Cobalt															
Copper	25.2	58.6	43.1	51.9	58.8	57.9J	64.3J	214J	73.4J	201J	181J	63.1	TCL	59.5	38.1
Iron	55600	275000	69100	267000	342000	359000	412000	294000	486000	215000	166000	466000	INORGANIC	40400	327000
Lead	162	340	79.6	282	358	287J	377J	75.1J	435J	104J	122J	504	COMPOUNDS	64.2	505
Magnesium	2310	2260J	2560J	3300J	2680J	2250J	2890J	616J	1320J	751J	1560J			1770J	
Manganese	591	1530	1690	1580	1690	1610J	2010J	151J	1160J	2060J	638J	75.6J		105J	87.9J
Mercury	53.7								0.47	0.51		0.47			
Nickel	24.9	31.6	26.8	24.2J	32.2	33.8	30.1	96.5	6.4J	62.5	70.4			172	
Potassium	564J	579J	942J	1120J	623J	1370J	1880J	1142UJ	1142UJ	1142UJ	1142UJ	4890		1590J	2200J
Selenium															
Silver															
Sodium	196J	382J	408J	478J	395J	455J	519J	437J	539J	198J	325J	751J		308J	506J
Thallium		2.7UJ													
Vanadium	31.0	88.1	40.2	99.1	111	109J	128J	104J	129J	64.6J	57.3J	147		23.8J	112
Zinc	130	325	194	272	307	263J	258J	291J	278J	278J	244J	114		192	96.1
Cyanide												11.4			

TABLE H
MARILLA STREET LANDFILL-SUPPLEMENTAL SWMFIP
TCL INORGANIC COMPOUNDS DETECTED IN THE NORTH DITCH SEDIMENT

PARAMETER DETECTED (mg/kg)	SAMPLE NUMBER AND DEPTH OF SAMPLE (ft.)						
	SS-25 0.0'-0.5'	SS-25 5.5'-6.2'	SS-25 7.0'-7.5'	SS-26 0.0'-0.5'	SS-26 0.9'-1.0'		
Aluminum	11900		7480	14000	4550		
Antimony							
Arsenic	9.5		4.7	23.4	1.2UJ		
Barium	65.5J		690	98.2	33.4J		
Beryllium							
Cadmium	0.7UJ	NOT	0.4UJ	3.1UJ	0.5UJ		
Calcium	37000	ANALYZED	44900	32500	114000		
Chromium	53.7	FOR	159	55.0	8.0		
Cobalt							
Copper	27.2	TCL	13.7	39.5	6.2J		
Iron	37600	INORGANIC	21800	78900	7030		
Lead	16.9	COMPOUNDS	93.9	146	4.9		
Magnesium	14300		6580	6450	22400		
Manganese	1930		2680	1980	261		
Mercury	0.22						
Nickel	22.3		16.4	36.0	9.6J		
Potassium	1540J		1580	2410	1142UJ		
Sellenium							
Silver							
Sodium	181J		149J	209J	179J		
Thallium				UJ			
Vanadium	44.5		53.9	61.1	14.7		
Zinc	101		464	379	41.1		
Cyanide							