MALCOLM PIRNIE

FOCUSED FEASIBILITY STUDY FOR THE MARILLA STREET LANDFILL WETLANDS

LTV STEEL COMPANY
CLEVELAND, OHIO

FEBRUARY 1996

Includes Appendices A and B

MALCOLM PIRNIE, INC.

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

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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 110 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 defined in ECL Section 27-1301(2). Consequently the site was listed in the Registry of Inactive Hazardous Waste Sites of New York (Site No. 915047) 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.

LTV Steel Company entered into an Order-on-Consent in October 1992 to undertake certain landfill closure activities. Specific requirements addressed by the Consent Order are:

- Prepare and implement a landfill closure plan pursuant to 6NYCRR Part 360 requirements (Complete).
- Plan and implement a Solid Waste Management Facility Investigation Program (SWMFIP) (Complete).
- Prepare and implement a post closure maintenance and monitoring plan for the site (pending completion of remedial activities, if necessary).

The investigations and reports completed as part of the SWMFIP have indicated potential impacts on the site groundwater quality (viz. elevated pH) and wetlands sediments (viz. primarily elevated metals concentrations). As a result, in November 1995, the site was reclassified by the NYSDEC to a Class "2" site. A Class 2 designation is defined as a site at which the presence of hazardous waste or hazardous waste constituents constitute a significant threat to the environment.

1.2 SITE DESCRIPTION AND HISTORY

1.2.1 Site Description

The approximate 110-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 29 acres of the site are comprised of wetlands, which are 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, 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 former 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 and precipitator dust, clarifier sludge, bricks, tool scale, scrap wood, railroad ties, and construction debris.

In addition to the Marilla Street site, there are nine other sites within one mile of the landfill which are presently listed as Class 2 or 2a on the New York State Registry of Inactive Hazardous Waste Sites. Those sites are described in the October 1993 SWMFIP report prepared by Malcolm Pirnie. Some of those sites are impacting ground and surface water quality both upgradient and downgradient of the Marilla Street Landfill.

1.2.2 Closure Activities

The landfill was operated as an above grade fill operation with minimal segregation of wastes prior to the effective date (viz. November 1980) of the Resource Conservation and Recovery Act (RCRA). In November 1980, some BOF precipitator dust generated at the Buffalo District Plant was analyzed and found to exceed the EP Toxic level for lead leachability and, therefore was placed in a segregated fill area from November 1980 until steel making operations were terminated at the Buffalo Plant in June/July 1981. The BOF Dust Area was subsequently closed under applicable state (Part 373) and federal (RCRA) hazardous waste regulations in September 1990. However, in a September 1989 determination, the NYSDEC acknowledged that BOF dust was excluded from hazardous

waste regulations, and the NYSDEC subsequently removed the site from the RCRA program.

NYSDEC approved final cover systems were constructed over the landfill site between August 1989 and October 1993. The work was performed under three separate contracts in accordance with NYSDEC-approved closure plans, design plans and specifications.

1.3 CLOSURE/REMEDIAL INVESTIGATIONS

The site has been investigated and closed under NYSDEC Solid Waste regulations (viz. 6NYCRR Part 360). In addition, the site is being investigated under the NYSDEC Inactive Hazardous Waste Site Remediation Program [viz. Title 6 of the New York State Code of Rules and Regulations, Part 375 (6NYCRR Part 375)].

1.3.1 Previous Investigations

A chronology of previous investigations and monitoring activities at the Marilla Street landfill along with details of the existing monitoring well network and site hydrogeologic conditions is presented in the October 1993 SWMFIP report prepared by Malcolm Pirnie, Inc. A total of 34 borings have been completed at the site. Twenty-three of these borings were completed as monitoring wells; however, four of these wells were abandoned due to vandalism, and the four wells were destroyed during cover system construction operations.

The current monitoring program was developed by LTV Steel between 1979 and 1986 with input from the NYSDEC. Quarterly monitoring has been performed consistently since January 1987. To meet both RCRA/6NYCRR Part 373 monitoring requirements for the BOF Dust Area and 6NYCRR Part 360 monitoring requirements for the remaining areas of the site, two monitoring programs were established as follows:

- Seven wells and the west ditch were established as the RCRA detection monitoring network for the BOF Dust Area. A RCRA compliance (Part 373) parameter list specific to the BOF Dust area was developed.

- Seven wells were monitored to fulfill Part 360 requirements for the remaining fill areas. Groundwater from these wells has been analyzed for a NYSDEC recommended Part 360 parameter list.

Although the site is not subject to RCRA/6NYCRR Part 373 monitoring requirements, the above monitoring program has remained in effect pending the results of the final SWMFIP investigation and closure activities.

1.3.2 SWMFIP

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.

Supplemental field investigations were later conducted within Wetland BU-1 in the vicinity of the Marilla Street Landfill to help develop a wetland remediation program. The results of the Supplemental SWMFIP were presented in a report and sent to the New York State Department of Environmental Conservation (NYSDEC) for review on September 15,

1995. The results and conclusions of the SWMFIP and Supplemental SWMFIP are summarized in Section 2.0.

On October 27, 1995, Malcolm Pirnie and LTV Steel Company met with the NYSDEC to discuss the results of the supplemental SWMFIP testing. Meeting minutes from that discussion are included in Appendix A. In summary, LTV outlined a preferred remedial approach focusing on closure of the wetland sediments in place along with wetland enhancement and/or mitigation to improve wildlife habitat and wetland values. The NYSDEC indicated that closure of the sediments in place was not their preferred approach but that consideration would be given to this approach provided that adequate justification is provided. It was agreed that a focused feasibility study would be prepared to provide the requested justification.

1.4 PURPOSE AND SCOPE

The purpose of the report is to summarize the results of a focused feasibility study of closure/remediation alternatives for the Marilla Street Landfill. This focused feasibility study identifies site impacts including the wetland sediment impacts and the elevated pH of the groundwater. Input from the NYSDEC Divisions of Hazardous Waste, Solid Waste and Fish and Wildlife, South District Council person, US Army Corps of Engineers, and the Coastal Zone Management Agency have been factored into the various analyses and evaluations performed as part of this focused feasibility study. The scope of the feasibility study included:

- Delineation of the wetlands immediately adjacent to the site.
- Providing a site map of the delineated wetland areas.
- Identification and detailed evaluation of closure/remedial alternatives.
- Performing a preliminary screening process of the closure/remedial alternatives.
- Selection of the recommended closure/remedial alternatives.

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2.0 NATURE AND EXTENT OF IMPACTS

2.1 INTRODUCTION

A Solid Waste Management Facility Investigation Program (SWMFIP) was initiated in January 1993. The results and conclusions of the SWMFIP are presented in the SWMFIP report submitted to the NYSDEC in November 1993. Supplemental field investigations were conducted within Wetland BU-1 in the vicinity of the site between September 1994 and August 1995 to better characterize the wetlands and define the areal and vertical extent of sediment contamination. Refer to the August 1995 Supplemental SWMFIP report prepared by Malcolm Pirnie, Inc. for a detailed discussion of the investigation results.

Additional wetland delineations were performed in November 1995 to more fully define the edge of wetlands in the areas of concern. (Refer to Appendix B for the Wetland Delineation Report.)

2.2 GROUNDWATER

Field measurements of pH at the Marilla Street Landfill made during the SWMFIP field investigation indicated that the shallow ground water is highly alkaline. Although hydraulic gradients along the groundwater flow path have been reduced by construction of the landfill cover system, some shallow groundwater flow is intercepted by a discharge zone in the adjacent wetland. Therefore, the potential for impacts on fish and wildlife exists.

Both slag and BOF dust, which are abundant waste materials at the site, have a high pH and are likely to be the source of the alkaline groundwater. Because some of the pH values documented in sampling reports exceed the regulatory definition of a corrosive waste (i.e., 12.5 standard units [S.U.]), a program was conducted during the Supplemental SWMFIP to assess the potential for contribution of analytical errors to pH measurements. There was no indication that analytical errors resulted in erroneous pH measurements. It was also demonstrated that the alkaline cement-bentonite grout used to construct the on-site

monitoring wells did not appear to be the source of the elevated pH observed in the shallow groundwater samples.

2.3 WETLAND SEDIMENTS

2.3.1 Wetland Sediment Characterizations

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 locations to results from a 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 indicated:

- 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 was 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 was low in all sampling areas.

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

It was therefore concluded that wetland sediments adjacent to the landfill have been impacted by site activities.

2.3.2 WET Assessment

The Army Corps of Engineers Wetland Evaluation Technique (Version 2.0), also know as WET, was applied to wetlands on the Marilla Landfill site to identify existing wetland functions and values. (Refer to Attachment B in the August 1995, SWMFIP report prepared by Malcolm Pirnie for a complete explanation of the WET assessment.)

The WET data can be used in the development of wetland mitigation plans, if needed. The data provides guidance for the development of plans to restore or enhance existing wetlands 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.

Based on WET scores, it was concluded that 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 flood flow 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 shallow depth of water, 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 perform can be enhanced. 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.

Mitigation plans could 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 flood flow/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 is a factor, aquatic habitat could be improved with 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.

2.3.3 Wetland Delineation

On September 13 and 14, 1994, Malcolm Pirnie, Inc. (MPI) conducted a wetlands delineation as part of the Supplemental Solid Waste Management Facility Investigation Program (SWMFIP) to identify wetlands directly contiguous to the 80 acre Marilla Street landfill that were potentially impacted by landfill activities. This 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". The wetland boundaries were identified, flagged, and surveyed. The results of this wetland delineation are presented in the Supplemental SWMFIP report.

Subsequently, MPI performed an on-site wetland delineation within the entire 110-acre LTV property limit shown on Sheet 1 in Appendix C. The delineation included the identification of freshwater wetlands on the land located on the east side of Hopkins Road as well as the land surrounding the landfill footprint.

Since this area is mapped as New York State Wetland BU-1, the wetland/nonwetland boundaries were identified using the NYSDEC Freshwater Wetlands Delineation Manual (NYSDEC, 1995). The routine delineation procedure was applied to determine the presence wetland/hydrophytic vegetation, hydric soils, and hydrology. Data collected were entered on the appropriate field data forms. Plant species were classified using the National List of Plant Species That Occur in Wetlands (Region 1), (Reed, 1988).

Wetland boundaries were identified with sequentially numbered flagging, and identified on a site base map. Upon completion of the wetland delineation, a survey was conducted and the surveyed points mapped. The wetlands identified tied into the same boundaries previously delineated in 1994. The field data and mapping information were combined with the 1994 Wetland Delineation Report data to create a comprehensive Wetland Delineation Report for LTV's 110-acre property (see Appendix B).

The delineated wetland boundaries are shown on Sheet 1 in Appendix C. The sizes of the individual wetland areas are summarized in Table 2-1 below.

TABLE 2-1

LTV STEEL COMPANY

MARILLA STREET LANDFILL WETLAND MITIGATION

MARILLA STREET LANDFILL WETLAND ACREAGE

Wetland Area	Size in Acres
South Pond Wetland Complex	10.82 (4.53)*
Wetland Complex East of Hopkins Street	5.77
North Ditch	0.86
North Pond West	3.64
North Pond East	3.77
West Ditch	4.2
Total	29.1

** Number in parenthesis is the acreage of the open water portion of the South Pond Wetland complex*

A total of 29.1 acres of wetland areas exists on or contiguous to LTV's property. Of that total, 16.1 acres has been demonstrated through the SWMFIP testing to contain impacted sediments.

2.4 SUMMARY

Investigations of the LTV Steel Company, Marilla Street Landfill site have indicated that the following site impacts are present:

- The shallow groundwater table at the site has been impacted by site disposal activities. The groundwater within the fill and shallow overburden exhibits an alkaline pH. Low to moderate concentrations of volatile organic compounds and high concentrations of calcium and potassium are evident. Inorganics which have been detected in excess of NYS Class GA groundwater quality standards include antimony, iron, lead, manganese, sodium and cyanide.

- Groundwater flows into the site from the east and discharges from the landfill into surface water along the southern, western and northern landfill boundaries.

- Trace concentrations of trichloroethene (TCE) are migrating from the shallow groundwater zone into surface water. Total iron and cyanide results exceed Class "D" surface water standards. The surface water samples also indicate an alkaline pH, however, it is generally much lower than pH levels measured on groundwater samples.

- Wetland sediments have been impacted by site disposal activities. Phenolic compounds and polynuclear aromatic hydrocarbons (PAH's) have been detected in sediment samples. Similar concentrations of PAHs and phenolic compounds also occur in waste/fill material. Since PAHs have a low aqueous solubility and are not likely to have migrated via groundwater advection, the occurrence of PAHs in sediment indicates that waste/fill material is present in at least the upper six inches of sediment (the sampling zone). Waste/fill material was previously excavated from the drainage ditch during the construction of the final cover system. There is likely to be residual waste/fill remaining in the ditch. Low concentrations of ketones were also detected at two sediment sampling locations.

Some sampling locations were also found to contain high iron levels and elevated concentrations of chromium, lead, manganese, mercury, zinc, and cyanide.

- The sediment and fill impact could vary in depth from the upper six inches to depths as great as 15 feet.
- The sediment sampling was performed within NYSDEC regulated wetland BU-1, a Class I wetland. Wetlands BU-1 are considered one of the three largest wetlands in the City of Buffalo.
- It was determined that low to moderate potential risks to fish and wildlife are associated with exposure to the waste and fill constituents in the surface water and sediment of the wetland environment adjacent to the landfill.

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3.0 REGULATORY AND POTENTIAL INVOLVED AGENCY ISSUES

3.1 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF FISH AND WILDLIFE

Mr. Ken Roblee, a biologist with Region 9 of NYSDEC Division of Fish and Wildlife, was contacted regarding the wetland remediation work that may be required at the Marilla Street Landfill site. A New York State Freshwater wetlands permit will be required for any work done in these wetlands, since a portion of the wetlands at the Marilla Street Landfill are identified as New York State Wetland BU-1, a Class I wetlands.

Mr. Roblee also stated that the following issues need to be addressed either during the feasibility study or during the design stage:

- West Ditch - He would like to see an open channel with vegetation planted along the edge to allow for wildlife movement between the pond areas.
- Replacement of wetlands - Any wetland area that will be destroyed during the remediation efforts must be replaced one acre for one acre. The replacement can occur either on-site or off-site.
- Burrowing animals - Muskrat and beaver will burrow anywhere from 1 to 3 feet below surface water into the sides of streams and wetlands. Burrowing may ruin the integrity of the cover system and could possibly result in a release of waste fill constituents into the wetland system.

3.2 CITY OF BUFFALO, SOUTH DISTRICT COUNCILPERSON

Ms. Bonnie King Lockwood is the South District councilperson. Ms. Lockwood was contacted about the proposed wetland remediation. She identified several issues including:

- Public Safety - She stated that the Marilla Street Landfill site is a Class 2 hazardous waste site. As such it poses a significant threat the human health and the environment. She wants assurances that any work done will protect the health and safety of the public.

- Public Access - Ms. Lockwood would like to see this aesthetically pleasing area opened to the public via a series of trails or wooden boardwalks. She would like the City of Buffalo to help locate the trails in the area.

- Responsibility - If a series of trails/boardwalks are constructed, someone will need to be responsible for the maintenance and upkeep.

3.3 CITY OF BUFFALO, GREEN WAY TASK FORCE

One of the goals of the Green Way Task Force is to develop a series of public hiking trails that link the Union Ship Canal, the South Park Recreational Facility, Tifft Nature Preserve, and the Outer Harbor. Access onto the Marilla Street Landfill would assist the task force in meeting its goals. The task force has indicated a desire for input into the placement of trails on the property.

3.4 UNITED STATES ARMY CORPS OF ENGINEERS

Mr. Gary McDannell of the United States Army Corps of Engineers was contacted regarding the wetland remediation at the Marilla Street Landfill Site. A Clean Water Act Section 404 Nationwide Permit Program #38 "Cleanup of Hazardous and Toxic Sites" will be required for the wetland remediation work.

3.5 COASTAL ZONE MANAGEMENT AGENCY

Mr. Walt Meyer from the New York State Coastal Zone Management Agency was contacted regarding the Marilla Street Landfill wetland remediation work. The Marilla Street Landfill is adjacent to a mapped coastal zone management area. Therefore, a Federal Consistency Form will need to be completed for the project. This form addresses 44 policy statements that are the goal of the Coastal Zone Management Agency. A copy of that form is included in Appendix D.

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4.0 EVALUATION OF REMEDIAL ALTERNATIVES

Final cover systems have been constructed on the Marilla Street Landfill. These final cover systems serve to effectively minimize infiltration into and leachate generation within the waste fill materials. The final cover systems also serve to effectively eliminate the potential for contaminant migration via the overland flow migration pathway. The primary potential contaminant migration pathway involves the flow of shallow groundwater into the adjacent freshwater wetlands.

As discussed in Section 2.2, a portion of the waste materials disposed at the site are under saturated conditions and, as a result, the shallow groundwater table has been impacted. The contaminated groundwater discharges from the landfill into wetland areas along the southern, western and northern boundaries of the landfill. As a result, surface water quality in the adjacent wetlands is adversely impacted to some degree. However, since the contribution of water to the wetland area as a result of shallow groundwater flow is small (viz. less than 3 percent of the total surface water runoff - see Section 3.3.3 site water balance calculations in the October 1993 SWMFIP report, Malcolm Pirnie, October 1993) relative to the contribution of water due to surface runoff from the landfill, the potential for water quality impacts resulting from groundwater discharge into wetland areas is minimal. The contribution of water to the wetland areas upstream from the site further reduces the potential for water quality impacts as a result of shallow groundwater discharge.

Sediment in the adjacent wetlands has also been impacted as a result of site disposal activities. Waste fill is present in some wetland areas. The presence of waste fill and contaminated sediment within the wetlands and the associated physiochemical interactions with the water column is the more likely source of surface water quality impacts within the wetland areas.

The wetlands located adjacent to the Marilla Street Landfill are considered valuable wildlife habitat. Since these wetlands have been adversely impacted as a result of site disposal activities, mitigation of on-going and/or potential wetland impacts is the focus of this Feasibility Study. Although the discharge of shallow groundwater into the wetlands is not considered a significant impact, and is not the focus of this feasibility study, any

reduction in the groundwater discharge which should be achieved through implementation of the identified alternative will be factored into the evaluations.

4.1 REMEDIAL ACTION GOALS AND OBJECTIVES

Based upon the results of the SWMFIP investigations, regulatory and involved agency issues and the desire of LTV Steel Company to perform the remedial construction activities as soon as possible, the following remedial action objectives have been established for the wetlands adjacent to the landfill:

- Project Schedule - Initiate the construction work as soon as possible in 1996 to maximize the potential for conduction of the majority of the remedial construction activities during dry weather conditions. If necessary, complete the construction in 1997. LTV Steel has already budgeted funds to achieve this goal.
- Maintain the existing wetland acreage.
- Perform remedial construction activities so as to minimize contact with and/or release of contaminated fill and sediments.
- Minimize the potential for recontamination of the wetlands by further minimizing the direct flow of contaminated groundwater from the landfill to the adjacent surface water bodies.
- Improve wildlife habitat adjacent to the wetlands.
- Maintain the aesthetic value of the site for potential future use as a public park or nature preserve.
- Mitigate any wetlands which are destroyed as a result of the remediation efforts on a 1:1 ratio.

→ Removal of contaminated sediment from Wetlands?

4.2 IDENTIFICATION AND SCREENING OF REMEDIAL ALTERNATIVES

Eight potential remedial alternatives have been identified including:

- No-Action.

- Limited Action.
- Wetland Filling/Off-Site Mitigation.
- Wetland Restoration/Hydraulic Dredging/Mechanical Dewatering/On-Site Disposal.
- Wetland Restoration/In situ Dewatering/Mechanical Excavation/On-Site Disposal.
- Wetland Restoration/In situ Solidification/Stabilization/Off-Site Mitigation.
- Wetland Restoration/In situ Sediment Containment with Soil/Bentonite Cover.
- Wetland Restoration/In situ Sediment Containment with Geocomposite Cover.

4.2.1 Alternative 1: No-Action

Description - Under the No-Action alternative, no remedial construction activities would take place. The wetland sediments and waste material would remain undisturbed. A routine water quality monitoring program would be developed and implemented.

Effectiveness - Implementation of the No-Action alternative would provide for continued use of the wetlands by wildlife and would maintain the existing aesthetic value of the site; however, it would provide no mechanism for reducing potential health risks to wildlife or improving upland habitat adjacent to the site. It also would not reduce the potential for further contamination of wetland sediments by shallow groundwater discharging from the landfill.

Implementability - The No-Action alternative can be readily implemented because no construction activities are required.

Cost - There are no capital costs associated with the No-Action alternative. However, there will be costs associated with the long-term environmental monitoring program. These costs include sampling fees, analytical services and report preparation.

There would also be routine maintenance costs associated with maintaining the integrity of the monitoring system (viz. redeveloping wells, assessing their integrity, well replacements as necessary). The annual operation and maintenance cost for the No-Action alternative have been estimated at $41,713 (See Appendix E).The total present worth of the No-Action alternative, assuming 8 percent interest over 30-years is $469,597. (See Table 4-1).

Conclusion - The No-Action alternative was eliminated from further consideration because it does not achieve the remedial action goals and objectives.

4.2.2 Alternative 2: Limited Action

Description - The Limited Action alternative would be identical to the no-action alternative with the exception that the landfill would be enhanced to better support wildlife. This would include reducing mowing events and planting special vegetation and shrubs along the wetland boundaries as well as enhancing vegetation within the wetlands.

Effectiveness - Implementation of the Limited Action alternative would provide for continued use of the wetlands by wildlife and would maintain the existing aesthetic value of the site; however, it would provide no mechanism for reducing potential health risks to wildlife. It also would not reduce the potential for further contamination of wetland sediments by shallow groundwater discharging from the landfill.

Implementability - The Limited Action alternative can also be readily implemented because only very limited site work is required.

Cost - The capital cost for the site enhancement under this alternative has been estimated at $20,000 (See Appendix E). The annual operation and maintenance costs for the Limited Action alternative would be slightly less than the No-Action alternative (viz. $33,713 per year) as a result of a reduction in the site mowing frequency. The total present worth of the limited action alternative assuming 8 percent interest over 30 years is $399,534 (See Table 4-1).

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TABLE 4-1
LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND MITIGATION

TOTAL PRESENT WORTH COST OF EACH ALTERNATIVE

Alternatives	Annual Cost for O & M	30 year Present Worth	Capital Cost	Total Present Worth
1	$41,713	$469,597	$0	$469,597
2	$33,713	$379,534	$20,000	$399,534
3	$53,213	$599,061	$2,459,970	$3,059,031
5	$53,213	$599,061	$7,783,700	$8,382,761
6	$53,213	$599,061	$7,998,480	$8,597,541
7	$53,213	$599,061	$2,975,000	$3,572,061
8	$53,213	$599,061	$2,200,200	$2,799,261

Conclusion - The Limited Action alternative was eliminated from further consideration because it does not meet the remedial action goals and objectives.

4.2.3 Alternative 3: Wetland Filling/Off-Site Mitigation

Description - The Wetland Filling alternative would involve filling the entire wetlands leaving only ditches or swales necessary to collect and transport surface water runoff and upstream discharge. Clean off-site soil fill material would be utilized followed by six inches of topsoil. The topsoil would be vegetated to prevent erosion.

Wetlands destroyed on site would be replaced by off-site mitigation at a 1 acre to 1 acre ratio (Area D discussion).

Effectiveness - Implementation of the Wetland Filling alternative would not provide for continued use of the wetlands by wildlife; however, it would provide a mechanism for reducing potential health risks to wildlife.

Implementability - The Wetland Filling alternative could also be readily implemented once a source of clean fill is located. However, off-site wetland mitigation is not easily implemented. Purchasing suitable property that provides appropriate hydrology takes time and requires an extensive potential environmental impact analysis as well as appropriate regulatory approvals and permits..

Cost - Construction activities would entail transporting significant quantities of clean soil and topsoil to the site. An estimated 80,000 cubic yards of fill and topsoil would be required to fill the wetlands. The estimated cost for filling the wetlands, including engineering contingencies and the construction elements is $2,459,970 (see Appendix E). The estimated cost for off-site mitigation is $632,000 (See Appendix E). The operations and maintenance cost for Alterative 3 would be identical to the No-Action alternative plus some additional costs associated with monitoring the integrity of the off-site wetlands (viz. $53,213 per year). The total present worth of the Wetland Filling/Offsite Mitigation alternative assuming 8 percent interest over 30 years is $3,059,031 (See Table 4-1).

Conclusion - Alternative 3 was eliminated from further consideration because it does not meet the remedial action goals and objectives. It does not retain the wetlands on-site for wildlife use nor would it meet the requirements of the project schedule.

4.2.4 Alternative 4: Wetland Restoration/Hydraulic Dredging/Mechanical Dewatering/On-Site Disposal

Description - Under Alternative 4, both of the north ponds, the west ditch and the south pond would be dredged using a hydraulic barge mounted dredge to remove contaminated sediments. Dredge water and dredged sediments would be pumped to an on-site treatment and dewatering system. Once the sediments have been dredged, the wetlands would need to be segregated from the adjacent fill materials using a liner system as described for Alternative 7 and 8 to prevent reintroduction of waste material into the wetlands and to minimize the flow of contaminated groundwater into the wetlands.

Effectiveness - Alternative 4 would be an effective method for removing contaminated sediments and preventing future contamination of wetland areas.

Implementability - Implementation of alternative 4 would be difficult if not impossible due to the type of waste materials present in the wetlands. The bottom of the wetlands are known to contain significant amounts of vegetation, slag, rocks, logs, large quantities of peat, bricks, tires, steel scrap, wood, railroad ties and other miscellaneous debris which would make hydraulic dredging and pumping of the slurry nearly impossible.

In addition, the long pumping distances between the north and south ends of the project combined with the significant head differentials between the dredge areas and the treatment system would make pumping of the slurry extremely difficult.

Costs - Since this alternative would be difficult if not impossible to implement, no cost estimate was prepared.

Conclusions - This alternative was eliminated from further consideration due to questions regarding implementability.

4.2.5 Alternative 5: Wetland Restoration/Excavate/Dewater Sediments/On-Site Disposal

Description - Under Alternative 5, each wetland area (the north ponds, west ditch and south pond) would be drained to the maximum degree possible and the remaining sediment allowed to dry (weather permitting) until such time as it could be excavated with a backhoe and/or dragline. Diversion of storm water would likely be required during dewatering and construction activities. Excavated sediment material would be loaded onto trucks or pans for transport to the top of the miscellaneous debris area. The excavated wetland area would then be lined with a geocomposite liner such as Bentomat and covered with six inches of clean soil material. The geocomposite liner would be keyed into the clay cover system layer on the landfill to provide a continuous barrier restricting groundwater discharge into the wetlands.

The excavated sediment material would be transferred to an unlined on-site impoundment within the Miscellaneous Debris Area for dewatering. This area was selected as it is the largest and flattest area available on-site. The existing cover system would first be stripped and stockpiled for later use in replacing the final cover system upon completion of the wetland excavation activities. The impoundment would then be constructed on top of fill material. Perimeter berms would be constructed of offsite fill materials. The porous nature of the slag fill on the bottom of the basin would aid in dewatering the sediment and waste materials.

The solids content of the excavated sediment material is uncertain and would be highly dependent upon the contractor's construction methods and weather conditions during construction. Stabilization of the material with soil, cement or some other agent after it has been placed within the basin may be necessary.

After the basin contents have been dewatered and stabilized, the dewatering area would be covered with an 18-inch thick clay layer and 12-inches of topsoil (the same as the current cover system design).

Effectiveness - The implementation of this alternative would remove the contaminated sediment and fill material thus preventing impacts to the wildlife utilizing the

wetlands. In addition, the geosynthetic layer would be effective in minimizing the potential for future contamination of the wetland areas by minimizing the flow of contaminated groundwater into the wetlands.

Implementability - Implementation of this alternative would require that special construction procedures be implemented in areas of unstable landfill slope conditions. When grading the site for final cover system construction, at least two areas were uncovered along the toe of slope adjacent to the wetlands that were highly unstable due to the types and quantity of fill materials present. One area encompassed the entire northern end of the Clarifier Sludge Area. The other encompassed the southwest corner of the Clarifier Sludge Area. Excavation of sediment in the vicinity of these areas would require that structural measures be taken to support the landfill slope to prevent it from sloughing into the water. Sheet piling would need to be installed along the toe of slope prior to excavation activities to prevent slope failures. It is also possible that other areas exist along the wetland boundaries that are structurally unstable. These areas might not be identifiable until construction activities have been initiated.

Cost - Verification sampling would likely be required as the excavation proceeds to verify that all contaminated materials are removed to the clean-up levels established by the NYSDEC. For the purpose of this estimate, we have assumed that all materials (fill material, peat, silt and sand) down to the existing underlying glacio-lacustrine clayey silt layer in each wetland area would be removed since it is somewhat permeable and potentially contaminated. Average depths of excavation, based upon the SWMFIP sampling data, are as follows:

Location	Average Depth of Excavation
Northeast Pond	11 Feet
Northwest Pond	11.2 Feet
West Ditch	6.1 Feet
South Pond	2.9 Feet

This equates to approximately 195,000 cubic yards of sediment/waste to be removed. The estimated capital cost for Alternative 5, including engineering, contingencies is $7,783,700 (see Appendix E). The operation and maintenance cost for Alternative 5 would be identical to the No-Action alternative plus some additional costs associated with monitoring the integrity of the restored wetlands (viz. $53,213 per year). The total present worth of the Wetland Filling/Off-Site Mitigation alternative assuming 8 percent interest over 30 years is $8,382, 761 (See Table 4-1).

Conclusions - Alternative 5 (Wetland Restoration/Excavate/Dewater Sediments/On-Site Disposal) achieves the remedial action goals and objectives and will be considered further in the detailed analysis.

4.2.6 Alternative 6: Wetland Restoration/In situ Solidification/Stabilization Off-Site Mitigation

Description - In situ solidification/stabilization would involve fixating the contaminants in-place by injecting stabilizing agents and cement-based solidification agents into the sediments. The solidification/stabilization agents could be applied to the sediments using proprietary mechanical mixing equipment attached to a crawler crane or large track-mounted backhoe. The mixing equipment consists either of a large diameter (typically 12-feet) circular mixing tool or two sets of paddle wheels equipped with auger teeth for efficient mixing. Generally, 60 to 70 cubic yards of sediment can be treated on an hourly basis using either mixing tool. However, where very dense sediments or large debris is present, treatment rates will be somewhat reduced unless the large debris can first removed. The solidification/stabilization agents are pumped into the sediment through the mixing equipment during mixing operations. The solidification/stabilization agents generally setup within 24 to 48 hours producing hard, cohesive sediments. A 20 to 40% volume increase typically occurs with the addition of the solidification/stabilization agents to sediments.

Prior to in situ treatment of the sediments, each wetland area would be drained to the maximum degree possible. Diversion of storm water would be required during dewatering operations. Wetland areas covered with abundant vegetative growth would

require clearing prior to in situ treatment in order to minimize the volume of organic matter that would be incorporated in the treated sediment. Solidification/stabilization with the mixing tool would begin along the outer perimeter of each wetland area and work progressively inward toward the center. This approach would allow the crawler-mounted crane or track-mounted backhoe equipped with the mixing tool to be driven out on to the treated sediment and would reduce the frequency of equipment bogging down in the dewatered, soft sediment. The weight of the machinery required to treat the sediments may mitigate some of the expected volume increase associated with the addition of solidification/stabilization agents to the sediments. The crane-mounted mixing tool equipment weighs approximately 140 tons and may compact the treated sediments to the same thickness currently occupied by the sediments. If the weight of the equipment exceeds the load-bearing capacity of the treated sediments, crane mats would be used to displace the load of the equipment (i.e., crane mats in excess of 20 feet in length would displace the total load on the treated sediments to 4 to 5 lbs/sq. in.).

Effectiveness - In situ solidification/stabilization of wetland sediments would reduce the leachability of contaminants present within the sediments, reduce the permeability of the sediments and thereby minimize the volume of groundwater that infiltrates to the wetland areas and would effectively minimize the potential exposure of contaminated sediments to wildlife.

Implementability - The solidification/stabilization alternative can be readily implemented. However, if the elevation of the treated sediments cannot be returned to the original elevation in the West Ditch and South Pond (areas with less than 2 feet of water) and wetland areas cannot be re-established, then construction of an engineered channel between the South Pond and Northwest Pond would be required to interconnect these waterways and off-site mitigation of additional wetlands to compensate for the loss of the treated wetland areas would be required.

Cost - We have assumed that the upper five feet of sediment/soil in each of the ponds and the West Ditch would be treated in situ with the mixing tool, thereby creating a five-foot thick layer of low permeability material with low leachability. Based on a total of 16.2 acres of wetland sediments, approximately 130,000 cubic yards of sediment would be treated. The treated sediments would be covered with a six-inch layer of loam type soil to provide a medium for the re-establishment of vegetation. The solidification/stabilization of the wetland sediments could be performed in a single 8-month construction season with simultaneous operation of two mixing tools. We have also assumed that off-site mitigation will be necessary.

The estimated capital cost for solidification/stabilization and off-site mitigation, including engineering and contingencies is $7,998,480 (see Appendix E). The operation and maintenance cost for Alternative 6 would be identical to the No-Action plus some additional costs associated with monitoring the integrity of the restored wetlands (viz. $53,213 per year). The total present worth of the Wetland Restoration/In situ Solidification/Off-Site Mitigation alternative assuming 8 percent interest over 30 years is $8,397,541 (See Table 4-1).

Conclusion - Alternative 6 (Wetland Restoration/In situ Solidification/Stabilization) achieves the remedial action goals and objectives and will be considered further in the detailed analysis.

4.2.7 Alternative 7: Wetland Restoration/In situ Sediment Capping with a Soil/Bentonite Cover

Description - Alternative 7 would involve containing the sediments and waste material in-place through the placement of a soil and bentonite cover. This would be accomplished by first temporarily draining the wetlands and allowing the sediment to dry to the maximum extent possible. Diversion of storm water would be required during dewatering operations. To provide structural support over the soft, wet sediments, a geogrid would then be placed over the bottom of the wetlands. Any large debris (e.g., logs and tires), or significant amounts of vegetation present on the wetland bottoms would be

removed prior to or during placement of the geogrid. Any removed materials would either be taken off-site for disposal at a permitted disposal facility or buried on-site beneath the existing cover system.

Following these activities, a twelve inch thick layer of soil and bentonite would be pushed in-place over the grid material to form a low permeability cover. Bentonite would be mixed on-site in bulk form though the use of a pug mill. The amount of bentonite would vary depending upon the clay content of the soil material (five percent was assumed for this evaluation). The bentonite/soil barrier layer would be tied into the existing clay barrier on the landfill final cover system to form one continuous barrier. Following placement of the soil/bentonite, a six inch thick layer of loam type soil would be placed over it for the re-establishment of wetland vegetation.

Effectiveness - Alternative 7 would effectively reduce potential exposure of wildlife to contaminated sediments by covering them in place. Also, the bentonite would reduce the permeability of the sediment layer and would thereby minimize the volume of groundwater that would infiltrate into the wetland areas.

Implementability - Alternative 7 can be readily implemented through use of conventional construction techniques. A two-year construction period would likely be required.

Cost - The estimated capital cost for Alternative 7 (Wetland Restoration/In situ Sediment Capping with a Soil/Bentonite Cover), including engineering and contingencies is $2,973,000 (see Appendix E). The operation and maintenance cost for Alternative 7 would include the costs identified for the No-Action alternative plus some additional costs associated with monitoring the integrity of the restored wetland areas (viz. $53,213 per year) The total present worth of the Wetland Restoration/In situ Sediment Capping with a Soil/Bentonite Cover Alternative assuming 8 percent interest over 30 years is $3,572,061 (see Table 4-1).

Conclusion - Alternative 7 achieves the remedial action goals and objectives and will be considered further in the detailed analysis.

4.2.8 Alternative 8: Wetland Restoration/In situ Sediment Capping with a Geocomposite Cover

Description - Alternative 8 would involve containing the sediments and waste materials in place through the placement of a low permeability geocomposite cover. This would be accomplished by temporarily draining the wetlands and allowing the sediment to dry to the maximum extent possible. Diversion of storm water would be required during dewatering operations. To provide structural support and a working surface over the soft, wet sediments, a geogrid would then be placed over the wetland bottom. Any large debris (logs, tire, etc.) or significant amounts of vegetation present on the wetland bottoms would be removed prior to or during placement of the geogrid. Any removed materials would either be taken off-site for disposal at a permitted disposal facility or buried on-site beneath the existing cover system.

Following placement of the grid material, twelve inches of soil would be placed over the grid to provide a dry working platform for equipment to work on. Next, a geocomposite cover consisting of two layers of filter fabric with a sodium bentonite layer between them, would be placed to act as both a physical and hydraulic barrier to sediment transport and groundwater movement. The edges of the geocomposite would overlap a minimum of twelve inches to provide a continuous barrier and would key into the existing clay barrier layer along the landfill toe of slope. The geocomposite would then be covered with six inches of off-site loam soil material to protect it and to provide a medium for the re-establishment of wetlands vegetation.

Effectiveness - Alternative 8 would effectively reduce potential exposure of wildlife to contaminated sediments by covering them in place. Also, the bentonite would reduce the permeability of the sediment layer and would thereby minimize the volume of groundwater that would infiltrate into the wetland areas.

Implementability - Alternative 8 can be readily implemented through use of convectional construction techniques. A two-year construction period would likely be required.

Cost - The estimated capital cost for Alternative 8, including engineering and contingencies is $2,200,200 (see Appendix E). The operation and maintenance cost for Alternative 8 would be identical to the No-Action alternative plus some additional costs associated with monitoring the integrity of the restored wetland area (viz. $53,213 per year). The total present worth of the Wetland Restoration/In situ Sediment Capping with a Geocomposite Cover alternative assuming 8 percent interest over 30 years is $2,799,261 (see Table 4-1).

Conclusion - Alternative 8 achieves the remedial action goals and objectives and will be considered further in the detailed analysis.

4.3 VEGETATION RESTORATION AND ENHANCEMENT

Implementation of one of Alternatives 5, 6, 7 and 8 would require wetland restoration following sediment remediation. Regardless of the remedial alternative selected, the objective would be to increase biodiversity on the LTV site by enhancing upland areas for wildlife use.

The purpose of wetland restoration would be three-fold: to stabilize and trap sediments, improve water quality, and create increased wildlife habitat for upland and water-dependent species. The West Ditch would provide a vegetated wetland corridor to link the North and South Ponds.

Wetland plant species selected for site restoration must meet the following criteria:

- Be a native species indigenous to the area.
- Provide wildlife value (i.e., nesting site, food, cover).

- Have a shallow root system to protect the integrity of the landfill cap and wetland cover system.
- Have a low growth pattern so as not to obstruct the scenic vistas of Lake Erie
- Be resistant to weather extremes typical of landfill habitats i.e., temperature extremes, droughty conditions, prevailing winds.

In addition to proposed plant species, planted areas will be seeded with annual rye grass at an application of 15 pounds per acre. Rye grass will not only stabilize the soils, but will also help to control soil temperature and moisture until slower germinating seed mixtures and transplants can be established. The following is a description of the vegetation restoration or enhancement concept for the wetland areas and adjoining landfill site.

4.3.1. West Ditch Plantings

The bank along the east side of the ditch would consist of areas planted with a mixture of shrubs and open areas. Three randomly spaced shrub areas ranging in size from 400 to 600 feet long and 20 to 25 feet wide would provide sufficient cover along this side of the ditch for wildlife. Shrubs would be planted in three alternating rows along an eight foot grid. A typical planting would consist of approximately 31 shrubs per 100 feet. Shrub species considered appropriate for revegetation along the West Ditch banks are provided in Table 4-2. The planting of these shrubs would increase the diversity of the habitat created and provide additional food sources for wildlife.

A seed mixture comprised of northern wildflowers and grass mixture would be planted between the shrub areas. The application rate of the seed mixture would be 12 ounces flower seed, 4 pounds of legumes and 42 pounds of grass seed per acre. This seed mixture includes fast growing grasses and native and naturalized pasture wildflowers. Components of the seed mix are provided in Table 4-3.

Planting along the west side of the ditch would consist of a mixture of cattails and grass. Three broad-leaf cattail (*Typha latifolia*) areas ranging in size from 400 to 650 feet long and 4 to 6 feet wide would be planted across from the open areas on the east side of the

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TABLE 4-2
LTV STEEL COMPANY
MARILLA STREET LANDFILL

SHRUB SPECIES RECOMMENDED FOR REVEGETATION OF THE WEST DITCH

Common Name	Scientific Name
Red Osier Dogwood	*Cornus stolenifera*
Silky Dogwood	*Cornus amomum*
Elderberry	*Sambucus canadensis*
Arrowwood	*Viburnum recognitum*
Tatarian Honeysuckle	*Lonicera tatarica*
Staghorn Sumac	*Rhus typhina*
American Cranberry	*Viburnum trilobum*
Streamco Willow	*Salix purpurea*

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TABLE 4-3
LTV STEEL COMPANY
MARILLA STREET LANDFILL

WEST DITCH SEED MIXTURE

Common Name	Scientific Name
Red Fescue	*Festuca rubra*
Annual Ryegrass	*Lolium multiflorum*
Queen Anne's lace	*Daucus carota*
Yarrow	*Achillea millefolium*
Daisy	*Chrysanthemum leucanthemum*
Smartweed	*Polygonum pensylvanicum*
Red top	*Agrostis alba*
Bird-foot trefoil	*Lotus corniculatus*
New England Aster	*Aster novae-angliae*
Black Eyed Susan	*Rudbeckia hirta*
Dame's Rocket	*Hesperis matronalis*

ditch. Cattails would be planted on a 6 foot grid. The seed mixture of northern wildflowers and grasses used on the east bank would be planted between the cattails.

4.3.2. North Ponds

Restoration of the North Ponds would consist of planting fringe broad-leaf cattails around the perimeter of the ponds where the water level is 18 inches or less. For the purpose of estimating the restoration costs for this study, it was assumed that a 20- foot wide fringe of vegetation would be planted at the perimeter of each pond. In addition, 50 randomly spaced spatterdock (*Nuphar lutes*) plants would be planted in the open water areas of each pond.

4.3.3 South Pond

Remediation of the South Pond is likely to require a minimum of 12 inches of cover material to cap contaminated sediments. Currently, the pond sustains 12 to 24 inches of water at its center, an area of approximately one acre. Placement of twelve inches of cover material in the South Pond would result in decreasing the standing water to possibly less than 12 inches. This area would be replanted with broad-leaf cattail. The south and east portions of the pond (approximately 1.2 acres) would be planted with a mixture of native grass and sedge species /wetland hummock mixture at a rate of 3.25 pounds per acre. Since these native seeds are slow to germinate, the area would be interplanted with bare root transplants on a four-foot grid to facilitate growth. The wetland hummock seed mixture and potential transplant species are provided in Table 4-4.

The portion of the pond adjacent to the landfill would be planted as a wet meadow (approximately 1.3 acres). This area would be seeded with 3.25 pounds per acre of a wet meadow seed mix interplanted with bare root transplants on a four foot grid. This seed mixture does not germinate well under water. The wet meadow seed mixture and potential transplant species are provided in Table 4-5.

The area bordering the forested floodplain (approximately 1 acre) would be planted with a shrub mixture similar to that found along the west ditch (see Table 4-2). Shrubs would be placed along alternating rows along an eight-foot grid.

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TABLE 4-4
LTV STEEL COMPANY
MARILLA STREET LANDFILL

WETLAND HUMMOCK PLANTING FOR SOUTH POND

Common Name	Scientific Name
Seed Mixture:	
Fox Sedge	*Carex vulpinoidea*
Rice Cut Grass	*Lersia oryzoides*
Sedge	*Carex lurida*
Fringed Sedge	*Carex crinita*
Soft Rush	*Juncus effusus*
Dark Green Bulrush	*Scirpus atrovirens*
Wool Grass	*Scirpus cyperinus*
Sedge	*Carex comosa*
Bladder Sedge	*Carex intumescens*
Bare Root Transplants:	
Blueflag	*Iris versicolor*
Cinnamon fern	*Osmunda cinnamomea*
Fringed Sedge	*Carex crinita*
Bladder Sedge	*Carex intumescens*
Soft Rush	*Juncus effusus*
Giant Burreed	*Sparganium eurycarpum*

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TABLE 4-5
LTV STEEL COMPANY
MARILLA STREET LANDFILL

WETLAND WILDFLOWER PLANTING FOR SOUTH POND

Common Name	Scientific Name
Seed Mix:	
Panic Grass	*Panicum dichotomiflorum*
Pennsylvania Smartweed	*Polygonum pennsylvanicum*
Nodding Beggar Ticks	*Bidens cernua*
Boneset	*Eupatorium perfoliatum*
Blue vervain	*Verbena hastata*
Joe Pye Weed	*Eupatorium maculatum*
Canada Goldenrod	*Solidago canadensis*
New York Ironweed	*Vernonia noveboracensis*
Bare Root Transplants:	
Blueflag	*Iris versicolor*
Blue vervain	*Verbena hastata*
Joe Pye Weed	*Eupatorium maculatum*
Boneset	*Eupatorium perfoliatum*
Sensitive Fern	*Onoclea sensibilis*
White Turtlehead	*Chelone glabra*

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4.3.4 Upland Enhancement

In addition to the wetland restoration, LTV Steel is proposing to enhance adjoining upland areas to increase biodiversity. These measures would likely include the following.

- The landfill site is currently mowed on a regular basis, consequently habitat is limited. To increase habitat diversity, it is recommended that the landfill cap be mowed annually to provide an open field habitat attractive to grassland bird species, small mammals and raptors, while controlling the establishment of woody vegetation. Mowing annually during late fall is preferred for several reasons: it would allow ground-nesting species to nest and raise young undisturbed; grasses and forbs to form seeds to generate the next season's plants, which are an important food item for native and migratory birds and small mammals.

- Placement of nesting boxes around the perimeter of the landfill. Clusters of three boxes would be placed every 500 feet. This would provide nesting sites for birds such as tree swallows, eastern bluebirds, and wrens.

- Placement of 10 randomly placed brush or rock piles on the landfill. These would provide cover for wildlife such as cottontail rabbits, small mammals, songbirds, and reptiles.

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5.0 DETAILED ANALYSIS OF ALTERNATIVES

This section presents a detailed analysis of the remedial alternatives remaining after screening. Each alternative is analyzed with respect to six criteria. These criteria provide a basis of comparison and ranking of each alternative:

Short-Term Impacts and Effectiveness - This criterion evaluates the effectiveness of alternatives in protecting human health and the environment during construction and implementation of the remedial action. Short-term effectiveness is assessed by protection of the community, protection of workers, environmental impacts, and time until protection is achieved.

Long-term Effectiveness and Permanence - This criterion evaluates the long-term protection of human health and the environment at the completion of the remedial action. Effectiveness is assessed by magnitude of residual risks, adequacy of controls in managing treatment residuals or untreated wastes that remain at the site, reliability of controls against possible failure, and potential to provide continued protection.

Reduction of Toxicity, Mobility and Volume - This evaluation criterion addresses the statutory preference for selecting remedial actions that permanently and significantly reduce constituent toxicity, mobility, or volume. This preference is satisfied when the treatment used destroys toxic constituents, irreversibly reduces constituent mobility, or reduces total volume of impacted media.

Implementability - This assessment evaluates the technical and administrative feasibility of implementing the alternative and the availability of services and materials.

Overall Protection of Human Health and the Environment - This assessment determines if a remedial alternative provides adequate protection and describes how risks

from each pathway are eliminated, reduced, or controlled. This evaluation considers any unacceptable short-term or cross-media impacts from an alternative.

Cost - This criterion evaluates the estimated capital, long-term operation and maintenance, and monitoring costs.

5.1 ANALYSIS OF ALTERNATIVES

5.1.1 Alternative 5 - Wetland Restoration/Excavate/Dewater Sediments/On-Site Disposal

This alternative would involve draining the wetland areas and allowing the remaining sediments to dry until such time as it could be excavated with either a backhoe or dragline. A discussion of the evaluation criteria for this alternative follows.

Short-Term Impacts and Effectiveness - Construction under this alternative would be of longer duration than the other alternatives due to the time involved with excavating and hauling sediment, soil, and waste materials. This would result in a longer period of loss for wildlife habitat. Also, there is the potential for increased fugitive dust during construction; although this is manageable through conventional construction monitoring. There will be an increase in noise levels during construction activities due to the increased truck traffic from hauling soil to and from the Site and equipment use on-site. Site workers may be subjected to increased chemical exposure during excavation of the sediments. These risks may be properly managed through personal protective equipment, site monitoring, and/or control measures.

This alternative would become effective immediately after excavation activities are complete and the geocomposite liner is in place.

Long-Term Effectiveness and Permanence - To assure long-term reliability, regularly scheduled maintenance would be performed. The implementation of this alternative would permanently remove the contaminated sediment and fill material. In

addition, the geosynthetic layer would be effective in preventing future contamination of the wetland areas by minimizing the flow of shallow groundwater directly into the wetland area.

Reduction of Toxicity, Mobility, or Volume - This alternative would indirectly reduce groundwater toxicity through the reduced flow of shallow groundwater directly to the wetland areas. Excavation of the sediments greatly reduces the volume of contaminants present. Removal of the sediments eliminates risks to wildlife from direct contact with the sediment.

Implementation - Implementation of this alternative would be difficult due to the slope stability problems. Special construction procedures such as sheet pilings would be required to stabilize the slope. Two areas of the landfill are known to have stability problems. Other unstable areas may be present. These areas would not be identified until the sediment has been excavated and the slope fails.

Overall Protection of Human Health and the Environment - The environmental risk assessment indicated potential concerns associated with long-term exposure to contaminants in the sediment. Also, the NYSDEC is concerned with the pH levels in the wetlands. This alternative alleviates these concerns by removing the sediment from the wetlands and minimizing the flow of shallow groundwater into the wetland areas.

Cost - The total construction cost associated with Alternative 5 is $7,783,700. The present worth cost is $8,382,761.

5.1.2 Alternative 6: Wetland Restoration/Insitu Solidification and Stabilization/Off-site Mitigation

Wetland Restoration/Insitu solidification/stabilization would involve fixating contaminants in-place by injecting stabilizing agents and cement-based solidification agents into the wetland sediments.

Short-Term Impacts and Effectiveness - This alternative would result in the short-term loss of wetland habitat. Site workers may be subjected to increased chemical exposure as a result of the construction activities. These risks may be properly managed through personal protective equipment, site monitoring, and/or control measures.

This alternative would become effective immediately after solidification/stabilization activities are complete.

Long-Term Effectiveness and Permanence - Implementation of this alternative would reduce impacts to the wetland areas by reducing the leachability of contaminants present within the sediments. It also reduces the permeability of the sediments and thereby would minimize the volume of shallow groundwater that discharges to the wetland areas.

Reduction of Toxicity, Mobility, or Volume - This alternative would directly reduce groundwater toxicity through the reduced flow of groundwater directly to the wetlands. The mobility of the contaminants would also be reduced by solidifying them in-place within the cement-based solidified layer.

Implementability - This alternative is readily implementable; however, if the sediment cannot be compacted during construction to pre-construction elevations, the wetland areas cannot be restored. There is insufficient area available on site to mitigate for lost wetland areas; therefore off-site mitigation would be necessary. Large pieces of debris which may be present within the sediment may also cause implementation problems with the solidifcation equipment unless they are first removed.

Overall Protection of Human Health and the Environment - The environmental risk assessment indicated potential concerns associated with long-term exposure to contaminants in the sediment and the pH of the surface water in the wetlands. This alternative alleviates these concerns by fixating the sediments in-place and minimizing the flow of shallow groundwater into the wetland areas.

Cost - The total construction cost associated with Alternative 6 is $7,998,480. The present worth cost is $8,597,541.

5.1.3 Alternative 7: Wetland Restoration/Insitu Sediment Capping with a Soil/Bentonite Cover

This alternative would contain the sediments and waste materials in-place through the placement of a soil and bentonite cover.

Short-Term Impacts and Effectiveness - This alternative would result in the short-term loss of wetland habitat. Site workers may be subjected to increased chemical exposure from the contaminated sediments during construction. These risks may be properly managed through personal protective equipment, site monitoring, and/or control measures.

This alternative would become effective immediately after the soil/bentonite cover is in place.

Long-Term Effectiveness and Permanence - Implementation of this alternative would reduce impacts to the wetland areas containing the sediments in place. It also reduces the permeability of the sediments layer and thereby would minimize the volume of shallow groundwater discharging to the wetland areas.

Implementability - This alternative is readily implementable.

Reduction of Toxicity, Mobility, and Volume - This alternative would reduce groundwater toxicity through the reduced flow of shallow groundwater to the wetland areas. The mobility of the contaminants would be greatly reduced as a result of the soil/bentonite barrier layer.

Overall Protection of Human Health and the Environment - The environmental risk assessment indicated potential concern associated with long-term exposure to contaminants in the sediment and with the pH of the surface water in the wetlands. This

alternative alleviates these concern by providing a low permeability barrier that would minimize the flow of shallow groundwater into the wetland areas.

Cost - The total construction cost associated with Alternative 7 is $2,973,000. The present worth cost is $3,572,061.

5.1.4 Alternative 8: Wetland Restoration/Insitu Sediment Capping with a Geocomposite Liner

This alternative would involve containing the sediments and waste materials in-place through the placement of a geocomposite cover that would act as a barrier layer.

Short-Term Impacts and Effectiveness - This alternative would result in the short-term loss of wetland habitat. Site workers may be subjected to increased chemical exposure during construction. These risks may be properly managed through personal protective equipment, site monitoring, and/or control measures.

This alternative would become effect immediately after geosynthetic layer is in place.

Long-Term Effectiveness and Permanence - Implementation of this alternative would reduce impacts to the wetland areas by containing the sediments in place. It also reduces the permeability of the sediment layer and thereby would minimize the volume of shallow groundwater discharging to the wetland areas..

Implementability - This alternative is readily implementable.

Reduction of Toxicity, Mobility, and Volume - This alternative would reduce groundwater toxicity through the reduced flow of shallow groundwater to the wetland areas. The mobility of the contaminants would be greatly reduced as a result of the soil/geocomposite barrier layer.

Overall Protection of Human Health and the Environment -The environmental risk assessment indicated potential concerns associated with long-term exposure to contaminants in the sediment and with the pH of the surface water in the wetlands. This alternative alleviates these concerns by providing a low permeability barrier that would minimize the flow of shallow groundwater into the wetland areas.

Cost - The total construction cost associated with Alternative 8 is $2,200,200. The present worth cost is $2,799,261.

5.2 COMPARISON OF ALTERNATIVES

A comparison of the remedial alternatives with respect to the six evaluation criteria is presented below:

Short-Term Impacts and Effectiveness - Each of the four remaining alternatives (5, 6, 7, 8) involves construction and therefore, the potential for worker exposure. Each alternative would be effective; and with provision of appropriate worker health and community safety measures, would not significantly impact public health. Each alternative involves the temporary loss of the wetland areas for use by wildlife

Excavation of the sediments would result in the longest potential for exposure and loss of habitat (Alt.5). It will take the longest time to construct due to the significant volumes of material which need to be handled.

Long-Term Effectiveness and Permanence - All four alternatives provide long-term effectiveness in reducing contact with contaminated sediments. Also, all four alternatives reduce the flow of shallow groundwater into the wetland areas through use of a low permeability barrier.

Reduction of Toxicity, Mobility or Volume - All four alternatives reduce potential impacts to wildlife by reducing the potential exposure to contaminated sediments. These alternatives also reduce the flow of shallow groundwater into the wetland areas.

Implementability - All four of the alternatives are readily implementable. However, the Excavation/Dewater Sediments/On-Site Disposal alternative (Alternative 5) carries with it uncertainties which are likely to cause potential problems during construction (such as additional dewatering measures due to the uncertainty of the sediment solids content, slope failures as a result of unstable landfill areas or additional excavation beyond that which is anticipated resulting from yet undecided cleanup levels to be established by the NYSDEC).

The Insitu Solidification/Stabilization Alternative (Alternative 6) may require mitigation efforts for the West Ditch if pre-construction elevations cannot be re-established. There is not enough area on site to mitigate this area, therefore off-site mitigation would be necessary. The wetland mitigation efforts would likely take a minimum of another full year to complete.

The primary disadvantage of the Insitu Sediment Capping with Soil/Bentonite Cover Alternative (Alternative 7) is the significant volumes of both soil and bentonite which would be required plus potential implementation problems associated with the handling of bulk quantities of soil and bentonite should weather conditions become unfavorable.

Large pieces of debris in the wetlands may also present implementation problems for Alternatives 6, 7 and 8. The debris may need to be mechanically removed.

Overall Protection of Human Health and the Environment - All four of the alternatives provide a low permeability barrier that would minimize the flow of shallow groundwater into the wetland areas. In addition, all four alternatives contain or remove the sediments reducing the potential for exposure to wildlife.

Costs - The Insitu Solidification/Stabilization Alternative (Alternative 6) is the most costly to implement (approximately four times that of Insitu sediment capping) (Alternative 7) with excavation the second most costly. Of the two in-situ sediment capping alternatives,

Alternative 8: In-situ Sediment Capping with a Geocomposite Cover is the least costly alternative.

5.3 RECOMMENDED REMEDIAL ALTERNATIVE

The recommended remedial approach for the Marilla Street Landfill is Alternative 8: Wetland Restoration/Insitu Sediment Capping with a Geocomposite Liner. This alternative meets all of the remedial action goals and objectives. It can:

- Be implemented in 1996.
- Maintain the existing wetland acreage
- Minimize contact with contaminated fill and sediments.
- Minimize the potential additional contamination of the wetlands by controlling the flow of potentially contaminated shallow groundwater from the landfill to the wetland areas.
- Improve wildlife habitat.
- Maintain the aesthetic value of the site.

This alternative also achieves these goals in a cost effective manner.

5.4 IMPLEMENTATION SCHEDULE

The NYSDEC has indicated that a Record-of-Decision (ROD) will be required to be prepared by the Department for this project prior to construction implementation. The ROD would set forth the selected remedial action plan for the site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the New York State Conservation Law (ECL). The ROD will take approximately four to five months to prepare.

Bid and award of the project can proceed only after issuance of the ROD. Construction begins shortly thereafter.

Construction is anticipated to begin by July or August 1996 and take two construction seasons to complete. LTV Steel Company has budgeted funds for the construction effort and is anxious to proceed with the project.

The following project Schedule is anticipated:

LTV STEEL COMPANY
MARILLA STREET LANDFILL

WETLANDS MITIGATION - PROJECT SCHEDULE

TASK	COMPLETION DATE
Submit focused Feasibility Report to NYSDEC for review	02/23/96
NYSDEC Review/Comment	03/15/96
Revise Report	04/01/96
Prepare ROD	08/01/96
Prepare Final Design/Specifications	08/01/96
Bid/Award	09/01/96
Initiate Construction	09/15/96
Construction Complete	11/01/97

MALCOLM PIRNIE

APPENDIX A

OCTOBER 27, 1995
MEETING MINUTES

LTV STEEL COMPANY
MARILLA STREET LANDFILL

SUPPLEMENTAL SOLID WASTE MANAGEMENT FACILITY INVESTIGATION PROGRAM (SWMFIP)

MINUTES OF MEETING
October 27, 1995

On October 27, 1995, Malcolm Pirnie and LTV Steel Company met with the New York State Department of Environmental Conservation (NYSDEC) to discuss the results of the supplemental SWMFIP testing at the Marilla Street Landfill. A report summarizing Malcolm Pirnie's findings had been previously sent to the NYSDEC for review on September 15, 1995.

Present at the meeting were:

Wayne Gould, LTV
John Daley, LTV
Robert Voytko, LTV
John Etchison, LTV
Dale Papajcik, LTV
Terry Ried, MPI
Kent McManus, MPI
Rob O'Laskey, MPI

Martin Doster, NYSDEC
Mary McIntosh, NYSDEC
Jaspal Wolia, NYSDEC
Ken Roblee, NYSDEC
Gary McDannell, USACOE

Topics of discussion included the following:

- Malcolm Pirnie provided a brief summary of the supplemental SWMFIP results. The main items of discussion were:
  - A wetland delineation was performed which indicated approximately 4.8 acres of wetland vegetation around the fringe area of the landfill. A full delineation of the pond and ditch perimeters was not performed.
  - The WET assessment indicates that the wetlands have the functional values of flood control, stabilizing sediment and nutrient removal. They have less value for wildlife utilization due to their small size, water quality and the presence of waste materials. Malcolm Pirnie recommended wetland restoration or enhancement either on-site or elsewhere.
  - The groundwater pH problem (values as high as 12.5) is waste-related.

- The extent of sediment impact in the pond and ditches adjacent to the landfill is extensive.

- Off-site migration of waste materials appears to be minimal. Railroad embankments around the perimeter of the ponds and ditches have seemed to contain the waste metals. Soluble metals could leave the site via culverts, however, the potential is considered minimal due to the high pH which promotes precipitation of the metals in the ditches and ponds.

- The NYSDEC indicated that the site classification is currently under review. It may be revised from a II-A classification to a Class II site due to the high pH problem and the wetlands impacts. The NYSDEC defines a II-A 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. A Class II designation is defined as a site at which hazardous waste constitutes a significant threat to the environment.

- Two property owners adjacent to LTV's site (Altift & Ramco) have similar wetland contamination problems under review. It is likely there will be wetland restoration associated with their sites. The NYSDEC suggested that LTV consider working together with those property owners to combine efforts. NYSDEC suggested that LTV consider disposal opportunities for waste materials at the Altift site.

  The NYSDEC estimated that the Altift and Ramco design efforts will take 9-12 months to complete. It will probably be two years before construction begins. LTV indicated that they do not wish to wait that long. Funds are budgeted for remediation work next year. Need to fast track this project.

- LTV indicated that they consider dredging or excavation of contaminated sediments undesirable due to the anticipated excessive cost associated with sediment dewatering/stabilization, sediment disposal, etc. There are also potential slope stability problems associated with dredging which makes this option difficult to implement. LTV indicated that it is not their desire to prepare a conventional feasibility study to evaluate numerous alternatives. Instead LTV proposed the following:

  - On-site closure of the ponds. Cover the sediments in-place with clean fill in a manner acceptable to the NYSDEC.

  - Fill in and channelize the west ditch.

  - Perform wetland enhancement and/or mitigation as necessary to improve wildlife habitat and restore wetland areas damaged by site activities.

- Ken Roblee at the NYSDEC Division of Fish/Wildlife has been on-site and has detailed information and photographs available in his files on site conditions. In general, the south pond is productive for wildlife use but appears to have few amphibians. The north pond is sterile. Ken didn't think that channelization of the west ditch was a problem. It was indicated that the State may consider the entire pond surface a wetland area.

- Before any remediation activities are initiated, a Record-of Decision (ROD) will be required. This will take 4-5 months to develop (after the remedial approach has been approved by the NYSDEC).

- The NYSDEC indicated that LTV's preferred approach is unconventional regarding Superfund priorities, however, when combined with other factors it may be acceptable. Factors which may help the NYSDEC approve the approach include:

  - Providing public access to the site.
  - Having the City of Buffalo's support.
  - Having the support of the Fish & Wildlife Division.

- After discussion, it was decided that Malcolm Pirnie will prepare a focused feasibility study to identify and evaluate alternatives and select the preferred approach. The feasibility study will:

  - Fully delineate the wetlands adjacent to the site. These efforts will be coordinated with the NYSDEC.
  - Provide a site survey of the delineated wetland areas.
  - Using data from previous site investigations, identify, select, and evaluate remedial action alternatives.
  - Perform a preliminary screening of the alternatives. Emphasize the preferred remedial technology to cover the sediment in place.
  - Evaluate potential wetland mitigation alternatives.
  - Address the significance of the high groundwater pH at the site.
  - Incorporate the input and concerns of the following into the program:
    - NYSDEC Division of Hazardous Waste, Solid Waste, and Fish/Wildlife.
    - City of Buffalo Parks Department.
    - City of Buffalo, South District Council persons.

- US Army Corps of Engineers
- Coastal Zone Management Agency.

The report is planned for submission by the end of this year so that it can be approved and a ROD prepared next Spring. Construction is anticipated to begin around July 1996.

- The NYSDEC suggested that the City of Buffalo council person (Bonnie King Lockwood) be contacted for her input. Green trails and wooden walkways through wetland areas should be discussed with her.

- MPI will contact the USACOE (Gary McDannell) regarding Corps permit requirements and the NYS Department of State, Coastal Zone Management Agency, (Walt Meyer 518-474-3642) to determine if the site is within their coastal management zone.

- There will be no changes in post-closure monitoring requirements for the site until the wetland issues have been addressed.

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APPENDIX B

DECEMBER 1995

WETLAND DELINEATION REPORT FOR THE MARILLA STREET LANDFILL

MALCOLM PIRNIE

SUPPLEMENTAL WETLAND DELINEATION REPORT FOR THE MARILLA STREET LANDFILL WETLANDS

LTV STEEL COMPANY
CLEVELAND, OHIO

JANUARY 1996

MALCOLM PIRNIE, INC.

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

0848-258-200

MALCOLM PIRNIE

SUPPLEMENTAL WETLAND DELINEATION REPORT FOR THE MARILLA STREET LANDFILL WETLANDS

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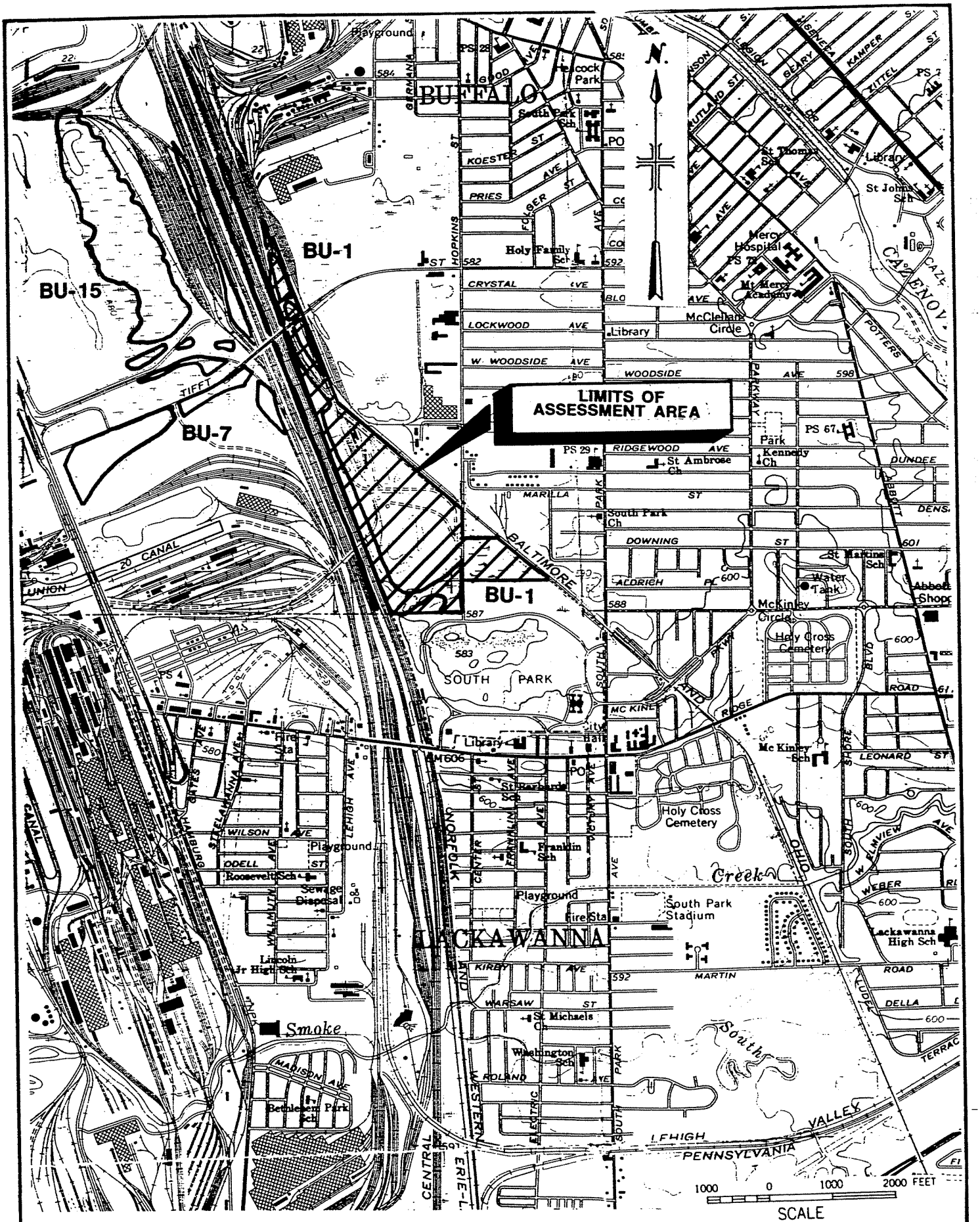
MALCOLM PIRNIE

1.0 INTRODUCTION

Portions of the LTV Steel Company (LTV) Marilla Street Landfill site (the site) property are identified as New York State Wetland BU-1 (See Figure 1). Wetland BU-1 is approximately 58 acres in size and is considered a Class I wetland. Wetland BU-1 is considered one of the three largest wetlands in the City of Buffalo.

On September 13 and 14, 1994, Malcolm Pirnie, Inc. conducted a wetlands delineation as part of a Supplemental Solid Waste Management Facility Investigation Program (SWMFIP) to identify wetlands directly contiguous to the 80 acre Marilla Street landfill that were potentially impacted by landfill activities. In addition, Malcolm Pirnie conducted a functions and values assessment for the wetlands as well as an ecological risk assessment for the site. Based on the results of these assessments, LTV is evaluating alternatives for mitigation of the wetlands located adjacent to the closed Marilla Street Landfill. The mitigation efforts will address three wetland complexes; the north ponds, the south pond, and the west ditch. To facilitate evaluation of alternatives for mitigation, LTV authorized Malcolm Pirnie to perform an on-site wetland delineation within the entire 110-acre LTV property limits shown on Figure 1. The delineation included the identification of freshwater wetlands on the land located on the east side of Hopkins Road as well as the land surrounding the landfill footprint.

A second field survey to identify and delineate on-site wetlands was conducted by Malcolm Pirnie on November 6 and 7, 1995. The information from this field effort has been combined with wetland data provided in the August 1995 Supplemental SWMFIP report prepared by Malcolm Pirnie to develop the Supplemental Wetland Delineation Report. The purpose of the wetland delineation efforts was to define and map the limits of jurisdictional wetlands in accordance with New York State Article 24 of the Environmental Conservation Law. The wetlands were delineated by application of the 1987 U.S. Army Corps of Engineers (USACE) methodology. It is the intent of this document to provide sufficient information to the Buffalo District of the USACE and the New York State Department of Environmental Conservation (NYSDEC) to enable a



SOURCE: U.S.G.S. BUFFALO SE, NY QUADRANGLE, 1965

MALCOLM PIRNIE

LTV STEEL COMPANY
BUFFALO, NEW YORK
MARILLA STREET LANDFILL
NEW YORK STATE WETLANDS MAP

MALCOLM PIRNIE, INC.

FIGURE 1

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jurisdictional determination of waters of the United States within the limits of the defined survey area.

2.0 SITE DESCRIPTION

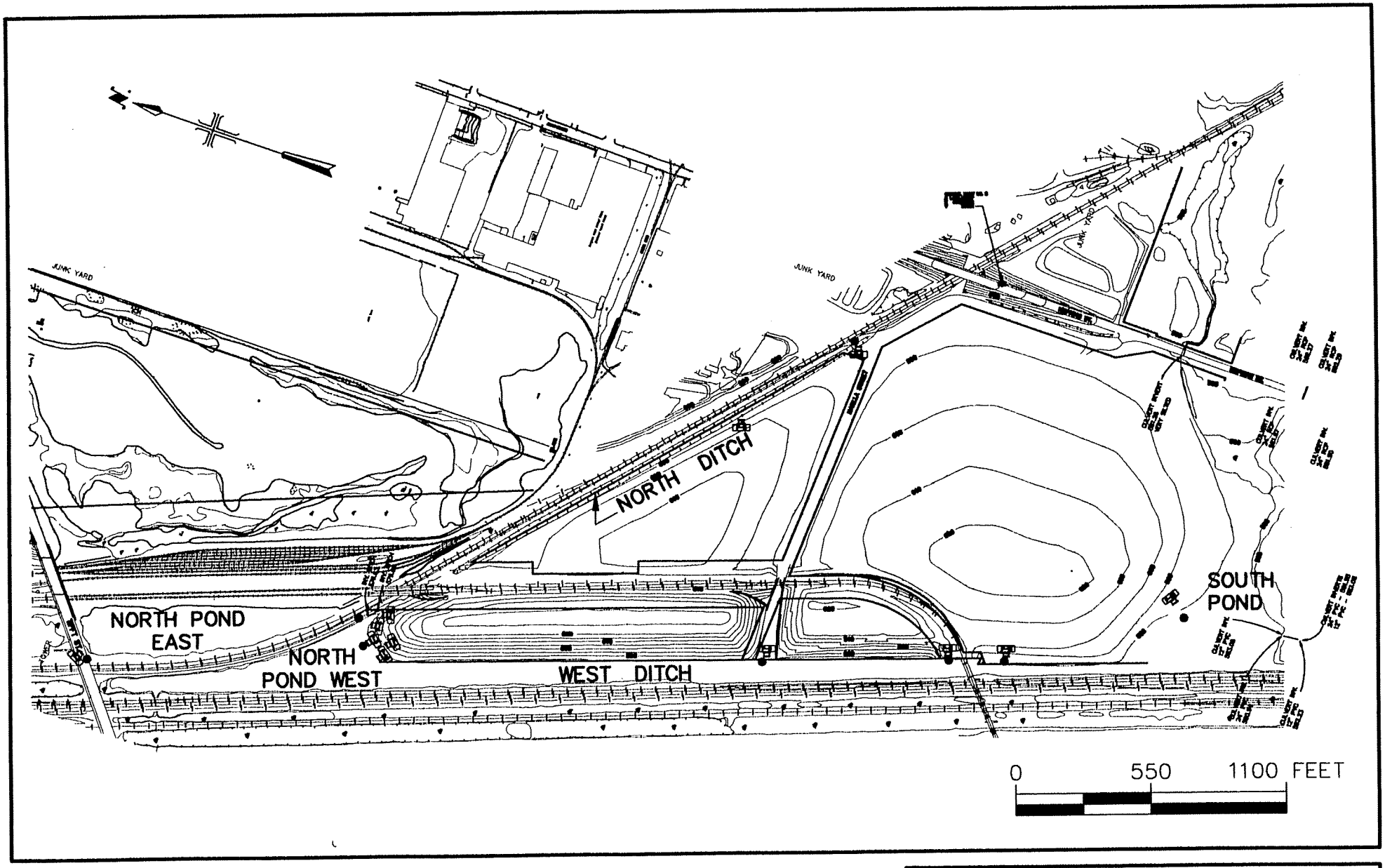
2.1 BACKGROUND

The Marilla Street Landfill is approximately 80 acres in size and is located on approximately 110 acres of land along Marilla and Hopkins Street in the City of Buffalo, New York (Figure 1). Approximately 25 acres of the property have not been disturbed by landfill activities and are topographically low. The site is owned by the LTV Steel Company. The NYSDEC has determined that the 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 #915047, and the NYSDEC has classified the site as Classification 2. In addition to the Marilla Street site, there are nine (9) sites within one (1) mile of the landfill which are presently listed as Class 2 or 2a on the New York State Registry of Inactive Hazardous Waste Sites.

The 110 acre parcel is bordered to the south and south east by the South Park Recreational Facility operated by Erie County, to the west by active railroad tracks of the Penn Central Railroad, and the north and north east by inactive railroad tracks of the Baltimore and Ohio railroad. Hopkins Street divides the LTV Steel property into two parcels.

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.

Surrounding the toe of slope for the landfill are unnamed open water areas and drainage ditches filled with standing water (Figure 2). For ease of reference to identify wetlands, the drainage ditches and open water areas shown on Figure 2 were designated by MPI according to their location based upon geographic orientation with respect to the landfill. These areas represent the majority of wetlands found on LTV property and are



MALCOLM PIRNIE

LTV-258-02

MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

DETAILED SITE MAP

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

FIGURE 2

hydrologically connected via culverts to the South Park Pond owned by the City of Buffalo and to each other. An additional wetland area is located on the east side of Hopkins Street.

A 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, the groundwater discharge to the wetlands is considered minor compared to runoff that collects from the landfill surface.

A Supplemental SWMFIP was conducted within New York State Wetland BU-1 in the vicinity of the Marilla Street Landfill. The boundary of the wetland was delineated directly adjacent to the landfill slope toe. The Wetland Evaluation Technique, Version 2.0 (WET), was applied to these wetland systems for the purpose of evaluating the baseline physical, chemical, and biological functions of the wetlands. In addition, sediment and subsurface soil sampling was conducted in the wetlands. The concentrations of chemicals detected n the sediments were found to pose a potential risk to wildlife. Therefore, a Focused Feasibility Study (FFS) is underway to evaluate potential wetland mitigation alternatives. As part of the FFS, a wetland delineation was conducted to identify all wetlands on the 110-acre LTV property. The wetlands identified are tied to the same boundaries previously delineated in 1994.

2.2 SITE ECOLOGY

Vegetation in the emergent wetland areas was dominated by common reed (*Phragmites communis*). Vegetation in the forested wetland areas was dominated by cottonwood (*Populus deltoides*). Vegetation in the undisturbed non-wetland areas consisted primarily of Japanese knotweed (*Polygonum cuspidatum*). The capped landfill areas were

primarily mowed fields dominated by Kentucky bluegrass (*Poa pratense*). Plant community types are discussed further in Section 3.0, Steps 4-6.

Five types of wetlands are classified on the USFWS National Wetland Inventory (NWI) mapping within the delineated site boundary (Figure 3). As shown on Figure 3, portions of the site are classified as PFO1E (palustrine forested broad-leaved deciduous seasonal saturation), PEM5E (palustrine emergent narrow-leaved persistent seasonal saturation), POWH (palustrine open water permanently flooded), POWZx (palustrine open water intermittently exposed/permanent excavated) and PSS1/EM5E (palustrine scrub-shrub broad-leaved deciduous emergent narrow-leaved seasonal saturation).

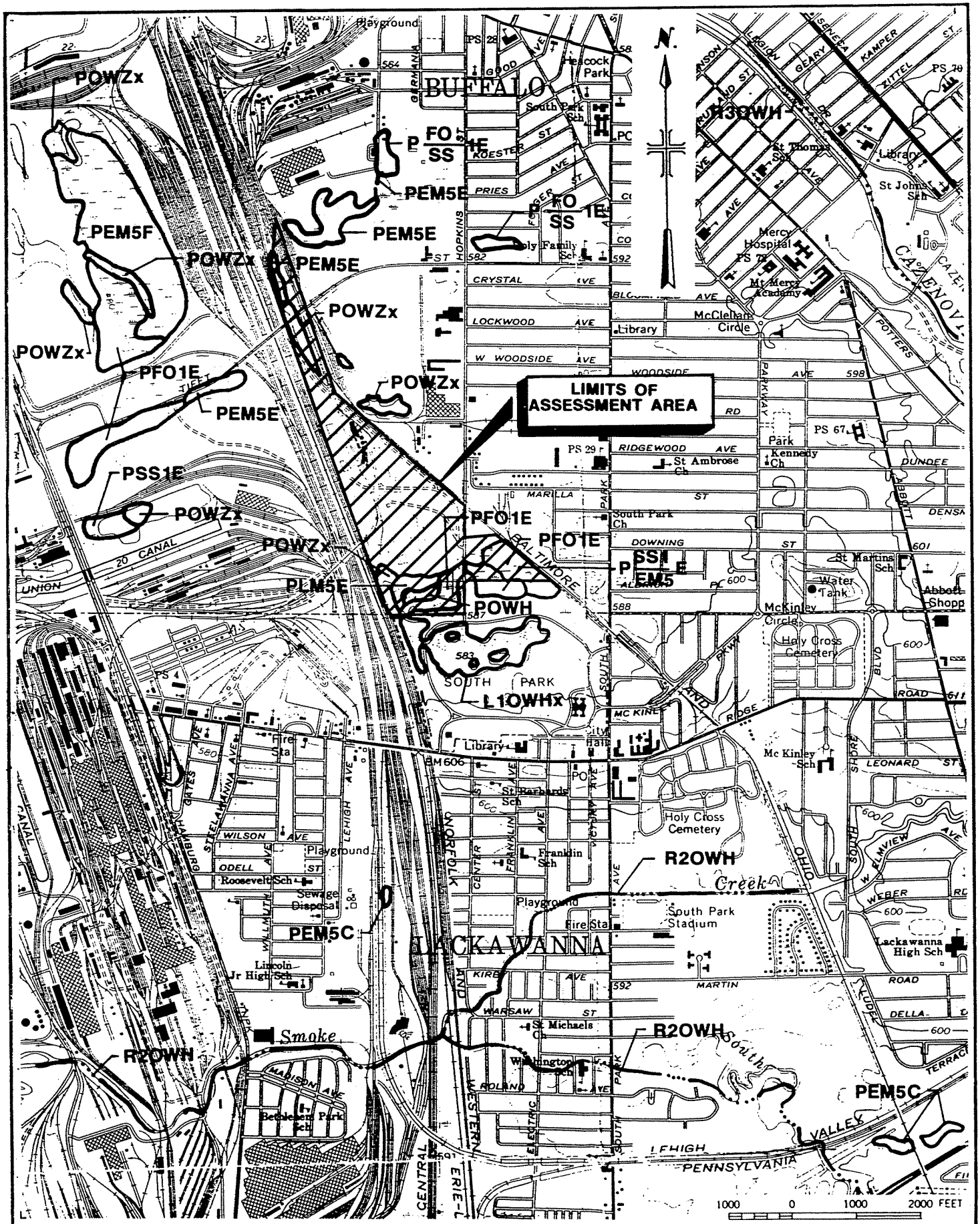
Due to the nature of the prior and existing use of the property, it was often difficult to retrieve an 12 to 18" soil profile because of the resistance imposed by fill material and the heavy clay used as capping material. On-site soils are discussed further in Section 3.0, Step 8.

2.3 AGENCY CONTACTS

State and federal agencies were contacted regarding the Marilla Street Landfill site as documented in Appendix C. The information received is summarized below.

New York State Department of State, Albany, New York - The New York State Department of State was contacted regarding coastal zones. The site is adjacent to a mapped coastal zone management area. A federal consistency form will need to be completed for the project (Meyer, 1995).

New York State Office of Parks Recreation and Historic Preservation, Waterford, New York - The New York State Office of Parks Recreation and Historic Preservation was contacted for information on historic and prehistoric artifacts located in the vicinity of the landfill. The site is immediately adjacent to South Park Pond area which is listed on the New York State and National Register of Historic Places. There are no known



SOURCE: U.S.G.S. BUFFALO SE, NY QUADRANGLE, 1965

MALCOLM PIRNIE

LTV STEEL COMPANY
BUFFALO, NEW YORK
MARILLA STREET LANDFILL

NATIONAL WETLANDS INVENTORY MAP

MALCOLM PIRNIE, INC.

FIGURE 3

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archaeological sites on or adjacent to the landfill (Kuhn, 1995). No archaeological sites are anticipated due to the disturbed nature of the site.

New York State Museum, Albany, New York - The New York State Museum provided information pertaining to prehistoric archaeological data. The landfill is in the general vicinity of three recorded sites. In addition, the physiographic characteristics of the area suggests a high probability of prehistoric occupation or use (NYSM, 1995). However, the Marilla Street Landfill site is a highly disturbed area where the probability is low.

New York State Department of Environmental Conservation, Latham, New York - The NYSDEC Natural Heritage Program was contacted for information on state-listed endangered, threatened, or special concern species in the vicinity of the landfill. The NYSDEC identified one rare plant, Harbinger-of-Spring (*Erigenia bulbosa*), as occurring in the vicinity of the landfill. This plant record was last seen in 1893 (Albert 1996). This plant was not observed during the wetlands delineation.

United States Fish and Wildlife Service, Cortland, New York - The U.S. Fish and Wildlife Service was contacted for information on federally listed endangered and threatened species. No federally listed or proposed endangered or threatened species are know to exist in the project area (Clough 1996).

3.0 METHODOLOGY

Since this area is mapped as New York State Wetland BU-1, the wetland/non-wetland boundaries were identified using the NYSDEC Freshwater Wetlands Delineation Manual (NYSDEC, 1995). The routine delineation procedure was applied to collect the necessary data. The procedure focused on the plant community types and characterized the vegetation, hydrology and soils using NYSDEC-established criteria. Data were collected at sampling stations noted on the data forms in Appendix A and on Figures 4 through 8.

Within each sample quadrant, dominant plant species for each vegetative stratum were classified using the National List of Plant Species That Occur in Wetlands: Northeast (Region 1) (Reed, 1988). On-site soil series were identified from mapping provided in the Soil Survey of Erie County, New York (USDA SCS, 1986). Soil bore holes were augered to a depth of 12 to 18" or refusal and observed for hydric soil characteristics and surficial ground water levels. Soil samples were characterized for hydric indicators using the Munsell Color Chart (Munsell, 1992). Wetland hydrology was determined by the presence of ponded surface water, saturated soils, and depth of water as observed in a limited number of hand-augered bore holes (see Field Data Forms in Appendix A).

3.1 PRE-INSPECTION PROCEDURES

Prior to the field survey, the following maps and documents were reviewed to gather background information on the project area: New York State Freshwater Wetland Inventory Maps, USFWS NWI maps, USGS Topographic Maps and the Erie County Soil Survey. Based on the review, an on-site inspection was required.

3.2 FIELD DELINEATION METHODS

The following procedure was used to determine the wetland boundary in accordance with the NYSDEC manual for a routine on-site delineation.

Steps 1- 3: Determine Whether Disturbed or Normal Conditions Exist

The LTV site is located in a commercial/industrial area. The site and adjacent areas consist of fill material, slag and debris such as asphalt, concrete and gravel. Normal environmental conditions that make wetland boundary delineation difficult did not exist in the surveyed areas.

Steps 4 - 6: Characterize Plant Community Types. Clarify Dominant Vegetation Species. Determine the Presence of Hydrophytic Vegetation.

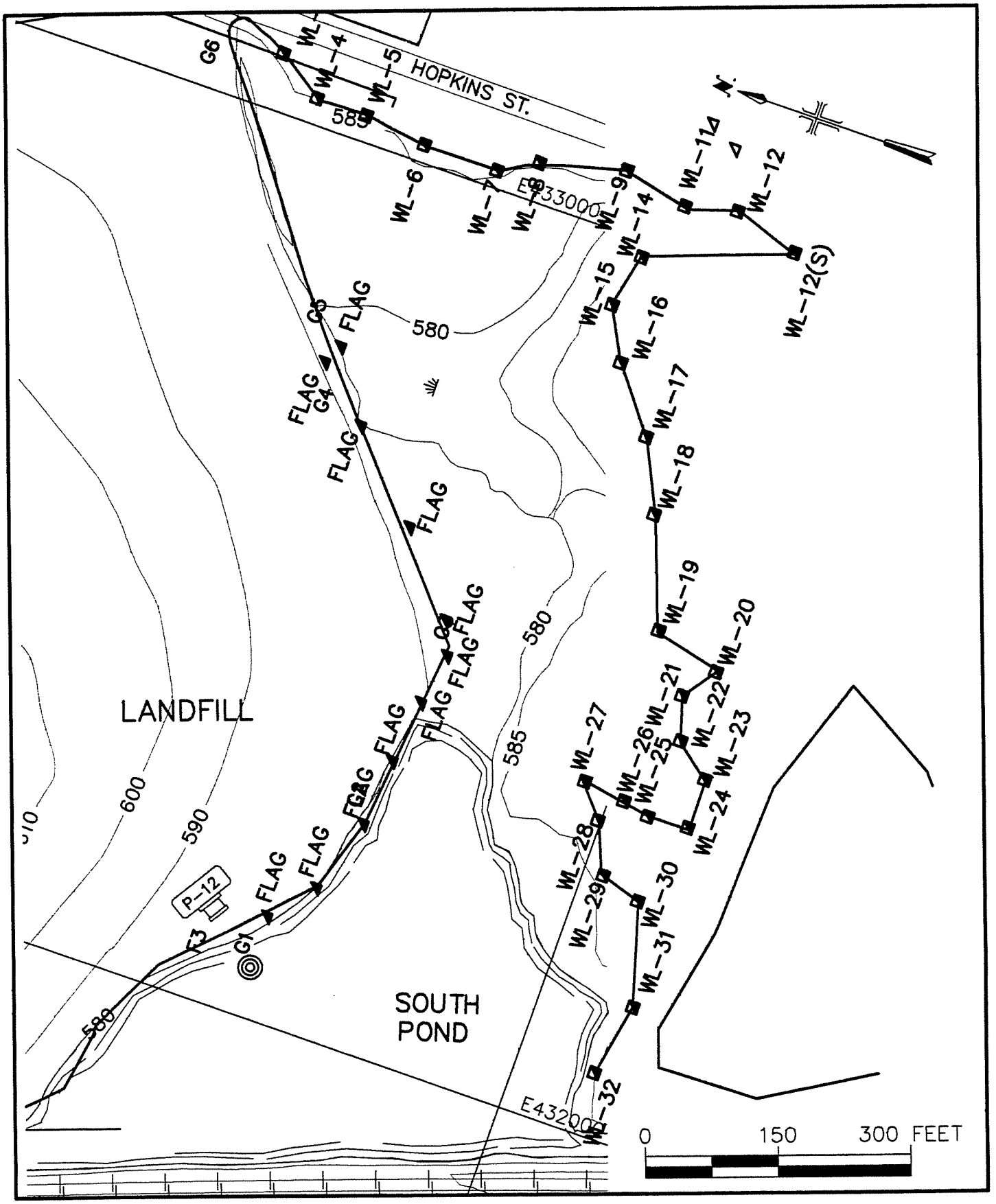
The dominant species that comprise the identified wetland areas are listed and classified on the data forms in Appendix A. Data forms were completed for each community type identified within a wetland area, and sampling points were collected at the wetland/non-wetland boundaries in order to establish the wetland line. The wetland areas are shown on Figures 4 through 8 .

Data is presented below for each wetland identified.

Wetland WL (including wetlands F and G from 1994 survey): Wetland WL is located south of the landfill on the west side of Hopkins Street (see Figure 4) and is referred to as the South Pond wetland complex. This wetland consists of four community types, a forested community, a scrub-shrub/forested community, an emergent community and an open water community. The forested community is dominated by cottonwood, a facultative species (FAC) and box elder (*Acer negundo*), a facultative plus species (FAC+). The understory was sparse and consisted of red oiser dogwood (*Cornus stolonifera*), a facultative plus wetland species (FACW+), and wild raisin (*Viburnum cassinoides*), a facultative wetland species (FACW). The non-wetland areas that adjoin the forested wetland community are dominated by Japanese knotweed, a facultative minus upland species (FACU-) and garlic mustard (*Alliara officinalis*) (FACU-).

The emergent community consisted primarily of common reed (*Phragmites communis*) (FACW). The non-wetland area was dominated by garlic mustard, Japanese knotweed and Canada goldenrod (*Solidago canadensis*), a facultative upland species (FACU).

FIGURE 4



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LTV-258-04

MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

SOUTH POND WETLANDS (WETLANDS WL,F,& G)

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

The forested/scrub-shrub community is dominated by red osier dogwood, silky dogwood (*Cornus amomum*) (FACW), and green ash (*Fraxinus pennsylvanica*). The shrub/sapling layer was dense. The non-wetland areas that adjoin the this wetland community are dominated by red oak (*Quercus rubra*) (FACU-), red-panicled dogwood (*Cornus racemosa*) (FAC) and tartarian honeysuckle (*Lonicera tartarica*) (FACU).

The open water community is dominated by common reed, purple loosestrife (*Lythrum salicaria*), a facultative plus wetland species (FACW+) and cattails (*Typha latifolia*), an obligate wetland species (OBL). The northern boundary of this community type (adjacent to the toe of the landfill) was delineated as part of the Supplemental SWMFIP. The landfill is the non-wetland community and is dominated by Kentucky bluegrass (FACU) and white clover (*Trifolium repens*) (FACU-).

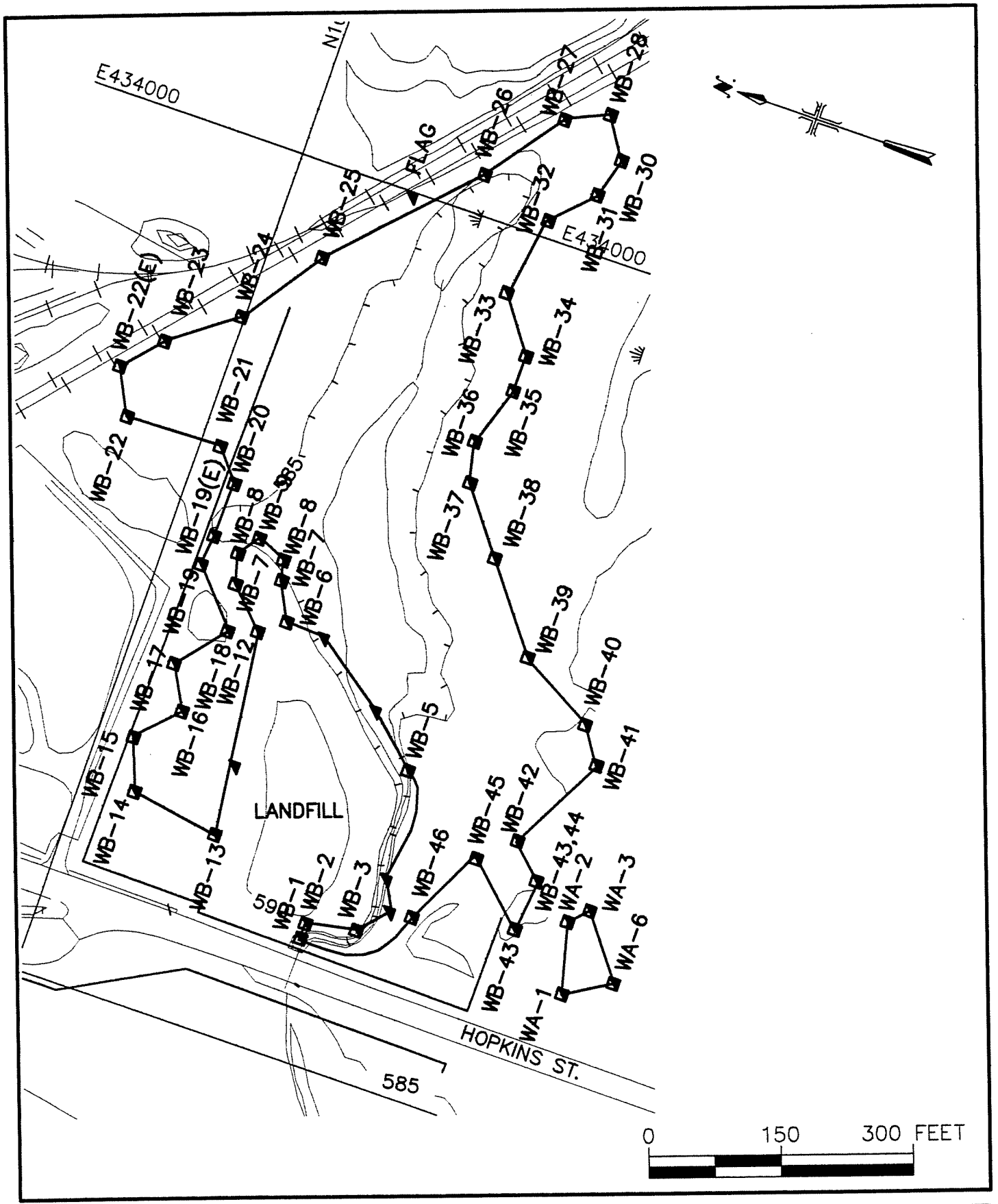
The dominant plant species in each wetland community type are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Wetland WA: Wetland WA is a small wetland pocket (approximately 2 acres) located adjacent to LTV property on the east side of Hopkins Street (see Figure 5). It is a forested area dominated by cottonwood, black willow (*Salix nigra*) (FACW) and wild raisin. The non-wetland area was dominated by cottonwood, summer grape (*Vitis aestivalis*) (FACU-), and ragweed (*Ambrosia artemsiifolia*) (FACU).

The dominant plant species in this wetland are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Wetland WB: Wetland WB is located on the east side of Hopkins Street (see Figure 5). This wetland consists of three community types, an open water/emergent community, a forested/shrub-scrub community, and a forested community. Portions of this wetland were disturbed from dumping activities. A junk yard boarders the Northern boundary and the Hopkins Street dump boarders the southern edge. The wetland contained mounds of fill and trash.

FIGURE 5



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LTV-258-05

MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

SOUTHEAST WETLANDS (WETLANDS WA & WB)

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

The open water/emergent area was dominated by purple loosestrife, common reed, and cattails. The non-wetland areas consisted of a small capped landfill dominated by Kentucky bluegrass.

The forested/scrub-shrub area consisted of a dense sapling/shrub layer interspersed by pole sized trees. The community was dominated by northern arrowwood (*Viburnum recognitum*) (FACW-), speckled alder (*Alnus rugosa*) (FACW+), crack willow (*Salix fragilis*) (FAC+), and black willow. The adjacent non-wetland area is dominated by maple-leaf viburnum (*Viburnum acerifolium*) (UPL), tartarian honeysuckle, and summer grape.

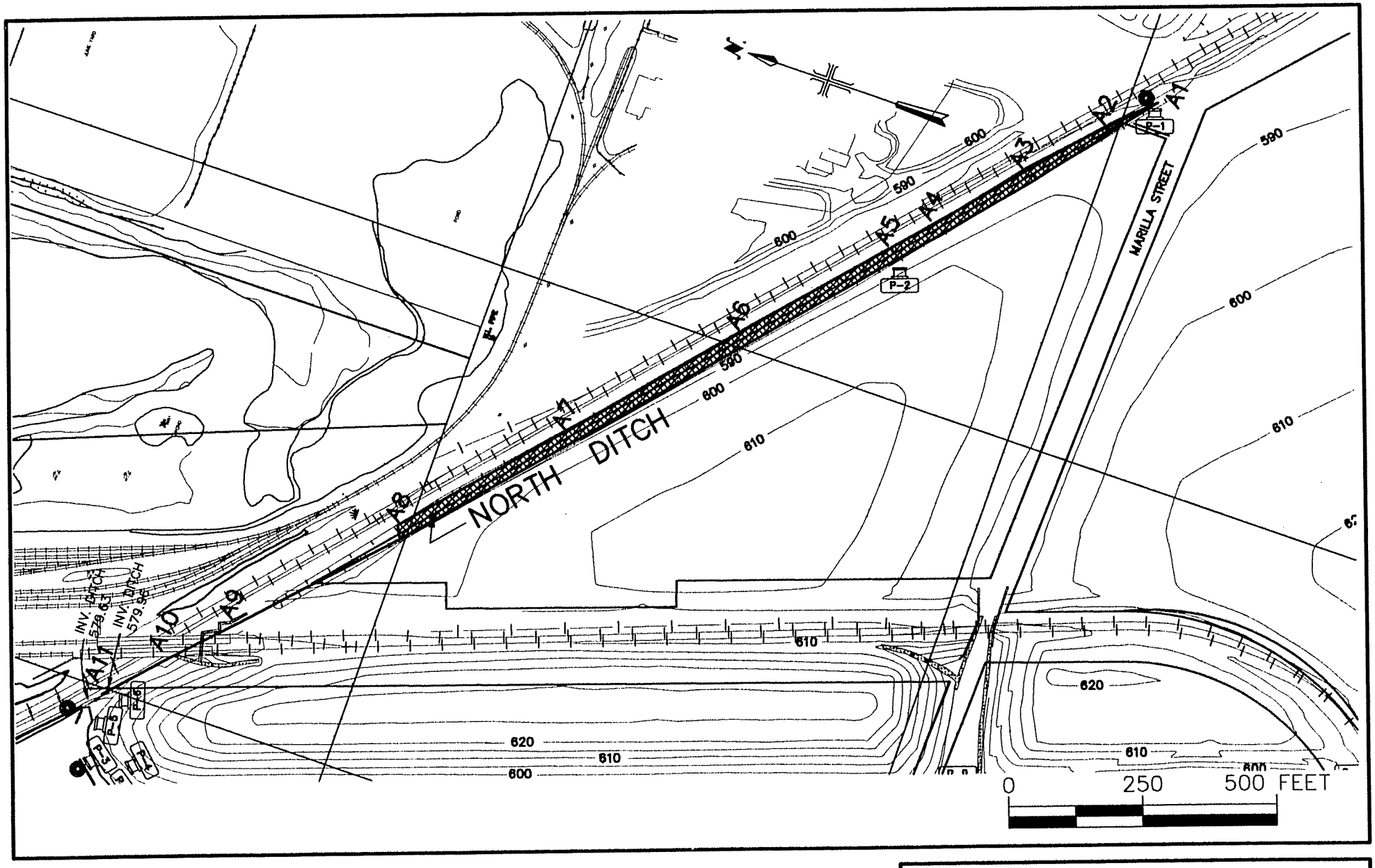
The forested community had an open canopy and a dense ground layer. Cottonwood, black willow and green ash dominated this community. The ground cover was dominated by late goldenrod (*Solidago gigantea*) (FACW). The adjacent non-wetland area was dominated by sugar maple (*Acer saccharum*) (UPL), garlic mustard, and Canada goldenrod.

The dominant plant species in each wetland community type are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Wetland A (North Ditch): This wetland is an emergent/open water man-made channel that boarders the northern end of the landfill (see Figure 6). It is dominated by common reed, purple loosestrife, and cattails. A few silky dogwood shrubs have invaded this area. The adjacent upland area was dominated by cottonwood, Canada goldenrod, and ragweed.

The dominant plant species in each wetland community type are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Wetland B and C (North Pond West): This wetland is located between the northern edge of the landfill, railroad tracks, and Tifft Street (see Figure 7). This wetland is an open water system surrounded by a fringe of emergent vegetation dominated by purple loosestrife, soft rush (*Juncus effusus*) (FACW), common reed and spotted jewelweed (*Impatiens capensis*) (FACW). The adjacent upland areas consisted of gravel railroad right-of-way, road easements, or the landfill cap.



MALCOLM PIRNIE

LTV-258-08

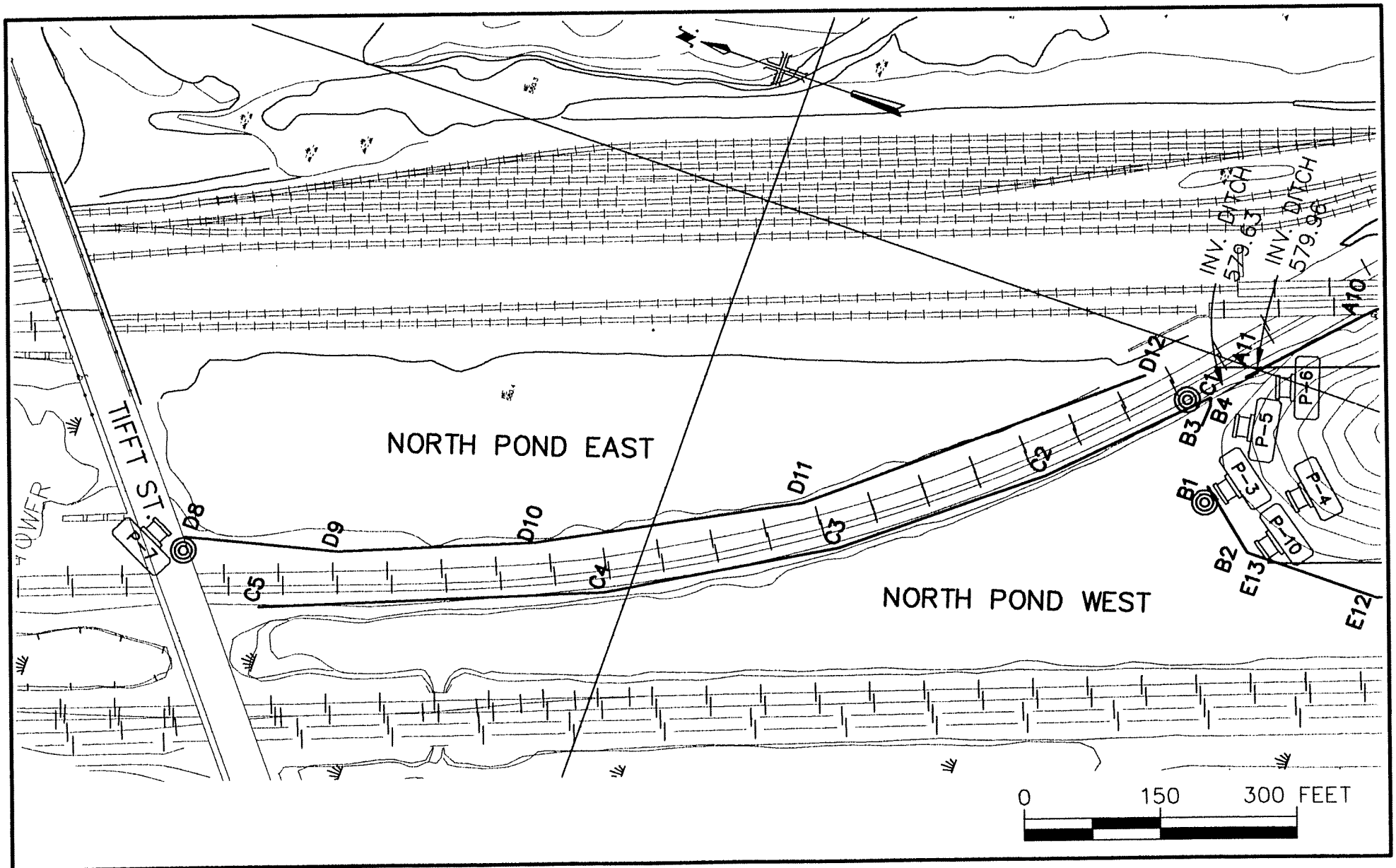
MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

NORTH DITCH AREA (WETLAND A)

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

FIGURE 6



MALCOLM PIRNIE

LTV-258-07

MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

NORTH PONDS AREA (WETLANDS B,C,& D)

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

FIGURE 7

The dominant plant species in each wetland community type are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Wetland D (North Pond East): This wetland is located between the north end of the landfill, railroad tracks and Tifft Street (see Figure 7). This wetland is similar to wetland B and C in that it is an open water system surrounded by a fringe of emergent vegetation. The dominant vegetation includes common reed and jewelweed. No upland vegetation was present adjacent to this wetland. Upland portions includes railroad right-of-way lined with crushed stone as well as piles of construction debris adjacent to bridge supports under Tifft Street.

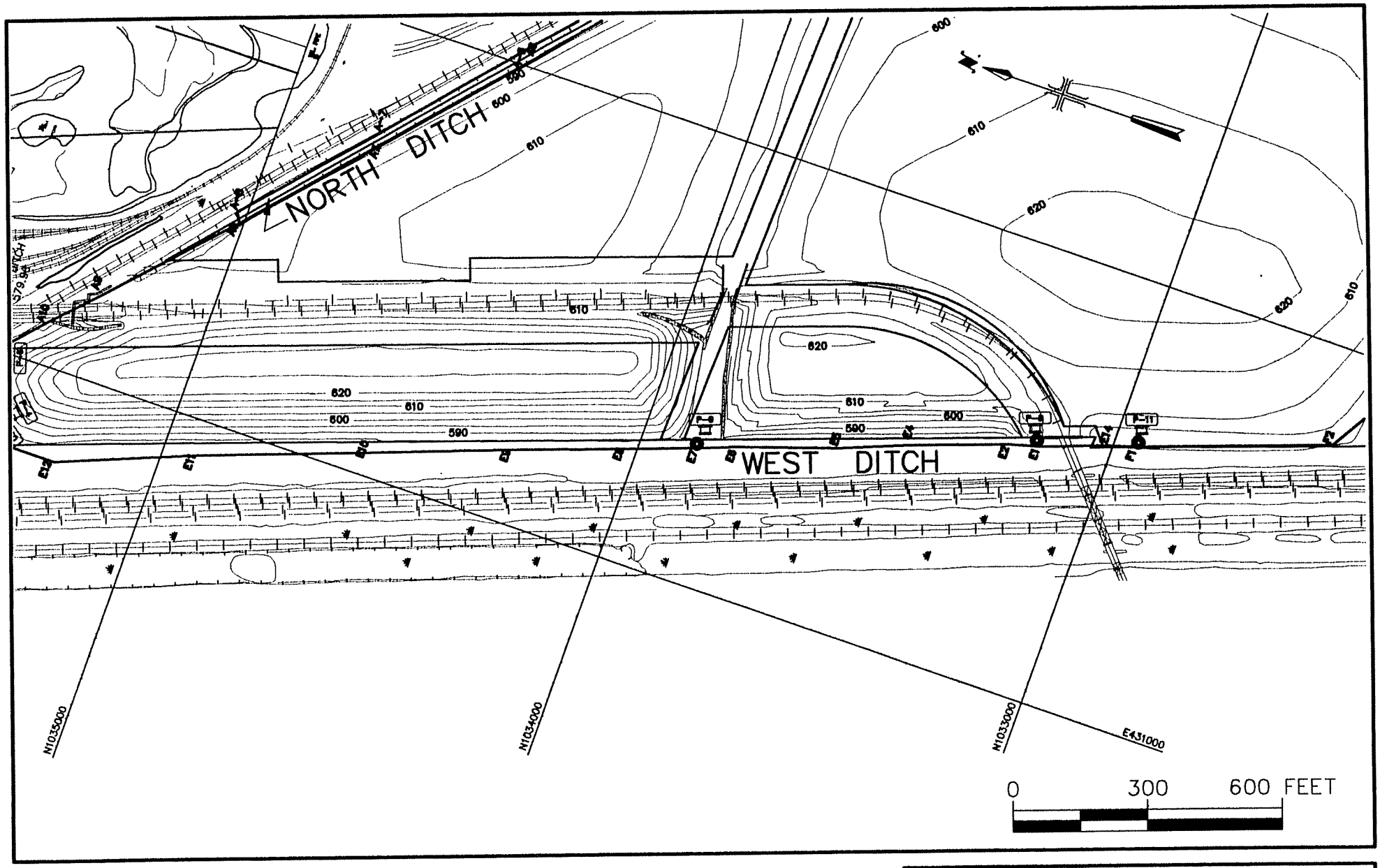
The dominant plant species in each wetland community type are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Wetland E (West Ditch): Wetland E parallels the west side of the landfill and is boarded by railroad tracks on the west (see Figure 8). This wetland is an open water man-made ditch with fringes of emergent vegetation dominated by common reed and purple loosestrife. The adjacent upland area is the landfill cap or railroad right-of-way.

The dominant plant species in each wetland community type are more than 50 percent FAC, FACW, or OBL indicating the hydrophytic criterion is met.

Step 7: Determine Whether Any of the "Hydrologic Field Indicators of Wetlands" are Present.

Positive wetland hydrology indicators were present in each wetland identified. The primary wetland hydrologic indicators were saturated soil within 12 inches of the surface , inundation (standing water), and drainage patterns in the wetlands. The New York State hydrology criteria was met where a positive primary wetland hydrology indicator was present.



MALCOLM PIRNIE

LTV-258-06

MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

WEST DITCH AREA (WETLAND E)

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

FIGURE 8

Step 8: Determine Whether Any of the "Soil Field Indicators of Wetland" are Present

The Erie County Soil Survey classifies the soils on the site as either Haplaquolls, ponded (Hn), Niagara silt loam (Na), Urthodents (Ud), smoothed or dump (Dp) (see Figure 9). Haplaquolls are listed as a hydric soil (USDA, 1988). The Niagara silt loam and the Urthodents, smoothed are listed on the New York State Hydric Soils list as having potential hydric inclusions. Niagara silt loam is a nearly level somewhat poorly drained soil. Urthodents, smoothed are a variable manmade cut and fill soil that has little or no profile development. Haplaquolls are deep, very poorly drained mineral soils that have a dark surface layer rich in organic matter.

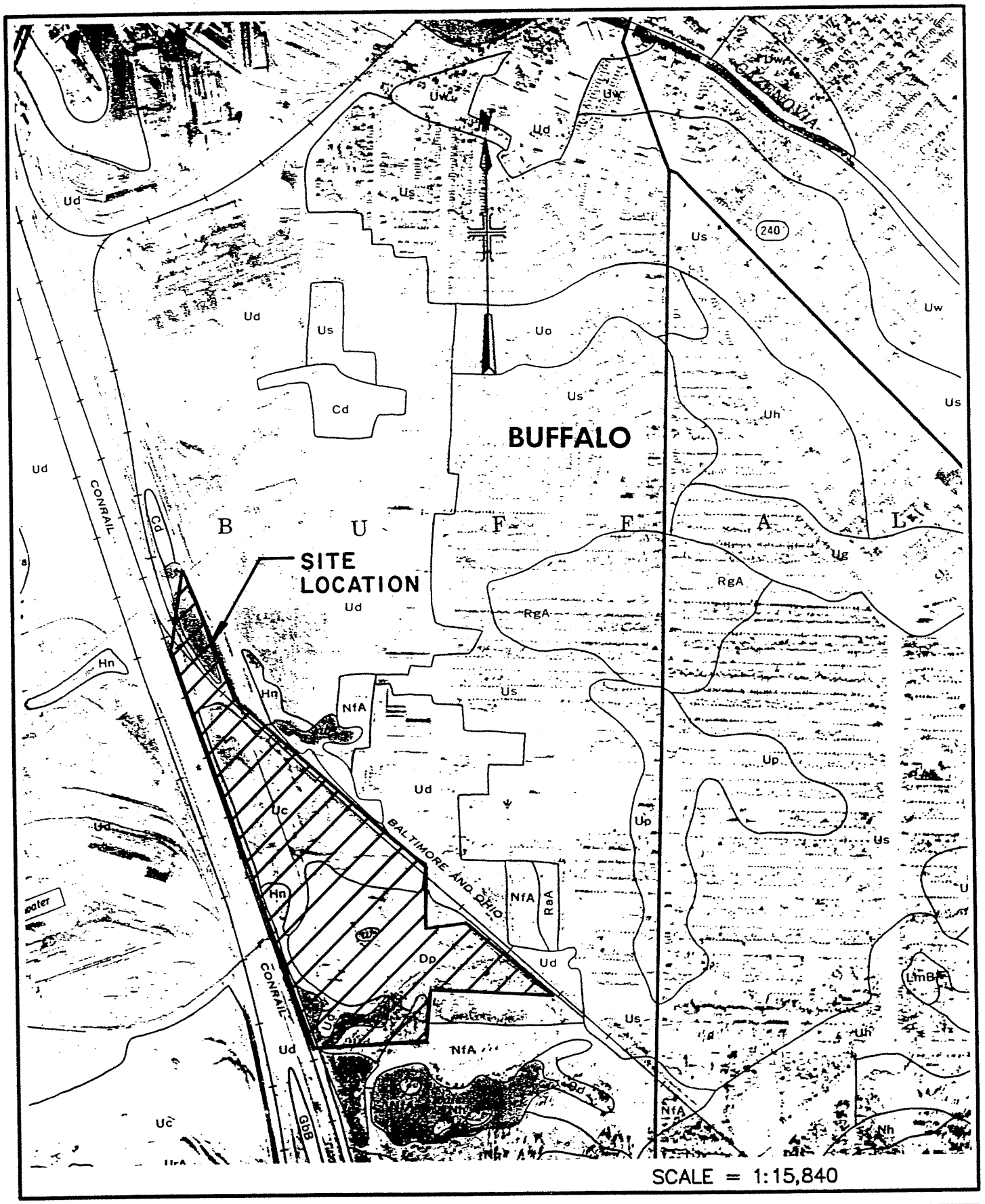
The Malcolm Pirnie field investigation revealed the upland soil matrix to be either disturbed non-hydric silty loams or silty clays, fill material consisting of gravel and asphalt, or the landfill cap. Most samples examined consisted of only the top 3 to 9 inches due to augering resistance from the fill material.

The Malcolm Pirnie field investigation revealed wetland soils to be clay or clay loams with hydric characteristics which included low chroma, high organic content on the surface layer, and the moisture content of the soil. Table 1 lists the wetland/non-wetland soil sampling points and Munsell Soil Color notations. Detailed descriptions of soil conditions are found on the field data forms in Appendix A.

Step 9: Delineate the Wetland/Non-Wetland Boundary

The wetland boundary shown on Figures 4 through 8, supports the New York State criteria for hydrophytic vegetation, wetland hydrology and hydric soils. The wetland boundary was determined by subtle changes in topography accompanied by the introduction of tartarian honeysuckle in the understory or by the presence of railroad right-of-way, the landfill or road easements. The wetland/non-wetland boundary was flagged in the field. Photographs of the wetland systems are presented in Appendix B.

FIGURE 9



MALCOLM PIRNIE

LTV-258-SS

MARILLA STREET LANDFILL
WETLANDS DELINEATION REPORT

SOILS SURVEY MAP

LTV STEEL COMPANY
BUFFALO, NY

DECEMBER 1995

MALCOLM PIRNIE

TABLE 1
LTV STEEL COMPANY - MARILLA STREET LANDFILL
MUNSELL SOIL COLOR NOTATIONS

Sampling Location	Hydric Soil	Non-Hydric Soil
WL-2	8 to 12 " 10YR 4/1	0 to 0.5" Fill
WL-10	0 to 7" 10 YR 2/1 7 to 18" 10 YR 5/2	0 to 0.5" Fill
WL-16	0 to 10" 10 YR 3/2 >10" 10 YR 5/2	0 to 6" 10 YR 3/2 6 to 14" 10 YR 5/4
WL-flags	0 to 4" 2.5 YR 4/2 4 to 16" 7.5 YR 2/0	Landfill Cap
WA-1	0 to 12" 10 YR 3/1	0 to 12" 10 YR 3/2
WB-4	0 to 12" 2.5/N	Landfill Cap
WB-29	0 to 6" 10 YR 3/1 6 to 12" 10 YR 5/2	0 to 12" 10 YR 3/2
WB-44	0 to 6" 10 YR 3/1 6 to 12" 10 YR 5/2	0 to 4" Fill
A-1	0 to 3" 2.5 Y 3/0	0 to 5" 10 YR 3/2
A-5	0 to 4" 2.5 Y 3/0	0 to 2" 2.5 Y 5/4 2 to 8" 2.5 Y 5/0
B-1	0 to 3" 2.5 Y 3/2 3 to 12" 5 YR 3/2	0 to 8" 10 YR 4/4 8 to 15" 2.5 Y 5/2
C-1	0 to 3" 10 YR 5/3 3 to 15" 10 YR 2/1	0 to 3" 7.5 YR 4/3
D-1	0 to 5" 7.5 YR 2/0	0 to 5" 7.5 YR 3/2
E-1	0 to 4" 2.5 Y 5/3 4 to 18" 2.5 Y 5/0	0 to 2" 10 YR 3/3
E-7	0 to 10" 2.5 Y 4/0 10 to 15" 2.5 Y 4/2	0 to 7" 10 YR 4/6 7 to 9" 2.5 YR 3/2
F-1	0 to 6" 2.5 Y 5/2 6 to 15" 2.5 Y 4/2	0 to 3" 2.5 Y 5/4 3 to 12" 2.5 Y 5/2
G-1	0 to 4" 2.5 Y 4/2 4 to 16" 7.5 YR 2/0 16 to 17" 2.5 Y 5/2	0 to 1" 10 YR 4/3 1 to 5" 2.5 Y 5/3

4.0 RESULTS AND CONCLUSIONS

Based on the field survey of vegetation, soils, hydrology and the data recorded on forms in Appendix A, the wetland areas identified adjacent to the landfill meet the state criteria as well as the federal criteria for a wetland designation based on the application of the New York State Fresh Water Delineation Manual (NYSDEC, 1995) and the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987). The acreage of the wetlands identified is shown in Table 2.

TABLE 2
LTV STEEL COMPANY
MARILLA STREET LANDFILL WETLAND ACREAGE

Wetland Area	Size in Acres
WL, F and G (South Pond)	10.82 (4.53)*
WA	0.08
WB	5.77
A (North Ditch)	0.86
B and C (North Pond West)	3.64
D (North Pond East)	3.77
E (West Ditch)	4.20

**Number in parenthesis is area of open water*

Figures 4 through 8 depict the delineated boundaries between the on-site wetlands and upland areas. The wetland acreage was determined by using AUTOCADD software to calculate the area within the surveyed lines.

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MALCOLM PIRNIE

APPENDIX A

DATA FORM FOR ROUTINE WETLAND DETERMINATIONS

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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 3"

Depth of Saturated Soil: Surface"

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

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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	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

Wetland Hydrology Indicators

Primary Indicators:

__X__ Inundation

__X__ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: 2"

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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	____ Concretions
____ Histic Epipedon	____ High Organic Content on Surface Layer
____ Sulfide Odor	____ Organic Streaking in Sandy Soil
____ Aquic Moisture Reg.	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma	____ 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:	9/13/94
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-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

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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
0-2"	A	2.5Y 5/4		Silty loam
2-8"	B	2.5Y 4/0		Hard Dry Clay

Hydric Soil Indicators

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

Remarks: Refusal at 8" due to heavy clay on landfill.
Hydric soil criteria met.

Wetland Determination

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

Remarks: All three 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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 12"

Depth of Saturated Soil: Surface

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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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
0-8"	A	10YR 4/4	5YR 5/8	Silty clay
8-15"	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:	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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: 3"

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	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content on Surface Layer
_____ Sulfide Odor	_____ Organic Streaking in Sandy Soil
_____ Aquic Moisture Reg.	_____ Listed on Local Hydric Soils List
_____ Reducing Conditions	_____ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma	_____ 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:	9/13/94
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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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"		7.5YR 4/3		Loamy silt with pebbles

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 3" due to the crushed stone that lines the railroad path. Hydric soils not present.

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:	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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 1"

Depth of Saturated Soil: Surface

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

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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: 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 3/2		Sandy stones with some silt

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 large stones below soil.
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:	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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 10"

Depth of Saturated Soil: 4"

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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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
0-2"		10YR 3/3		Sandy 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 2" due to stones below soil surface.
Hydric soils not present.

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:	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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 10"

Depth of Saturated Soil: Surface

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:	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

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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
0-7"	A	10YR 4/6		Silty loam with some clay
7-9"	B	2.5Y 3/2		Clay with silt

Hydric Soil Indicators

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

Remarks: Refusal at 9" 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:	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

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

__X__ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 11"

Depth of Saturated Soil: 4"

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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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:	9/14/94
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

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

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: 14"

Depth of Saturated Soil: 4"

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	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content on Surface Layer
_____ Sulfide Odor	_____ Organic Streaking in Sandy Soil
_____ Aquic Moisture Reg.	_____ Listed on Local Hydric Soils List
__X__ Reducing Conditions	_____ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma	_____ 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:	9/14/94
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

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ Saturated in upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Field Characteristics

Depth of Surface Water: _____

Depth to Water in Pit: _____

Depth of Saturated Soil: _____

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	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content on Surface Layer
_____ Sulfide Odor	_____ Organic Streaking in Sandy Soil
_____ Aquic Moisture Reg.	_____ Listed on Local Hydric Soils List
_____ Reducing Conditions	_____ Listed on National Hydric Soils List
_____ Gleyed or Low-Chroma	_____ 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: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: WL
Is the site significantly disturbed? No	Transect ID: flagging tape # 1-11
Is the area potential Problem Area? No	Plot ID: 1(near flag #2)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Cornus stolonifera*	shrub	FACW+
2. *Populus deltoides*	tree	FAC
3. *Phragmites communis*	herbaceous	FACW
4. *Tussilago farfara*	herbaceous	FACU
5. *Lythrum salicaria*	herbaceous	FACW+
6. *Acer negundo*	tree	FAC+
7. *Glechoma hederacea*	herbaceous	FACU
8. *Viburnum cassinoides*	shrub	FACW

Percent of Dominant Species that are OBL, FACW, or FAC 63%

(Excluding FAC) 50%

Comments: Phragmites dominated a ditch that bordered the toe of the landfill. Also present in the ditch were cattails and purple loosestrife. The area adjacent to the ditch was forested. The tree layer was dominated by cottonwood. The shrub layer was dominated by wild raisin. The herbaceous layer was sparse with gill-over-the ground and coltsfoot as the co-dominant. An upland berm possibly created from ditch construction, parrallels the ditch. Other species present include regal privet, poison ivy, tartarian honeysuckle (on fringe), silky dogwood. Hydrophytic vegetation criteria met

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

x No Recorded Data

Wetland Hydrology Indicators

Primary Indicators:

X Inundation (in ditch)

_____ 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

Field Characteristics

Depth of Surface Water: 2" (in ditch)

Depth to Water in Pit: > 12"

Depth of Saturated Soil: > 12"

Remarks: Standing water is in the ditch adjacent to the toe of the landfill. No free standing water in the test pit. The soils were wet but not saturated. Hydrology criteria met.

SOILS

Series and Phase: Niagara Silt Loam	Drainage Class: Somewhat Poorly Drained
Taxonomy (Subgroup): Mesic Aeric Ochraqualfs	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
Soils in ditch to 12"	A/B	10 YR 2/1	7.5 YR 4/6 (few)	clayey muck
Soils 10 feet north of ditch near Hopkins Rd				
8 to 12 inches	B	10 YR 4/1	7.5 YR 4/6 (few)	clay

Hydric Soil Indicators

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

Remarks: The soils 10 feet north of the ditch are saturated at 14 inches. A distinct clay lens defines the B horizon Hydric soil criteria met. The mapped soil series is listed ont he New york State Hydric Soils list as having hydric inclusions.

Wetland Determination

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

Remarks: The wetland area near Hopkins Road has been used for dumping various household items and construction debris. The wetland sample point was taken adjacent to flagging tape #2. The area meets the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site:LTV Marilla Street Landfill	Date: November 6, 1995
Applicant/Owner: LTV Steel	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: WL
Is the site significantly disturbed? No	Transect ID: flagging tape # 9 - 11
Is the area potential Problem Area? No	Plot ID: 2 (near flag #10)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Phragmites communis*	herbaceous	FACW
2.		
3.		
4.		
5.		
6.		

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

(Excluding FAC) 100%

Comments This area is a pocket of phragmites which divides the forested wetland in two. The area is fringed by upland shrubs Tartarian honeysuckle and common buckthorn) along the road edge. Snags ares present in this community. The hydrophytic vegetation criteria is met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: 7"

Depth of Saturated Soil: 6"

Remarks: A road culvert was located in this area. A drainage ditch is located on the western side of Hopkins Street. However, the eastern side (in this wetland) has no defined drainage channel. Hydrology criteria is met

SOILS

Series and Phase: Niagara Silt Loam	Drainage Class: Somewhat poorly drained
Taxonomy (Subgroup): Mesic Aeric Ochraqualfs	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 7 inches	A	10 yr 2/1	none	clayey loam
7 to 18 inches	B	10YR 5/2	10 YR 5/8 many	clay

Hydric Soil Indicators

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

Remarks: Hydric soil criteria met. The soil series is listed on the New York State Hydric Soils List as having hydric inclusions.

Wetland Determination

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

Remarks: This emergent community divides the forested area. This area meets the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: WL
Is the site significantly disturbed? No	Transect ID: flagging tape # 11 - 33
Is the area potential Problem Area? No	Plot ID: 3 (near flag #16)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Viburnum cassinoides*	Shrub	FACW
2. *Populus deltoides*	Tree	FAC
3. *Fraxinus pennsylvanica*	Tree	FACW
4. *Cornus stolonifera*	Shrub	FACW+
5. *Cornus amomum*	Shrub	FACW
6. *Salix nigra*	Tree	FACW+
7.		
8.		

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

(Excluding FAC) 83%

Comments This is a scrub-shrub/forested area. The trees range in diameter (2 to 6 inches). This area has the look of a fllodplain wetland. The shrub layer is very dense. The fringe closer to the ponds has the black willow. Herbaceous layer was very sparse and consisted of gill-over-the -ground, and bitter evening nightshade. The criteria for hydrophytic vegetaiton is met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ 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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: The wetland area recieves water from roadside runoff and culverts. The soils were wet but not saturated. The area has the look of a floodplain wetland. This area probably has seasonally hydrology. Evidence of run-off and ponding throughout the wetland.

SOILS

Series and Phase: Udorthents, smoothed	Drainage Class: variable but usually well drained
Taxonomy (Subgroup): man-made soil with no profile	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 10"	A	10 YR 3/2	N/A	High organic content
>10"	B	10 YR 5/2	10 YR 5/8 many	clay

Hydric Soil Indicators

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

Remarks: The criteria for hydric soil is met. This soil is listed on the New York State Hydric soils list as having hydric inclusions.

Wetland Determination

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

Remarks: At flagging tape #15 this wetland turned north-east at a right angle. The sample point location was near flagging tape number 16. This area meets the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel Corporation	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: WL
Is the site significantly disturbed? No	Transect ID: South Pond
Is the area potential Problem Area? No	Plot ID: 4 (pink flags) boarder of South

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Typha latifolia*	Herbaceous	OBL
2. *Phragmites communis*	Herbaceous	FACW
3. *Lythrum salicaria*	Herbaceous	FACW
4.		
5.		
6.		
7.		
8.		

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

(Excluding FAC) 100%

Comments Open water/emergent marsh. The open water area is fringed by emergent vegetation. This area is identified as the South Pond by LTV Steel. This area meets the criteria for hydrophytic vegetation.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

x No Recorded Data

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

Field Characteristics

Depth of Surface Water: 1 to 2 feet

Depth to Water in Pit: 0"

Depth of Saturated Soil: 0"

Remarks: Area of open water fringed by emergent vegetation. Hydrology criteria is met.

SOILS

Series and Phase:Urodents, smoothed	Drainage Class: variable but generally well drained
Taxonomy (Subgroup): Man-made soil with no profile	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 - 4"	A	2.5 YR 4/2	N/A	muck
4" - 16"	B	7.5 YR 2/0	N/A	muck

Hydric Soil Indicators

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

Remarks: Hydric soil criteria is met . This soil series is listed on the New York State Hydric Soils list as having hydric inclusions.

Wetland Determination

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

Remarks: All three wetland parameters are present. This wetland also includes a ditch that runs along the toe of the landfill. The area meets the criteria for designation as a wetland. A culvert from the South Park pond drains into this open water wetland. This wetland is also hydrologically connected to the North Ponds via the West Ditch.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New Yok
Do normal conditions exist on site? Yes	Community ID: Upl (for WL)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 1 (near flagging tape #2)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Alliaria officinalis*	Herbaceous	FACU-
2. *Polygonum cuspidatum*	Herbaceous	FACU-
3. *Vitis aestivalis*	Woody Vine	FACU-
4. *Ambrosia artemisiifolia*	Herbaceous	FACU
5. *Rhus typhina*	Shrub	UPL
6.		
7.		
8.		

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

(Excluding FAC) 0%

Comments: Weedy roadside area. This sample point does not meet the criteria for hydrophytic vegetation. This upland point was located adjacent to Hopkins Street.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

x No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"___

Remarks: This area does not meet the criteria for hydology.

SOILS

Series and Phase:Niagara Silt Loam	Drainage Class: Somewhat poorly drained
Taxonomy (Subgroup):Mesic aeric ochraqualfs	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 0.5"	A	Soils not present in sufficient quantity to identify matrix		fill, gravel, asphalt

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: Auger refusal at 0.5" from surface. Gravel and asphalt present. Seems almost like and old road bed. Area does not meet criteria for hydric soils.

Wetland Determination

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

Remarks: This area does not meet the requirements for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: Upl (for WL)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 2 (Flagging tape number 10)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Ambrosia artemisiifolia*	Herbaceous	FACU
2. *Polygonum cuspidatum*	Herbaceous	FACU-
3. *Alliaria officinalis*	Herbaceous	FACU-
4. *Solidago canadensis*	Herbaceous	FACU
5.		
6.		
7.		
8.		

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

(Excluding FAC) 0%

Comments: This area does not meet the criteria for hydrophytic vegetation

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

x No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: No hydrology present

SOILS

Series and Phase:Niagara Silt Loam	Drainage Class: Somewhat poorly drained
Taxonomy (Subgroup):Mesic aeric ochraqualfs	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 0.5"	A	Soils not present in sufficient quantity to identify matrix		fill, gravel, asphalt

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: Auger refusal at 0.5" from surface. Gravel and asphalt present. Seems almost like and old road bed. Area does not meet criteria for hydric soils.

Wetland Determination

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

Remarks: This area does not meet the requirements for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: Upl (for WL)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 3 (near flagging tape #15)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Alliaria officinalis*	Herbaceous	FACU-
2. *Solidago canadensis*	Herbaceous	FACU
3. *Acer rubrum*	Tree	FAC
4. *Quercus rubra*	Tree	FACU-
5. *Viburnum acerifolium*	Shrub	UPL
6. *Cornus racemosa*	Shrub	FAC
7. *Allium tricoccum*	Herbaceous	FACU
8. *Lonicera tatarica*	Shrub	FACU*

Percent of Dominant Species that are OBL, FACW, or FAC 25%

(Excluding FAC) 0%

Comments : Upland are is a woodlot dominated by red oaks in the over story and red-panicled dogwood in the shrub layer. The hydrophytic criteria is not met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: No hydrologic criteria present

SOILS

Series and Phase: Udorthents, smoothed	Drainage Class: Variable but usually well drained
Taxonomy (Subgroup): man-made soil with no profile	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 - 6"	A	10 YR 3/2	none	silt loam
6 - 14"	B	10 YR 5/4	10 YR 5/8 many	silt 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: Does not meet the criteria for a hydric soil.

Wetland Determination

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

Remarks: This area does not meet the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 6, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: UPL (for WL)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 4 (Landfill cap)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Taraxacum officinale*	Herbaceous	FACU-
2. *Trifolium repens*	Herbaceous	FACU-
3. *Plantago major*	Herbaceous	FACU
4. *Plantago lanceolata*	Herbaceous	UPL
5. *Vicia cracca*	Herbaceous	UPL
6. *Poa pratensis*	Herbaceous	FACU
7.		
8.		

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

(Excluding FAC) 0%

Comments: Does not meet the criteria for hydrophytic vegetation

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks:
Does not meet the criteria for hydrology

SOILS

Series and Phase: Dump	Drainage Class: Not classified
Taxonomy (Subgroup): Not classified	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
Landfill cap	No sample			

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: No soil sample taken. Landfill cap material.

Wetland Determination

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

Remarks: This area does not meet the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel COmpany	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vanglaio	State: New York
Do normal conditions exist on site? Yes	Community ID: WA
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 1 (near flag WA1)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1 *Populus deltoides*	tree	FAC
2 *Salix nigra*	tree	FACW
3 *Fraxinus pennsylvanica*	tree/sapling	FACW+
4 *Viburnum cassinoides*	shrub	FACW
5		
6		
7		
8		

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

(Excluding FAC) 75%

Comments This small depressional area is dominated by cottonwood and ash. Hydrophytic vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ 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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: Soils were wet but not saturated. No water in the bore holes. Drainage pattrerns and ponding effects evident in the wetland. Hydrology criteria met.

SOILS

Series and Phase: Dump	Drainage Class: Not classified
Taxonomy (Subgroup): Not classified	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 4 to 6"		10 YR 3/1		
6 - 12 to 18"		10 YR 3/1	10 YR 5/4 few	silty 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 met.

Wetland Determination

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

Remarks:This area meets the criteria for designation as a wetland. It is a small depressional area located in the central section of the site (PFO1E). This area is approximately an acre in size.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: UPL (for WA)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 5 (near flag WA1)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Populus deltoides*	tree	FAC
2. *Fraxinus pennsylvanica*	tree	FACW
3. *Ambrosia artemsiifolia*	herbaceous	FACU
4. *Alliaria officinalis*	herbaceous	FACU-
5. *Solidago canadensis*	herbaceous	FACU
6. *Vitis aestivalis*	woody vine	FACU-
7. *Lonicera tartarica*	shrub	FACU*
8.		

Percent of Dominant Species that are OBL, FACW, or FAC 28.5%

(Excluding FAC) 14.3%

Comments: Upland area is a narrow strip of vegetation on a berm located between two forested wetland areas. The tree layer is dominated by cottonwood while the shrub layer is dominated by Tartarian honeysuckle. Hydrophytic vegetation criteria is not met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: Does not meet criteria for hydrology

SOILS

Series and Phase: Dump	Drainage Class: Not classified
Taxonomy (Subgroup): Not classified	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 12 to 18"		10 YR 3/2	none	Loam

Hydric Soil Indicators

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

Remarks: Soil profile is homogenous dark brown. No mottles. It is a loam with roots and orgainc material in the upper 4 to 6". Hydric soil criteria is not met.

Wetland Determination

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

Remarks: This area does not meet the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vanglio	State: New York
Do normal conditions exist on site? Yes	Community ID: WB (flags 1 through 6) some flags in between not #'ed due to snow
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 1 (near flag 4)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Phragmites communis*	herbaceous	FACW
2. *Typha latifolia*	herbaceous	OBL
3.		
4.		
5.		
6.		
7.		
8.		

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

(Excluding FAC) 100%

Comments: This area is an emergent/open water wetland area dominated by phragmites. It borders the capped landfill area. Hydrophytic vegetation criteria is met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 12 to 24"

Depth to Water in Pit: 0"

Depth of Saturated Soil: 0"

Remarks: Hydrology criteria is met. Area of open water is less than an acre.

SOILS

Series and Phase: Dump

Drainage Class: Not classified

Taxonomy (Subgroup): Not classified

Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 12 to 18"		2.5/N	none	muck

Hydric Soil Indicators

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

Remarks: Hydric soil criteria met.

Wetland Determination

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

Remarks: This area mets the criteria for designation as a wetland. This community type is forms the central portion of a larger wetland complex.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: WB (flags 10 through 41)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 2 (flag 29)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Alnus rugosa*	shrub	FACW+
2. *Viburnum recognitum*	shrub	FACW-
3. *Salix fragilis*	shrub	FAC+
4. *Sambucus canadensis*	shrub	FACW-
5. *Populus deltoides*	tree	FAC
6. *Salix nigra*	tree	FACW+
7. *Impatiens capensis*	herbaceous	FACW
8. *Onoclea sensibilis*	herbaceous	FACW

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

(Excluding FAC) 87.5%

Comments: This portion of the wetland is a dense scrub-shrub area dominated by speckled alder and northern arrowwood. It has a sparse tree and herbaceous layer. Hydrophytic vegetation criteria is met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: 1"

Depth of Saturated Soil: 0"

Remarks: Hydrology criteria met.

SOILS

Series and Phase: Dump	Drainage Class: Not classified
Taxonomy (Subgroup): Not classified	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 4 to 6"		10YR3/1		
6 to 12 to 18"		10 YR 5/2	10 YR 5/8 (few)	silty 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 met.

Wetland Determination

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

Remarks: This area meets the criteria for designation as a wetland. This community borders an open water area.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: WB (flags 41 - 46)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 3 (near flag 44)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Populus deltoides*	tree	FAC
2. *Salix nigra*	tree	FACW+
3. *Fraxinus pennsylvanica*	tree	FACW
4. *Viburnum recognitum*	shrub	FACW-
5. *Solidago gigantea*	herbaceous	FACW
6.		
7.		
8.		

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC)

Comments: Forest community dominated by cottonwood and black willow adjacent to Hopkins Street. Hydrophytic vegetation criteria met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ 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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: Patterns formed by run-off and ponding were observed throughout the wetland.The flow from this wetland enters a culvert at Hopkins Street and flows to the south pond. Hydrology criteria met.

SOILS

Series and Phase: Dump	Drainage Class: Not classified
Taxonomy (Subgroup): Not classified	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 4 to 6"		10YR3/1		
6 to 12 to 18"		10 YR 5/2	10 YR 5/8 (few)	silty 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 met.

Wetland Determination

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

Remarks: This area meets the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Corporation	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: UPL (for WB)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 6 (landfill cap)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Taraxacum officinale*	herbaceous	FACU-
2. *Trifolium repens*	herbaceous	FACU-
3. *Poa pratensis*	herbaceous	FACU
4. *Plantago major*	herbaceous	FACU
5.		
6.		
7.		
8.		

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

(Excluding FAC) 0%

Comments: This upland is a small capped landfill located between the wetland and a junk yard. It has been planted with white clover and Kentucky bluegrass. Hydrophytic vegetation criteria is not met.

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: Hydrology criteria is not met.

SOILS

Series and Phase: Dump	Drainage Class: Not Classified
Taxonomy (Subgroup): Not Classified	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description

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: Soils sample not taken due to sample point being taken on a capped landfill.

Wetland Determination

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

Remarks: This area does not the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: UPL (for WB)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 7 (near flag 29)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Viburnum acerifolium*	shrub	UPL
2. *Lonicera tartarica*	shrub	FACU*
3. *Vitis aestivalis*	woody vine	FACU-
4. *Alliaria officinalis*	herbaceous	FACU-
5.		
6.		
7.		
8.		

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

(Excluding FAC) 0%

Comments: Does not meet hydrophytic vegetation criteria

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: Hydrology criteria not met

SOILS

Series and Phase: Dump	Drainage Class: Not Classified
Taxonomy (Subgroup): Not Classified	Field Observations Confirm Mapped Type? Yes (No)

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 12 to 18"		10 YR 3/2	none	silt loam

Hydric Soil Indicators

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

Remarks: Hydric soil criteria not met.

Wetland Determination

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

Remarks: This area does not meet the criteria for designation as a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION

Project Site: LTV Marilla Street Landfill	Date: Nov. 7, 1995
Applicant/Owner: LTV Steel Company	Municipality: City of Buffalo
Investigator: Joan Hansen and Judy Vangalio	State: New York
Do normal conditions exist on site? Yes	Community ID: UPL (for WB)
Is the site significantly disturbed? No	Transect ID:
Is the area potential Problem Area? No	Plot ID: 8 (near flag 43)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. *Acer saaccharum*	tree	FACU-
2. *Populus deltoides*	tree	FAC
3. *Viburnum acerifolium*	shrub	UPL
4. *Allaira officinalis*	herbaceous	FACU-
5. *Solidago canadensis*	herbaceous	FACU
6. *Solidago gigantica*	herbaceous	FACW
7.		
8.		

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

(excluding FAC) 16.6%

Comments: The goldenrods were located closer to Hopkins Street. Hydrophytic vegetation criteria not met

HYDROLOGY

Recorded Data:

_____ Tide Gauge

_____ Aerial Photos

_____ Other

X No Recorded Data

Wetland Hydrology Indicators

Primary Indicators:

_____ Inundation

_____ 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

Field Characteristics

Depth of Surface Water: 0"

Depth to Water in Pit: >12"

Depth of Saturated Soil: >12"

Remarks: Fill appears to have been placed in wetlands. Mounds and berms with evidence of drainage between Hydrology criteria is met.

SOILS

Series and Phase: Dump	Drainage Class: Not Classified
Taxonomy (Subgroup): Not Classified	Field Observations Confirm Mapped Type? (Yes) No

Profile Observations

Depth	Horizon	Matrix Color	Mottle Color	Soil Description
0 to 4 to 6"				fill

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: Auger refusal from 1 to 6 inches. This area had a variety of waste material including construction debris, concrete slabs, bricks, rocks, cars, and mounds of what appears to be ash.

Wetland Determination

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

Remarks: This area does not meet the criteria for designation as a wetland. Fill appears to have been placed in wetlands or wetlands developed between the mounds and berms because of changes in patterns fo site run-off/hydrology. Some of the berms had phragmites growing on them.

MALCOLM PIRNIE

APPENDIX B

WETLANDS DELINEATION PHOTOLOG
LTV MARILLA STREET LANDFILL

NOVEMBER 6, 7, 1995

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.

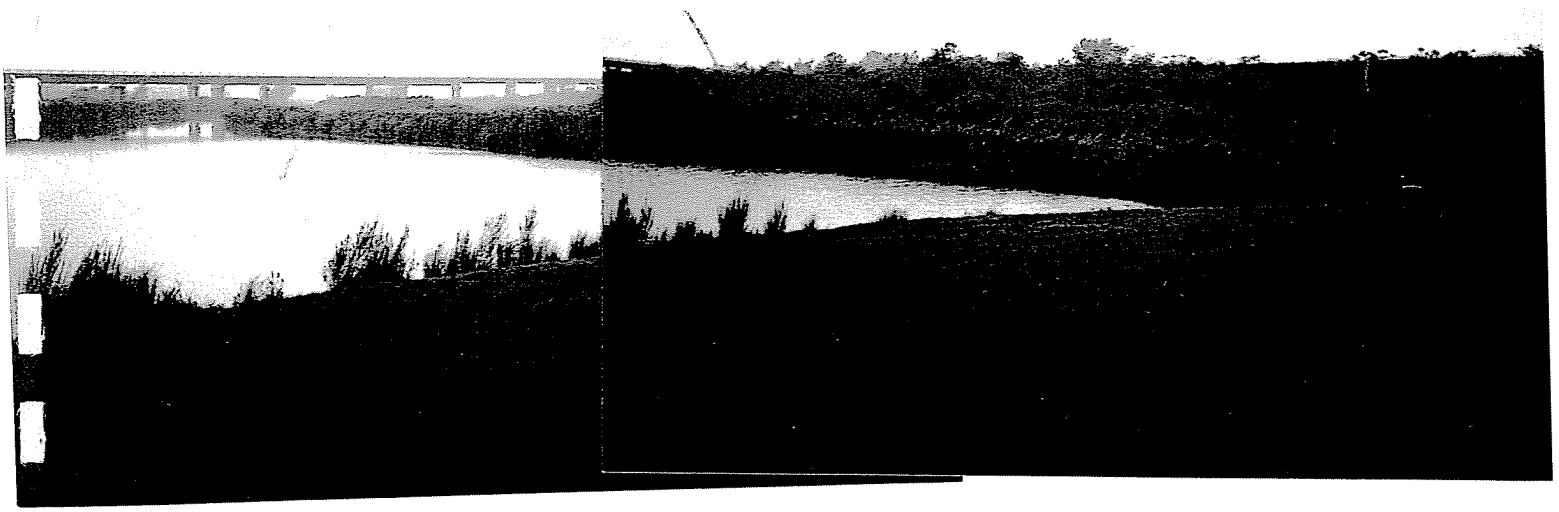


PHOTO #4
Panoramic view of wetlands B and C.
Looking left to right, view of wetland B is from northwest
to northeast into North Pond West from the landfill toe-of-slope.
The strip of Wetland C is shown to the right on the
eastern shore of North Pond West.

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.

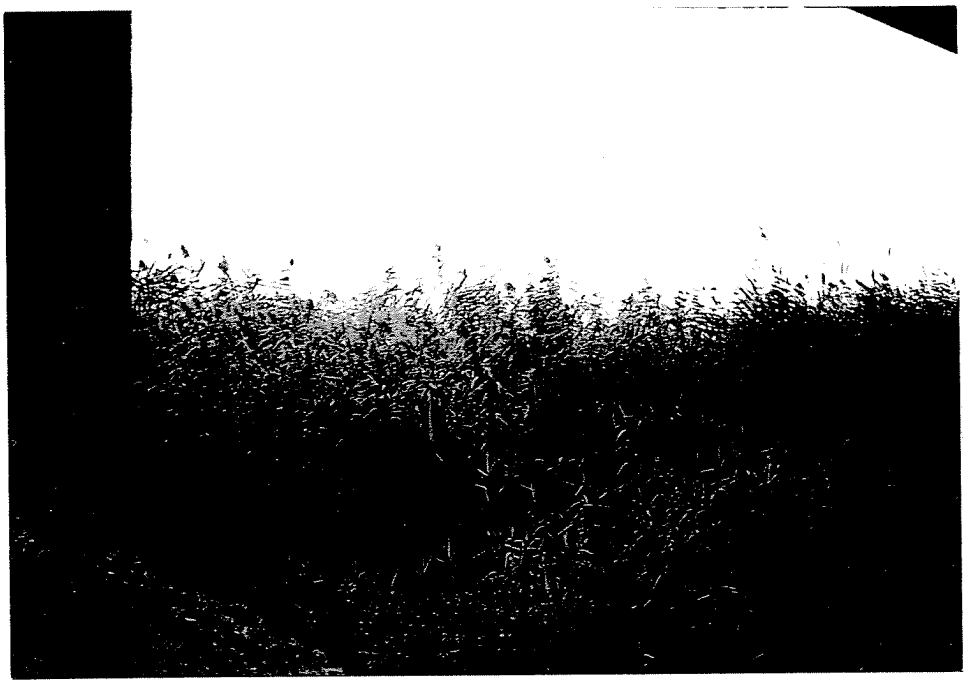


PHOTO #7
Wetland delineation flag D-8.
View is from underneath Tift Street looking southeast toward North Pond East.

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.

MALCOLM PIRNIE

Photo #1 - Site west of Hopkins Street
Description: Looking north at floodplain wetland near flag #3. The West Ditch and closed

Photo #2 - Site west of Hopkins Street
Description: Looking east at upland dominated by Japanese knotweed in area near flag #3.

Photo #3 - Site West of Hopkins Street
Description: Looking north at upland/wetland interface near flag #8. The area is typical of the floodplain wetlands located between Hopkins Street and the West Ditch.

Photo #4 - Site west of Hopkins Street
Description: Looking east near flag #8 at upland dominated by Japanese knotweed.

Photo #5 - Site west of Hopkins Street
Description: Typical upland/wetland interface in the mid-section of the site. *Phragmites* dominate the wetland area and red-osier dogwood is common in the transition area between upland and wetland.

Photo #6 - Site west of Hopkins Street
Description: Upland/wetland interface in area near South Pond. *Phragmites* dominates the wetland, Japanese knotweed dominates the upland.

Photo #7 - Site west of Hopkins Street
Description: Looking northwest in the area near South Pond. Wetlands dominated by *Phragmites*, Tartarian honeysuckle and eastern cottonwood are common in the transition area between upland and wetland.

Photo #8 - Site west of Hopkins Street
Description: Looking east along boundary of the West Ditch and closed landfill.

MALCOLM PIRNIE

Photo #9 - Site west of Hopkins Street
Description: Twin culvert provide the hydrologic connection between the wetland east of Hopkins Street and the South Pond.

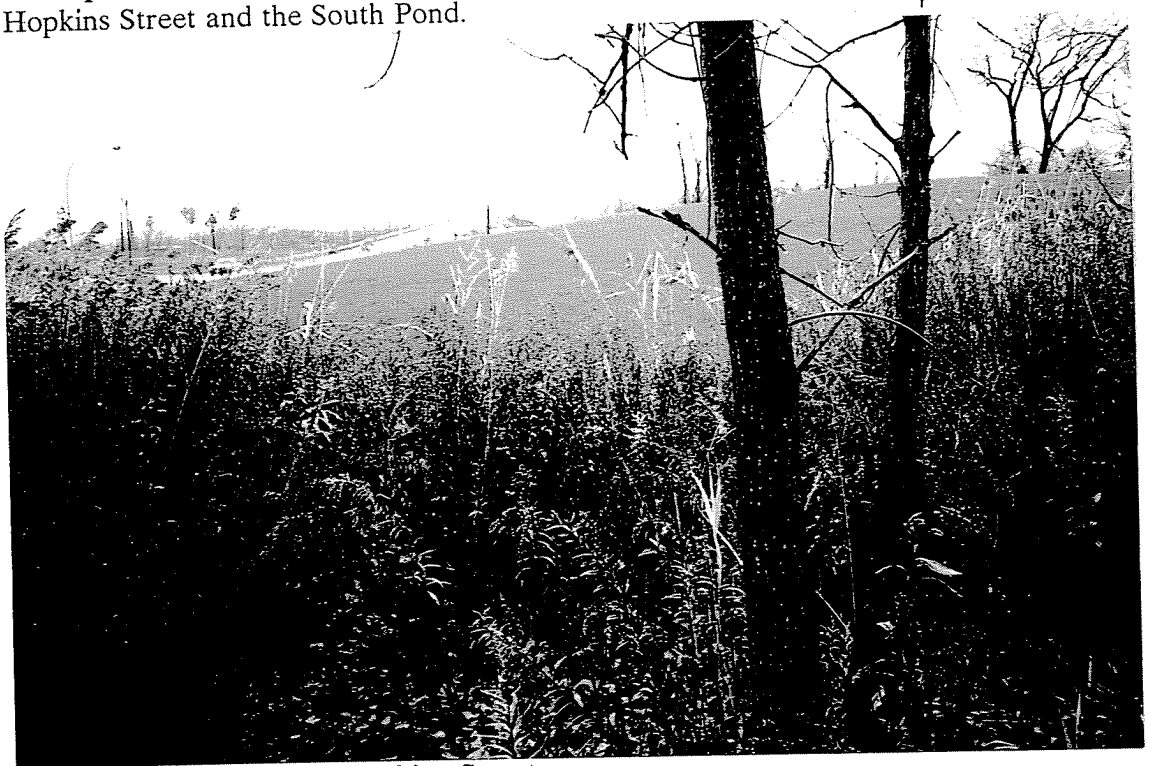


Photo #10 - Site east of Hopkins Street
Description: Northern boundary of wetland paralleling ditch at top of landfill slope. Flow is connected by culvert under Hopkins Street to West Ditch.

Photo #11 - Site east of Hopkins Street
Description: One of the culverts forming the hydrologic link between wetlands east of Hopkins Street and the West Ditch and South Pond.

Photo #12 - Site east of Hopkins Street
Description: Photo shows a portion of a small circular upland inclusion in the emergent area bordering the adjoining junk yard north of the site.

MALCOLM PIRNIE

APPENDIX C

AGENCY RESPONSES

NEW YORK STATE MUSEUM

3122 Cultural Education Center
Albany, NY 12230
518/474-5813 FAX 518/473-8496

Anthropological Survey

DATE: 12/22/1995

To:
JUDITH VANGALIO
MALCOLM PIRNIE, INC.
53515 ABBOTT RD., P.O.BOX 1938
BUFFALO, NY 14219

Proposed Project: MAULLA STREET LANDFILL
7.5' U.S.G.S. Quad: BUFFALO SE

In response to your request our staff has conducted a search of our data files* for locations and descriptions of prehistoric archaeological sites within the area indicated above. The results of the search are given below.

If specific information requested has not been provided by this letter, it is likely that we are not able to provide it at this time, either because of staff limitations or policy regarding disclosure of archaeological site data.

Questions regarding this reply can be directed to the site file manager, at (518) 474-5813 or the above address. Please refer to the N.Y.S.M. site identification numbers when requesting additional information.

Please resubmit this request if action is taken more than one year after your initial information request.

*[NOTE: Our files normally do not contain historic archeological sites or architectural properties. For information on these types of sites as well as prehistoric sites not listed in the N.Y.S.M. files contact The State Historic Preservation Office; Office of Parks, Recreation & Historic Preservation; Agency Building #1; Empire State Plaza; Albany,NY,12238 at (518) 474-0479.

RESULTS OF THE FILE SEARCH:

Recorded sites ARE located in or within one mile of the project area. If so, see attached list.

Code "ACP" = sites reported by Arthur C. Parker in The Archeology Of New York, 1922, as transcribed from his unpublished maps.

SEARCH CONDUCTED BY: BH (initials) Anthropological Survey, NYS Museum

cc: N.Y.S. OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION; HISTORIC PRESERVATION FIELD SERVICES BUREAU

12/22/1995 To: JUDITH VANGALIO, MALCOLM PIRNIE, INC.

Project: MAULLA STREET LANDFILL Topo. Maps: BUFFALO SE
BW (initials) Anthropological Survey, NYSM

New York State Museum Prehistoric Archaeological Site Files
EVALUATION OF ARCHAEOLOGICAL SENSITIVITY FOR PREHISTORIC (NATIVE AMERICAN) SITES
Examination of the data suggests that the location indicated has the following sensitivity rating:

HIGH PROBABILITY OF PRODUCING PREHISTORIC ARCHAEOLOGICAL DATA.

The reasons for this finding are given below:

[ ] A RECORDED SITE(S) IS(ARE) INDICATED IN, ADJACENT TO, OR IN THE VICINITY OF THE LOCATION AND WE HAVE REASON TO BELIEVE IT(THEY) COULD BE IMPACTED BY THE PROPOSED ACTIVITY.

[✓] A RECORDED SITE IS INDICATED IN THE GENERAL VICINITY OR SOME DISTANCE AWAY. DUE TO THE MARGIN OF ERROR IN THE LOCATION DATA IT IS POSSIBLE THE SITE ACTUALLY EXISTS IN OR IMMEDIATELY ADJACENT TO THE LOCATION.

[✓] THE TERRAIN IN THE LOCATION IS SIMILAR TO TERRAIN IN THE GENERAL VICINITY WHERE RECORDED ARCHAEOLOGICAL SITES ARE INDICATED.

[✓] THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION SUGGEST A HIGH PROBABILITY OF PREHISTORIC OCCUPATION OR USE.

[ ] THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION SUGGEST A MEDIUM PROBABILITY OF PREHISTORIC OCCUPATION OR USE.

[ ] THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION SUGGEST A LOW PROBABILITY OF PREHISTORIC OCCUPATION OR USE.

[ ] EVIDENCE OF CULTURAL OR NATURAL DESTRUCTIVE IMPACTS SUGGESTS A LOSS OF ORIGINAL CULTURAL DEPOSITS IN THIS LOCATION.

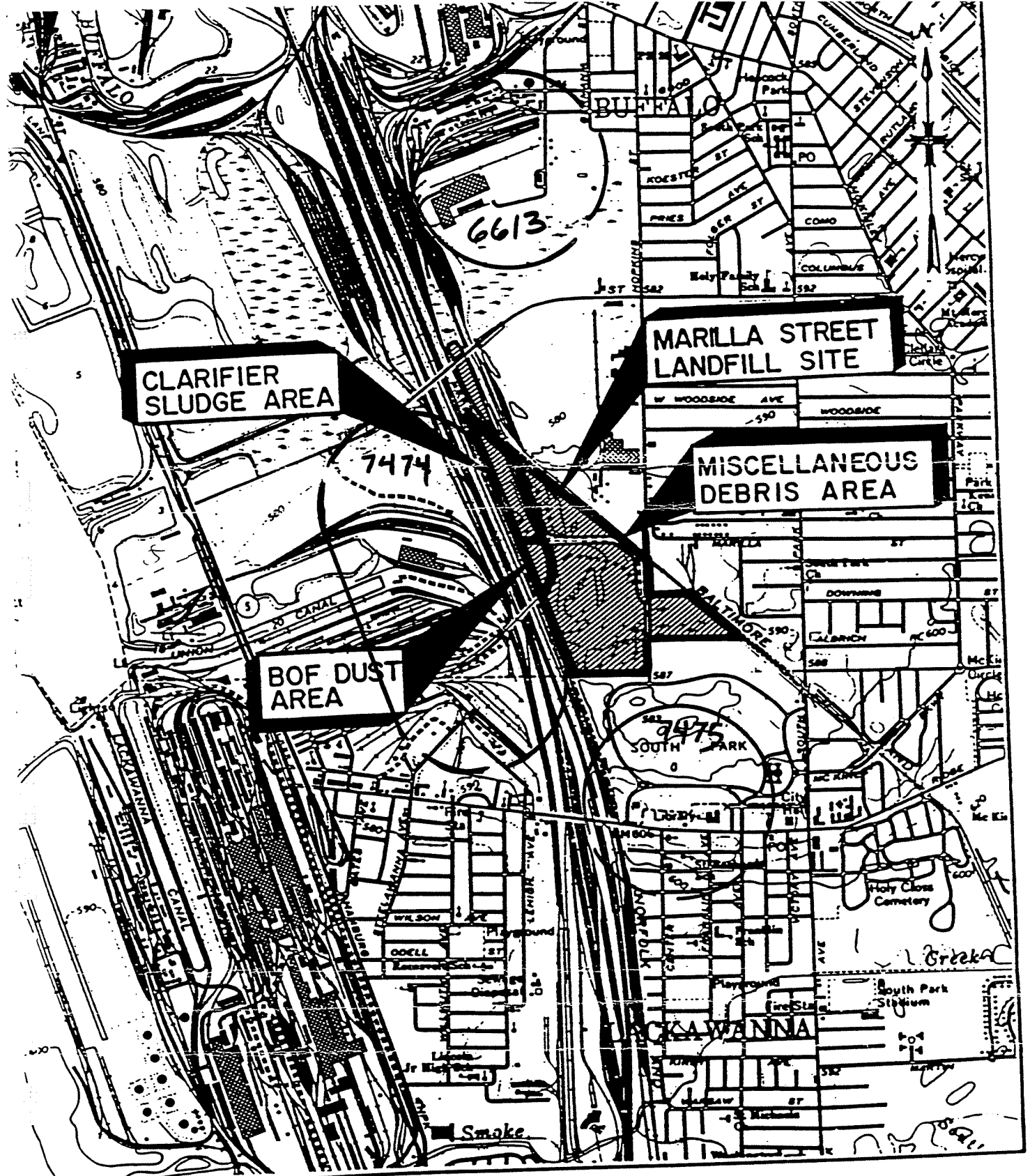
[ ] THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION ARE MIXED, A HIGHER THAN AVERAGE PROBABILITY OF PREHISTORIC OCCUPATION OR USE IS SUGGESTED FOR AREAS IN THE VICINITY OF EITHER PRESENT OR PREEXISTING BODIES OF WATER, WATERWAYS, OR SWAMPS. A HIGHER THAN AVERAGE PROBABILITY IS SUGGESTED FOR ROCK FACES WHICH AFFORD SHELTER OR FOR AREAS SHELTERED BY BLUFFS OR HILLS. AREAS IN THE VICINITY OF CHERT DEPOSITS HAVE A HIGHER THAN AVERAGE PROBABILITY OF USE. DISTINCTIVE HILLS OR LOW RIDGES HAVE AN AVERAGE PROBABILITY OF USE AS A BURYING GROUND. LOW PROBABILITY IS SUGGESTED FOR AREAS OF EROSIONAL STEEP SLOPE.

[ ] PROBABILITY RATING IS BASED ON THE ASSUMED PRESENCE OF INTACT ORIGINAL DEPOSITS, POSSIBILITY UNDER FILL, IN THE AREA. IF NEAR WATER OR IF DEEPLY BURIED, MATERIALS MAY OCCUR SUBMERGED BELOW THE WATER TABLE.

[ ] INFORMATION ON OTHER SITES MAY BE AVAILABLE IN A REGIONAL INVENTORY MAINTAINED AT THE FOLLOWING LOCATION(S).

COMMENTS:

cc: N.Y.S. OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION; H. P. FIELD SERVICES BUREAU



NOTE: TOPOGRAPHY TAKEN FROM 1965 BUFFALO S.E., N.Y. U.S.G.S. QUADRANGLE 7.5 MIN. SERIES.

MALCOLM PIRNIE

LTV - 17

QUADRANGLE LOCATION

MARILLA STREET LANDFILL CLOSURE

VICINITY MAP

N.Y.S. MUSEUM ARCHAEOLOGICAL SITE FILE
INFORMATION FOR PLANNING STUDIES AND GENERAL USE
CONFIDENTIAL:INFORMATION FOR RELEASE ONLY AS REQUIRED BY LAW
OR AS AUTHORIZED IN WRITING BY THE NYSM ANTHROPOLOGY SURVEY

NYSM SITE ID. #	REPORTED: SITE TYPE,	AGE,	PHASE(+),	STRATIG	CO.	U. S. G. S. TOPOGRAPHIC MAP 15'
6613	TRACES OF OCCUPATION	NO INFO	NO INFO	NO INFO		BUFFALO
7474	TRACES OF OCCUP.	NO INFO	NO INFO	NO INFO	ERIW	BUFFALO
7475	CAMP	NO INFO	NO INFO	NO INFO	ERIW	BUFFALO

New York State Museum
Anthropological Survey

N.Y.S.M.Prehistoric Site File
Data Request Form

NAME Judith Vangalio

COMPANY/INSTITUTIONOR GROUP REPRESENTED Malcolm Pirnie

ADDRESS 53515 Abbott Road P.O. Box 1938
Buffalo, NY 14219 Phone # 716-828-1300

If appropriate give Project Identifier Marilla Street Landfill

NOTE: Normal search distance is within 1 mile for projects of less than one mile square. For larger projects the search distance may be reduced to one half mile.

AREA FOR WHICH FILE SEARCH IS REQUESTED: Provide a copy of U.S.G.S. topographic map(s) with the project area indicated.

7.5' U.S.G.S. map name(s) Buffalo, SE, _____

OR If a U.S.G.S. topographic map is not available use a detailed map to show the project and search areas. Give an exact description of the boundaries of each. Identify the county and town of the project area.

County Erie Town _____ City, village Buffalo

TYPE OF DATA REQUESTED: (Specify level of detail required, precision of location data, amount of site boundary information and cultural data). Prehistoric file search on and adjacent to the site outlined on attached map. exact locations necessary due to potential dredging activities in wetlands on site.

PURPOSE OF REQUEST: (Specify whether for private research, environmental impact review, planning and development, or other, and for whom). Information is for a feasibility study for a SMS listed hazardous waste site. US Army Corp of Engineers is requiring this information.

EVENTUAL DISTRIBUTION OF DATA: (Specify range of data use and distribution, publication, reproduction, etc.). Data will be used in design of remedial alternatives for mitigation of wetland areas. Exact location of sites will not be released to public.

WHERE POSSIBLE RESPONSE WILL BE MADE WITHIN FOUR WEEKS OF RECEIPT OF THIS REQUEST. YOU WILL BE NOTIFIED BY PHONE OF ANY UNAVOIDABLE DELAY.

I understand that N.Y.S. Museum Site File information must be marked and maintained as 'Confidential: for use only as required by State or Federal Law or by written permission of the N.Y.S. Museum Anthropological Survey.

Judith Vangalio 12/18/95
Signature Date

Return: N.Y.S.M. Site Files
Room 3122
Cultural Education Center
Albany, New York 12230

RESUBMIT THIS REQUEST IF ACTION IS TAKEN MORE THAN ONE YEAR AFTER RESPONSE DATE.

FOR ADDITIONAL SITE FILE SEARCH INFORMATION CALL: (518) 474-5813 FAX: (518) 473-8496

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643

December 7, 1995

Judith Vangalio
Malcolm Pirnie, Inc.
S. 3515 Abbott Road
P.O. Box 1938
Buffalo, NY 14219-0138

Dear Ms. Vangalio:

Re: CORPS
Marilla Street Landfill/LTV Steel
Buffalo, Erie County
95PR2710

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966 and the relevant implementing regulations.

Based upon this review, the SHPO can provide the following comments:

-The project area is immediately adjacent to South Park which is listed on the State and National Registers of Historic Places.

-There are no known archeological sites in or adjacent to the project area.

When responding, please be sure to refer to the OPRHP project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643 ext. 255.

Sincerely,

Robert D. Kuhn, Ph.D.
Historic Preservation Coordinator
Field Services Bureau

RDK:cm

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wildlife Resources Center
700 Troy-Schenectady Road
Latham, NY 12110-2400 (518) 783-3932

January 5, 1996

Judith Vangalio
Malcolm Pirnie, Inc.
S. 3515 Abbott Road, PO Box 1938
Buffalo, NY 14219-0138

Dear Ms. Vangalio:

We have reviewed the New York Natural Heritage Program files with respect to your recent request for biological information concerning the Feasibility Study of the Marilla Street Landfill, site as indicated on your enclosed map, located in the City of Buffalo, Erie County, New York State.

Enclosed is a computer printout covering the area you requested to be reviewed by our staff. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

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

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

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

Sincerely,

Deborah Albert

Deborah L. Albert
Information Services
New York Natural Heritage Program

Encs.
cc: Reg. 9, Wildlife Mgr.

BIOLOGICAL AND CONSERVATION DATA SYSTEM - ELEMENT OCCURRENCE REPORT, 11 DEC 1995
Prepared by N.Y.S.D.E.C. Natural Heritage Program, Latham New York

(This report contains sensitive information which should be treated in a sensitive manner. Refer to the users guide for explanation of codes and ranks.)

* COUNTY & TOWN	USGS TOPO MAP/ LAT. & LONG.	PRECISION	LAST SEEN	EO RANK	SCIENTIFIC AND COMMON NAME	ELEMENT TYPE	NY STATUS	US STATUS	HERITAGE RANKS	OFFICE USE	OFFICE USE
* ERIE											
CITY OF LACKAWANNA	BUFFALO SE 424912 784848	M	1893	X	ERIGENIA BULBOSA HARBINGER-OF-SPRING	VASCULAR PLANT	U		G5 S1		4207877 2

1 Records Processed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REGULATORY AFFAIRS REGIONAL OFFICES

REGION	COUNTIES	NAME	ADDRESS AND PHONE NO.
Region 1	Nassau Suffolk	Robert Greene Permit Administrator	Loop Road, Bldg. 40 SUNY Stony Brook, NY 11790-2356 (516) 751-1389
Region 2	New York City	John Ferguson Permit Administrator	Hunters Point Plaza 4740 21st Street Long Island City, NY 11101-5407 (718) 482-4997
Region 3	Dutchess Orange Putnam Rockland, Sullivan Ulster, Westchester	Margaret Duke Permit Administrator	21 South Putt Corners Road New Paltz, NY 12561-1696 (914) 256-3032
Region 4	Albany Columbia Delaware Greene, Montgomery, Otsego Rensselaer, Schenectady, Schoharie	William J. Clarke Permit Administrator	1159 Westcott Road Schenectady, NY 12306-2014 (518) 382-0680
Region 5	Clinton Essex Franklin Fulton, Hamilton Saratoga, Warren, Washington	Richard Wild Permit Administrator	Route 86 Ray Brook, NY 12977 (518) 891-1370
Region 6	Herkimer Jefferson Lewis Oneida, St. Lawrence	Randy Vaas Permit Administrator	State Office Building 317 Washington Street Watertown, NY 13601 (315) 785-2246
Region 7	Broome Cayuga Chenango Cortland, Madison, Onondaga Oswego, Tioga, Tompkins	Robert Torba Permit Administrator	615 Erie Blvd. West Syracuse, NY 13204-2400 (315) 426-7439
Region 8	Chemung Genesee Livingston Monroe, Ontario, Orleans Schuyler, Seneca, Steuben Wayne, Yates	Albert Butkas Permit Administrator	6274 East Avon-Lima Road Avon, NY 14414 (716) 226-2466
Region 9	Allegany Cattaraugus Chautauqua Erie, Niagara, Wyoming	Steven Doleski Permit Administrator	270 Michigan Avenue Buffalo, NY 14203-2999 (716) 851-7165

USERS GUIDE TO NATURAL HERITAGE DATA

DATA SENSITIVITY: **The data provided in these reports is sensitive and should be treated in a sensitive manner. The data is for your in-house use and may not be released to the general public or incorporated in any public document without prior permission from the Natural Heritage Program.**

BIOLOGICAL AND CONSERVATION DATA SYSTEM (BCD) ELEMENT OCCURRENCE REPORTS:

COUNTY NAME: County where the element occurrence is located.
TOWN NAME: Town where the element occurrence is located.
USGS 7 1/2' TOPOGRAPHIC MAP: Name of 7.5 minute US Geological Survey (USGS) quadrangle map (scale 1:24,000).
LAT: Centrum latitude coordinates of the location of the occurrence. Important: latitude and longitude must be used with PRECISION (see below). For example, the location of an occurrence with M (minute) precision is not precisely known at this time and is thought to occur somewhere within a 1.5 mile radius of the given latitude/longitude coordinates.
LONG: Centrum longitude coordinates of the location of the occurrence. See also LAT above.
PRECISION: S - seconds: Location known precisely. (within a 300' or 1-second radius of the latitude and longitude given.
M - minutes: Location known only to within a 1.5 mile (1 minute) radius of the latitude and longitude given.
SIZE (acres): Approximate acres occupied by the element at this location.
SCIENTIFIC NAME: Scientific name of the element occurrence.
COMMON NAME: Common name of the element occurrence.
ELEMENT TYPE: Type of element (i.e. plant, community, other, etc.)
LAST SEEN: Year element occurrence last observed extant at this location.
EO RANK: Comparative evaluation summarizing the quality, condition, viability and defensibility of this occurrence. Use in combination with LAST SEEN and PRECISION.
A-E = Extant: A=excellent, B=good, C=marginal, D=poor, E=extant but with insufficiently data to assign a rank of A - D.
F = Failed to find. Did not locate species, but habitat is still there and further field work is justified.
H = Historic. Historic occurrence without any recent field information.
X = Extirpated. Field/other data indicates element/habitat is destroyed and the element no longer exists at this location.

NYS STATUS - animals: Categories of Endangered and Threatened species are defined in New York State Environmental Conservation Law section 11-0535. Endangered, Threatened, and Special Concern species are listed in regulation 6NYCRR 182.5.
E = Endangered Species: any species which meet one of the following criteria:
1) Any native species in imminent danger of extirpation or extinction in New York.
2) Any species listed as endangered by the United States Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.
T = Threatened Species: any species which meet one of the following criteria:
1) Any native species likely to become an endangered species within the foreseeable future in NY.
2) Any species listed as threatened by the U.S. Department of the Interior, as enumerated in the Code of the Federal Regulations 50 CFR 17.11.
SC = Special Concern Species: those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York. Unlike the first two categories, species of special concern receive no additional legal protection under Environmental Conservation Law section 11-0535 (Endangered and Threatened Species).
P = Protected Wildlife (defined in Environmental Conservation Law section 11-0103): wild game, protected wild birds, and endangered species of wildlife.
U = Unprotected (defined in Environmental Conservation Law section 11-0103): the species may be taken at any time without limit; however a license to take may be required.
G = Game (defined in Environmental Conservation Law section 11-0103): any of a variety of big game or small game species as stated in the Environmental Conservation Law; many normally have an open season for at least part of the year, and are protected at other times.

NYS STATUS - plants: The following categories are defined in regulation 6NYCRR part 193.3 and apply to New York State Environmental Conservation Law section 9-1503.
(blank) = no state status
E = Endangered Species: listed species are those with:
1) 5 or fewer extant sites, or
2) fewer than 1,000 individuals, or
3) restricted to fewer than 4 U.S.G.S. 7 1/2 minute topographical maps, or
4) species listed as endangered by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.
T = Threatened: listed species are those with:
1) 6 to fewer than 20 extant sites, or
2) 1,000 to fewer than 3,000 individuals, or
3) restricted to not less than 4 or more than 7 U.S.G.S. 7 and 1/2 minute topographical maps, or
4) listed as threatened by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.
R = Rare: listed species have:
1) 20 to 35 extant sites, or
2) 3,000 to 5,000 individuals statewide.
U = Unprotected
V = Exploitably vulnerable: listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked.

NYS STATUS - communities: At this time there are no categories defined for communities.

continued on next page

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, New York 13045

January 11, 1996

Ms. Judith Vangalio
Project Biologist
Malcolm Pirnie, Inc.
PO Box 1938
Buffalo, NY 14219-0138

Dear Ms. Vangalio:

This responds to your letter of December 1, 1995, requesting information on the presence of endangered or threatened species in the vicinity of the Marilla Street Landfill, located in the City of Buffalo, Erie County, New York. We apologize for the delay in responding to your request. Employees in this office were furloughed for three weeks from December 18, 1995, through January 5, 1996, due to a lack of Congressionally authorized funding.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the U.S. Fish and Wildlife Service (Service). Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of Federally listed and proposed endangered and threatened species in New York is enclosed for your information.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under the Fish and Wildlife Coordination Act or other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact:

New York State Department of
Environmental Conservation
Region 9
128 South Street
Olean, NY 14760
(716) 851-7000

New York State Department of
Environmental Conservation
Wildlife Resources Center - Information Serv.
New York Natural Heritage Program
700 Troy-Schenectady Road
Latham, NY 12110-2400
(518) 783-3932

If you have any questions regarding this letter, contact Kim Claypoole at (607) 753-9334.

Sincerely,

Mark W. Clough

ACTING FOR

Sherry W. Morgan
Field Supervisor

Enclosure

cc: NYSDEC, Olean, NY (Regulatory Services)
NYSDEC, Latham, NY
COE, Buffalo, NY
EPA, Chief, Marine & Wetlands Protection Branch, New York, NY

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES IN NEW YORK

Common Name	Scientific Name	Status	Distribution
FISHES			
Sturgeon, shortnose*	*Acipenser brevirostrum*	E	Hudson River & other Atlantic coastal rivers
REPTILES			
Turtle, green*	*Chelonia mydas*	T	Oceanic summer visitor coastal waters
Turtle, hawksbill*	*Eretmochelys imbricata*	E	Oceanic summer visitor coastal waters
Turtle, leatherback*	*Dermochelys coriacea*	E	Oceanic summer resident coastal waters
Turtle, loggerhead*	*Caretta caretta*	T	Oceanic summer resident coastal waters
Turtle, Atlantic ridley*	*Lepidochelys kempii*	E	Oceanic summer resident coastal waters
BIRDS			
Eagle, bald	*Haliaeetus leucocephalus*	T	Entire state
Falcon, peregrine	*Falco peregrinus*	E	Entire state - re-establishment to former breeding range in progress
Plover, piping	*Charadrius melodus*	E	Great Lakes Watershed
		T	Remainder of coastal New York
Tern, roseate	*Sterna dougallii dougallii*	E	Southeastern coastal portions of state
MAMMALS			
Bat, Indiana	*Myotis sodalis*	E	Entire state
Cougar, eastern	*Felis concolor couguar*	E	Entire state - probably extinct
Whale, blue*	*Balaenoptera musculus*	E	Oceanic
Whale, finback*	*Balaenoptera physalus*	E	Oceanic
Whale, humpback*	*Megaptera novaeangliae*	E	Oceanic
Whale, right*	*Eubalaena glacialis*	E	Oceanic
Whale, sei*	*Balaenoptera borealis*	E	Oceanic
Whale, sperm*	*Physeter catodon*	E	Oceanic
MOLLUSKS			
Snail, Chittenango ovate amber	*Succinea chittenangoensis*	T	Madison County
Mussel, dwarf wedge	*Alasmidonta heterodon*	E	Orange County - lower Neversink River

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

Region 5 - 08/11/95 - 2 pp.

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES IN NEW YORK (Cont'd)

Common Name	Scientific Name	Status	Distribution
BUTTERFLIES			
Butterfly, Karner blue	*Lycaeides melissa samuelis*	E	Albany, Saratoga, Warren, and Schenectady Counties
PLANTS			
Monkshood, northern wild	*Aconitum noveboracense*	T	Ulster, Sullivan, and Delaware Counties
Pogonia, small whorled	*Isotria medeoloides*	T	Entire state
Swamp pink	*Helonias bullata*	T	Staten Island - presumed extirpated
Gerardia, sandplain	*Agalinis acuta*	E	Nassau and Suffolk Counties
Fern, American hart's-tongue	*Phyllitis scolopendrium* var. *americana*	T	Onondaga and Madison Counties
Orchid, eastern prairie fringed	*Platanthera leucophea*	T	Not relocated in New York
Bulrush, northeastern	*Scirpus ancistrochaetus*	E	Not relocated in New York
Roseroot, Leedy's	*Sedum integrifolium* ssp. *Leedyi*	T	West shore of Seneca Lake
Amaranth, seabeach	*Amaranthus pumilus*	T	Atlantic coastal plain beaches
Goldenrod, Houghton's	*Solidago houghtonii*	T	Genesee County

E=endangered T=threatened P=proposed

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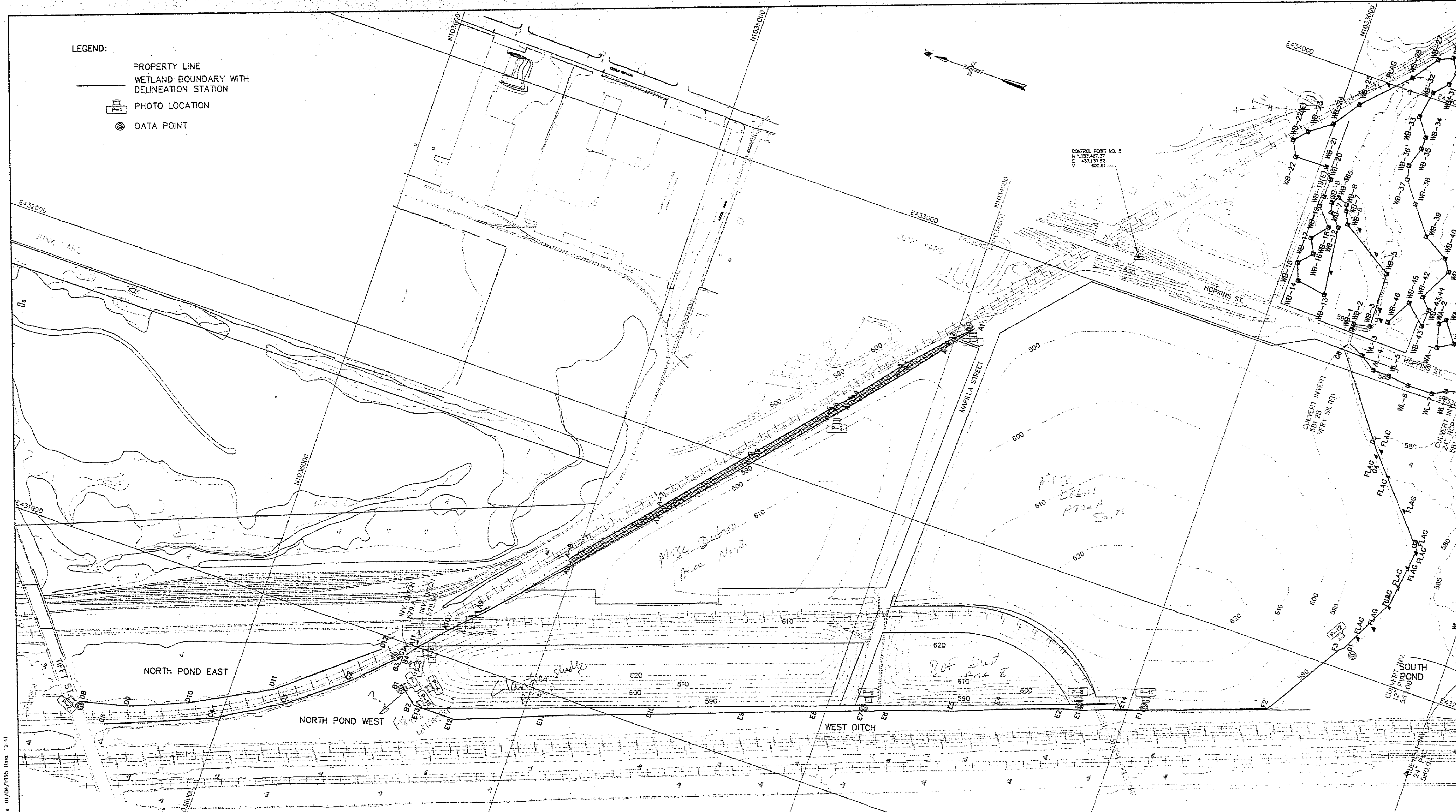
MALCOLM PIRNIE

APPENDIX C

WETLAND BOUNDARIES

LEGEND:

- PROPERTY LINE
- WETLAND BOUNDARY WITH DELINEATION STATION
- 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.

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES D.C.
DWN K.L.
CKD

LTV STEEL COMPANY
BUFFALO, NEW YORK

MARILLA STREET LANDFILL
WETLAND BOUNDARIES
PLATE 1
SCALE: AS NOTED

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

MALCOLM PIRNIE

APPENDIX D

COASTAL ZONE MANAGEMENT AGENCY FEDERAL CONSISTENCY FORM

MALCOLM PIRNIE

1.0 INTRODUCTION

1.1 GENERAL

The Marilla Street Landfill is approximately 80 acres in size and is located on 110 acres of land (the site) along Marilla and Hopkins Streets in the City of Buffalo, Erie County, New York (see Figure 1). The site is owned by the LTV Steel Company formerly known as Republic Steel. 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 is identified by NYSDEC as a class 2 site.

1.2 SITE DESCRIPTION

The 110-acre parcel is bordered on the south by the South Park Recreational Facility operated by the City of Buffalo, on the west by active railroad tracks of the Penn Central Railroad, and on the north and northeast by inactive railroad tracks of the Baltimore and Ohio Railroad. Hopkins Street divides the LTV property into two parcels. Approximately 10 acres of the property is located on the east side of Hopkins Street. Approximately 25 acres of the site is comprised of open water and wetland, a portion of which is NYSDEC regulated wetland BU-1 (see Figure 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.

1.3 BACKGROUND

The landfill areas were closed by 1993 in accordance with NYSDEC-approved closure plans. A Solid Waste Management Facility Investigation Program (SWMFIP) 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. A Supplemental SWMFIP was conducted in the period September 1994 through March 1995. The Supplemental SWMFIP report, submitted to the NYSDEC in August 1995, presented the delineation of the wetland areas contiguous to the landfill slope and applied the U.S. Army Corps Wetland Evaluation Technique (WET, Version 2.0) for the purpose of assessing the baseline physical, chemical and biological functions of these wetlands. In addition, sediment and subsurface soil sampling were conducted in the wetlands. The concentrations of chemicals in the surface water, pore water and sediment were found to pose a low to moderate risk to fish and wildlife.

1.4 PURPOSE AND OBJECTIVES

Based on the results and conclusions of the two SWMFIP reports, a Focused Feasibility Study (FSS) is in progress to evaluate potential wetland mitigation remediation alternatives. In order to implement, many of the alternatives, a state Freshwater Wetlands Permit (ECL Article 24) and a Section 404 permit under the Federal Clean Waters Act would be required. The site is also located adjacent to a mapped Coastal Zone Management Area. As such, an evaluation of the project in relation to the 44 policies of the New York Coastal Management Program is required (viz. Federal Consistency Form). A detailed discussion of the policies applicable to the site is provided in this report.

2.0 POLICY STATEMENTS

Based on the evaluation of the 44 Policy Statements, the following policies are applicable to the Marilla Street Landfill.

Policy 7 **Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.**

Following the procedures outlined in the NYSDEC manual entitled "Technical Memorandum: Procedures for Designation as "Significant Coastal Fish and Wildlife Habitats"" (NYSDEC, 1984), the wetland areas were evaluated for designation as a "Significant Coastal Fish and Wildlife Habitat". A numerical value is calculated using established criteria for rating the significance of each habitat evaluated. Significance is calculated using the following formula:

$$S = HI \times R$$

Where:
S = Significance
HI = Habitat Index
R = Replacibility

The Habitat Index is calculated as follows:

$$HI = ER + SV + HU + PL$$

Where:
ER = Ecosystem Rarity
SV = Species Vulnerability
HU = Human Use
PL = Population Level

Ecosystem Rarity is defined as the "uniqueness" of the plant and animal community and the physical, structural, and chemical features which support this community. The wetlands were identified as New York State wetland BU-1, a Class I wetland system. This wetland is one of the three largest in the City of Buffalo, and is unique to the City. The community consists of open water/emergent wetlands, which is not rare in Erie County. A

value of three (3) was assigned to these wetlands. This value falls in between not rare (value of 0) and unique on a county level (value of 9).

Species Vulnerability is defined as those wildlife species listed as Endangered, Threatened, or of Special Concern as defined in 6 NYCRR Part 182. No endangered, threatened or special concern wildlife species were identified in this area; therefore a value of zero (0) was assigned to this wetland.

Human Use refers to significant (i.e. demonstrable) commercial, recreational or educational wildlife related human uses. The wetlands are located adjacent to the South Park Recreational Facility which is owned in part by both the City of Buffalo and Erie County. A series of trails was observed in the South Pond Wetland area during a wetland delineation conducted in November of 1995. The range of values is from 0, no significant human use values to 49, world significance. A value of four (4) was assigned to this wetland which indicated the area is important for recreational use on a county level.

Population Level refers to the concentration of a species on an area during its normal period of occurrence, and loss of the habitat may have a significant long term effect on the population of a species. A marsh survey conducted by Ken Roblee, a biologist with the NYSDEC, from April through June 1995 did not identify any unusual populations of wildlife, therefore a value of zero (0) was assigned to this wetland. The range of values is from 0, no unusual concentration to 49, concentration of a species is unusual in the world. The Habitat Index is equal to seven (7).

Replacibility refers to an equivalent replacement for the same fish and wildlife and uses of that fish and wildlife. A value of 0.8 was assigned based on the following:

- Techniques are available for replacement which allow a reasonable likelihood for success;
- Potential replacement site identified. Other industrial properties exist along the Buffalo River that could be used for replacement.
- Will be replaced through independent processes, without active management within ten years.

The significance value of this wetland is 5.6 (HI [7] X R [0.8]). Habitats with scores above 15.5 are recommended for designation as a "significant coastal fish and wildlife

habitat". The significance value of the wetlands located adjacent to the Marilla Street Landfill does not meet this requirement, therefore, this policy statement does not apply to this wetlands mitigation/remediation project.

Policy 8 **Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sublethal or lethal effect on those resources.**

The results of the two SWMFIP reports indicate that waste/fill if present in the wetlands, and 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. The flow of shallow groundwater that is impacted by waste/fill constituents is intercepted by a discharge zone in the wetlands 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 site. In addition, one of the remedial action objectives established for the focused feasibility study is to minimize or prevent the dissolution of waste/fill materials present in the sediments. Therefore, the proposed remedial work is compatible with this policy statement because it will minimize aor present the release of hazardous substances from on-site wetlands into the adjacent coastal zone area.

Policy 9 **Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources.**

The site is located adjacent to the South Park Recreational Facility. LTV has initiated discussions with the City of Buffalo regarding the possibility of enhancing existing trails on LTV property to extend to and compliment those already present on the South Park Recreational Facility. LTV is considering offering the City of Buffalo operation of the wetland area and possibly the entire site as a City Recreational Facility.

The mitigation of the wetlands on the landfill site will enhance the habitat for wildlife species. If containment is the recommended mitigation/remediation alternative, constructed activity would likely increase the vegetative fringe surrounding the ponds, creating cover for wildlife species such as waterfowl and muskrats. If dredging is the recommended mitigation/remediation alternative, the removal of vegetation and contaminated sediments would temporarily disturb the wetlands. Upon completion, the wetland area would be restored with native plant species that would provide wildlife benefits. Therefore, mitigation/remediation of the wetlands would be compatible with this policy.

Policy 19: Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities.

The City of Buffalo has established the Greenway Task Force whose objective is to connect the waterfront with a series of trails for public recreational use (i.e., hiking and bicycling). Specifically in the area of the Marilla Street Landfill, the Task Force would like to establish a trail from the Union Ship Canal to the South Park Recreational Facility to Tifft Nature Preserve and eventually to Buffalo's Outer Harbor.

Following wetland mitigation/remediation, LTV may consider offering public access to the restored areas. By increasing public access in the area, the LTV wetland mitigation project would be consistent with the Greenway Task Force's goals and ultimately the goal of this policy.

Policy 25: Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.

Mitigation/remediation of the wetlands on the LTV site will involve the temporary disturbance of the wetlands areas. Following construction, the wetlands will be revegetated/restored. Since wetland acres will be temporarily disturbed and there will be no net loss of wetlands, the overall scenic quality of the area will not be altered. Therefore, wetland mitigation/remediation and restoration are consistent with this policy.

Policy 30: Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.

Discharge of contaminated groundwater to the wetland systems has been minimized by the landfill final cover system. In addition, the purpose of the focused feasibility study is to evaluate and recommend a mitigative/remedial alternative that would minimize or prevent the dissolution of waste/fill material present in the sediments to surface/coastal waters.

LTV Steel Company also has implemented a routine ground and surface water monitoring program. Groundwater has been collected and analyzed on a quarterly basis since 1987. Results are summarized and submitted to the NYSDEC.

Implementation of the recommended wetland mitigation/remediation approach and continued monitoring of the site water quality meet the requirements of this policy.

Policy 35: Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands and wetlands.

Removal of contaminated sediments via dredging is one of the mitigation/remediation alternatives being considered as part of the focused feasibility study. If the dredging alternate is implemented, the removed material would be dewatered and either disposed of on-site or shipped off-site for disposal. In addition, erosion control devises would be used to prevent siltation to down gradient water bodies. The wetland area will be revegetated upon completion of sediment removal activities. Therefore, these activities would only result in a temporary disturbance to the wetland areas, and would be consistent with the policy. If containment of the wetland areas is the preferred alternative, this policy would not be applicable.

Policy 37: Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.

The purpose of wetland mitigation/remediation is to prevent/minimize the release of constituents into the wetland areas and the associated water quality impacts. During the construction process, best management practices would be employed to control/contain contaminated sediments and prevent soil erosion, thereby preventing discharge of sediments and/or soils to coastal waters. Therefore, wetland mitigation/remediation would be consistent with this policy.

Policy 38: The quality and quantity of surface water and groundwater supplies, will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.

The groundwater and surface water within one mile of the landfill is not used as a source of drinking water. Lake Erie, located approximately 2 miles west of the site is the source of municipal water for the area.

The purpose of placing the final cover systems over the landfill and implementing a wetland mitigation/remediation plan is to improve the groundwater and surface water quality on and adjacent to the landfill site. Therefore, the wetland mitigation project is consistent with this policy.

Policy 39: The transport, storage, treatment and disposal of solid waste, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land and scenic resources.

The Marilla Street landfill was closed in accordance with applicable 6NYCRR Part 360 and 373 requirements. Additional waste will not be disposed of in this landfill; therefore, this policy is not applicable.

Policy 40: Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

The goal of the focused feasibility study is to evaluate alternatives for mitigation/remediation of the wetlands adjacent to the Marilla Street Landfill. The mitigation/remediation efforts would increase the quality and functional value of these wetlands for fish and wildlife. In addition, the remediation/restoration efforts would improve the scenic quality of the area for human use. Therefore, the project is consistent with this policy statement.

3.0 CONCLUSION

The wetland mitigation/remediation project being evaluated by LTV Steel Company for the wetlands adjacent to the Marilla Street Landfill is consistent with the policies established by the New York Department of State Coastal Management Program.

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP, shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT

1. Name: LTV STEEL COMPANY
(please print)
2. Address: 3100 EAST 45TH STREET, CLEVELAND, OH 44127
3. Telephone: Area Code (216) 429-6539

B. PROPOSED ACTIVITY

1. Brief description of activity: Wetland mitigation at an inactive hazardous waste site (#915047)
See Attached Report for more details.
2. Purpose of activity: Clean-up/restoration of wetland areas.
3. Location of activity:

Erie	City of Buffalo	Hopkins and Marilla Streets
County	City, Town or Village	Street or Site Description

4. Type of federal permit/license required: Section 404 Clean Water Act
5. Federal application number, if known: Unknown
6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known: Freshwater wetlands permit (6NYCRR Part 663)
New York State DEC, Landfill Closure.

C. COASTAL ASSESSMENT Check either "YES" or "NO" for each of the following questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

	YES	NO
1. Will the proposed activity result in any of the following:		
a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)	___	X
b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)	___	X
c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)	___	X
d. Reduction of existing or potential public access to or along coastal waters? (19, 20)	___	X
e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10)	___	X
f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)	___	X
g. Siting of a facility essential to the generation or transmission of energy? (27)	___	X
h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)	___	X
i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)	___	X
j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)	___	X
k. Transport, stroage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)	___	X
l. Adverse effect upon land or water uses within the State's small harbors? (4)	___	X
2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:		
a. State designated freshwater or tidal wetland? (44)	X	___
b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17,)	___	X
c. State designated significant fish and/or wildlife habitat? (7)	___	X
d. State designated significant scenic resource or area? (24)	___	X
e. State designated important agricultural lands? (26)	___	X
f. Beach, dune or barrier island? (12)	___	X
g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)	___	X
h. State, county, or local park? (19, 20)	X	___
i. Historic resource listed on the National or State Register of Historic Places? (23)	X	___

	YES	NO
3. Will the proposed activity require any of the following		
a. Waterfront site? (2, 21, 22)	___	X
b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)	___	X
c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)	___	X
d. State water quality permit or certification? (30, 38, 40)	X	___
e. State air quality permit or certification? (41, 43)	___	X
4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document*)	___	X

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.

2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. In the space provided below or on a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

See Attached Report

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, ane will be conducted in a manner consistent with such program."

Applicant/Agent's Name: _____

Address: 3100 East 45th Street, Cleveland, OH 44127

Telephone: Area Code (216) 429-6539

Applicant/Agent's Signature: _____ Date: _____

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the New York State Department of State, Division of Coastal Resources and Waterfront Revitalization, 162 Washington Avenue, Albany, New York 12231.

   a. Original signed form.
   b. Copy of the completed federal agency application.
   c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

*These state and local documents are available for inspection at the offices of many federal agencies, Department of Environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

MALCOLM PIRNIE

APPENDIX E

ALTERNATIVE COST ESTIMATES

MALCOLM PIRNIE

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND MITIGATION

ALTERNATIVE 1: NO ACTION

Item	Quantity	Units	Unit Cost	Total Cost
Inspection/Sampling Labor	200	hours	55.00	11,000
Analytical Cost	4	sampling event	3,115.75	12,463
Report Labor	150	hours	55.00	8,250
Mowing	5	events	2,000.00	10,000
			Annual Cost	$ 41,713
			30 Year PW For Above	469,597
			Capital Cost	8,250
			Total Present Worth	$469,597

MALCOLM PIRNIE

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND MITIGATION

ALTERNATIVE 2: LIMITED ACTION

Item	Quantity	Units	Unit Cost	Total Cost
Inspection/Sampling Labor	200	hours	55.00	11,000
Analytical Cost	4	sampling event	3,115.75	12,463
Report Labor	150	hours	55.00	8,250
Mowing	1	events	2,000.00	2,000
			Total Annual Cost	$ 33,713
			30 Year PW For Above	379,534
			Capital Cost	20,000
			Total Present Worth	$399,534

MALCOLM PIRNIE

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND MITIGATION

ALTERNATIVE 3: BACKFILL WETLANDS

Item	Quantity	Units	Unit Cost	Total Cost
Capital Costs				
Siltation Control	--	ls	10,000	10,000
Fill Wetlands				
- Fill Soil	66,500	cy	12	798,000
- Topsoil (6")	13,000	cy	20	260,000
- Seeding	16.1	ac	2,000	32,200
Health/Safety Plan	--	ls	20,000	20,000
Site Restoration	--	ls	15,000	15,000
Off-Site Wetland Mitigation[1]	16	ac	39,500	632,000
			Subtotal	$1,822,200
			35% Engineering Contingencies	637,770
			Total	$2,459,970
Operation and Maintenance Costs				
Inspection/Sampling Labor	400	hrs	55.00	22,000
Analytical Cost	4	sampling event	3,115.75	12,463
Report Labor	150	hrs	55.00	8,250
Mowing	5	events	2,000.00	10,000
Replacement Plants		lump sum		500
			Annual Cost	$ 53,213
			30 Year PW for Above	599,061
			Capital Cost	2,459,970
			Total Present Worth	$3,059,031

Notes:
[1] Cost does not include property costs.

Assumptions: *- No wetland dewatering will be required.*
- No wetland mitigation costs are included since insufficient area exists on-site.

MALCOLM PIRNIE

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND RESTORATION
ALTERNATIVE 5: EXCAVATE/DEWATER SEDIMENTS WITH ON-SITE DISPOSAL

Item	Quantity	Units	Unit Cost	Total Cost
Capital Costs				
Dewater Wetlands	10	months	4,000	40,000
Siltation Control	--	ls	10,000	10,000
Toc-of-Slope Haul Road - Soil - Gravel - Restoration	 12,100 1,400 2.5	 cy cy acres	 12 20 2,000	 145,000 28,000 5,000
Excavate Sediment	195,000	cy	4	780,000
On-Site Trucking	195,000	cy	2.50	487,500
Excavate/Stockpile Existing Cover	50,000	cy	4	200,000
Construct Berms	33,000	cy	15	495,000
Stabilize Sediments with Cement	195,000	cy	7	1,365,000
Backhoe for Mixing Cement	8	months	17,000	136,000
Cover Sediment Basin 18" Clay 12" Topsoil Reseed Basin Area	 30,000 20,000 12	 cy cy ac	 12 10 2,000	 360,000 200,000 24,000
Install Sheet Piling	15,000	SF	20	300,000
Line Excavated Areas Geocomposite 6" Soil Cover	 82,000 13,000	 sy cy	 4.50 12.00	 369,000 156,000
Verification Sampling	--	ls	150,000	150,000
Health/Safety	--	ls	255,000	255,000
General Site Restoration	--	ls	15,000	15,000
Wetland Vegetation Restoration	--	ls	40,000	40,000
			Subtotal	$5,765,700
			35% Engineering & Contingencies	2,018,000
			Total Cost	$7,783,700

MALCOLM PIRNIE

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND RESTORATION
ALTERNATIVE 5: EXCAVATE/DEWATER SEDIMENTS WITH ON-SITE DISPOSAL

Item	Quantity	Units	Unit Cost	Total Cost
Operation and Maintenance Costs				
Inspection/Sampling Labor	400	hrs	55.00	22,000
Analytical Costs	4	sampling event	3,115.75	12,463
Report Labor	150	hrs	55.00	8,250
Mowing	5	events	2,000.00	10,000
Replacement Plants	lump sum			500
			Annual Cost	$ 53,213
			30 Year PW for Above	599,061
			Capital Cost	7,783,700
			Total Present Worth	$8,382,761

MALCOLM PIRNIE

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND RESTORATION

ALTERNATIVE 6: INSITU SOLIDIFICATION/STABILIZATION

Item/Material	Quantity	Units	Unit Cost	1996 Estimated Total Cost
Capital Costs				
Construction Cost				
Mobilization/Demob	1	ls	200,000	200,000
Dewater Wetlands	8	months	4,000	32,000
Siltation Control	1	ls	10,000	10,000
S/S Agent Cost (Cement-Based)	40,000	cy	50.00	2,000,000
S/S Mixing Tool Operation	130,000	cy	20	2,600,000
Soil Cover (6" thick)	13,000	cy	12	156,000
General Site Restoration	1	ls	15,000	15,000
Wetland Vegetation Restoration	1	ls	40,000	40,000
West Ditch Restoration - 12" Soil Cover - Open Concrete Gutter - Reseed Ditch Area	 11,100 3,000 16.1	 cy lf acres	 12 10 2,000	 188,700 36,000 32,200
Remove Large Debris	—	ls	75,000	75,000
Remove Existing Vegetation Transport Vegetation Excavate/Stockpile Existing Cover Recover Vegetation - 18" Clay - 12" Topsoil - Reseed	7,200	 cy cy cy cy cy acres	 4.00 2.50 4.00 12.00 10.00 2,000	 28,800 18,000 6,000 30,000 15,000 1,200
Health/Safety		ls		260,000
Off-Site Wetland Mitigation[1]	4	acres	39,500	165,900
			Subtotal	$5,924,800
			35% Engineering & Contingencies	2,073,680
			Total Cost	$7,998,480

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LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND RESTORATION

ALTERNATIVE 6: INSITU SOLIDIFICATION/STABILIZATION

Item/Material	Quantity	Units	Unit Cost	1996 Estimated Total Cost
Operation and Maintenance Costs				
Inspection/Sampling Labor	400	hrs	55.00	22,000
Analytical Costs	4	sampling event	3,115.75	12,463
Report Labor	150	hrs	55.00	8,250
Mowing	5	events	2,000.00	10,000
Replacement Plants	lump sum			500
			Annual Cost	$ 53,213
			30 Year PW for Above	599,061
			Capital Cost	7,998,480
			Total Present Worth	$8,597,541

Notes: (1) Cost does not include property costs to mitigate on.

LTV STEEL COMPANY
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ALTERNATIVE 7: INSITU SEDIMENT CAPPING WITH SOIL/BENTONITE BARRIER

Item	Quantity	Units	Unit Cost	Total Cost
Capital Costs				
Dewater Wetlands	8	months	4,000	32,000
Remove Large Debris	--	ls	75,000	75,000
Siltation Control	--	ls	10,000	10,000
Remove Existing Vegetation	7,200	cy	4.00	28,800
On-Site Transportation	7,200	cy	2.50	18,000
Excavate/Stockpile Exisitng Cover	4,000	cy	4.00	16,000
Recover Vegetation				
- 18" Clay	2,500	cy	12.00	30,000
- 12" Topsoil	1,500	cy	10.00	15,000
- Reseeding	0.6	acres	2,000	1,200
Toe-of-Slope Haul Road				
- Soil	12,100	cy	12.00	145,200
- Gravel	1,400	cy	20.00	28,000
- Restoration	2.5	acres	20.00	5,000
Cap Wetlands				
- Geogrid	82,000	sy	2.30	188,600
- 12" Soil/Bentonite Layer	26,000	cy	47.50	1,235,000
- 6" Soil Cover	13,000	cy	12.00	156,000
Health/Safety	--	ls	65,000	65,000
Wetland Vegetation Restoration	--	ls	40,000	40,000
General Site Restoration	--	ls	15,000	15,000
			Subtotal	$2,203,800
			35% Engineering & Contingencies	771,200
			Total Cost	$2,975,000

LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND RESTORATION

ALTERNATIVE 7: INSITU SEDIMENT CAPPING WITH SOIL/BENTONITE BARRIER

Item	Quantity	Units	Unit Cost	Total Cost
Operation and Maintenance Costs				
Inspection/Sampling Labor	400	hrs	55.00	22,000
Analytical Costs	4	sampling event	3,115.75	12,463
Report Labor	150	hrs	55.00	8,250
Mowing	5	events	2,000.00	10,000
Replacement Plants	lump sum			500
			Annual Cost	$ 53,213
			30 Year PW for Above	599,061
			Capital Cost	2,973,000
			Total Present Worth	$3,572,061

Assumption: *West Ditch volume will decrease by an average of 6 inches. Twelve inches of sediment over the majority of the ditch will be excavated to remove vegetation and eighteen inches of soil and bentonite will be added (12" of soil/bentonite and 6" for vegetation). No new wetland mitigation area will be required.*

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MARILLA STREET LANDFILL
WETLAND RESTORATION

ALTERNATIVE 8: INSITU SEDIMENT CAPPING WITH GEOCOMPOSITE LINER

Item	Quantity	Units	Unit Cost	Total Cost
Capital Costs				
Dewater Wetlands	8	months	4,000	32,000
Remove Large Debris	--	ls	75,000	75,000
Siltation Control	--	ls	10,000	10,000
Remove Existing Vegetation	7,200	cy	4.00	28,800
On-Site Transportation	7,200	cy	2.50	18,000
Excavate/Stockpile Existing Cover	4,000	cy	4.00	16,000
Recover Vegetation				
- 18" Clay	2,500	cy	12.00	30,000
- 12" Topsoil	1,500	cy	10.00	15,000
- Reseeding	0.6	cy	2,000	1,200
Cap Wetlands				
- Geogrid	82,000	sy	2.30	188,600
- 12" Soil Base on Grid	26,000	cy	12.00	312,000
- Geocomposite	82,000	sy	4.50	369,000
- 6" Soil Cover	13,000	cy	12.00	156,000
Health/Safety	--	ls	65,000	65,000
General Site Restoration	--	ls	15,000	15,000
Toe-of-Slope Haul Road				
- Soil	12,100	cy	12	145,200
- Gravel	1,400	cy	20	28,000
- Restoration	2.5	acres	2,000	5,000
Wetland Vegetation Restoration	--	ls	40,000	40,000
			Subtotal	$1,629,800
			35% Engineering & Contingencies	570,400
			Total Cost	$2,200,200

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LTV STEEL COMPANY
MARILLA STREET LANDFILL
WETLAND RESTORATION

ALTERNATIVE 8: INSITU SEDIMENT CAPPING WITH GEOCOMPOSITE LINER

Item	Quantity	Units	Unit Cost	Total Cost
Operation and Maintenance Costs				
Inspection/Sampling Labor	400	hrs	55.00	22,000
Analytical Costs	4	sampling event	3,115.75	12,463
Report Labor	150	hrs	55.00	8,250
Mowing	5	events	2,000.00	10,000
Replacement Plants	lump sum			500
			Annual Cost	$ 53,213
			30 Year PW for Above	599,061
			Capital Cost	2,200,200
			Total Present Worth	$2,799,261

Assumption: *West Ditch volume will decrease by an average of 6 inches. Twelve inches sediment over the majority of the ditch will be excavated to remove vegetation and eighteen inches of soil will be added (12 inches below and 6 inches above geocomposite). No new wetland mitigation area will be required.*