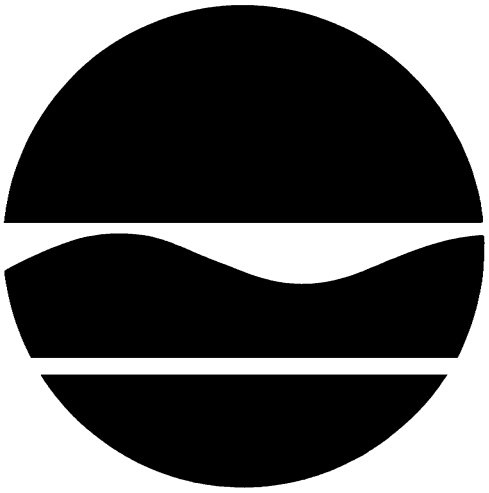
DECISION DOCUMENT

N.L. INDUSTRIES SITE

Depew(V), Erie County, New York

June 2005



Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the N. L. Industries Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, operation of a brass foundry at the site have resulted in the disposal of hazardous wastes, including specific metal parameters (primarily lead). These wastes have contaminated the surface and subsurface soils at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to surface soil; and

- a significant environmental threat associated with the erosion of surface and subsurface soils impacted by the metals.

To eliminate or mitigate these threats, the NYSDEC proposes the following remedy:

- To prepare a remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program;

- All contaminated soil/fill within the West Undeveloped Area and the western half of the Central Undeveloped area (minimum 4.1 acres) would be excavated until remedial action levels are met which is believed to be when native soil is encountered;

- Excavated soil would be placed in a containment cell in the east end of the Central Undeveloped area which will be properly engineered for parking of trucks. The height shall not exceed 6 ft. and will be no larger than 1.1 acres;

- All soil/fill unable to be accommodated under the containment cell will be disposed off-site at an approved disposal facility;

- An asphalt/vegetative cap would be constructed over the consolidated soil/fill area to prevent exposure to contaminated soils. The cover would consist of either a minimum of 18" of clean soil underlain by geo-synthetic liner (GSL) or a suitable layer of binder and asphalt top coat (6 inch minimum) underlain by GSL;

- The soil beneath the existing parking area to the west of the building, the Plant and office building and the east parking lot would remain in place and be maintained. Future development or alteration of these structures will require management of the soils in accordance with the Site Management Plan;

- Clean soil used for backfill of excavated areas would constitute soil with no analytes in exceedance of NYSDEC TAGM 4046 soil cleanup objectives or local site background as

determined by the procedure in DER 10 ("Tech Guide");

- A minimum 18 inch soil cover with a demarcation layer would be constructed in all non-paved areas to prevent exposure to contaminated soils. The cover would consist of clean soil of sufficient quality to support vegetation. Clean soil would constitute soil with no analytes in exceedance of NYSDEC TAGM 4046 soil cleanup objectives or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc) would be covered by a paving system or concrete at least 6 inches in thickness;

- Since the remedy results in contamination above unrestricted levels remaining at the site, a site management plan (SMP) will be developed and implemented . The SMP will include the institutional controls and engineering controls to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) provide for the operation and maintenance of the components of the remedy; (c) monitor the groundwater; and (d) identify any use restrictions on site development or groundwater use; and

- Imposition of an institutional control in the form of an environmental easement that would: (a) require compliance with the approved site management plan (SMP); (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Erie County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC I C/ EC certification on a periodic basis determined by the Department;

- The SMP will require the property owner to provide an Institutional Control/ Engineering Control (IC/EC) certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department annually or for a period to be approved by the NYSDEC, which would certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation an maintenance or soil management plan.

The proposed remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

This Decision Document identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference

The NYSDEC has issued this Decision Document as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the "Remedial Investigation/Feasibility Study (RI/FS) Report" December 2004, and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

NYSDEC Region 9 Office
270 Michigan Avenue

Buffalo, New York 14203
For an appointment contact:
Mr. Gregory Sutton
(716)851-7220

Depew Village Hall
Village Clerk Office
342 Manitou Street
Depew, New York 14043

SECTION 2: SITE LOCATION AND DESCRIPTION

The site is located at 3241 Walden Avenue in Depew, New York, which is a suburb to the east of Buffalo. The property is situated on the south side of Walden Avenue, approximately 584.42 feet west of the center line of Transit Road. The property is legally described as Part of Lot 68, Township 11, Range 7 of the Holland Land Company's Survey in the Village of Depew, Town of Cheektowaga, County of Erie. The subject property is approximately 7.5 acres in size. The site is located in a mixed commercial/industrial and residential area. Commercial/industrial properties adjoin the east and west sides of the subject site. The properties located across the street, on the north side of Walden Avenue, are a mixture of residential and some commercial sites (e.g. restaurant). The south side of the property is bordered by railway tracks, while a concrete mixing plant is situated further to the south. The topography of the subject property and immediate surrounding area has a generally flat grade. The property location is shown on Figure 1. The facility is currently used to operate paper fibre recycling activities. The site has one main building (63,400 ft^2) located at the east side of the property. The east side of the property is paved with asphalt for employee parking. A truck loading/unloading and trailer parking area is located west of the building. The area west of the fenced-off trucking yard, to the tree-covered area, is described as the central portion of the property, for the purpose of this report. This area is not used for the paper fibre recycling activities and is currently vacant. The former lagoon and marsh area was located at the south side of the central undeveloped area. The area between the central portion of the property and the west property line is defined as the west undeveloped area, for the purpose of this report. The west undeveloped area of the property is also vacant and is not used for on-site operations. This area is covered with imported fill, including construction debris (i.e., brick and large concrete fragments), and is partially occupied by heavy equipment and miscellaneous items stored by the adjacent business to the west.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The site property was first developed for industrial use in 1892. Past activities have included brass foundry operations conducted between 1892 and 1972 (i.e., 80 years), smelting operations carried out in the early part of the century, and the processing of babbitt (a soft alloy of tin, copper and antimony). These operations were performed by various companies:

1892-1899: Buffalo Brass Company (Buffalo Brass) at the east side of the property;

1899-1936: Magnus Metal Corporation (Magnus);

During the early 1900s, Empire Smelting Company conducted operations in the area of the current trucking yard; and

1936-1972: National Lead Company acquired the entire property from Magnus.

The name Magnus remained with the company, and was called Magnus Metal, a Division of National Lead Company. National Lead Company eventually changed its name to NL Industries Inc.

1972 - late 1980's: The property was sold to a company called Anglo that later became Domtar which operated on the property until the late 1980's.

Present: Norampac (a Division of Cascades Group) purchased the property in the late 1980's for operation of a paper cycling facility. Currently Metro Waste Paper Recovery Inc. (Metro Waste), member of Cascades Group, is operating a paper fibre recycling activities at the site. Current features of the property are presented in Figure 2.

3.2: Remedial History

Prior to completing this RI/FS, a number of investigations have been conducted on the subject property since the mid-1980s. NUS Corporation (NUS) conducted the first environmental investigation of the subject property for the United States Environmental Protection Agency (USEPA). NUS completed an off-site reconnaissance of the property in early 1986 and prepared a report entitled, *Potential Hazardous Waste Site Preliminary Assessment, N.L. Industries, Inc., 3241 Walden Avenue, Depew, NY, EPA Site ID Number NYD980531636*. On March 31,1987, NUS conducted a site inspection, on behalf of the USEPA, and collected 3 sediment and 4 soil samples for laboratory analyses. Elevated concentrations of several polycyclic aromatic hydrocarbons (PAHs) and metals (e.g. lead, copper, and zinc) were detected in the surficial soils. The results of this investigation are summarized in the NUS report entitled, *Site Inspection Report, N.L. Industries/Buffalo Plant, Depew, New York*, dated July 29, 1988.

In 1998, NYSDEC approached Norampac regarding the elevated PAHs and metals detected at the subject property and requested that Norampac carry out a subsurface investigation. Since that time, Norampac's consultant XCG has completed a number of subsurface investigations, in addition to the aforementioned Limited Phase 1 ESA (Environmental Site Assessment).

These investigations are summarized as follows:

- *Draft, Limited Phase 2 Environmental Site Assessment, 3241 Walden Avenue, Depew, New York,* February 10,1999*;*
- *Draft, Limited Phase 2 Environmental Site Assessment, Former Oil Tanks Area, 3241 Walden Avenue, Depew, New York,* February 10,1999;
- *Draft, Additional Phase 2 Environmental Site Assessment, 3241 Walden Avenue, Depew, New York,* May 18,1999;
- *Draft, Off-Site Surficial Soil Investigation, 3241 Walden Avenue, Depew, New York,* July 26,1999; and
- *Final Remedial Investigation/Feasibility Study (RI/FS), Former NL Industries Site, 3241 Walden Avenue, Depew, New York,* dated December 2004.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and Norampac, Inc. entered into a Consent Order on July 14, 1999. The Order obligates the responsible parties to conduct an Interim Remedial Measure and a RI/FS. Upon completion of the RI/FS, the company has requested to enter into New York State's Brownfield Cleanup Program and implement the remedy in accordance with those program requirements.

N.L. Industries entered into a Administrative Order with the USEPA in the fall of 2004 to investigate and remove lead impacted soil from approximately 30 off-site residential properties

north of the property. This work is expected to be completed in 2005.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and/or the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between May 2000 and November 2002. The field activities and findings of the investigation are described in the RI report.

The following activities have been conducted at the site:

- Research of historical information;
- Installation of 48 soil borings and 7 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Sampling of 7 new and existing monitoring wells;
- Collection of 1 surface water samples;
- Collection of 69 subsurface soil samples;
- Collection of 55 surface soil samples; and
- Collection of 2 aquatic sediment samples;

To determine whether the soil and groundwater contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code;
- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels"; and
- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments".

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI report.

5.1.1: Site Geology and Hydrogeology

In general, the shallow soils across the site consist of varying types of soil/fill overlying a native silty clay stratum. Bedrock was not encountered in any of the deep boreholes drilled across the entire site (26 feet was the deepest borehole). On site fill material consists of soils of varying grades, such as sand, gravel, silty sand, and sandy silt that has been mixed with metal waste (e.g. foundry sands, smelting residues, babbitt residues, process water residues, etc.). This fill material was produced from decades of historical on-site industrial operations and is referred to as "metal-impacted fill".

The depth of the fill at the site was generally between approximately 2 to 6 feet below grade with the exception of the marsh and lagoon areas. The consistency of the native silty clay was generally the same throughout the property. The bottom of the former lagoon extended to approximately 10 to 12 feet below ground surface. In the former marsh area, the metal-impacted fill was encountered to 4 feet below grade in both boreholes drilled. Both of these areas were saturated with perched water.

The overburden material along the rail siding consisted of rail ballast underlain by fill, which was comprised of sand and gravel, and silty clay mixed with metal waste from past on-site industrial operations.

The manufacturing building contains a concrete floor slab which was approximately 6 inches thick. The fill beneath the floor consisted of different grades of soil, including medium to coarse sand, with some silt and gravel, mixed with various metal waste from historical on-site industrial activities between 4 and 8 feet.

Site hydrogeology was determined by the installation of seven groundwater monitoring wells throughout the property. There are two different groundwater layers present beneath the site, and are separated by the top of the stiff native silty clay layer. Perched water was encountered in the fill material at various drilling locations; however, the natural shallow groundwater-bearing zone is situated in the native silty clay. The low hydraulic conductivity of the silty clay causes infiltrated surface water to remain "perched" in the fill layer. The silty clay layer becomes saturated at approximately 15 feet below grade. Based on site measurements, the shallow groundwater is estimated to flow in a northwesterly direction. Scajaquada Creek is located approximately 0.25 miles to the north of the subject site.

5.1.2: Nature of Contamination

As described in the RI report, many soil, and groundwater samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are semi-volatile organic compounds (SVOCs), and inorganics (metals).

For the purpose of discussion, the property has been divided into six main areas:

1. West undeveloped area;
2. Central undeveloped area;
3. Trucking yard, rail siding;
4. Parking Lot;
5. Building; and
6. Off-site Residential and Commercial Area.

A majority of the fill material at the property contains metals, in particular lead, at concentrations that exceeded the TAGM 4046 Cleanup Objectives. The Toxicity Characteristic Leaching Procedure (TCLP) results indicate that much of the metal-impacted fill exceeds the regulatory limit for lead. In general, soil samples that contained elevated levels of lead also had elevated copper and zinc concentrations, detected at levels that exceed TAGM 4046 guidance values.

Residual petroleum hydrocarbon impacts were also detected in the fill material, but to a much lesser extent than the metals. Petroleum impacts were limited to the south end of the parking lot, rail siding, south part of the trucking yard, and former lagoon/marsh area. The residual petroleum hydrocarbons were found in the same areas as the metal impacted fill material. The underlying very stiff to hard silty clay was found to act as an effective barrier to vertical migration of contaminants. This is supported by the analytical results from samples of the native soil which showed low levels of the contaminants of concern.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for waste, soil, and sediment. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in and compares

the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation. Figure 3 presents the sample points across the site.

Surface Soil

Surface soil sampling (0-2 inches) was limited in the Remedial Investigation to the West Undeveloped Area and areas directly along Walden Avenue and the CSX Rail line. This was done because the remaining areas of the site have either soil (placed as part of the IRM), pavement or building structure in place which limits exposure. Prior to placement of the soil cover IRM, that is further discussed in Section 5.2, the Central Undeveloped Area contained elevated levels of copper, iron, lead and zinc in surface soils that exceeded TAGM - 4046 guidance values. As an example, lead values ranged from 4,700 ppm to 29,000 ppm compared to a guidance value of 400 ppm.

West Undeveloped Area: Nine Surface soil samples were collected within this area. Lead was determined to be the primary Chemical of Concern (COC). The concentration of lead in surface soils in this area ranged from 89 ppm to 330 ppm which were all below the guidance value of 400 ppm

Walden Avenue Right of Way: Eleven surface soil samples were collected along the northern property line between the fence line and Walden Avenue. The concentration of lead in surface soils in this area ranged from 280 ppm to 11,000 ppm. Concentrations appeared to increase from west to east. The highest concentration (11,000 ppm) was detected adjacent to the West-Central Undeveloped Areas.

Rail Road Siding: Twelve surface soil samples were collected along the railroad berm on the southern property line of the site. The concentration of lead in surface soils in this area ranged from 380 ppm to 13,000 ppm. Concentrations appeared to increase from west to east. The highest concentration (13,000 ppm) was detected adjacent to the Main Plant Building.

Subsurface Soil

Central Undeveloped Area (lagoon/marsh area): The physical attributes of this area include a former wastewater lagoon and a low marsh area. Soil samples were collected from the fill material in the former lagoon. The concentration of a number of metals exceeded the TAGM-4046 Cleanup Objectives including; arsenic, beryllium, mercury, cadmium, chromium, copper, iron, lead, nickel, and zinc. Of greatest significance are the elevated concentrations of lead, and to a lesser extent copper and zinc. The concentrations of copper ranged from 1,900 ppm to 54,000 ppm compared to a guidance value for this parameter of 25 ppm. Zinc concentrations ranged from 1,700 ppm to 89,000 ppm compared to the guidance value for zinc of 20 ppm. For these same samples, the concentration of lead was 1,600 ppm to 86,000 ppm compared to a typical range of 200 to 500 ppm in urban areas. A typical guidance value of 400 ppm was used for comparison purpose. Soil samples from the underlying native silty clay were also analyzed to determine if the metals were migrating vertically downwards. The concentrations of copper, lead, and zinc in the underlying native silty clay were significantly lower than the upper fill material. The copper and zinc concentrations ranged from 30 to 48 ppm, and 74 to 120 ppm, respectively, while the concentrations of lead ranged between 18 ppm and 50 ppm.

Samples of the fill material were collected from the former marsh area, which is adjacent to the west of the former lagoon. These samples also contained a number of metals that exceeded guidance values, including elevated concentrations of copper (11,000 ppm), lead (7,900 pm), and zinc (15,000 ppm). A soil sample from the underlying native silty clay unit

contained relatively low concentrations of copper (45 ppm), lead (41 ppm) and zinc (90 ppm).

Samples of the fill material from the former lagoon and marsh were also analyzed for volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs) to address the reported historical #2 fuel oil release located in this area. The samples exhibited a mild odor and sheen and several PAHs were detected at low levels (less than 1 ppm). While the PAHs may be the result of the former spill, they also could be the result of the general industrial nature of the fill material. The analysis did not detect VOCs above the laboratory's method detection limits (MDLs).

Remaining Central Undeveloped Area: Soil samples were collected in the remaining central undeveloped area beyond the former lagoon and marsh. Analytical results of the fill material in the general central undeveloped area indicated lead concentrations ranging from 4,700 ppm to 39,000 ppm, which exceed the guidance value of 400 ppm. Two native silty clay samples were analyzed for metals and showed lead concentrations between 22 ppm and 51 ppm.

Several soil/fill samples from the central undeveloped area were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals analysis to determine the soil waste classification under Part 371, New York Codes, Rules, and Regulations (6NYCRR). The sample with the lowest total lead concentration, MW98-2 (1,600 ppm) had a leachate concentration of 8.7 mg/l. Soil sample BH98-1 had a total lead concentration of 86,000 ppm and a leachate concentration of 210 mg/l. The concentration of lead in the leachate extracted from each sample exceeded the regulatory level of 5 ppm.

In summary, soil sampling at 21 locations in the central undeveloped area has shown that lead in the fill material is present at concentrations exceeding the guidance value of 400 ppm throughout this area, from boundary to boundary. These elevated lead concentrations ranged between 1,600 ppm to 86,000 ppm. The concentrations of lead in the underlying native silty clay (18 to 51 ppm) were significantly lower than the fill and were well below the TAGM-4046 value. TCLP analysis of chosen samples all exceeded the regulatory limit of 5 ppm.

West Undeveloped Area

The west undeveloped area is defined as the land extending from the fenced-in central area to the west property line. This area is essentially vacant with the exception of the storage of some heavy and miscellaneous equipment by the neighboring business to the west. Soil samples were collected from 10 boreholes. The soil quality in the west undeveloped area is somewhat different than in the central undeveloped area, as the lead concentrations in the fill varied throughout this section of the property. In fill material samples lead concentrations ranged from 210 ppm to 20,000 ppm. The low and high concentrations of lead are not located in clearly defined areas. Rather, the elevated lead concentrations in the fill material are scattered sporadically throughout the west undeveloped area. This may be a result of random historical placement or grading of metal wastes.

The fill material samples from four locations (BH99-1, BH99-3, BH99-6, and BH99- 7) were analyzed for TCLP metals to determine the soil waste classification. The results showed concentration of lead in the leachate extracted from BH99-7 was 17 ppm, which exceeds the regulatory level of 5 ppm. The total lead detected in this fill sample was 8,400 ppm. The remaining sample results were all below the laboratory MDL of 0.022 ppm. Samples of the underlying native silty clay showed that the lead concentrations ranged from 13 to 28 ppm.

Trucking Yard and Rail Siding

Trucking Yard: The exterior operational area of the property is comprised of the trucking yard

located adjacent to the west side of the building and the rail siding situated along the south side.

The analytical results of fill material collected from the trucking yard were similar to those found in the central undeveloped area. Fill material samples contained a number of metals which exceeded the guidance values. The concentrations of copper, lead, and zinc exceeded the TAGM 4046 values in all fill samples. The copper concentrations ranged from 2,700 ppm to 60,000 ppm which exceeds the guidance value of 25 ppm. The zinc concentrations ranged from 1,700 ppm to 55,000 ppm which exceeded the guidance value for zinc of 20 ppm. The lead concentrations in the fill were well above the guidance value of 400 ppm and ranged in concentration from 2,000 ppm to 31,000 ppm. The fill material was also analyzed for TCLP metals. The concentrations of lead in the leachate ranged from 21 ppm to 89 ppm for samples with corresponding total values of 7,700 ppm to 18,000 ppm.

Petroleum hydrocarbon odors were detected in the fill material at boreholes BH99-10 and BH99-19 located near the south side of the trucking yard. Samples of the fill material from these locations were analyzed for VOCs and PAHs. Concentrations of 1,2,4-trimethylbenzene (0.11 ppm), benzene (0.026 ppm), and xylenes (0.145 ppm) were detected which did not exceed the guidance values of 3.4 ppm, 0.06 ppm and 1.2 ppm, respectively. Acetone (1.7 ppm) and methylene chloride (0.47 ppm) were also detected at concentrations that exceeded the guidance values for each compound (0.20 ppm and 0.10 ppm, respectively). In fill material samples, nine PAH parameters slightly exceeded the guidance values (less than 1 ppm).

Similar to the undeveloped portions of the property, the analytical results of the underlying native silty clay in the trucking yard showed concentrations of lead ranged from 16 ppm to 32 ppm. Copper was also detected above guidance values between 30 ppm and 76 ppm.

Rail Siding Area: Samples of the fill material showed concentrations of copper ranged from 2,600 ppm at the east end of the rail siding to 24,000 ppm to the west. These values are well above the guidance value of 25 ppm. The concentrations of zinc ranged between 1,800 ppm to 12,000 ppm, compared to the guidance value of 20 ppm. The concentrations of lead in the fill material ranged from 1,900 ppm to 13,000 ppm were all above the guidance value of 400 ppm. The fill material samples were analyzed for TCLP metals. The maximum concentration of lead ranged from 1.1 ppm (total lead was 1,900 ppm) to l00 ppm (total lead was 7,700 ppm).

Petroleum hydrocarbon odors and an oily sheen were observed in the fill material under the rail siding. Soil samples were collected and analyzed for VOCs and PAHs parameters. While low concentrations of benzene, xylenes, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected, only methylene chloride exceeded its guidance value (0.10 ppm) with a maximum concentration of 0.53 ppm. Fifteen PAH compounds were also detected in all the subsurface samples. Benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, and dibenzo(a,h)anthracene were detected above guidance values in a range of 1.2 to 8.9 ppm.

The analytical results of the underlying silty clay samples along the rail siding were similar to those detected in other areas of the property, except for BH99-15. The concentrations of copper and zinc slightly exceeded the guidance values. Generally the lead concentrations was similar to other native soil samples (less than 20 ppm) with the exception of BH99-l5 which was 6,500 ppm.

Building and Parking Lot

The subsurface conditions under the building and parking lot located at the east side of the property were evaluated separately since the contaminants in these areas are already covered by concrete and

asphalt, respectively. Sampling in the parking lot was conducted to address two areas. The initial testing focused on the south side of the parking lot. Three oil tanks were formerly stored in this area, two of which were located below grade in a concrete-lined basement. The second investigation was carried out from the center to the north end of the parking lot to determine the general quality of the fill material underlying the asphalt. Several soil samples were collected of the material used in and around the former oil tanks basement. The results of this sampling detected several metals present. The prominent parameters were again copper, zinc, and lead at concentrations much lower in this fill than the fill located elsewhere on the property. Copper, lead and zinc were detected at ranges of (36 ppm - 1,500 ppm), (8 ppm -1,500 ppm), and (18 ppm - 760 ppm), respectively.

VOC and PAH analyses were conducted on some of the soil samples in the area of the tank basement because of evidence that soil contained a slight sheen and mild hydrocarbon odor. Results of the analysis of VOCs showed no VOCs above detection limits with the exception of acetone which was detected just slightly above the guidance value of 0.20 ppm. While twelve PAHs compounds were also detected in all the subsurface samples, only benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene, were detected above guidance values in a range of 0.13 to 0.9 ppm. The fill material sample from BH5 was also analyzed for PCBs. The results indicate that total PCBs were below the laboratory's MDL of 0.076 ppm.

Parking Lot: Sample results showed this area to be similar to the fill material collected from other areas of the site. Elevated levels of copper, zinc and lead were detected at maximum concentrations of 38,000 ppm 30,000 ppm and 22,000 ppm, respectively. Results of the analysis for TCLP metals showed a concentration of lead in leachate of 7.0 ppm (total lead was 6,000 ppm), which exceeded the regulatory level of 5 ppm.

Building: Boreholes were drilled through the building floor slab and placed at different sections of the building in an effort to develop a good understanding of the subsurface conditions beneath the structure. Samples of the fill material showed concentrations of copper ranged from 630 ppm to 36,000 ppm. These values are well above the guidance value of 25 ppm. The concentrations of zinc ranged between 500 ppm to 30,000 ppm, compared to the guidance value of 20 ppm. The concentrations of lead in the fill material ranged from 860 ppm to 27,000 ppm were all above the guidance value of 400 ppm. Two native silty clay samples from beneath the building were chemically analyzed to determine if the metals were migrating vertically downwards. Similar to the results elsewhere on the property, the lead concentrations in the silty clay (25 ppm and 60 ppm) were below the guidance value.

A slight petroleum odor and a slight oily sheen were detected in four of the boreholes drilled through the floor slab. Samples of the fill material were analyzed for VOCs and PAHs. Acetone was detected in all samples at concentration slightly exceeding (0.25 ppm max.) guidance value of 0.2 ppm. 2-Butanone and tetrachloroethene were also detected at concentration below their respect guidance values. While fourteen PAHs compounds were also detected in the subsurface samples, only benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and dibenzo(a,h)anthracene , were detected above guidance values in a range of 0.07 to 2.0 ppm.

Figure 4 shows the Proposed Remediation Plan to address the lead contamination on-site.

Off-site Residential And Commercial Areas

In September 2003 the NYS Department of Health (DOH) in co-operation with the federal Agency for Toxic Substances and Disease

Registry (ATSDR), issued a Health Consultation on the off-site residential properties adjacent to the site. Initial samples collected in 1999 along the street curb of Walden Avenue show lead concentrations to range from 450 ppm to 1400 ppm. As the sampling area was expanded to the northeast additional samples showed lead concentrations in the range of 73 ppm to 5300 ppm in surface soils. In total 131 soils samples were collected from 33 residential lots northeast of the plant site. Of these 33 properties 19 had lead concentrations exceeding the guidance value of 400 ppm. Subsequent sampling by USEPA has increased the number of effected properties to 25. In general elevated lead values were limited to the upper 6 to 12 inches of soil. The elevated lead concentrations in this area are suspected to be from air borne deposition of contaminants from historical manufacturing operations at the facility.

Groundwater

The analysis of site groundwater indicated elevated concentrations of iron, magnesium, and sodium. The concentrations of lead in all groundwater samples were below the TOGS 1.1.1 Standard (25 ppb), except for MW98-3 (765 ppb). This elevated concentration may have been a result of excessive amounts of suspended solids in the water, as the turbidity at the time of sampling was relatively high (100 NTUs). This elevated concentration of lead in the groundwater appears to be an isolated occurrence, based on the results of other testing throughout the property. Groundwater from monitoring wells MW98-2, MW98-4, and MW99-2 were also analyzed for VOCs, SVOCs, pesticides, and PCBs. The analytical results were either below the laboratory's detection limit or detectable but below the TOGS 1.1.1 Standards or Guidance Values. Although there are some exceedances of the TOGS 1.1.1 Standards or Guidance Values, with respect to bromide, metals, and PAHs, these values were developed for groundwater that is used as a source of drinking water. The subject property and surrounding area is serviced by a municipal drinking water supply, which draws its water from a surface water body. Since the subject property and surrounding land is situated in a well developed urbanized area, the use of water supply wells are not expected to exist in the study area. Given that the minor exceedances of a few select compounds are based on drinking water standards and the subject property area does not use groundwater for potable purposes, these elevated concentrations are not considered to be a significant concern.

Storm Sewer Sediment

To address concerns regarding the potential off-site migration of surface soil particles to the storm water sewer system, sediment samples from a catch basin located on the south side of Walden Avenue, in front of the trucking yard and Scajaquada Creek, near the outfall of the storm sewer, were collected and analyzed for metals. The lead concentration in the sediment sample from the catch basin (SEDOO-1) was 1,100 ppm, which exceeds the guidance value of 400 ppm. The source of the lead is most likely rainwater carrying impacted surface soil particles to the catch basin in the trucking yard, which is connected to the storm sewer.

The lead concentrations in the sediment near the outfall ranged from 520-589 ppm, which is above the guidance value of 110 ppm. Sampling upstream (184 ppm) and downstream (55 ppm) reflects the impacts from urban runoff to the creek in this area.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

5.2.1: On-Site Activities

In July 1999, Norampac, Inc. implemented a IRM program in the central portion of the property. The IRM consisted of constructing a hydroseeded-topsoil cover and erecting a chain

link fence surrounding this area. In the fall of 2004 the owner installed new concrete truck load pads, a new scale pit and paved the active parking area directly west of the building structure. Contaminated soil from this work was consolidated on site and was covered with clean-soil and seeded. These actions were carried out to eliminate potential direct human exposure with the metals impacted fill, until a final remedial solution was developed. The actions eliminated the potential for direct contact with site contaminants and the transport of contaminants off-site through dust or surface water run-off mechanisms.

5.2.1: Off-site Activities

As discussed in Section 4, N.L. Industries entered into an Administrative Order with the USEPA in the fall of 2004 to investigate and remove lead impacted soil from approximately 30 off-site residential properties north of the Site on the North side of Walden Avenue. This work is expected to be completed in 2005. Specific information on the project can be found by contacting USEPA at (716) 283-7626.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5 of the RI report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

At this site, contamination exists in subsurface soils. For a complete exposure pathway to occur, persons would have to come into contact with the contaminated soil or inhale lead contaminated soil particles. Exposure to these media could occur through maintenance activities which might disturb the soil at the site and fugitive dust. Currently, the potential pathways of exposure are for employees of the facility, and utility and maintenance workers performing subsurface work. These potential pathways of exposure are:

* Dermal (skin) contact with contaminated subsurface soils; and

* Inhalation of contaminated particulates.

The site is located in an industrial area and is not readily accessible to the public or workers at adjacent businesses. All occupied structures in the area are served by public water. Completed pathways may occur in the future for utility workers or site workers during subsurface construction work activities.

5.4: Summary of Environmental Impacts

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts

include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The following environmental exposure pathways and ecological risks have been identified:

- Storm drain sediment samples indicate that erosion of contaminated soils is occurring which threatens the creek; and

- To a lesser extent site contamination has also impacted the groundwater resource in the upper clay/silt unit. Metals such as lead and iron are detected at or slightly above groundwater standards. The effected groundwater is not a source of drinking water in the area. It is noted that the entire area is served by a public water system.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to lead in surface and subsurface soils;

- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards;

- the release of contaminants from surface soil into surface water through storm water erosion; and

- the release of contaminants from surface soil into the air through wind borne dust.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards; and

- Prevent human ingestion, contact and/or inhalation of soil having lead concentrations in excess of 400 ppm.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the N.L. Industries Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated media of concern, e.g., soils, at the site.

Alternative #1**: No Further Action**

Present Worth: $196,788
Capital Cost: $0
Annual OM&M:
(Years 1-30): $10,040

Alternative 1: No Further Action

The No Further Action alternative recognizes remediation of the site conducted under a previously completed IRM as discussed previously in Section 5.2. To evaluate the effectiveness of the remediation completed under the IRM, only continued monitoring is necessary.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Limited Action - Groundwater Monitoring, Fencing and Site Use Restrictions

Present Worth: $221,788
Capital Cost: $25,000
Annual OM&M:
(Years 1-30): $10,040

Alternative 2 is an extension to the No Action alternative. This scenario also involves groundwater monitoring and maintaining the existing asphalt cap and concrete building floor. Additional actions include access and restrictions to the use of the site. Fencing would be placed around the perimeter of the property to limit entry by potential off-site receptors. Chain-link fencing and lockable gates already exist in the trucking yard and in the area of the rail siding. In addition, a chain-link fence was erected in the central undeveloped area. Fencing would not be required in the parking lot as there is no exposed metals-impacted fill in this area. As such, the only part of the property requiring the construction of a new fence would be the west undeveloped area. Restrictive covenants can be imposed on the use of the property. Regular inspection, maintenance of the caps along with use restrictions and reporting would be required under an environmental easement, if this alternative were implemented.

Alternative 3: Soil Consolidation and Capping

Present Worth: $1,947,516
Capital Cost: $1,612,396
Annual OM&M:
(Years 1-30): $21,800

Alternative 3 consists of a combination of excavation and consolidation of soil on site with placement of surface caps on existing site soils. Different cover materials would be placed in different sections of the property, depending on its use. This alternative would virtually eliminate any exposure to the metals-impacted fill. Inhalation of air-borne particulates would be prevented as wind scouring of the surface soil would no longer occur. Rainwater would run off the caps or migrate to on-site catch basins. The surface caps provide a barrier to direct contact, thereby eliminating any dermal uptake. Furthermore, the infiltration of rainwater into the ground would be significantly reduced, thereby minimizing any leaching potential in the soil. Contaminated soil from the west and western central areas (minimum 4.1 acres) would be excavated to meet TAGM 4046 cleanup goals and consolidated in the central area. Clean general fill and topsoil cover would be placed in the excavated areas and seeded. Consolidation of site soils in the central area would then be capped with an asphalt cover and engineered for use as truck parking. Consolidation of soils would be limited by the proper engineering design of the new parking area. Excess soil, not able to be consolidated under the cap, would be disposed off-site at a permitted landfill. The surface cap in the trucking

yard would consist of paving the entire area with asphalt. Minor grading would be conducted to facilitate proper drainage. Regular inspection, maintenance of the caps along with use restriction and reporting would be required under an environmental easement, if this alternative were implemented.

Alternative 4: Excavation and Off-site Disposal

Present Worth: $12,331,522
Capital Cost: $12,316,150
Annual OM&M:
(Years 1-30): $1000

Alternative 4 calls for the excavation of fill from the west and central undeveloped areas, trucking yard, and rail siding. The excavated soil would then be directly disposed of at an off-site landfill. The existing asphalt cap in the parking lot would remain intact. The site characterization indicated that the central undeveloped area, trucking yard, rail siding, and most of the parking lot contained leachable lead above the regulatory levels, and is therefore, classified as hazardous. In the west undeveloped area, the fill contained high levels of lead and was classified as hazardous at sporadic locations. As such, this area is a mixture of characteristically hazardous and non-hazardous materials. Clean soil and gravel (for the trucking yard) would be imported and backfilled in the excavated areas. In addition, a vegetated topsoil layer would be placed in the west and central undeveloped area, to restore this part of the property to reusable conditions. Removal of a contaminated site soil/fill would remove exposure to site contaminants. Contaminated soil would remain under the existing building structure and parking lot and therefore use restriction and reporting would be required under an environmental easement, if this alternative were implemented.

Alternative 5: Soil Washing With Disposal On-site

Present Worth: $10,398,686
Capital Cost: $10,360,205
Annual OM&M:
(Years 1-30): $2,500

Alternative 5 consists of implementing soil washing at the west and central undeveloped areas, the trucking yard, and rail siding. Impacted soil/fill would be excavated in these areas and hauled to an on-site washing unit. The cleaned soil would then be returned to the excavated areas, backfilled, and compacted. In the west and central undeveloped areas, a vegetated topsoil layer would be placed over the backfilled area, to restore the site to reusable conditions. The soil washing process will generate reduced volume of concentrated hazardous soil and contaminated water. The hazardous soil would then be disposed of off-site at a landfill. The existing asphalt cap in the parking lot would remain intact. Contaminated soil would remain under the existing building structure and parking lot and therefore use restrictions and reporting would be required under an environmental easement, if this alternative were implemented.

Alternative 6: Insitu Chemical Fixation and Capping

Present Worth: $4,640,740
Capital Cost: $4,305,620
Annual OM&M:
(Years 1-30): $21,800

Alternative 6 consists of carrying out in-situ chemical fixation at the west and central undeveloped areas, trucking yard, and rail siding. The existing asphalt cap in the parking lot would remain intact. The proprietary compound, EnviroBlend®, would be mixed in-situ with conventional construction equipment (e.g. excavators, augers, etc.). This would meet the remedial action objective of reducing the leachable lead to below hazardous levels. To meet the remedial action objective of preventing exposure to soil containing total lead greater than 400 ppm, a cover would be placed over the stabilized soil. In the west and central undeveloped area, a surface cover consisting of vegetated topsoil would be used. The trucking yard would be paved with new asphalt.

Contaminated soil would remain under the existing building structure and parking lot and therefore use restrictions and reporting would be required under an environmental easement, if this alternative were implemented.

Alternative 7: Ex-situ Chemical Fixation and Off-site Disposal

Present Worth: $8,464,541
Capital Cost: $8,426,110
Annual OM&M:
(Years 1-30): $2,500

Alternative 7 is similar to Alternative 6, except the mixing of EnviroBlend® would be performed ex-situ and the treated soil would be disposed of at an approved solid waste landfill (i.e., non-hazardous). Disposal of the treated soil in this manner must meet the more stringent Universal Treatment Standard (UTS) value for lead listed in NY State's LDR regulation (6 NYCRR Part 376). Impacted fill from the west and central undeveloped area, trucking yard, and rail siding would be excavated and hauled to a central processing area. The impacted soil and reagents would be mixed in a pug mill, and subsequently hauled off-site for disposal. Clean soil and gravel would be imported to the property for backfill and compaction. In the west and central undeveloped area, a vegetated topsoil layer would be placed to restore this area to reusable conditions. The existing asphalt cap in the parking lot would be maintained in this alternative. Contaminated soil would remain under the existing building structure and parking lot and therefore use restrictions and reporting would be required under an environmental easement, if this alternative were implemented.

Alternative 8: Ex-situ Chemical Fixation and Capping on-site

Present Worth: $5,521,730
Capital Cost: $5,186,610
Annual OM&M:
(Years 1-30): $21,800

Alternative 8 is similar to Alternative 7, except that the treated soil would be managed on-site after completing the ex-situ mixing with EnviroBlend®. The existing asphalt cap in the parking lot would be maintained in this alternative. Impacted fill from the west and central undeveloped area, trucking yard, and rail siding would be excavated and hauled to a central processing area. The impacted soil and reagents would be mixed in a pug mill, and subsequently returned to the excavated areas for backfill and compaction. This would meet the remedial action objective of reducing the leachable lead to below hazardous levels. To meet the remedial action objective of preventing exposure to soil containing total lead greater than 400 ppm, a cap would be placed over the stabilized soil. In the west and central undeveloped area, a surface cover consisting of vegetated topsoil would be used. The trucking yard would be paved with new asphalt. Contaminated soil would remain under the existing building structure and parking lot and therefore use restrictions and reporting would be required under an environmental easement, if this alternative were implemented.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2 .

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Decision Document are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The NYSDEC is proposing Alternative 3, Soil Consolidation and Capping as the remedy for this site. The elements of this remedy are described at the end of this section. The proposed remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 3 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site because it best meets the criteria established for remediation at this site. It is

protective of human health and the environment, it permanently reduces the risks associated with the contaminants at the site, it is easily implementable and it allows for full use of the property in a beneficial manner. For these reasons, Alternative 3 is the preferred soil remedial management plan.

The advantages and disadvantages offered by the remedial alternative were weighed with respect to the seven evaluation criteria. The preferred alternative adequately protects human health and the environment in both the long and short term.
Alternative 3 (Soil Consolidation and Capping) has short-term impacts (e.g. noise and dust generation) which can easily be controlled.

Alternative 3 achieves long-term effectiveness by excavation and removal of contaminated overburden soils as well as capping and controlling the remainder of soils under an asphalt parking lot and building. It is recognized that contaminated soil will remain beneath the active building and parking area east of the building because it is not feasible to demolish an occupied building. It also does reduce the long term health or environmental threat since none of these soils are in contact with receptors. The need for property use restrictions and long-term monitoring is recognized.
Alternative 3 is is readily implementable.
Alternative 3 would greatly reduce the mobility of contaminants through capping. The effectiveness of onsite capping is dependent upon the long-term maintenance of the containment system.
The cost of alternative 3 is feasible when compared to the costs of other alternatives achieving similar remedial goals.
The estimated present worth cost to implement the remedy is $1,947,516. The cost to construct the remedy is estimated to be $1,612,396 and the estimated average annual operation, maintenance, and monitoring costs for 30 years is $21,800.

The elements of the proposed remedy, as shown in figure 4, are as follows:

1. To prepare a remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program;

2. All contaminated soil/fill within the West Undeveloped Area and the western half of the Central Undeveloped area (minimum 4.1 acres) would be excavated until remedial action levels are met which is believed to be when native soil is encountered;

3. Excavated soil would be placed in a containment cell in the east end of the Central Undeveloped area which will be properly engineered for parking of trucks. The height shall not exceed 6 ft. and will be no larger than 1.1 acres;

4. All soil/fill unable to be accommodated under the containment cell will be disposed off-site at an approved disposal facility;

5. An asphalt/vegetative cap would be constructed over the consolidated soil/fill area to prevent exposure to contaminated soils. The cover would consist of either a minimum of 18" of clean soil underlain by geo-synthetic liner (GSL) or a suitable layer of binder and asphalt top coat (6 inch minimum) underlain by GSL;

6. The soil beneath the existing parking area to the west of the building, the Plant and office building and the east parking lot would remain in place and be maintained. Future development or alteration of these structures will require management of the soils in accordance with the Site Management Plan;

7. Clean soil used for backfill of excavated areas would constitute soil with no analytes in exceedance of NYSDEC TAGM 4046 soil cleanup objectives or local site

background as determined by the procedure in DER 10 ("Tech Guide");

8. A minimum 18 inch soil cover with a demarcation layer would be constructed in all non-paved areas to prevent exposure to contaminated soils. The cover would consist of clean soil of sufficient quality to support vegetation. Clean soil would constitute soil with no analytes in exceedance of NYSDEC TAGM 4046 soil cleanup objectives or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc) would be covered by a paving system or concrete at least 6 inches in thickness;

9. Since the remedy results in contamination above unrestricted levels remaining at the site, a site management plan (SMP) will be developed and implemented . The SMP will include the institutional controls and engineering controls to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) provide for the operation and maintenance of the components of the remedy; (c) monitor the groundwater; and (d) identify any use restrictions on site development or groundwater use; and

10. Imposition of an institutional control in the form of an environmental easement that would: (a) require compliance with the approved site management plan (SMP); (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Erie County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC I C/ EC certification on a periodic basis determined by the Department;

11. The SMP will require the property owner to provide an Institutional Control/ Engineering Control (IC/EC) certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department annually or for a period to be approved by the NYSDEC, which would certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation an maintenance or soil management plan.

TABLE 1
Nature and Extent of Contamination
May 2000 and November 2002

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Acetone	0.32 – 1.7	0.2	10 of 18
	Methylene chloride	0.45 – 0.71	0.1	5 of 18
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	0.29 – 7.2	0.224 or MDL	18 of 24
	Benzo(b)fluoranthene	1.3 – 7.3	1.1	5 of 24
	Benzo(k)fluoranthene	2.1 – 4.4	1.1	15 of 24
	Benzo(a)pyrene	0.15 – 6.0	0.061 or MDL	15 of 24
	Dibenzo(ah)anthracene	0.21 – 1.5	0.014 or MDL	8 of 24
PCB/Pesticides	None Detected			
Metals	Arsenic	8.6 – 42	7.5 or SB	26 of 58
	Mercury	0.16 – 29	0.1	34 of 59
	Cadmium	1.2 – 33	1 or SB	39 of 69
	Chromium	11 – 940	10 or SB	64 of 69
	Copper	28 – 60,000	25 or SB	66 of 69
	Lead	520 – 86,000	400	35 of 69
	Zinc	26 – 89,000	20 or SB	68 of 69

TABLE 1
Nature and Extent of Contamination (Cont.)

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	None detected	-	-	-
Semivolatile Organic Compounds (SVOCs)	None detected	-	-	-
PCB/Pesticides	None detected	-	-	-
Metals	Arsenic	9.3 – 32	7.5 of SB	8 of 8
	Mercury	0.16 – 1.5	0.1	8 of 8
	Cadmium	1.1 – 11	1 or SB	26 of 30
	Chromium	16 – 250	10 or SB	29 of 30
	Copper	38 – 17,000	25 or SB	30 of 30
	Lead	1,800 – 19,000	400	17 of 30
	Zinc	180 – 26,000	20 or SB	30 of 30

TABLE 1
Nature and Extent of Contamination (Cont.)

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	None detected	-	-	-
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	0.9	0.002*	1 of 9
	Chrysene	1	0.002*	1 of 9
	Benzo(b)fluoranthene	1	0.002*	1 of 9
	Benzo(k)fluoranthene	0.9	0.002*	1 of 9
	Benzo(a)pyrene	1	ND*	1 of 9
	Bis(2-ethylhexyl)phthalate	7	5*	1 of 4
PCB/Pesticides	None detected	-	-	-
Metals	Antimony	14.7	3*	1 of 8
	Cadmium	6.5	5*	1 of 18
	Copper	220 – 628	200*	2 of 18
	Iron	302 – 7,160	300*	10 of 18
	Lead	26 - 765	25*	6 of 18

TABLE 1
Nature and Extent of Contamination (Cont.)

Sediments	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (SEL) (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	NA			
Semivolatile Organic Compounds (SVOCs)	NA			
PCB/Pesticides	NA			
Metals	Lead	55 - 589	110	2 of 4

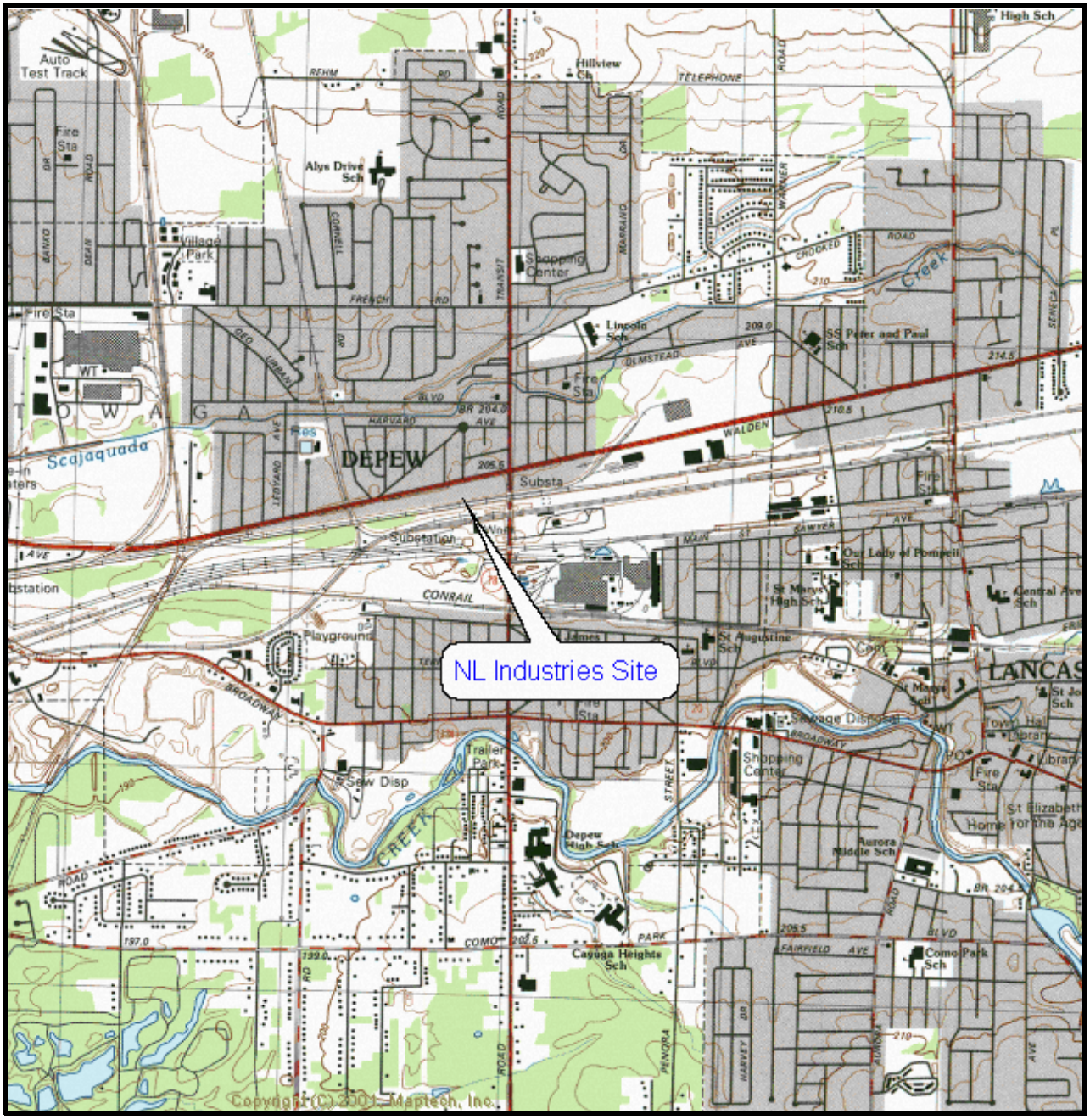
a ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter

[b] SCG = standards, criteria, and guidance values; {list SCGs for each medium}

[c] LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the LEL is exceeded, the impact is considered to be moderate.

Table 2
Remedial Alternative Costs
N.L. Industries Site
Depew(V), Erie County

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
1. - No Further Action	$0	$10,040	$196,788
2. - Limited Action - Groundwater Monitoring, Fencing and Site Use	$25,000	$10,040	$221,788
3. - Soil Consolidation and Capping	$1,612,396	$21,800	$1,947,516
4. - Excavation and Off-site Disposal	$12,316,150	$1000	$12,331,522
5. - **Soil Washing w/Disposal On-site**	$10,360,205	$2,500	$10,398,686
6. - Insitu Chemical Fixation and Capping	$4,305,620	$21,800	$4,640,740
7. - Ex-situ Chemical Fixation and Off-site Disposal	$8,426,110	$2,500	$8,464,541
8. - Ex-situ Chemical Fixation and Capping on-site	$5,186,610	$21,800	$5,521,730



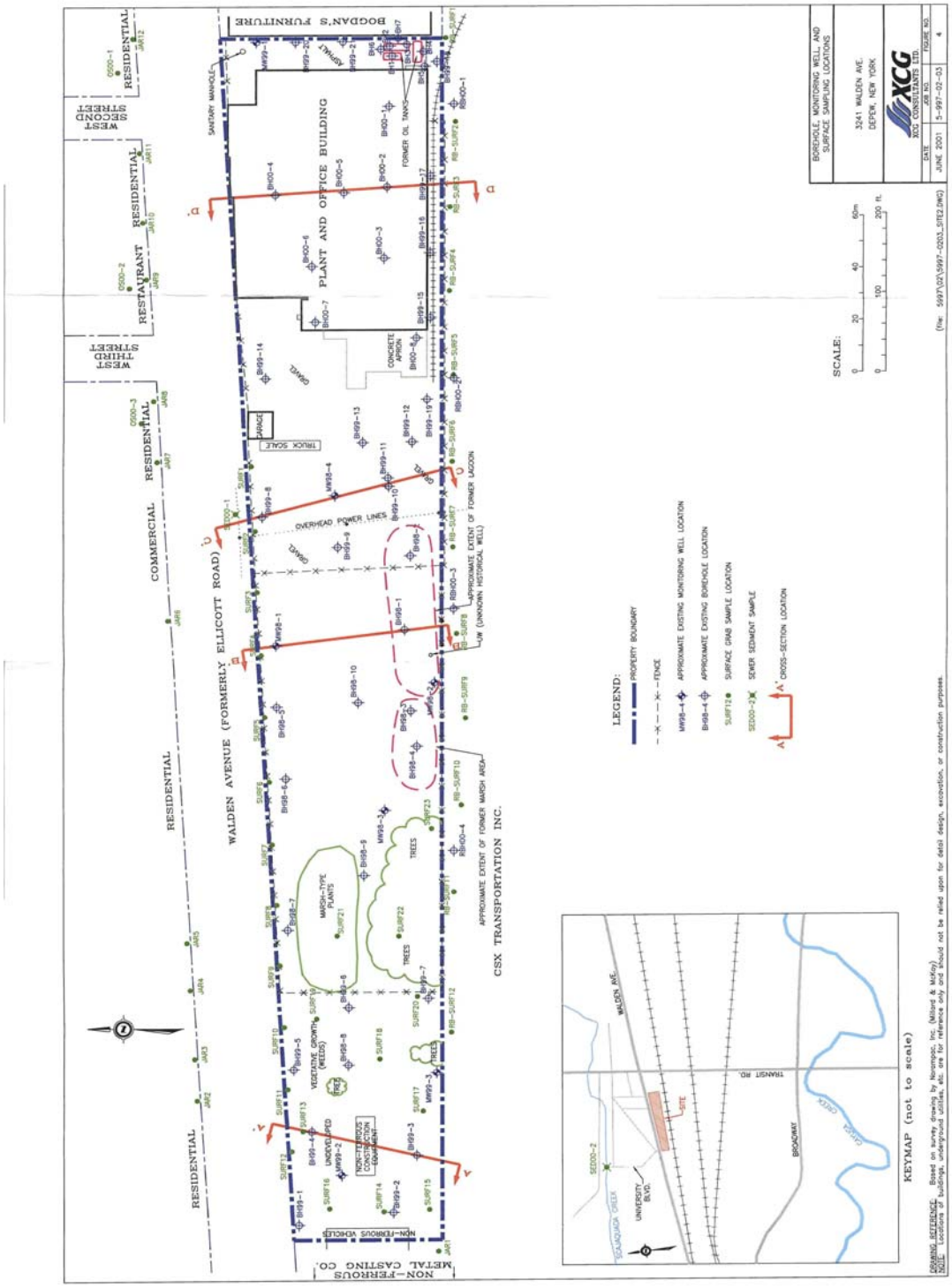
Source: Lancaster
1982 Geologic Survey 7.5 x15 Minute Topographic Quadrangle

SITE LOCATION MAP

N.L. Industries Site
Depew(V), Erie County
Project No. V00353-9

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Region 9 - Buffalo

Figure 1


BOREHOLE, MONITORING WELL AND SURFACE SAMPLING LOCATIONS
3241 WALDEN AVE.
DEPEW, NEW YORK
XCG
DATE
JUNE 2001
JOB NO.
5-997-02-03
FIGURE NO.
4
SCALE:
LEGEND:
PROPERTY BOUNDARY
FENCE
APPROXIMATE EXISTING MONITORING WELL LOCATION
APPROXIMATE EXISTING BOREHOLE LOCATION
SURFACE GRAB SAMPLE LOCATION
SEWER SEDIMENT SAMPLE
CROSS-SECTION LOCATION
KEYMAP (not to scale)
WALDEN AVE.
TRANSIT RD.
BROADWAY
CAZENOVIA CREEK
UNIVERSITY BLVD.
SITE
BOGDAN'S FURNITURE
PLANT AND OFFICE BUILDING
FORMER OIL TANKS
CONCRETE APRON
GARAGE
TRUCK SCALE
SANITARY MANHOLE
OVERHEAD POWER LINES
APPROXIMATE EXTENT OF FORMER LAGOON
UW (UNKNOWN HISTORICAL WELL)
APPROXIMATE EXTENT OF FORMER MARSH AREA
CSX TRANSPORTATION INC.
WALDEN AVENUE (FORMERLY ELLICOTT ROAD)
RESIDENTIAL
COMMERCIAL
RESTAURANT
WEST SECOND STREET
WEST THIRD STREET
NON-FERROUS METAL CASTING CO.
MARSH-TYPE PLANTS
VEGETATIVE GROWTH (WEEDS)
TREES
UNDEVELOPED
NON-HAZARDOUS CONSTRUCTION DEBRIS
NON-FERROUS VEHICLES
DRAINAGE DITCH
DRAWING REFERENCE: Based on survey drawing by Nanmopoc, Inc. (Millard & McKay).
NOTE: Locations of buildings, underground utilities, etc. are for reference only and should not be relied upon for detail design, excavation, or construction purposes.
(File: 5997\02\5997-0203_SITE2.DWG)