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CITY OF BUFFALO, ERIE COUNTY
DEPARTMENT OF COMMUNITY DEVELOPMENT

MAIN-LASALLE REVITALIZATION PROJECT

SOILS MANAGEMENT PLAN
PHASE I - SITE REMEDIATION

prepared for:

Buffalo Urban Renewal Agency
City of Buffalo
Buffalo, New York 14202

prepared by:

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SOILS MANAGEMENT PLAN
FOR THE
PHASE I - SITE REMEDIATION
AT THE
MAIN-LASALLE
REVITALIZATION PROJECT

PREPARED FOR

BUFFALO URBAN RENEWAL AGENCY
CITY OF BUFFALO
BUFFALO, NEW YORK 14202

PREPARED BY:

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REVISED FEBRUARY 1999

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 General Description of Project

The Buffalo Urban Renewal Agency (BURA) is proposing to redevelop an approximate 7 acre site in Buffalo's University District. The proposed redevelopment consists of the construction of 31 single family houses on the site, which extends along the former railroad right of way between Main and East Amherst Streets, beginning at or near the southeast corner of the intersection of Main Street and LaSalle Avenue and extending about half way to East Amherst Street. The site is bounded on the East by a former stone quarry which was partially backfilled with a variety of materials during the 1950's and 1960's; to the west, the site is bounded by several industrial properties, Bennett High School, a bowling alley and parking lots.

The site does not include any area where rock was excavated during the operations of the former quarry adjacent to the site, nor does it include any area where any fill has been placed within, on or over such areas.

Investigations conducted to date at the site, and adjoining parcels, indicated the top of bedrock to be high (i.e. at depths less than 15 feet) in the areas outside the quarry, and various contaminants to be present in the soils/fill both on the site and the adjoining quarry area. These contaminants are primarily limited to polynuclear aromatic hydrocarbons (PAHs) and metals.

1.2 Objectives of the Soils Management Plan

The primary objective of the soils management plan is to provide a description of how the soils/fill materials present at the site will be handled during the remediation and/or construction of Phase I of this project to minimize the risks to human health and the environment. Any subsequent phases of development will require a new, or revised, soils management plan.

1.3 Organization of this Plan

Section 2 of this plan presents a brief discussion of the site history and a description of the site. Section 3 presents an overview of the existing site conditions based previously on environmental investigations. Additionally, the nature and extent of contaminants detected in the subsurface materials and associated health risks are discussed. Section 4 provides an overview of the proposed site redevelopment. The proposed soils management strategies are outlined in Section 5. On-site soil handling procedures are discussed in Section 6 and Contractor requirements are outlined in Section 7. Section 8 discusses proposed radon testing and Section 9 presents methane gas testing and management strategies.

1.4 Citizen Participation

The proposed redevelopment project will potentially impact local residents, commercial businesses, McCarthy Park users, and others in the surrounding areas. In order to inform these groups, as well as other interested parties, about the various aspects of the redevelopment project, BURA will develop and distribute a series of fact sheets. All fact sheets, public mailings, and mailing lists will be submitted to the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) for review and approval ten days prior to distribution to the community.

These fact sheets will be distributed to district councilmen and other parties identified on the State Environmental Quality Review Act (SEQRA) mailing list which previously has been utilized for this project. Items that will be discussed in the fact sheets will include, but not be limited to:

- The scope of the redevelopment project and the organizations involved
- The nature and extent of contaminants present at the site
- Additional testing (e.g., radon and methane gas sampling)
- Community safety considerations (e.g. fugitive dust control, fencing, etc.)

- The type of construction activities to be performed
- The proposed construction schedule for completion of different construction tasks

Should it be necessary, BURA will hold a public informational meeting, prior to the start of construction.

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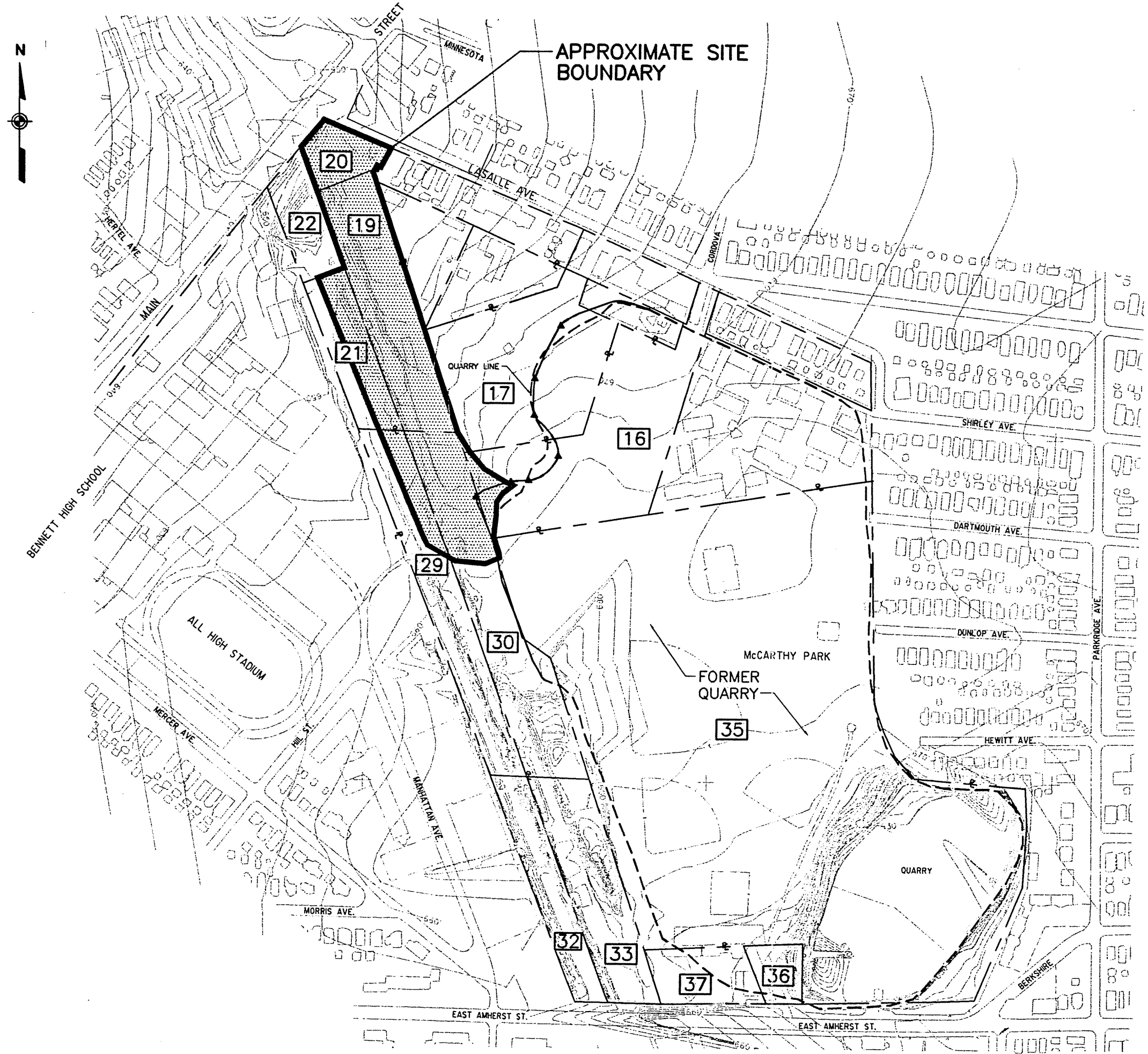

LEGEND

35 PARCEL NUMBER

300 0 300

SCALE IN FEET

MAIN–LASALLE
LIMIT OF STUDY AREA

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FIGURE 2–1

CC–4541

2.0 SITE HISTORY AND DESCRIPTION

2.1 Site Description

The overall proposed redevelopment site is comprised of several parcels (i.e., parcels 19, 20, and portions of parcels 16, 21, 29, and 30) totaling approximately 7 acres in area (Figure 2-1). In addition to the parcels contained within the proposed redevelopment site, URSG also investigated parcels 16, 17, 32, 33, 35, and 36 as shown on Figure 2-1. The site is located primarily along an abandoned Conrail right of way. The site is bounded by the Conrail right of way to the south; a former stone quarry to the east which was partially backfilled with a variety of materials; LaSalle Avenue to the north; and, industrial properties and Bennett High School to the west. Access to the site is via a roadway at the northern end of the site. The topography over the majority of the site is very irregular within the limits of the abandoned railroad ROW. This is primarily due to the cut associated with the former railroad tracks and to piles of soil/construction and demolition (C&D) material which have been disposed in this area. The surrounding areas are relatively flat.

The surface of the site generally is covered with a mix of grass and small bushes, although limited areas are open and stone (gravel or C&D) covered, with sparse vegetation.

2.2 Site Background

The Environmental Site Assessment report (Frontier Technical Associates, September 1994), which was prepared for parcel No. 16, indicates that the area east of the site was formerly operated by Buffalo Crushed Stone as a quarry for the production of crushed stone (Onondaga limestone). Quarrying operations originated in the early 1900's and continued into the late 1940's. Bulk loading and shipment of the stone was accomplished via the railroad along the western edge of the quarry. Following cessation of quarrying operations, the area occupied by the present reservoir was conveyed to the City of Buffalo. By 1951, filling of the quarry with waste materials, including coal ash, incinerator ash, household refuse, C&D materials, and putrescible wastes was well underway, particularly at the northern end. In 1960, the City acquired an adjoining 24.75 acres on the condition that the area be filled and used as a public park. By 1972, approximately 80 percent

of the quarry had been filled. The southern end of the quarry was left open, and is currently utilized as a stormwater retention basin by the Buffalo Sewer Authority. The southern two-thirds of the filled quarry area was covered with 2 to 3 feet of fill material and graded to create McCarthy Park. Conrail ceased operation of the railroad ROW and subsequently removed the railroad tracks. The northeast corner of the filled quarry was developed for residential use in the 1980's.

Due to the disposal of waste materials in the quarry, and the fact that it was not closed in accordance with applicable solid waste regulations, the quarry initially was listed on the NYSDEC Registry of Inactive Hazardous Waste Sites. The quarry subsequently was delisted by the NYSDEC based on the information gathered during both Phase I and Phase II investigations performed; however, the quarry was considered by the NYSDEC for further study under the Hazardous Substance Waste Disposal Study.

2.3 Previous Investigations

In 1985, RECRA Environmental, Inc. (RECRA) completed a Phase I Environmental Site Assessment of the quarry for the NYSDEC. This investigation consisted primarily of a historical data search, and no intrusive investigations or analytical testing were completed.

In the spring of 1989, Ecology and Environment (E&E) conducted a Phase II investigation of the quarry under contract to the NYSDEC. This investigation included an electromagnetic terrain conductivity (EM 31) survey, a magnetometer survey, drilling of 3 bedrock monitoring wells, air monitoring surveys, and collection and analysis of 8 waste, 8 soil and 3 groundwater samples. The results of the investigations indicated the following:

- The depth of the quarry is approximately 45 feet below the adjacent ground surface.
- The depth to groundwater in the bedrock wells ranged from 33 to 45 feet, with flow to the northwest.

- Soil samples exhibited PAHs at concentrations which exceeded the NYSDEC recommended soil cleanup objectives as presented in NYSDEC Technical and Administrative Guidance Memorandum: *Determination of Soil Cleanup Objectives and Cleanup Levels*. PAHs are typically associated with waste oils and incomplete combustion of fuels, and are often found associated with ash, cinders and railroad ties (creosote).

- The groundwater samples showed exceedances of the NYSDEC standards for Class GA water as presented in the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) *Ambient Water Quality Standards and Guidance Values*, for iron and magnesium.

- Waste samples exhibited concentrations of lead which exceeded the typical background levels for soils in the eastern United States as presented in the above-referenced NYSDEC soil cleanup document.

The results of the investigations are presented in E&E's report entitled, *Engineering Investigations at Inactive Hazardous Waste Sites in New York, Phase II Investigations, LaSalle Reservoir Site, Site No. 915033*, April 1991.

In September 1995, Frontier Technical Associates, Inc. (Frontier) conducted an Environmental Site Assessment (ESA) of the 5 acre parcel No. 16, located in the northern portion of the area. In general, this parcel straddles the northern quarry boundary, with about one half of the parcel located over the former quarry, and the other half located just north of the quarry highwall. This assessment included a search of historical site records, a review of environmental databases, installation of 7 borings, and collection and analysis of 4 composite soil samples.

The investigations indicated that the quarry area had been backfilled with up to 44 feet of fill materials consisting of gravel, sand, silt, clay, bricks, glass, cinders, ash, wood, metal, tar, and miscellaneous unidentifiable materials. Most of the fill materials were dry, although there appeared to be zero to two feet of water above the top of bedrock (bottom of fill). Contaminants detected in

the fill materials included Total Petroleum Hydrocarbons (TPH) and elevated concentrations of lead, mercury and zinc. PAHs were also present in one soil sample at concentrations above the NYSDEC recommended soil cleanup objectives. The results of the ESA are presented in a report entitled, *Environmental Site Assessment, Hill/Cordova Street Extension Area, Buffalo, New York*, dated September 12, 1995.

URSG conducted investigations in 1996 and 1997 to provide additional information pertaining to environmental and geotechnical conditions at the site and adjoining parcels for the redevelopment design. These investigations included test pit excavation/soil sampling and soil vapor surveys. Investigation results were used to perform a health risk assessment and to evaluate alternatives to remediate the site. Details of previous investigations conducted by URSG are summarized in this soil management plan and in the *Main-LaSalle Revitalization Project Site Investigation Report*, prepared by URSG (dated April 1997).

In order to determine the suitability of the onsite C&D material for use as backfill in both the residential and non-residential areas, a test pitting and soil sampling program was implemented in September 1998. The intent of the program was to provide visual characterization of the C&D materials at depth and to determine the levels of contamination, if any, present in the C&D material along the southern portion of the railroad ROW. A total of 9 test pits (TP-75 to TP-83) were excavated to depths ranging from 8 to 20 feet at the location shown in Appendix A, Figure A-1. Samples were collected and analyzed at a rate of 1 sample per 2500 cy of soil material for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and Target Analyte List (TAL) metals.

Based on the results of the analyses, no VOCs, pesticides or PCBs were detected at levels above the NYSDEC soil cleanup objectives. Several metals were detected at typical background levels for the City of Buffalo. Total carcinogenic(c) PAHs in all the samples were <10ppm and in several cases, were at or near 1 ppm. Results from the C&D materials sampling including test pit locations, test pit logs, analytical results and the data usability summary report are found in Appendix A.

Four additional test pits (TP-71 through TP-74) were excavated in the soil pile located in the northern portion of the site to determine its suitability for reuse at the site. None of the four soil samples exhibited levels of VOCs, pesticides or PCBs at levels which exceed NYSDEC recommended soil cleanup objectives. Total c-PAH levels ranged from none detected at TP-71 and TP-72 to 4.3 ppm at TP-73. Several metals were detected at concentrations typically found in the City of Buffalo. Test pit locations, logs and analytical results are found in Appendix A.

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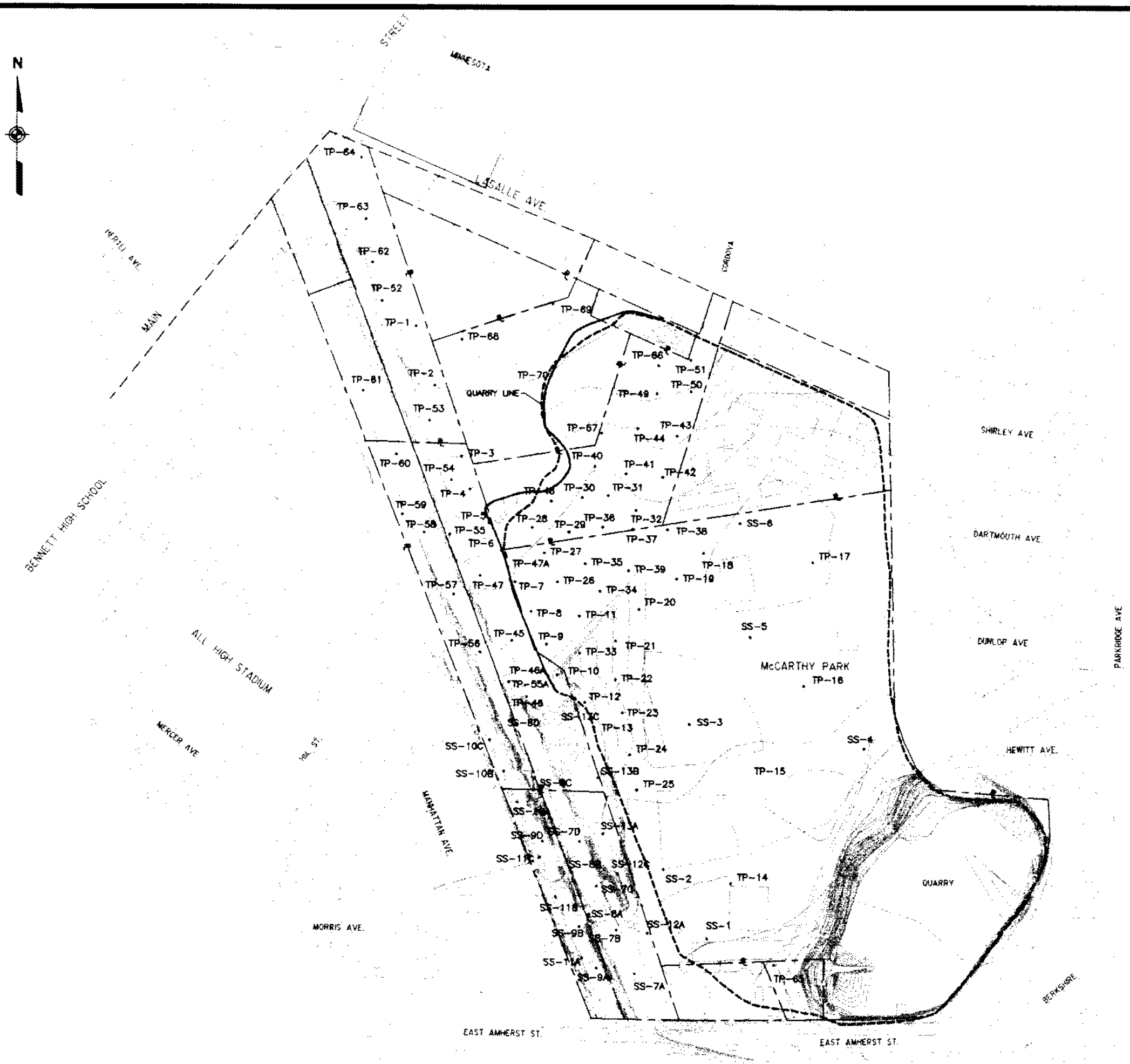

LEGEND

0'–10'

>10'

MAIN–LASALLE
DEPTH TO BEDROCK

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FIGURE 3–1

CC–4537

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N

STREET

MINNESOTA

LASALLE AVE.

CORDOVA

SHIRLEY AVE.

DARTMOUTH AVE.

DUNLOP AVE.

PARKRIDGE AVE.

HEWITT AVE.

BERKSHIRE

MAIN

KEPPEL AVE.

BENNETT HIGH SCHOOL

ALL HIGH STADIUM

MERCER AVE.

HILL ST.

MANHATTAN AVE.

MORRIS AVE.

EAST AMHERST ST.

McCARTHY PARK

QUARRY

QUARRY LINE

TP-64 TP-63 TP-62 TP-52 TP-1 TP-68 TP-61 TP-2 TP-53 TP-3 TP-60 TP-54 TP-4 TP-59 TP-5A TP-58 TP-5 TP-55 TP-6 TP-47 TP-57 TP-45 TP-56 TP-55A TP-46 TP-46A TP-47A TP-27 TP-7 TP-8 TP-9 TP-10 TP-11 TP-12 TP-13 TP-24 TP-25 TP-26 TP-28 TP-28A TP-29 TP-30 TP-31 TP-32 TP-33 TP-34 TP-35 TP-36 TP-37 TP-39 TP-20 TP-21 TP-22 TP-23 TP-69 TP-69A TP-70 TP-70A TP-71 TP-67 TP-66 TP-51 TP-49 TP-50 TP-43 TP-44 TP-40 TP-40A TP-41 TP-42 TP-38 TP-18 TP-19 TP-17 TP-16 TP-15 TP-14

SS-8D SS-13C SS-10C SS-10B SS-8C SS-10A SS-9D SS-11C SS-11B SS-9B SS-11A SS-9A SS-8B SS-7C SS-8A SS-7B SS-7A SS-13B SS-13A SS-12C SS-12A SS-6 SS-5 SS-3 SS-4 SS-2 SS-1

640 650 660 670 680 690

LEGEND

- FILL– SAND, GRAVEL, CRUSHED ROCK, C&D, ASH/CINDERS (BRICK, WOOD AND CONCRETE)
- ■ FILL – SAND, GRAVEL FOUNDRY SAND, C&D AND HOUSEHOLD DEBRIS
- ▲ FILL – CLAYEY SILT, SANDY SILT,
- ⬭ ASH, CRUSHED ROCK, HOUSEHOLD DEBRIS GARBAGE, AND PUTRESCIBLE WASTE (MAIN COMPONENT IS ASH)

300 0 300

SCALE IN FEET

MAIN–LASALLE
SOIL DELINEATION

URS CONSULTANTS, INC.

FIGURE 3–2

CC–4536A

3.0 EXISTING SITE CONDITIONS

3.1 High Bedrock Areas

Based on the field investigations, bedrock in the areas outside the limits of the quarry was typically encountered at depths ranging from 2 feet to about 10 feet. This depth increases in areas where C&D materials have been disposed above the original ground surface. This is particularly evident along the southern half of the Conrail ROW (parcels 30, 32 and 33). The depth to bedrock in the high bedrock areas is depicted on Figure 3-1. Bedrock was also exposed at various locations along the western side of the site, particularly in the railroad cut in parcels 30 and 33.

The bedrock, which is comprised of the Onondaga Limestone, is horizontally bedded, slightly weathered, and generally hard. The rock is both vertically and horizontally jointed/fractured. The bedrock surface is relatively flat to irregular, with a gentle dip to the south. Top of rock elevations range from about 665 feet to 676 feet along the western margin of the quarry; from about 659 feet to 662 feet just north and west of the quarry high wall; and, from 656 feet to 651 feet near the intersection of Main Street and LaSalle Avenue.

The northern portion of the quarry high wall was delineated by test pits excavated in parcels 16, 17, 30 and 35. The surveyed location of the high wall, as identified by the test pits in this area, is plotted on Figure 3-1.

3.2 Soil and Fill Materials

The various soil/fill materials encountered during the investigations are described below and are depicted on Figure 3-2.

The overburden encountered above the bedrock surface in the high bedrock areas (outside the quarry), consists primarily of fill material containing crushed rock, sand, railroad ballast, ash and C&D (concrete, brick, wood, etc.) materials, and/or native soils (silty sand/gravel/clay). This is particularly true in the high bedrock areas north and northwest of the quarry. In the southern portion

of the high bedrock areas (i.e. the southern portion of the railroad ROW along western margin of the site), the overburden consists of railroad ballast in the lower areas which formerly contained the railroad tracks, and C&D materials in the areas between and adjacent to the former railroad tracks.

Based on the test pits completed in September 1998, the C&D material consist primarily of a mixture of clay, silt, sand and gravel, with some localized pieces of concrete, brick, shot rock (gravel size), railroad ballast (cinders) and occasional pieces of wood. The soil pile in the northern portion of the site consists almost entirely of clay, silt sand and gravel, with occasional railroad ballast and pieces of concrete & brick.

Soil cover in the northern portion of the quarry area, between McCarthy Park and the high bedrock areas, generally consists of 4 to 6 inches of topsoil and 0 to 4 feet of sand/gravel and/or C&D material overlying predominantly coal ash/incinerator ash, with minor amounts of household debris (glass, metal, wood, etc.). The amount of household debris increases to the southeast.

Soil cover in the area of McCarthy Park generally consists of 4 to 6 inches of topsoil and 12 to 18 inches of silty sand/crushed stone/C&D material. This is underlain by fill materials composed primarily of ash (coal and incinerator), with varying amounts of foundry sands, fly ash, C&D material, household debris and putrescible wastes. The amount of household debris and putrescible wastes increases to the south.

3.3 Nature and Extent of Contamination

In order to assess the type and extent of contamination, the analytical results from samples collected during the investigation were compared with the NYSDEC soil cleanup objectives. A summary of the analytical data and the comparison with the NYSDEC soil cleanup objectives is presented in Appendices A and B.

Evaluation of the analytical data indicated that VOCs, SVOCs, and metals were detected in soils across the site and the adjoining parcels and a limited number of VOCs were detected in the soil vapor survey (SVS) samples. The distribution and nature of these contaminants are discussed below.

3.3.1 Volatile Organic Compounds (VOCs)

VOCs, including trichloroethylene (TCE), toluene, methylene chloride, acetone, vinyl acetate, benzene, 1,1,1-trichloroethane, and xylene were detected in soil samples from both the high bedrock and quarry areas, although they were typically at very low concentrations. Only acetone concentrations exceeded the NYSDEC recommended soil cleanup objectives in two samples.

VOCs, consisting of vinyl chloride and toluene, were detected in only 4 of the 60 SVS samples. Additionally, methane was detected at very low levels in only 3 of the 9 SVS samples. The elevated VOCs were associated with test pits located within the limits of the former quarry. No VOCs or methane were detected in any of the SVS samples obtained from the high bedrock areas.

3.3.2 Semivolatile Organic Compounds (SVOCs)

SVOCs, which were detected in all the soil samples analyzed, consisted primarily of PAHs. These PAHs are most likely associated with the ash materials which are prevalent across the site. The analytical data indicates that most of the samples from the quarry and high bedrock areas north and northwest of the quarry exhibited exceedances of the NYSDEC recommended soil cleanup objectives. In the southern portion of the railroad ROW, the fill materials in the low areas along the former track alignments, exhibited similar elevated levels of PAHs. However, the C&D materials which have been disposed above the bedrock surface (~ Elev. 676±) in this portion of the site are generally clean (i.e. uncontaminated). Whereas PAHs were detected in the soil/fill samples collected from the southern portion of the railroad ROW and the soil pile in the northern portion of the site. The materials tested from this area exhibited total c-PAH levels of less than 10 ppm.

3.3.3 Inorganics

Metals were detected in all the soil samples which were analyzed for metals. Exceedances of the NYSDEC recommended soil cleanup levels for one or more metals (i.e., zinc, manganese, iron, copper, arsenic, nickel, chromium, beryllium, selenium and mercury) were noted in most the soil samples collected from contaminated soil areas. Samples collected from non-contaminated

soil/C&D areas exhibited metals at lower concentrations. Only copper, iron, mercury, nickel and zinc exceeded NYSDEC recommended soil cleanup levels. As with the SVOCs, the samples which showed exceedances for metals, are distributed across the site in both the high bedrock and quarry areas. This is also most likely attributable to the presence of ash materials across the site, in that, metal concentrations are typically elevated in ash.

3.3.4 Pesticides and Polychlorinated Biphenyls (PCBs)

Pesticides were detected in most of the 39 soil samples collected from contaminated soil areas although at very low concentrations. Only one sample from the quarry area exhibited pesticide (dieldrin) concentrations which slightly exceeded the NYSDEC recommended soil cleanup objective. Pesticides were detected in only one sample collected from non-contaminated soil/C&D areas at concentrations which were less than NYSDEC recommended soil cleanup levels.

PCBs were detected in only one soil sample collected from contaminated soil areas. The PCB concentration (1,000 ppb) was equal to the recommended soil cleanup objective. PCBs were detected in only one soil sample collected from non-contaminated soil/C&D areas at a concentration which is less than the NYSDEC recommended soil cleanup objective.

3.4 Health Risks

A baseline HRA was performed to evaluate potential adverse human health effects resulting from exposure to contaminants from the site following redevelopment and in the absence of remedial measures. Risk posed by exposure to site soils given reasonably expected future exposure scenarios were quantified in accordance with appropriate United States Environmental Protection Agency (USEPA) guidance documents. The HRA was performed on samples collected from contaminated soil areas only.

The risk evaluation demonstrates that under the potential future use scenarios, chemicals of potential concern (PAHs, PCB Aroclor-1254, and metals) detected at the Main LaSalle site do not pose potential adverse noncarcinogenic health effects to residents or recreational visitors to the site.

However, the noncarcinogenic health risk to the construction worker exceeds acceptable limits as a result of inhalation of fugitive dust that could be generated during construction activities.

The results of the cancer risk evaluation for residential, construction and recreational scenarios demonstrate that contaminated soils at the site contribute to potential cancer risks. In all three scenarios, the risk is greater than the USEPA "No Action" level of 1×10^{-6}, but lower than the "Immediate Action" level of 1×10^{-4}.

Based on a qualitative health risk assessment (HRA) using data from the C&D samples from the southern portion of the railroad ROW and the soil pile in the northen portion of the site, the C&D material does not pose a risk greater than $1x10^{-6}$ to residents, construction workers, or recreational users. Additionally, the total c-PAH concentrations in the upper 3 feet of the C&D materials are below the 1 ppm. Consequently, this material should be suitable for use as clean fill, anywhere on site. Soil samples collected at depth in C&D areas exhibited total c-PAH concentrations of less than 10 ppm, and in most cases the concentrations were between 1 ppm and 2 ppm. This material is suitable for use anywhere onsite at depths greater than one foot.

Completed pathways at the site are limited to dermal contact, ingestion and inhalation of fugitive dust. Therefore, the soils management strategies should focus on reducing and eliminating the potential for workers and/or future residents to come in contact with the contaminated site soils and/or to inhale fugitive dust.

4.0 PROPOSED SITE REDEVELOPMENT

As indicated previously, the overall proposed site redevelopment consists of construction of 31 residential units. Based on the results of the site investigations, health risk assessment and evaluation of remedial alternatives, it was recommended that:

- Some form of remediation be implemented prior to redevelopment to limit dermal contact, ingestion, and inhalation of fugitive dust by construction workers, residents and recreational users.

- Residential areas should be sited in those areas (high bedrock areas) where the thickness of contaminated soils/fill material is minimal. The contaminated soils/fill should be removed in these residential areas down to the top of natural soil or bedrock, whichever is encountered first.

- Roadways and commercial/retail development should be designed to cover or 'cap' some of the contaminated soil/fill areas to minimize the need for remediation.

- Development in the quarry area should be restricted to recreational uses and/or commercial/retail development, assuming the developed area is wholly paved, landscaped or covered by the concrete floor slab.

- No basements should be constructed, unless the full thickness of the contaminated soil/fill material at that location has been removed or remediated.

- The quarry area should be capped with clean fill to mitigate the potential for dermal contact, ingestion, or inhalation of fugitive dust by future recreational users.

Based on the above recommendations, the overall site redevelopment plan was revised, and a new site development plan issued (Figure 4-1). As indicated on this plan, residential development

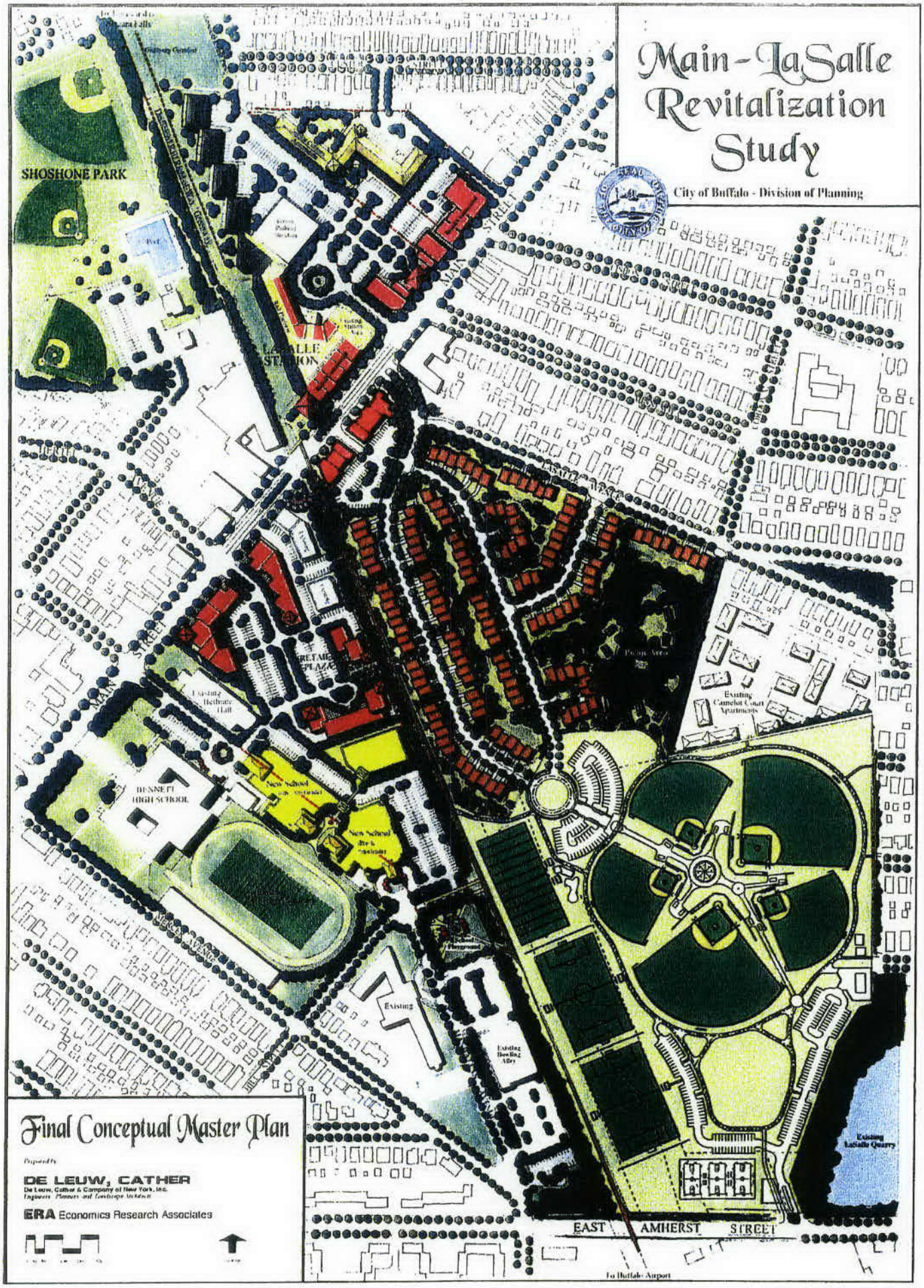
Main - LaSalle Revitalization Study
City of Buffalo - Division of Planning
SHOSHONE PARK
LASALLE STATION
BENNETT HIGH SCHOOL
Existing Camelot Court Apartments
EAST AMHERST STREET
Final Conceptual Master Plan
DE LEUW, CATHER
ERA Economics Research Associates

Figure 4-1

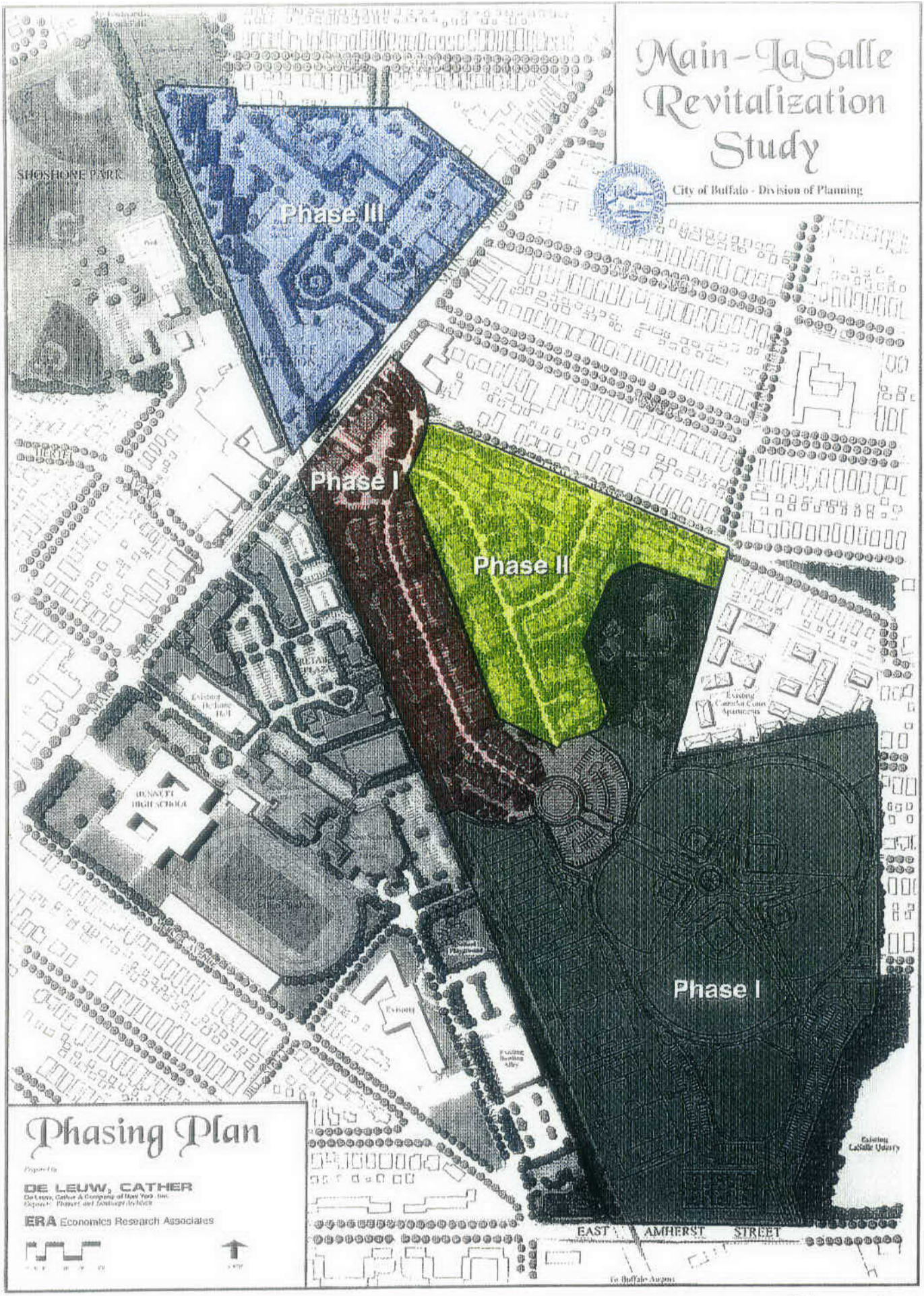
Main-LaSalle Revitalization Study
City of Buffalo - Division of Planning
SHOSHONE PARK
Phase III
Phase I
Phase II
Phase I
Existing Richmond Hall
Existing Camelot Court Apartments
BENJAMIN FRANKLIN HIGH SCHOOL
Existing LaSalle Library
EAST AMHERST STREET
To Buffalo Airport
Phasing Plan
DE LEUW, CATHER
ERA Economics Research Associates

Figure 4-2

is limited to those areas which are outside the quarry limits and underlain by high bedrock. The areas within the quarry boundary have been restricted to recreational uses.

It is currently proposed that the redevelopment work will be conducted in two, or more, phases. Phase I will involve construction activities in parcels 16, 19, 20, 21, 29, 30, 32, 33, 35, 36 and 37 as shown in Figure 4-2. This work will consist of installing the main access roadway from LaSalle Avenue into the western half of the site, with construction of homes along both sides of the roadway. Additionally, regrading and capping of McCarthy Park and the southern portion of the former railroad ROW (parcels 16, 32, 33, 35, 36, 37 and portions of parcels 29 and 30) will also be completed during Phase I. This will involve placement of 12 inches of compacted clayey fill over those portions of the park above the former quarry, and 6 inches of topsoil over all the areas proposed for regrading (i.e., park, railroad ROW). Additionally, 6 inches of topsoil will be placed in the "wooded area" immediately west of the existing Camelot Court Apartments, which is proposed for passive recreation activities.

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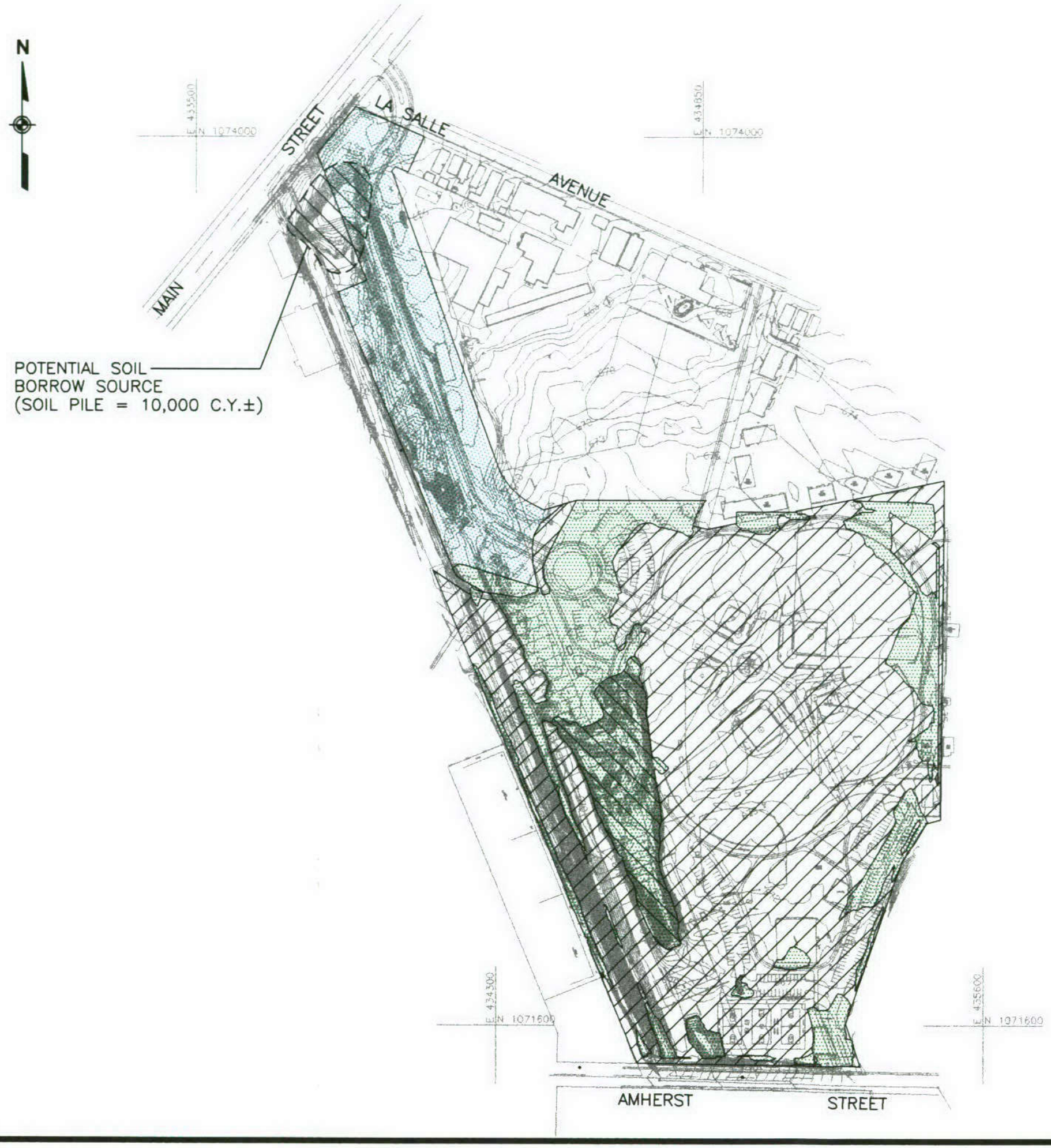


LEGEND

- PHASE 1 AREA – CONTAMINATED SOIL TO BE EXCAVATED
- PROPOSED CONTAMINATED SOIL DISPOSAL AREA
- MATERIAL IN PARK AREA TO BE EXCAVATED
- C & D MATERIAL WITH <10 ppm TOTAL CPAH

300' 0 300'

SCALE: 1"= 300'

MAIN–LASALLE SOILS MANAGEMENT PLAN

URS CONSULTANTS, INC.

FIGURE 5–1

CC–5533A

5.0 SOILS MANAGEMENT STRATEGIES

5.1 General

As indicated in Section 3.4, the contaminated soils at the site pose a risk to construction workers and/or future residents and/or recreational users if they are not properly managed. The Site Investigation Report prepared by URSG, dated January 1997 (Revised April 1997), identified and evaluated various remedial alternatives which would be applicable to the site. Based on review of the various alternatives and the proposed Phase I development scenario, it has been determined that the following general approach will be utilized in managing contaminated soils in the Phase I areas.

- All contaminated soils underlying areas slated for residential development (including roadways and green spaces) will be removed down to the top of natural soils or bedrock, whichever is encountered first, prior to development.

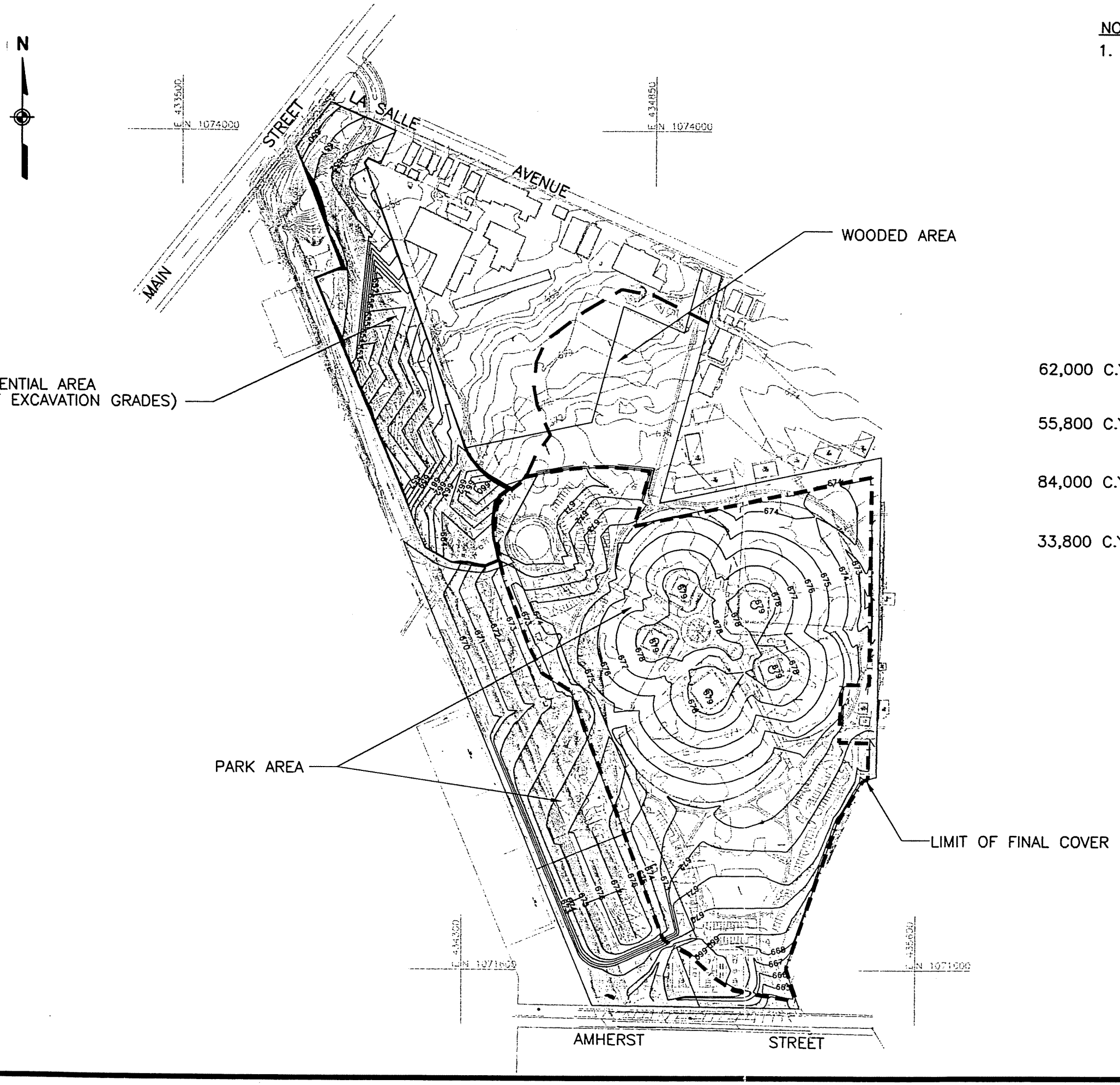
- The contaminated soils will be disposed onsite in areas slated for recreational development. No contaminated soils or C&D material with total c-PAH values of greater than 1 ppm will be present in the top 6 to 18 inches of the finished grade in those areas which are capped with topsoil or clayey soils and topsoil, respectively. The following areas of the site, in order of preference, will be utilized for onsite disposal of contaminated soils removed from the residential areas:

  - McCarthy Park area prior to capping

  - southern portion of the railroad ROW (parcels 29, 30, 32 and 33)

- C&D materials from the southern portion of the railroad ROW will be used as subgrade fill below the final cover in the park and in railroad ROW areas. Additionally, C&D material which meet analytical requirements may be used as backfill in the Phase I residential areas.

J:\35453\CAD\100\ 1=300 4/2/99-2 SLS



NOTE:

1. THE ENTIRE PARK AND WOODED AREAS WILL RECEIVE SIX INCHES OF TOPSOIL.

QUANTITIES

62,000 C.Y.	–	PHASE 1 AREA – CONTAMINATED SOIL TO BE EXCAVATED FROM THE RESIDENTIAL AREA
55,800 C.Y.	–	MATERIAL TO BE EXCAVATED FROM THE PARK AREA AND REUSED AS FILL
84,000 C.Y.	–	FILL REQUIRED TO ACHIEVE SUBGRADE ELEVATIONS IN THE PARK AREA
33,800 C.Y.	–	FILL MATERIAL AVAILABLE FOR REUSE IN THE RESIDENTIAL AREA (SUBJECT TO MEETING ANALYTICAL REQUIREMENTS)

LEGEND

675 PROPOSED SUBGRADE CONTOUR

300' 0 300'

SCALE: 1"= 300'

MAIN–LASALLE
PROPOSED SUBGRADE GRADING PLAN

URS CONSULTANTS, INC.

FIGURE 5–2

CC–5536A

The proposed excavation and disposal areas are identified on Figure 5-1.

Should the volumes of contaminated soil to be managed exceed the onsite disposal capacity, the excess soils will be transported by a licensed solid waste hauler to a permitted disposal facility. If any hazardous waste is encountered, it will be transported by a licensed hazardous waste hauler to a permitted Part 373 treatment, storage and disposal facility. This will also apply to any contaminated soils excavated once filling, grading and capping of the designated onsite disposal areas has been completed.

NYSDEC will be provided a copy of the plans and specifications provided to the contractor for their records. All plans and specifications will be stamped by a professional engineer licensed to practice in the State of New York. Information pertaining to deed restrictions will be included in the voluntary agreement.

5.2 Contaminated Soil and Disposal Area Volume Estimates

5.2.1 Contaminated Soil Volumes

In order to estimate the volume of contaminated soil which would be generated from the Phase I residential development area, the data collected during the site investigations was used to determine the elevation of the top of natural soil or bedrock, whichever was encountered first. These elevations subsequently were plotted on the base map and contoured to generate a 'Limit of Excavation' surface (Figure 5-2). Computer-aided drafting and design (CADD) methods were then used to calculate the volumetric difference between the existing ground surface and the 'Limit of Excavation' surface. As indicated on Figure 5-2, Phase I will generate approximately 62,000 cy of contaminated soils.

5.2.2 Disposal Volumes

In a similar manner, CADD methods were used to estimate the available disposal volumes in the southern portion of the railroad ROW (Parcels 29, 30, 32 and 33) and McCarthy Park (Parcel

35). The volumetric difference between the proposed subgrade grading surface as shown on Figure 5-2 and the existing ground surface in the disposal area was calculated to determine the available disposal volume. This volume is approximately 84,000 cy, which is sufficient to manage the contaminated soils from the Phase I area.

Additionally, there is an estimated 55,800 cy of C&D/soil material which must be excavated from the park and railroad ROW to meet the proposed subgrade elevations. Much of the material will be required to be used as fill elsewhere in the park to meet subgrade elevations. Preliminary testing on approximately 35,000 cy of the 55,800 cy area of C&D/soil material located between the railroad tracks and the park, showed that the material will likely meet residential site reuse criteria. The testing of this material was previously discussed in this report.

The analytical requirements for reusing site materials in the residential area were established in agreement with both the NYSDEC and the NYSDOH. The requirements are provided in Appendix E.

5.3 Wooded Area

The existing wooded area located west of the existing Camelot Court Apartments (Figure 4-2) is slated for passive recreation activities (i.e., trails and picnic areas). In order to maintain the existing large trees in this area, clearing will be limited to removal of grasses, bushes and small trees (i.e., < 3" diameter). The area will then be covered with a six-inch thick layer of topsoil and seeded.

5.4 Final Cover System

Once all the contaminated soils have been placed and graded, they will be covered over with clean soils. In the areas above the former quarry, a 12-inch thick layer of compacted clayey soil with a maximum permeability of 1×10^{-5} cm/sec will be placed. This will be covered with a six-inch thick layer of topsoil and seeded. In the areas outside the limits of the quarry (i.e., railroad ROW and

wooded area), a six-inch thick layer of topsoil will be placed and seeded. The type and limits of the final cover system are shown on Figure 5-2.

6.0 SOIL HANDLING PROCEDURES

Prior to the commencement of any construction activities, the Contractor shall develop a Site Health and Safety Plan that meets the requirements outlined in Appendix C.

6.1 Contaminated Soil

As previously indicated, contaminated soils from the Phase I development area will be reused onsite to raise the grade in McCarthy Park (Parcel 35) and to fill in the railroad ROW track wells located in southern portion of the site (Parcels 29, 30, 32 and 33).

Based on the existing analytical data, the soils in the Phase I area slated for residential development are non-hazardous, contaminated soils. Considering these soils will be disposed onsite in areas with similar levels of contamination, no further analytical testing is proposed. During excavation, both the contaminated soils which will be removed and the underlying native soils to remain in place will be visually examined and screened with a photoionization detector (PID) to confirm that the soils at depth (i.e., greater than one foot depth) do not vary significantly in composition from the near surface soils, which were previously tested. In the event that there is significant variation, or visual evidence of different type of contaminants from those previously identified, samples will be collected and analyzed for SVOCs and metals at a maximum frequency of one sample per acre. The onsite NYSDEC representative may require additional sampling based on significant variations in the soil. Samples will be sent to the laboratory for analysis. Materials which vary significantly from the near surface materials will be segregated, and placed on and under plastic sheeting. Based on the analytical results, appropriate handling and/or disposal requirements will be determined.

Various water lines and sewer lines will be installed to service both the residential and recreational areas. In order to ensure worker safety during installation and/or future repair of these lines in areas of the site where they pass through contaminated soils, the procedures to ensure proper management of the soils listed below will be followed.

- Contaminated soils will be excavated for a distance of 10 feet on either side of the center line of the proposed line to a depth of 1 foot below the proposed pipe invert elevation. The contaminated soils will be used for regrading the park and/or to raise the elevation of the railroad ROW.

- The resultant trench will be backfilled with compacted areas of clean (< 10 ppm total c-PAH) soils to the required subgrade elevation.

- The area will be covered with 6-inches of topsoil and/or 12 inches of clayey soil, as appropriate.

- The water/sewer lines will be installed as necessary, through the clean, compacted soils.

Excess contaminated soil will be used to raise the elevation of McCarthy Park. To the fullest extent possible, contaminated soil will be reused onsite in order to reduce potential costs incurred concerning offsite disposal. Any contaminated material remaining at the end of the construction project will be transported by a licensed solid waste hauler to a permitted landfill. Under no circumstances will contaminated soil occupy the final elevation at the end of construction in any area of the site. All areas to be filled with contaminated soil/fill will be covered or capped with a minimum of 6 inches of topsoil. Areas overlying the former quarry will be covered with 12 inches of clayey soil and six inches of topsoil. This will reduce or eliminate any potential dermal, inhalation or ingestion hazards for future residents or recreational visitors associated with the contaminated soil.

6.2 Non-Contaminated Soil/C&D Material

Analytical results from three composite soil samples (SS-8, SS-12 and SS-13) collected from the C&D material in the southern portion of the railroad ROW showed no detection of VOCs, pesticides or PCBs. Total c-PAH values ranged from none detected in SS-12 to 1.4 ppm in SS-13. Several metals were detected at levels typically present on site.

Analytical results from 13 soil samples collected form test pits (TP-71 through TP-83) in C&D areas, showed no VOCs, pesticides or PCBs were detected at concentrations which exceeded the NYSDEC recommended soil cleanup objectives. Total c-PAH values ranged from none detected in TP-71, TP-72 and TP-82 to 7.4 ppm in TP-79. Most total c-PAH levels were between 1 ppm and 2 ppm. Several metals were detected at levels typically found in the City of Buffalo. Generally, the C&D material consisted predominantly of soils with only minimal amounts of concrete and brick as indicated on the test pit logs (Appendix A).

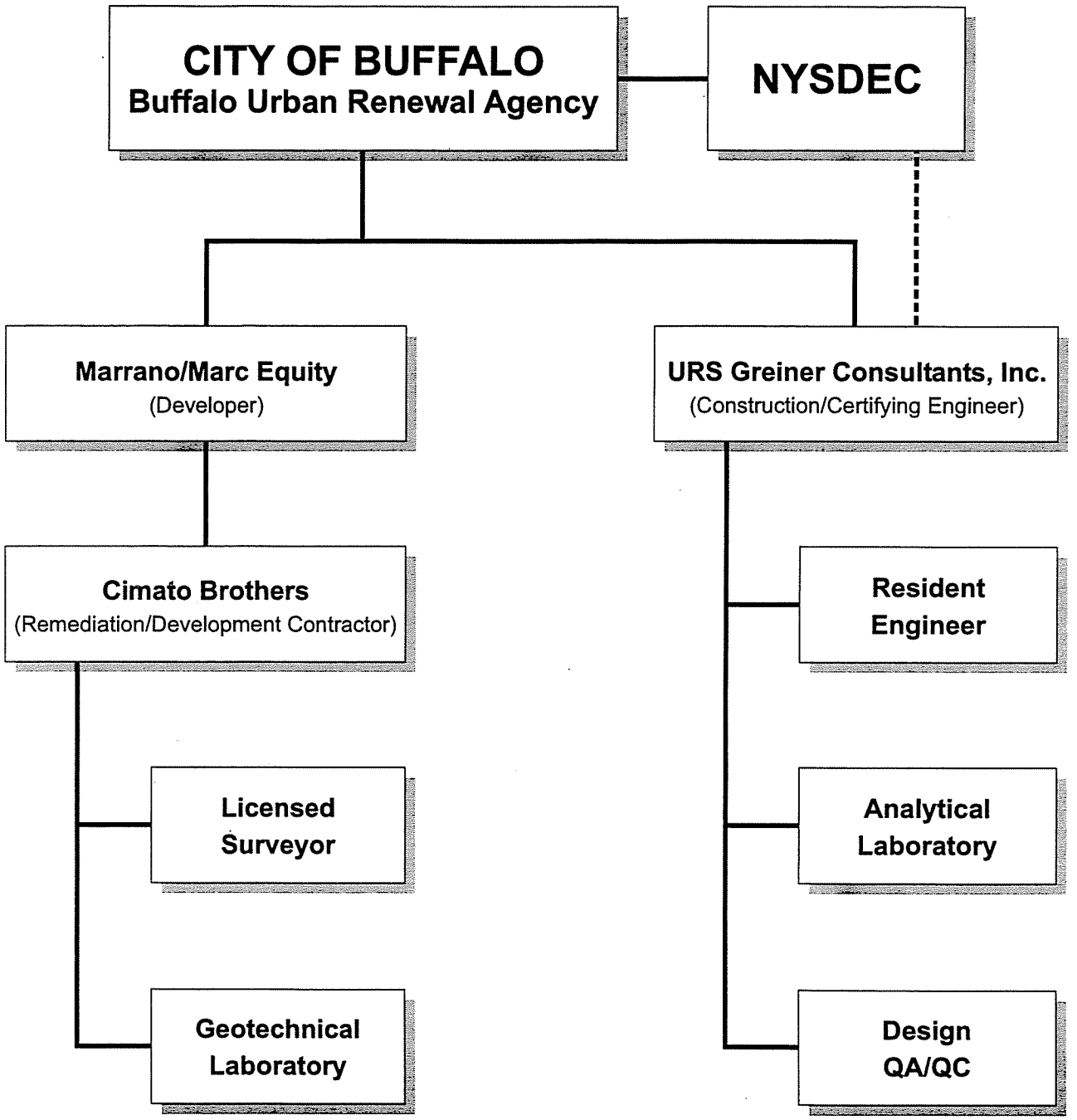
As discussed with the NYSDEC and the NYSDOH, soils to be used as backfill in residential areas at depths greater than two feet must have total c-PAH levels less than 10 ppm (TAGM 4046) and total PAH levels less than 100 ppm. Soils to be used in the upper two feet of fill in the residential area, or as clayey soil/top soil for final cover in non residential areas, must have total c-PAH levels less than 1 ppm, and total PAH levels less than 10 ppm.

Based on the analytical results and geotechnical nature of the soils in the C&D area, this material is suitable for use in the residential area at depths greater than two feet and below the cap in non-residential areas. In some cases, the material is suitable for use as clean fill in the upper two feet of the residential area. However, in order to ensure the long-term health and safety of residents and recreational users, the use of this material as backfill will be limited to depths greater than two feet in the residential areas and beneath the topsoil and/or clayey cap material in the non-residential areas.

Additionally, this material will be used in the following areas, in order of preference:

- Upper portion of grading fill in railroad ROW
- Upper portion of grading fill in park
- Lower portion of backfill in residential area

During backfilling of the residential areas with onsite C&D materials, the engineer or the NYSDEC representative may request additional sampling for total c-PAHs, total PAHs and/or metals at a maximum frequency of one sample per 500 cy if significant variations in material is encountered.



URS Greiner

PROJECT ORGANIZATION CHART

FIGURE 7-1

AG13255-35453.01-092498-GCM

Any C&D material placed in the residential area below two foot depth will be covered with soils meeting the criteria for the upper two foot zone to eliminate the potential for dermal contact, ingestion or inhalation of dust from the underlying soils.

6.3 Testing Requirements

Throughout the project, both analytical and geotechnical testing will be performed to characterize the various materials being utilized onsite. A brief listing of the testing is presented below. A detailed description of the testing requirements and procedures to be used are contained in the Construction Quality Assurance Plan (Appendix D) and the Chemical Quality Management Plan (Appendix E).

6.3.1 Analytical Testing

It is anticipated that the low permeability soils, topsoil and other miscellaneous fill to be imported from off site will be obtained from existing commercial suppliers and will be certified 'clean' by the suppliers. However, should the contractor propose to import materials from other non-certifiable sources, one representative sample of the material from each proposed source will be obtained and analyzed for TCL organics and TAL metals. NYSDEC may require more than one sample to be analyzed for TCL/TAL parameters from non-certifiable sources, if deemed necessary.

6.3.2 Geotechnical Testing

Prior to use onsite, the low permeability soils will be tested by the contractor's geotechnical laboratory to determine the soils engineering properties. A minimum of one sample from each proposed source will be collected and tested for:

- Grain size and hydrometer
- Moisture content
- Atterberg Limits
- Moisture-density curve (Standard Proctor)

- Permeability

Additionally, the soils excavated from the residential area will be tested to determine the moisture-density relationship.

7.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The key organizations involved in the design and construction of remediation for the Main-LaSalle Revitalization Project include: the owner, the City of Buffalo; the NYSDEC, the designer, URS Greiner Consultants, Inc., the developer, Marrano/Marc Equity; the construction QA/QC firm, URS Greiner Consultants, Inc.; and independent testing laboratories. The responsibilities of each organization are presented in the Construction Quality Assurance (CQA) Plan which can be found in Appendix D. The proposed project organization is presented in Figure 7-1.

8.0 RADON TESTING

8.1 General

Previous investigations in and around McCarthy Park concluded that there may be a potential for radon gas to be present in the upper portion of the Onondaga limestone unit that underlies the site. To determine if a radon gas hazard exists at the site, representative soil gas samples will be collected at predetermined locations around the site prior to commencement of excavation activities. Radon testing results will be submitted to the NYSDOH for review prior to the placement of clean soil in the residential areas.

8.2 Reference Standards

Soil gas samples will be collected in accordance with ASTM Standard D 5314-92 "Standard Guide for Soil Gas Monitoring in the Vadose Zone", and with Section 9.4.1 of USEPA "Subsurface Characterization and Monitoring Techniques, Volume II: the Vadose Zone, Field Screening and Analytical Methods" (EPA/625/R-93/003b, May 1993).

8.3 Sample Collection Procedures

An air track or air rotary drill will be used to advance approximately ten 6-inch diameter holes through the overburden and up to ten (10) feet into the underlying bedrock within the Phase I housing development area. A section of Schedule 40 polyvinyl chloride (PVC) riser pipe, fitted with a conical end piece to form a tight seal, will be inserted into each hole and firmly seated into the top of bedrock. Once each section of pipe has been firmly seated into the bedrock, the annular space around the pipe will be backfilled with hydrated bentonite chips, bentonite pellets, or slurry to create a minimum two (2) foot thick seal. The bentonite will be hydrated with potable water and allowed to stand for a minimum of two (2) hours to ensure a good seal. Each section of pipe will be fitted with a PVC cap.

NYSDOH-approved radon test kits will be installed in each open rock hole for a period of two days. The test kits will be removed on the second day and will be sent to the laboratory for radon gas analysis. Radon test results will be submitted to the NYSDOH for review. The results will also be included in the Construction Monitoring Report.

9.0 METHANE GAS TESTING AND MANAGEMENT

9.1 General

As previously indicated, the former quarry was filled with a variety of materials, including some putrescible wastes. Testing performed during the site investigations did not indicate the presence of methane. However, while the majority of the organic wastes in the landfill should have degraded, methane gas production may still be a byproduct of residual wastes. Once the low permeability cap has been installed on top of the landfill, any methane gas generated will tend to migrate horizontally, toward the perimeter of the capped area. This could potentially result in methane gas migrating into the existing housing north of the former quarry and the maintenance building and concession stand along the east side of the quarry. In order to prevent the methane gas, if any, from reaching the homes, a 50-foot wide buffer zone between the cap and the housing complex/buildings will only be capped with 6 inches of topsoil. This will allow any methane gas to dissipate through the soil. To determine the presence and concentration of methane gas within the 50-foot zone, representative soil gas measurements will be taken periodically at predetermined locations. Specifically, an initial survey will be performed within two weeks following completion of capping the quarry to obtain baseline levels. Additional surveys will be performed in the following spring and late summer.

9.2 Reference Standards

Soil gas samples will be collected in accordance with ASTM Standard D 5314-92 "Standard Guide for Soil Gas Monitoring in the Vadose Zone", and with Section 9.4.1 of USEPA "Subsurface Characterization and Monitoring Techniques, Volume II: the Vadose Zone, Field Screening and Analytical Methods" (EPA/625/R-93/003b, May 1993).

9.3 Sample Collection Procedures

Soil gas samples for methane gas analysis will be collected as follows:

A slide hammer equipped with a slam bar or a rotary hammer drill will be used to open a 0.5-inch diameter hole through the overburden to a depth of three to five feet below ground surface at 25 locations around the existing housing complex. A ventilated soil gas probe will be inserted into each hole. A Foxboro Total Vapor Analyzer (TVA) or equivalent, which is equipped with a flame ionization detector (FID) and a photoionization detector (PID) will be used to measure volatile organic vapors in parts per million (ppm). A Bacharach Senteniel 44 Combustible Gas Indicator (CGI) or equivalent will be used to measure methane in ppm and percent oxygen. Instrument calibration/operation procedures and detection limits are presented in Appendix F.

Additionally, if the levels of VOCs detected are more than 5ppm above ambient background levels, samples of the soil gas will be collected and submitted to the laboratory for analysis of volatile organics.

APPENDIX A

C&D SAMPLING DATA

J:\0535453.00\CAD\ 1=300 2/19/99-1 KAH

LEGEND

SS-8D ● COMPOSITE SURFACE SOIL SAMPLE

TP-77 ▮ TEST TRENCH LOCATION

300 0 300

SCALE IN FEET

MAIN-LASALLE
C&D AREA SAMPLE LOCATIONS

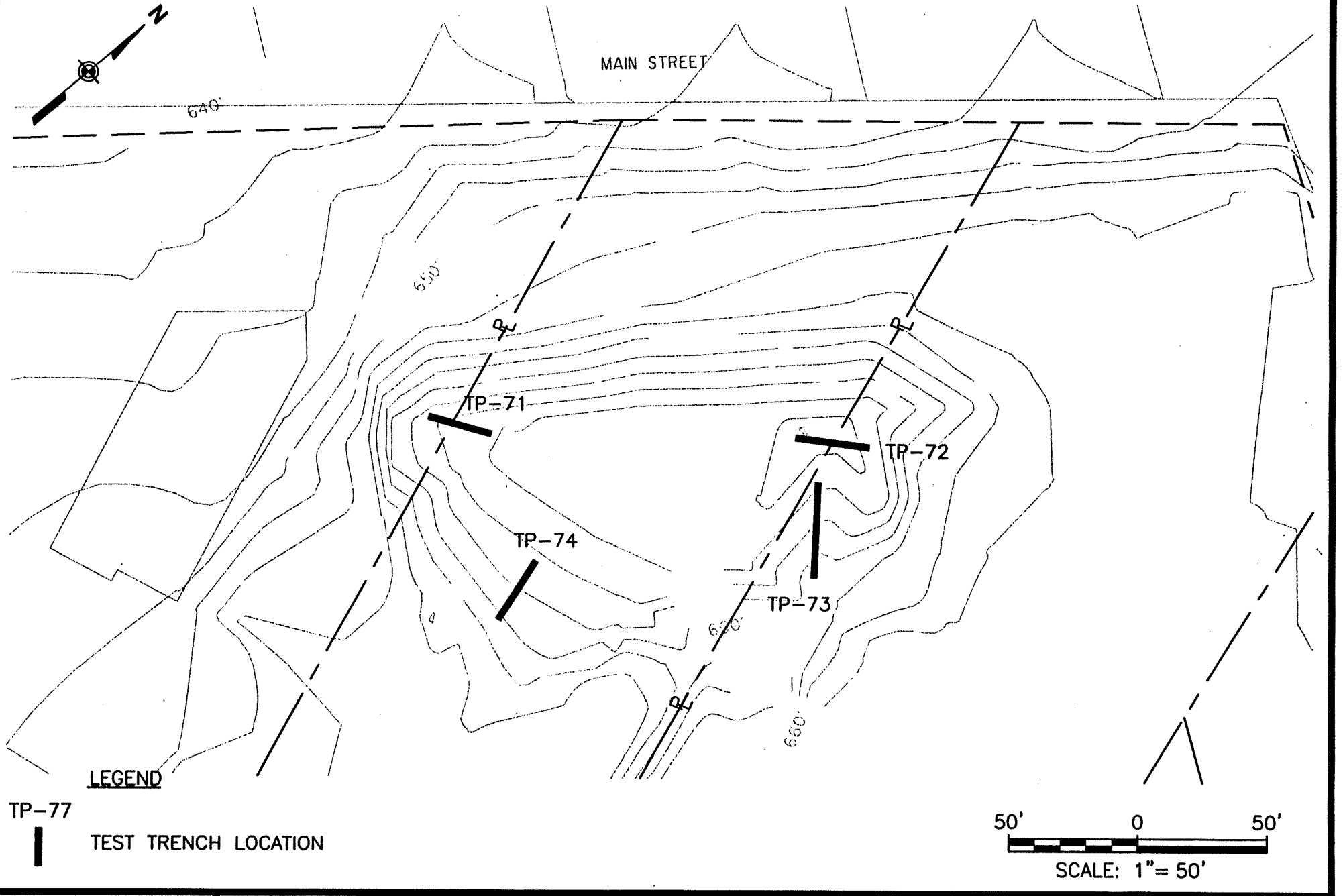
URS CONSULTANTS, INC.

FIGURE A-1

CC-6004

AC-13756

35453\CAD\1=50 2/19/99-1 KAH



URS Greiner Consultants, Inc.

MAIN & LaSALLE
SOIL PILE

FIGURE A-2

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LaSalle		SHEET: 1 OF 1
CLIENT: City of BUFFALO	JOB NUMBER: 05354453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC	LOCATION: SEE SITE MAP	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 666'	
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332B TRACKHOE	
PIT NUMBER: TP-71	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
1–5	–	–	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE-COARSE GRAVEL (ANGULAR-ROUNDED) TYPICALLY UNDER 2", TRACE CONCRETE, BRICK, ASPHALT	0
6–9	–	–	FILL: MOIST, VERY STIFF, MEDIUM GRAY, SILTY CLAY, SOME FINE TO MEDIUM SAND, FINE TO COARSE GRAVEL, TRACE ASPHALT, BRICK, SLIGHT TO MEDIUM PLASTIC	0
10–11	–	–	FILL: MOIST, VERY STIFF, LIGHT GRAY, SILTY CLAY, SOME FINE TO MEDIUM SAND, FINE TO COARSE GRAVEL, TRACE ASPHALT, BRICK	0
12			TEST PIT COMPLETED AT 11.5'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) "MAIN - TP71-(0-11')
TEST PIT REMAINED OPEN TO COMPLETION, NO ODOR OR VISIBLE SIGNS OF STAINING
DESCRIPTION AND MEASUREMENTS FROM SOUTHWEST EDGE OF TEST PIT

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LaSALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 0535453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 668'	
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332B TRACKHOE	
PIT NUMBER: TP-72	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
1–4	-	-	FILL: DRY, HARD, REDDISH BROWN SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR - ROUNDED), TRACE ASPHALT, CONCRETE	0
5–6	-	-	FILL: MOIST, MEDIUM DENSE, BLACK CINDER, SOME FINE TO COARSE GRAVEL (ANGULAR), TRACE COAL, SLAG.	0
7–8	-	-	FILL: MOIST, MEDIUM DENSE, LIGHT BROWN, SILTY FINE SAND	0
9–10	-	-	FILL: MOIST, MEDIUM DENSE, BROWN, FINE TO MEDIUM SAND, SOME FINE TO COARSE GRAVEL (ANGULAR) TRACE SHOT ROCK.	0
11			TEST PIT COMPLETED AT 11.0'	
12	-	-		

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAINL-TP 72-(0-11)
TEST PIT REMAINED OPEN TO 5.0', BELOW 5.0' TEST PIT WALLS CAVED IN. NO ODOR OR VISIBLE SIGNS OF STAINING. DESCRIPTIONS AND MEASUREMENTS FROM NORTHEAST EDGE OF TEST PIT

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 0535453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 667	
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332B TRACKHOE	
PIT NUMBER: TP-73	GEOLOGIST: SCOTT MCABE	
	GROUND WATER: NOT ENCOUNTERED	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
1–4	-	-	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR - SUB-ROUNDED), TRACE ASPHALT, CONCRETE	0
5–6	-	-	FILL: MOIST, DENSE, BLACK, CINDER, SOME FINE TO COARSE GRAVEL (ANGULAR) TRACE SLAG	0
7–8	-	-	FILL: MOIST, STIFF, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE SAND, FINE TO COARSE GRAVEL (ANGULAR - ROUNDED) TRACE SHOT ROCK. SLIGHTLY PLASTIC	0
9–10	-	-	MOIST, MEDIUM DENSE, REDDISH BROWN, FINE SAND, SOME FINE TO MEDIUM GRAVEL (SUB-ROUNDED - ROUNDED)	0
11	-	-	MOIST, MEDIUM DENSE, FINE TO MEDIUM SAND, SOME FINE TO COARSE GRAVEL (ANGULAR - ROUNDED), SHOT ROCK, TRACE SILT.	0
12			TEST PIT COMPLETED AT 12.0'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8082, TAL METALS, CYANIDE) MAIN1-TP73-(6-8)
TEST PIT REMAINED OPEN TO 9.0', BELOW 9.0' TEST PIT WALLS CAVED IN, NO ODOR, OR VISIBLE SIGNS OF STAINING. DESCRIPTION AND MEASUREMENTS FROM NORTH WEST EDGE OF TEST PIT

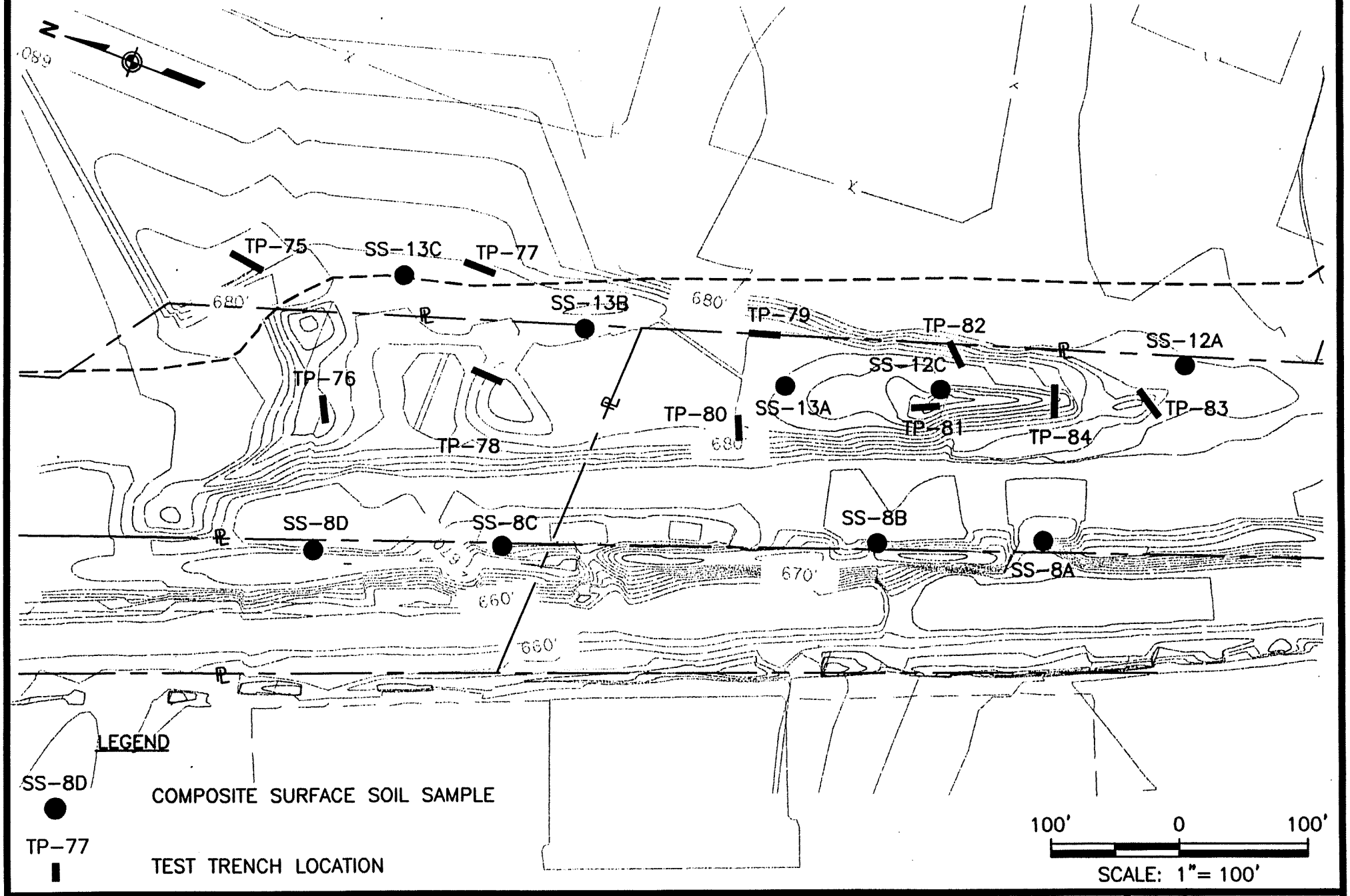
TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 0535453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 662'	
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332B TRACKHOE	
PIT NUMBER: TP-74	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2 – 4	-	-	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR), TRACE ASPHALT, CEMENT	0
6 – 8	-	-	FILL: MOIST, VERY STIFF, BROWN SILTY CLAY, SOME FINE TO COARSE SAND, FINE TO COARSE GRAVEL, (ANGULAR), SHOT ROCK, TRACE BRICK.	0
10 – 12 – 14	-	-	FILL: MOIST, DENSE, MEDIUM GRAY, FINE TO COARSE SAND, FINE TO COARSE GRAVEL (ANGULAR), SOME CINDER, SCRAP METAL, WOOD, TRACE SILT	0
16	-	-	FILL: MOIST, STIFF, GRAYISH BROWN, SILTY CLAY, SOME FINE TO COARSE ANGULAR GRAVEL, SHOT ROCK.	0
18 – 20			TEST PIT COMPLETED AT 18.0'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAIN1-TP74-(0-18)
TEST PIT REMAINED OPEN TO 9.0' BELOW 9.0' TEST PIT WALLS CAVED IN. NO ODOR OR VISIBLE SIGNS OF STAINING. DESCRIPTIONS AND MEASUREMENTS FROM NORTH EDGE OF TEST PIT



URS Greiner Consultants, Inc.

MAIN & LaSALLE
SOUTHERN PORTION OF RAILROAD R.O.W.

FIGURE A-3

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN-LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 0535453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC	LOCATION: SEE SITE MAP	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 685'	
DATE COMPLETED: 9-24-98	OPERATOR: MCW / CAT 332B TRACK HOE	
PIT NUMBER: TP-75	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2	-	-	FILL: DRY TO MOIST, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR TO ROUNDED), CONCRETE, TRACE SHOT ROCK.	0
4				
6				
8				
10				
12	-	-	FILL: MOIST, DENSE, MEDIUM GRAY, FINE TO COARSE SAND / FINE TO COARSE GRAVEL (ANGULAR) SOME WOOD, METAL, PLASTIC	0
14				
16	-	-	FILL: MOIST, DENSE, FINE TO MEDIUM SANDY SILT, SOME FINE TO COARSE GRAVEL (ANGULAR), TRACE BRICK.	0
18			TEST PIT COMPLETED AT 18.0'	
20				

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAINL-TP75-(0-18')
TEST PIT REMAINED OPEN TO 12.0', BELOW 12.0' TEST PIT WALLS CAVED IN. NO ODOR OR VISIBLE SIGNS OF STAINING. DESCRIPTION AND MEASUREMENTS TAKEN FROM NORTH EDGE OF TEST PIT

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN-LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 0535453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC	LOCATION: SEE SITE MAP.	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 685'	
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332 B TRACK HOE	
PIT NUMBER: TP-76	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2	-	-	FILL: MOIST, MEDIUM DENSE, BROWN, SILTY FINE SAND, SOME FINE TO COARSE GRAVEL (ANGULAR), TRACE CONCRETE, BRICK.	0
4				
6	-	-	FILL: MOIST, STIFF, MEDIUM GRAY, FINE SANDY SILT, SOME FINE TO COARSE GRAVEL (ANGULAR), TRACE CLAY, BRICK.	0
8				
10	-	-	FILL: MOIST, MEDIUM DENSE, MEDIUM GRAY, FINE TO COARSE SAND / FINE TO COARSE GRAVEL (ANGULAR) TRACE CINDER, BRICK.	0
12	-	-	FILL: MOIST, MEDIUM DENSE, BLACK. CINDER, SOME SLAG, COAL.	0
14	-	-	MOIST, MEDIUM STIFF, FINE SANDY SILT, SOME FINE TO COARSE GRAVEL, SHOT ROCK.	0
			TEST PIT COMPLETED AT 14' BEDROCK ENCOUNTERED 14.0', BUCKET REFUSAL.	

COMMENTS: SAMPLES SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAIN-TP76-(0-14) TEST PIT REMAINED OPEN TO 11.0', BELOW 11.0' TEST PIT WALLS CAVED IN, NO ODORS OR VISIBLE SIGNS OF STAINING. DESCRIPTION AND MEASUREMENTS FROM SOUTHWEST EDGE OF TEST PIT

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN-LASALLE		SHEET: 1	OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 053453.01		
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP		
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 684'		
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332B TRACKHOE		
PIT NUMBER: TP-77	GEOLOGIST: SCOTT MCCABE		
	GROUND WATER: NOT ENCOUNTERED.		

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2–4	-	-	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL, CONCRETE, ASPHALT	0
6	-	-	FILL: DRY, HARD, GRAY, CONCRETE, SHOT ROCK, FINE TO COARSE GRAVEL (ANGULAR), FINE TO COARSE SAND.	0
8–12	-	-	FILL: MOIST, STIFF, BROWN, SILTY CLAY, SOME FINE TO COARSE SAND, FINE TO COARSE GRAVEL (ANGULAR), SHOT ROCK, TRACE CONCRETE, ASPHALT.	0
14				
16	-	-	FILL: CINDER, SOME BOTTLES, CANS, SHEET METAL, WOOD, GRAVEL, TRACE SHOT ROCK, PLASTIC (HOUSE HOLD REFUSE).	0
18–20			TEST PIT COMPLETED AT 17.0'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, BOSC, TAL METALS, CYANIDE) MAINL-TP77 (7-17) TEST PIT CAVED (5-7) AND (15-17') NO ODOR OR VISIBLE SIGNS OF STAINING, DESCRIPTION AND MEASUREMENTS TAKEN FROM SOUTHEAST EDGE OF TEST PIT.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 053453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-24-98	GROUND ELEVATION: @ 689'	
DATE COMPLETED: 9-24-98	OPERATOR: DON / CAT 332B TRACK HOE	
PIT NUMBER: TP-78	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2			FILL: MOIST, MEDIUM DENSE - DENSE, BROWN SILTY FINE TO MEDIUM SAND, SOME FINE TO MEDIUM GRAVEL (ANGULAR) TRACE GLASS, ASPHALT, CONCRETE	
4	-	-		0
6				
8				
10	-	-	FILL: MOIST, GRAY, FINE TO COARSE SAND / FINE TO COARSE GRAVEL (ANGULAR) SOME, BRICK, CONCRETE, SHOT ROCK, FENCE.	0
12	-	-	FILL: MOIST, MEDIUM DENSE, BLACK, CINDER, SOME FINE TO COARSE SAND, FINE TO COARSE GRAVEL (ANGULAR), SLAG.	0
14	-	-	FILL: MOIST, MEDIUM STIFF, REDDISH BROWN, FINE SANDY SILT, SOME FINE TO COARSE GRAVEL, TRACE CLAY	0
16	-	-	FILL: MOIST, STIFF, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR TO SUB-ROUNDED) SLIGHTLY PLASTIC	0
20			TEST PIT COMPLETED AT 19.0'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8082, TAL METALS, CYANIDE) NATIVE - TP78-(0-4)
TEST PIT REMAINED OPEN, NO ODOR OR VISIBLE SIGNS OF STAINING. DESCRIPTION AND MEASUREMENTS FROM SOUTHEAST EDGE OF TEST PIT

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 05355153.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-25-98	GROUND ELEVATION: @ 682'	
DATE COMPLETED: 9-25-98	OPERATOR: DON / CAT 332B TRACKHOE	
PIT NUMBER: TP-79	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2 – 4	–	–	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR - SUB-ROUNDED), CONCRETE, SHOT ROCK.	0
6	–	–	FILL: MOIST, HARD, GRAY, SHOT ROCK, FINE TO COARSE GRAVEL (ANGULAR), FINE TO COARSE SAND.	0
8 – 10 – 12	–	–	FILL: MOIST, HARD, BROWN, SILTY CLAY, SOME FINE GRAVEL (ROUNDED), TRACE FINE TO COARSE SAND, CONCRETE, BRICK.	0
14 – 16 – 18	–	–	FILL: MOIST, MEDIUM DENSE, BLACK, CINDER, SOME SLAG, COAL, TRACE BRICK, CONCRETE, WOOD	0
20 – 22			TEST PIT COMPLETED AT 20.0'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAINL-TP 79-(13-20) MAINL-TP 79-(13-20) DUP. TEST PIT CAVED IN (5-7') AND (13-20') NO ODORS OR VISIBLE SIGNS OF STAINING. DESCRIPTIONS AND MEASUREMENTS FROM NORTHWEST EDGE OF TEST PIT.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN) - LASALLE	SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 653453.01
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP
DATE STARTED: 9-25-98	GROUND ELEVATION: @ 682
DATE COMPLETED: 9-25-98	OPERATOR: DON / CAT 332B TRACKHOE
PIT NUMBER: TP-80	GEOLOGIST: SCOTT MCCABE
	GROUND WATER: NOT ENCOUNTERED.

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
1–3	–	–	FILL; DRY, HARD, REDDISH-BROWN SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR) TRACE SHOT ROCK.	0
3–5	–	–	FILL; MOIST, HARD, GRAY, COARSE GRAVEL, SOME FINE TO COARSE SAND	0
6–7	–	–	FILL: MOIST, DENSE, BLACK, CINDER, SOME FINE TO COARSE GRAVEL (ANGULAR), SLAG.	0
8	–	–	MOIST, DENSE, REDDISH BROWN FINE SANDY SILT, SOME SHOT ROCK, GRAVEL (ANGULAR)	0
8–12			TEST PIT COMPLETED AT 8.0', BEDROCK ENCOUNTERED 8.0' BUCKET REFUSAL	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAIN/L - TP 80 - 0-8) TEST PIT OPEN TO COMPLETION, DESCRIPTION AND MEASUREMENTS FROM SOUTH WEST EDGE OF TEST PIT.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAW-LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 053453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-25-98	GROUND ELEVATION: @ 892'	
DATE COMPLETED: 9-25-98	OPERATOR: DON / CAT 322B TRACKHOE	
PIT NUMBER: TP-81	GEOLOGIST: SCOTT INGLAGE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2–4–6–8	–	–	FILL; DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL, (ANGULAR), TRACE SHOT ROCK.	0
10–12	–	–	FILL; MOIST, VERY STIFF, MEDIUM GRAY, SILTY CLAY, SOME FINE GRAVEL (ANGULAR), TRACE COARSE SAND, SLIGHTLY PLASTIC	0
14	–	–	FILL; MOIST, DENSE, BLACK, CINDER SOME FINE TO COARSE GRAVEL, SLAG.	0
16	–	–	MOIST, STIFF, LIGHT BROWN, FINE SANDY SILT, TRACE COARSE SAND, FINE GRAVEL (ANGULAR), SHOT ROCK.	0
18			TEST PIT COMPLETED AT 16.0', BEDROCK ENCOUNTERED 16.0' BUCKET REFUSAL.	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8050, TAL METALS, CYANIDE), MAW-TP 81-(0-13) TEST PIT OPEN TO COMPLETION, DESCRIPTION AND MEASUREMENT FROM SOUTH EAST EDGE OF TEST PIT

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN - LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 053453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP	
DATE STARTED: 9-25-98	GROUND ELEVATION: @ 689'	
DATE COMPLETED: 9-25-98	OPERATOR: DOW / CAT 332B TRACKHOE	
PIT NUMBER: TP-82	GEOLOGIST: SCOTT NILSAGE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2	—	—	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, FINE TO COARSE GRAVEL (ANGULAR - SUB-ROUNDED) TRACE CONCRETE.	0
4				
6	—	—	FILL: DRY, VERY STIFF, FINE SANDY SILT, SOME FINE TO COARSE GRAVEL (ANGULAR - ROUNDED)	0
8			FILL: MOIST, HARD, REDDISH BROWN SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR - ROUNDED)	0
10	—	—	FILL: MOIST, DENSE FINE TO COARSE SAND / FINE TO COARSE GRAVEL (ANGULAR)	0
12	—	—	FILL: MOIST, STIFF, MEDIUM GRAY, FINE SANDY SILT, TRACE COARSE SAND, FINE GRAVEL (ANGULAR)	0
14				
16	—	—	FILL: MOIST, DENSE, CINDER, SOME GLASS, METAL, PIPE, CANS, PLASTIC (HOUSEHOLD REFUSE), SLAG.	0
18				
20			TEST PIT COMPLETED AT 19.0'	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8050, TAL METALS, CYANIDE). SAMPLE - TP 82 - (0-19) TEST PIT OPEN TO 19', BELOW 15.0' TEST PIT WALLS CAVED IN. DESCRIPTION AND MEASUREMENTS FROM SOUTH WEST EDGE OF TEST PIT.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAW-LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 053453.01	
CONTRACTOR: CIMINTO BROTHERS CONSTRUCTION INC.	LOCATION: SEE SITE MAP.	
DATE STARTED: 9-25-98	GROUND ELEVATION: @ 673'	
DATE COMPLETED: 9-25-98	OPERATOR: DOW / CAT 332B TRACKHOE	
PIT NUMBER: TP-83	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
1–6	–	–	FILL; DRY, STIFF, BROWN, FINE SANDY SILT, TRACE FINE TO COARSE GRAVEL (ANGULAR), CLAY, ROOTS.	0
6	–	–	FILL; HARD, POURED CONCRETE	0
7–10	–	–	FILL; DRY, VERY DENSE, BROWNISH GRAY, CINDER, FINE TO COARSE GRAVEL, (ANGULAR), FINE TO COARSE SAND, SILT, TRACE CLAY, SLAG.	0
11–12			TEST PIT COMPLETED AT 10.0', BEDROCK ENCOUNTERED 10.0', BUCKET REFUSAL.	

COMMENTS: SAMPLE SUBMITTED FOR ANALYSIS (8260, 8270, 8080, TAL METALS, CYANIDE) MAW-L-TP83-(0-10), TEST PIT OPEN TO COMPLETION, DESCRIPTION AND MEASUREMENTS FROM NORTHEAST EDGE OF TEST PIT.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: MAIN) - LASALLE		SHEET: 1 OF 1
CLIENT: CITY OF BUFFALO	JOB NUMBER: 053453.01	
CONTRACTOR: CIMATO BROTHERS CONSTRUCTION INC	LOCATION: SEE SITE MAP.	
DATE STARTED: 9-25-98	GROUND ELEVATION: @ 689'	
DATE COMPLETED: 9-25-98	OPERATOR: DOW / CAT 322B TRACKHOE	
PIT NUMBER: TP-84	GEOLOGIST: SCOTT MCCABE	
	GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION	HNU (PID)
2–8	–	–	FILL: DRY, HARD, REDDISH BROWN, SILTY CLAY, SOME FINE TO COARSE GRAVEL (ANGULAR - ROUNDED), TRACE SHOT ROCK, CONCRETE.	0
10	–	–	FILL: MOIST, DENSE, BLACK, CINDER, SOME SLAG, FINE TO COARSE GRAVEL (ANGULAR)	0
12	–	–	FILL: MOIST, STIFF, MEDIUM GRAY, FINE SANDY SILT, SOME FINE GRAVEL (ANGULAR TO ROUNDED), TRACE CLAY.	0
14–16	–	–	FILL: MOIST, DENSE, BLACK, CINDER, SOME SLAG, RAILROAD TIES, SLAG.	0
18–20			TEST PIT COMPLETED AT 17.0', BEDROCK ENCOUNTERED 17.0', BUCKET REFUSAL.	

COMMENTS: TEST PIT OPEN TO COMPLETION, DESCRIPTION AND MEASUREMENTS TAKEN FROM INSIDE OF PIT (HIGHEST POINT).

TABLE A-1
MAIN LASALLE REVITALIZATION PROJECT
C & D PILE
SOIL SAMPLE RESULTS

Location I.D.			TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.			TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix			Soil	Soil	Soil	Soil	Soil
Date Sampled			09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units	Criteria*					
Volatiles							
Methylene Chloride	UG/KG	100					2.7
Trichloroethene	UG/KG	700					
Toluene	UG/KG	1500					
Semivolatiles							
Naphthalene	UG/KG	13000			80		
2-Methylnaphthalene	UG/KG	36400			90		
Acenaphthylene	UG/KG	41000			120		
Acenaphthene	UG/KG	50000					
Dibenzofuran	UG/KG	6200			60		
Fluorene	UG/KG	50000					
Phenanthrene	UG/KG	50000			330	320	130
Anthracene	UG/KG	50000			130	100	
Carbazole	UG/KG				60		
Fluoranthene	UG/KG	50000			1100	530	240
Pyrene	UG/KG	50000			1100	480	320
Benzo(a)anthracene (1)	UG/KG	224			770	380	150
Chrysene (1)	UG/KG	400			840	400	140
bis(2-Ethylhexyl)phthalate	UG/KG	50000					150
Benzo(b)fluoranthene (1)	UG/KG	224			1100	580	180
Benzo(k)fluoranthene (1)	UG/KG	224			520	200	80
Benzo(a)pyrene (1)	UG/KG	61			720	450	140
Indeno(1,2,3-cd)pyrene (1)	UG/KG	3200			440	210	
Dibenz(a,h)anthracene (1)	UG/KG	14					
Benzo(g,h,i)perylene	UG/KG	50000			380	200	
Total c-PAHs	UG/KG				4390	2220	690
Total PAHs	UG/KG				7720	3850	1380
Pesticide/PCB							
4,4'-DDE	UG/KG	2100					
4,4'-DDD	UG/KG	2900					
4,4'-DDT	UG/KG	2100					
Aroclor 1254	UG/KG	1000				180	
Metals							
Aluminum	MG/KG		14700	5130	5570	6350	8510
Arsenic	MG/KG	7.5					

NOTES:

*** - Recommended Soil Cleanup Objectives (TAGM #4046, Revised April, 1995)**

Only detected results reported.

(1) - cPAH

( ) - Concentration exceeds Criteria.

TABLE A-1
MAIN LASALLE REVITALIZATION PROJECT
C & D PILE
SOIL SAMPLE RESULTS

Location I.D.			TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.			TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix			Soil	Soil	Soil	Soil	Soil
Date Sampled			09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units	Criteria*					
Metals							
Barium	MG/KG	300	88.6	33.0	32.4	58.2	71.1
Beryllium	MG/KG	0.16	1.09	0.347	0.375	0.566	0.565
Cadmium	MG/KG	10	0.624		0.987		1.32
Calcium	MG/KG		134000	35800	36200	72900	61200
Chromium	MG/KG	50	17.6	8.09	8.29	17.4	17.9
Cobalt	MG/KG	30	6.09	2.40	2.78	1.24	4.59
Copper	MG/KG	25	20.8	29.0	26.1	11.5	33.0
Iron	MG/KG	2000	20400	14300	16200	8560	17300
Lead	MG/KG		18.3	36.3	40.6	19.6	128
Vanadium	MG/KG	150	28.4	11.2	11.2	12.2	19.1
Magnesium	MG/KG		1830	8760	10300	14000	24400
Manganese	MG/KG		689	289	327	820	382
Mercury	MG/KG	0.1	0.034	0.085	0.069	0.12	0.16
Nickel	MG/KG	13	21.3	11.7	11.5	11.3	17.8
Potassium	MG/KG		2360	608	639	805	1440
Sodium	MG/KG		378	143	100	152	147
Zinc	MG/KG	20	65	69.5	68.2	39.2	111
Cyanide	MG/KG					1.24	

NOTES:

*** - Recommended Soil Cleanup Objectives (TAGM #4046, Revised April, 1995)**

Only detected results reported.

(1) - cPAH

( ) - Concentration exceeds Criteria.

TABLE A-1
MAIN LASALLE REVITALIZATION PROJECT
C & D PILE
SOIL SAMPLE RESULTS

Location I.D.			TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.			TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix			Soil	Soil	Soil	Soil	Soil
Date Sampled			09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units	Criteria*					
Volatiles							
Methylene Chloride	UG/KG	100					2.7
Trichloroethene	UG/KG	700					
Toluene	UG/KG	1500				2.3	3.1
Semivolatiles							
Naphthalene	UG/KG	13000			70		60
2-Methylnaphthalene	UG/KG	36400			160		70
Acenaphthylene	UG/KG	41000					
Acenaphthene	UG/KG	50000					
Dibenzofuran	UG/KG	6200					
Fluorene	UG/KG	50000					
Phenanthrene	UG/KG	50000	310	520	330	560	180
Anthracene	UG/KG	50000	80		80		
Carbazole	UG/KG						
Fluoranthene	UG/KG	50000	470	740	410	1500	380
Pyrene	UG/KG	50000	390	710	340	1600	420
Benzo(a)anthracene (1)	UG/KG	224	230	430	210	1200	270
Chrysene (1)	UG/KG	400	230	410	220	1300	330
bis(2-Ethylhexyl)phthalate	UG/KG	50000		280		320	
Benzo(b)fluoranthene (1)	UG/KG	224	340	510	300	2000	510
Benzo(k)fluoranthene (1)	UG/KG	224	110		150	880	170
Benzo(a)pyrene (1)	UG/KG	61	240	380	210	1400	300
Indeno(1,2,3-cd)pyrene (1)	UG/KG	3200	90		90	660	220
Dibenz(a,h)anthracene (1)	UG/KG	14					60
Benzo(g,h,i)perylene	UG/KG	50000	80		70	620	180
Total c-PAHs	UG/KG		1240	1730	1180	7440	1860
Total PAHs	UG/KG		2570	3700	2640	11720	3150
Pesticide/PCB							
4,4'-DDE	UG/KG	2100				120	
4,4'-DDD	UG/KG	2900				300	
4,4'-DDT	UG/KG	2100				140	
Aroclor 1254	UG/KG	1000					
Metals							
Aluminum	MG/KG		7250	8540	7670	5090	8330
Arsenic	MG/KG	7.5				16.7	

NOTES:

*** - Recommended Soil Cleanup Objectives (TAGM #4046, Revised April, 1995)**

Only detected results reported.

(1) - cPAH

( ) - Concentration exceeds Criteria.

TABLE A-1
MAIN LASALLE REVITALIZATION PROJECT
C & D PILE
SOIL SAMPLE RESULTS

Location I.D.			TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.			TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix			Soil	Soil	Soil	Soil	Soil
Date Sampled			09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units	Criteria*					
Metals							
Barium	MG/KG	300	76.1	87.6	62.2	115	34.8
Beryllium	MG/KG	0.16	0.391	0.561	0.548	0.508	0.403
Cadmium	MG/KG	10	0.916	1.56	1.85	1.44	0.873
Calcium	MG/KG		22500	85400	43300	26400	30300
Chromium	MG/KG	50	10.4	42.2	11.5	19.8	9.77
Cobalt	MG/KG	30	2.23	3.29	4.42	3.70	3.87
Copper	MG/KG	25	23.3	36.2	33.7	59.2	15.9
Iron	MG/KG	2000	11600	14500	15500	12900	13400
Lead	MG/KG		108	106	70.2	319	38.5
Vanadium	MG/KG	150	15.0	17.7	17.2	14.7	19.8
Magnesium	MG/KG		6990	32300	17300	4390	7170
Manganese	MG/KG		229	533	516	369	365
Mercury	MG/KG	0.1	0.26	0.13	0.17	0.088	0.046
Nickel	MG/KG	13	10.5	14.6	17.3	26.8	9.61
Potassium	MG/KG		770	1470	993	547	866
Sodium	MG/KG		117	259	116	164	96.8
Zinc	MG/KG	20	95.4	137	163	243	58.1
Cyanide	MG/KG						

NOTES:

*** - Recommended Soil Cleanup Objectives (TAGM #4046, Revised April, 1995)**

Only detected results reported.

(1) - cPAH

( ) - Concentration exceeds Criteria.

TABLE A-1
MAIN LASALLE REVITALIZATION PROJECT
C & D PILE
SOIL SAMPLE RESULTS

Location I.D.			TP-81	TP-82	TP-83
Sample I.D.			TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix			Soil	Soil	Soil
Date Sampled			09/25/98	09/25/98	09/25/98
Parameter	**Units**	**Criteria***			
Volatiles					
Methylene Chloride	UG/KG	100			
Trichloroethene	UG/KG	700	3.0		
Toluene	UG/KG	1500			
Semivolatiles					
Naphthalene	UG/KG	13000			160
2-Methylnaphthalene	UG/KG	36400			160
Acenaphthylene	UG/KG	41000			
Acenaphthene	UG/KG	50000			100
Dibenzofuran	UG/KG	6200			90
Fluorene	UG/KG	50000			60
Phenanthrene	UG/KG	50000	70		760
Anthracene	UG/KG	50000			190
Carbazole	UG/KG				100
Fluoranthene	UG/KG	50000	80		830
Pyrene	UG/KG	50000	90		800
Benzo(a)anthracene (1)	UG/KG	224			530
Chrysene (1)	UG/KG	400	60		530
bis(2-Ethylhexyl)phthalate	UG/KG	50000			100
Benzo(b)fluoranthene (1)	UG/KG	224	60		660
Benzo(k)fluoranthene (1)	UG/KG	224			240
Benzo(a)pyrene (1)	UG/KG	61			450
Indeno(1,2,3-cd)pyrene (1)	UG/KG	3200			230
Dibenz(a,h)anthracene (1)	UG/KG	14			70
Benzo(g,h,i)perylene	UG/KG	50000			200
Total c-PAHs	UG/KG		120		2710
Total PAHs	UG/KG		360		5970
Pesticide/PCB					
4,4'-DDE	UG/KG	2100			
4,4'-DDD	UG/KG	2900			
4,4'-DDT	UG/KG	2100			
Aroclor 1254	UG/KG	1000			
Metals					
Aluminum	MG/KG		6040	7950	9270
Arsenic	MG/KG	7.5			

NOTES:

*** - Recommended Soil Cleanup Objectives (TAGM #4046, Revised April, 1995)**

Only detected results reported.

(1) - cPAH

( ) - Concentration exceeds Criteria.

TABLE A-1
MAIN LASALLE REVITALIZATION PROJECT
C & D PILE
SOIL SAMPLE RESULTS

Location I.D.			TP-81	TP-82	TP-83
Sample I.D.			TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix			Soil	Soil	Soil
Date Sampled			09/25/98	09/25/98	09/25/98
Parameter	Units	Criteria*			
Metals					
Barium	MG/KG	300	51.1	73.2	76.4
Beryllium	MG/KG	0.16	0.376	0.398	0.702
Cadmium	MG/KG	10	0.883	0.616	0.783
Calcium	MG/KG		106000	65300	14600
Chromium	MG/KG	50	9.85	12.3	16.0
Cobalt	MG/KG	30	2.77	4.41	5.50
Copper	MG/KG	25	29.1	22.0	85.6
Iron	MG/KG	2000	12500	14400	25700
Lead	MG/KG		29.8	13.7	267
Vanadium	MG/KG	150	13.5	17.8	22.7
Magnesium	MG/KG		18800	24200	5690
Manganese	MG/KG		592	493	400
Mercury	MG/KG	0.1	0.11		0.088
Nickel	MG/KG	13	13.4	15.3	18.2
Potassium	MG/KG		708	1860	1080
Sodium	MG/KG		159	184	108
Zinc	MG/KG	20	86.0	104	202
Cyanide	MG/KG				

NOTES:

*** - Recommended Soil Cleanup Objectives (TAGM #4046, Revised April, 1995)**

Only detected results reported.

(1) - cPAH

( ) - Concentration exceeds Criteria.

DATA USABILITY SUMMARY REPORT

Main - LaSalle Revitalization Project

Analyses Performed by:

FRIEND LABORATORY, INC.

Waverly, NY

Prepared by:

URS GREINER CONSULTANTS, INC.

FEBRUARY, 1999

35453/Revital.Pro/ta

TABLE OF CONTENTS

TABLES

I. Analytical Methodologies

The evaluated data is from the September 24, 1998 sampling of thirteen soil samples and one field duplicate. Due to a laboratory oversight, the field duplicate sample was not analyzed. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), and target analyte list (TCL) metals in accordance with U.S. Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Final Update III, June 1997.

A limited data validation was performed following the general guidelines in EPA Region II CLP Organics Data Review, SOP No. HW-6, Revision #11, June 1996 and USEPA Region II Evaluation of Metals Data for the Contract Laboratory Program (CLP), SOP Revision XI, January 1992.

The following are the sample IDs reviewed in this report.

MainL-TP-71-(0-11)	MainL-TP-78-(0-19)
MainL-TP-72-(0-11)	MainL-TP-79-(13-20)
MainL-TP-73-(0-12)	MainL-TP-79-(13-20) Dup
MainL-TP-74-(0-18)	MainL-TP-80-(0-8)
MainL-TP-75-(0-18)	MainL-TP-81-(0-13)
MainL-TP-76-(0-14)	MainL-TP-82-(0-15)
MainL-TP-77-(7-17)	MainL-TP-83-(0-10)

II. Data Deliverable Completeness

The analytical data package was in accordance with NYSDEC ASP Category B data deliverable requirements.

III Holding Times

All samples were extracted and/or analyzed within EPA Region II and method hold time criteria.

IV. Quality Control (QC) Data

A. QC Blanks:

All compound/analyte blank concentrations were below the contract required quantitation (organics) and detection (metals) limits with the following exception.

Acetone was detected in all three volatile method blank. Following EPA Region II validation guidelines, this compound was qualified "U" (undetected) in all samples except MainL-TP-80-(0-8) and MainL-TP-83-(0-10) where acetone was not detected.

B. Instrument Tune Criteria (VOCs/SVOCs)

All method specific instrument tuning criteria were met.

C. Initial and Continuing Calibrations

All organic initial and continuing calibrations met SW8260 and SW8270 method criteria with the following exceptions.

2-Butanone and 2-hexanone exceeded EPA Region II validation guidelines of 25 % D (i.e., difference) for one volatile continuing calibration. These compounds were not detected in any samples, however, following EPA validation guidelines the associated sample detection limits were qualified as estimated ("UJ").

The volatile continuing calibration associated with MainL-TP-78-(0-19), MainL-TP-82-(0-15), and MainL-TP-83-(0-10) exceeded EPA Region II validation guidelines of 25 % D for many of the target compounds. No compounds were detected, with the exception of the previously qualified acetone. Following EPA validation guidelines the associated sample detection limits were qualified as estimated ("UJ").

Methoxychlor exceeded continuing calibration criteria. This compound was not detected, however, following EPA validation guidelines, all sample detection limits for that compound were qualified as estimated ("UJ").

DDT was detected in MainL-TP-79-(13-20), however, the percent difference between the primary and secondary column exceeded 25% D. Following EPA validation guidelines, the result is qualified as estimated ("J").

The percent recoveries of silver, chromium, and manganese in one or more of the CRDL standards failed EPA Region II criteria of 80%-120%. Following EPA Region II validation guidelines, silver and chromium results were qualified as estimated ("J/UJ") in all samples. Manganese results in all samples were rejected ("R") due to CRDL recoveries less than the EPA validation guideline of 50%.

D. Surrogate/Internal Standard Recoveries (VOCs/SVOCs)

With the exception of MainL-TP-71-(0-11), MainL-TP-76-(0-14), and MainL-TP-82-(0-14), all samples had one or more internal standards less method criteria. Samples were reanalyzed with similar results. One internal standard for MainL-TP-79-(13-20) and MainL-TP-80-(0-8), was less than 25% of method criteria. Following EPA validation guidelines, 1,1,2,2-tetrachloroethane was

rejected ("R") in both samples. All other compounds associated with non-compliant internal standards were qualified as estimated ("J/UJ").

One or more volatile surrogate recoveries in all samples, except for MainL-TP-71-(0-11), exceeded laboratory established criteria limits. Following EPA validation guidelines, all detected results are considered as estimated.

E. Matrix Spike Recoveries

Qualifications of the analytical results due to matrix spike outliers are noted below.

The percent recovery of antimony was outside the method QC limits in one or more inorganic matrix spike analysis. Antimony was not detected in any of the samples, however EPA Region II validation guidelines require compound detection limits be qualified as estimated ("UJ") in all samples.

F. Field Duplicates

One field duplicate sample (i.e., MainL-TP-79-(13-20) Dup) was collected, however, the laboratory used this sample for matrix spike and matrix spike duplicates analysis and failed to analyze this sample as a field duplicate.

G. Laboratory Control Samples (LCSs)

No qualification of the data was needed due to LCS outliers.

V. Sample Results

Results listed on the reporting forms were in agreement with the raw data, and no transcription/calculation errors were detected. The results not previously mentioned in this report are considered as usable as reported.

VI. Summary

All sample analyses were found to be compliant with the method and EPA Region II validation guideline criteria, except where previously noted. Those results qualified as estimated ("J/UJ") should be considered conditionally usable. Those results qualified as rejected ("R") should be considered unusable.

TABLE 1
DATA QUALIFIERS

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified the; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.		TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units					
Volatiles						
Chloromethane	UG/KG	6 U	5 U	5 U	5 U	6 U
Bromomethane	UG/KG	6 U	5 U	5 U	5 U	6 U
Vinyl Chloride	UG/KG	6 U	5 U	5 U	5 U	6 U
Chloroethane	UG/KG	6 U	5 U	5 U	5 U	6 U
Methylene Chloride	UG/KG	6 U	5 U	5 U	5 U	2.7 J
Acetone	UG/KG	30 U	27 U	28 U	27 U	49 U
Carbon Disulfide	UG/KG	6 U	5 U	5 U	5 U	6 U
1,1-Dichloroethene	UG/KG	6 U	5 U	5 U	5 U	6 U
1,1-Dichloroethane	UG/KG	6 U	5 U	5 U	5 U	6 U
1,2-Dichloroethene (cis)	UG/KG	6 U	5 U	5 U	5 U	6 U
1,2-Dichloroethene (trans)	UG/KG	6 U	5 U	5 U	5 U	6 U
Chloroform	UG/KG	6 U	5 U	5 U	5 U	6 U
Methyl Ethyl Ketone (2-Butanone)	UG/KG	30 UJ	25 UJ	26 UJ	27 UJ	29 UJ
1,2-Dichloroethane	UG/KG	6 U	5 U	5 U	5 U	6 U
1,1,1-Trichloroethane	UG/KG	6 U	5 U	5 U	5 U	6 U
Carbon Tetrachloride	UG/KG	6 U	5 U	5 U	5 U	6 U
Bromodichloromethane	UG/KG	6 U	5 U	5 U	5 U	6 U
1,2-Dichloropropane	UG/KG	6 U	5 U	5 U	5 U	6 U
cis-1,3-Dichloropropene	UG/KG	6 U	5 U	5 U	5 U	6 U
Trichloroethene	UG/KG	6 U	5 U	5 U	5 U	6 U
Benzene	UG/KG	6 U	5 U	5 U	5 U	6 U
Dibromochloromethane	UG/KG	6 U	5 U	5 U	5 U	6 U
trans-1,3-Dichloropropene	UG/KG	6 U	5 U	5 U	5 U	6 U
1,1,2-Trichloroethane	UG/KG	6 U	5 U	5 U	5 U	6 U
Bromoform	UG/KG	6 U	5 U	5 U	5 U	6 U
4-Methyl-2-Pentanone	UG/KG	12 U	10 U	10 U	11 U	11 U
2-Hexanone	UG/KG	12 UJ	10 UJ	10 UJ	11 UJ	11 UJ
Tetrachloroethene	UG/KG	6 U	5 U	5 U	5 U	6 U
1,1,2,2-Tetrachloroethane	UG/KG	6 U	5 UJ	5 UJ	5 UJ	6 UJ
Toluene	UG/KG	6 U	5 U	5 U	5 U	6 U
Chlorobenzene	UG/KG	6 U	5 U	5 U	5 U	6 U
Ethylbenzene	UG/KG	6 U	5 U	5 U	5 U	6 U
Styrene	UG/KG	6 U	5 U	5 U	5 U	6 U
m,p-Xylene	UG/KG	6 U	5 U	5 U	5 U	6 U
o-Xylene	UG/KG	6 U	5 U	5 U	5 U	6 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.		TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units					
Semivolatiles						
Phenol	UG/KG	290 U	270 U	270 U	280 U	280 U
bis(2-Chloroethyl)ether	UG/KG	290 U	270 U	270 U	280 U	280 U
2-Chlorophenol	UG/KG	290 U	270 U	270 U	280 U	280 U
1,3-Dichlorobenzene	UG/KG	290 U	270 U	270 U	280 U	280 U
1,4-Dichlorobenzene	UG/KG	290 U	270 U	270 U	280 U	280 U
Benzyl Alcohol	UG/KG	290 U	270 U	270 U	280 U	280 U
1,2-Dichlorobenzene	UG/KG	290 U	270 U	270 U	280 U	280 U
2-Methylphenol (o-cresol)	UG/KG	290 U	270 U	270 U	280 U	280 U
2,2'-oxybis(1-Chloropropane)	UG/KG	290 U	270 U	270 U	280 U	280 U
4-Methylphenol (p-cresol)	UG/KG	290 U	270 U	270 U	280 U	280 U
N-Nitroso-di-n-propylamine	UG/KG	290 U	270 U	270 U	280 U	280 U
Hexachloroethane	UG/KG	290 U	270 U	270 U	280 U	280 U
Nitrobenzene	UG/KG	290 U	270 U	270 U	280 U	280 U
Isophorone	UG/KG	290 U	270 U	270 U	280 U	280 U
2-Nitrophenol	UG/KG	290 U	270 U	270 U	280 U	280 U
2,4-Dimethylphenol	UG/KG	290 U	270 U	270 U	280 U	280 U
bis(2-Chloroethoxy)methane	UG/KG	290 U	270 U	270 U	280 U	280 U
Benzoic Acid	UG/KG	290 U	270 U	270 U	280 U	280 U
2,4-Dichlorophenol	UG/KG	290 U	270 U	270 U	280 U	280 U
1,2,4-Trichlorobenzene	UG/KG	290 U	270 U	270 U	280 U	280 U
Naphthalene	UG/KG	290 U	270 U	80 J	280 U	280 U
4-Chloroaniline	UG/KG	580 U	540 U	540 U	560 U	570 U
Hexachlorobutadiene	UG/KG	290 U	270 U	270 U	280 U	280 U
4-Chloro-3-methylphenol	UG/KG	580 U	540 U	540 U	560 U	570 U
2-Methylnaphthalene	UG/KG	290 U	270 U	90 J	280 U	280 U
Hexachlorocyclopentadiene	UG/KG	290 U	270 U	270 U	280 U	280 U
2,4,6-Trichlorophenol	UG/KG	290 U	270 U	270 U	280 U	280 U
2,4,5-Trichlorophenol	UG/KG	290 U	270 U	270 U	280 U	280 U
2-Chloronaphthalene	UG/KG	290 U	270 U	270 U	280 U	280 U
2-Nitroaniline	UG/KG	1200 U	1100 U	1100 U	1200 U	1100 U
Dimethylphthalate	UG/KG	290 U	270 U	270 U	280 U	280 U
Acenaphthylene	UG/KG	290 U	270 U	120 J	280 U	280 U
3-Nitroaniline	UG/KG	1200 U	1100 U	1100 U	1200 U	1100 U
2,6-Dinitrotoluene	UG/KG	290 U	270 U	270 U	280 U	280 U
Acenaphthene	UG/KG	290 U	270 U	270 U	280 U	280 U
2,4-Dinitrophenol	UG/KG	1200 U	1100 U	1100 U	1200 U	1100 U
4-Nitrophenol	UG/KG	1200 U	1100 U	1100 U	1200 U	1100 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.		TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units					
Semivolatiles						
Dibenzofuran	UG/KG	290 U	270 U	60 J	280 U	280 U
2,4-Dinitrotoluene	UG/KG	290 U	270 U	270 U	280 U	280 U
Diethylphthalate	UG/KG	290 U	270 U	270 U	280 U	280 U
Fluorene	UG/KG	290 U	270 U	270 U	280 U	280 U
4-Nitroaniline	UG/KG	1200 U	1100 U	1100 U	1200 U	1100 U
4-Chlorophenyl-phenylether	UG/KG	290 U	270 U	270 U	280 U	280 U
4,6-Dinitro-2-methylphenol	UG/KG	290 U	270 U	270 U	280 U	280 U
N-Nitrosodiphenylamine	UG/KG	290 U	270 U	270 U	280 U	280 U
4-Bromophenyl-phenylether	UG/KG	290 U	270 U	270 U	280 U	280 U
Hexachlorobenzene	UG/KG	290 U	270 U	270 U	280 U	280 U
Pentachlorophenol	UG/KG	290 U	270 U	270 U	280 U	280 U
Phenanthrene	UG/KG	290 U	270 U	330	320	130 J
Anthracene	UG/KG	290 U	270 U	130 J	100 J	280 U
Carbazole	UG/KG	290 U	270 U	60 J	280 U	280 U
Di-n-butylphthalate	UG/KG	290 U	270 U	270 U	280 U	280 U
Fluoranthene	UG/KG	290 U	270 U	1100	530	240 J
Pyrene	UG/KG	290 U	270 U	1100	480	320
Butylbenzylphthalate	UG/KG	290 U	270 U	270 U	280 U	280 U
3,3'-Dichlorobenzidine	UG/KG	580 U	540 U	540 U	560 U	570 U
Benzo(a)anthracene	UG/KG	290 U	270 U	770	380	150 J
Chrysene	UG/KG	290 U	270 U	840	400	140 J
bis(2-Ethylhexyl)phthalate	UG/KG	290 U	270 U	270 U	280 U	150 J
Di-n-octylphthalate	UG/KG	290 U	270 U	270 U	280 U	280 U
Benzo(b)fluoranthene	UG/KG	290 U	270 U	1100	580	180 J
Benzo(k)fluoranthene	UG/KG	290 U	270 U	520	200 J	80 J
Benzo(a)pyrene	UG/KG	290 U	270 U	720	450	140 J
Indeno(1,2,3-cd)pyrene	UG/KG	290 U	270 U	440	210 J	280 U
Dibenz(a,h)anthracene	UG/KG	290 U	270 U	270 U	280 U	280 U
Benzo(g,h,i)perylene	UG/KG	290 U	270 U	380	200 J	280 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.		TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units					
Pesticide/PCB						
alpha-BHC	UG/KG	30 U	30 U	30 U	30 U	30 U
beta-BHC	UG/KG	30 U	30 U	30 U	30 U	30 U
gamma-BHC (Lindane)	UG/KG	30 U	30 U	30 U	30 U	30 U
delta-BHC	UG/KG	30 U	30 U	30 U	30 U	30 U
Heptachlor	UG/KG	30 U	30 U	30 U	30 U	30 U
Aldrin	UG/KG	30 U	30 U	30 U	30 U	30 U
Heptachlor epoxide	UG/KG	30 U	30 U	30 U	30 U	30 U
Endosulfan I	UG/KG	30 U	30 U	30 U	30 U	30 U
Dieldrin	UG/KG	30 U	30 U	30 U	30 U	30 U
4,4'-DDE	UG/KG	30 U	30 U	30 U	30 U	30 U
Endrin	UG/KG	30 U	30 U	30 U	30 U	30 U
Endosulfan II	UG/KG	30 U	30 U	30 U	30 U	30 U
4,4'-DDD	UG/KG	30 U	30 U	30 U	30 U	30 U
Endrin aldehyde	UG/KG	30 U	30 U	30 U	30 U	30 U
Endosulfan sulfate	UG/KG	30 U	30 U	30 U	30 U	30 U
4,4'-DDT	UG/KG	30 U	30 U	30 U	30 U	30 U
Endrin ketone	UG/KG	30 U	30 U	30 U	30 U	30 U
Methoxychlor	UG/KG	30 UJ	30 UJ	30 UJ	30 UJ	30 UJ
Toxaphene	UG/KG	300 U	300 U	300 U	300 U	300 U
Technical Chlordane	UG/KG	30 U	30 U	30 U	30 U	30 U
Aroclor 1016	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1221	UG/KG	100 U	100 U	100 U	100 U	100 U
Aroclor 1232	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1242	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1248	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1254	UG/KG	50 U	50 U	50 U	180	50 U
Aroclor 1260	UG/KG	50 U	50 U	50 U	50 U	50 U
alpha-Chlordane	UG/KG	30 U	30 U	30 U	30 U	30 U
gamma-Chlordane	UG/KG	30 U	30 U	30 U	30 U	30 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-71	TP-72	TP-73	TP-74	TP-75
Sample I.D.		TP-71 (0-11)	TP-72 (0-11)	TP-73 (0-12)	TP-74 (0-18)	TP-75 (0-18)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/24/98	09/24/98
Parameter	Units					
Metals						
Aluminum	MG/KG	14700	5130	5570	6350	8510
Antimony	MG/KG	5.78 UJ	5.50 UJ	5.45 UJ	5.83 UJ	5.45 UJ
Arsenic	MG/KG	13.9 U	13.2 U	13.0 U	14.0 U	13.1 U
Barium	MG/KG	88.6	33.0	32.4	58.2	71.1
Beryllium	MG/KG	1.09	0.347	0.375	0.566	0.565
Cadmium	MG/KG	0.624	0.551 U	0.987	0.583 U	1.32
Calcium	MG/KG	134000	35800	36200	72900	61200
Chromium	MG/KG	17.6	8.09	8.29	17.4	17.9
Cobalt	MG/KG	6.09	2.40	2.78	1.24	4.59
Copper	MG/KG	20.8	29.0	26.1	11.5	33.0
Iron	MG/KG	20400	14300	16200	8560	17300
Lead	MG/KG	18.3	36.3	40.6	19.6	128
Vanadium	MG/KG	28.4	11.2	11.2	12.2	19.1
Magnesium	MG/KG	1830	8760	10300	14000	24400
Manganese	MG/KG	689	289	327	820	382
Mercury	MG/KG	0.034	0.085	0.069	0.12	0.16
Nickel	MG/KG	21.3	11.7	11.5	11.3	17.8
Potassium	MG/KG	2360	608	639	805	1440
Selenium	MG/KG	8.10 U	7.71 U	7.57 U	8.16 U	7.66 U
Silver	MG/KG	1.16 UJ	1.10 UJ	1.09 UJ	1.17 UJ	1.09 UJ
Sodium	MG/KG	378	143	100	152	147
Thallium	MG/KG	7.52 U	7.16 U	7.03 U	7.58 U	7.11 U
Zinc	MG/KG	65	69.5	68.2	39.2	111
Cyanide	MG/KG	0.620 U	0.524 U	0.513 U	1.24	0.471 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.		TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units					
Volatiles						
Chloromethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
Bromomethane	UG/KG	6 U	5 U	5 U	5.6 UJ	5 U
Vinyl Chloride	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
Chloroethane	UG/KG	6 U	5 U	5 U	5.6 UJ	5 U
Methylene Chloride	UG/KG	6 U	5 U	5 UJ	5.6 UJ	2.7 J
Acetone	UG/KG	52 U	26 U	27 U	28 UJ	27 U
Carbon Disulfide	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
1,1-Dichloroethene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
1,1-Dichloroethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
1,2-Dichloroethene (cis)	UG/KG	6 U	6 U	5 U	5.6 UJ	5 U
1,2-Dichloroethene (trans)	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
Chloroform	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
Methyl Ethyl Ketone (2-Butanone)	UG/KG	28 UJ	26 UJ	27 UJ	28 UJ	27 UJ
1,2-Dichloroethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
1,1,1-Trichloroethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
Carbon Tetrachloride	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
Bromodichloromethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 U
1,2-Dichloropropane	UG/KG	6 U	5 U	5 U	5.6 UJ	5 U
cis-1,3-Dichloropropene	UG/KG	6 U	5 U	5 U	5.6 UJ	5 U
Trichloroethene	UG/KG	6 U	5 U	5 U	5.6 UJ	5 U
Benzene	UG/KG	6 U	5 U	5 U	5.6 UJ	5 U
Dibromochloromethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
trans-1,3-Dichloropropene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
1,1,2-Trichloroethane	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
Bromoform	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
4-Methyl-2-Pentanone	UG/KG	11 U	10 U	11 UJ	11 UJ	11 UJ
2-Hexanone	UG/KG	11 UJ	10 UJ	11 UJ	11 UJ	11 UJ
Tetrachloroethene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
1,1,2,2-Tetrachloroethane	UG/KG	6 U	5 UJ	5 UJ	5.6 UR	5 UR
Toluene	UG/KG	6 U	5 U	5 UJ	2.3 J	3.1 J
Chlorobenzene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
Ethylbenzene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
Styrene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
m,p-Xylene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ
o-Xylene	UG/KG	6 U	5 U	5 UJ	5.6 UJ	5 UJ

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.		TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units					
Semivolatiles						
Phenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
bis(2-Chloroethyl)ether	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2-Chlorophenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
1,3-Dichlorobenzene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
1,4-Dichlorobenzene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Benzyl Alcohol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
1,2-Dichlorobenzene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2-Methylphenol (o-cresol)	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,2'-oxybis(1-Chloropropane)	UG/KG	280 U	1400 U	270 U	1500 U	260 U
4-Methylphenol (p-cresol)	UG/KG	280 U	1400 U	270 U	1500 U	260 U
N-Nitroso-di-n-propylamine	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Hexachloroethane	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Nitrobenzene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Isophorone	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2-Nitrophenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,4-Dimethylphenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
bis(2-Chloroethoxy)methane	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Benzoic Acid	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,4-Dichlorophenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
1,2,4-Trichlorobenzene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Naphthalene	UG/KG	280 U	1400 U	70 J	1500 U	60 J
4-Chloroaniline	UG/KG	560 U	2800 U	540 U	3000 U	520 U
Hexachlorobutadiene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
4-Chloro-3-methylphenol	UG/KG	560 U	2800 U	540 U	3000 U	520 U
2-Methylnaphthalene	UG/KG	280 U	1400 U	160 J	1500 U	70 J
Hexachlorocyclopentadiene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,4,6-Trichlorophenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,4,5-Trichlorophenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2-Chloronaphthalene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2-Nitroaniline	UG/KG	1200 U	5600 U	1100 U	6000 U	1000 U
Dimethylphthalate	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Acenaphthylene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
3-Nitroaniline	UG/KG	1200 U	5600 U	1100 U	1100 U	1000 U
2,6-Dinitrotoluene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Acenaphthene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,4-Dinitrophenol	UG/KG	1200 U	5600 U	1100 U	6000 U	1000 U
4-Nitrophenol	UG/KG	1200 U	5600 U	1100 U	6000 U	1000 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.		TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units					
Semivolatiles						
Dibenzofuran	UG/KG	280 U	1400 U	270 U	1500 U	260 U
2,4-Dinitrotoluene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Diethylphthalate	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Fluorene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
4-Nitroaniline	UG/KG	1200 U	5600 U	1100 U	6000 U	1000 U
4-Chlorophenyl-phenylether	UG/KG	280 U	5600 U	1100 U	6000 U	1000 U
4,6-Dinitro-2-methylphenol	UG/KG	280 U	1400 U	270 U	1500 U	260 U
N-Nitrosodiphenylamine	UG/KG	280 U	1400 U	270 U	1500 U	260 U
4-Bromophenyl-phenylether	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Hexachlorobenzene	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Pentachlorophenol	UG/KG	280 U	5600 U	1100 U	6000 U	1000 U
Phenanthrene	UG/KG	310	520 J	330	560 J	180 J
Anthracene	UG/KG	80 J	1400 U	80 J	1500 U	260 U
Carbazole	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Di-n-butylphthalate	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Fluoranthene	UG/KG	470	740 J	410	1500	380 J
Pyrene	UG/KG	390	710 J	340	1600	420
Butylbenzylphthalate	UG/KG	280 U	1400 U	270 U	1500 U	260 U
3,3'-Dichlorobenzidine	UG/KG	560 U	2800 U	2800 U	3000 U	1000 U
Benzo(a)anthracene	UG/KG	230 J	430 J	210 J	1200 J	270
Chrysene	UG/KG	230 J	410 J	220 J	1300 J	330
bis(2-Ethylhexyl)phthalate	UG/KG	280 U	280 J	270 U	320 J	260 U
Di-n-octylphthalate	UG/KG	280 U	1400 U	270 U	1500 U	260 U
Benzo(b)fluoranthene	UG/KG	340	510 J	300	2000	510
Benzo(k)fluoranthene	UG/KG	110 J	1400 U	150 J	880 J	170 J
Benzo(a)pyrene	UG/KG	240 J	380 J	210 J	1400 J	300
Indeno(1,2,3-cd)pyrene	UG/KG	90 J	1400 U	90 J	660 J	220 J
Dibenz(a,h)anthracene	UG/KG	280 U	1400 U	270 U	1500 U	60 J
Benzo(g,h,i)perylene	UG/KG	80 J	1400 U	70 J	620 J	180 J

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.		TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units					
Pesticide/PCB						
alpha-BHC	UG/KG	30 U	30 U	30 U	30 U	30 U
beta-BHC	UG/KG	30 U	30 U	30 U	30 U	30 U
gamma-BHC (Lindane)	UG/KG	30 U	30 U	30 U	30 U	30 U
delta-BHC	UG/KG	30 U	30 U	30 U	30 U	30 U
Heptachlor	UG/KG	30 U	30 U	30 U	30 U	30 U
Aldrin	UG/KG	30 U	30 U	30 U	30 U	30 U
Heptachlor epoxide	UG/KG	30 U	30 U	30 U	30 U	30 U
Endosulfan I	UG/KG	30 U	30 U	30 U	30 U	30 U
Dieldrin	UG/KG	30 U	30 U	30 U	30 U	30 U
4,4'-DDE	UG/KG	30 U	30 U	30 U	120	30 U
Endrin	UG/KG	30 U	30 U	30 U	30 U	30 U
Endosulfan II	UG/KG	30 U	30 U	30 U	30 U	30 U
4,4'-DDD	UG/KG	30 U	30 U	30 U	300	30 U
Endrin aldehyde	UG/KG	30 U	30 U	30 U	30 U	30 U
Endosulfan sulfate	UG/KG	30 U	30 U	30 U	30 U	30 U
4,4'-DDT	UG/KG	30 U	30 U	30 U	140 J	30 U
Endrin ketone	UG/KG	30 U	30 U	30 U	30 U	30 U
Methoxychlor	UG/KG	30 UJ	30 UJ	30 UJ	30 UJ	30 UJ
Toxaphene	UG/KG	300 U	300 U	300 U	300 U	300 U
Technical Chlordane	UG/KG	30 U	30 U	30 U	30 U	30 U
Aroclor 1016	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1221	UG/KG	100 U	100 U	100 U	100 U	100 U
Aroclor 1232	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1242	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1248	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1254	UG/KG	50 U	50 U	50 U	50 U	50 U
Aroclor 1260	UG/KG	50 U	50 U	50 U	50 U	50 U
alpha-Chlordane	UG/KG	30 U	30 U	30 U	30 U	30 U
gamma-Chlordane	UG/KG	30 U	30 U	30 U	30 U	30 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-76	TP-77	TP-78	TP-79	TP-80
Sample I.D.		TP-76 (0-14)	TP-77 (7-17)	TP-78 (0-19)	TP-79 (13-20)	TP-80 (0-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		09/24/98	09/24/98	09/24/98	09/25/98	09/25/98
Parameter	Units					
Metals						
Aluminum	MG/KG	7250	8540	7670	5090	8330
Antimony	MG/KG	5.89 UJ	5.55 UJ	5.50 UJ	5.59 UJ	5.49 UJ
Arsenic	MG/KG	14.1 U	13.3 U	13.2 U	16.7	13.2 U
Barium	MG/KG	76.1	87.6	62.2	115	34.8
Beryllium	MG/KG	0.391	0.561	0.548	0.508	0.403
Cadmium	MG/KG	0.916	1.56	1.85	1.44	0.873
Calcium	MG/KG	22500	85400	43300	26400	30300
Chromium	MG/KG	10.4	42.2	11.5	19.8	9.77
Cobalt	MG/KG	2.23	3.29	4.42	3.70	3.87
Copper	MG/KG	23.3	36.2	33.7	59.2	15.9
Iron	MG/KG	11600	14500	15500	12900	13400
Lead	MG/KG	108	106	70.2	319	38.5
Vanadium	MG/KG	15.0	17.7	17.2	14.7	19.8
Magnesium	MG/KG	6990	32300	17300	4390	7170
Manganese	MG/KG	229	533	516	369	365
Mercury	MG/KG	0.26	0.13	0.17	0.088	0.046
Nickel	MG/KG	10.5	14.6	17.3	26.8	9.61
Potassium	MG/KG	770	1470	993	547	866
Selenium	MG/KG	8.25 U	7.76 U	7.70 U	7.82 U	7.69 U
Silver	MG/KG	1.18 UJ	1.11 UJ	1.10 UJ	1.12 UJ	1.10 UJ
Sodium	MG/KG	117	259	116	164	96.8
Thallium	MG/KG	7.66 U	7.21 U	7.15 U	7.26 U	7.14 U
Zinc	MG/KG	95.4	137	163	243	58.1
Cyanide	MG/KG	0.596 U	0.501 U	0.540 U	0.553 U	0.563 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-81	TP-82	TP-83
Sample I.D.		TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix		Soil	Soil	Soil
Date Sampled		09/25/98	09/25/98	09/25/98
Parameter	Units			
Volatiles				
Chloromethane	UG/KG	5 U	5 UJ	5 UJ
Bromomethane	UG/KG	5 U	5 U	5 U
Vinyl Chloride	UG/KG	5 U	5 UJ	5 UJ
Chloroethane	UG/KG	5 U	5 U	5 U
Methylene Chloride	UG/KG	5 U	5 UJ	5 UJ
Acetone	UG/KG	30 U	27 UJ	26 UJ
Carbon Disulfide	UG/KG	5 U	5 UJ	5 UJ
1,1-Dichloroethene	UG/KG	5 U	5 UJ	5 UJ
1,1-Dichloroethane	UG/KG	5 U	5 UJ	5 UJ
1,2-Dichloroethene (cis)	UG/KG	5 U	5 U	5 U
1,2-Dichloroethene (trans)	UG/KG	5 U	5 UJ	5 UJ
Chloroform	UG/KG	5 U	5 UJ	5 UJ
Methyl Ethyl Ketone (2-Butanone)	UG/KG	27 UJ	27 UJ	26 UJ
1,2-Dichloroethane	UG/KG	5 U	5 UJ	5 UJ
1,1,1-Trichloroethane	UG/KG	5 U	5 UJ	5 UJ
Carbon Tetrachloride	UG/KG	5 U	5 UJ	5 UJ
Bromodichloromethane	UG/KG	5 U	5 UJ	5 UJ
1,2-Dichloropropane	UG/KG	5 U	5 U	5 U
cis-1,3-Dichloropropene	UG/KG	5 U	5 U	5 U
Trichloroethene	UG/KG	3.0 J	5 U	5 U
Benzene	UG/KG	5 U	5 U	5 U
Dibromochloromethane	UG/KG	5 U	5 U	5 U
trans-1,3-Dichloropropene	UG/KG	5 U	5 UJ	5 UJ
1,1,2-Trichloroethane	UG/KG	5 U	5 U	5 UJ
Bromoform	UG/KG	5 U	5 U	5 U
4-Methyl-2-Pentanone	UG/KG	11 U	11 UJ	10 UJ
2-Hexanone	UG/KG	11 UJ	11 UJ	10 UJ
Tetrachloroethene	UG/KG	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	UG/KG	5 UJ	5 U	5 UJ
Toluene	UG/KG	5 U	5 U	5 U
Chlorobenzene	UG/KG	5 U	5 U	5 U
Ethylbenzene	UG/KG	5 U	5 U	5 U
Styrene	UG/KG	5 U	5 U	5 U
m,p-Xylene	UG/KG	5 U	5 U	5 U
o-Xylene	UG/KG	5 U	5 U	5 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-81	TP-82	TP-83
Sample I.D.		TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix		Soil	Soil	Soil
Date Sampled		09/25/98	09/25/98	09/25/98
Parameter	Units			
Semivolatiles				
Phenol	UG/KG	300 U	270 U	270 U
bis(2-Chloroethyl)ether	UG/KG	300 U	270 U	270 U
2-Chlorophenol	UG/KG	300 U	270 U	270 U
1,3-Dichlorobenzene	UG/KG	300 U	270 U	270 U
1,4-Dichlorobenzene	UG/KG	300 U	270 U	270 U
Benzyl Alcohol	UG/KG	300 U	270 U	270 U
1,2-Dichlorobenzene	UG/KG	300 U	270 U	270 U
2-Methylphenol (o-cresol)	UG/KG	300 U	270 U	270 U
2,2'-oxybis(1-Chloropropane)	UG/KG	300 U	270 U	270 U
4-Methylphenol (p-cresol)	UG/KG	300 U	270 U	270 U
N-Nitroso-di-n-propylamine	UG/KG	300 U	270 U	270 U
Hexachloroethane	UG/KG	300 U	270 U	270 U
Nitrobenzene	UG/KG	300 U	270 U	270 U
Isophorone	UG/KG	300 U	270 U	270 U
2-Nitrophenol	UG/KG	300 U	270 U	270 U
2,4-Dimethylphenol	UG/KG	300 U	270 U	270 U
bis(2-Chloroethoxy)methane	UG/KG	300 U	270 U	270 U
Benzoic Acid	UG/KG	300 U	270 U	270 U
2,4-Dichlorophenol	UG/KG	300 U	270 U	270 U
1,2,4-Trichlorobenzene	UG/KG	300 U	270 U	270 U
Naphthalene	UG/KG	300 U	270 U	160 J
4-Chloroaniline	UG/KG	600 U	540 U	540 U
Hexachlorobutadiene	UG/KG	300 U	270 U	270 U
4-Chloro-3-methylphenol	UG/KG	600 U	540 U	540 U
2-Methylnaphthalene	UG/KG	300 U	270 U	160 J
Hexachlorocyclopentadiene	UG/KG	300 U	270 U	270 U
2,4,6-Trichlorophenol	UG/KG	300 U	270 U	270 U
2,4,5-Trichlorophenol	UG/KG	300 U	270 U	270 U
2-Chloronaphthalene	UG/KG	300 U	270 U	270 U
2-Nitroaniline	UG/KG	1200 U	1100 U	1100 U
Dimethylphthalate	UG/KG	300 U	270 U	270 U
Acenaphthylene	UG/KG	300 U	270 U	270 U
3-Nitroaniline	UG/KG	1200 U	1100 U	1100 U
2,6-Dinitrotoluene	UG/KG	300 U	270 U	270 U
Acenaphthene	UG/KG	300 U	270 U	100 J
2,4-Dinitrophenol	UG/KG	1200 U	1100 U	1100 U
4-Nitrophenol	UG/KG	1200 U	1100 U	1100 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-81	TP-82	TP-83
Sample I.D.		TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix		Soil	Soil	Soil
Date Sampled		09/25/98	09/25/98	09/25/98
Parameter	Units			
Semivolatiles				
Dibenzofuran	UG/KG	300 U	270 U	90 J
2,4-Dinitrotoluene	UG/KG	300 U	270 U	270 U
Diethylphthalate	UG/KG	300 U	270 U	270 U
Fluorene	UG/KG	300 U	270 U	60 J
4-Nitroaniline	UG/KG	1200 U	1100 U	1100 U
4-Chlorophenyl-phenylether	UG/KG	1200 U	1100 U	1100 U
4,6-Dinitro-2-methylphenol	UG/KG	300 U	270 U	270 U
N-Nitrosodiphenylamine	UG/KG	300 U	270 U	270 U
4-Bromophenyl-phenylether	UG/KG	300 U	270 U	270 U
Hexachlorobenzene	UG/KG	300 U	270 U	270 U
Pentachlorophenol	UG/KG	1200 U	1100 U	1100 U
Phenanthrene	UG/KG	70 J	270 U	760
Anthracene	UG/KG	300 U	270 U	190 J
Carbazole	UG/KG	300 U	270 U	100 J
Di-n-butylphthalate	UG/KG	300 U	270 U	270 U
Fluoranthene	UG/KG	80 J	270 U	830
Pyrene	UG/KG	90 J	270 U	800
Butylbenzylphthalate	UG/KG	300 U	270 U	270 U
3,3'-Dichlorobenzidine	UG/KG	600 U	540 U	540 U
Benzo(a)anthracene	UG/KG	300 U	270 U	530
Chrysene	UG/KG	60 J	270 U	530
bis(2-Ethylhexyl)phthalate	UG/KG	300 U	270 U	100 J
Di-n-octylphthalate	UG/KG	300 U	270 U	270 U
Benzo(b)fluoranthene	UG/KG	60 J	270 U	660
Benzo(k)fluoranthene	UG/KG	300 U	270 U	240 J
Benzo(a)pyrene	UG/KG	300 U	270 U	450
Indeno(1,2,3-cd)pyrene	UG/KG	300 U	270 U	230 J
Dibenz(a,h)anthracene	UG/KG	300 U	270 U	70 J
Benzo(g,h,i)perylene	UG/KG	300 U	270 U	200 J

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-81	TP-82	TP-83
Sample I.D.		TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix		Soil	Soil	Soil
Date Sampled		09/25/98	09/25/98	09/25/98
Parameter	Units			
Pesticide/PCB				
alpha-BHC	UG/KG	30 U	30 U	30 U
beta-BHC	UG/KG	30 U	30 U	30 U
gamma-BHC (Lindane)	UG/KG	30 U	30 U	30 U
delta-BHC	UG/KG	30 U	30 U	30 U
Heptachlor	UG/KG	30 U	30 U	30 U
Aldrin	UG/KG	30 U	30 U	30 U
Heptachlor epoxide	UG/KG	30 U	30 U	30 U
Endosulfan I	UG/KG	30 U	30 U	30 U
Dieldrin	UG/KG	30 U	30 U	30 U
4,4'-DDE	UG/KG	30 U	30 U	30 U
Endrin	UG/KG	30 U	30 U	30 U
Endosulfan II	UG/KG	30 U	30 U	30 U
4,4'-DDD	UG/KG	30 U	30 U	30 U
Endrin aldehyde	UG/KG	30 U	30 U	30 U
Endosulfan sulfate	UG/KG	30 U	30 U	30 U
4,4'-DDT	UG/KG	30 U	30 U	30 U
Endrin ketone	UG/KG	30 U	30 U	30 U
Methoxychlor	UG/KG	30 UJ	30 UJ	30 UJ
Toxaphene	UG/KG	300 U	300 U	300 U
Technical Chlordane	UG/KG	30 U	30 U	30 U
Aroclor 1016	UG/KG	50 U	50 U	50 U
Aroclor 1221	UG/KG	100 U	100 U	100 U
Aroclor 1232	UG/KG	50 U	50 U	50 U
Aroclor 1242	UG/KG	50 U	50 U	50 U
Aroclor 1248	UG/KG	50 U	50 U	50 U
Aroclor 1254	UG/KG	50 U	50 U	50 U
Aroclor 1260	UG/KG	50 U	50 U	50 U
alpha-Chlordane	UG/KG	30 U	30 U	30 U
gamma-Chlordane	UG/KG	30 U	30 U	30 U

TABLE 1
VALIDATION SUMMARY TABLE
SOIL SAMPLE RESULTS
MAIN LASALLE REVITALIZATION PROJECT

Location I.D.		TP-81	TP-82	TP-83
Sample I.D.		TP-81 (0-13)	TP-82 (0-15)	TP-83 (0-10)
Matrix		Soil	Soil	Soil
Date Sampled		09/25/98	09/25/98	09/25/98
Parameter	Units			
Metals				
Aluminum	MG/KG	6040	7950	9270
Antimony	MG/KG	5.85 UJ	5.12 UJ	5.45 UJ
Arsenic	MG/KG	14.1 U	12.2 U	13.1 U
Barium	MG/KG	51.1	73.2	76.4
Beryllium	MG/KG	0.376	0.398	0.702
Cadmium	MG/KG	0.883	0.616	0.783
Calcium	MG/KG	106000	65300	14600
Chromium	MG/KG	9.85	12.3	16.0
Cobalt	MG/KG	2.77	4.41	5.50
Copper	MG/KG	29.1	22.0	85.6
Iron	MG/KG	12500	14400	25700
Lead	MG/KG	29.8	13.7	267
Vanadium	MG/KG	13.5	17.8	22.7
Magnesium	MG/KG	18800	24200	5690
Manganese	MG/KG	592	493	400
Mercury	MG/KG	0.11	0.011 U	0.088
Nickel	MG/KG	13.4	15.3	18.2
Potassium	MG/KG	708	1860	1080
Selenium	MG/KG	8.20 U	7.17 U	7.66 U
Silver	MG/KG	1.17 UJ	1.02 UJ	1.09 UJ
Sodium	MG/KG	159	184	108
Thallium	MG/KG	7.61 U	6.66 U	7.12 U
Zinc	MG/KG	86.0	104	202
Cyanide	MG/KG	0.455 U	0.571 U	0.549 U

APPENDIX B

ANALYTICAL DATA SUMMARY

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			SS-07,SS-09	SS-08	SS-10,SS-11	SS-12	SS-13
Date Sampled			11/13/97	11/13/97	11/13/97	11/21/97	11/21/97
Parameter	Units	TAGM #4046					
Chloromethane	UG/KG		4				
Acetone	UG/KG	200					
1,1,1-Trichloroethane	UG/KG	800					
Trichloroethene	UG/KG	700					
Benzene	UG/KG	60					
Toluene	UG/KG	1500			1		
Xylene (total)	UG/KG	1200					
Benzoic Acid	UG/KG	2700	318	316	285		
Naphthalene	UG/KG	13000	275				
2-Methylnaphthalene	UG/KG	36400	341				
Acenaphthylene	UG/KG	41000	746		79		
Acenaphthene	UG/KG	50000	130				
Dibenzofuran	UG/KG	6200	285				
Fluorene	UG/KG	50000	100				
Phenanthrene	UG/KG	50000	1450	180	331	99	411
Anthracene	UG/KG	50000	556				77
Carbazole	UG/KG		225				
Di-n-butylphthalate	UG/KG	8100					
Fluoranthene	UG/KG	50000	2220	229	531	85	372
Pyrene	UG/KG	50000	6470	311	991	157	810
Butylbenzylphthalate	UG/KG	50000					
Benzo(a)anthracene	UG/KG	224 or MDL	1980	101	363		228
Chrysene	UG/KG	400	3030	209	635		303
bis(2-Ethylhexyl)phthalate	UG/KG	50000	249	127	142	87	81
Benzo(b)fluoranthene	UG/KG	224 or MDL	3190	180	601		243
Benzo(k)fluoranthene	UG/KG	224 or MDL	3020	162	565		279
Benzo(a)pyrene	UG/KG	61 or MDL	2400	134	431		256
Indeno(1,2,3-cd)pyrene	UG/KG	3200	1900		229		112
Dibenz(a,h)anthracene	UG/KG	14 or MDL	606		93		
Benzo(g,h,i)perylene	UG/KG	50000	1960	80	238		129
Dieldrin	UG/KG	44				3.93	3.5
4,4'-DDE	UG/KG	2100	31.7			2.29	
4,4'-DDD	UG/KG	2900					
4,4'-DDT	UG/KG	2100					
Zinc	MG/KG	20 or SB	239	75	52.6	119	152

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			SS-07,SS-09	SS-08	SS-10,SS-11	SS-12	SS-13
Date Sampled			11/13/97	11/13/97	11/13/97	11/21/97	11/21/97
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	140	35.8	51.5	33.2	127
Cadmium	MG/KG	1 or SB	10.5	4.6	1.9	2.5	2.7
Cobalt	MG/KG	30 or SB	5	4.2	2.9	4	3.8
Nickel	MG/KG	13 or SB	53.7	14.3	12.8	10.8	15
Barium	MG/KG	300 or SB	84.1	39.8	33.8	67.6	70.2
Manganese	MG/KG	SB	596	390	361	446	457
Iron	MG/KG	2000 or SB	92400	38700	12800	15200	16600
Chromium	MG/KG	50 or SB	56.8	14	7.2	14.1	11.2
Magnesium	MG/KG	SB	2300	3190	9980	11500	13400
Vanadium	MG/KG	150 or SB	16.2	15.1	7.8	15.9	12.7
Aluminum	MG/KG	SB	2090	4860	2760	9840	6290
Beryllium	MG/KG	0.16 or SB					
Calcium	MG/KG	SB	16000	6270	52700	39900	30100
Copper	MG/KG	25 or SB	137	53.4	86.1	17.2	66.5
Silver	MG/KG	SB					
Potassium	MG/KG	SB	173	447	267	1050	416
Sodium	MG/KG	SB	2070	980	402	449	504
Arsenic	MG/KG	7.5 or SB	15.6	11.7	8.59	5.07	7.64
Antimony	MG/KG	SB					
Selenium	MG/KG	2 or SB	0.740	0.54		0.37	0.8
Thallium	MG/KG	SB					
Mercury	MG/KG	0.1	0.225	0.08	0.116	0.099	0.434
Cyanide	MG/KG		1.73	0.36	0.06	NA	NA

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-02	TP-04	TP-28A	TP-40A	TP-52
Date Sampled			08/05/96	08/05/96	11/06/96	11/06/96	08/12/96
Parameter	Units	TAGM #4046					
Chloromethane	UG/KG						
Acetone	UG/KG	200					
1,1,1-Trichloroethane	UG/KG	800					
Trichloroethene	UG/KG	700					
Benzene	UG/KG	60					
Toluene	UG/KG	1500					
Xylene (total)	UG/KG	1200					
Benzoic Acid	UG/KG	2700					
Naphthalene	UG/KG	13000				510	
2-Methylnaphthalene	UG/KG	36400					
Acenaphthylene	UG/KG	41000					
Acenaphthene	UG/KG	50000	1236		82	850	
Dibenzofuran	UG/KG	6200			50	580	
Fluorene	UG/KG	50000		80	99	980	
Phenanthrene	UG/KG	50000	1340	1210	1200	9000	336
Anthracene	UG/KG	50000	4360	220	220	1800	85
Carbazole	UG/KG		770		NA	NA	
Di-n-butylphthalate	UG/KG	8100		89			
Fluoranthene	UG/KG	50000	26600	1710	1200	8100	537
Pyrene	UG/KG	50000	19400	1110	1900	14000	508
Butylbenzylphthalate	UG/KG	50000		423	150		
Benzo(a)anthracene	UG/KG	224 or MDL	14500	1100	970	6900	324
Chrysene	UG/KG	400	13700	1110	1000	6900	389
bis(2-Ethylhexyl)phthalate	UG/KG	50000		76	80		
Benzo(b)fluoranthene	UG/KG	224 or MDL	13600	1240	1000	8600	385
Benzo(k)fluoranthene	UG/KG	224 or MDL	14140	1120	700		315
Benzo(a)pyrene	UG/KG	61 or MDL	14800	1120	910	5800	314
Indeno(1,2,3-cd)pyrene	UG/KG	3200	4460	231	800	4300	82
Dibenz(a,h)anthracene	UG/KG	14 or MDL		340	500	3200	
Benzo(g,h,i)perylene	UG/KG	50000	4000	228	810	4800	76
Dieldrin	UG/KG	44					
4,4'-DDE	UG/KG	2100		3.7			
4,4'-DDD	UG/KG	2900					
4,4'-DDT	UG/KG	2100				170	
Zinc	MG/KG	20 or SB	101	122	110	680	194

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-02	TP-04	TP-28A	TP-40A	TP-52
Date Sampled			08/05/96	08/05/96	11/06/96	11/06/96	08/12/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	85.6	81.7	56	550	166
Cadmium	MG/KG	1 or SB	2.9	2.5		1.9	4.5
Cobalt	MG/KG	30 or SB			7.5	8.4	4.7
Nickel	MG/KG	13 or SB	19.4	9.2	2.6	35	12.1
Barium	MG/KG	300 or SB	48.1	39.1	60	430	91.4
Manganese	MG/KG	SB	344	603	360	510	1220
Iron	MG/KG	2000 or SB	11300	8700	11000	17000	16800
Chromium	MG/KG	50 or SB	19.8	29.6	15	23	85.4
Magnesium	MG/KG	SB	33000	21900	9100	5600	4720
Vanadium	MG/KG	150 or SB	8.6	9.5	17	32	19.6
Aluminum	MG/KG	SB	3900	3260	21000	21000	8060
Beryllium	MG/KG	0.16 or SB				0.81	
Calcium	MG/KG	SB	100000	89900	73000	22000	24300
Copper	MG/KG	25 or SB	37.7	20.7	28	110	38.1
Silver	MG/KG	SB					
Potassium	MG/KG	SB	789	513	2200	2200	599
Sodium	MG/KG	SB	412	264	200	310	412
Arsenic	MG/KG	7.5 or SB	11	4.3	10	15	7.4
Antimony	MG/KG	SB					
Selenium	MG/KG	2 or SB	0.54		1.1	2.8	0.96
Thallium	MG/KG	SB	0.34	0.33			
Mercury	MG/KG	0.1	0.171	0.13	0.12	0.35	0.194
Cyanide	MG/KG		0.133				0.783

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-53	TP-54	TP-55	TP-56	TP-57
Date Sampled			08/13/96	08/13/96	08/13/96	08/13/96	08/13/96
Parameter	Units	TAGM #4046					
Chloromethane	UG/KG						
Acetone	UG/KG	200	26			31	36
1,1,1-Trichloroethane	UG/KG	800					
Trichloroethene	UG/KG	700				2	
Benzene	UG/KG	60	1			1	2
Toluene	UG/KG	1500					
Xylene (total)	UG/KG	1200					
Benzoic Acid	UG/KG	2700				292	
Naphthalene	UG/KG	13000	665	144	87	102	77
2-Methylnaphthalene	UG/KG	36400	1040	201	150	172	122
Acenaphthylene	UG/KG	41000	84			82	
Acenaphthene	UG/KG	50000	108				
Dibenzofuran	UG/KG	6200	429	95		72	
Fluorene	UG/KG	50000					
Phenanthrene	UG/KG	50000	1960	904	227	506	203
Anthracene	UG/KG	50000	357	179		96	
Carbazole	UG/KG		168	86			
Di-n-butylphthalate	UG/KG	8100	176	98	88	97	75
Fluoranthene	UG/KG	50000	1480	901	241	1260	180
Pyrene	UG/KG	50000	3670	2910	417	1940	159
Butylbenzylphthalate	UG/KG	50000					
Benzo(a)anthracene	UG/KG	224 or MDL	1390	1190	139	922	75
Chrysene	UG/KG	400	1780	1580	224	1112	121
bis(2-Ethylhexyl)phthalate	UG/KG	50000	177	233	158	167	112
Benzo(b)fluoranthene	UG/KG	224 or MDL	1640	1060	222	1150	95
Benzo(k)fluoranthene	UG/KG	224 or MDL	1390	1052	141	920	80
Benzo(a)pyrene	UG/KG	61 or MDL	1410	1970	162	1080	79
Indeno(1,2,3-cd)pyrene	UG/KG	3200	1460	1500	151	672	
Dibenz(a,h)anthracene	UG/KG	14 or MDL	554	895			
Benzo(g,h,i)perylene	UG/KG	50000	1510	4130	196	724	
Dieldrin	UG/KG	44					
4,4'-DDE	UG/KG	2100					
4,4'-DDD	UG/KG	2900					
4,4'-DDT	UG/KG	2100					
Zinc	MG/KG	20 or SB	199	196	155	170	78.9

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-53	TP-54	TP-55	TP-56	TP-57
Date Sampled			08/13/96	08/13/96	08/13/96	08/13/96	08/13/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	117	95.4	64.8	108	118
Cadmium	MG/KG	1 or SB	3.7	3.6	7.7	5.3	4.5
Cobalt	MG/KG	30 or SB	3.6		8.5	4.8	3.7
Nickel	MG/KG	13 or SB	13.8	14.5	22.1	16	13.9
Barium	MG/KG	300 or SB	90	66.4	67.3	76.6	28.3
Manganese	MG/KG	SB	210	274	457	383	449
Iron	MG/KG	2000 or SB	12400	12900	37000	22300	14900
Chromium	MG/KG	50 or SB	9.2	10.4	12	10.9	4.8
Magnesium	MG/KG	SB	19800	13400	3400	6600	16500
Vanadium	MG/KG	150 or SB	9	10	13.9	12.7	5.9
Aluminum	MG/KG	SB	2660	3420	8190	5400	2000
Beryllium	MG/KG	0.16 or SB					
Calcium	MG/KG	SB	96400	81700	15300	29700	86900
Copper	MG/KG	25 or SB	46.3	57	43.7	40.9	513
Silver	MG/KG	SB					
Potassium	MG/KG	SB	429	625	617	415	221
Sodium	MG/KG	SB	393	402	842	570	351
Arsenic	MG/KG	7.5 or SB	24	5.8	9.8	11	11
Antimony	MG/KG	SB					1.6
Selenium	MG/KG	2 or SB	1.2	1.2	1.2	1.1	
Thallium	MG/KG	SB					
Mercury	MG/KG	0.1	0.276	0.19	0.109	0.212	0.207
Cyanide	MG/KG		0.142	0.250	0.458	0.331	0.088

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-58	TP-59	TP-60	TP-61	TP-62
Date Sampled			08/13/96	08/13/96	08/13/96	08/13/96	08/12/96
Parameter	Units	TAGM #4046					
Chloromethane	UG/KG						
Acetone	UG/KG	200	82	175	66		
1,1,1-Trichloroethane	UG/KG	800					
Trichloroethene	UG/KG	700					1
Benzene	UG/KG	60.	2	4	1		
Toluene	UG/KG	1500					
Xylene (total)	UG/KG	1200					
Benzoic Acid	UG/KG	2700					
Naphthalene	UG/KG	13000		208			
2-Methylnaphthalene	UG/KG	36400		308			
Acenaphthylene	UG/KG	41000		187			
Acenaphthene	UG/KG	50000				143	
Dibenzofuran	UG/KG	6200		166		94	
Fluorene	UG/KG	50000					
Phenanthrene	UG/KG	50000	174	1065	337	1200	
Anthracene	UG/KG	50000		176	74	336	
Carbazole	UG/KG			103		137	
Di-n-butylphthalate	UG/KG	8100	99	84		80	
Fluoranthene	UG/KG	50000	170	2110	327	1480	
Pyrene	UG/KG	50000	196	3450	1020	3200	77
Butylbenzylphthalate	UG/KG	50000					
Benzo(a)anthracene	UG/KG	224 or MDL	80	1520	328	1110	
Chrysene	UG/KG	400	141	2000	405	1210	
bis(2-Ethylhexyl)phthalate	UG/KG	50000	220	151	157	331	
Benzo(b)fluoranthene	UG/KG	224 or MDL	103	2400	354	976	
Benzo(k)fluoranthene	UG/KG	224 or MDL	86	1920	287	974	
Benzo(a)pyrene	UG/KG	61 or MDL	85	1740	456	979	
Indeno(1,2,3-cd)pyrene	UG/KG	3200		1140	507	690	
Dibenz(a,h)anthracene	UG/KG	14 or MDL		445		256	
Benzo(g,h,i)perylene	UG/KG	50000		1080	758	793	
Dieldrin	UG/KG	44					
4,4'-DDE	UG/KG	2100			8	27.1	
4,4'-DDD	UG/KG	2900					
4,4'-DDT	UG/KG	2100					
Zinc	MG/KG	20 or SB	52.2	116	61.5	53.9	21.8

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-58	TP-59	TP-60	TP-61	TP-62
Date Sampled			08/13/96	08/13/96	08/13/96	08/13/96	08/12/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	21.1	148	71.4	22.6	28.7
Cadmium	MG/KG	1 or SB	4.8	7.9	1.7	1.8	
Cobalt	MG/KG	30 or SB	5	6.1			
Nickel	MG/KG	13 or SB	13.2	16.1	8.2		
Barium	MG/KG	300 or SB	53.7	92.2	64.3	14.3	500
Manganese	MG/KG	SB	445	365	708	202	5250
Iron	MG/KG	2000 or SB	15800	26700	6100	3690	2260
Chromium	MG/KG	50 or SB	7.5	10.5	6.7	1.9	82.7
Magnesium	MG/KG	SB	10200	5500	14400	16700	4900
Vanadium	MG/KG	150 or SB	12.3	10.7	7.4		
Aluminum	MG/KG	SB	6920	3720	5550	1660	36400
Beryllium	MG/KG	0.16 or SB					1.6
Calcium	MG/KG	SB	64400	28900	126000	47700	296000
Copper	MG/KG	25 or SB	25.8	129	11.6	5	12.5
Silver	MG/KG	SB					
Potassium	MG/KG	SB	379	382	450	173	1980
Sodium	MG/KG	SB	387	584	366	138	773
Arsenic	MG/KG	7.5 or SB	6.7	127	3.4	1.3	
Antimony	MG/KG	SB					
Selenium	MG/KG	2 or SB	0.59	1.4			4.2
Thallium	MG/KG	SB					
Mercury	MG/KG	0.1	0.177	0.082	0.027	0.035	
Cyanide	MG/KG		0.113	0.595	0.169	0.234	53.3

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-62A	TP-63	TP-64	TP-65	TP-68
Date Sampled			08/15/96	08/12/96	08/12/96	08/15/96	08/15/96
Parameter	Units	TAGM #4046					
Chloromethane	UG/KG		NA				
Acetone	UG/KG	200	NA		350	60	
1,1,1-Trichloroethane	UG/KG	800	NA		2		
Trichloroethene	UG/KG	700	NA	1	2		
Benzene	UG/KG	60	NA		5		
Toluene	UG/KG	1500	NA		1		
Xylene (total)	UG/KG	1200	NA		1		
Benzoic Acid	UG/KG	2700	NA				
Naphthalene	UG/KG	13000	NA		549	99	
2-Methylnaphthalene	UG/KG	36400	NA		1190	149	
Acenaphthylene	UG/KG	41000	NA				
Acenaphthene	UG/KG	50000	NA	85	208	459	
Dibenzofuran	UG/KG	6200	NA		483	219	
Fluorene	UG/KG	50000	NA	92		227	
Phenanthrene	UG/KG	50000	NA	942	2310	5700	1120
Anthracene	UG/KG	50000	NA	255	536	1630	166
Carbazole	UG/KG		NA	90	183	376	97
Di-n-butylphthalate	UG/KG	8100	NA		92	130	72
Fluoranthene	UG/KG	50000	NA	2010	1830	4630	1520
Pyrene	UG/KG	50000	NA	1380	3610	15900	1160
Butylbenzylphthalate	UG/KG	50000	NA				
Benzo(a)anthracene	UG/KG	224 or MDL	NA	1050	1600	6390	1030
Chrysene	UG/KG	400	NA	1110	1750	6310	1080
bis(2-Ethylhexyl)phthalate	UG/KG	50000	NA	148	276	376	83
Benzo(b)fluoranthene	UG/KG	224 or MDL	NA	1360	1390	4270	1150
Benzo(k)fluoranthene	UG/KG	224 or MDL	NA	1360	1220	4270	1010
Benzo(a)pyrene	UG/KG	61 or MDL	NA	1110	1710	574	1050
Indeno(1,2,3-cd)pyrene	UG/KG	3200	NA	252	1420	3160	1400
Dibenz(a,h)anthracene	UG/KG	14 or MDL	NA		553	2290	
Benzo(g,h,i)perylene	UG/KG	50000	NA	204	1750	3360	
Dieldrin	UG/KG	44	NA			9.4	
4,4'-DDE	UG/KG	2100	NA	29.6		30.2	19.2
4,4'-DDD	UG/KG	2900	NA			34.4	
4,4'-DDT	UG/KG	2100	NA				
Zinc	MG/KG	20 or SB	8.8	99.6	39.4	114	84.4

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-62A	TP-63	TP-64	TP-65	TP-68
Date Sampled			08/15/96	08/12/96	08/12/96	08/15/96	08/15/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	18.1	73.3	29.3	132	74.4
Cadmium	MG/KG	1 or SB		4	3.6	2	
Cobalt	MG/KG	30 or SB		5.8	4.7		
Nickel	MG/KG	13 or SB		16.7	15.4	13	9.6
Barium	MG/KG	300 or SB	449	79.9	34.4	89.8	47.2
Manganese	MG/KG	SB	4960	600	147	263	307
Iron	MG/KG	2000 or SB	1030	14600	14000	8380	8020
Chromium	MG/KG	50 or SB	48.4	15.8	7.4	11.3	11.3
Magnesium	MG/KG	SB	4740	23000	2720	20500	2420
Vanadium	MG/KG	150 or SB		15.3	12.2	8	7.1
Aluminum	MG/KG	SB	36400	9140	1320	2620	4170
Beryllium	MG/KG	0.16 or SB	0.77				
Calcium	MG/KG	SB	311000	80600	40000	149000	8170
Copper	MG/KG	25 or SB	6.2	22.7	17.7	41.1	23.3
Silver	MG/KG	SB	3.2				
Potassium	MG/KG	SB	1255	1190	406	367	300
Sodium	MG/KG	SB	528	492	419	334	218
Arsenic	MG/KG	7.5 or SB	5.1	5.7	16	9.4	6.5
Antimony	MG/KG	SB					
Selenium	MG/KG	2 or SB	0.58	0.92	2.1	1.3	0.47
Thallium	MG/KG	SB			0.72		
Mercury	MG/KG	0.1		0.09	0.275	0.339	0.201
Cyanide	MG/KG		34	0.133	0.126	0.189	0.830

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-69	TP-69A	TP-70
Date Sampled			08/15/96	11/06/96	08/15/96
Parameter	Units	TAGM #4046			
Chloromethane	UG/KG				
Acetone	UG/KG	200			
1,1,1-Trichloroethane	UG/KG	800			
Trichloroethene	UG/KG	700			
Benzene	UG/KG	60			
Toluene	UG/KG	1500			
Xylene (total)	UG/KG	1200			
Benzoic Acid	UG/KG	2700			
Naphthalene	UG/KG	13000			407
2-Methylnaphthalene	UG/KG	36400			255
Acenaphthylene	UG/KG	41000		240	172
Acenaphthene	UG/KG	50000			595
Dibenzofuran	UG/KG	6200			414
Fluorene	UG/KG	50000		240	592
Phenanthrene	UG/KG	50000	593	2600	5620
Anthracene	UG/KG	50000		590	1640
Carbazole	UG/KG			NA	427
Di-n-butylphthalate	UG/KG	8100	62		103
Fluoranthene	UG/KG	50000	567	3700	3773
Pyrene	UG/KG	50000	223	6600	11900
Butylbenzylphthalate	UG/KG	50000			
Benzo(a)anthracene	UG/KG	224 or MDL	649	3300	4905
Chrysene	UG/KG	400	653	3800	5180
bis(2-Ethylhexyl)phthalate	UG/KG	50000	93		234
Benzo(b)fluoranthene	UG/KG	224 or MDL	796	4900	3650
Benzo(k)fluoranthene	UG/KG	224 or MDL	707		3460
Benzo(a)pyrene	UG/KG	61 or MDL		3200	4760
Indeno(1,2,3-cd)pyrene	UG/KG	3200		3000	4460
Dibenz(a,h)anthracene	UG/KG	14 or MDL		2300	1790
Benzo(g,h,i)perylene	UG/KG	50000		3600	5080
Dieldrin	UG/KG	44			
4,4'-DDE	UG/KG	2100		7	
4,4'-DDD	UG/KG	2900			
4,4'-DDT	UG/KG	2100			
Zinc	MG/KG	20 or SB	52.1	360	406

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-1
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
HIGH BEDROCK AREA
SOIL

Sample Location I.D.			TP-69	TP-69A	TP-70
Date Sampled			08/15/96	11/06/96	08/15/96
Parameter	Units	TAGM #4046			
Lead	MG/KG	SB	28.8	170	565
Cadmium	MG/KG	1 or SB	5.5		2.7
Cobalt	MG/KG	30 or SB	4.5	6.1	5.3
Nickel	MG/KG	13 or SB	6.7	12	17.1
Barium	MG/KG	300 or SB	129	140	173
Manganese	MG/KG	SB	1790	110	332
Iron	MG/KG	2000 or SB	47300	12000	17800
Chromium	MG/KG	50 or SB	10.4	22	18.5
Magnesium	MG/KG	SB	6570	6800	14000
Vanadium	MG/KG	150 or SB	40.4	22	17.7
Aluminum	MG/KG	SB	28600	20000	6740
Beryllium	MG/KG	0.16 or SB	2.2		
Calcium	MG/KG	SB	115000	23000	43100
Copper	MG/KG	25 or SB	11.1	50	77.7
Silver	MG/KG	SB			
Potassium	MG/KG	SB	1530	1900	655
Sodium	MG/KG	SB	1070	180	534
Arsenic	MG/KG	7.5 or SB	9.7	12	19
Antimony	MG/KG	SB			
Selenium	MG/KG	2 or SB	2.4	2.6	0.98
Thallium	MG/KG	SB			
Mercury	MG/KG	0.1	0.014	0.24	0.775
Cyanide	MG/KG		6.530		0.317

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			SS-01	SS-02	SS-03	SS-04	SS-05
Date Sampled			08/14/96	08/14/96	08/14/96	08/14/96	08/14/96
Parameter	Units	TAGM #4046					
Acetone	UG/KG	200					
Methyl Ethyl Ketone	UG/KG	300					
Vinyl Acetate	UG/KG						
Trichloroethene	UG/KG	700	2		1		
Toluene	UG/KG	1500					
Ethylbenzene	UG/KG	5500					
Xylene (total)	UG/KG	1200					
Naphthalene	UG/KG	13000	135				
2-Methylnaphthalene	UG/KG	36400	119				
Acenaphthylene	UG/KG	41000					
Acenaphthene	UG/KG	50000	427				
Dibenzofuran	UG/KG	6200	267				
Fluorene	UG/KG	50000	169				
Phenanthrene	UG/KG	50000	3890	477		826	657
Anthracene	UG/KG	50000	1030			107	
Carbazole	UG/KG		950				
Di-n-butylphthalate	UG/KG	8100	160				73
Fluoranthene	UG/KG	50000	5220	438		1000	677
Pyrene	UG/KG	50000	8530		139	527	259
Butylbenzylphthalate	UG/KG	50000	76				
Benzo(a)anthracene	UG/KG	224 or MDL	3630	612	638	791	716
Chrysene	UG/KG	400	4110	614	634	829	725
bis(2-Ethylhexyl)phthalate	UG/KG	50000	332		110	95	149
Benzo(b)fluoranthene	UG/KG	224 or MDL	3670		810	933	896
Benzo(k)fluoranthene	UG/KG	224 or MDL	3630		720	844	780
Benzo(a)pyrene	UG/KG	61 or MDL	3910			796	723
Indeno(1,2,3-cd)pyrene	UG/KG	3200	2970			208	
Dibenz(a,h)anthracene	UG/KG	14 or MDL	1140				
Benzo(g,h,i)perylene	UG/KG	50000	3260			226	
Dieldrin	UG/KG	44	18.1	1.4	4.5	2.1	48.1
4,4'-DDE	UG/KG	2100	23.7	2.2	6.5	4.6	77.8
4,4'-DDD	UG/KG	2900			3.1	7.2	60.9
4,4'-DDT	UG/KG	2100			12.8		47.8
Aroclor 1254	UG/KG	1000					
Zinc	MG/KG	20 or SB	NA	NA	NA	NA	NA

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			SS-01	SS-02	SS-03	SS-04	SS-05
Date Sampled			08/14/96	08/14/96	08/14/96	08/14/96	08/14/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	NA	NA	NA	NA	NA
Cadmium	MG/KG	1 or SB	NA	NA	NA	NA	NA
Cobalt	MG/KG	30 or SB	NA	NA	NA	NA	NA
Nickel	MG/KG	13 or SB	NA	NA	NA	NA	NA
Barium	MG/KG	300 or SB	NA	NA	NA	NA	NA
Manganese	MG/KG	SB	NA	NA	NA	NA	NA
Iron	MG/KG	2000 or SB	NA	NA	NA	NA	NA
Chromium	MG/KG	50 or SB	NA	NA	NA	NA	NA
Magnesium	MG/KG	SB	NA	NA	NA	NA	NA
Vanadium	MG/KG	150 or SB	NA	NA	NA	NA	NA
Aluminum	MG/KG	SB	NA	NA	NA	NA	NA
Calcium	MG/KG	SB	NA	NA	NA	NA	NA
Copper	MG/KG	25 or SB	NA	NA	NA	NA	NA
Potassium	MG/KG	SB	NA	NA	NA	NA	NA
Sodium	MG/KG	SB	NA	NA	NA	NA	NA
Arsenic	MG/KG	7.5 or SB	NA	NA	NA	NA	NA
Selenium	MG/KG	2 or SB	NA	NA	NA	NA	NA
Thallium	MG/KG	SB	NA	NA	NA	NA	NA
Mercury	MG/KG	0.1	NA	NA	NA	NA	NA

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			SS-06	TP-06	TP-08	TP-10	TP-13
Date Sampled			08/14/96	08/05/96	08/05/96	08/05/96	08/06/96
Parameter	Units	TAGM #4046					
Acetone	UG/KG	200		42	73	59	36
Methyl Ethyl Ketone	UG/KG	300					
Vinyl Acetate	UG/KG						
Trichloroethene	UG/KG	700	2				
Toluene	UG/KG	1500					
Ethylbenzene	UG/KG	5500					
Xylene (total)	UG/KG	1200					
Naphthalene	UG/KG	13000				110	103
2-Methylnaphthalene	UG/KG	36400				183	
Acenaphthylene	UG/KG	41000					
Acenaphthene	UG/KG	50000		139			165
Dibenzofuran	UG/KG	6200					134
Fluorene	UG/KG	50000		129			225
Phenanthrene	UG/KG	50000	1052	1530	800	559	1990
Anthracene	UG/KG	50000	157	365	78		512
Carbazole	UG/KG		86	199			211
Di-n-butylphthalate	UG/KG	8100					
Fluoranthene	UG/KG	50000	1660	2190	1400	437	2790
Pyrene	UG/KG	50000	1050	1660	1030	110	1940
Butylbenzylphthalate	UG/KG	50000					
Benzo(a)anthracene	UG/KG	224 or MDL	1020	1247	1560	615	1560
Chrysene	UG/KG	400	1070	1190	1790	625	1500
bis(2-Ethylhexyl)phthalate	UG/KG	50000	6274	133			85
Benzo(b)fluoranthene	UG/KG	224 or MDL	1200	1160	3460	777	1420
Benzo(k)fluoranthene	UG/KG	224 or MDL	1194	1140	2700	687	1470
Benzo(a)pyrene	UG/KG	61 or MDL	1110	1250	3060		1400
Indeno(1,2,3-cd)pyrene	UG/KG	3200	319	439	1570		245
Dibenz(a,h)anthracene	UG/KG	14 or MDL			829		
Benzo(g,h,i)perylene	UG/KG	50000		427	1590		178
Dieldrin	UG/KG	44					
4,4'-DDE	UG/KG	2100	31.7	7			4.05
4,4'-DDD	UG/KG	2900		6.7			3.1
4,4'-DDT	UG/KG	2100					
Aroclor 1254	UG/KG	1000					
Zinc	MG/KG	20 or SB	NA	52.1	288	69.7	NA

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			SS-06	TP-06	TP-08	TP-10	TP-13
Date Sampled			08/14/96	08/05/96	08/05/96	08/05/96	08/06/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	NA	46.1	75	25.6	NA
Cadmium	MG/KG	1 or SB	NA	3.1	5	2.5	NA
Cobalt	MG/KG	30 or SB	NA	4.4	3.3		NA
Nickel	MG/KG	13 or SB	NA	14.3	11.7	8.1	NA
Barium	MG/KG	300 or SB	NA	27.7	289	65.6	NA
Manganese	MG/KG	SB	NA	187	784	317	NA
Iron	MG/KG	2000 or SB	NA	10100	17100	9000	NA
Chromium	MG/KG	50 or SB	NA	9.2	23	13.5	NA
Magnesium	MG/KG	SB	NA	53500	10000	6420	NA
Vanadium	MG/KG	150 or SB	NA	7.3	9.5	7.8	NA
Aluminum	MG/KG	SB	NA	4520	5920	5000	NA
Calcium	MG/KG	SB	NA	106000	20900	24500	NA
Copper	MG/KG	25 or SB	NA	20.2	107	24.5	NA
Potassium	MG/KG	SB	NA	934	671	461	NA
Sodium	MG/KG	SB	NA	349	465	281	NA
Arsenic	MG/KG	7.5 or SB	NA	6.8	7.2	4.3	NA
Selenium	MG/KG	2 or SB	NA		2.2	0.92	NA
Thallium	MG/KG	SB	NA		0.35		NA
Mercury	MG/KG	0.1	NA	0.337	0.197	0.046	NA

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NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			TP-14	TP-15	TP-16	TP-17	TP-29
Date Sampled			08/06/96	08/06/96	08/06/96	08/06/96	11/04/96
Parameter	Units	TAGM #4046					
Acetone	UG/KG	200	40	360	41		
Methyl Ethyl Ketone	UG/KG	300		58			
Vinyl Acetate	UG/KG		23				
Trichloroethene	UG/KG	700					
Toluene	UG/KG	1500		2			
Ethylbenzene	UG/KG	5500		6			
Xylene (total)	UG/KG	1200		13			
Naphthalene	UG/KG	13000		242			140
2-Methylnaphthalene	UG/KG	36400	88	210			110
Acenaphthylene	UG/KG	41000		92			
Acenaphthene	UG/KG	50000	299	238			310
Dibenzofuran	UG/KG	6200	167	122			180
Fluorene	UG/KG	50000	333	226			350
Phenanthrene	UG/KG	50000	3190	1860	449	79	3200
Anthracene	UG/KG	50000	620	362			820
Carbazole	UG/KG		385	217			NA
Di-n-butylphthalate	UG/KG	8100		83			
Fluoranthene	UG/KG	50000	4590	3350	516	139	3700
Pyrene	UG/KG	50000	2240	1470	268	113	5300
Butylbenzylphthalate	UG/KG	50000					
Benzo(a)anthracene	UG/KG	224 or MDL	1730	1560	603		3200
Chrysene	UG/KG	400	2000	1690	608	84	2500
bis(2-Ethylhexyl)phthalate	UG/KG	50000	439	490	74	121	140
Benzo(b)fluoranthene	UG/KG	224 or MDL	1890	2620	753		3800
Benzo(k)fluoranthene	UG/KG	224 or MDL	2390	2300	648	73	
Benzo(a)pyrene	UG/KG	61 or MDL	1570	2070	599		2600
Indeno(1,2,3-cd)pyrene	UG/KG	3200	181	548			2100
Dibenz(a,h)anthracene	UG/KG	14 or MDL					1400
Benzo(g,h,i)perylene	UG/KG	50000		500	139		2200
Dieldrin	UG/KG	44					
4,4'-DDE	UG/KG	2100	30.2	53.5	4.1	7.2	34
4,4'-DDD	UG/KG	2900	253	415	3.5	5.6	
4,4'-DDT	UG/KG	2100				5.8	210
Aroclor 1254	UG/KG	1000					1000
Zinc	MG/KG	20 or SB	NA	NA	NA	NA	340

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			TP-14	TP-15	TP-16	TP-17	TP-29
Date Sampled			08/06/96	08/06/96	08/06/96	08/06/96	11/04/96
Parameter	Units	TAGM #4046					
Lead	MG/KG	SB	NA	NA	NA	NA	460
Cadmium	MG/KG	1 or SB	NA	NA	NA	NA	6.6
Cobalt	MG/KG	30 or SB	NA	NA	NA	NA	7
Nickel	MG/KG	13 or SB	NA	NA	NA	NA	20
Barium	MG/KG	300 or SB	NA	NA	NA	NA	180
Manganese	MG/KG	SB	NA	NA	NA	NA	280
Iron	MG/KG	2000 or SB	NA	NA	NA	NA	2000
Chromium	MG/KG	50 or SB	NA	NA	NA	NA	16
Magnesium	MG/KG	SB	NA	NA	NA	NA	7300
Vanadium	MG/KG	150 or SB	NA	NA	NA	NA	23
Aluminum	MG/KG	SB	NA	NA	NA	NA	6300
Calcium	MG/KG	SB	NA	NA	NA	NA	22000
Copper	MG/KG	25 or SB	NA	NA	NA	NA	120
Potassium	MG/KG	SB	NA	NA	NA	NA	14000
Sodium	MG/KG	SB	NA	NA	NA	NA	27000
Arsenic	MG/KG	7.5 or SB	NA	NA	NA	NA	14
Selenium	MG/KG	2 or SB	NA	NA	NA	NA	2
Thallium	MG/KG	SB	NA	NA	NA	NA	
Mercury	MG/KG	0.1	NA	NA	NA	NA	0.3

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			TP-41	TP-66
Date Sampled			11/04/96	11/04/96
Parameter	Units	TAGM #4046		
Acetone	UG/KG	200		
Methyl Ethyl Ketone	UG/KG	300		
Vinyl Acetate	UG/KG			
Trichloroethene	UG/KG	700		
Toluene	UG/KG	1500		
Ethylbenzene	UG/KG	5500		
Xylene (total)	UG/KG	1200		
Naphthalene	UG/KG	13000		130
2-Methylnaphthalene	UG/KG	36400		89
Acenaphthylene	UG/KG	41000		
Acenaphthene	UG/KG	50000	180	200
Dibenzofuran	UG/KG	6200	130	160
Fluorene	UG/KG	50000	230	280
Phenanthrene	UG/KG	50000	2400	2800
Anthracene	UG/KG	50000	520	680
Carbazole	UG/KG		NA	NA
Di-n-butylphthalate	UG/KG	8100		
Fluoranthene	UG/KG	50000	2600	2600
Pyrene	UG/KG	50000	4800	5900
Butylbenzylphthalate	UG/KG	50000		
Benzo(a)anthracene	UG/KG	224 or MDL	2400	2900
Chrysene	UG/KG	400	2400	2800
bis(2-Ethylhexyl)phthalate	UG/KG	50000		270
Benzo(b)fluoranthene	UG/KG	224 or MDL	2700	3900
Benzo(k)fluoranthene	UG/KG	224 or MDL		
Benzo(a)pyrene	UG/KG	61 or MDL	2000	2700
Indeno(1,2,3-cd)pyrene	UG/KG	3200	1500	2000
Dibenz(a,h)anthracene	UG/KG	14 or MDL	1000	1300
Benzo(g,h,i)perylene	UG/KG	50000	1600	2300
Dieldrin	UG/KG	44		
4,4'-DDE	UG/KG	2100	120	
4,4'-DDD	UG/KG	2900		
4,4'-DDT	UG/KG	2100	18	35
Aroclor 1254	UG/KG	1000		
Zinc	MG/KG	20 or SB	390	780

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-2
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *
QUARRY AREA
SOIL

Sample Location I.D.			TP-41	TP-66
Date Sampled			11/04/96	11/04/96
Parameter	Units	TAGM #4046		
Lead	MG/KG	SB	400	990
Cadmium	MG/KG	1 or SB	4.1	4.6
Cobalt	MG/KG	30 or SB	7.9	7.0
Nickel	MG/KG	13 or SB	32	21
Barium	MG/KG	300 or SB	150	410
Manganese	MG/KG	SB	500	360
Iron	MG/KG	2000 or SB	27000	22000
Chromium	MG/KG	50 or SB	20	21
Magnesium	MG/KG	SB	15000	7700
Vanadium	MG/KG	150 or SB	25	22
Aluminum	MG/KG	SB	8700	8600
Calcium	MG/KG	SB	49000	28000
Copper	MG/KG	25 or SB	160	210
Potassium	MG/KG	SB	25000	20000
Sodium	MG/KG	SB	2500	2100
Arsenic	MG/KG	7.5 or SB	9.5	14
Selenium	MG/KG	2 or SB	1.8	1.7
Thallium	MG/KG	SB		
Mercury	MG/KG	0.1	1.2	0.6

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

NA - Not Analyzed.

Recommended Soil Cleanup Objectives (TAGM #4046, Revised April,1995)

( ) - Concentration exceeds criteria.

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-01	TP-02	TP-03	TP-04	TP-05
Date Sampled			08/12/96	08/12/96	08/12/96	08/12/96	08/15/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-06	TP-07	TP-08	TP-09	TP-10
Date Sampled			08/12/96	08/12/96	08/12/96	08/12/96	08/12/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-11	TP-12	TP-13	TP-14	TP-15
Date Sampled			08/12/96	08/12/96	08/12/96	08/14/96	08/14/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-16	TP-17	TP-18	TP-19	TP-20
Date Sampled			08/12/96	08/14/96	08/12/96	08/13/96	08/14/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-21	TP-22	TP-23	TP-24	TP-25
Date Sampled			08/14/96	08/13/96	08/13/96	08/13/96	08/13/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-26	TP-27	TP-28	TP-29	TP-30
Date Sampled			08/13/96	08/13/96	08/13/96	08/13/96	08/13/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-31	TP-32	TP-33	TP-34	TP-35
Date Sampled			08/13/96	08/13/96	08/13/96	08/13/96	08/13/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)		0.98			

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-36	TP-37	TP-38	TP-39	TP-40
Date Sampled			08/14/96	08/14/96	08/14/96	08/14/96	08/14/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)		0.82			

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-41	TP-42	TP-43	TP-44	TP-45
Date Sampled			08/14/96	08/14/96	08/14/96	08/14/96	08/14/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)				1.1	
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)		2.1			

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-46	TP-46A	TP-48	TP-49	TP-50
Date Sampled			08/15/96	08/15/96	08/15/96	08/15/96	08/15/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)				4	

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-51	TP-52	TP-53	TP-54	TP-62
Date Sampled			08/15/96	08/15/96	08/15/96	08/15/96	08/15/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)					

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

TABLE 4-3
MAIN LASALLE REVITALIZATION PROJECT
CITY OF BUFFALO
ANALYTICAL DATA SUMMARY *

SOIL GAS

Sample Location I.D.			TP-63	TP-64	TP-65	TP-66	TP-67
Date Sampled			08/15/96	08/15/96	08/15/96	08/15/96	08/15/96
Parameter	Units	Criteria **					
Toluene	MG/M³	2 (1) or 89 (2)					
Vinyl Chloride	MG/M³	0.2 (1) or 1.3 (2)				2.8	

* - Results are shown only for analytes detected. Only those parameters with detections are included in summary.

** - New York State Air Guide - 1: Guidelines for the Control of Toxic Ambient Air Contaminants, 1991

(1) Annual guideline concentration

(2) Short-term guideline concentration

( ) - Concentration exceeds criteria

APPENDIX C

SITE HEALTH AND SAFETY PLAN

SITE HEALTH AND SAFETY PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

SITE HEALTH AND SAFETY PLAN

1.0 SCOPE

This section specifies the minimum requirements for health, safety, and emergency response for the project. The Contractor shall develop and implement a written Site Health and Safety Plan (SHASP) which at a minimum meets the requirements of this item and complies with applicable Federal and State regulations. The SHASP shall be submitted for review to the Engineer before any onsite work can be initiated. The SHASP, complete with all comments addressed, will be made a part of the Contract Documents.

1.1 References

The Site Health and Safety Plan shall meet applicable requirements contained in the following publications.

- 29 CFR 1910, General Industry, Occupational Safety and Health Administration (OSHA) Safety and Health Standards.
- 29 CFR 1926, Construction Industry, OSHA Safety and Health Standards.
- USEPA Order 1440.2, Health and Safety Requirements for Employees Engaged in Field Activities, July 12, 1981.
- NIOSH/OSHA/USCG/USEPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.
- Standard Operating Safety Guides, United States Environmental Protection Agency, Office of Emergency and Remedial Response, November 1984.

- "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices." American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, Current Edition.

- "Guide to Occupational Exposure Values." American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, Current Edition.

- Department of Labor, Occupational Safety and Health Administration, 29 CFR, Part 1910, Air Contaminants; Final Rule, January 19, 1989.

- "Pocket Guide to Chemical Hazards" National Institute for Occupational Safety and Health and Occupational Safety and Health Administration, current edition.

1.2 Definitions

- Onsite Personnel: Onsite personnel shall include the Contractor, Subcontractor(s), the Owner and his representatives, and the local, state, and federal government representatives having jurisdiction over the work performed under this contract, as well as all employees/agents of these parties.

- Visitors: All personnel present on site not qualifying as Onsite Personnel.

- Health and Safety Manager: The Health and Safety Manager (HSM) must have a formal education and training in occupational health and safety with a minimum of three years experience in hazardous waste site operations. The HSM must have a working knowledge of State and Federal Occupational Safety and Health Regulations. He shall be responsible for the development, implementation, and oversight of the SHASP and shall provide necessary direction and supervision to the Site Health and Safety Officer. He shall also be responsible for site- specific training, review of air monitoring data, and review of any accident reports. The HSM shall be available during normal working hours.

- Site Health and Safety Officer: The Site Health and Safety Officer (SHSO) must have a minimum of two years of related experience. He must have a working knowledge of State and Federal Occupational Safety and Health Regulations and must have demonstrable experience in the proper use of air monitoring instrumentation used at the site. The SHSO shall be certified in CPR and first aid. The SHSO must be on site during active working hours. The responsibilities of the SHSO are as follows:

  a. Implement the SHASP on site
  b. Enforce day-to-day health and safety protocols in effect on site
  c. Require that all workers involved in intrusive activities on the site have had appropriate waste site worker training and medical examinations, and review and maintain training and medical certifications on site
  d. Require that all personnel entering the site understand the provisions of the SHASP
  e. Conduct daily health and safety inspections and prepare weekly reports
  f. Conduct periodic training sessions in proper use and maintenance of personal protective equipment and safety practices
  g. Check the condition of all emergency equipment weekly and its availability on a daily basis
  h. Conduct periodic emergency response drills
  i. Conduct daily health and safety meetings each morning
  j. Direct and advise Contractor personnel, visitors, and Subcontractor(s) on all aspects, especially changes, related to health and safety requirements at the site
  k. Conduct necessary health and safety monitoring
  l. Conduct air monitoring program
  m. Monitor site and perimeter conditions and determine all necessary changes in levels of personal protection and, if warranted, execute work stoppages
  n. Report changes in site conditions and changes in personal protection requirements to the Engineer

o. Prepare accident/incident reports

p. Prepare and maintain all Field Activities Forms in an orderly fashion

- Monitoring: Monitoring includes the use of real-time direct reading field instruments to provide necessary information for the selection of proper personal protective equipment for onsite personnel and visitors and for the protection of general public health and the environment during the performance of the work on site.

- Medical Consultant: The Medical Consultant must be a physician that is certified in occupational medicine and familiar with potential site hazards of the project. The Medical Consultant shall be available to consult with local emergency medical services and will provide medical evaluations of personnel assigned to the project.

1.3 Site Health and Safety Plan Requirements

This contract will require work which may involve exposure to physical and chemical hazards. The Contractor shall ensure adequate protection for all onsite personnel and implement a complete Site Health and Safety Plan for all personnel working on or visiting the site. The Site Health and Safety Plan shall address, as a minimum, the following subject areas in accordance with 29 CFR, 1910.120:

- Health and safety organization (responsibilities, qualifications, and chain-of-command).

- A health and safety risk or hazard analysis for each site task and operation to be performed.

- Provisions for employee training to assure compliance with 1910.120(e).

- Personal protective equipment (PPE) to be used by employees for each of the site tasks and operations being conducted to eliminate potential exposures as required by the personal protective equipment program in 1910.120(g)(5).

- Medical surveillance requirements in accordance with 1910.120(f).

- Real-time air monitoring to identify and monitor exposures to onsite personnel and offsite receptors; personnel and environmental sampling techniques and instrumentation to be used.

- Site control measures in accordance with 1910.120(d).

- Personnel and equipment decontamination procedures in accordance with 1910.120(k).

- Standard Operating Safety Procedures, engineering controls, and work practices.

- An Emergency Response Plan meeting the requirements of 1910.120(l) for safe and effective responses to emergencies, including communications, emergency rescue, fire protection, ambulance service, first aid, spill/release response, PPE, and other equipment.

- First aid requirements.

- Confined space entry procedures meeting the requirements of 1910.146.

- A spill containment program meeting the requirements of 1910.120(j).

- Heat/cold stress monitoring.

- Logs, reports, and record keeping.

- Site description and contamination evaluation.

1.4 Submittals

- The Contractor's Site Health and Safety Plan (SHASP) submitted to the Engineer prior to the startup of work.

- Written certification of hazardous waste site worker training (initial and refresher), site-specific health and safety training, first aid training, and medical surveillance for all personnel participating in intrusive construction activities.

1.5 Compliance

- Consistent disregard for the provisions of the SHASP by the Contractor or his Subcontractor(s), or employees shall be deemed just and sufficient cause for stoppage of work. Such work stoppage shall not form the basis of claim for either extra payment or extension of time for the project completion.

- The Contractor's compliance with the minimum requirements in these specifications does not relieve the Contractor from the responsibility of implementing proper health and safety procedures under unforeseen conditions.

2.0 EXECUTION OF WORK

The Contractor shall: (a) develop and submit for review a Site Health and Safety Plan; (b) employ a Health and Safety Manager, Site Health and Safety Officer, and a Medical Consultant; and (c) conduct all necessary monitoring activities to protect his onsite personnel and others in the area.

2.1 Site Health and Safety Plan Implementation

The SHASP shall be developed and implemented by the Contractor's HSM. The requirements described herein shall be used as a minimum outline description of the SHASP. The SHASP shall be site-specific and incorporate an assessment of the hazards associated with the remediation work to be performed under this Contract. The SHASP shall address potential hazards associated with the performance of work.

2.2 Site Health and Safety Plan Elements

2.2.1 Health and Safety Organization

The Contractor shall submit a health and safety organization chart naming key project personnel, defining their duties, responsibilities, and presenting a structure to implement the SHASP as well as address problems and take corrective actions. Key project personnel will at a minimum include the Contractor's Project Manager, Health and Safety Manager, Site Health and Safety Officer, and field team personnel.

2.2.2 Hazard Assessment

The purpose of the Hazard Assessment is to provide information necessary for selecting personal protective equipment, establishing air monitoring requirements, and determining health and safety procedures necessary to protect all onsite personnel, the environment, and the public.

- Chemical Hazards: A qualitative evaluation of chemical hazards shall be based on the following:

  a. Nature of potential contaminants
  b. Locations of potential contaminants at the project site
  c. Levels of contaminants
  d. Potential for personnel/public exposure during various site activities

e. Effects of potential contaminants on human health

- Physical Hazards: The Contractor shall assess the potential for physical hazards affecting personnel during the performance of work.

2.2.3 Training

- General: The Contractor shall certify that all personnel assigned to or regularly entering areas of intrusive activity beyond the Support Zone for the purpose of performing or supervising work, for health, safety, security, or administrative purposes, for maintenance, or for any other site-related function, have received appropriate health and safety training in accordance with 29 CFR 1910.120 (e). Training shall consist of a minimum of 40 hours initial off-site training and three (3) days onsite experience. Twenty-four (24) hours of initial off-site training is acceptable for workers on site only occasionally for a specific limited task and who are unlikely to be exposed over Permissible Exposure Limits (PELs). In addition, the Contractor's supervisory personnel shall have a minimum of eight (8) hours additional specialized training on managing hazardous waste operations. Documentation of all such training shall be submitted to the Engineer before any employees will be allowed beyond the Support Zone.

- Site-Specific Training: All personnel assigned to or entering active intrusive work areas of the site shall complete one site-specific training session to guarantee that all such personnel are familiar with the use of health and safety, respiratory, and protective equipment and with the safety and security procedures required for the site. The initial site-specific training session shall be conducted by the HSM. The Contractor shall notify the Engineer at least five (5) days prior to the initial site-specific training session so that the Owner and Government personnel involved in the project may attend. Follow-up site-specific training sessions for new personnel or visitors shall be conducted by the SHSO. The Contractor shall provide site-specific training to all Contractor's and Subcontractor's employees and Government

representatives consistent with the requirements of OSHA Standard 29 CFR 1910.120, prior to the commencement of work. The site-specific training program shall address all elements of the SHASP.

- Records: The Contractor shall keep records of all training periods, documenting date, attendance, and topics covered. Additionally, the Contractor shall be responsible for, and shall guarantee that, only personnel successfully completing the required training are permitted to enter active intrusive work areas of the site.

2.2.4 Medical Surveillance

The Contractor shall provide the services of a Medical Consultant who is a physician board certified in occupational medicine to perform the medical examinations for all employees who perform intrusive work in the Exclusion Zone, in accordance with 29 CFR 1910.120(f). The Medical Consultant shall review the medical examination results to certify if Contractor's personnel are fit to perform assigned tasks using personal protective equipment. The medical surveillance protocol to be implemented is the Medical Consultant's responsibility but shall meet the requirements of USEPA, OSHA Standards 29 CFR 1910.134, and ANSI Z88.2-1980. The components of the Contractor's medical examination shall be included in the SHASP. The Contractor shall maintain and preserve medical records on workers permitted to enter beyond the Support Zone for 30 years after they leave employment as per 29 CFR Part 1910.20.

Onsite personnel entering the Exclusion Zone, and not employed by the Contractor or his Subcontractor shall be required to sign a declaration that he/she has undergone a physical examination of the same or similar scope and has been certified fit to enter contaminated areas requiring personal protective equipment necessary for this project.

Lost-Time Injuries: Any employee who develops a lost-time injury or illness during the period of the contract as a result of work in the Exclusion Zone must be evaluated by the Medical Consultant. The employee's supervisor shall be provided with a written statement indicating the employee's fitness (ability to return to work), signed by the Medical Consultant prior to allowing the

employee to re-enter the Exclusion Zone. A copy of this written statement shall be submitted to the Engineer. An accident report describing the events leading up to and causing the injury or illness shall be submitted to the Engineer.

2.3 Site Control

The Contractor shall establish a system to control access to the site. This system shall be incorporated into the layout of the site into work zones. The work zones shall include the Support Zone, Contamination Reduction Zones, and Exclusion Zones (active intrusive work areas). The system shall assure that only authorized persons enter active intrusive work areas.

- The Contractor shall restrict access and mark the outer limits of the active intrusive work areas with high visibility barrier tape or flagging and signs warning unauthorized personnel not to enter.

- If construction is concurrent, the Contractor will be responsible for establishing a means of communication between the active work areas. The Contractor will also be responsible for establishing a means of communication between workers within the same work area.

- Site security shall be established and maintained.

2.4 Standard Safety Practices

The Contractor shall develop, implement, and enforce safe work practices and engineering safeguards for the work covered under these specifications. General site health and safety directives for conducting onsite work which shall be included in the SHASP and enforced during site activities include but are not limited to:

- Eating and smoking shall be prohibited except in designated areas outside the Exclusion Zone and Contamination Reduction Zone as identified by the SHSO.

- Before initiating any non-routine operation in any restricted area, all personnel shall consult the SHSO about health and safety requirements for the operations.

- A buddy system shall be implemented for all activities involving the use of respiratory protective equipment.

- The Contractor shall implement protocols for loading and unloading material on site. These protocols shall include DOT requirements covering such items as grounding, placarding, driver qualifications, and the use of wheel locks. Operation of other heavy construction equipment shall be in accordance with OSHA Standard 29 CFR Part 1926.

2.5 Personal Protective Equipment

The Contractor shall provide all onsite personnel with appropriate personal protective equipment and protective clothing as required by the SHASP. The Contractor shall ensure that all safety equipment and protective clothing is kept clean and well-maintained.

Selection of personal protective equipment is based on the potential toxicity or physical dangers associated with hazardous materials and possible routes of exposure. Based on known or anticipated hazards, personnel will be required to wear a minimum of Level D protection. The adequacy of personal protection shall be confirmed through air monitoring conducted by the Contractor's Site Health and Safety Officer (SHSO). If the need to upgrade the level of personal protection arises, the SHSO will provide his personnel with the appropriate equipment. PPE selection, evaluation, and re-evaluation is an on-going process directly related to the change in conditions as encountered at the site.

Various levels of PPE must be made available on site during construction activities. It is anticipated that Level D and Level D-Modified PPE will be required.

2.6 Decontamination

- Equipment Decontamination: The Contractor shall construct a decontamination pad within the Contamination Reduction Zone(s) for removing soil from all vehicles and equipment leaving the exclusion zone(s). The decontamination pad(s) shall include a high-pressure water wash area for equipment and vehicles. A designated clean area shall be established within the Contamination Reduction Zone(s) for performing equipment maintenance.

  Any item taken into the Exclusion Zone must be assumed to be contaminated and must be carefully inspected and/or decontaminated before the item leaves the area. All contaminated vehicles, equipment, and materials shall be cleaned and decontaminated to the satisfaction of the Engineer prior to leaving the area. All construction material shall be handled and brought on site in such a way as to minimize the potential for contaminants being carried off site. Separate, clearly-marked parking and delivery areas shall be established.

- Water used for personnel and equipment decontamination will be collected and pumped into a recharge trench which will allow the water to seep into the ground within the limits of the final cover system.

- Personnel Decontamination: Personnel shall be required to go through a thorough decontamination procedure in the Contamination Reduction Zone prior to entering the Support Zone. Decontamination shall consist of soap and water washing of worker's hands, and face, and wet wiping of worker's boots or shoes.

2.7 Air Monitoring

The Contractor shall perform continuous real-time monitoring during active work at each work area and at site perimeter stations. Real-time organic vapor monitoring shall be conducted using Photoionization and/or Flame Ionization Detectors at each active work area within the breathing zone.

All real-time monitoring shall be run continuously during active work. Real-time monitoring for combustibles, oxygen, hydrogen sulfide, and particulates shall also be run continuously along with the organic vapor monitoring. In addition, real-time, direct reading monitors shall be used at least hourly at one upwind and three downwind perimeter stations to monitor releases resulting from onsite activity and to provide information necessary to determine work rates and the implementation of control measures to prevent unacceptable contaminations from leaving the site. Results of the real-time monitoring shall be logged and reported to the Engineer daily.

3.0 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

- Fire Extinguishers: The type and number of fire extinguishers shall be determined by the Contractor. Inspection and maintenance shall be the responsibility of the Contractor. At least one 20-lb type ABC fire extinguisher shall be located at each entrance to each active work area with additional units located in onsite offices, and on each piece of heavy equipment. These fire extinguishers shall be utilized for putting out equipment or personnel fires and not to be employed as sole fire fighting equipment for large site fire.

- Emergency Eye Wash: Portable emergency eye wash units shall be provided by the Contractor. These portable units must be protected from freezing and shall be located close to the work area and at each equipment decontamination station. The emergency eye wash units shall meet the requirements specified in ANSI Z358.1-1981.

- First Aid Kits: The size and number of kits shall be sufficient for the maximum number of people on site at one time. The kits shall be equipped as per the recommendations of the Medical Consultant and shall be able to provide stabilization for patients requiring offsite treatment and general first aid. The first aid kit locations shall be specially marked and provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions.

- Onsite Emergency Vehicle: The Contractor shall provide at all times while onsite work proceeds, a designated emergency vehicle which will be used to transport injured personnel to the hospital for treatment. This vehicle shall contain a map showing the route and written directions to the hospital.

4.0 EMERGENCY RESPONSE PLAN AND PROCEDURES

The Contractor shall develop an Emergency Response Plan which shall be submitted as part of the SHASP. This plan shall be designed to delineate contingency procedures to be used in the event of injuries to employees or other site-related accidents. The Emergency Response Plan shall include the procedures to be used to mitigate the harmful effects of chemical exposure as well as rescue and first aid services to be rendered. The Contractor shall coordinate with local agencies (fire department, police department, emergency medical services, etc.) prior to beginning work.

Emergency response agencies and current telephone numbers shall be included in the SHASP.

4.1 Contingency Procedures

The Contractor shall include in the SHASP a set of contingency procedures. At a minimum, these procedures shall describe:

a) The actions that the Contractor will take in response to a worker injury or illness, a heavy equipment related accidents, fires, explosions, or any spill of contaminated materials;

b) The name, address, and phone number (home and office) of the person(s) designated by the Contractor to act as emergency coordinator;

c) A list of all emergency equipment at the site;

d) Fires: The Contractor shall develop procedures for responding to both small and large fires which shall address the following minimum actions:

- Evacuation procedures.
- Extinguishing methods.

- Notification of emergency response services, Engineer, and Owner.

e) Escape routes which will be used in the event of a sudden release, explosion, fire, etc.;

f) A map showing the route to the nearest hospital;

The Contractor shall prepare a Contingency Plan designed to prevent the spread of contaminants to adjacent areas. The plan shall incorporate a comprehensive air monitoring program which will follow NYSDEC and NYSDOH guidelines for a Community Air Monitoring Plan and shall meet the minimum requirements of the Project Contingency Plan. The Community Air Monitoring Plan particulate limits shall be modified for this project as follows:

- An action level of 150 micrograms per cubic meter (integrated over a maximum period of 15 minutes) shall be established.

- If the site particulate levels exceed the 150 micrograms/cubic meter limit, then particulate measurements upwind of the site will be recorded. If the waste site level exceeds background by more than 100 micrograms/cubic meter, then remedial site activities must be performed.

The NYSDEC and NYSDOH Community Air Monitoring Plan has been provided as an attachment to this section.

The Contractor shall promptly report in writing to the Engineer and Owner all accidents arising out of, or in connection with, the performance of the work, whether on or adjacent to the site, which caused death, personal injury, or property damage, giving full details and statements of witnesses.

4.2 Accident Investigation and Reporting

The Contractor shall develop a system, including forms, on which the pertinent details about accidents, damage, existing hazards, and actions taken to alleviate problems can be listed . These forms shall be appended to the Contractor's SHASP.

5.0 HEAT/COLD STRESS MONITORING

As a minimum, the Contractor shall establish work/rest schedules based on ambient conditions and the level of protection being utilized and identify necessary physiological monitoring requirements.

Procedures to monitor, avoid, and treat heat/cold stress shall be established in accordance with "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, October 1985; U.S. Dept. of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety Health; Publication No. 85-115.

Field implementation of the Heat/Cold Stress Prevention Plan shall be performed by a person with current first aid/CPR certification who is trained to recognize symptoms of heat and cold stress.

6.0 SPILL CONTROL PLAN

The Contractor shall provide spill control measures; including methods, means, and facilities required to prevent contamination by site wastes, contaminated groundwater, equipment fuels, oils, and greases, and any other potentially hazardous materials. If a spill occurs, the following actions, at a minimum, shall be taken by the Contractor.

a. Notify the Owner and Engineer immediately.

b. Take immediate measures to control and contain the spill within the site boundaries.

c. Keep unnecessary people away, isolate the hazardous area, and deny entry.

d. Stay upwind; keep out of low lying areas.

e. Allow no flares, smoking, or flames in hazard area.

f. For liquids, keep combustibles away from the spilled material.

7.0 DOCUMENTATION

7.1 Logs, Reports, and Recordkeeping

The Contractor shall maintain logs and reports covering the implementation of the SHASP. The format shall be developed by the Contractor to include Daily Safety Logs, Air Monitoring Logs, and a Close-Out Safety Report. These logs and reports shall be appended to the Contractor's SHASP.

7.2 Daily Safety Logs

Daily Safety Logs shall be completed by the SHSO and submitted to the Engineer on a daily basis. These logs shall include:

a. Date.

b. Work area(s) checked.

c. Employees present in work areas.

d. Equipment being utilized by employees.

e. Protective clothing being worn by employees.

f. Protective devices being used by employees.

g. Accidents or breaches of procedure.

7.3 Air Monitoring Logs

Air Monitoring Logs shall be completed by the SHSO and submitted to the Engineer on a daily basis. These logs shall include:

a. Date of report.

b. Equipment utilized for air monitoring.

c. Real-time air monitoring readings from each work location.

d. Calibration records.

e. Signature of individual taking readings.

f. Specific locations of real-time readings.

g. Exact time monitoring was conducted.

h. Meteorological conditions.

i. Any required equipment repair.

7.4 Close-out Safety Report

At the completion of the work, the Contractor shall submit a Close-out Safety Report. The report shall be signed and dated by the Site Health and Safety Officer and submitted to the Engineer. The report shall include procedures and techniques used to decontaminate equipment, vehicles, and decontamination facilities. The report shall include a summary of safety aspects of the entire project.

8.0 COMMUNICATIONS

A hardline or cellular telephone communications system shall be established by the Contractor. Two way radios shall be utilized for onsite communication. A map giving directions to the nearest hospital and a list of emergency numbers, including the Owner, Engineer, police, fire, ambulance, hospital, and the NYSDEC shall be prominently posted near the telephone.

9.0 POSTED REGULATIONS

The Contractor shall develop a series of posted regulations which shall address onsite protocols regarding use of personal protective equipment, personal hygiene, and provisions for smoking and eating on the site.

These protocols shall be posted at various locations on site and shall be reviewed with the Contractor's personnel.

SITE HEALTH AND SAFETY PLAN

ATTACHMENT C1

COMMUNITY AIR MONITORING PLAN

Community Air Monitoring Plan
(Ground Intrusive Activities)

Real-time air monitoring, for volatile compounds and particulate levels at the perimeter of the work area is necessary. The plan must include the following:

- Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

- Particulates should be continuously monitored upwind, downwind and within the work area at temporary particulate monitoring stations. If the downwind particulate level is 100* $\mu g/m^3$ greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

(*See Section 4.1 for revised particulate requirements - a level of 150 $\mu g/m^3$ is normally specified)

Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- The organic vapor level 200 ft. downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and if the following levels persist for more than 30 minutes in the 20-Foot Zones, then the Major Vapor Emission Response Plan shall automatically be placed into effect;

- if organic vapor levels are approaching 5 ppm above background.

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health and Safety Plan of the Work Plan will go into effect.

2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.

3. Frequent air monitoring will be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

APPENDIX D

CONSTRUCTION QUALITY ASSURANCE PLAN

CONSTRUCTION QUALITY ASSURANCE PLAN

TABLE OF CONTENTS

CONSTRUCTION QUALITY ASSURANCE PLAN

TABLE OF CONTENTS

1.0 GENERAL

This Construction Quality Assurance (CQA) Plan describes the methods and procedures that will be used during Phase I - Site Remediation at the Main-LaSalle Revitalization Project.

1.1 Definitions

The following definitions and abbreviations apply to this plan:

ACGIH - American Council of Government Industrial Hygienists

ASTM - American Society of Testing and Materials

BUD - Beneficial Use Determination meeting the requirements of 6 NYCRR Part 360-1.15.

C&D - Construction and demolition material

CITY - City of Buffalo, Buffalo Urban Renewal Agency

CPAH - Carcinogenic Polynuclear Aromatic hydrocarbon

CQA - Construction Quality Assurance

ENGINEER - The person or persons designated by the Owner to represent him on specified aspects of the project. Duties delegated to the Engineer will include items such as construction quality assurance sampling, testing, site access controls, determination of limits of work, and measurement of work for payment and final acceptance.

LAYER - A compacted soil stratum (e.g. structural fill) placed in one or more lifts, exclusive of construction joints. Geosynthetic items also may be referred to as layers, either composite (bonded) systems or individual components.

LIFT - A construction increment (sub-layer) of a soil layer, placed at one time, having a compaction thickness of 12 inches or less.

NIOSH - National Institute of Occupational Safety and Health

NYSDEC - New York State Department of Environmental Conservation

OSHA - Occupational Safety and Health Administration

OWNER - City of Buffalo

PLANS - Typically a document describing a method of operations, but may also refer to construction drawings.

PAH - Polynuclear aromatic hydrocarbon

PPM - Parts per million

QA/QC - Quality Assurance/Quality Control

RCRA - Resource Conservation and Recovery Act

ROW - Right-of-way

Other definitions, abbreviations and acronyms used in this document will be as defined in the Contract Documents.

1.2 Overview

The primary objectives of the remediation at the site are to: (1) remove all contaminated soils underlying areas slated for residential development (including roadways and green spaces) down to

the top of natural soils or bedrock; (2) place the contaminated soils in areas slated for recreational development; and (3)place a final cover system over the refuse filled quarry area of the site.

1.3 Responsibility and Authority

The key organizations involved in the design and construction of remediation for the site include: the Owner, the City of Buffalo; the designer, URS Greiner Consultants, Inc.; NYSDEC; the developer, Marrano/Marc Equity; the remedial construction Contractor, Cimato Brothers; the Construction QA/QC firm, URS Greiner Consultants, Inc.; and independent testing laboratories. Personnel responsible for performance and adherence to this plan will be provided in the forthcoming construction documents.

1.3.1 NYSDEC

The NYSDEC will review the Owner's Soils Management Plan for compliance with the Agency's regulations and approve the design for remediation. The NYSDEC also will review and approve the Construction Monitoring Report and all QA/QC documentation collected during construction to confirm that the approved CQA plan was followed and that remediation was in accordance with approved drawings and specifications. The NYSDEC will be provided with a schedule for construction activities prior to the commencement of construction.

1.3.2 Owner

As the Owner, the City of Buffalo is responsible for the design and construction of the Main-LaSalle Revitalization Project site. This responsibility includes producing and complying with the approved CQA plan for the construction and remediation. The City of Buffalo has the responsibility to monitor and control the quality of construction and related activities to see that they conform with the approved Contract Specifications and any necessary plans. The Owner has the option and responsibility to select professional organizations to assist it in fulfilling these responsibilities. URS Greiner Consultants, Inc. (URSG) assisted the Owner in preparation of the Contract Specifications, and this CQA plan. URSG will be retained by the City of Buffalo to provide construction QA/QC.

1.3.3 Engineer

An independent construction QA/QC firm (referred to hereinafter as the "Engineer") will be retained by the City of Buffalo to perform construction monitoring and construction quality assurance in accordance with the approved CQA plan. The QA personnel from that firm will monitor construction and remediation activities. The QA/QC firm will assign qualified personnel, either in the office or in the field, to review the Contractor's submittals. QA personnel who will be assigned specific responsibilities and tasks will include: a Project Officer, Project Manager, QA Engineer (same as the Resident Engineer), and the necessary supporting engineering and QA inspection personnel. The project will be performed under the supervision of a professional engineer licensed to practice in the State of New York.

The firm will produce, after the finish of the project, a Construction Monitoring Report that documents for the NYSDEC that the project was constructed and completed in accordance with all applicable documents and requirements such as the approved specifications. The report will be stamped by a professional engineer licensed to practice in the state of New York or other qualified representative of the firm. The report will be submitted to the NYSDEC within 45 days of project completion.

Specific QA responsibilities of the Project Officer will include: overall technical quality assurance; and certification, on behalf of the QA/QC firm, that the construction was completed in general conformance with the approved design specifications.

Specific responsibilities of the Project Manager will include:

- Reviewing design criteria, drawings, specifications, and plans so that the CQA plan can be implemented;

- Support the Resident Engineer in meetings with the Contractor and/or NYSDEC, as necessary;

- Consulting with the Resident Engineer on field problems and corrective measures;
- Making periodic site visits to review the adequacy of the work, as necessary;
- Scheduling and coordinating QA activities; and
- Witnessing critical aspects of construction work, as necessary.

The QA Engineer will be a resident position throughout critical periods of construction. Specific responsibilities of the QA Engineer will include:

- Serving as the primary interface with NYSDEC and construction contractor personnel;
- Providing daily direction and support of QA inspection personnel in performing observations and tests (e.g., confirming that regular calibration of testing equipment is properly conducted and recorded, confirming that the testing equipment and procedures are proper and do not adversely impact the inspection process, and confirming that the test data are accurately recorded and maintained);
- Informing the Project Manager of any problems or deficiencies;
- Observing all critical aspects of construction work, as necessary;
- Providing prompt inspection of suspected deficient or non-standard work and determination of required corrective measures; providing reports to the City of Buffalo on the inspection results (e.g., interpretation of all data sheets and reports, identification of any work not meeting the requirements of this plan, and verification that corrective measures have been implemented to correct defective work);
- Reviewing and accepting the Contractor's documentation;

- Reviewing and approving the QA inspector's daily reports; and

- Reviewing and approving the Contractor's requests for payment.

Specific responsibilities of supporting QA inspection personnel (if required) will include:

- Performing continuous monitoring of the work in progress for compliance with the approved drawings and specifications and with the CQA plan;

- Verifying that the equipment used by the Contractor's testing laboratories meets the test requirements and that the tests are conducted according to the CQA plan;

- Preparation of daily written reports to the Engineer that document the results of their inspection, including work that is not of acceptable quality or that fails to conform to Contract Documents; and

- Verifying through inspection that labels, tags, manifests, and other identifying documents of all construction materials conform to material specifications.

1.3.4 Developer

The Developer will be responsible for all construction and remediation activities being undertaken by the Remedial Construction Contractor at the Main-LaSalle Revitalization Project site. This responsibility includes complying with the approved CQA plan for the construction and remediation. The Developer has the responsibility to monitor and control the quality of construction and related activities to see that they conform with the approved Contract Specifications and any necessary plans.

1.3.5 Remedial Construction Contractor (Contractor)

The Contractor will be responsible for constructing the work in accordance with the design specifications and will be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor will be responsible for furnishing all labor, materials, equipment, tools, and other facilities and incidentals necessary for completion of the work. QA/QC requirements from the approved CQA plan will be included in the contract documents. The Contractor will be required to coordinate his activities with the Engineer, as necessary, and to comply fully with the QA/QC requirements.

During site remediation/construction, the Contractor will be required to provide an on-site Soils Manager who will be responsible for the implementation of the Soil Management Plan. The responsibilities of the on-site Soils Manager include:

- Management of excavated contaminated soil including handling, reuse, and/or on-site storage. If visual contamination or volatile organic vapor readings, as determined with a photoionization detector (PID), are identified, which are dissimilar to the composition or PID readings previously obtained from the near surface contaminated soils, segregation, sampling, and analytical testing to characterize the material will be required.

- Management of excavated non-contaminated soil. This includes the sampling and analytical testing of C&D material located on site. Based on analytical test results, the material shall be used as fill in either the residential or non-residential areas of the site.

- Final cover construction. This includes appropriately capping all designated areas with 12 inches of low permeability soil and/or 6 inches of top soil as applicable.

- Implementation of a perimeter air quality monitoring program for organic vapors in accordance with the SSHP (Appendix C) and dust monitoring/suppression in accordance with NYSDEC TAGM 4031.

- Implementation of the Site Health and Safety Plan (SHASP).

- Implementation of erosion and sediment control procedures to prevent runoff from contaminated areas impacting adjacent non-contaminated areas.

- Ensuring compliance with the Contractor's material handling Work Plan.

1.3.6 Surveyor

Surveying will be the responsibility of the Contractor. All surveys for the establishment of benchmarks and baselines, payment quantity verification, construction layout, and record/as-built documentation will be carried out by persons practiced in land survey techniques and under the direction of a Professional Land Surveyor licensed in the State of New York. The surveyor shall assist in the development of specified record drawings and supplemental record drawings which shall verify that the work was properly performed.

1.3.7 Independent Testing Laboratories

The testing laboratories will be responsible for performing QA/QC testing in accordance with test methods described in the specifications. Independent testing laboratories will be retained by the Contractor and subject to the approval of the Engineer. An independent testing laboratory may be employed by the Owner for the purpose of performing conformance or corroboratory testing of the Contractor's work. Test results of the Owner's laboratory will supersede those of the Contractor's laboratory. The Engineer will direct the testing laboratories with respect to sampling locations and minimum testing frequencies. Both geotechnical and analytical laboratories will be required:

- Geotechnical Testing Laboratory - shall conduct preconstruction testing on proposed off-site soil borrow materials to ensure compliance with project requirements. Both low permeability soil and topsoil shall be tested. The geotechnical laboratory shall also field test the low permeability soil to verify that the required densities and permeabilities are achieved during construction of the final cover system.

- Analytical Laboratory - shall conduct analyses on potentially non-contaminated materials (i.e. construction and demolition debris) to assess where the materials can be reused on site. Analytical testing shall also be performed by a NYSDOH ELAP-CLP certified laboratory on low permeability soil and topsoil borrow sources to verify that contaminant levels do not exceed acceptable levels, unless the supplier provides acceptable certifications that the materials were derived from "clean" virgin sources.

1.4 Construction Season

The end of the construction season will be determined when work cannot be completed in accordance with the requirements of the specifications and of the CQA plan, and/or when acceptable QA/QC test results cannot be obtained by the Contractor due to weather conditions.

1.5 Record Keeping

The QA inspectors will prepare daily field inspection reports summarizing QA inspections for the Engineer's review. The Engineer will review and sign the reports and provide a copy to the Owner. The reports will include the QA inspectors' narrative. Field reports relevant to the construction monitoring report (CMR) will be included in the CMR for submittal to the NYSDEC.

The Engineer will record the minutes of meetings, such as the preconstruction meeting and project progress meetings. He will distribute copies of the minutes to participants in the meeting and to parties affected by decisions made at the meetings, including the NYSDEC, during the construction period.

The Engineer will keep a record of all proposed design change recommendations and change orders. The records will be submitted for review to all parties involved in the process of proposed design and cost changes.

2.0 SOIL MATERIALS

Soil materials, which will be utilized on the site include the following:

- Contaminated soil
- Non-Contaminated Soils (C&D Debris)
- Low permeability Soil
- Topsoil

2.1 General Requirements

- Material Management Work Plan: The Contractor shall develop and submit a Material Management Work Plan which will detail excavation and placement procedures for both onsite and offsite materials. The plan shall contain specific provisions for the control and monitoring of dust. The Plan shall include work sequencing to minimize dust and contingency measures which will be employed, as necessary. The Plan will be reviewed and approved by the Engineer and submitted to the NYSDEC for their records prior to beginning soils excavation and placement activities.

- All fill materials proposed for use onsite shall be approved by the Engineer prior to planned placement. The fill materials shall be placed in maximum lift thicknesses (measured after compaction) as specified for each material. Fill shall be spread in approximately horizontal layers of uniform thickness by bulldozers or other approved means and compacted by approved compaction equipment. If necessary, discing, harrowing, or other approved means shall be employed to break up the material, to blend it with water, or to aerate (dewater) it to reduce moisture content prior to

compaction. The placement moisture content shall be maintained to promote effective compaction.

- Handling, spreading and compacting of materials and the construction of all fill materials shall be performed in accordance with the best commonly used modern practice, and shall be directed toward obtaining a stable and homogeneous fill which is free of stratifications, lenses, or pockets which do not satisfy the specifications.

- No material shall be placed above a previous lift of fill or prepared subgrade until the specified field and laboratory testing has been performed to verify that the required properties have been achieved for the underlying material.

- The top surface and edges of each lift shall be scarified, and moisture added as necessary prior to placement of subsequent lifts, to provide a homogeneous mass as deemed necessary by the Engineer.

- If, in the judgement of the Engineer, the soil to be used for fill does not conform to the characteristics of the pre-approved and tested borrow material samples, the material will be rejected and shall be removed and/or discarded by the Contractor to approved disposal areas.

- Placing soils which are frozen will not be permitted. Placed fill material which becomes frozen shall be removed prior to placing additional fill unless it can be verified with in place testing that the required material properties of the in place material have been maintained. Fill shall not be placed on frozen materials.

2.2 Contaminated Soil

Contaminated soil is defined as all existing onsite fill materials, with the exception of the potentially non-contaminated soils (C&D material) in the railroad right-of-way of the site. The analytical properties of this soil were established during previous site studies and contaminant levels

are provided in previously issued reports. These soils shall be excavated and utilized as grading fill elsewhere on the site.

2.2.1 Preconstruction Testing

The Contractor's geotechnical laboratory shall perform Standard Proctor tests (ASTM D-698) for each identified soil type. The test results will be used during soil placement to verify that required soil compaction is achieved.

2.2.2 Excavation

The specific means, methods, and equipment used to excavate the soil shall be as proposed by the Contractor. The Engineer's representative will be on site during all excavation activities to verify that all fill materials are removed. This verification will be based on visual observations. The Engineer's representative will also monitor the soils with a photoionization detector (PID) to confirm that the soil contaminant levels do not vary significantly from expected levels.

2.2.3 Placement

Contaminated soils shall be used outside of the residential area as subgrade fill. The soil shall be placed in one (1) foot lifts and compacted to a minimum of 95% of maximum dry density as determined by the Standard Proctor tests. Field density tests (ASTM D-2922) shall be performed by the Contractor's geotechnical laboratory at a rate of 9 tests/acre/lift. Contaminated soil placement tolerances shall be ±0.2 feet from required elevations or as required to achieve specified slopes.

2.3 Non-Contaminated Soils (C&D Debris)

Potentially non-contaminated soils consisting of C&D debris located in the southwest portion of the site as delineated on the project drawings. Soils from these areas which meets the analytical criteria will be used as fill in the residential area of the site. Soils which fail to meet the residential criteria will be placed in other areas of the site as subgrade fill.

2.3.1 Preconstruction Testing

The Contractor's analytical laboratory shall analyze all samples for the full target compound list and target analyte list (TCL and TAL) of analytes using the United States Environmental Protection Agency's SW-846 methodologies as outlined in the Chemical Quality Management Plan. One sample will be collected for each 2,500 cy of fill.

All non-contaminated soils to be placed in the residential and non-residential areas at depths greater than one foot shall have analyte levels below that specified by the NYSDEC maximum total c-PAH level of 10 ppm. All non-contaminated soils to be placed in residential and non-residential areas at depths less than one foot shall have a maximum total c-PAH level of 1 ppm.

Quality control of the analytical results shall be established (at a minimum) with the following:

- Chain of Custody forms for all samples.
- Documentation of instrument and method detection limits
- QC blanks (trip, method, rinsate)
- Matrix spike recoveries

2.3.2 Excavation and Placement

The means, methods and equipment used to excavate and place the non-contaminated soils shall be as proposed by the Contractor. The non-contaminated soils shall be placed in maximum lift thicknesses of one (1) foot and shall be compacted using a minimum of four (4) passes with an 8 ton compactor. Due to the variable nature of the non-contaminated soils it is not feasible to require specific minimum densities. Non-contaminated soils placement tolerances shall be ±0.2 feet from required elevations or as required to achieve specified slopes.

2.3.1 Preconstruction Testing

The Contractor's analytical laboratory shall analyze all samples for the full target compound list and target analyte list (TCL and TAL) of analytes using the United States Environmental Protection Agency's SW-846 methodologies as outlined in the Chemical Quality Management Plan. One sample will be collected for each 2,500 cy of fill.

All non-contaminated soils to be placed in the residential and non-residential areas at depths greater than two feet shall have analyte levels below that specified by the NYSDEC maximum total c-PAH level of 10 ppm and total PAH level of 100 ppm. All non-contaminated soils to be placed in residential and non-residential areas at depths less than two feet shall have a maximum total c-PAH level of 1 ppm, and total PAH level of 10 ppm.

Quality control of the analytical results shall be established (at a minimum) with the following:

- Chain of Custody forms for all samples.
- Documentation of instrument and method detection limits
- QC blanks (trip, method, rinsate)
- Matrix spike recoveries

2.3.2 Excavation and Placement

The means, methods and equipment used to excavate and place the non-contaminated soils shall be as proposed by the Contractor. The non-contaminated soils shall be placed in maximum lift thicknesses of one (1) foot and shall be compacted using a minimum of four (4) passes with an 8 ton compactor. Due to the variable nature of the non-contaminated soils it is not feasible to require specific minimum densities. Non-contaminated soils placement tolerances shall be ±0.2 feet from required elevations or as required to achieve specified slopes.

2.4 Low Permeability Soil

Low permeability soil shall be provided by the Contractor from off-site sources. The soil shall be classified as CL, SC, GC, SM, GM or ML using the Unified Soil Classification System and shall have a maximum in-place permeability of $1x10^{-5}$ cm/sec. This soil will be placed to a one (1) foot depth for the final cover construction. The placement tolerance for low permeability soil shall be ± 0.1 feet in thickness.

2.4.1 Preconstruction Testing

One sample from each proposed borrow source shall be analyzed to ensure that the soil meets TAGM 4046 requirements, unless the material is obtained from a commercial supplier using virgin sources, and is certified "clean".

The Contractor's geotechnical laboratory shall perform the tests as noted below:

Test	Method	Frequency
Grain Size and Hydrometer	ASTM D-422	1/2,500 cy
Moisture Content	ASTM D-2216	1/1,000 cy
Atterberg Limits	ASTM D-4318	1/2,500 cy
Moisture-Density Curve (Standard Proctor)	ASTM D-698	1/5,000 cy
Permeability	ASTM D-5084	Minimum of 3 and as required to establish minimum density and moisture requirements

2.4.2 Placement

The means, methods and equipment used to place the low permeability soil shall be as proposed by the Contractor. The soil shall be placed in maximum one (1) foot lifts. The soil shall be placed within the moisture content and density criteria established on the Preconstruction testing to

ensure that permeability requirements are achieved. At a minimum the soil will be compacted to 95% of maximum dry density as determined by Standard Proctor (ASTM D-698).

Field testing shall be performed by the Contractor's geotechnical laboratory. In-place density tests (ASTM D-2922) shall be performed at a rate of 9 tests/acre/lift. In situ permeability samples will be collected and tested at a rate of 1 test/acre/lift.

2.5 Topsoil

Topsoil shall be provided by the Contractor from off-site sources. Topsoil shall be placed to a six (6) inch depth throughout the site except for the residential area where no topsoil will be placed under the Phase 1 Remediation Contract.

2.5.1 Preconstruction Testing

One sample from each proposed borrow source shall be analyzed to ensure that the soil meets TAGM 4046 requirements, unless the material is obtained from a commercial supplier using virgin sources, and is certified "clean".

2.5.2 Placement

Topsoil shall be placed in single lift. The material shall be placed to a 0.5 foot depth with a ± 0.1 foot tolerance.

3.0 SURVEY

3.1 General

The work to be performed under this section consists of providing all necessary survey information required to construct all elements and phases of the project as shown on the plans to document the completed construction. The survey will serve to establish compliance with required slopes and layer thicknesses, to achieve requirements of the cover system in the Specifications.

The work will be performed by a State of New York licensed surveyor with current registration.

3.2 Quality Evaluation

The Contractor will arrange for permanent horizontal and vertical control points to be established on the site. Coordinates will be based on the New York State Plane Coordinate System. Elevations will be based on the National Geodetic Vertical Datum of 1927.

The Contractor is responsible for submittals, including all original survey field notes, records, and calibrations. The Engineer will review and approve the Contractor's submittals for conformance with the Specifications. All original survey field notes, records, and calculations will become the property of the Owner.

The Contractor's surveyor will execute the survey work in accordance with the Specifications. The Engineer may at any time inspect all or any portion of the survey work, or notes made by the Contractor. Such checking by the Engineer will not relieve the Contractor of any responsibility for the accuracy or completeness of his work. There will be an Engineer's survey if deemed necessary by the Engineer, as a means to verify the work.

The Contractor's surveyor shall provide all survey activities necessary for the preparation and furnishing of record drawings and supplemental record drawings. These drawings will be submitted for Owner and regulatory review as part of the construction monitoring report.

4.0 EROSION AND SEDIMENTATION CONTROL

4.1 General

Erosion and sedimentation control measures employed in this project will be identified by the Contractor in his Erosion and Sedimentation Control Plan. This plan will be submitted to the Engineer for review and approval prior to the start of construction.

The plan shall demonstrate compliance with NYSDEC document "SPDES General Permit for Storm Water Discharge for Construction Activities" dated August 1, 1993 including recommended details and methods.

4.2 Materials

All materials used will conform to the Specifications, the standards, guidelines, and permits.

4.3 Construction Quality Evaluation

Successful erosion and sediment control, including payment of any monetary fines or other costs associated with escape of sediments from the site, will be the responsibility of the Contractor. Repair of any of Contractor's work damaged by erosion prior to acceptance of the entire project by the Owner will be the responsibility of the Contractor.

The QA inspection personnel will document in their daily reports, any erosion damage to the project. They also will make periodic inspections, as required by the weather, of the area surrounding the site to check for escaped sediments, including fugitive dust. The results of such inspections will be reported immediately to the Contractor. The Engineer will assist the Contractor in identifying what remedial measures, if any, are necessary to address any identified problems.

5.0 CONSTRUCTION MONITORING REPORT

The Engineer will produce a Construction Monitoring Report documenting that the project was constructed and completed in conformance with the project specifications and this QA/QC Plan. The report shall be stamped by a professional engineer licensed to practice in New York State.

5.1 Report Contents - General

The Construction Monitoring Report will contain the following at a minimum.

- Narrative of work activities
- Quality control test results
- Test reports
- Daily observation reports
- Record Drawings
- Supplemental Record Drawings

5.2 Record Drawings

The Contractor shall markup project drawings to document variations in construction as required to meet field conditions. Items required to be documented include, but are not limited to:

Dimensional changes to the Drawings

Revisions to details shown on the Drawings

Locations and depths of underground utilities

Revisions to routing of piping and conduits

Correct grade and alignment of roads and other structures

Changes made by change order or Construction Change Directive

Changes made following the Engineer's written orders

Details not on original Contract Drawings

Revised grading elevations

Revised drainage

5.3 Supplemental Record Drawings

The Contractor(s) shall prepare and submit supplemental record drawings of the work completed as described in the technical specifications. The following supplemental record drawings shall be required:

- Elevations of the Final Cover System subgrade. The drawing will show spot elevations on the established grid system and one foot topographic contour lines.

- Low permeability soil layer elevations

- Finish grade (topsoil) elevations. The topsoil layer will include all final grades associated with the contract including both areas inside and outside of the final cover limits.

- Each of the Final Cover Soil Layer supplemental record drawings shall indicate the top and bottom elevations of the layer, as well as the total thickness of the layer, on a 50-foot by 50-foot grid, at the toes, tops and midpoints of slopes, at the final cover limits, at the tie-in point to adjacent grades and at other unique points that do not lie on grid points. Each drawing shall also show record contour lines of the top of the layer.

Supplemental Record drawings shall be stamped and signed by a land surveyor licensed in the State of New York. Each supplemental record drawing shall be prepared on a 24" by 36" sheet and shall locate all work referenced to the limits of work. All locations shall be referenced to the horizontal coordinate system. The grid coordinate system shall be shown on all supplemental record drawings. Elevations shall be referenced to the vertical control established for the project.

6.0 RADON AND METHANE TESTING

6.1 Scope

A radon gas investigation will be performed in the proposed residential area of the site. The investigation will be performed to evaluate the potential for radon gas to migrate into the basements of the proposed houses.

A methane gas investigation will be conducted to evaluate the impact of the proposed final cover system on methane gas migration. There are concerns that the cover system may cause gas to migrate toward the existing housing located adjacent to the site. The investigation will measure methane gas in the buffer zone between the outer edge of the final cover system and adjacent structures.

The radon and methane testing will be performed independently of the site regrading and final cover construction.

6.2 Reference Standards, Sampling and Analysis

Sampling and Analysis procedures shall be as discussed in Section 8.0 and 9.0 of the Soils Management Plan.

6.3 Quality Assurance

Quality assurance for the Radon and Methane Sampling and Analysis will consist of observations of all field activities. The engineer will be on site during all activities. The Engineer will select all borehole/sample locations and will witness all radon readings recorded on the portable gas detector and the collection of all methane samples.

6.4 Deliverables

A Radon Analysis Report will be issued by the Engineer which provide specific test results and provides design/remediation recommendations. The methane report shall provide all analytical results and a diagram of sample locations.

APPENDIX E

CHEMICAL QUALITY MANAGEMENT PLAN

CHEMICAL QUALITY MANAGEMENT PLAN
TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 GENERAL

This section discusses the minimum requirements for the analytical sampling, testing and reporting associated with the site regrading and final cover construction. Analytical site activities are summarized as follows:

- Representative samples of the soil borrow will be collected at a rate of one (1) sample per source per soil type. Samples of the C&D debris proposed for use as non-contaminated soils on site will be collected at the rate of one (1) sample for each 2,500 cubic yards or any portion thereof for borrow sources of material. Timely analysis of the samples shall be arranged for at an ELAP-certified laboratory. The laboratory shall have current ELAP certification for the specific analytical method it performs under this contract. The purpose is to chemically test and certify the environmental quality of the materials proposed for use as subgrade fill and cover as specified in the Technical Sections.

- The Owner reserves the right to collect random samples of the contaminated and non-contaminated soil borrow and to conduct independent chemical analyses of the materials. In the event that test results indicate unacceptable results, then the materials will not be used.

1.1 Applicable Publications

The references listed below shall be utilized by the Contractor when performing site activities to the extent referenced. The publications are referred to in the text by the basis designation only (e.g., OSWER 9360.4-10).

CODE OF FEDERAL REGULATIONS (CFR)

CFR 40 Part 50	National Primary and Secondary Ambient Air Quality Standards
CFR 49 Part 173, Appendix E	Guidelines for the Classification and Packing Group Assignment of Class 4 Materials

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC)

NYSDEC ASP	Analytical Services Protocol (ASP), October 1995 Edition

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

CERCLA	Region II Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, October 1989
OSWER 9360.4-10	Removal Program Representative Sampling Guidance, Vol.1: Soil, November 1991
SW-846	Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods, Final Update III, June 1997
EPA-600/4-79-020	Methods for Chemical Analysis of Water and Wastes, Revised March 1983.

EPA-600/4-84-076 — Characterization of Hazardous Waste Sites - A Method Manual: Volume II. Available Sampling Methods, Second Edition, December 1984, NTIS No. PB85-168771

2.0 SAMPLING

2.1 Scope

This section includes work associated with sampling and testing:

- Samples of the C&D debris proposed for use as backfill in the residential area shall be collected at a rate of one sample per ~~acre~~ 2500 cy. Only C&D debris that meet the requirements of this section will be used as fill in residential areas.
- Samples of the off-site material to be used as low permeability soil and topsoil shall be collected at a rate of one sample per borrow source for each material type. Only soils which meet the criteria of this section will be used on the site.

2.2 Sampling Personnel and Data Logging

Samples are to be taken by qualified personnel only. Personnel shall have documentable experience collecting such samples and shall meet all health and safety requirements for this type of work. Field sampling data shall be recorded in a bound log book consisting of the following:

- Date and time of sampling.
- Sample identification.
- Sample location: Each sample shall be specific to each respective stockpile or borrow area such that material can be tracked.
- Observations, including descriptions of material sampled, visual identification of soil, presence of odors, groundwater, etc.
- Weather conditions (e.g., temperature, wind, clouds, precipitation).
- Printed name of sampling personnel.
- Requested Analytical Parameters

2.3 Quality Control (QC) Samples for Off-Site Laboratory Analyses

Quality control (QC) samples will be collected and analyzed by the contract laboratory. These QC samples include replicates of field samples, matrix spikes, matrix spike duplicates, method blanks and rinsate blanks. QC samples, which represent approximately 5% of the field samples, help to identify and diagnose problems related to sampling and analysis. Failure to meet method required QC criteria will result in the review and possible qualification of all affected data. Notification of failure to meet QC criteria shall be made as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered. Failure to meet method required QC criteria may result in the resampling and reanalysis by the contract laboratory, at no additional cost to URSG.

2.4 Sample Custody

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures also serve to minimize loss or misidentification of samples, and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in these investigations will follow the chain-of-custody guidelines of *NEIC Policies and Procedures*, prepared by the National Enforcement Investigations Center (NEIC) of the USEPA Office of Enforcement.

Qualified personnel will be responsible for monitoring all chain-of-custody activities and for collecting chain-of-custody documentation for the permanent project file. A sample is "Under Custody" if:

- It is in one's possession, or
- It is in one's view, after being in one's possession, or
- It was in one's possession and one locked it up, or
- It is in a designated secure area.

2.4.1 Chain-of-Custody

Chain-of-custody is initiated in the laboratory when the sample bottles are cleaned, packed, and shipped to the site for use in the field. When the bottles are received at the site, they will be checked for any breach of chain-of-custody seals or any evidence of tampering.

2.4.2 Sample Identification Code

A sample identification code will be used to identify each environmental sample collected and field QC blank prepared during the field investigation. This identification system will provide a tracking procedure to allow information concerning a particular location to be easily and accurately retrieved. This system also will verify that each sample is unique and will not be confused with any other sample.

A complete list of sample numbers will be maintained by qualified personnel. Each sample number will follow the format described as follows:

Example Sample ID:

CD-TP-1-2'

LPS-TP-2-3'

TS-TP-4,5'

Sample ID Definitions

TP1 - Test Pit #1

TP2 - Test Pit #2

Location Identifier

CD-C&D debris
LPS-Low Permeability Soil
TS-Topsoil

Sample Type Codes

RB = Rinse Blank
MS = Matrix Spike
SD = Matrix Spike Duplicate
NI = Environmental Sample

Sample Depth

1-2' = Beginning - Ending Depth

Matrix Type

SO = Soil

2.4.3 Paperwork/Labels

The sample bottles will be carried into the field by qualified personnel, where they will be used to collect samples. When the samples are collected, bottle labels will be filled out by qualified personnel. Each label will include the following information:

- Site name
- Sample identification
- Project number
- Date/time
- Sampler's initials
- Sample preservation (if any)
- Analysis required

At the time of sampling, the sample information will be recorded in a logbook and on a chain-of-custody form (Figure 6-1), noting on each any difficulties encountered in sampling. All label, logbook, and chain-of-custody entries shall be made using waterproof ink. The sample information recorded in the logbook should be at least as detailed as that recorded on the labels, and should indicate the type of sample (e.g., soil, sludge, etc.), preservation technique, and sampling location, in sufficient detail to allow re-sampling at the same location.

The filled containers will be placed in chests containing ice and custody will be maintained for all samples until they are transferred to the command office for processing. After samples are processed they will be prepared for shipping.

2.5 Preservation and Storage

Properly labeled sample containers shall be placed in zip-lock bags and stored in an iced durable cooler during sampling operations. Following the conclusion of sampling operations on any given day, samples will either be shipped directly to the appropriate laboratory(s), or be transferred to refrigerated storage space maintained at 4°C. In every instance, samples must be received at the

appropriate laboratories within a maximum of 48 hours of sample collection (or sooner if required by the analytical method). Samples will be maintained in a refrigerated condition at all times, including during transportation. Sample preservation and holding time requirements are summarized in the referenced methods.

2.6 Sampling Procedures

2.6.1 Sample Types

The following is a list of sample types that will be collected for this project:

- C&D debris.
- Low permeability soil and topsoil.

2.6.2 Sample Collection Requirements and Sampling Locations

- C&D debris shall be analyzed at the contract laboratory to confirm the material is clean (below specified limits - see Tables 1A through -1D) prior to use as backfill in the residential areas of the site. C&D material which exceeds the limits shall be used as subgrade fill in other areas of the site.

  1.) The C&D debris will be sampled and analyzed prior to commencing site excavation activities. Existing C&D debris piles will be leveled-off to facilitate sample collection. At random locations, test pits will be excavated to the full depth of the soil pile.

  2.) Composite samples shall be taken at each test pit location such that the full depth of the soil is represented in the sample. Samples will be taken using EPA approved sampling methods, as specified in EPA-600/4-84-076.

Sampling devices shall be decontaminated between samples using USEPA approved decontamination procedures.

- The low permeability soil and topsoil shall be analyzed at the contract laboratory to confirm the material is clean (below the specified limits - see Tables 1A through 1D) prior to being used on the site. Soil which exceeds the limits shall not be used.

  1.) One composite sample will be collected from random locations at each borrow site, for each material. The Owner will be notified prior to sampling so they can observe all sampling operations. The number of grab samples per composite will be determined in the field.

  2.) Sampling methods and decontamination of equipment shall be as noted above.

3.0 ANALYTICAL METHODS

C&D debris proposed for use as backfill in the residential area shall be tested for Target Compound List (TCL) organics and Target Analyte List (TAL) metals and shall be analyzed following the applicable USEPA SW-846 procedures. Only materials which contain concentrations of organic compounds and inorganic analytes below the C&D debris use criteria (see Tables 1A - 1D) shall be used. Samples shall be analyzed for:

Volatile Organics (Method SW8260B);
Semivolatile Organics (Method SW8270C);
Organochlorine Pesticides and PCBs (Method SW8081A/SW8082);
TAL Metals (Method SW6010B/7000A);
Total Cyanide (Method SW9012A);

The TAL metals shall be analyzed following SW-846 Method 6010B except for arsenic (Method SW7060A), lead (Method SW7421), selenium (Method SW7740), thallium (Method SW7841), and Mercury (Method SW7471A).

4.0 ANALYTICAL REPORTS AND DELIVERABLES

The analytical data packages must conform to NYSDEC ASP Category B deliverables. The turnaround time (TAT) for the soil and C&D debris shall be not more than 10 working days for telefaxed results, with the data packages to follow 10 working days later. TATs are measured from the date the samples are received at the laboratory.

5.0 DATA VALIDATION

Data validation/evaluation for this project shall be performed in accordance with EPA Region II CLP Organic Data Review, SOP No. HW-6, Rev. #11, June 1996 and USEPA Region II CLP Inorganic Data Review, SOP No. HW-2, Rev. #XI, January 1992 (or most recent version).

All analytical samples collected will receive a limited data review. This review will include a review of holding times, completeness of all required deliverables, review of QC results (surrogates, spikes, duplicates) to determine if the data is within the protocol required limits and specifications, a determination that all samples were analyzed using estimated and agreed upon analytical protocols, an evaluation of the raw data to confirm the results provided in the data summary sheets agree with the quality control verification forms, and a review of laboratory data qualifiers.

Where possible, discrepancies will be resolved by URSG's chemists (i.e., letters will be written to laboratories). A complete analytical data validation is not anticipated. However, if the initial limited data review reveals significant deviations and problems with the analytical data, URSG may recommend a complete validation of the data.

5.1 Data Usability

A Data Usability Summary Report (DUSR) will be prepared following the data validation. The DUSR will describe the samples and the analytical parameters. Data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data is discussed. The DUSR will also include recommendations on resampling/reanalysis.

TABLE 1-A

Clean Material Use Criteria - Maximum Allowable Concentrations

Volatile Organic Contaminants

Contaminant	Clean Material Use Criteria (mg/kg)	Contaminant	Clean Material Use Criteria (mg/kg)
Total VOCs	<10.0	1,1-Dichloroethene	0.4
Acetone	0.2	1,2-Dichloroethene (total)	*
Benzene	0.06	1,2-Dichloropropane	*
Bromodichloromethane	*	1,3-Dichloropropene (trans)	*
Bromoform	*	Ethylbenzene	5.5
Bromomethane	*	2-Hexanone	*
2-Butanone	0.3	Methylene Chloride	0.1
Carbon Disulfide	2.7	4-Methyl-2-Pentanone	1.0
Carbon Tetrachloride	0.6	Styrene	*
Chlorobenzene	1.7	Tetrachloroethene	1.4
Chloroethane	1.9	1,1,1-Trichloroethane	0.8
Chloroform	0.3	1,1,2-Trichloroethane	*
Chloromethane	*	1,1,2,2-Tetrachloroethane	0.6
cis-1,3-Dichloropropene	*	Toluene	1.5
Dibromochloromethane		1,2,4-Trichlorobenzene	3.4
1,1-Dichloroethane	0.2	Trichloroethene	0.7
1,2-Dichloroethane	0.1	Vinyl Chloride	0.2
1,2-Dichlorobenzene	7.9	Xylenes (Total)	1.2
1,3-Dichlorobenzene	1.6		
1,4-Dichlorobenzene	8.5		

Source: NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, April 1995.

* Contaminants with an "*" do not have individual limits in the NYSDEC's TAGM 4046. The total of all TCL volatile organic compounds, however, shall not exceed the maximum allowable concentration listed above as Total VOCs.

TABLE 1B

Clean Material Use Criteria - Maximum Allowable Concentrations

Semivolatile Organic Contaminants

Contaminant	Clean Material Use Criteria (mg/kg or ppm)	Contaminant	Clean Material Use Criteria (mg/kg or ppm)
Total SVOCs (1)	<500	Diethylphthalate	7.1
Acenaphthene	50.0	Dimethylphthalate	2.0
Acenaphthylene	41.0	Di-n-butylphthalate	8.1
Anthracene	50.0	Di-n-octylphthalate	50.0
Benzo(a)anthracene	0.224 or MDL**	Fluoranthene	50.0
Benzo(a)pyrene	0.061 or MDL**	Fluorene	50.0
Benzo(b)fluoranthene	0.224 or MDL	Hexachlorobenzene	0.41
Benzo(g,h,i)perylene	50.0	Hexachlorobutadiene	(1)
Benzo(k)fluoranthene	0.224 or MDL	Hexachloroethane	(1)
bis(2-ethylhexyl)phthalate	50.0	Hexachlorocyclopentadiene	(1)
bis(2-Chloroethyl)ether	(1)	Indeno(1,2,3-cd)pyrene	3.2
bis(2-Chloroethoxy)methane	(1)	Isophorone	4.4
4-Bromophenylphenylether	(1)	2-Methylnaphthalene	36.4
Butylbenzylphthalate	50.0	2-Methylphenol	0.100 or MDL
Carbazole	(1)	4-Methylphenol	0.9
Chrysene	0.4	Naphthalene	13.0
4-Chloroaniline	0.220 or MDL	Nitrobenzene	0.200 or MDL
4-Chloro-3-methylphenol	0.240 or MDL	2-Nitroaniline	0.430 or MDL
2-Chlorophenol	0.8	4-Nitroaniline	(1)
4-Chlorophenylphenylether	(1)	2-Nitrophenol	0.330 or MDL
2-Chloronaphthalene	(1)	4-Nitrophenol	0.100 or MDL
2,4-Dinitrotoluene	(1)	3-Nitroaniline	0.500 or MDL
Dibenzofuran	6.2	N-Nitroso-di-n-propylamine	(1)
Dibenz(a,h)anthracene	0.014 or MDL	N-Nitrosodiphenylamine	(1)
3,3'-Dichlorobenzidine	(1)	2,2'-oxybis(1-Chloropropane)	(1)
2,4-Dichlorophenol	0.4	Pentachlorophenol	1.0 or MDL
4,6 Dinitro-2-methylphenol	(1)	Phenanthrene	50.0
2,4-Dimethylphenol	(1)	Phenol	0.03 or MDL
2,4-Dinitrophenol	0.200 or MDL	Pyrene	50.0
2,6-Dinitrotoluene	1.0	2,4,5-Trichlorophenol	0.1
		2,4,6-Trichlorophenol	(1)
		Total cPAH	**

TABLE 1-B

Clean Material Use Criteria - Maximum Allowable Concentrations

Semivolatile Organic Contaminants

Contaminant	Clean Material Use Criteria (mg/kg or ppm)	Contaminant	Clean Material Use Criteria (mg/kg or ppm)
Total SVOCs (1)	<500	Diethylphthalate	7.1
Acenaphthene	50.0	Dimethylphthalate	2.0
Acenaphthylene	41.0	Di-n-butylphthalate	8.1
Anthracene	50.0	Di-n-octylphthalate	50.0
Benzo(a)anthracene	0.224 or MDL**	Fluoranthene	50.0
Benzo(a)pyrene	0.061 or MDL**	Fluorene	50.0
Benzo(b)fluoranthene	1.1	Hexachlorobenzene	0.41
Benzo(g,h,i)perylene	50.0	Hexachlorobutadiene	(1)
Benzo(k)fluoranthene	1.1	Hexachloroethane	(1)
bis(2-ethylhexyl)phthalate	50.0	Hexachlorocyclopentadiene	(1)
bis(2-Chloroethyl)ether	(1)	Indeno(1,2,3-cd)pyrene	3.2
bis(2-Chloroethoxy)methane	(1)	Isophorone	4.4
4-Bromophenylphenylether	(1)	2-Methylnaphthalene	36.4
Butylbenzylphthalate	50.0	2-Methylphenol	0.100 or MDL
Carbazole	(1)	4-Methylphenol	0.9
Chrysene	0.4	Naphthalene	13.0
4-Chloroaniline	0.220 or MDL	Nitrobenzene	0.200 or MDL
4-Chloro-3-methylphenol	0.240 or MDL	2-Nitroaniline	0.430 or MDL
2-Chlorophenol	0.8	4-Nitroaniline	(1)
4-Chlorophenylphenylether	(1)	2-Nitrophenol	0.330 or MDL
2-Chloronaphthalene	(1)	4-Nitrophenol	0.100 or MDL
2,4-Dinitrotoluene	(1)	3-Nitroaniline	0.500 or MDL
Dibenzofuran	6.2	N-Nitroso-di-n-propylamine	(1)
Dibenz(a,h)anthracene	0.014 or MDL	N-Nitrosodiphenylamine	(1)
3,3'-Dichlorobenzidine	(1)	2,2'-oxybis(1-Chloropropane)	(1)
2,4-Dichlorophenol	0.4	Pentachlorophenol	1.0 or MDL
4,6 Dinitro-2-methylphenol	(1)	Phenanthrene	50.0
2,4-Dimethylphenol	(1)	Phenol	0.03 or MDL
2,4-Dinitrophenol	0.200 or MDL	Pyrene	50.0
2,6-Dinitrotoluene	1.0	2,4,5-Trichlorophenol	0.1
		2,4,6-Trichlorophenol	(1)
		Total cPAH	**

TABLE 1B (Con't)

Source: NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, April 1995.

** Materials from on or off site sources which are to be utilized as backfill in the residential area at depths greater than two feet must have a total cPAH level of 10 ppm or less and total PAH level less than 100 ppm. Low permeability soil, top soil, and fill materials to be utilized as the final cover in residential and/or non-residential areas must have a total cPAH level of 1 ppm or less, and a total PAH level less than 10 ppm.

MDL = Method Detection Limit

(1) Total non-carcinogenic SVOCs are required to be 500 ppm or less.

TABLE 1-C
Clean Material Use Criteria - Maximum Allowable Concentration
Organic Pesticides and PCBs

Contaminant	Clean Material Use Criteria (mg/kg or ppm)	Contaminant	Clean Material Use Criteria (mg/kg or ppm)
Total Pesticides	<10 ppm	gamma-BHC (Lindane)	0.06
Aldrin	0.041	gamma-chlordane	0.54
alpha-BHC	0.11	Heptachlor	0.10
Endrin aldehyde	*	Heptachlor epoxide	0.02
Alpha-chlordane	*	Methoxychlor	*
beta-BHC	0.2	Toxaphene	*
delta-BHC	0.3	Total PCBs	1.0
4,4'-DDD	2.9		
4,4'-DDE	2.1		
4,4'-DDT	2.1		
Dieldrin	0.044		
Endosulfan I	0.9		
Endosulfan II	0.9		
Endosulfan sulfate	1.0		
Endrin	0.10		
Endrin ketone	*		

Source: NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, April 1995.

N/A - Not Available

* Contaminants marked with an "*" do not have individual limits in NYSDEC's TAGM 4046; however, the total pesticides and PCB concentrations shall be less than the maximum allowable concentrations listed above as Total Pesticides and Total PCBs, respectively.

TABLE 1D
Clean Material Use Criteria - Maximum Allowable Concentrations
Metals

Contaminant	Clean Material Use Criteria (mg/kg or ppm)
Aluminum	33,000*
Antimony	5**
Arsenic	7.5*
Barium	300*
Beryllium	0.16*
Cadmium	10*
Calcium	66,800**
Chromium	50*
Cobalt	30*
Copper	25*
Cyanide	43***
Iron	54,000**
Lead	500****
Magnesium	5,000**
Manganese	450***
Mercury	0.1*
Nickel	13*
Potassium	1050***
Selenium	2*
Silver	<1***
Sodium	170***
Thallium	<1***
Vanadium	150*
Zinc	200**

* NYSDEC TAGM (HWR-94-4046), April 1995

** City of Buffalo background levels from the East Ferry Street Site (NYSDEC, 1998)

*** Site background average concentration from Main-LaSalle non-contaminated soil/C&D material

**** Average background lead level in metropolitan or suburban area near highways.

APPENDIX F

INSTRUMENT CALIBRATION AND OPERATION PROCEDURES

FIELD MONITORING INSTRUMENTS

Calibration procedures for electronic instruments are summarized on the following pages. More detailed procedures for instrument calibration and maintenance can be found in the equipment operating manuals. A copy of the manufacturer's operating manual for each instrument will be kept at the site. All field sampling equipment will be calibrated each day of use. The calibration procedures and results will be recorded in the field log book.

Calibration of the Photoionization Detector

The photoionization detector (PID) (HNu Model PI 101) is a portable instrument used to detect, measure, and provide a direct reading of the concentration of a variety of trace gasses. The detector employs the principle of photoionization. This process involves the absorption of ultraviolet light by a gas molecule leading to ionization:

$$RH + + hv = RH+ + e-$$

Where:

RH+ = trace gas

hv = photon with an energy level equal to or greater than the ionization potential of RH

e- = freed electron from ionization

The PID will be calibrated to benzene using isobutylene (a non-toxic surrogate gas standard). In order to use isobutylene for calibration, the calibration setting must be compensated for the difference in photoionization sensitivity between the two gases. The compensated calibration setting is calculated as follows:

$$\text{Compensated Setting} = \text{Isobutylene (ppm)} \times \frac{PS(\text{isobutylene})}{PS(\text{benzene})}$$

$$= 100 \times \frac{7.0}{12.20}$$

$$= 57.4 \text{ ppm}$$

where PS = photoionization sensitivity

In operation, the meter will give a direct reading of the concentration of the gas being measured (benzene).

Calibration Procedure

1) Turn function switch to BATT. The needle should be in the green region.

2) Turn function switch to STANDBY. Set the zero point with the zero set control.

3) Attach the ¼-inch tubing to the probe inlet and to the regulator on the tank of isobutylene and open the valve on the regulator. NOTE: If the pressure in the isobutylene tank is below 200 psi, consider the tank exhausted and use a full tank.

4) Turn the function switch to the 0-200 range.

5) Adjust the span setting so the meter gives a reading of 57-58 ppm.

Calibration of the Combustible Gas

The instructions listed below review the operation of the Bachrach Sentinel 44 Combustible/Gas Indicator.

1. Press the POWER key.

2. Observe that the Liquid Crystal Display (LCD) backlight turns on. The backlight stays on for 30 seconds and then turns off.

3. Observe that the LCD sequences through the following messages:

- Serial number and software version.

SERIAL xxxxxx
VERSION yyy

Where xxxxxx = serial number of unit
yy = software version level

- Battery voltage and its capacity

BATTERY TEST
xx.xV yy% CAP

Where xx.x = battery voltage
yy = remaining battery capacity

- If the dosimeter functions are turned on, the remaining number of dosimeter recording segments and hours for TWA and STEL calculations are displayed.

DOS CAPACITY
xx SGMNTS yy HR

Where xx = remaining number of recording segments
yy = remaining number of recording hours

- Month, day, and year the instrument was last calibrated

LAST CAL DATE
mm/dd/yy

- Alarm messages (e.g., "LOW BATTERY" "CALIBRATION EXPIRED", "MEMORY FULL", "ONLY x:x HOURS STORAGE REMAIN").

- Real Time Gas display. A typical fresh-air four-gas display is shown below.

20.9	0	0	0
02	LEL	CO	H2S

4. The instrument now starts monitoring the surrounding air and provides readouts of the detected concentrations of oxygen and combustibles. A confidence beep is sounded once every minute to assure the user that the unit is on and monitoring the gas channels.

5. Allow the instrument to warmup for several minutes until the gas-display stabilizes. Then if one or more gas readings exceed the limits listed below while sampling fresh air, the sensors should be software zeroed.

Oxygen	20.9$\pm$ 0.5%
Combustibles	$\pm$ LEL

6. Before each day's usage, sensitivity must be tested on a known concentration of calibration gas specified on the instrument nameplate that is equivalent to 25 to 50% of full scale concentration. Accuracy must be within $\pm$20%. Use mixture of methane and oxygen in air span gas for calibration. Adjust potentiometric screw accordingly.