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Report

Phase II Investigation
One-Acre Site

City of Niagara Falls
Niagara Falls, New York

October 1996

O'BRIEN & GERE
ENGINEERS, INC.

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REPORT

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City of Niagara Falls
Niagara Falls, New York

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1. Introduction

O'Brien & Gere Engineers, Inc. (O'Brien & Gere) was retained by the City of Niagara Falls to complete a Phase II Investigation of the One-Acre parcel. The One-Acre parcel, now referred to as the One-Acre site, is located within the City of Niagara Falls Corporate Limits immediately south of Buffalo Avenue and adjacent to the eastern border of the existing City of Niagara Falls Water Treatment Plant (WTP) (See Figure 1). The north, south and eastern side of the site is surrounded by the de-listed portion of the Buffalo Avenue site which is the location of the new City of Niagara Falls WTP currently under construction (see Figure 2). The Occidental Petroleum Corporation S-Area is located approximately 1000 ft west of the site.

The One-Acre site was originally a portion of the de-listed Buffalo Avenue Site (Former site #932080B). The One-Acre site was not de-listed as elevated concentrations of lead and chlorinated benzene compounds were detected in subsurface soils and ground water. Coincident with the de-listing of the Buffalo Avenue Site , the One-Acre site was annexed to the Eastern Area of the City of Niagara Falls WTP Site which is currently a Class 2a in the New York State Department of Environmental Conservation (NYSDEC) Registry of In-Active Hazardous Waste Sites (site code #932080A). This classification signifies that sufficient data does not exist to allow the NYSDEC to properly classify the site.

1.1. Site description

The topography of the site is generally flat with surface elevations of approximately 573 ft above mean sea level. Presently, the site is a vacant field surrounded by chain link fence. Access to the site is limited to authorized personnel only.

The site is part of a former low lying area that was filled. Miscellaneous fill material was reportedly placed at the site between the 1930's and 1950's to reclaim land to facilitate construction in the area. The miscellaneous fill material reportedly consists of construction debris and potentially incinerator refuse. Between 1958 and 1963, "shot rock," which consists of gravel size

angular dolostone in a matrix of reddish brown sand, was placed atop the miscellaneous fill. This "shot rock" was associated with the construction of the NYPA power project.

1.2. Previous investigations

Malcolm-Pirnie and Dames & Moore were retained by the City of Niagara Falls to complete preliminary and Phase II investigations at the former Buffalo Avenue site which included the One-Acre site. As part of the preliminary site investigation, Malcolm-Pirnie completed three soil borings designated as BH-4, BH-5 and BH-6 at the One-Acre site. As part of the Phase II investigation, monitoring wells MW-7S and MW-7D were installed and ground water samples were collected and analyzed from these wells.

The majority of investigatory activities completed at the One-Acre site were completed by O'Brien & Gere in 1991 as part of the Buffalo Avenue Site Investigation (O'Brien & Gere, 1991). The investigatory tasks completed include:

- Sampling and analysis of ground water from monitoring wells MW-7S and MW-7D.
- Surface soil sampling and analyses at two locations (SS-20 and SS-23).
- Subsurface soil sampling and analysis at nine locations(SB-27, SB-28, SB-29, SB-33, SB-33A, SB-33B, SB-33C, SB-33D and SB-33E).

1.3. Report organization

This Phase II Report is divided into four sections. The contents of each section of this report are summarized below.

- Section 1 includes the introduction, site description, previous investigations, and the report organization.
- Section 2 describes background data, previous investigation results, and the field methods utilized in this investigation.

- Section 3 discusses site geology and hydrogeology, and discusses the results of surface and subsurface soil analyses.
- Section 4 presents a summary of the results as well as conclusions.

2. Investigation

2.1. Background information review

Background information was reviewed to evaluate historic disposal procedures at the site. The origin of the waste is an important factor in establishing if the solid waste has the potential of being listed as a hazardous waste under 6 NYCRR Part 371. Documents reviewed as part of this investigation were obtained from the City of Niagara Falls and are listed in the references section of this report. In summary, the previous investigations documented that the fill in the area likely progressed in three distinct phases as summarized below:

1. Miscellaneous waste which includes refuse, incinerator residue and miscellaneous debris were alleged to be disposed of on-site from the 1930's to the 1950's.

2. Dredged material from the construction of the Niagara River Ice Canal was allegedly disposed on the property by the NYPA.

3. Soil, rock (i.e. "shot rock") and other materials excavated by the NYPA during construction of the Niagara Power Project conduits were placed on-site from 1958 to 1963.

Additional information about the origin of fill material specifically placed within the boundaries of the One-Acre site was not found during this information review.

2.2. Previous investigation results

As previously mentioned, Malcolm-Pirnie and Dames & Moore were retained by the City of Niagara Falls to complete preliminary and Phase II investigations, respectively. Additional information about the One-Acre site

was obtained during the Buffalo Avenue Site Investigation completed by O'Brien & Gere and is summarized below:

- Two surface soils samples designated as SS-20 and SS-23 were collected at the One-Acre site during the Buffalo Avenue Site Investigation (see Figure 3). The primary concern in surface soil were the elevated concentrations of lead and chromium at SS-20 in the northern portion of the site. A complete discussion of the analytical results are presented in Section 3.3.1.

- Subsurface soils samples were collected at nine locations at the One-Acre site as part of the Buffalo Avenue Site Investigation. A complete discussion of the compounds detected in the subsurface soil is presented in section 3.3.2 of this report. In summary the One-Acre site was not de-listed as elevated lead concentrations were detected in the subsurface soil at SB-33, located in the northern portion of the site

- A second reason that the One-Acre site was not de-listed was that chlorobenzene, 1,3-dichlorobenzene and 1,4-dichlorobenzene, which are considered indicators parameters of S-Area materials, were detected in the ground water at monitoring wells MW-7S and MW-7D. The concentration of individual compounds ranged between 2.7 and 7 μg/L. Data from soils collected between 5 and 13.5 ft bgs at soil boring SB-27, located approximately 20 ft south of MW-7S also contained 1,3-dichlorobenzene, 1,4-dichlorobenzene and 1,2,4-trichlorobenzene at concentrations ranging from 730 μg/Kg to 2,300 μg/Kg.

  It is speculated that the ground water quality in this area was affected by soils in the vicinity of the monitoring well and therefore are localized in extent and are not migrating.

2.3. Field methods

The field methods utilized during this Phase II Investigation were completed in accordance with the protocols presented in the New Water Treatment Plant Site Suitability Assessment Work Plan and the New Water Treatment Site Acquisition Investigation Work Plan prepared by O'Brien & Gere in 1991. These work plans were approved by the NYSDEC.

The laboratory data completed as part of this investigation contained sufficient documentation and QA/QC samples to allow for the completion of a data

useability assessment. The results of the data useability assessment are summarized in section 3.2.

2.3.1. Surface soil

As part of the Phase II investigation, six surface soil samples were collected at the One-Acre site in the immediate vicinity of SB-33 to evaluate the concentration of lead in the surface soils.

Surface soil sampling locations were selected based on previous analytical results which indicated elevated levels of lead in the subsurface at SB-33 and to the west of SB-33. Samples designated SB-33F, SB-33G, SB-33I, SB-33J, and SB-33K were collected at approximately 25-foot intervals away from SB-33 to the south, southwest, northwest, north and east (see Figure 4). The sample SB-33H was collected 75 ft west of SB-33 to assess the western extent of elevated lead concentrations. Soil descriptions are presented on Table 1.

Surface soil samples SB-33F through SB-33K were collected from a depth of 0 to 2 feet by driving a split-spoon sampler. The samples were analyzed for total lead and leacheable lead using TCLP analyses. The samples were submitted to O'Brien & Gere Laboratories, Inc. for laboratory analysis. Samples were not analyzed for EPTOX lead as was originally proposed based on discussions with Mr. Glenn May, the on-site NYSDEC representative. Surface soil results collected as part of this investigation, as well as surface results collected in 1991 as part of the Buffalo Avenue Site Investigation, are presented on Tables 2 through 5 and illustrated on Figure 4.

Each split spoon was cleaned using an alconox wash, methanol rinse and a final distilled water rinse. Samples were immediately transferred to coolers packed with ice. Proper chain of custody documentation was maintained.

2.3.2. Subsurface soil sampling

Five soil borings, designated SB-7A through SB-7E, were completed as part of the Phase II Investigation at the One-Acre site to evaluate the lateral extent of chlorinated benzene compounds previously identified at monitoring well MW-7S and soil boring SB-27. Locations of the soil borings designated as SB-7A through SB-7E are illustrated on Figure 5.

Additionally, one soil boring designated as SB-7F was completed adjacent to MW-7S (See Figure 5). A subsurface soil sample from the boring was analyzed using TCLP analyses to assess if the fill material present in the One-Acre site is characteristic of hazardous waste as defined in 40 CFR Part 261.

The soil borings were completed using hollow stem auger drilling methods. Continuous split-spoon soil samples were collected from the ground surface to the base of the fill material, in accordance with ASTM method D-1586-84. The soil samples were described by the on-site O'Brien & Gere hydrogeologist. The soil description included moisture content, color, density, and grain size distribution. A portion of each soil sample was placed in a glass jar and covered with aluminum foil. Each sample was allowed to equilibrate at a temperature of 70°F. A photoionization detector (PID) with a 10.2 eV lamp was then used to monitor the headspace of each sample. Samples for analyses were selected based on PID readings and visual inspection. Subsequent to completion, the boreholes were grouted to the ground surface. Soil descriptions and PID readings are described on the soil boring logs contained in Appendix A.

Subsurface samples from soil boring SB-7A through SB-7E were submitted to O'Brien & Gere Laboratories, Inc. for analyses using NYSDEC ASP with Superfund deliverables. The following analyses were completed:

- VOCs via NYSDEC ASP method 91-1
- SVOCs via NYSDEC ASP method 91-2
- PCB/Pesticides via NYSDEC ASP method 91-3.
- Chromium and lead via ASP methodologies.

Four additional parameters were also quantified with the SVOC analyses and included: 1,3,5-trichlorobenzene, 1,2,3-trichlorobenzene, 1,2,4,5-tetrachlorobenzene and 1,2,3,4-tetrachlorobenzene. Samples could not be analyzed for 1,2,3,5-trichlorobenzene as planned. This compound coeluted and could not be distinguished from other compounds. Analytical results are presented in Tables 5 through 9.

QA\QC samples collected included a field duplicate, equipment blank, matrix spike and matrix spike duplicate. A laboratory trip blank was also included in each cooler that contained samples for VOC analyses.

A subsurface sample from soil boring SB-7F was submitted to O'Brien & Gere Laboratories, Inc. for analysis according to the constituents outlined in 40 CFR Part 261. The following analyses were completed:

- TCLP VOCs via USEPA method 8240
- TCLP SVOCs via USEPA method 8270
- TCLP Pesticides via USEPA method 8080
- TCLP Inorganics via USEPA 6000-7000 series

NYS category B deliverables were provided by the laboratory for validation purposes of the SB-7F subsurface fill samples. QA/QC samples included a matrix spike, matrix spike duplicate and a blind duplicate. A trip blank was deemed not necessary given the higher detection limits associated with the TCLP methods. The analytical results are presented on Table 14.

Drilling equipment was decontaminated prior to initiating activities, between each boring location, and at the completion of the field program. The split-spoon was decontaminated between each location using an alconox wash, methanol rinse and a final distilled water rinse. Decontamination fluids, drill cuttings and purge water generated during installation, sampling, and development were placed in labeled New York State Department of Transportation (NYSDOT) approved 55-gallon drums, and were temporarily stored at a designated location at the WTP. Samples of the drums of were collected for characterization. Laboratory results are presented in Appendix B. The water was subsequently discharged to the City of Niagara Falls Waste Water Treatment Plant (WWTP) in accordance with applicable regulations. The drill cuttings will be placed in the near by S-Area landfill.

3. Investigation results

3.1. Site geology/hydrogeology

The unconsolidated deposits identified at the One-Acre site in descending order from the ground surface are "shot rock", miscellaneous fill, lacustrine clay and glacial till. Beneath the till, dolostone bedrock is present (O'Brien & Gere, 1991c).

"Shot rock" is present immediately below the surface and typically extends to approximately 5 ft below the ground surface. The miscellaneous fill is also approximately 5 ft thick and extends to a depth of 10 ft below ground surface. The total thickness of the miscellaneous fill material and "shot rock" are illustrated on Figure 6. Beneath the miscellaneous fill material a lacustrine clay was encountered that extends to 28 ft below the ground surface at MW-7D. The till at MW-7D was 6.5 ft thick and extended to 34.5 ft below the ground surface, where bedrock is encountered. The bedrock is dolostone from the Silurian Lockport Group.

Ground water was encountered approximately 10 ft below the ground surface at MW-7S in July 1991 (O'Brien & Gere, 1991c). The overburden ground water flow direction in the area is generally to the south-southwest towards the Niagara River.

3.2. Data usability

A data usability assessment was performed in accordance with *Guidance for Data Usability in Risk Assessment* (USEPA Office of Emergency and Remedial Response 1992). The data usability assessment summarizes the results of both the Eastern Area and the One-Acre site. A data useability assessment was not completed for each separate site. The overall goal of this assessment was to evaluate the potential cumulative effects of data quality issues on the final data generated by the laboratory. Additionally, an assessment of the need for a complete data validation was performed.

The data usability assessment was performed on the samples collected during this investigation. The data were collected according to the scope of work specified in the Work Plan. The analytical methods specified in the scope of work were performed according to method criteria.

Additional questions that were answered during the data usability assessment involved various factors that could potentially impact the data quality. Chain of custody was maintained and field and analytical laboratory records were complete. The laboratory performed a typical level of review for this type of data package deliverable.

The laboratory method detection limits met method criteria; however, not all laboratory detection limits met regulatory standards.

The parameters that had detection limits greater than the regulatory limits are as follows:

Analyte	Regulatory Standard (μg/L)	Method Detection Limit (μg/L)
hexachlorobenzene	0.35	0.71
pentachlorophenol	1	4.02
benzo(a)anthracene	0.002	1.13
chrysene	0.002	0.58
benzo(b)fluoranthene	0.002	1.14
indeno(1,2,3-cd)pyrene	0.002	0.63

It should be noted, however, that the regulatory limits identified are guidance values. While the laboratory detection limits do not meet regulatory standards, they did meet the sensitivity requirements of the analytical methods. This may affect the ability to interpret results with respect to standards and criteria; however, this deviation does not represent a significant impact to overall data quality and does not, in itself, necessitate a complete data validation.

Data quality with respect to *precision* was evaluated through the analysis of field and laboratory duplicate samples. Relative percent differences were calculated for field and laboratory duplicates and, for this investigation, the data were 100% usable with respect to precision.

Data quality with respect to accuracy is indicated by matrix spikes, laboratory control samples, and surrogate recoveries. The acid fraction of one subsurface soil for SVOCs analyses was determined to be unusable based on matrix spike recoveries less than 10 %. The results for two PCB/pesticides analytes were determined to be unusable in one surface soil sample based on matrix spike recoveries less than 10 %. Therefore, data usability with respect to accuracy was 99% for SVOC analyses and greater than 99% for PCB/pesticides.

The calculations for data usability are presented below:

Total # analytes per SVOC analyses = 88
Total # SVOC analyses =17 samples
Total # of SVOC analytes analyzed =1496

Rejected SVOC compounds(acid fraction in one sample) = 14
Data Usability Calculation =

$$1496 - \frac{14}{1496} \times 100 = 99.06\%$$

Total # analytes per PCB/pesticide analyses = 28
Total # PCB/pesticide analyses = 17 samples
Total # of PCB/pesticide analytes analyzed = 476

Total of rejected PCB/pesticides = 2
Data Usability Calculation =

$$476 - \frac{2}{476} \times 100 = 99.57\%$$

~~Data Usability Calculation =~~ Holding times, sample preservation, and blank sample results are indicators of the *representativeness* of the analytical data. Data usability with respect to representativeness was unaffected by low level blank contamination detected in some blanks associated with these samples and for this investigation, the data were 100% usable with respect to representativeness.

Comparability is maintained provided that the analytical methods remained the same over time. A major component of comparability is the use of standard reference materials for calibration and QC. These standards are compared to other unknowns to verify their concentrations. Since standard analytical methods and reporting procedures as specified in the Work Plan were consistently used by the laboratory, the data usability with respect to comparability was not affected.

Data usability with respect to *completeness* is the percentage of sample results that have been determined to be usable during the data evaluation process. Data usability with respect to completeness was greater than 99% overall.

Data completeness is calculated as follows for each individual method:

$$\%\ Completeness = \frac{Total\ Number\ of\ sample\ Results\ "Usable"\ for\ Qualitative\ and\ Quantitative\ Purposes}{Total\ number\ of\ Results\ Reported\ for\ the\ Individual\ Method}$$

(Number of total sample results = number of analytes per sample X number of samples)

Based on the results of the usability assessment, a further complete data validation is not needed for these samples to be used as part of this investigation.

3.3. Analytical results

As stated in Section 1.1 of this document, the site is located approximately 1000 ft. east of Occidental Petroleum Corporation S -Area. Compounds identified by the NYSDEC to be indicators of S-Area materials include:

VOCs: vinyl chloride, 1,2-dichloroethene, trichloroethene, benzene, tetrachloroethene, and chlorobenzene.

SVOCs: 1,3 -dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, 2,4,5- trichlorophenol, hexachlorobenzene, 1,2,3-trichlorobenzene, 1,2,4,5-tetrachlorobenzene, 1,2,3,4-tetrachlorobenzene, and octachlorocyclopentene.

In the discussions of the analytical results which follow, the VOCs and SVOCs have been subdivided into groups. For VOCs, the S-Area indicator compounds are discussed separately from the other VOCs detected. The SVOCs have been subdivided into three groups for clearer presentation of the results: S-Area indicator compounds, polynuclear aromatic hydrocarbons (PAHs), and other SVOCs.

Appendix D contains historical analytical data collected at Buffalo Avenue.

3.3.1. Surface soils

Two surface soils samples designated as SS-20 and SS-23 were collected at the One-Acre site during the Buffalo Avenue Site Investigation (see Figure 3). In addition, six surface soil samples designated as SB-33F through SB-33K were collected as part of the Phase II Investigation. The laboratory data collected from the One-Acre site during the Buffalo Avenue Site Investigation as well as the Phase II Investigation are presented on Tables 2 through 5.

Volatile organic compounds

Surface Soils SS-20 and SS-23 were not analyzed for VOCs.

Semivolatile organic compounds

S-Area SVOCs

The only S-Area SVOC detected in surface soils was hexachlorobenzene in sample SS-20 at 210 μg/Kg (see Table 2). This concentration is below the 350 μg/kg detected at SS-22 located at the de-listed Buffalo Avenue site. No S-Area SVOCs were detected at SS-23 located in the southern portion of the site.

PAHs

PAHs which can be due to asphalt or asphalt like material were detected in each sample. The following PAHs were detected in the surface soil at the site: naphthalene, 2-methylnaphthalene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, ideno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

The data indicate that concentrations of PAHs ranged between 9,474 μg/Kg at SS-20 in the northern portion of the site to 1048 μg/Kg at SS-23 in the southern portion of the site. The concentrations of PAHs detected are typical of Niagara Falls surface soils (NCHD, 1987).

Other SVOCs.
Three other SVOC compounds were detected in the surface soil. Di-n-butylphthalate and bis(2ethylhexyl)phthalate which are common plasticizers and are commonly found is Niagara Falls surface soils were detected at concentrations ranging between 300 and 4,000 μg/Kg. The only other SVOC compound detected was dibenzofuran at 65 μg/Kg at SS-20 located in the northern portion of the site.

PCBs/pesticides
No PCBs were detected in the two surface samples and low concentrations of only two pesticide compounds were detected at SS-20 (see Table 3). The pesticides detected at SS-20 were 4.4'-DDE at 28 μg/Kg and heptachlor epoxide at 2.1 μg/Kg. 4,4'-DDE was not detected at the de-listed Buffalo Avenue Site; while the maximum concentration of heptachlor epoxide detected at the de-listed Buffalo Avenue site was 59 μg/Kg. No pesticides were detected at SS-23 located in the southern portion of the site.

Inorganics
With respect to inorganics seven constituents were detected at concentrations greater than typical surface soil concentrations presented in several articles (Shacklette et al(1971 and 1984), Bowen (1979), and Walsh (1981) (see Table 4). Of the constituents detected only lead at SS-20 located in the northern portion of the site was elevated with respect to other surface soils in the area. Additional surface soil samples designated as SB-33F through SB-33 K were collected at 50 ft intervals around SS-20 during the Phase II Investigation. The samples were analyzed for only lead and TCLP lead as agreed upon with the NYSDEC (see Table 5). The lead, TCLP and EPTOX lead data collected as part of previous investigations as well as this Phase II Investigation are illustrated on Figure 4.

The results indicate that elevated lead concentrations in the surface soil are limited to a small area in the vicinity of SS-20. The maximum concentration of total lead detected in the surface soil at the de-listed Buffalo Avenue site was 449 mg/Kg at location SS-5 (O'Brien & Gere, 1991a). The concentrations of lead detected in the surface soil at the SS-20 area were below the maximum concentration noted at Buffalo Avenue with the exception of SB-33J, where 527 mg/Kg of lead was detected. Total lead concentrations at other locations ranged from 33 mg/Kg at SS-23 to 318 mg/Kg at SB-33I. In general, high concentrations of lead concentrations are found north and west of SB-33, and lower concentrations are found south and east of SB-33 (see Figure 4).

Samples were also analyzed for TCLP lead to evaluate the leaching potential of lead from the soils. A soil sample with a TCLP lead concentration greater than 5 mg/L exhibits the characteristics of hazardous waste as set forth by 40 CFR Part 261. The data indicate that only the surface soil sample collected at SB-33G where TCLP lead was detected at 21 mg/Kg exceeded the 5 mg/L criteria (see Table 5). The remaining TCLP lead concentrations ranged from non-detect at two locations (SB-33I and SB-33K) to 2 mg/L at SB-33H. The variations in concentrations are due to the heterogeneous nature of the fill material at the One-Acre site.

3.3.2. Subsurface soil samples

Soil borings designated as SB-27, SB-28, SB-29 and SB-33 were completed in the One -Acre Parcel during the Buffalo Avenue Site Investigation. The analytical data are presented on Tables 5 through 9 and are illustrated on Figures 4 and 5. The results of previous investigations indicated elevated concentrations of chlorobenzene components in the vicinity of SB-27. Based on this information, five soil borings designated as SB-7A through SB-7E were completed during the Phase II Investigation. Subsurface samples collected during the Phase II Investigation were analyzed for VOCs, SVOCs, PCB/pesticides, and inorganics (lead and chromium only) in accordance with NYSDEC ASP procedures.

Results from SB-33 located in the northern portion of the site indicated that elevated concentrations of lead were noted in the subsurface soil samples. Five additional soil borings designated as SB-33A through SB-33E were completed in October 1991 to evaluate the lateral extent of lead contamination in subsurface soils in the northern portion of the site. The results of these samples are discussed below as they were not discussed in Buffalo Avenue Site Investigation Report. The lead data is summarized on Table 5 and illustrated on Figure 4.

Volatile organic compounds

The results of the VOC analyses are presented on Table 6. Methylene chloride, acetone and 2-butanone were detected in each sample during the Phase II Investigation. These compounds are usually associated with laboratory interferences and, therefore, will not be discussed further.

S-Area VOCs

In general, low concentrations of S-Area VOCs were detected at the One-Acre site. No S-Area VOCs were detected in six of thirteen samples collected. At other locations, the concentrations ranged from 0.3 μg/Kg at SB-33(SR) to 170 μg/Kg at SB-7E. The data indicate that the highest concentrations of S-

Area VOCs are found in the south and southwestern portions of the site (see Figure 5).

The concentrations of individual parameters were generally similar to those detected at the de-listed Buffalo Avenue Site with the exception of SB-7C and SB-7E(dup). At SB-7C, benzene was detected at 74 μg/Kg, whereas the highest concentration detected at the de-listed Buffalo Avenue site was 1.0 μg/Kg. At SB-7E(dup), chlorobenzene was detected at 160 μg/Kg which is higher than 8 μg/Kg detected at the de-listed Buffalo Avenue Site. However the sample collected from SB-7E contained only 12 μg/Kg of chlorobenzene, which marginally exceeds the highest concentration detected at de-listed Buffalo Avenue site. This variation is likely due to the heterogeneous nature of the soil and the distribution of compounds within the fill.

Other VOCs

Other VOCs detected in the subsurface soils at the One-Acre site included carbon disulfide, chloroform, 1,1,1-trichloroethane, trans-1,3-dichloropropene, toluene, ethylbenzene, styrene and xylene. No other VOCs were detected in six samples: SB-7A, SB-27SR, SB-28W, SB-29SR, SB-29W, and SB-33W. Low concentrations of other VOCs were detected at concentrations ranging from 1 to 13 μg/Kg at SB-7B, SB-7D, SB-27W, SB-28SR, SB-33SR. Similar to the S-Area VOCs, the highest total concentrations of other VOCs were detected at SB-7C (357 μg/Kg) and SB-7E (61 μg/Kg).

At SB-7C, petroleum related compounds including toluene, ethylbenzene, and xylene were detected at individual concentrations ranging from 170 μg/Kg to 18 μg/Kg. These concentrations are greater than those detected at the de-listed Buffalo Avenue Site. In addition, styrene and trans-1,3-dichloropropene were detected at 23 and 2 μg/Kg, respectively. These compounds were not detected at the de-listed Buffalo Avenue site.

At SB-7E and SB-7E(dup), the total concentrations of "other VOCs" were 53 μg/Kg and 61 μg/Kg. The concentrations of most compounds were similar in these two samples with the exception of carbon disulfide and chloroform. Chloroform was detected in SB-7E and the associated duplicate sample (SB-7E (dups) at concentrations of 45 μg/Kg and 8 μg/Kg. Similarly, carbon disulfide was detected at 38 μg/Kg at SB-7E (dup) and at 2 μg/Kg at SB-7E.

Additional other VOCs detected at these locations were either below or marginally above the maximum concentrations detected at the de-listed Buffalo Avenue Site.

Semivolatile organic compounds

The results of the SVOC analyses are presented on Tables 7 and are illustrated on Figure 5. The data indicated that primarily S-Area SVOCs and PAHs were detected.

S-Area SVOCs

No S-Area SVOCs were detected in eight of the thirteen samples collected. In general, the data indicate relatively low levels of S-Area SVOCs are found in the south and south western portion of the One-Acre site (Figure 5). Furthermore, the highest concentrations were detected in the deeper samples collected from the miscellaneous waste fill material, as compared to concentrations observed in the shallow samples collected from the "shot rock".

S-Area compounds were not detected at soil boring SB-7A, SB-7B and SB-7C, SB-29 and SB-33 which are located southeast and north of MW-7S. At soil boring SB-27 and SB-28 samples were collected from both the "shot rock" and miscellaneous waste fill material. The samples collected from the "shot rock" at these locations did not contain any S-Area SVOCs. However S-Area SVOCs at SB-27 and SB-28 were detected in the deeper samples, collected from the miscellaneous waste fill with total concentrations ranging from 4310 to 870 μg/Kg. The total concentrations of S-Area SVOCs from the miscellaneous waste material at SB-7D and SB-7E were 3400 and 4280 μg/kg, respectively. The highest total concentration of these compounds detected at the de-listed Buffalo Avenue site was 1580 μg/Kg at SB-22 (O'Brien & Gere, 1991d).

PAHs

PAHs which can be due to asphalt or asphalt like material were detected in twelve of thirteen samples. The following PAHs were detected at the site: naphthalene, 2-methylnaphthalene, 2-chloronaphthalene, acenaphthalene, acenaphthene, fluorene, phenenathrene, anthracene, fluoranthene, pyrene, benzo(a) anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, ideno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

The maximum concentration of total PAHs detected at the de-listed Buffalo Avenue site was 142,500 μg/Kg at SB-15 (O'Brien & Gere, 1991c). The total PAH concentration in each sample collected from the One- Acre site was below the maximum total PAH concentration detected at the de-listed Buffalo Site, with the exception of SB-7D and SB-33W. At SB-7D, located in the southern portion of the site, the total PAH concentration was 934,200 μg/Kg. At SB-33W, located in the northern portion of the site, the total PAH concentration was 323,620 μg/Kg. Given the location of these samples at near

opposite ends of the site, and the presence of significantly lower concentrations of PAHs between the samples, it appears that the elevated concentrations are localized and are due to the heterogenous nature of the fill material.

Other SVOCs

Other SVOCs that were detected in the subsurface soils at the site include: phenol, 2-methylphenol, 4-methylphenol, 2,4-methylphenol, 4-chloroaniline, dibenzofuran, carbazole, di-n-butylphthalte, bis(2-ethylhexyl)phthalate, and 3,3'-dichlorobenzidine. The total concentration of other SVOCs ranged from non-detect at SB-27 to 122,800 μg/kg at SB-7D.

In general, the data indicate that the highest concentrations of other SVOCs are primarily found in the south and southwest portions of the One-Acre site. The majority of these compounds were not detected at the de-listed Buffalo Site.

At SB-7D, the majority of other SVOC concentrations are due to 3,3'-dichlorobenzidine and carbazole which were detected at 91,000 μg/Kg and 27,000 μg/Kg. The phenolic based compounds including phenol, 2-methylphenol, 4-methylphenol, 2,4-methylphenol were only detected at SB-7C located in southern portion of the site and at SB-33 located in the northern portion of the site . The distribution of these compounds is highly variable and is likely due to the heterogenous nature of the fill material.

Other compounds detected in most samples were bis(2-ethyhexyl) phthalate and di-n-butyphthalate, which are common plasticizers. The compounds are commonly found in Niagara Falls surface soils or may be due to sampling and/or laboratory contamination. Dibenzofuran was detected in soil borings SB-7A through SB-7E, SB-27W, SB-28W, SB-29SR, and SB-33W at concentrations ranging from 28 to 6000 μg/Kg. Dibenzofuran was not detected at the de-listed Buffalo Avenue Site.

PCB/Pesticides

Data collected from the One-Acre in 1991 as part of the Buffalo Avenue Site Investigation as well as data collected during the Phase II Investigation are summarized below and on Table 8. The data indicate that no PCB compounds were detected at any of the subsurface sample locations with the exception of 2200 μg/Kg of Aroclor 1242 at SB-27W (5 - 13.5 ft bgs).

Pesticides were detected in eight of thirteen subsurface sample collected during this investigation. The highest total pesticide concentration from the de-listed

Buffalo Avenue site was 69 μg/Kg with individual compounds not exceeding 24 μg/Kg.

The total concentration of pesticides at most locations was below the maximum total concentration detected at the de-listed Buffalo Avenue site with the exception of three samples SB-29SR, SB-28 W, and SB-7E located in the central portion of the site. At these locations the pesticides detected at the highest concentrations were delta-BHC and beta-BHC, with concentrations ranging from 6.8 μg/Kg to 2900 μg/Kg.

A duplicate sample at SB-7E contained concentrations of pesticides 2 to 10 times lower for each individual parameter. The variability of pesticide concentrations illustrates the hetrogeonous nature of the fill material.

Inorganics

Data collected from the One-Acre site in 1991 as part of the Buffalo Avenue Site Investigation as well as data collected during the Phase II Investigation are summarized below.

The analytical data from SB-27, SB-28, SB-29 and SB-33 are presented on Table 9. The data indicate that six elements were detected slightly above typical background concentrations (Shacklette, et. al). However, concentrations of lead, chromium and mercury at several locations appeared to be anomalous. Therefore, selected samples were analyzed for TCLP and EPTOX lead, chromium and mercury. As previously discussed, the analytical data indicate that all samples were below regulatory criteria with the exception of SB-33 which had an EPTOX lead concentration of was 39.1 mg/L. However, the TLCP lead result for this sample was only 0.66 mg/L.

Based on the elevated EPTOX concentration at SB-33, five additional subsurface soils samples were collected at 50-ft intervals away from SB-33 and a sample was collected adjacent to SB-33 in October 1991. The results indicated that the concentrations of lead in the subsurface soils ranged from 32 mg/Kg at SB-33B to 330 mg/Kg at SB-33D located to the west. Only the sample from SB-33 (4 to 7 ft) exhibited characteristics of hazardous waste per EPTOX analyses. Samples collected from SB-33A through SB-33E did not exhibit characteristics of hazardous waste per TCLP criteria.

As part of the Phase II Investigation completed in 1995, soil samples from SB-7A through SB-7E completed in southern portion of the site were analyzed for lead and chromium. Chromium and lead were detected in each of the subsurface soil sample as indicated on Table 2. Chromium was below the typical concentration detected in soil, with the exception of SB-7D where 42.6

mg/Kg was detected. However, this concentration is below the maximum concentration detected at the de-listed Buffalo Avenue Site. Lead levels ranged from 19.9 mg/Kg at SB-7A to 292 mg/Kg at SB-7D. These concentrations are above typical concentration in soils, but below the maximum concentration detected at the Buffalo Avenue Site.

3.3.3. Ground water

Monitoring wells MW-7S and MW-7D were installed at the One- Acre Site by Dames & Moore in 1987. Monitoring well MW-7S was installed in fill material to a depth of 11.8 ft bgs. Monitoring well MW-7D was installed in bedrock was completed at a depth of 44.3 ft bgs. As part of the Buffalo Avenue Site investigation completed in 1991 these monitoring wells were sampled on two occasions. The results of the 1991 analyses are summarized on tables 10 through 13 and are discussed below.

Volatile organic compounds

The results of the VOCs analyses are presented on Table 10.

S-Area VOCs

Chlorobenzene was the only VOC detected in the ground water at the One-Acre site. The New York ~~State~~ Class GA standard for chlorobenzene is 5 μg/L. In June 1991 chlorobenzene was detected at 5 μg/L at MW-7D, but was not detected in a duplicate sample collected. Chlorobenzene was also not detected in the ground water sample collected from MW-7S in June 1991.

Chlorobenzene was detected during the September 1991 sampling event in both wells. The concentration of chlorobenzene at MW-7S was 6 μg/L and the concentration at MW-7D was 2.7 μg/L. In summary, the data indicate low levels of VOCs in ground water at the One-Acre site.

Other VOCs

No other VOCs were detected in the ground water at MW-7S and MW-7D.

Semivolatile organic compounds

The results of the SVOC analyses are summarized on Table 11. SVOC analyses were completed on one occasion as part the Buffalo Avenue Site Investigation.

S-Area SVOCs

S-Area SVOCs were detected at low concentrations at MW-7S. The compounds detected were 1,3 dichlorobenzene, and 1,4-dichlorobenzene at

individual concentrations of 6 μg/L. The concentrations detected slightly exceed the NYS Class GA standard of 5 μg/L for 1,2- dichlorobenzene and 4.7 μg/l for 1,4-dichlorobenzene. S-Area SVOCs were not detected at monitoring well MW-7D. The data indicate that SVOCs have not migrated into bedrock.

PAHs
No PAHs were detected in ground water at the site.

Other SVOCs
No Other SVOCs were detected in ground water at the site.

PCB/Pesticides
The results of the PCB/Pesticide ground water analyses are presented on Table 12. The data indicate that no PCBs were detected in the ground water. In summary, low concentrations of several pesticides were detected in shallow and deep ground water.

The pesticides detected in shallow well MW-7S include aldrin, Alpha-BHC, Beta-BHC, Delta-BHC, endosulfan I, endrin, and heptachlor epoxide at concentrations ranging between 0.008 μg/L and 0.81 μg/L. Total pesticide concentrations have ranged between 0.064 and 1.046 μg/L.

The ground water data collected from the shallow zone is similar to the other media in that the concentrations in a given sample can vary. A duplicate sample was collected at MW-7S during the June sampling event, indicated similar concentrations of most pesticides with the exception of Alpha-BHC. Alpha-BHC concentrations varied from 0.81 μg/L to 0.089 μg/L in a duplicate sample.

The only pesticide detected at MW-7D installed in bedrock was gamma- BHC at 0.16 μg/L; however gamma-BHC was not detected in a duplicate sample collected. The concentration of gamma-BHC detected marginally exceeds the highest concentration of 0.12 μg/L detected at the de-listed Buffalo Avenue site.

Inorganics
Ground water samples for inorganics were collected for both total(unfiltered) and soluble (filtered) analyses. Results of these analyses are presented on Table 13. Filtered samples were collected from each well since the ground water exhibited turbidity values greater than 50 NTU at each location. Ground water samples which exhibit elevated NTU readings generally contain suspended sediment, which in turn contains inorganics. As required by the

analytical procedures, ground water samples are preserved with nitric acid. In samples with sediment, the preservation causes inorganics from the sediment to solubilize into the water. In our opinion samples for inorganic analyses collected from monitoring wells with a high turbidity are not considered representative of those inorganics which migrate with the ground water system. Filtered samples where the sediment is removed prior to preservation, are more likely to provide representative results of inorganics in solution.

In general, the data indicate that higher concentrations of inorganics in total (unfiltered) samples when compared to soluble (filtered) samples. Furthermore, lower concentrations of inorganics were detected at MW-7D installed in bedrock as compared to monitoring well MW-7S installed in fill material. The results of the total (unfiltered) analyses from MW-7D indicate that iron, magnesium, sodium, chromium, lead and manganese were detected at concentrations above NYS Class GA standards. In the filtered samples only sodium exceeded NYS Class GA Standards. It is likely that sodium detected at MW-7D is naturally occurring as other bedrock monitoring wells at the de-listed Buffalo Avenue site contained similar concentrations of sodium. The results of the total (unfiltered) analyses from MW-7S indicate that antimony, chromium, iron, lead, manganese mercury, sodium and zinc were detected at concentrations above NYS Class GA Standards. The results of the soluble (filtered) analyses indicate that antimony, iron, lead, manganese and sodium were detected at concentrations marginally exceeding NYS Class GA standards.

3.3.4. TCLP Analyses

A subsurface sample was collected from soil boring SB-7F, located in the southern portion of the site in February 1996. The sample was analyzed to assess if the material is characteristic of hazardous waste using TCLP in accordance with 40 CFR part 261. The results of the analyses are summarized on Table 14.

In summary, based on the results of the VOC, SVOC and PCB/Pesticide analyses, the fill material is not characteristic of hazardous waste as defined by 40CFR Part 261

The data indicate that no metals were detected with the exception of lead at 11 mg/L. The concentration of lead detected exceeds the regulatory limit of 5 mg/L, therefore the sample exhibits characteristics of hazardous waste as set forth by 40 CFR Part 261. As a result of the elevated TCLP lead concentrations the sample was also analyzed for total lead. A total lead concentration of 3100 mg/Kg was detected.

In summary, with the exception of lead, the fill material at the One-Acre site is not characteristic of hazardous waste.

4. Summary

4.1. Summary

The One-Acre site is located immediately south of Buffalo Avenue. The north, south and western portions of the site are surrounded by the de-listed portion of the Buffalo Avenue Site, which is the location of the new City of Niagara Falls WTP currently under construction. The western portion of the site is bordered by the City of Niagara Falls - Eastern Area which is a Class 2A inactive hazardous waste site in the NYSDEC registry of inactive hazardous sites. .

The overburden materials at the One-Acre site, in descending order from the ground surface are shot rock, miscellaneous fill , lacustrine clay, glacial till and bedrock. Background information reviewed documented that the fill in the area proceeded in three distinct phases as summarized below:

- Miscellaneous waste material which included incinerator refuse and other debris were alleged to be disposed of on-site from the 1930's to the 1950's.
- Dredged material from the construction of the Niagara River Ice Canal was allegedly disposed on the property by the NYPA.
- Shot rock and other material excavated by the NYPA during construction of the Niagara Power projects conduits were placed on-site from 1958 until 1963.

Ground water is generally encountered approximately 10 ft below the ground surface and flows to the south-southwest towards the Niagara River.

The analytical data indicate that the distribution of contaminants in surface soil and subsurface soil are highly variable across the site. The variability of contaminants at the site is indicative of the heterogenous nature of the fill material present at the site. Based on data from the previous investigations the primary concern was elevated lead concentrations noted in several samples

collected from the northern portion of the site, and the presence of organic compounds, primarily S-Area indicator compounds, in subsurface soils and ground water in the southern portion of the site. The sampling and subsequent analyses of samples collected during the Phase II investigation were focused on addressing these concerns.

The following discusses in more details the distribution of VOCs, SVOCs, inorganics and pesticides/PCBs in the media sampled. Analytical results for VOCs and SVOCs were divided into groups of compounds including, S- Area indicator parameters where they were identified to be present. S- Area indicator compounds are those associated with the Occidental Petroleum Corporation S-Area which is located approximately 1000 ft west of the site.

Volatile Organic Compounds

VOCs were detected in ground water and subsurface soil samples. Surface soil samples were not analyzed for VOCs. Monitoring wells MW-7S, installed in fill material, and MW-7D, installed in bedrock, were sampled on two occasions. The data indicate that the only VOC detected in the ground water was chlorobenzene, an S- Area indicator parameter. At MW-7S the concentration of chlorobenzene ranged between non-detect and 5 ug/L, and at MW-7D the concentration ranged between non-detect and 6 ug/L. When detected these concentrations were slightly above the New York State Class GA Standards of 5 ug/L. No other VOCs were detected in either the shallow or deep ground water.

In subsurface soils, S-Area VOCs were primarily detected sporadically in the south and southwestern portions of the site. . The concentration of S-Area VOCs at 11 of the 13 subsurface samples were similar to the de-listed Buffalo Avenue site. At locations SB-7C and SB-7E benzene and chlorobenzene were detected at concentrations slightly above those detected at the de-listed Buffalo Avenue Site. However, a duplicate sample collected at SB-7E contained significantly lower concentrations of chlorobenzene. The variability of concentrations in a given sample is indicative of the heterogenous nature of the fill. Other VOCs were detected at low concentrations in the southern portion of the site. The concentrations of most compounds were similar to those observed at the de-listed Buffalo Avenue Site.

Semivolatile Organic Compounds

SVOCs were detected in ground water, surface soil and subsurface soil. The identified compounds were divided into 3 groups for discussion: PAHs, other SVOCs and "S" Area SVOCs.

In the surface soil samples, PAH compounds, which are typical of asphalt or asphalt like materials were detected in each of the two samples analyzed. The concentrations of PAHs detected are typical of Niagara Falls surface soils. In subsurface soil samples, only 2 of the 13 samples collected exceeded the concentrations detected at the de-listed Buffalo Avenue Site. The locations where exceedances were noted were at opposite ends of the site which indicates that PAHs are sporadically distributed and are related to the heterogenous nature of the site. PAHs were not detected in the ground water at the site, which indicates that PAHs from soils are not migrating into the ground water.

Other SVOCs that were common to both surface soils and subsurface soil included di-n-butyphthalate and bis-(2ethylhexyl)phthalate and dibenzofuran. The phthalate compounds are plasticizers which are commonly found in soils in the Niagara Falls Area. In subsurface soils phenolic based compounds were only detected at two locations; SB-33 in the northern portion of the site and SB-7C located in the southern portion of the site. Additionally in the southern portion of the site at SB-7D, 3,3'-dichlorobenzidine and carbazole were detected at elevated concentrations. The distribution of other SVOCs in subsurface soil is highly variable as a result of the heterogenous nature of the fill material present. No other SVOCs were detected in the ground water at the site.

In surface soil, S- Area SVOCs were detected at concentration below the maximum detected at the de-listed Buffalo Avenue Site. With respect to subsurface soils, S- Area SVOCs were detected in five of the thirteen samples collected. The data indicate that only two samples designated as SB-7D and SB-7E, located in the southern portion of the site contained total S-Area SVOCs at concentrations greater than the maximum total concentration detected at the de-listed Buffalo Avenue site. In ground water S-Area SVOCs were detected at monitoring well MW-7S screened in the fill material The compounds detected were 1,3 dichlorobenzene and 1,4- dichlorobenzene at concentrations slightly exceeding the NYS Class GA standards. S- Area SVOCs were not detected at MW-7D screened in bedrock.

Pesticide/PCBs

No PCBs were detected in ground water or surface soil samples collected at the site. PCB(Aroclor 1242) was only detected in one of the thirteen subsurface soil samples collected at 2,200 ug/Kg.

Pesticides were detected in surface soil, subsurface soil and ground water sample at low concentrations. In surface soil sample SS-20, located in the northern portion of the site the total pesticide concentration was 30.1 ug/Kg. No pesticides were detected in surface soils at SS-23, located in the southern portion of the site. In subsurface samples only 3 of the 13 samples analyzed for pesticides contained concentrations greater than the maximum total concentration detected at the de-listed Buffalo Avenue Site. The samples were located in the central portion of the One- Acre site.

In ground water higher concentrations of pesticides were detected in the shallow well than the deep well. The total pesticide concentration at MW-7S ranged between 0.064 and 1.046 ug/L. This variation is likely due to the heterogenous nature of the fill material placed at the site. At MW-7D only gamma-BHC was detected at 0.016 ug/L which marginally exceeds the 0.012 ug/L detected at the de-listed Buffalo Avenue Site.

Inorganics

In summary the primary concern at the site is elevated levels of lead in surface and subsurface soil that are sporadically distributed. The concentrations of total lead detected in seven of the eight surface soil samples were below the maximum detected at the de-listed Buffalo Avenue Site. In subsurface soils total lead concentrations detected were below the maximum detected at the de-listed Buffalo Avenue site with the exception of SB-7F located in the southern portion of the site.

For ground water both total (unfiltered) and soluble (filtered) samples were collected and analyzed. Due to the elevated turbidity of the samples collected only the filtered samples were considered representative of inorganics migrating in the ground water. In the deep zone only sodium, was detected above NYS Class GA Standards; however it is likely that sodium detected at MW-7D is naturally occurring as other bedrock monitoring wells at the de-listed Buffalo Avenue site contained similar concentrations. The results of the filtered analyses at MW-7S indicate that antimony, iron, lead, manganese and sodium were detected at concentrations marginally exceeding NYS Class GA standards. The concentrations are likely related to the fill material present at the site.

TCLP Analyses

Based on the elevated lead concentrations noted in surface soil and subsurface soils selected samples were analyzed to evaluate the leaching potential of lead

from soil using EPTOX and/or TCLP methods. Only one of the eight surface soil samples analyzed for lead exceeded the TCLP criteria of 5 mg/L.

In the northern portion of the site a sample collected at SB-33 (4 to 7 ft) was analyzed for both TCLP and EPTOX lead. The data indicate that the TCLP lead concentration was 0.66 mg/L which is below regulatory criteria, however the EPTOX lead concentration detected was 39.1 mg/L which exceeds regulatory criteria. Five additional subsurface soil samples were collected around the SB-33 area, and none of the samples exceeded the regulatory limit of 5 mg/L.

In 1996 sample of the fill material from the southern portion of the site was analyzed for the VOCs, SVOCs, pesticides and metals. The results indicated that with respect to VOCs, SVOCs and pesticides that the fill material was not considered characteristic of hazardous waste per 40 CFR part 261. The data indicated that no metals were detected with exception of lead at 11 mg/L. The concentration of lead detected exceed the regulatory limit of 5 mg/L, therefore the sample exhibits characteristics of hazardous waste as set forth by 40 CFR Part 261.

In summary three samples (one surface and two subsurface soils samples) from a total of eighteen samples collected and analyzed for EPTOX and/or TCLP lead exceeded regulatory limits.

4.2. Conclusions

Part 371.1 of 6 NYCRR identifies which solid wastes are subject to regulation as hazardous wastes under Parts 370 through 373, 375 and 376 of 6 NYCRR. Under Part 371, *Identification And Listing Of Hazardous Wastes*, criteria for identifying the characteristics of hazardous waste are presented. These criteria include characteristics of waste, and origin of wastes. Therefore, to evaluate whether the fill material in the One- Acre site is a hazardous waste, analytical laboratory testing was performed and background review was completed.

Analyses were completed on the surface soil and fill material for TCLP as defined in part 6 NYCRR Part 371.3 and 40 CFR Part 261. The results of these analyses indicate that with respect to VOCs, SVOCs, pesticides/PCBs and inorganics that the fill material at the One-Acre site is below the regulatory levels listed in Part 371.3. and 40 CFR Part 261 with the exception of lead. The data indicate that at most locations the concentrations of leachable lead are below the regulatory levels listed in part 371.3. One surface

soil sample and two subsurface soil samples from a total of 18 samples collected and analyzed for leachable lead exceeded the regulatory criteria of 5 mg/L. The data indicate that the distribution of lead is highly variable and is due to the heterogenous nature of the fill material.

Background review offered little insight into the origin and disposal practices at the One- Acre Site although the NYSDEC listing information for the site in the *Inactive Hazardous Waste Sites* listing document indicates that municipal incinerator ash was placed on the site. However, as listed in Part 371.1, incinerator ash is exempt from listing as a hazardous waste when the waste incinerated is a form of household waste. Household waste is defined as any waste material derived from households, (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and day use recreation areas) including garbage, trash and sanitary wastes in septic tanks. Therefore, One-Acre site is not listed under Part 371.4 as a non-specific source by origin.

VOCs, SVOCs, pesticides and inorganics were detected in ground water on at least one occasion at concentrations slightly exceeding NYS Class GA standards. Based on information presented in the Buffalo Avenue Site Investigation and the recently completed Phase II Investigation for the Eastern Area the data does not indicates that these constituents are migrating away from the One-Acre site. The constituents detected are due to the characteristics of the fill material.

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Table 1

Phase II Investigation
Water Treatment Plant - One Acre Parcel
Niagara Falls, New York

Surface Soil Descriptions

Sample #	Blow Counts/ 6 Inches	Description
One Acre Parcel		
SB-33G	9-13-14-24	Damp, med. brown, med. dense SILT, some very fine sand, little clay, little fine to med. angular gravel.
SB-33F	8-8-9-8	Damp, dark brown, med. dense SILT, some very fine sand, little fine angular gravel.
SB-33H	7-16-9-6	Dry, brown to gray, med. dense SILT, some very fine sand, some fine to med. angular gravel, little fine to coarse sand.
SB-33I	3-18-26-20	Dry to damp, brown to black, denseSILT, some fine sand,little fine to coarse angular grvael, trace cinders, trace clay.
SB-33J	3-5-9-10	Dry, brown to black, med. dense SILT, some very fine sand, little fine to coarse angular gravel, trace white ash, trace cinders, trace orange brick.
SB-33K	3-6-17-17	Dry to damp, gray to brown, med. dense SILT some fine to coarse gravel, little fine to med. sand trace clay.

Table 2
Phase II - Investigation
One-Acre Site - Buffalo Avenue
Surface Soils - Semivolatile Organic Compounds

	SS-20 5/91	SS-23 5/91
Phenol	810 u	730 u
bis(2-chloroethyl) ether	810 u	730 u
2-Chlorophenol	810 u	730 u
1,3 - Dichlorobenzene	810 u	730 u
1,4 - Dichlorobenzene	810 u	730 u
Benzyl alcohol	810 u	730 u
1,2-Dichlorobenzene	810 u	730 u
2-Methylphenol	810 u	730 u
bis(2-chloroisoprpyl)ether	810 u	730 u
4- methylphenol	810 u	730 u
N-Nitroso-di-n-propylamine	810 u	730 u
Hexachloroethane	810 u	730 u
Nitrobenzene	810 u	730 u
Isophorone	810 u	730 u
2-Nitrophenol	810 u	730 u
2,4-Dimethylphenol	810 u	730 u
Benzoic Acid	4000 u	3500 u
Bis(2-chloroethoxy)methane	810 u	730 u
2,4-Dichlorophenol	810 u	730 u
1,2,4-Trichlorobenzene*	810 u	730 u
Naphthalene**	120 j	730 u
4-Chloroaniline	810 u	730 u
Hexachlorobutadiene*	810 u	730 u
4-Chloro-3-methylphenol	810 u	730 u
2-methylnaphthalene**	120 j	730 u
Hexachlorocyclopentadiene*	810 u	730 u
2,4,6 - Trichlorophenol	810 u	730 u
2,4,5 - Trichlorophenol*	4000 u	3500 u
2 - Chloronaphthalene**	810 u	730 u
2-Nitroaniline	4000 u	3500 u
Dimethylphthalate	810 u	730 u
Acenaphthylene**	810 u	730 u
2,6-Dinitrotoluene	810 u	730 u
3-Nitroaniline	4000 u	3500 u
Acenaphthene**	810 u	730 u
2,4-Dinitrophenol	4000 u	3500 u
4-Nitrophenol	4000 u	3500 u
Dibenzofuran	65 j	730 u
2,4-Dinitrotoluene	810 u	730 u
Diethylphthalate	810 u	730 u
4-Chlorophenol-phenylether	810 u	730 u
Flourene*	810 u	730 u
4-Nitroaniline	4000 u	3500 u
4,6-Dinitro-2-methylphenol	4000 u	3500 u
N-Nitorosodiphenylamine	810 u	730 u
4-Bromophenyl-phenylether	810 u	730 u
Hexachlorobenzene*	210 j	730 u

Table 2
Phase II - Investigation
One-Acre Site - Buffalo Avenue
Surface Soils - Semivolatile Organic Compounds

	SS-20 5/91	SS-23 5/91
Pentachlorophenol	4000 u	3500 u
Phenanthrene**	930	67 j
Anthracene**	200 j	730 u
Di-n-butylphthalate	300 j	730 u
Fluoranthene**	1500	730 u
Pyrene**	1400	730 j
Butylbenzylphthalate	810 u	730 u
3,3-Dichlorobenzidine	1600 u	1500 u
Benzo(a) anthracene**	920	75 j
Chrysene**	980	730 u
Bis(2ethylhexyl)phthalate	4000	2000
Di-n-octylphthalate	810 u	730 u
Benzo(b)fluoranthene**	1200	110 j
Benzo(k)fluoranthene**	590 j	730 u
Benzo(a)pyrene**	670 j	66 j
Indeno(1,2,3-cd)pyrene**	420 j	730 u
Dibenz(a,h)anthracene**	94 j	730 u
Benzo(g,h,i)perylene**	330 j	730 u
S-Area SVOCs	210	ND
PAHs	9,474	1,048
Other SVOCs	4,365	2,000

All Values (ug/kg)
u- Compound analyzed but not detected
j- Estimated value

Table 3
Phase II - Investigation
One-Acre Site - Buffalo Avenue
Surface Soils - Pesticide/PCBs

	SS-20 5/91	SS-23 5/91
Aldrin	20 u	18 u
Alpha- BHC	20 u	18 u
Beta- BHC	20 u	18 u
Delta- BHC	20 u	18 u
Gamma-BHC	20 u	18 u
Chlordane	200 u	180 u
4,4-DDD	40 u	36 u
4,4-DDE	28 j	18 u
4,4-DDT	40 u	36 u
Dieldrin	40 u	36 u
Endosulfan I	20 u	18 u
Endosulfan II	40 u	36 u
Endosulfan sulfate	40 u	36 u
Endrin	40 u	36 u
Heptachlor	20 u	18 u
Heptachlor epoxide	2.1 j	18 u
Endrin Ketone	40 u	36 u
Methoxychlor	200 u	18 u
Aroclor-1016	200 u	18 u
Aroclor-1016	200 u	18 u
Aroclor-1221	200 u	18 u
Aroclor-1232	200 u	18 u
Aroclor-1242	200 u	18 u
Aroclor-1248	200 u	18 u
Aroclor-1254	400 u	36 u
Aroclor-1260	400 u	36 u
Toxaphene	400 u	36 u
Total Pesticides	30.1	ND

All Values (ug/Kg)
u- Compound analyzed but not detected
j- Estimated value
ND - Not detected

Table 4
Phase II Investigation
One-Acre Site - Buffalo Avenue
Surface Soil

	TYPICAL RANGE **	SS-20	SS-23
ALUMINUM	1000-25,000	9,140.0	8,590.0
ANTIMONY	-------	1.2 UJ	1.1 UJ
ARSENIC	3-12	5.4 J	2.4 J
BARIUM	15-600	113.0 J	69.7 J
BERYLLIUM	0-1.75	1.2 UJ	1.1 UJ
CADMIUM	0.01-2	1.2 UJ	1.1 UJ
CALCIUM	130-35,000	110,000.0	127,000.0
CHROMIUM	1.5-40	75.0 J	19.1 J
COBALT	2.5-60	9.3 J	7.4 J
COPPER	<1-15	37.3 J	15.1 J
IRON	17,500-25,000	13,100.0	14,900.0
LEAD	1-12.5	120.0 J	33.0
MAGNESIUM	2,500-6,000	58,600.0	58,200.0
MANGANESE	50-5,000	554.0 R	574.0 R
MERCURY	0.042-0.066	1.7 J	3.0 J
NICKEL	0.5-25	21.4 J	21.4 J
POTASSIUM	8,500-43,000	1,750.0	3,220.0
SELENIUM	<1-0.125	1.2 R	1.1 R
SILVER		1.5 UJ	1.3 UJ
SODIUM	6,000-8,000	443.0 U	350.0 U
THALLIUM	-------	1.2 UJ	1.1 UJ
VANADIUM	25-60	23.8 J	21.5 U
ZINC	37-60	220.0 J	150.0 J
CYANIDE	-------	1.2 U	1.1 U

Notes: All values reported in mg/kg (ppm).
U - Indicates element was analyzed for but not detected.
B - Indicates a value greater than or equal to the instrument detection limit, but less than the contract required detection limit.
NA - Not analyzed.
R - Reinjected by data validator.
J - Indicates an estimated value.

Table 5
Phase II Investigation
One-Acre Site - Buffalo Avenue
Surface and Subsurface Soil - Inorganics

Surface Soils Location:	SB-33F	SB-33G	SB-33H	SB-33I	SB-33I BLD DUP	SB-33J	SB-33K	SS-20	SS-23
Date Collected:	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	5/91	5/91
Depth:	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'
Lead (mg/Kg)	52.7	151	294	302	318	527	115	120	33
TCLP Lead (mg/L)	0.5	21	2	0.5 U	0.8	0.7	0.5 U	0.018	NA
EPTOX Lead (mg/L)	NA	NA	NA	NA	NA	NA	NA	0.26	NA

Subsurface Soils Location:	SB-33	SB-33	SB-33A	SB-33B	SB-33C	SB-33D	SB-33E	SB-7F	SB-27W	SB-28W	SB-29SR
Date Collected:	5/15/91	5/15/91	10/14/91	10/14/91	10/14/91	10/14/91	10/14/91	2/96	5/91	5/91	5/91
Depth:	2-4'	4-7'	4-7'	4-8'	6-10'	4-8'	4-8'	Comp	5-13.5'	5-11'	4-7'
Lead (mg/Kg)	121	1510	41	32	36	330	320	3100	179	371	175
TCLP Lead (mg/L)	0.018	0.66	0.5 U	0.5 U	0.5 U	1.6	0.5 U	11	0.223	0.16	0.079
EPTOX Lead (mg/L)	0.16	39.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	1.87	0.225	0.885

Location:			SB-7A	SB-7B	SB-7C	SB-7D	SB-7E	SB-7E BLD DUP
Date Collected:			2/9/95	2/9/95	2/10/95	2/10/95	2/10/95	2/10/95
Depth:			10-12'	10-12'	8-10'	8-10'	8-10'	8-10'
	Max. Conc. from Buffalo Ave. Site	Typical Range						
Chromium (mg/Kg)	708	1.5 - 40	13.4	10.3	16.1	42.8	14.2	29.3
Lead (mg/Kg)	928	1 - 12.5	19.1	40.7	246	292	77.2	132
% Total Solids			80.4	79.0	78.2	81.2	74.1	66.7

Notes: U - Not Detected
NA - Not Analyzed

Table 9
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil Semivolatile Organic Compound
Niagara Falls, New York

Location:		SB-27SR	SB-27W	SB-28SR	SB-28W	SB-29SR	SB-29W	SB-33SR	SB-33W
Date Collected:		5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91
Depth:		(2-5)	(5-13.5)	(2-5)	(5-11)	(4-7)	(7-11)	(2-4)	(4-7)
	Typical Range								
Aluminum	1000-25000	4620	4610	7880	3850	11200	11000	4960	3880
Antimony	---	1.1 UJ	135 J	1.1 UJ	22.0 J	4.3 J	1.1 UJ	2.1 J	8.8 J
Arsenic	3 - 12	4.1 J	7.5 J	4.7 J	6.3 J	5.8 J	3.4 J	3.4 J	10.9 J
Barium	15 - 600	49.7	38.2	86.5	76.0	107	93.1	118	1240
Beryllium	0 - 1.75	1.1 U	1.3 U	1.1 U	1.4 U	1.2 U	1.3	1.1 U	1.3 U
Cadmium	0.01 - 2.0	1.1 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.1 U	1.3 U
Calcium	130 - 35000	129000 J	55800 J	1720 J	35600	72900	56400	1250 J	57700
Chromium	1.5 - 40	13.0	26.7	29.4 J	708	57.0 J	13.9 J	126 J	26.4 J
Cobalt	2.5 - 60	4.3 U	5.3 U	11.3 UJ	14.5 UJ	11.9 UJ	11.2 UJ	10.6 UJ	13.1 UJ
Copper	<1 - 15	11.5	87.2	22.9	87.1	69.5	28.9	32.0	164
Iron	17500 - 25000	9200 J	7500 J	14100	77200	19000	10500	9920	32000
Lead	1 - 12.5	47.3	179	88.1	371 J	175 J	14.1 J	121 J	1510 J
Magnesium	2500 - 6000	66600 J	1470 J	50200	7630	24100	9440	78900	6000
Manganese	50 - 5000	676 J	44.7 J	486	244 J	456	322 J	546	293 J
Mercury	0.042 - 0.066	0.62	3.6	0.67	5.1	2.8	0.10 U	0.40	0.85
Nickel	0.5 - 25	15.1	62.2	19.3	56.9	29.7	37.8	14.7	20.0
Potassium	8500 - 43000	852	145	1270	569	1680	435	931	421
Selenium	<0.1 - 0.125	1.1 R	1.3 R	1.1 R	1.4 R	1.1 R	1.1 R	10.5 R	1.3 R
Silver		1.3 U	1.6 U	1.4 U	1.7 U	1.4 U	1.3 U	1.3 U	1.6 U
Sodium	6000 - 8000	195 U	269 U	678 U	873 U	1320 U	670 U	635 U	784 U
Thallium	---	1.1 U	1.3 U	1.1 U	1.4 U	1.1 U	1.1 U	1.0 U	1.3 U
Vanadium	25 - 60	10.0	29.5	24.9 J	33.3 J	29.7 J	38.0 J	33.9	23.5 J
Zinc	37 - 60	65.7 J	111 J	179 J	449 J	175 J	37.0 J	222 J	394 J
Cyanide	---	1.15 U	9.87	1.1 U	1.4 U	3.8	1.1 U	1.1 U	1.3 U
Leachability Testing (mg/L)	Regulatory Limit								
TCLP Lead	5	NA	0.223	NA	0.16	0.079	NA	0.018	0.66
EP TOX Lead	5	NA	1.87	NA	0.225	0.885	NA	0.16	39.1
TCLP Chromium	5	NA	NA	NA	0.024	NA	NA	0.017	NA
EPTOX Chromium	5	NA	NA	NA	0.024	NA	NA	0.01	NA
TCLP Mercury	0.2	NA	NA	NA	0.0002	NA	NA	NA	NA
EPTOX Mercury	0.2	NA	NA	NA	0.0002	NA	NA	NA	NA

Notes: All concentrations reported in mg/kg (ppm), except as noted.
** - Referenced from Bowen (1979), Shacklette et al (1984), Shacklette et al (1971), Walsh et al (1977).
U - Indicates element was analyzed for but not detected.
B - Indicates a value greater than or equal to the instrument detection limit but less than the contract required detection limit.
J - Indicates an estimated value. (GC/MS only).
TCLP and Eptox results in mg/L (ppm).

Table 10
Phase II Investigation
One-Acre Site - Buffalo Avenue
Ground Water Volatile Organic Data

	MW-7S 6/91	MW-7S 9/91	MW-7D 6/91	BL Dup MW-7D 6/91	MW-7D 9/91
CHLOROMETHANE	10 u	0.4 u	10 u	10 u	0.4 u
BROMOMETHANE	10 u	0.4 u	10 u	10 u	0.4 u
VINYL CHLORIDE*	10 u	0.4 u	10 u	10 u	0.4 u
CHLOROETHANE	10 u	0.4 u	10 u	10 u	0.4 u
METHYLENE CHLORIDE	5 u	0.2 u	5 u	5 u	0.2 u
ACETONE	10 u		10 u	10 u	
CARBON DISULFIDE	5 u		5 u	5 u	
1,1-DICHLOROETHENE	5 u	0.2 u	5 u	5 u	0.2 u
1,1-DICHLOROETHANE	5 u	0.2 u	5 u	5 u	0.2 u
1,2-DICHLOROETHENE (TOTAL)*	5 u	0.2 u	5 u	5 u	0.2 u
CHLOROFORM	5 u	0.2 u	5 u	5 u	0.2 u
1,2-DICHLOROETHANE	5 u	0.2 u	5 u	5 u	0.2 u
2-BUTANONE	10 u		10 u	10 u	
1,1,1-TRICHLOROETHANE	5 u	0.2 u	5 u	5 u	0.2 u
CARBON TETRACHLORIDE	5 u	0.2 u	5 u	5 u	0.2 u
VINYL ACETATE	5 u		5 u	5 u	
BROMODICHLOROMETHANE	5 u	0.2 u	5 u	5 u	0.2 u
1,2-DICHLOROPROPANE	5 u	0.2 u	5 u	5 u	0.2 u
CIS-1,3-DICHLOROPROPANE	5 u	0.2 u	5 u	5 u	0.2 u
TRICHLOROETHENE*	5 u	0.2 u	5 u	5 u	0.2 u
DIBROMOCHLOROMETHANE	5 u	0.2 u	5 u	5 u	0.2 u
1,1,2-TRICHLOROETHANE	5 u	0.2 u	5 u	5 u	0.2 u
BENZENE*	0.8 u	0.2 u	5 u	5 u	0.2 u
TRANS-1,3-DICHLOROPROPANE	5 u	0.2 u	5 u	5 u	0.2 u
BROMOFORM	5 u	1 u	5 u	5 u	1 u
4-METHYL-2-PENTANONE	10 u		10 u	10 u	
2-HEXANONE	10 u		10 u	10 u	
TETRACHLOROETHENE*	5 u	0.2 u	5 u	5 u	0.2 u
1,1,2,2-TETRACHLOROETHENE	5 u	0.2 u	5 u	5 u	0.2 u
TOLUENE	5 u	0.2 u	5 u	5 u	0.2 u
CHLOROBENZENE*	5 u	6 j	5	5 u	2.7
ETHYLBENZENE	5 u	0.2 u	5 u	5 u	0.2 u
STYRENE	5 u		5 u	5 u	
TOTAL XYLENES	5 u	0.2 u	5 u	5 u	0.2 u
Total S-Area VOCs	ND	6	5	ND	2.7
Other VOCs	ND	ND	ND	ND	ND

Notes: Data from Buffalo Avenue Site Investigation Report;
O'Brien & Gere Engineers, Inc.; 1991C
Results presented in ug/kg (ppb)
U - Compound Analyzed but not detected
J - Indicates an estimated value (GC/MS only)
B - Analyte is found in the associated blank as well as in the sample.
RE - Sample reanalyzed due to quality control assurances.
* - "S" Area Indicator

Table 11
Phase II Investigation
One-Acre Site - Buffalo Avenue
Ground Water - Semivolatile Organic Compounds

	MW-7D 6/91	BL Dup MW-7D 6/91	MW-7S 6/91
Phenol	12 u	12 u	12 u
bis(2-chloroethyl) ether	12 u	12 u	12 u
2-Chlorophenol	12 u	12 u	12 u
1,3 - Dichlorobenzene*	12 u	12 u	6 j
1,4 - Dichlorobenzene*	12 u	12 u	6 j
Benzyl alcohol	12 u	12 u	12 u
1,2-Dichlorobenzene*	12 u	12 u	12 u
2-Methylphenol	12 u	12 u	12 u
bis(2-chloroisoprpyl)ether	12 u	12 u	12 u
4- methylphenol	12 u	12 u	12 u
N-Nitroso-di-n-propylamine	12 u	12 u	12 u
Hexachloroethane	12 u	12 u	12 u
Nitrobenzene	12 u	12 u	12 u
Isophorone	12 u	12 u	12 u
2-Nitrophenol	12 u	12 u	12 u
2,4-Dimethylphenol	12 u	12 u	12 u
Benzoic Acid	62 u	62 u	62 u
Bis(2-chloroethoxy)methane	12 u	12 u	12 u
2,4-Dichlorophenol	12 u	12 u	12 u
1,2,4-Trichlorobenzene*	12 u	12 u	12 u
Naphthalene**	12 u	12 u	12 u
4-Chloroaniline	12 u	12 u	12 u
Hexachlorobutadiene*	12 u	12 u	12 u
4-Chloro-3-methylphenol	12 u	12 u	12 u
2-methylnaphthalene**	12 u	12 u	12 u
Hexachlorocyclopentadiene.*	12 u	12 u	12 u
2,4,6 - Trichlorophenol	12 u	12 u	12 u
2,4,5 - Trichlorophenol*	62 u	62 u	62 u
2 - Chloronaphthalene*	12 u	12 u	12 u
2-Nitroaniline	62 u	62 u	62 u
Dimethylphthalate	12 u	12 u	12 u
Acenaphthylene*	12 u	12 u	12 u
2,6-Dinitrotoluene	12 u	12 u	12 u
3-Nitroaniline	62 u	62 u	62 u
Acenaphthene*	12 u	12 u	12 u
2,4-Dinitrophenol	62 u	62 u	62 u
4-Nitrophenol	62 u	62 u	62 u
Dibenzofuran	12 u	12 u	12 u
2,4-Dinitrotoluene	12 u	12 u	12 u
Diethylphthalate	12 u	12 u	12 u
4-Chlorophenol-phenylether	12 u	12 u	12 u
Fluorene**	12 u	12 u	12 u
4-Nitroaniline	62 u	62 u	62 u
4,6-Dinitro-2-methylphenol	62 u	62 u	62 u
N-Nitorosodiphenylamine	12 u	12 u	12 u
4-Bromophenyl-phenylether	12 u	12 u	12 u
Hexachlorobenzene*	12 u	12 u	12 u

Table 11
Phase II Investigation
One-Acre Site - Buffalo Avenue
Ground Water - Semivolatile Organic Compounds

	MW-7D 6/91	BL Dup MW-7D 6/91	MW-7S 6/91
Pentachlorophenol	62 u	62 u	62 u
Phenanthrene**	12 u	12 u	12 u
Anthracene**	12 u	12 u	12 u
Di-n-butylphthalate	12 u	12 u	12 u
Fluoranthene**	12 u	12 u	12 u
Pyrene**	12 u	12 u	12 u
Butylbenzylphthalate	12 u	12 u	12 u
3,3-Dichlorobenzidine	25 u	25 u	25 u
Benzo(a) anthracene**	12 u	12 u	12 u
Chrysene**	12 u	12 u	12 u
Bis(2ethylhexyl)phthalate	12 u	12 u	12 u
Di-n-octylphthalate	12 u	12 u	12 u
Benzo(b)fluoranthene**	12 u	12 u	12 u
Benzo(k)fluoranthene**	12 u	12 u	12 u
Benzo(a)pyrene**	12 u	12 u	12 u
Indeno(1,2,3-cd)pyrene**	12 u	12 u	12 u
Dibenz(a,h)anthracene**	12 u	12 u	12 u
Benzo(g,h,i)perylene**	12 u	12 u	12 u
Total S-Area SVOCs	ND	ND	12
PAHs	ND	ND	ND
Other SVOCs	ND	ND	ND

All Values (ug/L)
u- Compound analyzed but not detected
j- Estimated value

Table 12
Phase II Investigation
One-Acre Site - Buffalo Avenue Site
Ground Water - Pesticides/PCBs

	MW-7S 6/91	MW-7S 9/91	BL DUP MW-7S 9/91	MW-7D 6/91	BL DUP MW-7D 6/91
Aldrin	0.07 u	0.071	0.067	0.07 u	0.07 u
Alpha- BHC	0.064 j	0.81	0.089	0.07 u	0.07 u
Beta- BHC	0.07 u	0.093	0.016	0.07 u	0.07 u
Delta- BHC	0.07 u	0.017	0.004	0.07 u	0.07 u
Gamma-BHC	0.33 u	0.004 u	0.004 u	0.07 u	0.16 u
Chlordane	0.07 u	0.007 u	0.07 u	0.07 u	0.07 u
4,4-DDD	0.2 u	0.001 u	0.01 u	0.2 u	0.2 u
4,4-DDE	0.2 u	0.001 u	0.01 u	0.2 u	0.2 u
4,4-DDT	0.2 u	0.001 u	0.01 u	0.2 u	0.2 u
Dieldrin	0.2 u	0.001 u	0.01 u	0.2 u	0.2 u
Endosulfan I	0.07 u	0.034	0.046	0.07 u	0.07 u
Endosulfan II	0.2 u	0.001 u	0.01 u	0.2 u	0.2 u
Endosulfan sulfate	0.2 u	0.001 u	0.01 u	0.2 u	0.2 u
Endrin	0.2 u	0.013	0.014	0.2 u	0.2 u
Endrin Aldehyde	0.2 u			0.2 u	0.2 u
Endrin Ketone	0.2 u	0.02 u	0.02 u	0.2 u	0.2 u
Heptachlor	0.07 u	0.004 u	0.004 u	0.07 u	0.07 u
Heptachlor epoxide	0.07 u	0.008	0.008	0.07 u	0.07 u
Methoxychlor	0.7 u	0.02 u	0.02 u	0.7 u	0.7 u
Aroclor-1016	0.7 u			0.7 u	0.7 u
Aroclor-1016	0.7 u			0.7 u	0.7 u
Aroclor-1221	0.7 u			0.7 u	0.7 u
Aroclor-1232	0.7 u			0.7 u	0.7 u
Aroclor-1242	0.7 u			0.7 u	0.7 u
Aroclor-1248	0.7 u			0.7 u	0.7 u
Aroclor-1254	2 u			2 u	2 u
Aroclor-1260	2 u			2 u	2 u
Toxaphene	2 u			2 u	2 u
Total Pesticides	0.064	1.046	0.24	ND	0.16

All Values (ug/L)
u- Compound analyzed but not detected
j- Estimated value
ND- Not detected

Table 13
Phase II Investigation
One-Acre Site - Buffalo Avenue
Ground Water - Inorganic Analyses

	NYS CLASS GA STANDARDS	DRINKING WATER STANDARDS*	MW-7S TOTAL 6/91	MW-7S TOTAL 9/91	BL DUP MW-7S TOTAL 9/91	MW-7S SOLUBLE 6/91	MW-7S SOLUBLE 9/91	BL DUP MW-7S SOLUBLE 9/91	MW-7D TOTAL 6/91	BL DUP MW-7D TOTAL 6/91	MW-7D TOTAL 9/91	MW-7D SOLUBLE 6/91	BL DUP MW-7D SOLUBLE 6/91	MW-7D SOLUBLE 9/91
ALUMINUM	NE		10.4 J			0.05 U			3.171 J	13.4 J		0.05 U	0.05 U	0.05 U
ANTIMONY	0.003 #		0.34	0.075 R	0.15 R	0.07	0.022 R	0.11 R	0.005 U	0.005 U	0.005 R	0.005 U	0.005 U	0.005 U
ARSENIC	0.025	0.05	0.012			0.005 U			0.005 U	0.006		0.005 U	0.005 U	0.005 U
BARIUM	1	1	0.339			0.046			0.03 U	0.0934		0.03 U	0.03 U	0.03 U
BERYLLIUM	0.003 #		0.005 U			0.005 U			0.005 U	0.005 U		0.005 U	0.005 U	0.005 U
CADMIUM	0.01	0.01	0.005 U			0.005 U			0.005 UJ	0.005 UJ		0.005 U	0.005 U	0.005 UJ
CALCIUM	NE		202			136			514	586		427	521 UJ	521
CHROMIUM	0.05	0.05	1.12 J	1.94 J	3.46 J	0.01 U	0.01	0.01 UJ	0.0208 J	0.0676 J	0.026	0.01 U	0.01 UJ	0.01 UJ
CHROMIUM HEXAVALENT				0.068 J	0.054 J		0.01	0.01 UJ			0.01 UJ			
COBALT	NE		0.0002 U			0.02 U			0.02 U	0.02 U		0.02 U	0.02 U	0.02 U
COPPER	0.2	1	0.182			0.01 U			0.057 U	0.059 U		0.021	0.017 J	0.017 J
IRON	0.3	0.3	29 J			12.03			4.66 J	20.2 J		0.035	0.0328	0.0328
LEAD	0.025	0.05	1.04 J	0.979	2.4 J	0.004	0.386 J	0.005 U	0.0169 J	0.089 J	0.022	0.004	0.007 J	0.007 J
MAGNESIUM	35 #		30.5			20.3			137	180		144	182	182
MANGANESE	0.3	0.3	0.52 J	1.01 J	0.749	0.415	0.003	0.372 J	0.157 J	0.687 J	0.286	0.017	0.0178 J	0.0178 J
MERCURY	0.002	0.002	0.0006		0.0208	0.0002 U		0.0002 U	0.0002 U	0.0002 U		0.0002 U	0.002 U	0.0002 U
NICKEL	NE		0.0503			0.02			0.02 U	0.0412	0.0002 U	0.02 U	0.02 U	0.02 U
POTASSIUM	NE		6.25			5.189			10	11.9		9.658	8.92	8.92
SELENIUM	0.01	0.01	0.005 U			0.005 U			0.005 U	0.005 U		0.005 U	0.005 U	0.005 U
SILVER	0.05	0.05	0.006 U			0.006 U			0.006 U	0.006 U		0.006 U	0.006 U	0.006 U
SODIUM	20	NL	28			28			230	235		220	230	230
THALLIUM	0.004 #		0.005 UJ			0.005 U			0.005 UJ	0.005 UJ		0.005 U	0.005 UJ	0.005 UJ
VANADIUM	NE		0.03 J			0.03 U			0.03 U	0.03 U		0.03 U	0.03 U	0.03 U
ZINC	0.3	5	1.54 J			0.009			0.168 J	0.218 J		0.005 U	0.005 U	0.005 U
CYANIDE	0.1		0.267			0.01 U			0.01 U	0.01 U		0.01 U		
pH			6.7			6.7			6.7			6.7		
CONDUCTIVITY			920			920			>2000			>2000		
TURBIDITY			>100			FILTERED			>100			FILTERED		

Notes: Conductivity measured in umho/cm
Turbidity measured in NTUs
All other values reported in mg/l (ppm)
- Guidance value
NL - No designated limit
** - NYCRR 10, Subpart 5
U - Indicates element was analyzed for but not detected
J - Indicates an estimated value (GC/MS only)

E - Indicates a value estimated or not reported due to the presence of interference
N - Indicates spike sample recovery is not within control limits
W - Post digestion spike for Furnance AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance
* - Indicates duplicate analysis is not within control limits
B - Indicates a value greater than or equal to the instrument detection limit but less than the contract required detection limit

Table 14

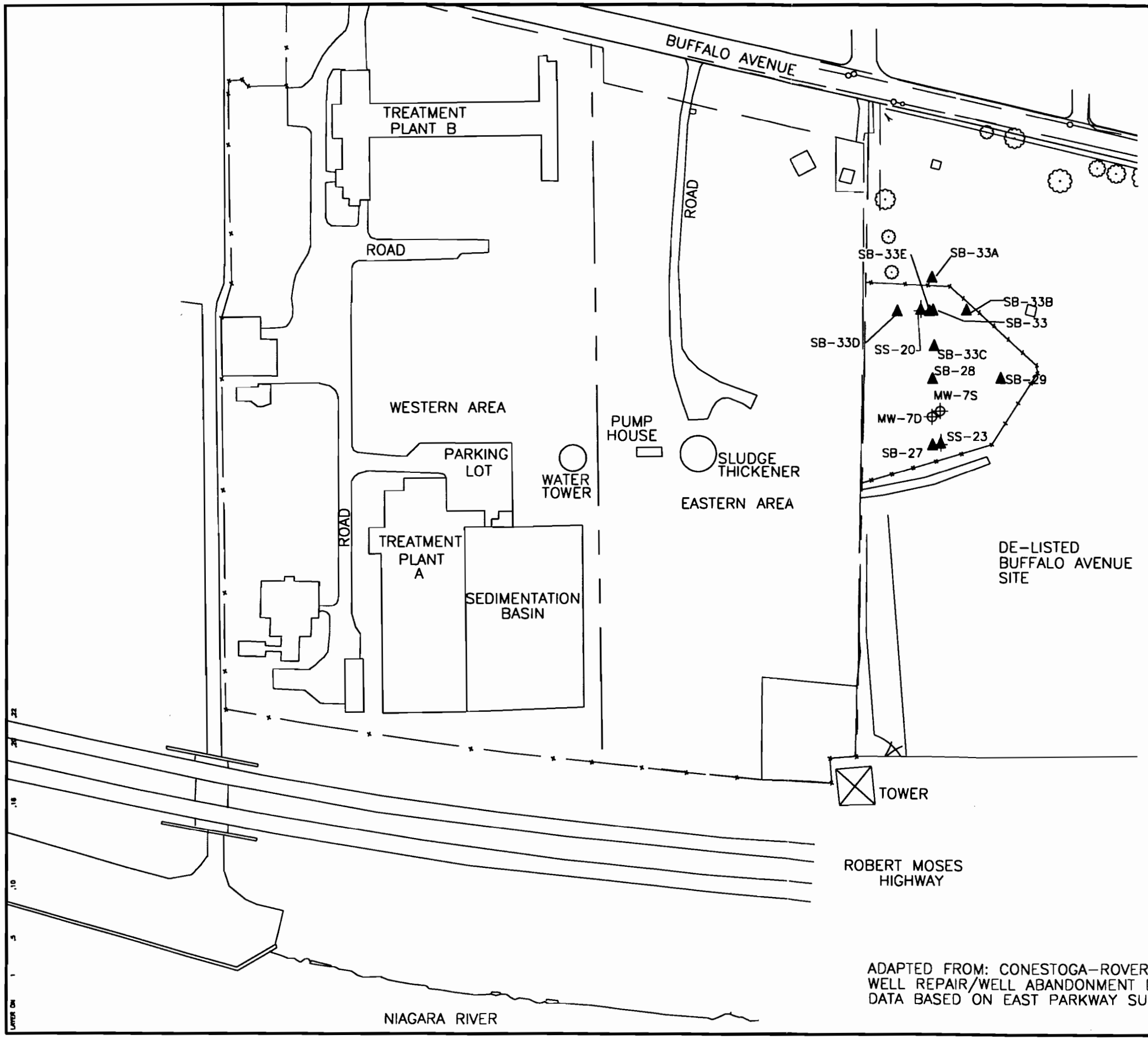
Phase II Investigation
Water Treatment Plant - One Acre Site
Niagara Falls, New York

TCLP Analysis

Location: / Date Collected:	Maximum Concentration Per Part 261 *	SB-7F 2/19/96
Pyridine	5.0	0.085 U
1,4-Dichlorobenzene	7.5	0.008 U
2-Methylphenol	-----	0.007 J
3&4-Methylphenol	-----	0.018
Hexachloroethane	0.13	0.008 U
Nitrobenzene	2.0	0.008 U
Hexachlorobutadiene	0.5	0.008 U
2,4,6-Trichlorophenol	2.0	0.008 U
2,4,5-Trichlorophenol	400.0	0.008 U
2,4-Dinitrotoluene	0.13	0.008 U
Hexachlorobenzene	0.13	0.008 U
Pentachlorophenol	-----	0.004 U
Vinyl chloride	0.2	<.002
1,1-Dichloroethene	0.7	<.001
Chlorobenzene	100.0	<.001
1,2-Dichloroethane	0.5	<.001
Chloroform	6.0	<.001
Benzene	0.5	<.001
Trichloroethene	0.5	<.001
2-Butanone	-----	<.001
Tetrachloroethene	0.7	<.001
Carbon tetrachloride	0.5	<.001
Arsenic	5.0	<5.0
Barium	100.0	<10
Cadmium	1.0	<1
Chromium	5.0	<5
Lead	5.0	11
Mercury	0.2	<.0005
Selenium	1.0	<.1
Silver	5.0	<.5
Lindane	0.4	<.00025
Heptachlor	0.008	<.00025
Heptachlor epoxide	-----	<.00025
Endrin	0.02	<.00050
Methoxychlor	10.0	<.0025
Chlordane	0.03	<.0025
Toxaphene	0.5	<.0025

Notes: Results reported in mg/L (ppm)
J - Estimated value.
U - Not detected.
* - 40CFR Part 261 Identification and Listing of Hazardous Waste.

FIGURE 3



ADAPTED FROM: CONESTOGA-ROVERS & ASSOCIATES WELL REPAIR/WELL ABANDONMENT DRAWING SURVEY DATA BASED ON EAST PARKWAY SURVEY BASELINE.

OCT. 1996

LEGEND

- SITE BOUNDARY PER RRT STIPULATION
- FENCE
- EXISTING MONITORING WELL
- SOIL BORING LOCATION
- SURFACE SOIL SAMPLE LOCATION

PHASE II INVESTIGATION
ONE-ACRE SITE-BUFFALO AVE.
NIAGARA FALLS, NEW YORK

PREVIOUS SAMPLE LOCATIONS

150 0 150

APPROX. SCALE IN FEET

1736.078-02F

O'BRIEN & GERE ENGINEERS,INC.

FIGURE 4

DEPTH INT.	4–7'
TOTAL Pb	41
TCLP Pb	<0.5
EPTOX Pb	<0.5

TOTAL Pb	527
TCLP Pb	0.7

TOTAL Pb	318
TCLP Pb	0.8

SB-36

DEPTH INT.	4–8'
TOTAL Pb	320
TCLP Pb	<0.5
EPTOX Pb	<0.5

DEPTH INT.	2–4'	4–7'
TOTAL Pb	121	1510
TCLP Pb	0.018	0.66
EPTOX Pb	0.16	39.10

SB-33A

SB-33I

SB-33J

TOTAL Pb	294
TCLP Pb	2

TOTAL Pb	120
TCLP Pb	.018
EPTOX Pb	0.260

SB-33H

SB-33

SB-33K

TOTAL Pb	115
TCLP Pb	<0.5

SB-33D

SB-33E

SS-20

SB-33B

DEPTH INT.	4–8'
TOTAL Pb	330
TCLP Pb	1.6
EPTOX Pb	<0.5

SB-33G

SB-33F

DEPTH INT.	4–8'
TOTAL Pb	32
TCLP Pb	<0.5
EPTOX Pb	<0.5

TOTAL Pb	52.7
TCLP Pb	0.5

TOTAL Pb	151
TCLP Pb	21

SB-33C

DEPTH INT.	6–10'
TOTAL Pb	36
TCLP Pb	<0.5
EPTOX Pb	<0.5

ONE-ACRE PARCEL

DEPTH INT.	2–5'	4–7'
TOTAL Pb	175	14.1
TCLP Pb	NA	0.079
EPTOX Pb	NA	0.885

SB-29

DEPTH INT.	2–5'	5–11'
TOTAL Pb	88.1	371
TCLP Pb	NA	0.160
EPTOX Pb	NA	0.225

SB-28

SB-7E

DEPTH INT.	8–10'
TOTAL Pb	132

MW-7S

DEPTH INT.	10–12'
TOTAL Pb	19.1

SB-7A

MW-7D

DEPTH INT.	COMP.
TOTAL Pb	3100
TCLP Pb	11

SB-7F

DEPTH INT.	10–12'
TOTAL Pb	40.7

SB-7B

DEPTH INT.	8–10'
TOTAL Pb	292

SB-7D

SS-23

TOTAL Pb	33

SB-27

SB-7C

DEPTH INT.	8–10'
TOTAL Pb	246

DEPTH INT.	2–5'	5–13.5'
TOTAL Pb	47.3	179
TCLP Pb	NA	0.223
EPTOX Pb	NA	1.870

ADAPTED FROM: CONESTOGA-ROVERS & ASSOCIATES WELL REPAIR/WELL ABANDONMENT DRAWING SURVEY DATA BASED ON EAST PARKWAY SURVEY BASELINE.

OCT. 1996

LEGEND

- SITE BOUNDARY PER RRT STIPULATION
- FENCE
- MONITORING WELL (OBG)
- SOIL BORING LOCATION
- SURFACE SOIL SAMPLE LOCATION

TOTAL Pb	121
TCLP Pb	0.018
EPTOX Pb	0.16

TOTAL LEAD CONCENTRATION (IN mg/kg)

TCLP LEAD CONCENTRATION (IN mg/L)

EPTOX LEAD CONCENTRATION (IN mg/L)

NA – NOT ANALYZED

PHASE II INVESTIGATION
ONE-ACRE SITE-BUFFALO AVE.
NIAGARA FALLS, NEW YORK

SOIL SAMPLE LOCATION MAP AND LEAD CONCENTRATIONS

40 0 40

APPROX. SCALE IN FEET

1736.078-005

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 5

SB-33	2-4'(SR)	4-7'(W)
VOCs TOTAL "S" AREA	0.3 ug/kg	2 ug/kg
VOCs OTHER VOCs	3 ug/kg	ND
SVOCs TOTAL "S" AREA	ND	ND
SVOCs PAHs	3463 ug/kg	323620 ug/kg
SVOCs OTHER SVOCs	257 ug/kg	6692 ug/kg
TOTAL PEST.	46 ug/kg	35 ug/kg

SB-28	2-5'(SR)	5-11'(W)
VOCs TOTAL "S" AREA	ND	ND
VOCs OTHER VOCs	1.0 ug/kg	ND
SVOCs TOTAL "S" AREA	ND	870 ug/kg
SVOCs PAHs	1788 ug/kg	32657 ug/kg
SVOCs OTHER SVOCs	39130 ug/kg	700 ug/kg
TOTAL PEST.	22 ug/kg	3273 ug/kg

SB-7E	8-10'
VOCs TOTAL "S" AREA	170 ug/kg
VOCs OTHER VOCs	61 ug/kg
SVOCs TOTAL "S" AREA	4280 ug/kg
SVOCs PAHs	28020 ug/kg
SVOCs OTHER SVOCs	3140 ug/kg
TOTAL PEST.	241 ug/kg 13.3)

SB-7D	8-10'
VOCs TOTAL "S" AREA	5.9 ug/kg
VOCs OTHER VOCs	13 ug/kg
SVOCs TOTAL "S" AREA	3400 ug/kg
SVOCs PAHs	934200 ug/kg
SVOCs OTHER SVOCs	122800 ug/kg
TOTAL PEST.	4.31 ug/kg

SB-27	2-5'(SR)	5-13.5'(W)
VOCs TOTAL "S" AREA	ND	19 ug/kg
VOCs OTHER VOCs	ND	2.8 ug/kg
SVOCs TOTAL "S" AREA	ND	4310 ug/kg
SVOCs PAHs	ND	70700 ug/kg
SVOCs OTHER SVOCs	ND	21150 ug/kg
TOTAL PEST.	ND	ND

SB-7C	8-10'
VOCs TOTAL "S" AREA	80 ug/kg
VOCs OTHER VOCs	357 ug/kg
SVOCs TOTAL "S" AREA	ND
SVOCs PAHs	125600 ug/kg
SVOCs OTHER SVOCs	39700 ug/kg
TOTAL PEST.	29.98 ug/kg

SB-29	4-7'(SR)	7-11'(W)
VOCs TOTAL "S" AREA	ND	ND
VOCs OTHER VOCs	ND	ND
SVOCs TOTAL "S" AREA	1000 ug/kg	ND
SVOCs PAHs	26050 ug/kg	2516 ug/kg
SVOCs OTHER SVOCs	1170 ug/kg	400 ug/kg
TOTAL PEST.	2263.8 ug/kg	ND

SB-7A	10-12'
VOCs TOTAL "S" AREA	ND
VOCs OTHER VOCs	ND
SVOCs TOTAL "S" AREA	ND
SVOCs PAHs	2241 ug/kg
SVOCs OTHER SVOCs	292 ug/kg
TOTAL PEST.	0.19 ug/kg

SB-7B	10-12'
VOCs TOTAL "S" AREA	ND
VOCs OTHER VOCs	9.7 ug/kg
SVOCs TOTAL "S" AREA	ND
SVOCs PAHs	759 ug/kg
SVOCs OTHER SVOCs	47 ug/kg
TOTAL PEST.	0.532 ug/kg

SB-36
SB-33A
SB-33E
SB-33
SB-33D
SB-33B
SB-33C
SB-28
SB-29
SB-7E
MW-7S
MW-7D
SB-7A
SB-7F
SB-7D
SB-7B
SB-27
SB-7C
ONE-ACRE PARCEL

ADAPTED FROM: CONESTOGA-ROVERS & ASSOCIATES
WELL REPAIR/WELL ABANDONMENT DRAWING SURVEY
DATA BASED ON EAST PARKWAY SURVEY BASELINE.
REVISED OCT. 96

LEGEND

- FENCE
- ▲ SOIL BORING LOCATION
- ND NON-DETECT
- NA NOT ANALYZED
- ( ) FILTERED (DISSOLVED) METALS
- VOCs VOLATILE ORGANIC COMPOUNDS
- SVOCs SEMIVOLATILE ORGANIC COMPOUNDS

PHASE II INVESTIGATION
ONE-ACRE SITE-BUFFALO AVE.
NIAGARA FALLS, NEW YORK

SUBSURFACE SOIL LOCATION AND CHEMICAL CONCENTRATION MAP

40 0 40

APPROX. SCALE IN FEET

1736.078-006

O'BRIEN & GERE ENGINEERS, INC.

Table 8
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil - PCB/Pecticides
Niagara Falls, New York

Location:		SB-7A	SB-7B	SB-7C	SB-7D	SB-7E	SB-7E DL	SB-7E BLD DUP	SB-27SR	SB-27W	SB-28SR	SB-28W	SB-29SR	SB-29W	SB-33SR	SB-33W
Date Collected:		2/9/95	2/9/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91
Depth:		10-12'	10-12'	8-10'	8-10'	8-10'	8-10'	8-10'	2-5'	5-13.5'	2-5'	5-11'	4-7'	7-11'	2-4'	4-7'
	Max Conc. from Buffalo Ave. Site															
alpha-BHC	ND	0.19 JP	0.38 JP	2.1 U	0.91 JP	2.3 U	23 U	2.5 U	19 U	88 U	18 U	23 U	19 U	20 U	17 U	110 U
beta-BHC	23.0	2.1 U	2.1 U	2.1 U	2.1 U	2.3 U	23 U	2.5 U	19 U	88 U	18 U	2900 J	2200 J	20 U	17 U	110 U
delta-BHC	ND	2.1 U	2.1 U	2.1 U	2.1 U	63 EP	110	2.3 JP	19 U	88 U	18 U	30 J	6.8 J	20 U	17 U	35 J
Lindane	22.0	2.1 U	2.1 U	2.1 UB	2.1 UB	24 B	20 JP	2.5 UB	19 U	88 U	18 U	120	16 J	20 U	17 U	110 U
Heptachlor	6.7	2.1 UB	0.038 BJP	2.3 BP	2.1 UB	2.3 UB	23 UB	0.77 BJP	19 U	88 U	18 U	16 J	19	20 U	17 U	110 U
Aldrin	11.0	2.1 U	2.1 U	2.1 U	2.1 U	2.3 U	23 U	2.5 U	19 U	88 U	5 J	23 U	22	20 U	7.5 J	110 U
Heptachlor epoxide	24.0	2.1 U	0.075 JP	2.1 U	2.1 U	2.3 U	23 U	1.2 JP	19 U	88 U	18 U	23 U	19 U	20 U	17 U	110 U
Endosulfan I	ND	2.1 U	2.1 U	0.78 JP	2.1 U	2.3 U	23 U	2.5 U	19 U	88 U	18 U	23 U	19 U	20 U	21	110 U
Dieldrin	11.0	4.2 U	0.077 JP	1.2 JP	3.4 J	15 P	21 JP	9.8 P	38 U	180 U	36 U	56	37 U	40 U	34 U	320 U
4,4'-DDE	19.0	4.2 U	4.2 UB	4.3 UB	4.1 UB	26 BP	36 JP	5 UB	38 U	180 U	36 U	45 U	27 J	40 U	34 U	320 U
Endrin	ND	4.2 U	4.2 U	4.3 U	4.1 U	4.5 U	45 U	5 U	38 U	180 U	36 U	95	37 J	40 U	7.5 J	320 U
Endosulfan II	ND	4.2 UB	0.43 BJP	4.3 UB	4.1 UB	39 BP	56 BP	5 UB	38 U	180 U	36 U	45 U	37 U	40 U	10 J	320 U
4,4'-DDD	16.0	4.2 U	0.074 BJP	1 BJ	1.2 BJP	29 B	42 J	4.8 BJP	38 U	180 U	17 J	45 U	37 U	40 U	34 U	320 U
Endosulfan sulfate	7.0	4.2 UB	4.2 UB	4.3 UB	4.1 UB	13 BP	45 UB	5 UB	38 U	180 U	36 U	45 U	37 U	40 U	34 U	320 U
4,4'-DDT	21.0	4.2 UB	1.1 BJP	1.6 BJP	4.1 UB	4.5 UB	22 BJ	49 B	38 U	180 U	36 U	56	37 U	40 U	34 U	320 U
Methoxychlor	ND	21 UB	21 U	28 P	21 U	23 U	230 UB	25 U	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
Endrin ketone	ND	4.2 UB	4.2 UB	4.3 UB	3 BJP	4.5 UB	45 UB	5 UB	38 U	180 U	36 U	45 U	37 U	40 U	34 U	320 U
Endrin aldehyde	ND	4.2 U	4.2 UB	4.3 UB	4.1 UB	4.5 UB	45 U	5 U	NA	NA	NA	NA	NA	NA	NA	NA
A-Chlordane	ND	1.6 BJP	2.1 UB	2.1 UB	1.5 BJP	2.3 UB	23 UB	1.6 BJP	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
G-Chlordane	ND	2.1 U	2.1 U	2.1 U	2.1 U	12 P	23 U	2.5 U	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
Toxaphene	ND	210 U	210 U	210 U	210 U	230 U	2300 U	250 U	380 U	1800 U	360 U	450 U	370 U	400 U	340 U	2200 U
PCB-1016	ND	42 U	42 U	43 U	41 U	45 U	450 U	50 U	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
PCB-1221	ND	83 U	84 U	85 U	82 U	90 U	900 U	100 U	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
PCB-1232	ND	42 U	42 U	43 U	41 U	45 U	450 U	50 U	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
PCB-1242	ND	42 U	42 U	43 U	41 U	45 U	450 U	50 U	190 U	2200	180 U	230 U	190 U	200 U	170 U	1100 U
PCB-1248	ND	42 U	42 U	43 U	41 U	45 U	450 U	50 U	190 U	880 U	180 U	230 U	190 U	200 U	170 U	1100 U
PCB-1254	ND	42 U	42 U	43 U	41 U	45 U	450 U	50 U	380 U	1800 U	360 U	450 U	370 U	400 U	340 U	2200 U
PCB-1260	ND	42 U	42 U	43 U	41 U	45 U	450 U	50 U	380 U	1800 U	360 U	450 U	370 U	400 U	340 U	2200 U
Total		0.19	0.532	29.98	4.31	241	241	13.3	ND	ND	22	3273	2263.8	ND	46	35

Notes: Concentration units in ug/kg (ppb).
J - Estimated value.
U - Not detected.
N - Spiked sample recovery not within control limits.
B - Analyte is found in the associated blank as well as in the sample.
P - Analyzed by ICP techniques.
E - The flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
ND - Not detected.
NA - Not Analyzed
DL - Dilution.
Maximum Concentration Detected at De-listed Buffalo Avenue Site. (O'Brien & Gere 1991a)

Table 7
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil Semivolatile Organic Compound
Niagara Falls, New York

Location:	SB-27SR	SB-27W	SB-27W	SB-28SR	SB-28SR	SB-28W	SB-29SR	SB-29W	SB-33SR	SB-33W	SB-33W
Date	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91
Depth:	(2-5)	(5-13.5)	(5-13.5) DL	(2-5)	(2-5) DL	(5-11)	(4-7)	(7-11)	(2-4)	(4-7)	(4-7) DL
Phenanthrene (**)	740 U	14000 J	4900 J	250 J	7500 U	4700	3900	460 J	410 J	52000 J	37000
Anthracene (**)	740 U	1800	700 J	750 U	7500 U	1200	920	790 U	81 J	14000	8300 J
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	740 U	850 U	8700 R	130 J	7500 U	920 U	740 U	110 J	110 J	1700 U	8400 U
Fluoranthene (**)	740 U	15000 J	5700 J	310 J	7500 U	5400	4200	490 J	630 J	62000 J	43000
Pyrene (**)	740 U	10000	5600 J	280 J	7500 U	4200	3600	410 J	500 J	57000 J	39000
Butylbenzylphthalate	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
3,3-Dichlorobenzidine	1500 U	1700 U	17000 R	1500 U	15000 U	1800 U	1500 U	1600 U	1400 U	3400 U	17000 U
Benzo(a)anthracene (**)	740 U	6000	3000 J	200 J	7500 U	2800	2500	250 J	370 J	36000 J	22000
Chrysene (**)	740 U	4600	8700 R	190 J	7500 U	3000	2200	250 J	380 J	31000 J	22000
bis(2-Ethylhexyl)phthalate	400 J	430 J	20000 J	32000 J	39000	200 J	560 J	290 J	130 J	610 J	360 J
Di-n-octylphthalate	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Benzo(b)fluoranthene (**)	740 U	6000	2800 J	230 J	7500 U	3500	3000	260 J	440 J	50000 J	27000
Benzo(k)fluoranthene (**)	740 U	2200	1400 J	120 J	7500 U	1800	1600	110 J	220 J	17000	12000
Benzo(a)pyrene (**)	740 U	4200	2300 J	130 J	7500 U	2300	510 J	170 J	300 J	32000 J	21000
Indeno(1,2,3-cd)pyrene (**)	740 U	1400	8700 R	750 U	7500 U	740 J	670 J	790 U	96 J	13000	14000
Dibenzo(a,h)anthracene (**)	740 U	250 J	8700 R	750 U	7500 U	260 J	160 J	790 U	680 U	590 J	2000 J
Benzo(g,h,i)perylene (**)	740 U	1000	8700 R	750 U	7500 U	610 J	390 J	790 U	680 U	8600	11000
Total "S" Area SVOCs	ND	4310	4310	ND	ND	870	1000	ND	ND	ND	ND
Total PAHs	ND	70700	70700	1788	1788	32657	26050	2516	3463	323620	323620
Other SVOCs	ND	21150	21150	39130	39130	700	1170	400	257	6692	6692

Notes: Concentration units in ug/kg (ppb).
J - Estimated value.
U - Not detected.
R -
* - "S" Area Indicator
** - PAH Compound

Table 7
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil Semivolatile Organic Compound
Niagara Falls, New York

Location:	SB-27SR	SB-27W	SB-27W	SB-28SR	SB-28SR	SB-28W	SB-29SR	SB-29W	SB-33SR	SB-33W	SB-33W
Date	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91
Depth:	(2-5)	(5-13.5)	(5-13.5) DL	(2-5)	(2-5) DL	(5-11)	(4-7)	(7-11)	(2-4)	(4-7)	(4-7) DL
Phenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	17 J	1700 U	8400 U
bis(2-Chloroethyl)ether	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2-Chlorophenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
1,3-Dichlorobenzene	740 U	730 J	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
1,4-Dichlorobenzene	740 U	2300	8700 R	750 U	7500 U	390 J	120 J	790 U	680 U	1700 U	8400 U
1,2-Dichlorobenzene	740 U	380 J	8700 R	750 U	7500 U	200 J	740 U	790 U	680 U	1700 U	8400 U
2-Methylphenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
4-Methylphenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	82 J	8400 U
N-Nitroso-di-n-propylamine	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Hexachloroethane	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Nitrobenzene	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Isophorone	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2-Nitrophenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2,4-Dimethylphenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
bis(2-Chloroethoxy)methane	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2,4-Dichlorophenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
1,2,4-Trichlorobenzene(*)	740 U	900	8700 R	750 U	7500 U	280 J	140 J	790 U	680 U	1700 U	8400 U
Naphthalene(**)	740 U	1100	8700 R	750 U	7500 U	580 J	740 J	69 J	680 U	15000	8700
4-Chloroaniline	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Hexachlorobutadiene (*)	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
4-Chloro-3-Methylphenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2-Methylnaphthalene (**)	740 U	560 J	8700 R	78 J	7500 U	170 J	370 J	47 J	680 U	17000	9700
Hexachlorocyclopentadiene (*)	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2,4,6-Trichlorophenol	740 U	850 R	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2,4,5-Trichlorophenol (*)	3600 U	4100 R	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
2-Chloronaphthalene (**)	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
2-Nitroaniline	3600 U	4100 U	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
Dimethyl phthalate	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Acenaphthylene (**)	740 U	320 J	8700 R	750 U	7500 U	97 J	200 J	790 U	680 U	620 J	8400 U
2,6-Dinitrotoluene	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
3-Nitroaniline	3600 U	4100 U	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
Acenaphthene (*)	740 U	340 J	8700 R	750 U	7500 U	550 J	330 J	790 U	36 J	11000	6300 J
2,4-Nitrophenol	3600 U	4100 R	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
4-Nitrophenol	3600 U	4100 R	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
Dibenzofuran	740 U	1500	460 J	750 U	7500 U	500 J	610 J	790 U	680 U	6000	3000 J
2,4-Dinitrotoluene	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Diethylphthalate	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
4-Chlorophenyl-phenylether	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Fluorene (**)	740 U	2000	8700 R	750 U	7500 U	750 J	760	790 U	680 U	11000	6200 J
4-Nitroaniline	3600 U	4100 U	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
4,6-Dinitro-2-methylphenol	3600 U	4100 R	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U
N-Nitrosodiphenylamine	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
4-Bromophenyl-phenylether	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Hexachlorobenzene (*)	740 U	850 U	8700 R	750 U	7500 U	920 U	740 U	790 U	680 U	1700 U	8400 U
Pentachlorophenol	3600 U	4100 R	42000 R	3600 U	36000 U	4500 U	3600 U	3900 U	3300 U	8100 U	41000 U

Table 7
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil Semivolatile Organic Compounds
Niagara Falls, New York

Location:	SB-7A	SB-7A RE	SB-7B	SB-7B RE	SB-7C	SB-7C RE	SB-7D	SB-7D DL	SB-7E	SB-7E DL	BLD DUP	BLD DUP RE
Date Collected:	2/9/95	2/9/95	2/9/95	2/9/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95
Depth:	10-12'	10-12'	10-12'	10-12'	8-10'	8-10'	8-10'	8-10'	8-10'	8-10'	8-10'	8-10'
Benzo(a)anthracene(**)	260 J	190 J	110 J	73 J	15000	12000 J	140000 E	77000 JD	3300	1900 JD	1600	1000
Chrysene(**)	290 J	190 J	140 J	96 J	12000 J	9400 J	140000 E	80000 JD	3600	2000 JD	1500	1000
bis(2-Ethylhexyl)phthalate	150 BJ	130 BJ	420 U	240 BJ	13000 U	3200 BJ	5400 BJ	120000 U	450 U	4500 U	500 U	190 BJ
Di-n-octylphthalate	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Benzo(b)fluoranthene(**)	410 U	260 J	420 U	420 U	13000 U	13000 U	93000	78000 JD	3000	2800 JD	1200	910
Benzo(k)fluoranthene(**)	410 U	230 J	420 U	420 U	13000 U	13000 U	130000 E	78000 JD	3000	1700 JD	1400	930
Benzo(a)pyrene(**)	410 U	250 J	420 U	420 U	13000 U	13000 U	120000 E	93000 JD	2800	2200 JD	1400	910
Indeno(1,2,3-cd)pyrene(**)	410 U	170 J	420 U	420 U	13000 U	13000 U	60000	41000 JD	450 U	1300 JD	500 U	550
Dibenz(a,h)anthracene(**)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Benzo(g,h,i)perylene(**)	410 U	420 U	420 U	420 U	13000 U	13000 U	53000	35000 JD	450 U	1000 JD	500 U	550
1,3,5-Trichlorobenzene	420 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
1,2,3-Trichlorobenzene(*)	420 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	350 J	280 J	32 J	32 J
1,2,4,5-Tetrachlorobenzene(*)	420 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	90 J	4500 U	500 U	500 U
1,2,3,4-Tetrachlorobenzene(*)	420 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	200 J	4500 U	500 U	500 U
Total "S" Area Indicator Parameters.	ND	ND	ND	ND	ND	ND	3400	3400	4280	4280	3202	2164
Total PAHs	1733	2241	759	728	125600	97700	934200	934200	28020	28020	14039	13798
Other VOCs	292	55	38	47	39700	23100	122800	122800	3140	3140	1265	982
Total TICs	700 J	500 J	3800 J	8200 JN	266000 JN	300000 J	338900 JN	130000 J	57100 JN			1700 J
Total TICs in Blanks	40000 BJN	30000 BJN	30000 BJN	20000 BJN	20000 BJN	20000 BJN	20000 BJN		30000 BJN	500000 BJN	30000 BJN	30000 BJN

Notes: Concentration units in ug/kg (ppb).
J - Estimated value.
U - Not detected.
N - Spiked sample recovery not within control limits.
B - Analyte is found in the associated blank as well as in the sample.
E - Identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
D - Identifies all compounds indentified in an analysis at a secondary dilution factor.
ND - Not detected.
DL - Dilution
RE - The sample was reanalyzed due to a surrogate failer, yielding the same results as the first analysis.
TICs - Tentatively Identified Compounds.
(*) - "S" Area indicator Parameters.
(**) - Polynuclear Aromatic Hydrocarbons.

Table 7
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil Semivolatile Organic Compounds
Niagara Falls, New York

Location:	SB-7A	SB-7A RE	SB-7B	SB-7B RE	SB-7C	SB-7C RE	SB-7D	SB-7D DL	SB-7E	SB-7E DL	BLD DUP	BLD DUP RE
Date Collected:	2/9/95	2/9/95	2/9/95	2/9/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95
Depth:	10-12'	10-12'	10-12'	10-12'	8-10'	8-10'	8-10'	8-10'	8-10'	8-10'	8-10'	8-10'
Phenol	410 U	420 U	420 U	420 U	2900 J	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
bis(2-Chloroethyl)ether	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2-Chlorophenol	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
1,3-Dichlorobenzene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	2400 J	120000 U	450 U	4500 U	500 U	500 U
1,4-Dichlorobenzene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	1000 J	120000 U	2700	1600 JD	870	550
1,2-Dichlorobenzene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	2300	1500
2-Methylphenol	410 U	420 U	420 U	420 U	3700 J	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2,2'-Oxybis(1-Chloropropane)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
4-Methylphenol	410 U	420 U	420 U	420 U	7400 J	5600 J	120000 U	120000 U	450 U	4500 U	500 U	500 U
N-Nitroso-di-n-propylamine	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Hexachloroethane	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Nitrobenzene	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Isophorone	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2-Nitrophenol	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2,4-Methylphenol	410 U	420 U	420 U	420 U	7200 J	5800 J	120000 U	120000 U	450 U	4500 U	500 U	500 U
bis(2-Chloroethoxy)methane	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2,4-Dichlorophenol	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
1,2,4-Trichlorobenzene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	940	690 JD	500 U	82 J
Naphthalene(**)	59 J	46 J	77 J	59 J	4700 J	3100 J	11000 J	6400 JD	560	360 JD	99 J	75 J
4-Chloroaniline	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	21 J
Hexachlorobutadiene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
4-Chloro-3-methylphenol	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2-Methylnaphthalene(**)	63 J	48 J	120 J	86 J	7700 J	5500 J	4300 J	120000 U	520	350 JD	500 U	38 J
Hexachlorocyclopentadiene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2,4,6-Trichlorophenol	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
2,4,5-Trichlorophenol(*)	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
2-Chloronaphthalene(**)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	120 J	4500 U	500 U	500 U
2-Nitroaniline	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
Dimethylphthalate	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Acenaphthylene(**)	410 U	420 U	420 U	420 U	7200 J	5700 J	120000 U	120000 U	450 U	150 JD	140 J	90 J
2,6-Dinitrotoluene	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
3-Nitroaniline	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
Acenaphthene	410 U	420 U	420 U	420 U	13000 U	13000 U	9600 J	6500 JD	450 U	4500 U	500 U	50 J
2,4-Dinitrophenol	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
4-Nitrophenol	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
Dibenzofuran	410 U	28 J	38 J	420 U	5400 J	4100 J	4800 J	120000 U	330 J	190 JD	75 J	62 J
2,4-Dinitrotoluene	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	220 J
Diethylphthalate	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
4-Chlorophenyl-phenylether	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Fluorene(**)	410 U	420 U	420 U	420 U	13000 U	13000 U	8300 J	120000 U	450 U	4500 U	500 U	85 J
4-Nitroaniline	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
4,6-Dinitro-2-methylphenol	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
N-Nitrosodiphenylamine	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
4-Bromophenyl-phenylether	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Hexachlorobenzene(*)	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	500 U
Pentachlorophenol	1000 U	1000 U	1100 U	1100 U	32000 U	32000 U	310000 U	310000 U	1100 U	11000 U	1200 U	1200 U
Phenanthrene(**)	270	210 J	160 J	130 J	28000	21000	90000	71000 JD	2800	2200 JD	1000	710
Anthracene(**)	71 J	47 J	29 J	25 J	14000	11000 J	28000	19000 JD	570	440 JD	300 J	200 J
Carbazole	410 U	420 U	420 U	420 U	6400 J	4000 J	27000	16000 JD	310 J	220 JD	190 J	120 J
Di-n-butylphthalate	42 J	37 J	420 U	47 J	13000 U	13000 U	120000 U	120000 U	450 U	4500 U	500 U	39 J
Fluoranthene(**)	340 J	240 J	140 J	99 J	20000	12000 J	140000 E	150000 D	4100 E	4400 JD	2400	1400
Pyrene(**)	380 J	360 J	180 J	160 J	17000	18000	210000 E	99000 JD	6200 E	2900 JD	3000	4800
Butylbenzylphthalate	410 U	420 U	420 U	420 U	13000 U	13000 U	120000 U	120000 U	450 U	210 JD	500 U	500 U
3,3'-Dichlorobenzidine	250 J	420 U	420 U	420 U	6700 J	3600 J	91000	68000 JD	2500	1500 JD	1000	520

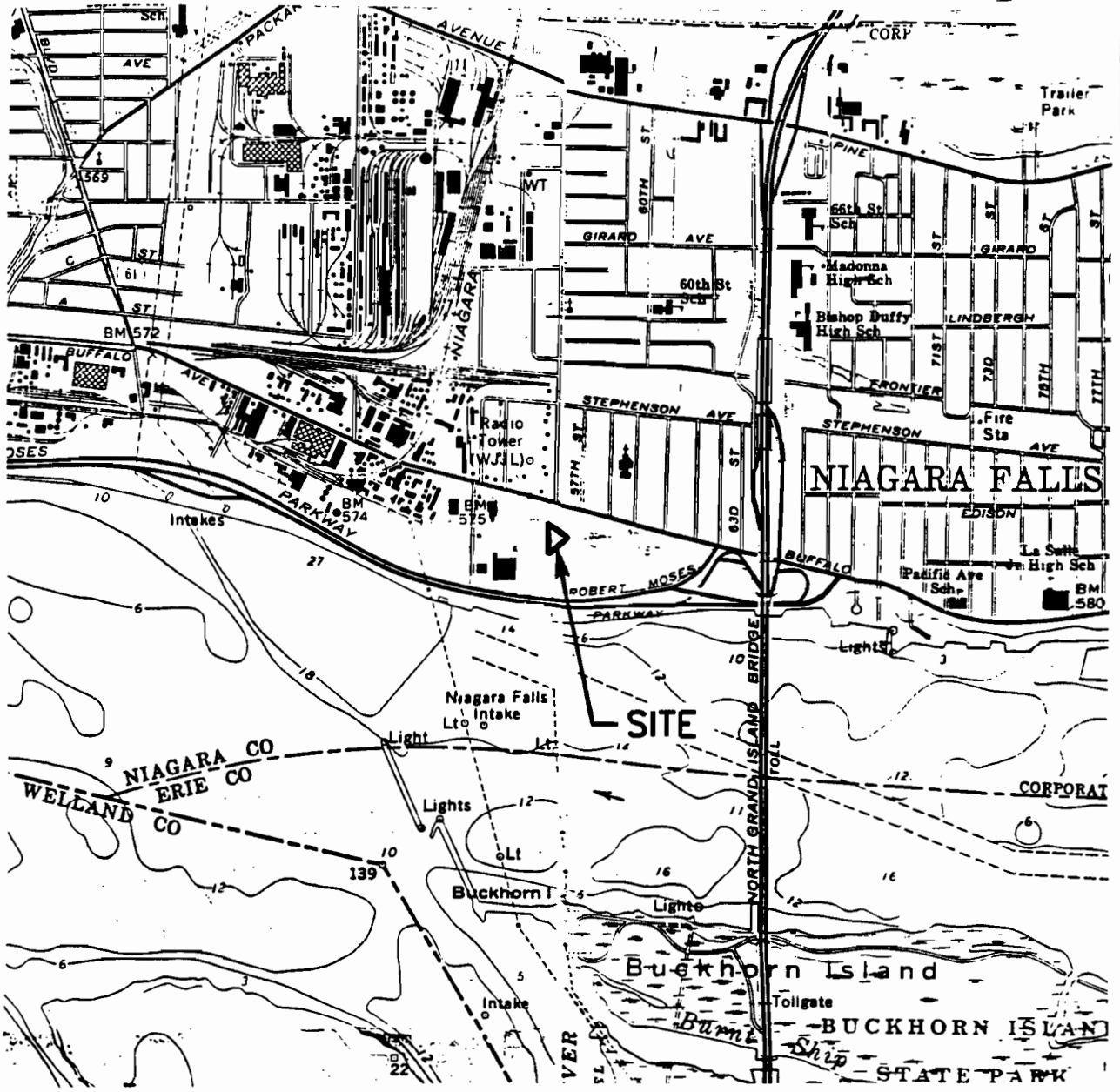
Table 6
Phase II Investigation
One-Acre Site - Buffalo Avenue
Subsurface Soil - Volatile Organic Compounds
Niagara Falls, New York

Location:	Max Conc. from Buffalo Ave. Site	SB-7A	SB-7B	SB-7C	SB-7D	SB-7E	SB-7E BLD DUP	QCTRPB	SB-27S	SB-27W	SB-28S	SB-28W	SB-29SR	SB-29W	SB-29W	SB-33SR	SB-33SR	SB-33W
Date Collected:		2/9/95	2/9/95	2/10/95	2/10/95	2/10/95	2/10/95	2/10/95	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91	5/91
Depth:		10-12'	10-12'	8-10'	8-10'	8-10'	8-10'	---	2-4'	5-6'	2-4'	6-8'	4-6'	7-8'	7-8' RE	2-4'	2-4'	4-6'
Chloromethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
Bromomethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
Vinyl chloride*	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
Chloroethane	25	12 U	13 U	13 U	12 U	13 U	15 U	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
Methylene chloride	25	2 BJ	5 BJ	3 J	2 BJ	3 J	4 J	10 U	6 U	7 U	5 U	6 U	5 U	18 UJ	8 UJ	5 U	5 U	7 U
Acetone	ND	19	36	58	34	39	150	10 U	11 U	33 U	11 U	63 U	62 U	39 UJ	42 UJ	12 U	13 U	92 U
Carbon disulfide	2	12 U	3 J	4 J	7 J	2 J	38	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
1,1-Dichloroethene	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
1,1-Dichloroethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
1,2-Dichloroethene (total)*	4	12 U	13 U	13 U	12 U	2 J	2 J	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Chloroform	2	12 U	0.7 J	13 U	1 J	45	8 J	10 U	6 U	0.8 J	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
1,2-Dichloroethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
2-Butanone	34	4 BJ	0.8 BJ	11 BJ	9 BJ	8 BJ	28	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
1,1,1-Trichloroethane	ND	12 U	2 J	13 U	1 J	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Carbon tetrachloride	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Bromodichloromethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
1,2-Dichloropropane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
cis-1,3-Dichloropropene	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Trichloroethene*	10	12 U	13 U	13 U	12 U	10 J	2 J	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Dibromochloromethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
1,1,2-Trichloroethane	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Benzene*	1	12 U	13 U	74	0.9 J	13 U	1 J	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
trans-1,3-Dichloropropene	ND	12 U	13 U	2 J	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Bromoform	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
4-Methyl-2-pentanone	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
2-Hexanone	ND	12 U	13 U	13 U	12 U	13 U	15 U	10 U	11 U	13 U	11 U	12 U	11 U	16 UJ	17 UJ	11 U	11 U	14 U
Tetrachloroethene*	3	12 U	13 U	13 U	12 U	18	6 J	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	0.3 J	0.3 J	2 J
1,1,2,2-Tetrachloroethane	2	12 U	13 U	13 U	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Toluene	7	12 U	4 J	140	2 J	3 J	6 J	10 U	6 U	2 J	0.8 J	6 U	5 U	8 UJ	8 UJ	1 J	2 J	7 U
Chlorobenzene*	8	12 U	13 U	6 J	5 J	12 J	160	10 U	6 U	19	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Ethylbenzene	0.3	12 U	13 U	18	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Styrene	ND	12 U	13 U	23	12 U	13 U	15 U	10 U	6 U	7 U	5 U	6 U	5 U	8 UJ	8 UJ	5 U	5 U	7 U
Xylenes (total)	5	12 U	13 U	170	2 J	6 J	9 J	10 U	6 U	7 U	0.1 J	6 U	5 U	8 UJ	8 UJ	5 U	1 J	7 U
"S" Area VOCs		ND	ND	80	5.9	42	170	ND	ND	19	ND	ND	ND	ND	ND	0.3	0.3	2
Other VOCs			9.7	357	13	53	61	ND	ND	2.8	1	ND	ND	ND	ND	1	3	ND
Total VOCs			9.7	437	18.9	95	231	ND	ND	21.8	1	ND	ND	ND	ND	1.3	3.3	ND
Total TICs		ND	ND	150 JN	60 JN	ND	1010 JN	60 JN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes: Concentration units in ug/kg (ppb).
J - Estimated value.
U - Not detected.
N - Spiked sample recovery not within control limits.
B - Analyte is found in the associated blank as well as in the sample.
ND - Not detected.
Maximum Concentration Detected at De-listed Buffalo Avenue Site (O'Brien & Gere, 1991a and NYSDEC)
SB-27 through SB-29 and SB-33 collected as part of the Buffalo Avenue Site Investigation.

JWM ALCNQUAD.DWG 1=1

FIGURE 1



PHASE II INVESTIGATION
ONE-ACRE SITE-BUFFALO AVENUE
NIAGARA FALLS, NEW YORK

LOCATION MAP

QUADRANGLE LOCATION

0 2000 4000

SCALE IN FEET

ADAPTED FROM THE NAIGARA FALLS & TONAWANDA, WEST NEW YORK U.S.G.S. QUADRANGLE MAPS

FILE: 1736.078-001
DATE: OCT. 1996

O'BRIEN & GERE ENGINEERS INC.

Appendix A

Soil Boring Logs and Monitoring Well Completion Diagrams

'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-27
PAGE 1 OF 1

CLIENT: City of Niagara Falls

PROJECT LOCATION: Buffalo Ave. Site

LE NO.: 1736.046

BORING COMPANY: Parratt-Wolff, Inc.
FOREMAN: Jim Lansing
BG GEOLOGIST: John Mason

SAMPLER Split Spoon 2"
HAMMER: 140 lbs.
FALL: 30"

ANALYTICAL SAMPLES

DEPTH	ID #	ANALYSIS
2-4'	SB-27SR	TCL VOC
5-6'	SB-27W	TCL VOC
2-5'	SB-27SR	TCL Para.
5-13.5'	SB-27W	TCL Para.

GROUND ELEVATION: 572.1'

LOCATION: N500 E1100

START DATE: 5/14/91
END DATE: 5/14/91

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0										
1										
2	1	2-4'	6-6-6-6	2'/1.5'	12	Dry, red brown, fine to very fine SAND, some angular medium gravel, some medium sand, little silt	SHOT ROCK		0	0
3										
4	2	4-6'	6-5-5-3	2'/2'	10	(4-5') Same as above			0	0
5						(5-6') Moist, black, medium SAND, some fine sand, white lime (reacts w/HCL) and purple zones	5'			
6	3	6-8'	4-3-7-6	2'/1'	10	Same as above, moist to wet, possible ash	MISC FILL		0	0
7										
8	4	8-10'	9-6-5-12	2'/2'	11	Same as above, concoidally-fractured black glass-like particles, reddish clasts, very fine gravel, white zone, ~1" thick near top			0	0
9										
10	5	10-12'	16-12-10-8	2'/0.5'	22	Wet, black to red to purple, medium to coarse SAND, some fine gravel			0	0
11										
12	6	12-14'	12-4-6-6	2'/2'	10	(12-13.5') Same as above			0	0
13										
14						(13.5-14') Laminated CLAY and SILT Bottom of Fill 13.5 ft. Bottom of Boring 14.0 ft.	13.5' NATIVE CLAY			
15										
16										
17										
18										
19										
20										

PID and Headspace analysis values reported in ppm using HNU model PI-101.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-28
PAGE 1 OF 1

CLIENT: City of Niagara Falls

PROJECT LOCATION: Buffalo Ave. Site

FILE NO.: 1736.046

BORING COMPANY: Parratt-Wolff, Inc.
FOREMAN: Jim Lansing
OBG GEOLOGIST: John Mason

SAMPLER Split Spoon 2"
HAMMER: 140 lbs.
FALL: 30"

ANALYTICAL SAMPLES

DEPTH	ID #	ANALYSIS
2-4'	SB-28S1	TCL VOC
6-8'	SB-28W	TCL VOC
2-5'	SB-28SR	TCL Para.
5-11'	SB-28W	TCL Para.

GROUND ELEVATION: 573.0'

LOCATION: N600 E1100

START DATE: 5/15/91
END DATE: 5/15/91

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0										
1										
2	1	2-4'	8-8-10-8	2'/1.5'	18	Dry, red/brown to olive green, very fine to fine SAND, some fine to medium angular, dark gray dolomite gravel, little silt and medium sand, trace clay	SHOT ROCK		0	0
3										
4	2	4-6'	6-6-6-5	2'/1'	12	Same as above			0	0
5						Changing to dry, black to red/brown, fine to medium SAND, little coarse and very fine sand,	5'			
6	3	6-8'	6-5-3-3	2'/2'	8	trace silt	MISC FILL		0	0
7						Same as above, black sand with white specs, trace black glass-like clasts				
8	4	8-10'	6-3-5-4	2'/2'	8	Same as above			0	0
9										
10	5	10-12'	3-4-5-6	2'/1'	9	Same as above, wet			0	0
11						Changing to damp, olive green to brown, silty CLAY	11' NATIVE CLAY			
12	6	12-14'	9-8-13-14	2'/1'	21	Moist, red/brown to olive green, silty CLAY, trace fine gravel			0	0
13										
14						Bottom of fill 11.0 ft.				
15						Bottom of Boring 14.0 ft.				
16										
17										
18										
19										
20										

PID and Headspace analysis values reported in ppm using HNU model PI-101.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-29
PAGE 1 OF 1

CLIENT: City of Niagara Falls

PROJECT LOCATION: Buffalo Ave. Site

FILE NO.: 1736.046

BORING COMPANY: Parratt-Wolff, Inc.
FOREMAN: Jim Lansing
OBG GEOLOGIST: John Mason

SAMPLER Split Spoon 2"
HAMMER: 140 lbs.
FALL: 30"

ANALYTICAL SAMPLES

DEPTH	ID #	ANALYSIS
4-6'	SB-29SR	TCL VOC
7-8'	SB-29W	TCL VOC
4-7'	SB-29SR	TCL Para.
7-11'	SB-29W	TCL Para.

GROUND ELEVATION: 573.1'

LOCATION: N600 E1200

START DATE: 5/15/91
END DATE: 5/15/91

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0										
1										
2	1	2-4'	6-6-5-8	2'/0	11	No recovery			—	—
3						Auger: Dry, red/brown, fine SAND, some silt, trace gravel	SHOT ROCK			
4	2	4-6'	9-10-	2'/1'	20	Same as above			0	0
5			10-11			Auger: trace black graphite-like chips				
6	3	6-8'	10-13-	2'/2'	26	(6-7') Same as above			0	0
7			13-14			(7-8') Dry to moist, black (shiny), medium to coarse SAND, little fine gravel, graphite-like clasts	7'			
8	4	8-10'	15-16-	2'/1'	27		MISC FILL		0	0
9			11-5			Moist, black to light green, medium SAND, little gravel and fine sand				
10	5	10-12'	2-2-4-5	2'/2'	6	(10-11') Same as above, wet			0	0
11						(11-12') Dry to moist, brown to olive green, fine SAND, some very fine sand, black spots	11'			
12	6	12-14'	12-13-	2'/1'	31	Dry to moist, red/brown to olive green silty CLAY	NATIVE		0	0
13			18-13							
14						Bottom of Fill 11.0 ft.				
15						Bottom of Boring 14.0 ft.				
16										
17										
18										
19										
20										

PID and Headspace analysis values reported in ppm using HNU model PI-101.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-33
PAGE 1 OF 1

CLIENT: City of Niagara Falls

PROJECT LOCATION: Buffalo Ave. Site

FILE NO.: 1736.046

BORING COMPANY: Parratt-Wolff, Inc.
FOREMAN: Jim Lansing
OBG GEOLOGIST: John Mason

SAMPLER Split Spoon 2"
HAMMER: 140 lbs.
FALL: 30"

ANALYTICAL SAMPLES

DEPTH	ID #	ANALYSIS
2-4'	SB-33SR	TCL VOC
4-6'	SB-33W	TCL VOC
2-4'	SB-33SR	TCL Para.
4-7'	SB-33W	TCL Para.

GROUND ELEVATION: 573.1'

LOCATION: N700 E1100

START DATE: 5/15/91
END DATE: 5/15/91

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0										
1										
2	1	2-4'	15-12-9-9	2'/1'	21	Dry, red/brown to brown, fine SAND, some silt and very fine sand, little angular dark gray dolomite fine gravel	SHOT ROCK		0	0
3										
4	2	4-6'	5-5-4-3	2'/2'	9	Moist, black, medium to coarse SAND, some fine sand, little graphite, trace green lime and glass	4' MISC FILL		0	0
5										
6	3	6-8'	4-3-3-2	2'/2'	6	(6-7') Same as above			0	0
7						(7-8') Moist to wet, olive green to brown/orange clayey SILT, some very fine sand	7' NATIVE SILTY SAND			
8						Bottom of Fill 7.0 ft. Bottom of Boring 8.0 ft.				
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

PID and Headspace analysis values reported in ppm using HNU model PI-101.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-7A

Client: City of Niagara Falls
One Acre Site Investigation
Proj. Loc: Niagara Falls, NY

File No.: 1736.078

Sampler: 2"Split Spoon

Hammer: 140 lbs.

Fall: 30"

Page 1 of 1
Location:

Start Date: 2/9/95
End Date: 2/9/95

Boring Company: SJB Services Inc.
Foreman: Ken Swinnich
OBG Geologist: Chawn O'Dell

Screen / Riser
Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing HS (ppm)
0	1	0-2	34-13	2.0/1.3	25	Dry, brown, medium dense, SILT, some very fine to fine sand, little fine angular gravel, trace organics (plant roots).			0.9
			12-10						
1									
2	2	2-4	9-9-7-7	2.0/1.5	16	Damp, brown, medium dense, SILT, some very fine to fine sand, little fine angular gravel.			0.8
3									
4	3	4-6	7-8-5-6	2.0/1.3	13	Damp, medium brown to olive, medium dense SILT and fine sand, little clay.			0.3
5									
6	4	6-8	4-5-4-4	2.0/1.2	9	Damp, medium brown to olive, loose SILT and fine SAND, some clay to 7.5 ft., then black cinders and white ash.			0.7
7									
8	5	8-10	10-14	2.0/1.4	23	Damp, red to medium brown, medium dense SILT, some clay, an ash and cinder layer at 9.0-9.5 ft., then organics (plant stalks).			0.2
			9-8						
9									
10	6	10-12	8-10	2.0/1.5	22	Damp to wet, brown to olive green, medium dense, SILT, some fine sand, some clay, little cinders, trace angular gravel.			2.1
			12-13						
11									
12	7	12-14	6-7-3-2	2.0/1.7	10	Saturated, dark olive green, medium dense, very fine SAND and SILT.			0.7
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									

The borehole was grouted to the surface.
HS - Headspace

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-7B

lent: City of Niagara Falls
One Acre Site Investigation
Proj. Loc: Niagara Falls, NY

e No.: 1736.078

Sampler: 2"Split Spoon

Hammer: 140 lbs.

Fall: 30"

Page 1 of 1
Location:

Start Date: 2/9/95
End Date: 2/9/95

ring Company: SJB Services Inc.
Foreman: Ken Swinnich
ORG Geologist: Chawn O'Dell

Screen / Riser | Grout / Sand Pack / Bentonite

Depth Below ade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing HS (ppm)
)	1	0-2	14-13	2.0/1.0	23	Dry, brown to gray, medium dense, medium to coarse GRAVEL, little silt, trace fine to medium sand, trace fine gravel.			1.3
			10-8						
1									
	2	2-4	35-18	2.0/1.3	32	Dry to damp, reddish brown to brown, dense, fine SAND, some silt, some fine to coarse gravel, little clay.			0.4
			14-13						
	3	4-6	3-4-3-3	2.0/1.2	7	Damp to wet, brown, loose, SILT and fine SAND, little clay, trace fine angular gravel.			0.0
6	4	6-8	4-3-4-5	2.0/1.5	7	Same as above.			0.3
8	5	8-10	5-2-1-1	2.0/0.3	3	Saturated, black, very loose CINDER and ASH, little recovery.			1.0
10	6	10-12	5-6-6-4	2.0/1.5	12	Saturated, brown to black, medium dense, SILT and very fine SAND, some cinders, little fine angular gravel, trace clay.			1.5
12	7	12-14	4-5-5-10	2.0/1.4	10	Saturated, olive green to brown, medium dense, very fine SAND, some silt (olive) laminations, turning to brown clay, little silt at 13.5 ft.			0.6
1									
1									
1									
17									
18									
19									
20									
21									
2									
3									

bo ole was grouted to the surface.
Headspace

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING SB-7C
Client: City of Niagara Falls One Acre Site Investigation Proj. Loc: Niagara Falls, NY File No.: 1736.078	Sampler: 2"Split Spoon Hammer: 140 lbs. Fall: 30"	Page 1 of 1 Location: Start Date: 2/10/95 End Date: 2/10/95
Boring Company: SJB Services Inc. Foreman: Dave Maddox OBG Geologist: Chawn O'Dell		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing HS (ppm)
0	1	0-2	2-4	2.0/1.5	18	Dry to damp, medium brown to gray, medium dense, SILT, some clay, little very fine sand to 1.5 ft., then coarse gravel.			0.6
			14-13						
1									
2	2	2-4	7-9-7-6	2.0/1.4	16	Damp, medium brown, medium dense, SILT, some clay, little very fine to fine sand.			0.2
3									
4	3	4-6	7-9-8-12	2.0/0.5	17	Dry, brownish gray, medium dense, medium to coarse, angular GRAVEL, little silt, little very fine sand.			0.9
5									
6	4	6-8	10-8-8-7	2.0/0.7	16	Damp, dark brown to black, medium dense, fine to medium SAND, some cinders, little white ash, little silt, trace coarse gravel.			0.5
7									
8	5	8-10	2-3-5-5	2.0/1.2	8	Wet, black, loose CINDERS, some silt, little orange brick, little fine angular gravel, little fine to coarse sand.			1.1
9									
10	6	10-12	7-3-4-4	2.0/1.8	7	Saturated, olive green, loose, fine SAND, some silt, little medium sand.			0.3
11									
12	7	12-14	4-5-7-5	2.0/2.0	12	Same as above, to 13.5 ft., then medium brown, medium dense, CLAY, some silt, trace horizontally and vertically bedded organics (plants).			0.0
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									

The borehole was grouted to the surface.
HS - Headspace

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING SB-7D

Client: City of Niagara Falls
One Acre Site Investigation
Proj. Loc: Niagara Falls, NY

File No.: 1736.078

Sampler: 2"Split Spoon

Hammer: 140 lbs.

Fall: 30"

Page 1 of 1
Location:

Start Date: 2/10/95
End Date: 2/10/95

Boring Company: SJB Services Inc.
Foreman: Dave Maddox
OBG Geologist: Chawn O'Dell

Screen / Riser
Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing HS (ppm)
0	1	0-2	3-4-4-5	2.0/1.7	8	Dry, medium brown, loose, SILT, some very fine to fine sand, little fine to medium angular gravel, trace cinders.			0.1
1									
2	2	2-4	4-6	2.0/1.0	17	Dry, light to medium brown, medium dense, fine SAND, some silt, some fine to coarse angular gravel, little medium sand, trace coarse sand.			0.9
3			11-11						
4	3	4-6	3-6-7-6	2.0/0.8	15	Damp, medium brown, medium dense, SILT, some very fine sand, little clay, trace fine angular gravel.			0.1
5									
6	4	6-8	6-6-8-6	2.0/1.0	14	Damp to wet, brown to black medium dense, fine SAND, some silt, little cinders, little fine to medium angular gravel, trace orange brick.			0.4
7									
8	5	8-10	3-6	1.2/1.1	87	Wet, black, loose SILT, some fine to coarse sand, little black cinders, little fine angular gravel to 9.0 ft., then very dense gravel/cobble, (spoon refusal). Auger/spoon refusal at 9.2 ft. Apparent large piece of shot rock. Boring terminated at 9.2 ft.			1.8
9			81/0.2						
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									

The borehole was grouted to the surface.
HS - Headspace

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING SB-7E
Client: City of Niagara Falls One Acre Site Investigation Proj. Loc: Niagara Falls, NY File No.: 1736.078	Sampler: 2"Split Spoon Hammer: 140 lbs. Fall: 30"	Page 1 of 1 Location: Start Date: 2/10/95 End Date: 2/10/95
Boring Company: SJB Services Inc. Foreman: Dave Maddox OBG Geologist: Chawn O'Dell		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing HS (ppm)
0	1	0-2	6-12	2.0/0.5	24	Damp, dark brown, medium dense, SILT, little very fine sand, little fine gravel, trace clay.			0.3
			12-14						
1									
2	2	2-4	10-11	2.0/0	20	No recovery.			–
			9-9						
3									
4	3	4-6	14-14	2.0/1.3	24	Damp, white, medium dense, ASH, some brown silt, little fine to medium angular gravel, trace sand, trace cinder (moderate odor).			1.1
			10-7						
5									
6	4	6-8	11-11	2.0/1.5	16	Damp, brown to black, medium dense, CINDER and SILT, little gravel, little white ash.			0.3
			5-5						
7									
8	5	8-10	8-4	2.0/2.0	11	Damp to wet, white, brown, black, medium dense, SILT, CINDERS and ASH, little fine gravel, trace orange brick (moderate odor).			3.5
			7-13						
9									
10	6	10-12	6-5-5-5	2.0/1.5	10	Wet, brown to black, medium dense SILT, some black cinders, little white ash, little fine angular gravel, little fine to coarse sand.			2.9
11									
12	7	12-14	3-3-5-8	2.0/1.8	8	Wet, olive green to brown, loose, fine SAND and SILT to 13.0 ft., then CLAY, some silt.			0.0
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									

The borehole was grouted to the surface.

HS - Headspace

CLIENT: NYPA, BUFFALO AVE. JOB # 13796-002

BORING MW-7D

SURFACE ELEVATION (FT) 573.03

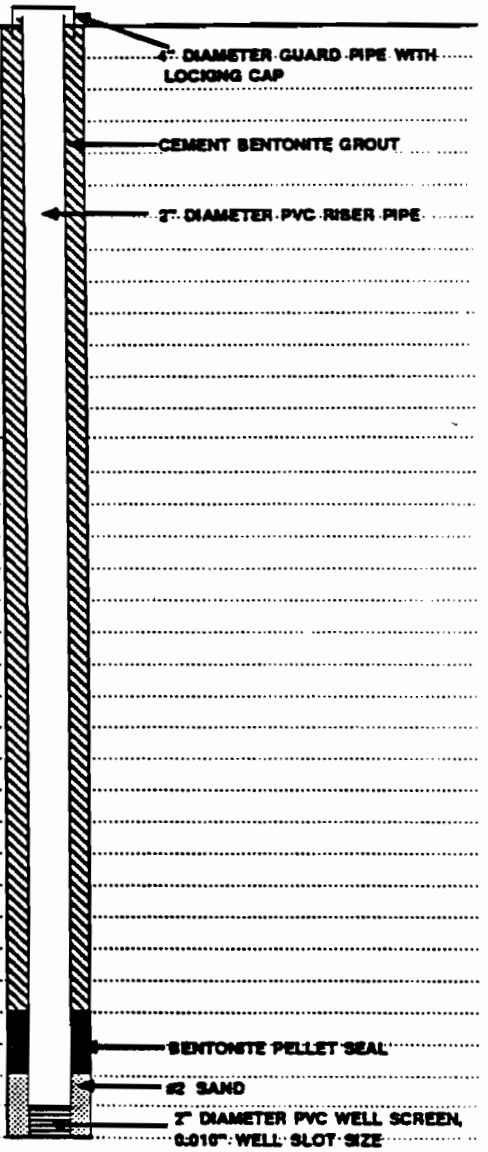
TOP OF CASING ELEVATION (FT) 575.18

DATE STARTED: 11/17/87
DATE FINISHED: 11/19/87

DEPTH TO WATER (FT)	14.0	14.2	14.15
DATE	12/2/87	12/8/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	3/11	17	GM (FILL)	DK BR-GRAY TOPSOIL, LITTLE ORG MATTER TRACE PEBBLE
		14/16			FILL, LT BR-BR RED SILTY-GRAVEL, LITTLE ROCK FGMT, TR CLAY, TR ORG MATTER
	2	7/5	11		
		7/8			LITTLE CLAY
	3	6/7	13		
5		17/16			DK BLK-GRAY CINDER, TRACE ASH
	4	23/9	13		LITTLE GRAVEL, TRACE SLAG
		5/3			
	5	3/4	14	CINDER	
		54/6			
10	6	3/3	19	ML	GRN-GRY SILT, TR ORG MATTER, TR ROCK FGMT, TRACE CLAY
		4/6		CINDER	DK BLK CINDER, LITTLE ORG MATTER, TRACE SLAG
				SS	
	7	3/7	16		GRY FINE SAND, TRACE SILT
		8/12			RED-BR CLAY, TR ORG MATTER (LAKE BED CLAY)
15	8	2/4	24		
		6/6		CL	
	9	WR	24		
		WR			
	10	WR/WH	24		
20		WH/1			
	11	WR/WR	24		
		WH/WH			
	12	WR/WR	24		
		WH/WH			
25	13	WR/WR	24		
		WH/WH			
	14	WR/WR	24		
		WH/WH			
	15	1/18	12		TILL, RED-BR SILTY-GRAVEL, LITTLE ROCK FRAGMENT
30		19/37			
	16	16/26	12	ML	
		32/46			
	17	7/40	12		
		42/66			
	18	31/55	9		
35		100-5"			GRY GRAVEL (DOLOMITE), SOME SILT, TRACE CLAY

AS BUILT DIAGRAM



CLIENT: NYPA, BUFFALO AVE. 13796-002

BORING MW-7S

SURFACE ELEVATION (FT) 573.52

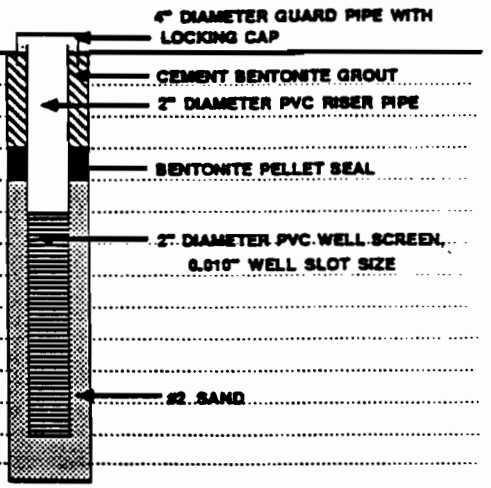
TOP OF CASING ELEVATION (FT) 575.86

DATE STARTED: 11/18/87
DATE FINISHED: 11/18/87

DEPTH TO WATER (FT)	10.5	10.63	10.8
DATE	12/2/87	12/8/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	17/19 15/8	16	GM (FILL)	DK BR-BLK TOPSOIL, LITTLE ORG MATTER, TRACE FINE SAND, TRACE ROCK FGMT
	2	8/17 28 75-3"	13		FILL, RED-BR GRAVELLY SILT, LITTLE ROCK FGMT, TR ORG MATTER, TR CLAY
5	3	12/5 7/11	13		LIGHT BROWN
	4	5/22 27/21	2	CINDER	BLK CINDER, TR GRAPHITE RODS, TR SLAG
	5	3/3 9/9	12		RED BR-BR SLAG, TR WHITE FUSED PEBBLES, TR GLASS, ORANGE RESIDUE (INCINERATOR WASTE)
10	6	4/6 4/4	14		BLK CINDER, LITTLE SILT, TR PAPER
				ML	DK GRY SILT, LITTLE CLAY, TR CINDER
	7	3/6 9/12	24	CL	CLAY, BLK-BR, LITTLE SILT, (LAKE BED CLAY)
15					BORING TERMINATED AT 14.9 FEET
20					
25					
30					
35					

AS BUILT DIAGRAM



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING OBG SB-7SF.
Client: City of Niagara Falls One Acre Site	Sampler: 2" Split Barrel	Page 1 of 1 Location: Approx. 10 ft South - Southeast of MW-7S
Proj. Loc: Niagara Falls, New York	Hammer: 140 lbs.	Start Date: 2/7/96
File No.: 1736.078	Fall: 30"	End Date: 2/7/96
Boring Company: SJB Services, Inc. Foreman: Jeff Leavell OBG Geologist: Chawn O'Dell		Screen = \ Grout Riser Sand Pack Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing HNU ppm	Field Testing UV
0	1	0-2	27-52	2'/2'	82	Pale brown (5YR 5/2), damp (frozen), extremely dense, fine to medium SAND some slit, little coarse sand, little fine to coarse angular gravel, trace organics (plant roots)			0.1	
			30-20							
1										
2	2	2-4	14-12	2'/1.5'	26	Moderate brown (5YR 4/4), damp, medium dense, fine to medium SAND, some SILT little clay, trace subangular to angular coarse sand and fine to coarse gravel			0.3	
			14-8							
3										
4	3	4-6	3-3	2'/0.2'	9	Moderate brown (5YR 4/4), moist, loose, very fine SAND, some silt, little clay, trace medium to coarse sand, trace fine angular gravel			1.4	
			6-8							
5										
6	4	6-8	3-4	2'/0.2'	8	Moderate brown (5YR 4/4), moist, loose, very fine SAND, some silt, little clay, trace medium to coarse sand trace fine angular gravel			1.9	
			4-5							
7										
8	5	8-10	3-5	2'/1.2'	12	Black (N1), saturated, medium dense CINDERS and fine to medium angular GRAVEL			4.1	
			7-10							
9										
10	6	10-12	5-3	2'/1.1'	7	Olive gray (5Y 4/1), saturated, loose, fine SAND, some medium sand, little silt, trace organics to approximately 11.5 ft, then light brownish gray (5YR 6/1), moist, medium dense, SILT, some clay trace organics			3.2	
			4-7							

The borehole was backfilled to the surface with a mixture of cuttings and cement/bentonite grout.

CPO:ers/sb-7sf

Appendix B

Purge Water and Decontamination Fluids Laboratory Characterization

O'BRIEN & GERE
ENGINEERS, INC.

April 13, 1995

RECEIVED
APR 14 1995

Mr. Al Zaepfel
Industrial Monitoring Coordinator
City of Niagara Falls
Wastewater Treatment Plant
P. O. Box 69
Niagara Falls, New York 14302

Re: City of Niagara Falls
Eastern Area

File: 1736.078

Dear Al:

In accordance with our recent conversations, enclosed are the results of the laboratory analysis performed on a composite water sample obtained from five 55-gallon drums located at the City of Niagara Falls Water Treatment Plant. The sample was composited from a grab from each one of the drums. As requested, the sample was analyzed for metals, PCB's, organics, pH, and SOC.

These drums contain water collected during ground water sampling activities at the one-acre Eastern Area adjacent to the construction site for the City's new water treatment plant. On behalf of the City of Niagara Falls Water Treatment Plant, we are requesting permission to discharge approximately 275 gallons of water to the Niagara Falls Wastewater Treatment Plant via a sanitary sewer in Buffalo Avenue.

If you have any questions or require additional information, please do not hesitate to contact me.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Robert P. Lannon, Jr., P.E.
Managing Engineer

RPL:bk

cc: Mr. Robert E. Game, City of Niagara Falls
Mr. Richard R. Roll, City of Niagara Falls
Ms. Karen L. Moran, O'Brien & Gere Engineers, Inc.
Ms. Deborah Y. Wright, O'Brien & Gere Engineers, Inc.

ACTS TESTING LABS, INC
25 Anderson Roa
Buffalo, NY 14225-492
Tel (716) 897-33C
Fax (716) 897-087

April 4 , 1995

Technical Report #5B-1679E R
Project # 1736.076
Project Name: City Niagara Falls Water T. Plant
REVISED

Mr. Robert P. Lannon, Jr.
O'BRIEN & GERE ENGINEERS, INC.

SUBJECT:

Analysis of one (1) water sample for various parameters. The sample was received on March 13, 1995.

RESULTS:

See Pages Two and Three.

EXPERIMENTAL:

Organochlorine Pesticides in water were determined according to United States Environmental Protection Agency Method 608: Organochlorine Pesticides and PCBs.

Polychlorinated Biphenyls (PCBs) in water were determined according to United States Environmental Protection Agency Method 608: Organochlorine Pesticides and PCBs.

Priority Pollutant Purgeables in Water were determined according to United States Environmental Protection Agency Method 624: Purgeables.

Priority Pollutant Semi-volatile compounds in water were determined according to United States Environmental Protection Agency Method 625: Base/Neutrals and Acids.

The analyses were determined according to procedures listed in "Standard Methods for the Examination of Water and Wastewater," 17th Edition, 1989.

ACTS TESTING LABS

EPA 625

	ACTS #5B-1679E COMPOSITE DRUM #1,2,3,4,5
2-Chlorophenol	< 1
1,3-Dichlorobenzene	< 1
1,4-Dichlorobenzene	< 1
1,2-Dichlorobenzene	< 1
2,4-Dichlorophenol	< 10
1,2,4-Trichlorobenzene	< 1
Naphthalene	< 1
Hexachlorobutadiene	< 1
4-Chloro-3-methylphenol	< 1
Hexachlorocyclopentadiene	< 1
2,4,6-Trichlorophenol	< 1
Dimethyphthalate	< 1
Acenaphthene	< 1
N-Nitrosodiphenylamine	< 1
Hexachlorobenzene	< 1
Phenanthrene	< 1
Dibutylphthalate	< 1
Fluoranthene	< 1
Pyrene	< 1
Butyl Benzyl Phthalate	< 1
Benzo(a)anthracene	< 1
Chrysene	< 1
Dichlorotoluene	< 1*
Trichlorotoluene	< 1*
Tetrachlorobenzene	< 1*
Dichlorobenzotrifloride	< 1*

EPA 608

Heptachlor	< 0.05
Endosulfan sulfate	< 0.05
PCB 1016	< 0.25
PCB 1221	< 0.25
PCB 1232	< 0.25
PCB 1242	< 0.25
PCB 1248	< 0.25
PCB 1254	< 0.25
PCB 1260	< 0.25
Mirex	< 0.10
Dechlorane	< 1.0

* Estimated Values

RESULTS:

	ACTS #5B-1679E COMPOSITE DRUM #1,2,3,4,5
Cadmium, Total	< 0.005
Chromium, Total	< 0.01
Copper, Total	< 0.01
Cyanide, Total	< 0.003
Lead, Total	< 0.03
Nickel, Total	< 0.01
Phenols, Total	0.044
Phosphorus, Total	< 0.05
pH, Total	9.10
Mercury, Total	< 0.0002
Zinc, Total	1.03
Total Suspended Solids	48.0 (68.0)*
Soluble Organic Carbon	3.1

Results are reported as milligrams per liter (mg/L).
*Duplicate

EPA 624	ACTS #5B-1679E COMPOSITE DRUM #1,2,3,4,5	
Benzene	0.5	o
Toluene	< 0.5	
Ethylbenzene	< 0.5	
M,P-Xylenes	< 1	
O-Xylene	< 0.5	
Vinyl Chlorine	< 0.5	
1,1-Dichloroethene	< 0.5	
Methylene Chloride	43B	o
Trans 1,2-Dichloroethene	< 0.5	
Chloroform	0.6	o
1,1,1-Trichloroethane	< 0.5	
Carbon Tetrachloride	< 0.5	
Trichloroethene	< 0.5	
Bromodichloromethane	< 0.5	
trans 1,3 Dichloropropene	< 0.5	
cis 1,3-Dichloropropene	< 0.5	
1,1,2-Trichloroethene	< 0.5	
Tetrachloroethane	< 0.5	
Dibromochloromethane	< 0.5	
Chlorobenzene	12	o
Bromoform	< 0.5	
1,1,2,2, Tetrachloroethane	< 0.5	
2-Chlorotoluene	< 0.5	
4-Chlorotoluene	< 0.5	

B-Found in method blank at 30.0 ug/L
Results are reported as micrograms per liter (ug/L).

ACTS TESTING LABS, INC.

Charles E. Hartke
Manager, Chemistry Laboratory

ACTS TESTING LABS, INC.

Elizabeth R. Hausler, Supervisor
Gas Chromatography Laboratory

ACTS TESTING LABS, INC.

Lisa M. Clerici, Supervisor
Wet Chemistry Laboratory

cme

Appendix C

Niagara Falls Background Concentrations
(letter from NCHD to NYSDEC dated 1987)

NIAGARA COUNTY
HEALTH DEPARTMENT
HUMAN RESOURCES BUILDING
MAIN POST OFFICE BOX 428
10th AND EAST FALLS STREET
NIAGARA FALLS, NEW YORK 14302

December 4, 1987

New York State DEC
50 Wolf Road
Room 222
Albany, New York 12233

Attention: Mr. Omar Nagi

Dear Mr. Nagi:

This letter is a response to your request for information on background concentrations of various substances in Niagara Falls area soil. As we discussed, this department has access to the results of thousands of soil sample analyses from the Niagara Falls area. We have compiled background profiles for arsenic, chromium, copper, lead and zinc. That information was previously provided to you. While we have not formally compiled background profiles for other compounds, we have observed fairly consistent patterns of occurrence for the following parameters:

1) BHC/HCCH - We have observed that one or more isomers occur in concentrations of up to 1 ppm each in about one sample in ten of soils from the Niagara Falls area. The occurrence seems to be sporatic, without pattern and in both surface and subsurface soils. The occurrence of this substance seems to be distributed throughout the area and we have no scenario as to what the source of this substance is.

2) DDT/DDE/DDD: These compounds are detected in about one sample in ten to twenty in concentrations of up to 0.5 ppm for DDT and 0.3 ppm for DDE and DDD. When they are detected the concentrations are typically in a ratio of about 3:2:1 (DDT: DDE: DDD). The compound have rarely been reported in samples collected at depths exceeding 12 inches in the Niagara Falls area. It appears that when these compounds are detected that they are remanents of historic DDT pesticide application.

3) Other Pesticides: Other pesticide compounds are occassionally detected in area soil samples in small concentrations. Our policy has been to regard such detections as background if they occur in less than 10% of the samples, in concentrations less than .5 ppm and where the compound cannot be attributed to any specific source.

4) PAH and Related Compounds: One or more of these compounds in concentrations up to 10 ppm each are commonly reported in nearly all surface (less than 12 inches) soil samples from the Niagara Falls area. These compounds are also reported in 10% of the deeper samples at concentrations up to 1 ppm each. Concentrations are higher when ash or asphalt pieces are present in the sample. Phthlate compounds are common in all area soil samples. We assume these compounds have been deposited as airborne particles from combustion sources, vehicle emission, industrial processes, etc. and they seem to be present throughout the Niagara Falls area.

5) Chlorobenzene Compounds: Various chlorobenzene compounds are detected in area soils occassionally in concentrations less than 0.1 ppm. We have noted a trend that these compounds are detected fairly commonly in the less than 1 ppb range when detection limits are adequately low. Several scenarios have been suggested as to the possible source of these contaminants.

6) Phenol: 5 to 10% of the general soil samples taken in this area report phenol in the 0.5 to 1 ppm range. Total recoverable phenolics are reported in about 75% of the samples in detectable quantities.

7) Other Semi-volatile Compounds: Other semi-volatile compounds occur only occassionally (less than 5% of the samples), in particular, other acid extractable semi-volatile compounds occur only rarely in quantities over 2 to 3 times detection limits.

8) Methylene Chloride/Acetone: These compounds have been reported in most soil samples from the Niagara Falls area in concentrations up to 0.15ppm and occassionally much higher These "detections" have often been attributed to the laboratory error or sampling problems but their is still some controversy as to whether or not this is completely correct. It probably was a more substantial factor in older analyses where these compounds were even more predominate. Reports of the occurrence of these compounds is equally common in both shallow and deep soils.

9) Toulene/Benzene - Toulene is reported inabout 20% of area soil samples and benzene in about 10%, both in concentrations up to about 20 to 30 ppb. Petroleum product use may be responsible for some of this substance.

10) Other Volatiles: Other volatile compounds are rarely observed as "background".

11) Metals: Data and curves for several metals were previously provided. In addition to these we note that antimony is reported in about 10% of samples, usually less than 2 to 3 times the detection limits. Cadmium is detected in 30 to 50% of soil samples, with an average concentration of about 4 ppm (using non-dectectable reports as zero for averaging). We would typically consider cadmium over 10 ppm as elevated. Mercury is detected in about 50% of soil samples. We have previously used 0.1 to 0.2 ppm as a typical background range for mercury.

The above guidelines should be considered flexible and not yet fully documented, but we have compared data from several area studies (USGS "Preliminary Evaluation of Chemical Migration to Groundwater and Niagara River..." 1984; NUS, Investigation of eighteen sites in LaSalle Area, Niagara Falls, 1986: Woodward Clyde, Soil sampling from proposed Texas Brine Corporation ROW, 1986; NCHD, Investigation of surface soil contamination at Gratwick Park, 1986) and there seems to be a general agreement of these data sets and the guidelines given above. The above data sets comprise over 500 individual soil samples from the area.

Please note that reference to background in the above discussion refers to both naturally occurring substances and man-made substances which are typically present across a wide area and not apparently related to a localized source such as a particular disposal site or industrial process.

I hope that you find the above ghidelines useful. Feel free to contact me with any questions at 716-284-3128.

Sincerely,

Michael E. Hopkins
Ass't. Public Health Engineer

MEH:lj

cc: Messrs. Vaughan & Devald
Mr. Tygert - DEC - Buffalo
Ms. L. Rusin -NYSDOH - Buffalo
Mr. R. Tramantano - NYSDOH - Albany

Appendix D

NYSDEC - S-Area and Buffalo Avenue Analytical Tables

TABLE 1 S-AREA SITE SPECIFIC PARAMETERS
Vinyl Chloride
1,2-dichloroethene, Total
Trichloroethylene
Tetrachloroethylene
Benzene
Chlorobenzene
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,2,3-trichlorobenzene
1,2,4-trichlorobenzene
1,2,3,4-tetrachlorobenzene
1,2,4,5-tetrachlorobenzene
Hexachlorobutadiene
Octachlorocyclopentene
Total Organic Halides (TOX)
Hexachlorocyclopentadiene
Hexachlorobexzene
2,4,5-Trichlorophenol

:ers/div12/5notes&d/table1

TABLE 2
BUFFALO AVENUE SITE, 932080A
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	B-2	B-3	B-6	B-7	B-8	B-8	B-9	B-10	B-11	B-12	SB-38	SB-39	SB-40	SB-40
Date Sampled	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	5/16/91	5/16/91	5/17/91	5/17/91
Sample Depth	15'-17'	20'-22'	20'-22'	30'-32'	5'-7'	10'-12'	10'-12'	25'-27'	5'-7'	30'-32'	2'-6'	2'-11'	2'-5'	5'-12'
Sample Description	Native	Native	Native	Native	Ashes	Native	Native	Native	Native	Native	Ashes	Ashes	Shot Rock	Ashes
Depth to Native Deposits	12.0	9.0	12.0	15.0	N/A	8.0	8.0	0.0	0.0	16.0	N/A	N/A	N/A	N/A
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
S-Area SSPL Volatiles														
1,2-Dichloroethene (Total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5J
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13
Tetrachloroethane	ND	ND	ND	ND	72	ND	ND	ND	ND	ND	1J	30	1100	30
Other TCL Volatiles														
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1J
S-Area SSPL Semivolatiles														
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	68J
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	49J	55J
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3500	3400
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18000J	1900
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14000J	1600
Other TCL Semivolatiles														
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	310J	ND
Phthalates														
Bis(2-ethylhexyl)phthalate	0.6	0.5	0.7	0.9	ND	1.0	1.0	0.6	1.0	0.9	610J	710J	1400	200J
Di-n-octylphthalate	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110J	110J	140J
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	210J	ND	ND	ND
Polyaromatic Hydrocarbons														
2-Methynaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	160J	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	62J	41J	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	99J	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	410J	310J	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	490J	380J	150J	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	260J	180J	59J	ND
Benzo(a)pryene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370J	260J	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200J	120J	ND	ND

TABLE 2
BUFFALO AVENUE SITE, 932080A
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	B-2	B-3	B-6	B-7	B-8	B-8	B-9	B-10	B-11	B-12	SB-38	SB-39	SB-40	SB-40
Date Sampled	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	1983 *	5/16/91	5/16/91	5/17/91	5/17/91
Sample Depth	15'-17'	20'-22'	20'-22'	30'-32'	5'-7'	10'-12'	10'-12'	25'-27'	5'-7'	30'-32'	2'-6'	2'-11'	2'-5'	5'-12'
Sample Description	Native	Native	Native	Native	Ashes	Native	Native	Native	Native	Native	Ashes	Ashes	Shot Rock	Ashes
Depth to Native Deposits	12.0	9.0	12.0	15.0	N/A	8.0	8.0	0.0	0.0	16.0	N/A	N/A	N/A	N/A
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Polyaromatic Hydrocarbons (Continued)														
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	360J	320J	100J	ND
Dibenzofuran	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	59J	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	99J	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	920	670J	150J	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100J	150J	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	780J	570J	67J	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	640J	490J	130J	ND
S-Area SSPL Pesticides														
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34J	ND
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.5J	ND	ND	ND
Gamma-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100J	ND	ND	ND
Other TCL Pesticides														
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2700	350
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12J	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	52J	71J	2200	ND
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	750	520	ND
Heptachlor Epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	50J
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	65	420	ND
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12J	ND	ND
Endosulfan Sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	52	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41J	ND	ND
Inorganic Compounds														
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	164000J	212000J	434000J	52000J
Mercury	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	910	2100	ND	1700

ug/kg	Micrograms/kilograms or parts per billion (ppb)
ND	Non-detect
J	Estimated concentration
N/A	Not analyzed
*	Exact sampling date not known

TABLE 3
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	SB-27	SB-27	SB-28	SB-28	SB-29	SB-29	SB-30	SB-30	SB-32	SB-33	SB-33	MW-6D
Date Sampled	5/14/91	5/14/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	11/20/87
Sample Depth	2'-5'	5'-13.5'	2'-5'	5'-11'	4'-7'	7'-11'	2'-11.5'	11.5'-12'	2'-4'	2'-4'	4'-7'	1'-3'
Sample Description	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Shot Rock	Ashes	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
S-Area SSPL Volatiles												
Benzene	ND	ND	ND	ND	ND	ND	ND	0.9J	ND	ND	ND	1.9J
Chlorobenzene	ND	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	10	0.9J	ND	ND	ND	ND
Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	0.3J	0.3J	2J	8.6
Other TCL Volatiles												
2-Butanone	ND	ND	ND	ND	ND	ND	ND	34	ND	ND	ND	8.6J
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	2J	ND	ND	ND	ND
Chloroform	ND	0.8J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	2J	0.8J	ND	ND	ND	ND	2J	1J	2J	ND	5.9
Total Xylenes	ND	ND	0.1J	ND	ND	ND	ND	ND	ND	1J	ND	3.3J
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-Area SSPL Semivolatiles												
1,2-Dichlorobenzene	ND	380J	ND	200J	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	730J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	2300	ND	390J	120J	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	900	ND	280J	140J	ND	ND	ND	ND	ND	ND	ND
Other TCL Semivolatiles												
Phenol	ND	ND	ND	ND	ND	ND	ND	4700	ND	17J	ND	ND
Phthalates												
Bis(2-ethylhexyl)phthalate	400J	430J	32000J	200J	560J	290J	650J	290J	360J	130J	610J	300J
Di-n-butylphthalate	ND	ND	130J	ND	ND	110J	370J	240J	130J	110J	ND	ND
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Polyaromatic Hydrocarbons												
2-Methynaphthalene	ND	560J	78J	170J	370J	47J	110J	73J	37J	ND	17000	ND
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	82J	ND
Acenaphthene	ND	340J	ND	550J	330J	ND	ND	59J	ND	36J	11000	ND
Acenaphthylene	ND	320J	ND	97J	200J	ND	ND	ND	ND	ND	620J	ND
Polyaromatic Hydrocarbons (Cont.)												

TABLE 3
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	SB-27	SB-27	SB-28	SB-28	SB-29	SB-29	SB-30	SB-30	SB-32	SB-33	SB-33	MW-6D
Date Sampled	5/14/91	5/14/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	11/20/87
Sample Depth	2'-5'	5'-13.5'	2'-5'	5'-11'	4'-7'	7'-11'	2'-11.5'	11.5'-12'	2'-4'	2'-4'	4'-7'	1'-3'
Sample Description	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Shot Rock	Ashes	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Anthracene	ND	1800	ND	1200	920	ND	43J	160J	ND	81J	14000	ND
Benzo(a)anthracene	ND	6000	200J	2800	2500	250J	130J	540J	80J	370J	36000J	ND
Benzo(b)fluoranthene	ND	6000	230J	3500	3000	260J	140J	790J	110J	440J	50000J	ND
Benzo(k)fluoranthene	ND	2200	120J	1800	1600	110J	65J	380J	ND	220J	17000	ND
Benzo(a)pryene	ND	4200	130J	2300	510J	170J	73J	590J	ND	300J	32000J	ND
Benzo(g,h,i)perylene	ND	1000	ND	610J	390J	ND	ND	390J	ND	ND	8600	ND
Chrysene	ND	4600	190J	3000	2200	250J	140J	590J	ND	380J	31000J	ND
Dibenzo(a,h)anthracene	ND	250J	ND	260J	160J	ND	ND	110J	ND	ND	590J	ND
Dibenzofuran	ND	1500	ND	500J	610J	ND	ND	65J	ND	ND	6000	ND
Fluorene	ND	2000	ND	750J	760	ND	ND	ND	ND	ND	11000	ND
Fluoranthene	ND	15000J	310J	5400	4200	490J	290J	1100	140J	630J	62000J	ND
Indeno(1,2,3-cd)pyrene	ND	1400	ND	740J	670J	ND	ND	430J	ND	96J	13000	ND
Naphthalene	ND	1100	ND	580J	740J	69J	ND	130J	ND	ND	15000	ND
Phenanthrene	ND	14000J	250J	4700	3900	460J	310J	730J	100J	410J	52000J	ND
Pyrene	ND	10000	280J	4200	3600	410J	220J	760J	120J	500J	57000J	ND
S-Area SSPL Pesticides												
Beta-BHC	ND	ND	ND	2900J	2200J	ND	ND	ND	ND	ND	ND	ND
Delta-BHC	ND	ND	ND	30J	6.8J	ND	ND	ND	ND	ND	35J	ND
Gamma-BHC	ND	ND	ND	120	16J	ND	ND	ND	ND	ND	ND	ND
Other TCL Pesticides												
4,4'-DDD	ND	ND	17J	ND	ND	ND	ND	13J	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	27J	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	56	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	ND	ND	5J	ND	22	ND	ND	3.6J	3.6J	7.5J	ND	ND
Dieldrin	ND	ND	ND	56	ND	ND	ND	ND	10J	ND	ND	ND
Heptachlor	ND	ND	ND	16J	19	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	14J	21	ND	ND
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	10J	ND	ND
Endosulfan Sulfate	ND	ND	ND	ND	ND	ND	ND	26J	ND	ND	ND	ND
Endrin	ND	ND	ND	95	37J	ND	ND	ND	ND	7.5J	ND	ND
TCL PCBs												
Aroclor-1242	ND	2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 3
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	SB-27	SB-27	SB-28	SB-28	SB-29	SB-29	SB-30	SB-30	SB-32	SB-33	SB-33	MW-6D
Date Sampled	5/14/91	5/14/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	5/15/91	11/20/87
Sample Depth	2'-5'	5'-13.5'	2'-5'	5'-11'	4'-7'	7'-11'	2'-11.5'	11.5'-12'	2'-4'	2'-4'	4'-7'	1'-3'
Sample Description	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Ashes	Shot Rock	Shot Rock	Ashes	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Inorganic Compounds												
Lead	47300	179000	88100	371000J	175000J	14100J	63400	N/A	76000	121000J	1510000J	DNU
Mercury	620	3600	670	5100	2800	ND	640	1200	ND	400	850	ND

ug/kg	Micrograms/kilograms or parts per billion (ppb)
ND	Non-detect
J	Estimated concentration
DNU	Data not useable due to QA/QC problems

TABLE 3
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	MW-6D	MW-6D	MW-7S	MW-7S	MW-7D	MW-7D	MW-7D	MW-8D	MW-8D	MW-8D	MW-8D
Date Sampled	11/20/87	11/20/87	11/18/87	11/18/87	11/17/87	11/17/87	11/17/87	11/16/87	11/16/87	11/16/87	11/16/87
Sample Depth	5'-6'	14'-16'	8'-10'	10'-12'	1'-3'	7'-8'	15'-17'	0'-6'	9'-16'	22'-26'	29'-33'
Sample Description	Native	Native	Ashes	Cinders	Misc. Fill	Ashes	Native	Misc. Fill	Native	Native	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
S-Area SSPL Volatiles											
Benzene	ND	ND	ND	ND	1.3J	1.6J	1.4J	1.4J	2.4J	1.7J	1.4J
Chlorobenzene	ND	ND	81	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other TCL Volatiles											
2-Butanone	ND	1.8J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	6.1J	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	4.8J	1.4J	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	3.6J	ND	ND	ND	1.8J	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND	ND	9.4J	ND	ND	3.7J	4.9J
S-Area SSPL Semivolatiles											
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	101J	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other TCL Semivolatiles											
Phenol	ND	ND	ND	ND	79J	ND	ND	ND	ND	ND	ND
Phthalates											
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	350J	800	900	474.5J	440J	680	1000
Di-n-butylphthalate	ND	ND	ND	ND	870B	110JB	ND	1158.1B	41000B	ND	140JB
Di-n-octylphthalate	ND	ND	ND	ND	100J	270J	ND	ND	ND	ND	ND
Polyaromatic Hydrocarbons											
2-Methynaphthalene	ND	ND	ND	ND	510J	260J	ND	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	1600	980	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Polyaromatic Hydrocarbons (Continued)											

TABLE 3
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	MW-6D	MW-6D	MW-7S	MW-7S	MW-7D	MW-7D	MW-7D	MW-8D	MW-8D	MW-8D	MW-8D
Date Sampled	11/20/87	11/20/87	11/18/87	11/18/87	11/17/87	11/17/87	11/17/87	11/16/87	11/16/87	11/16/87	11/16/87
Sample Depth	5'-6'	14'-16'	8'-10'	10'-12'	1'-3'	7'-8'	15'-17'	0'-6'	9'-16'	22'-26'	29'-33'
Sample Description	Native	Native	Ashes	Cinders	Misc. Fill	Ashes	Native	Misc. Fill	Native	Native	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Anthracene	ND	ND	3300J	ND	4200	2800	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	6100	3000	ND	ND	141J	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	4300	2800	116J	ND	140J	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	2000	1200	ND	ND	ND	ND	ND
Benzo(a)pryene	ND	ND	ND	ND	4400B	2400B	ND	ND	91JB	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	2700	1600	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	5800	3100	138J	ND	180J	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	1100	450J	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	1300	900	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	1500	1200	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	6800	5400	280J	ND	320J	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	2800	1500	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	1800	690	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	9400	7800	390J	ND	170J	ND	ND
Pyrene	ND	ND	ND	ND	7600	5600	310J	ND	68J	ND	ND
S-Area SSPL Pesticides											
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gamma-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other TCL Pesticides											
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	292	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	9J	ND
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCL PCBs											
Aroclor-1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 3
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	MW-6D	MW-6D	MW-7S	MW-7S	MW-7D	MW-7D	MW-7D	MW-8D	MW-8D	MW-8D	MW-8D
Date Sampled	11/20/87	11/20/87	11/18/87	11/18/87	11/17/87	11/17/87	11/17/87	11/16/87	11/16/87	11/16/87	11/16/87
Sample Depth	5'-6'	14'-16'	8'-10'	10'-12'	1'-3'	7'-8'	15'-17'	0'-6'	9'-16'	22'-26'	29'-33'
Sample Description	Native	Native	Ashes	Cinders	Misc. Fill	Ashes	Native	Misc. Fill	Native	Native	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Inorganic Compounds											
Lead	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU
Mercury	ND	ND	8.8	5.6	DNU	ND	ND	ND	DNU	ND	ND

ug/kg	Micrograms/kilograms or parts per billion (ppb)
ND	Non-detect
J	Estimated concentration
DNU	Data not useable due to QA/QC problems

TABLE 4
WATER TREATMENT PLANT PROPERTY
ADJACENT TO THE BUFFALO AVENUE SITE, 932080A
SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Borehole/Well Number	280	281	284	285	286	287	291	294	294
Date Sampled	5/13/87	5/7/87	6/1/87	5/11/87	5/13/87	6/5/87	6/18/87	5/27/87	5/27/87
Sample Depth	4'-8'	4'-8'	6'-8'	4'-8'	4'-8'	6'-20.8'	2'-19.8'	12'-30'	30'-32'
Sample Description	Native	Native	Native	Misc Fill	Slag/Misc	Ash/Misc	Ash/Slag	Ashes	Native
Parameter	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
S-Area SSPL Volatiles									
Chlorobenzene	ND	ND	ND	24	ND	39	33	18	ND
S-Area SSPL Semivolatiles									
Trichlorobenzene, Total	ND	ND	ND	ND	201	ND	1400	333	ND
Tetrachlorobenzene, Total	ND	ND	ND	ND	580	ND	1190	5360	158
Hexachlorobenzene	410	ND	ND	128	1700	1000	463	8450	267
Octachlorocyclopentene	ND	ND	ND	ND	ND	ND	ND	971	ND
Hexachlorocyclodecane, Total	ND	ND	ND	ND	267	ND	ND	13200	291
Perchloropentacyclodecane	ND	ND	ND	ND	ND	ND	ND	633	ND
Miscellaneous Analyses									
Total Organic Carbon	ND	ND	ND	ND	ND	59000	ND	46000	ND
Total Organic Halides	ND	ND	ND	ND	200	300	200	25000	100

ug/kg Micrograms/kilograms or parts per billion (ppb)
ND Non-detect
Note: Samples were only analyzed for S-Area Site Specific Parameters.

TABLE 5
BUFFALO AVENUE SITE, 932080A
SUMMARY OF COMPOUNDS DETECTED IN SHALLOW GROUNDWATER SAMPLES

Well Number Date Sampled Screened Interval Material Screened	B-1 12/7/82, 1/26/83 29.0-34.0 Native	B-2 12/7/82, 1/26/83 19.0-24.0 Native	B-3 12/7/82, 1/26/83 26.5-31.5 Native	B-4 12/7/82, 1/26/83 29.0-34.0 Native	B-5 12/7/82, 1/26/83 5.0-10.0 Native	B-6 12/7/82, 1/26/83 17.0-22.0 Native	B-7 12/7/82, 1/26/83 31.5-36.5 Native	B-8 12/7/82, 1/26/83 29.0-34.0 Native	B-9 12/7/82, 1/26/83 7.0-12.0 Native	B-10 12/7/82, 1/26/83 28.0-33.0 Native	B-11 12/7/82, 1/26/83 5.0-10.0 Native	B-12 12/7/82, 1/26/83 31.0-36.0 Native	MW-16S 9/19/91 5.0-15.0 Ash/Native	Ground-* Water Standard
Parameter	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
S-Area SSPL Volatiles														
Benzene	11	11	16	ND	100	ND	ND	ND	29	ND	ND	ND	ND	ND
TCL Semivolatiles														
2-Methylpantane	24	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	N/A	NS
4-Hydroxyl-4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	200	ND	ND	ND	ND	N/A	NS
Hexanoic Acid	ND	ND	ND	ND	ND	ND	70	ND	ND	ND	ND	ND	N/A	NS
Octanoic Acid	ND	ND	100	ND	ND	ND	400	ND	ND	ND	ND	ND	N/A	NS
Caprolactam	ND	ND	ND	ND	ND	ND	800	ND	ND	ND	ND	ND	N/A	NS
Phenol	20	10	20	ND	20	10	75	40	40	10	10	10	ND	1
Phthalates														
Bis(2-ethylhexyl)phthalate	30	ND	100	300	43	ND	100	310	ND	100	70	ND	ND	50
Di-n-butylphthalate	ND	ND	15	ND	ND	12	11	15	ND	ND	ND	ND	ND	50
S-Area SSPL Pesticides														
Alpha-BHC	ND	0.05	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	0.008	ND
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.051J	ND
Other TCL Pesticides														
Heptachlor Epoxide	ND	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan	ND	ND	ND	ND	ND	ND	ND	ND	0.29	ND	ND	ND	ND	NS
Inorganic Compounds														
Lead	ND	400	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	640J	25
Mercury	66	140	72	ND	510	53	310	120	220	100	3	56	7.6	2
Miscellaneous Analyses														
Total Organic Carbon	40600	74600	58800	ND	110000	16200	36400	65200	203000	10300	41800	10600	N/A	NS
Total Organic Halides	81	139	21	ND	38	63	27	16	37	25	30	493	N/A	NS

* Ambient Water Quality Standards and Guidance Values. Standards or guidance values are for Class GA waters.
NS No standard
ug/l Micrograms/liter or parts per billion (ppb)
J Estimated concentration
ND Non-detect
N/A Not analyzed

TABLE 6
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN SHALLOW GROUNDWATER SAMPLES

Well Number Date Sampled	MW-6S 12/10/87	MW-6S 6/91	MW-7S 12/10/87	MW-7S 6/91	MW-7S 9/91	MW-8S 12/9/87	MW-8S 6/91	MW-8S 9/91	Ground-* Water Standard
Screened Interval Material Screened	4.0-8.0 Alluvium		5.0-12.0 Ash/Cinders			11.0-21.0 Alluvium			
Parameter	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
S-Area SSPL Volatiles									
Benzene	ND	ND	1.7JB	0.8J	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	N/A	6	ND	ND	ND	5
S-Area SSPL Semivolatiles									
1,3-Dichlorobenzene	ND	ND	ND	6J	N/A	ND	ND	N/A	5
1,4-Dichlorobenzene	ND	ND	ND	6J	N/A	ND	ND	N/A	4 7
Other TCL Semivolatiles									
Benzoic Acid	ND	ND	1200	ND	N/A	ND	ND	N/A	NS
Phthalates									
Bis(2-ethylhexyl)phthalate	2700B	ND	2200B	ND	N/A	410B	ND	N/A	50
S-Area SSPL Pesticides									
Alpha-BHC	ND	ND	ND	0.064J	0.81	ND	ND	ND	ND
Beta-BHC	ND	0.09	ND	ND	0.093	ND	ND	ND	ND
Delta-BHC	ND	ND	2.76	ND	0.017	ND	ND	ND	ND
Gamma-BHC	ND	0.046J	ND	ND	ND	ND	0.049J	ND	ND
Other TCL Pesticides									
Aldrin	ND	ND	1.67	ND	0.071	ND	ND	ND	NS
Heptachlor Epoxide	ND	ND	0.12	ND	0.008	ND	ND	ND	ND
Endosulfan I	0.01J	ND	4.38	ND	0.034	ND	ND	ND	NS
Endrin	ND	ND	ND	ND	0.013	ND	ND	ND	ND
Inorganic Compounds									
Lead	DNU	78J	8861	1040J	979	DNU	4J	N/A	25
Mercury	ND	ND	50.6	0.6	N/A	2.1	0.5	N/A	2

* Ambient Water Quality Standards and Guidance Values. Standards or guidance values are for Class GA waters.
ug/l Micrograms/liter or parts per billion (ppb)
ND Non-detect
NS No standard
B Compound detected in blank
J Estimated concentration
N/A Not analyzed
DNU Data not useable do to QA/QC problems.

TABLE 7
WATER TREATMENT PLANT PROPERTY
ADJACENT TO THE BUFFALO AVENUE SITE, 932080A
SUMMARY OF COMPOUNDS DETECTED IN SHALLOW GROUNDWATER SAMPLES

Well Number Date Sampled Screened Interval Material Screened	CW-11A 3/3/88 11.0-26.0 F/A/C	CW-13A 3/8/88 1.5-16.5 Fill	OW-261 4/22/88 22.8-27.8 Alluvium	OW-262 4/19/88 27.4-32.4 Alluvium	OW-263 4/22/88 21.0-26.0 Alluvium	OW-280 3/25/88 4.1-9.1 A/C	OW-281 3/22/88 4.0-9.0 Clay	OW-284 3/22/88 4.0-9.0 F/A/C	OW-285 3/23/88 5.3-10.3 F/A/C	OW-286 3/23/88 6.2-11.2 F/A/C	OW-287 3/25/88 9.8-20.8 F/A	OW-291 3/24/88 8.3-20.5 F/A/C	OW-294 3/9/88 25.0-30.0 Alluvium	Ground-* Water Standard
Parameter	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
S-Area SSPL Volatiles														
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	5
S-Area SSPL Semivolatiles														
Trichlorobenzene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	34	ND	180	ND	5
Tetrachlorobenzene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	47	ND	5
Miscellaneous Analyses														
Total Organic Carbon	ND	ND	ND	ND	ND	ND	ND	24000	ND	ND	ND	ND	ND	NS
Total Organic Halides	1900	100	300	ND	600	100	ND	ND	ND	300	100	700	ND	NS

* Ambient Water Quality Standards and Guidance Values. Standards or guidance values are for Class GA waters.
ug/l Micrograms/liter or parts per billion (ppb)
ND Non-detect
NS No standard
F/A/C Fill/Alluvium/Clay
F/A Fill/Alluvium
A/C Alluvium/Clay
Note: Samples were only analyzed for S-Area Site Specific Parameters.

TABLE 8
THE ONE ACRE BUFFALO AVENUE SITE, 932080B
SUMMARY OF COMPOUNDS DETECTED IN BEDROCK GROUNDWATER SAMPLES

Well Number	MW-6D	MW-6D	MW-6D	MW-7D	MW-7D	MW-7D	MW-8D	MW-8D	MW-8D	Ground-* Water Standard
Date Sampled	12/10/87	6/91	9/91	12/10/87	6/91	9/91	12/10/87	6/91	9/91	
Screened Interval	32.0-42.0			34.0-44.0			35.0-45.0			
Material Screened	Till/Bedrock			Till/Bedrock			Bedrock			
Parameter	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
S-Area SSPL Volatiles										
Benzene	1.5JB	ND	ND	1.5J	ND	ND	1.2J	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	5	2.7	ND	3J	3.3	5
Trichloroethene	ND	ND	ND	1.2J	ND	ND	ND	ND	ND	5
Phthalates										
Bis(2-ethylhexyl)phthalate	65B	ND	N/A	95B	ND	N/A	74B	ND	N/A	50
Di-n-butylphthalate	25	ND	N/A	ND	ND	N/A	ND	ND	N/A	NS
S-Area SSPL Pesticides										
Gamma-BHC	ND	0.086	ND	ND	0.16	N/A	ND	0.045	N/A	ND
Other TCL Pesticides										
Heptachlor Epoxide	1.8J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Inorganic Compounds										
Lead	DNU	12J	N/A	DNU	16.9J	22.0	DNU	132J	N/A	25
Mercury	ND	ND	N/A	0.2	ND	N/A	0.3	ND	N/A	2

* Ambient Water Quality Standards and Guidance Values. Standards or guidance values are for Class GA waters.
ug/l Micrograms/liter or parts per billion (ppb)
ND Non-detect
NS No standard
J Estimated concentration
B Compound detected in blank
N/A Not analyzed
DNU Data not useable do to QA/QC problems

TABLE 9
WATER TREATMENT PLANT PROPERTY
ADJACENT TO THE BUFFALO AVENUE SITE, 932080A
SUMMARY OF COMPOUNDS DETECTED IN BEDROCK GROUNDWATER SAMPLES

Well Number Date Sampled Screened Interval Material Screened	OW-200 8/26/87 30.6-46.2 Bedrock	OW-200 9/1/87 46.2-61.0 Bedrock	OW-201 10/8/87 31.5-46.3 Bedrock	OW-201 10/9/87 46.3-61.3 Bedrock	OW-202 10/27/87 37.0-52.0 Bedrock	OW-202 10/28/87 52.0-67.0 Bedrock	OW-215 12/9/87 37.7-55.6 Bedrock	OW-215 12/10/87 55.6-70.6 Bedrock	OW-216 1/21/88 30.8-45.8 Bedrock	OW-216 1/26/88 45.8-60.8 Bedrock	Ground-* Water Standard
Parameter	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
S-Area SSPL Volatiles											
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	6580	5
S-Area SSPL Semivolatiles											
Trichlorobenzene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	3880	5
Tetrachlorobenzene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	3230	5
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	216	5
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	0.35
Octachlorocyclopentene	ND	ND	ND	ND	ND	ND	ND	ND	ND	246	NS
S-Area SSPL Pesticides											
Total BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	282	ND
Miscellaneous Analyses											
Total Organic Carbon	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS
Total Organic Halides	ND	ND	ND	ND	ND	ND	400	ND	ND	37000	NS

* Ambient Water Quality Standards and Guidance Values. Standards or guidance values are for Class GA waters.
ug/l Micrograms/liter or parts per billion (ppb)
ND Non-detect
NS No standard
Note: Samples were only analyzed for S-Area Site Specific Parameters.