Department of Environmental Conservation

Division of Environmental Remediation

Site Investigation Report

59th Street Site, City of Niagara Falls, Niagara County, New York

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New York State Department of Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

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1.0 EXECUTIVE SUMMARY

The 59th Street Site consists of eleven parcels between Kies and Baker avenues near 59th Street in the City of Niagara Falls, Niagara County, New York (Figures 1-1 and 1-2). The total area of the Site is approximately 1.25 acres. The Site is located in a residential neighborhood, and is bordered to the north by Baker Avenue, to the east by residential property on 59th Street, to the south by Kies Avenue and to the west by residential property and vacant land (Figure 1-3). The northern portion of the Site is heavily vegetated with wetland-type grasses and trees, although free-standing surface water was not observed during the Site Investigation.

Available information indicates that a large pit was excavated on the southern portion of the Site between 1978 and 1980 and utilized for the disposal of an undetermined quantity of sludge and drums. There were also reports that Love Canal demolition debris was disposed of on the property. Residents later observed the removal of the sludge and most of the drums, but this has not been confirmed.

The stratigraphy of the Site was evaluated by examining the stratigraphic logs obtained from the soil borings completed during the Site Investigation. With increasing depth, the geologic units encountered include fill, fluvial silty clay and sand, and glaciolacustrine silty clay and clay. The bedrock underlying the Site is the Guelph Dolostone of the Lockport Group. Fill material at the Site consists predominantly of clean fill or reddish brown silty clay that was utilized to fill the southwestern portion of the Site (lighter tone on Figure 1-3).

Groundwater in the shallow overburden zone was encountered within a yellow brown, fine-grained sand deposit, which was saturated at each boring location in which it was encountered. Seven micro-wells were installed within this deposit during the Site Investigation. Water level data obtained from these micro-wells reveals that shallow overburden zone groundwater under the 59th Street Site flows to the south toward Kies Avenue.

The results of the Site Investigation indicate that Site soils contain semivolatile organic compounds, pesticides, polychlorinated biphenyls (PCBs) and metals. Only the concentrations of benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo (a,h)anthracene, BHC, and the USEPA priority pollutant metals arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc exceeded the NYSDEC TAGM 4046 soil cleanup objectives. Many of these contaminants were also detected in background soil samples collected as part of the NYSDEC Site Investigation, and none of the concentrations significantly exceeded the soil cleanup objectives.

Volatile organic compounds, semivolatile organic compounds, pesticides and PCBs were not detected in any of the groundwater samples collected from the 59th Street Site. Although eleven metals were detected in Site groundwater, only iron was detected at concentrations that exceeded the NYSDEC Class GA groundwater standards or guidance values.

The Site Investigation conducted at the 59th Street Site revealed that consequential amounts of hazardous wastes or substances are not present at this Site. As a result, the 59th Street Site should not be listed in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites in New York State.

2.0 INTRODUCTION

Between December 2004 and April 2006 the New York State Department of Environmental Conservation (NYSDEC) conducted a Site Investigation at the 59th Street Site in the City of Niagara Falls, Niagara County, New York (Figure 1-1). The 59th Street Site, located between Kies and Baker avenues near 59th Street, occupies a total area of approximately 1.25 acres (Figures 1-2 and 1-3). Although the Site is not listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State (Registry), it is included in the NYSDEC's Hazardous Substance Site study. As a result, the Division of Environmental Remediation (DER) conducted a Site Investigation at the Site to determine if hazardous wastes or substances were present, and if present, to determine if there was a consequential amount. The Site Investigation was also conducted to determine the degree to which historical waste disposal has contaminated Site groundwater, surface soil and subsurface soil. The study results will be utilized to determine whether the 59th Street Site should be included in the Registry, and if so, what classification the Site should be assigned.

This report summarizes the findings of the Site Investigation. The remaining sections of this report are organized as follows:

- **Section 3.0, Site History and Background:** Section 3.0 describes the Site, and discusses the disposal history and previous investigations completed at the Site;

- **Section 4.0, Study Objectives and Scope of Work:** Section 4.0 describes the objectives of the Site Investigation and the activities that were completed during the Site Investigation;

- **Section 5.0, Geology and Hydrogeology:** Section 5.0 describes the regional and Site geology and hydrogeology. The characteristics, areal extent and hydrogeologic properties of the strata are discussed;

- **Section 6.0, Investigation Results:** Section 6.0 describes the findings of the Site Investigation, including general observations and a summary of the analytical results obtained from various environmental media (i.e., surface soil, subsurface soil and groundwater);

- **Section 7.0, Discussion and Recommendation:** Section 7.0 summarizes the findings of the Site Investigation as they relate to the objectives presented in Section 4.0. Recommendations for future activities regarding the Site are also discussed; and

- **Section 8.0, References:** Section 8.0 contains a list of references utilized or cited in the report.

Figures, tables and appendices, in that order, follow Section 8.0.

3.0 SITE HISTORY AND BACKGROUND

3.1 Site Description

The 59th Street Site consists of eleven parcels between Kies and Baker avenues near 59th Street in the City of Niagara Falls, Niagara County, New York (Figures 1-1 and 1-2). The Site occupies a total area of approximately 1.25 acres in a residential neighborhood, and is bordered to the north by Baker Avenue, to the east by residential property on 59th Street, to the south by Kies Avenue and to the west by residential property and vacant land (Figure 1-3). Current and former industrial facilities, however, are located nearby to the north, south and west. The northern portion of the Site is heavily vegetated with wetland-type grasses and trees, although free-standing surface water was not observed during the Site Investigation. The topography of the 59th Street Site is relatively flat, ranging in elevation from 570.96 feet amsl to 572.89 feet amsl.

3.2 Site History

According to area residents, a large pit was excavated on the southern portion of the Site between 1978 and 1980 and utilized for the disposal of an undetermined quantity of sludge and drums. Following complaints to local authorities regarding this dumping, residents observed the removal of the sludge and drums from the Site. Construction debris and other fill materials were utilized to backfill the pit. There were also reports that Love Canal demolition debris was disposed of on the property, but this has not been confirmed.

In 1985 the NUS Corporation completed an investigation of the Site for the United States Environmental Protection Agency (USEPA). At the time of the investigation a deteriorated, buried drum was observed. There is no indication that any drum contents, if present, were sampled. Six surface soil or near surface soil samples, however, were collected during the investigation (Figure 3-1) and submitted to a laboratory for chemical analysis. The analytical results for these samples are summarized in Table 3-1.

Volatile organic compounds were not detected in any of the soil samples collected from the 59th Street Site by NUS. Twenty-two semivolatile organic compounds, however, were detected in the samples with fourteen of these constituents being polycyclic aromatic hydrocarbons (PAHs). Of these compounds, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and chrysene were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 3-1).

Phthalates [bis(2-ethylhexyl)phthalate and butylbenzylphthalate] were detected in three of the samples collected from the Site by NUS (Table 3-1). None of the concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives.

Other semivolatile organic compounds detected in Site soils included 1,2-diphenylhydrazine, phenol, 4-methylphenol, dibenzofuran, n-nitrosodiphenylamine and hexachlorobenzene (Table 3-1). None of the concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives. The analyses for semivolatile organic compounds in samples S-1, S-2 and S-5 did not pass QA/QC requirements.

The soil samples collected from the 59th Street Site by NUS were also analyzed for PCBs and pesticides (Table 3-1). PCBs were detected in five of the samples at concentrations ranging from 380.0 to 2,700 µg/kg. Only the concentration in the surface soil sample (2,700 µg/kg) exceeded the NYSDEC TAGM 4046 soil cleanup objective. Pesticides were not detected in any of the samples.

Fourteen metals were detected in the soil samples collected from the 59th Street Site by NUS (Table 3-1). Of these compounds, eleven were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives, with seven of these metals being USEPA priority pollutant metals. USEPA priority pollutant metals are toxic metals for which technology-based effluent limitations and guidelines are required by Federal law. The priority pollutant metals exceeding the soil cleanup objectives (with the number of exceedances and maximum concentrations) include: cadmium (4 samples; 32.0 mg/kg), chromium (5 samples; 124 mg/kg), copper (6 samples; 135 mg/kg), lead (2 sample; 5,990 mg/kg), mercury (6 samples; 4.3 mg/kg), nickel (5 samples; 74.0 mg/kg) and zinc (6 samples; 4,035 mg/kg).

4.0 STUDY OBJECTIVES AND SCOPE OF WORK

4.1 Objectives

The overall objective of the Site Investigation was to obtain information sufficient to determine if the 59th Street Site should be included in the Registry, and if so, what the appropriate Site classification should be. The specific objectives of this investigation were to:

- evaluate the Site to determine if hazardous wastes or substances are present, and if present, to determine if there is a consequential amount; and

- determine the degree to which historical waste disposal has contaminated Site groundwater, surface soil and subsurface soil.

These objectives were determined through the analysis of fill, soil and water samples obtained from soil borings and micro-wells completed during the investigation.

4.2 Scope of Work

To meet the study objectives, the following activities were completed during the Site Investigation: (1) a soil boring program, (2) micro-well installation, (3) water level measurements, (4) collection of environmental samples for chemical analysis, and (5) preparation of a Site map. These activities are briefly described in the following sections. All field work was conducted in level D personal protective equipment, while air monitoring for organic vapors was completed during intrusive activities by NYSDEC personnel. The direct push vehicle and sampling equipment were deconed prior to the implementation of field activities, with the sampling equipment decontaminated between samples.

4.2.1 *Soil Boring Program*

To determine if any hazardous wastes or hazardous substances were present on-site, a series of soil borings were completed at the Site utilizing the direct push technique. During the Site Investigation, twelve soil borings were completed at the following locations for the following reasons:

- borings SB-1 thru SB-3 were completed along the western boundary of the Site for the purpose of installing micro-wells MW-1 thru MW-3 (Figure 4-1). Additionally, surface and subsurface soil/fill samples were collected from these borings;

- boring SB-4 was completed in the south-central portion of the Site for the purpose of

locating waste that was reportedly disposed on site and installing micro-well MW-4 (Figure 4-1). Additionally, surface and subsurface soil/fill samples were collected from this boring;

- borings SB-5 and SB-6 were completed in the northeast and southeast corners of the Site for the purpose of installing micro-wells MW-5 and MW-6 (Figure 4-1). Additionally, surface and subsurface soil/fill samples were collected from these borings; and

- borings SB-7 thru SB-12 were completed in the south-central portion of the Site to further evaluate the historical disposal area (Figure 4-1). Additionally, surface and subsurface soil/fill samples were collected from borings SB-7, SB-8, SB-11 and SB-12, while micro-well MW-7 was installed in boring SB-11.

Continuous macro core samples were collected at each location with discrete samples collected for chemical analysis (see Section 4.2.4 below).

4.2.2 *Micro-Wells*

Seven soil borings (SB-1 thru SB-6, and SB-11) were converted into micro-wells to evaluate groundwater flow patterns across the Site and to determine whether contamination is migrating from the former disposal area. The locations of these wells are shown on Figure 4-1. All wells were constructed of 1" diameter threaded/flush joint Schedule 40 PVC screen and riser with appropriate sand pack, bentonite seal and grout. All wells, with the exception of MW-3, were completed with an approximate 3' stickup. Well MW-3 was completed as a flush mount because it was located in a lawn. Well construction diagrams are included in Appendix A and summarized in Table 4-1. Following construction, the wells were developed in accordance with standard well development protocols by NYSDEC personnel. Samples were subsequently collected from each well and submitted to Severn Trent Laboratories, Inc. (STL) in Amherst, New York, for chemical analysis.

4.2.3 *Water Level Measurements*

Water levels were measured six times in the newly constructed wells between December 14, 2004 and April 25, 2006. The water level data obtained during this study were utilized to evaluate groundwater flow patterns across the Site.

4.2.4 *Sample Collection and Analysis*

With the exception of the macro core samples collected during the soil boring program, all samples

were collected by NYSDEC personnel. During the Site Investigation seven groundwater samples (Figure 4-1), eight surface soil samples (Figure 4-2), fourteen subsurface soil samples at ten locations (Figure 4-3) and three background soil samples (Figure 4-4) were collected and submitted to STL for chemical analysis. Twenty-one of the soil samples were analyzed for semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, and metals. Four additional soil samples were analyzed for volatile organic compounds (VOCs). Six of the seven groundwater samples were analyzed for VOCs, SVOCs, PCBs, pesticides and metals; the groundwater sample from micro-well MW-6 was only analyzed for VOCs and metals due to the slow recharge rate of this well. Information concerning sample collection and analysis is given in Table 4-2.

4.2.5 *Surveying and Mapping*

Niagara Boundary and Mapping Services of Niagara Falls, New York was subcontracted to complete all surveying and mapping activities at the 59th Street Site. The NAD 83/96 Harn (New York west zone 3103) datum was utilized for horizontal control, while the NAVD 88 datum was utilized for vertical control. The final map shows the Site boundaries, the 11 parcels that make up the Site, adjacent roads, the locations of all borings completed during the Site Investigation, and catch basins and sanitary sewers along Kies Avenue. In addition, the ground surface elevation was surveyed at each boring location, while the top-of-riser elevation of each micro-well was also surveyed. The coordinates for each boring are given in Appendix C, the ground surface elevations are given in Appendix A, and the top-of-riser elevations are given in Table 4-2.

5.0 GEOLOGY AND HYDROGEOLOGY

Site Investigation activities were undertaken, in part, to determine the characteristics, areal extent and hydrogeologic properties of the geologic strata underlying the 59th Street Site. This is important as these attributes of the geologic strata govern the occurrence and flow of groundwater across the Site. These attributes also govern the potential for contaminant migration from the Site, and determine the rate and extent of this migration. As a result, a detailed evaluation of the geology at the 59th Street Site is essential. Before completing such a detailed evaluation, however, it is important to first describe the regional geologic history of the western New York area as a general knowledge of this history is critical to a complete understanding of the complex interrelationships between the various geologic strata and their hydrogeologic properties.

5.1 Regional Geology

5.1.1 *Surficial Geology*

Geologic evidence suggests that at least four major glacial episodes covered parts of North America during the Pleistocene Epoch (Buehler and Tesmer, 1963). In western New York, however, there is evidence of only two such episodes. The last glacial event in the area, the Wisconsin, eroded and modified the earlier glacial deposits to such an extent that little evidence of their existence remains. These glacial events widened the preexisting valleys and basins, and led to the development of the present day drainage system in western New York (La Sala, 1968).

A complex sequence of proglacial lakes that formed during the final retreat of the Wisconsin ice sheet inundated an extensive area of western New York. This succession originated in the Erie-Huron Basin prior to 14,000 years ago as the ice sheet retreated from the basin. Further retreat produced Lake Arkona about 13,600 years ago (Hough, 1958); a readvance of the ice sheet followed about 13,000 years ago and resulted in a water level increase to the Lake Whittlesey stage. A series of advances and retreats over the next 300 years produced, from latest to earliest, lakes Warren, Wayne, Lowest Warren, Grassmere, Lundy and Tonawanda, the last forming about 9,800 years ago (Calkins and Brett, 1978). To the north, Lake Iroquois occupied the Ontario Basin at this time. This lake sequence was responsible for the deposition of stratified lacustrine clays, silts, sands and gravels that now cover much of western New York.

The Pleistocene Epoch presented a variety of environments that resulted in the deposition of unconsolidated deposits. In the Niagara Falls area these deposits include the following (Woodward-Clyde and Conestoga-Rovers & Associates, 1992):

- Glacial till, consisting of a non-sorted, non-stratified mixture of sand, silt, clay, gravel and

rock fragments deposited directly from glacial ice;

- Glaciolacustrine deposits, consisting primarily of silt, sand and clay deposited in lakes that formed during melting of the ice sheets; and

- Glaciofluvial deposits, consisting of sand and gravel deposited either by glacial meltwater streams or by the reworking of till and other glacial deposits along the shore of former glacial lakes, and modern rivers and streams.

In Niagara County the thickness of these deposits varies considerably, ranging from less than 2 feet near the Niagara Escarpment to approximately 45 feet at the Frontier Pendleton Quarry Site (Golder, 1989).

5.1.2 *Bedrock Geology*

The bedrock underlying western New York is characterized as a thick sequence of shales, sandstones, limestones and dolostones deposited in ancient seas during the Ordovician, Silurian and Devonian Periods (Buehler and Tesmer, 1963). This stratigraphic sequence is summarized in Table 5-1. Bedrock bedding generally strikes in an east-west direction, approximately paralleling the Niagara and Onondaga Escarpments, and dips to the south at approximately 30 to 40 feet per mile (Johnson, 1964; La Sala, 1968; Yager and Kappel, 1987). Erosion and weathering, however, have produced local perturbations in the bedrock surface configuration (Snyder Engineering, 1987).

The uppermost bedrock formation underlying the 59th Street Site is the Guelph Dolostone of the Lockport Group (Table 5-1), which was deposited in a shallow sea environment during the Middle Silurian Period (439-408 million years ago) (Brett et al., 1995). The Lockport Group varies in thickness from 20 to 175 feet (Johnson, 1964; Brett et al., 1995), and is greater than 50 feet thick beneath the 59th Street Site. Brett et al (1995, page 45) describe the Lockport Group as a "massive- to medium-bedded, argillaceous dolomite with minor amounts of dolomite and shale." The upper 10 to 25 feet of the Lockport Group contains abundant bedding planes and vertical fractures enlarged by dissolution and glacial scour (Miller and Kappel, 1987).

5.2 Site Geology

The stratigraphy of the 59th Street Site was evaluated by examining the stratigraphic logs completed during the Site Investigation (Appendix A). These data were utilized to construct a geologic cross-section across the southern portion of the Site (Figure 5-1), the location of which is shown in Figure 5-2. A

stratigraphic summary of these logs is given in Table 5-2.

5.2.1 *Fill Material*

Subsurface soil and fill samples were collected continuously from the ground surface to a depth of 12 feet at most of the soil borings completed during the Site Investigation. Fill material was encountered in 10 of 12 borings completed at the Site, and was encountered either at the ground surface (3 locations) or directly beneath a thin topsoil or silty loam layer (7 locations). Where present, the thin topsoil or silty loam layer ranged in thickness from 0.1 to 0.7 feet (Table 5-2).

The fill material consisted predominantly of clean fill (i.e., soil with some bricks and C&D material) or imported reddish brown silty clay (lighter tone on Figure 1-3). A neighbor indicated that the reddish brown silty clay was placed across the southwestern portion of the Site within the last several years to fill in a low-lying area that was utilized by children in the winter for ice skating. The thickness of the fill material ranged from 0.2 to 5.6 feet (Figure 5-1; Table 5-2), with the thickest fill (borings SB-7 and SB-12) thought to be the location of the former disposal pit and boring SB-8 the location of the former skating pond.

5.2.2 *Native Deposits*

The available stratigraphic data indicate that three distinct native deposits underlie the 59th Street Site. The first of these deposits is an alluvial or glaciofluvial silty clay. This deposit is light gray in color with extensive orange mottling, is relatively stiff, and typically does not contain any pebbles. The light gray silty clay was encountered in 10 of 12 borings completed at the Site at depths ranging from 0.1 to 4.0 feet below ground surface (bgs) (Table 5-2). Where present, the thickness of this deposit ranged from 0.8 to 4.5 feet (Figure 5-1; Table 5-2), and was thinnest or absent in borings (SB-7, SB-8 and SB-12).

The second native deposit underlying the Site is a yellow brown, fine-grained sand with orange mottling. This deposit was encountered in 10 of 11 borings completed to depths greater than 4.0 feet bgs and was found at depths ranging from 4.0 to 5.3 feet bgs (Table 5-2). Where present, the thickness of this deposit ranged from 0.6 to 1.8 feet (Figure 5-1; Table 5-2). The fine-grained sand deposit was not encountered in boring SB-12.

The third native deposit encountered during the Site Investigation is a glaciolacustrine silty clay that was likely deposited in a glacial lake that formed during the melting of the Wisconsin ice sheet. This deposit is reddish brown with orange and light gray mottling that decreases with depth, is stiff to very stiff, moist, and typically does not contain any pebbles. With depth, this deposit grades into a stiff to very stiff clay that

is chocolate brown in color. This gradational contact is represented by the dashed line on Figure 5-1.

The reddish brown silty clay was encountered in 11 of 11 borings completed to depths greater than 4.0 feet bgs and was found at depths ranging from 5.0 to 7.0 feet (Figure 5-1; Table 5-2). The total thickness of this deposit was not determined during the Site Investigation.

5.3 Regional Hydrogeology

The principal aquifers in the Niagara Falls area include unconsolidated glacial deposits and bedrock of the Lockport Group (Johnson, 1964; Woodward-Clyde and Conestoga-Rovers & Associates, 1992). Most of the unconsolidated deposits in the area consist of fine-grained lacustrine and glacial deposits with hydraulic conductivities on the order of 10^{-7} cm/s or less (Woodward-Clyde and Conestoga-Rovers & Associates, 1992). As a result, groundwater yields from these deposits are generally too low for domestic or industrial purposes. These deposits, however, often contain horizontal laminations and sand lenses that can produce perched water table conditions, or if areally extensive, can be utilized as sources of water (La Sala, 1968).

In 1986 the NUS Corporation completed an investigation of the LaSalle Area located north and northeast of the 59th Street Site to evaluate the hydrogeology of that area. This investigation identified two overburden water bearing zones: (1) a shallow overburden zone consisting of the fill and fine-grained sand deposits and (2) a deep overburden zone consisting of glacial till and regolith (unconsolidated weathered bedrock). The second zone directly overlies the Lockport Dolostone bedrock and may be hydraulically connected with it. The NUS study determined that groundwater in the shallow overburden zone flows to the northwest, while groundwater in the deep overburden zone generally flows to the southwest.

The Lockport Group consists predominantly of dolostone; however, thin beds of limestone and shaly dolostone, and small irregularly shaped masses of gypsum are common. These thin beds and masses are subject to dissolution by groundwater, resulting in the enlargement of fractures and the formation of migration pathways that can transmit large quantities of groundwater. Groundwater wells completed in the Lockport Group have yields commonly ranging from 10 to 100 gpm (Miller and Kappel, 1987), with yields up to 950 gpm reported (Yager and Kappel, 1987). Groundwater in the Lockport Group is typically either a calcium-sulfate or calcium-bicarbonate water, is very hard, and is highly mineralized; calcium, bicarbonate, magnesium, sulfate and chloride are present in significant concentrations (Johnson, 1964). Due to this poor water quality and the proximity of the Niagara River, an important source of municipal drinking water throughout Western New York, bedrock groundwater is not extensively utilized as a domestic water source in the Niagara Falls area. Because of the significant well yields, however, groundwater is commonly utilized

for industrial purposes (i.e., non-contact cooling).

Groundwater occurs primarily within the Lockport Group in the following types of openings: (1) weathered surface fractures, (2) bedding joints, (3) vertical joints, and (4) small cavities and vugs. The principal control on groundwater flow, however, is the vertical and horizontal bedding plane fractures. The latter are the primary groundwater flow pathways in the Niagara Falls area and are areally extensive over several miles (Johnson, 1964; Yager and Kappel, 1987). Johnson (1964) identified seven such zones in the Niagara Falls area. Some horizontal groundwater flow also occurs through small cavities and vugs (Woodward-Clyde and Conestoga-Rovers & Associates, 1992). Vertical movement of groundwater also occurs, especially in the upper 10 to 25 feet of rock where vertical fractures, created by stress relief from tectonic events and glacial rebound (Gross and Engelder, 1991), have been enlarged by glacial scour and dissolution. Vertical movement of groundwater within the Lockport Group is quite prevalent, with both upward and downward gradients observed (Woodward-Clyde and Conestoga-Rovers & Associates, 1992).

The 1986 NUS investigation also evaluated the hydrogeology of the Lockport Dolostone. This study determined that groundwater flow in the upper bedrock is to the southwest in the western portion of the study area, but is toward the south in the eastern portion of that area.

5.4 Site Hydrogeology

The hydrogeology of the 59th Street Site was evaluated by examining data obtained during the Site Investigation. Based upon the shallow nature of the former disposal pit, all seven micro-wells installed during the investigation were screened within the shallow overburden zone identified by NUS (1986). Groundwater in this zone was encountered within the yellow brown, fine-grained sand deposit, which was saturated at each boring location in which it was encountered.

In situ hydraulic conductivity tests were conducted on micro-wells MW-3, MW-4, MW-5 and MW-7. These tests were completed by utilizing bail down test methods, with the field data evaluated by the solution developed by Bouwer and Rice (1976). The hydraulic conductivities obtained from these tests are summarized in Table 5-4, and range from 4.65×10^{-6} to 1.37×10^{-4} cm/sec. The arithmetic and geometric means of these data are 5.12×10^{-5} and 2.57×10^{-5} cm/sec, respectively.

Water level measurements from the seven micro-wells were collected six times between December 14, 2004 and April 25, 2006 (Table 5-3). This table indicates that groundwater elevations during this period ranged from 569.01 to 571.91 feet amsl. The hydrographs constructed from these data are shown as Figure

5-3. The paucity of data obtained during the Site Investigation, however, makes it difficult to evaluate seasonal variations in the wells, although it is likely that water levels fluctuate widely due to evapotranspiration and infiltration of precipitation and snow melt into the fine grained sand deposit of the shallow overburden zone. In general, it is suspected that water levels would be higher during wet-weather conditions and lower during the relatively dry months. The sharp increase in water levels observed on April 25, 2006 (Figure 5-3 and Table 5-3) followed rainfall events on April 22 and 23, 2006, and appears to support this supposition.

The water level data obtained from the micro-wells were also utilized to construct groundwater contour maps. Representative maps are shown as Figures 5-4 and 5-5, and reveal that shallow overburden zone groundwater under the 59th Street Site flows to the south toward Kies Avenue. This flow direction is almost opposite to that determined by the NUS Corporation for an the LaSalle Area (see Section 5.3), and may be influenced by the sanitary storm sewer that underlies Kies Avenue.

6.0 INVESTIGATION RESULTS

A brief description of the activities completed during the Site Investigation of the 59th Street Site was presented in Section 4.0. In this section, a detailed evaluation of the observations made during the investigation and the analytical results obtained from the samples are presented. Analytical results are summarized by environmental media (e.g., surface soil, subsurface soil and groundwater).

6.1 General Observations

The northern portion of the Site is heavily vegetated with wetland-type grasses and trees (Figures 6-1 thru 6-3), although free-standing surface water was not observed during the Site Investigation. The general limits of this area is shown in Figure 4-1. Construction and demolition debris was observed throughout this area, but no evidence of drums or waste materials was found.

The southeastern portion of the Site is covered with wild grasses and phragmities (Figure 6-4 and 6-5), while mowed grass covers the southwestern portion of the Site. The mowed area correlates with the lighter tone on Figure 1-3. Mowed grass also covers the entire northern portion of the Site between the heavily vegetated area and Baker Avenue (Figure 6-3).

6.2 Surface Soil

Eight surface soil samples from the 59th Street Site were collected during the Site Investigation. The locations of these samples are shown on Figure 4-2. All samples consisted of native topsoil or soil fill, and were collected to evaluate the nature of surface soil contamination at the Site. The samples were submitted to Severn Trent Laboratories for chemical analysis of Target Compound List (TCL) semivolatile organic compounds, TCL pesticides, TCL PCBs and Target Analyte List (TAL) metals. The analytical results for these samples are summarized in Table 6-1, while information concerning sample collection and analysis is given in Table 4-2.

The soil cleanup objectives for surface soil were obtained from the NYSDEC publication entitled "*Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels*", Division of Environmental Remediation, October 1995. The soil cleanup objectives for individual semivolatile organic compounds were taken directly from Table 2, while the soil cleanup objective for total semivolatile organic compounds was established at 500,000 µg/kg as described in the TAGM. The surface soil cleanup objective for PCBs is 1,000 µg/kg. For pesticides, the soil cleanup objectives were taken directly from Table 3 of the TAGM.

TAGM 4046 allows the use of background concentrations for metals so long as the background samples are collected from areas not impacted by the site and any other source of contaminants. During the Site Investigation of the 59th Street Site, three shallow soil samples were collected from off-site locations (Figure 4-4) to define background soil concentrations in the vicinity of the Site. These results are summarized in Table 6-3. To help evaluate these data for use as background concentrations, the three samples were also analyzed for semivolatile organic compounds, PCBs and pesticides. These results are also summarized in Table 6-3. This table shows that the contaminants detected in samples BS-2 and BS-3, along with their concentrations, are very similar, suggesting that these samples are representative of background conditions. Sample BS-1, however, contained nine additional semivolatile organic compounds and PCBs, with most of the contaminants (including metals) detected at higher concentrations. This suggests that sample BS-1 has been impacted by some other source of contaminants. As a result, only the average metal concentrations in samples BS-2 and BS-3 were used to determine Site Background values.

Thirteen semivolatile organic compounds were detected in the surface soil samples with eleven of these constituents being polycyclic aromatic hydrocarbons (PAHs). PAHs are a group of over 100 different chemicals that are ubiquitous in the environment. Sources of PAHs include incomplete combustion of coal, oil, gasoline, garbage, wood from stoves, automobiles and incinerators. PAHs are also found in coal tar, crude oil, creosote, roofing tar, medicines, dyes, plastics and pesticides. The presence of PAHs in surface soil at the 59th Street Site is likely related to the industrial facilities located north, south and west of the Site. Of these compounds, only benzo(a)anthracene, benzo(a)pyrene, chrysene and dibenzo(a,h)anthracene were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-1). All of these concentrations, however, were estimated due to their low values.

Phthalates [bis(2-ethylhexyl)phthalate and di-n-octylphthalate] were detected in four of the surface soil samples collected from the Site (Table 6-1). None of the concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives. In addition, the total SVOC concentrations did not exceed the TAGM 4046 soil cleanup objective (Table 6-1).

The surface soil samples collected from the 59th Street Site were also analyzed for PCBs and pesticides (Table 6-1). PCBs were detected in three of the samples at concentrations ranging from 230.0 to 460J µg/kg. None of these concentrations, however, exceeded the NYSDEC TAGM 4046 surface soil cleanup objective. Pesticides, including BHC, chlordane, DDD, DDE, DDT, dieldrin, endosulfan II and heptachlor epoxide, were detected in seven of the surface soil samples (Table 6-1). None of the concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives.

Nineteen metals were detected in the surface soil samples collected from the 59th Street Site (Table 6-1). Of these compounds, fifteen were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives, with eleven of these metals being USEPA priority pollutant metals. USEPA priority pollutant metals are toxic metals for which technology-based effluent limitations and guidelines are required by Federal law. The priority pollutant metals exceeding the soil cleanup objectives (with the number of exceedances and maximum concentrations) include: arsenic (4 samples; 9.7 mg/kg), beryllium (6 samples; 1.1 mg/kg), cadmium (2 samples; 1.5 mg/kg), chromium (3 samples; 71.2 mg/kg), copper (5 samples; 45.4 mg/kg), lead (1 sample; 566 mg/kg), mercury (7 samples; 3.4 mg/kg), nickel (4 samples; 45.8 mg/kg), silver (8 samples; 0.55 mg/kg), thallium (7 samples; 0.87 mg/kg) and zinc (8 samples; 308 mg/kg).

6.3 Subsurface Soil

Fourteen subsurface soil samples at ten locations from the 59th Street Site were collected during the Site Investigation. The sample locations are shown on Figure 4-3. All samples consisted of native topsoil or fill, and were collected to evaluate the nature of subsurface soil contamination at the Site. Ten of these samples were submitted to Severn Trent Laboratories for chemical analysis of TCL semivolatile organic compounds, TCL pesticides, TCL PCBs and TAL metals. The remaining samples were also submitted to Severn Trent Laboratories but only for chemical analysis of TCL volatile organic compounds. The analytical results for these samples are summarized in Table 6-2, while information concerning sample collection and analysis is given in Table 4-2.

The soil cleanup objectives for subsurface soil were obtained from the NYSDEC publication entitled "*Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels*", Division of Environmental Remediation, October 1995. The soil cleanup objectives for individual volatile and semivolatile organic compounds were taken directly from Table 2, while the soil cleanup objective for total semivolatile organic compounds was established at 500,000 µg/kg as described in the TAGM. The subsurface soil cleanup objective for PCBs is 10,000 µg/kg. For pesticides, the soil cleanup objectives were taken directly from Table 3 of the TAGM. For metals, the Site Background values obtained during the Site Investigation were again utilized.

Volatile organic compounds were not detected in any of the subsurface soil samples collected from the 59th Street Site. Sixteen semivolatile organic compounds were detected, however, with fourteen of these constituents being polycyclic aromatic hydrocarbons (PAHs). Of these compounds, benzo(a)anthracene, benzo(a)pyrene and dibenzo(a,h)anthracene were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-2). All of these concentrations, however, were estimated due

to their low values. The presence of PAHs in subsurface soil at the 59th Street Site is likely related to the industrial facilities located north, south and west of the Site.

Phthalates [bis(2-ethylhexyl)phthalate and di-n-butylphthalate] were detected in six of ten subsurface soil samples collected from the Site (Table 6-2). None of the concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives. In addition, the total SVOC concentrations did not exceed the TAGM 4046 soil cleanup objective (Table 6-2).

The subsurface soil samples collected from the 59th Street Site were also analyzed for PCBs and pesticides (Table 6-2). PCBs were detected in six of the samples at concentrations ranging from 6.2J to 1,700 µg/kg. None of these concentrations, however, exceeded the NYSDEC TAGM 4046 subsurface soil cleanup objective. Pesticides, including BHC, DDE, DDT, endrin and endrin aldehyde were detected in five of the subsurface soil samples (Table 6-2). Only the concentration of a-BHC (130 µg/kg) and b-BHC (230 µg/kg) in one sample (SB-12) slightly exceeded the NYSDEC TAGM 4046 soil cleanup objectives (a-BHC; 110 µg/kg and b-BHC; 220 µg/kg).

Nineteen metals were detected in the subsurface soil samples collected from the 59th Street Site (Table 6-2). Of these compounds, seventeen were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives, with twelve of these metals being USEPA priority pollutant metals. The priority pollutant metals exceeding the soil cleanup objectives (with the number of exceedances and maximum concentrations) include: arsenic (1 sample; 13.4 mg/kg), beryllium (5 samples; 0.79 mg/kg), cadmium (2 samples; 9.8 mg/kg), chromium (4 samples; 101 mg/kg), copper (4 samples; 672 mg/kg), lead (1 sample; 695 mg/kg), mercury (7 samples; 0.843 mg/kg), nickel (5 samples; 42.1 mg/kg), selenium (1 sample; 2.5 mg/kg), silver (10 samples; 2.4 mg/kg), thallium (9 samples; 1.0 mg/kg) and zinc (5 samples; 2,000 mg/kg).

6.4 Groundwater

As part of the Site Investigation, seven soil borings (SB-1 thru SB-6, and SB-11) were converted into micro-wells to evaluate groundwater flow patterns across the Site and to determine whether historic waste disposal has contaminated Site groundwater. The locations of these wells are shown on Figure 4-1. A groundwater sample from each micro-well was collected during the Site Investigation and submitted to Severn Trent Laboratories for chemical analysis. Six of the seven groundwater samples were analyzed for TCL volatile organic compounds, TCL semivolatile organic compounds, TCL pesticides, TCL PCBs and TAL metals; the groundwater sample from micro-well MW-6 was only analyzed for TCL volatile organic compounds and TAL metals due to the slow recharge rate of this well. The analytical results for these

samples are summarized in Table 6-4, while information concerning sample collection and analysis is given in Table 4-2. The well development, and purge and sample logs, are included in Appendix B.

The water quality standards and guidance values for groundwater were obtained from the NYSDEC publication entitled "*Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*", Division of Water, June 1998. The groundwater standards and guidance values for individual contaminants were taken directly from Table 1.

Volatile organic compounds, semivolatile organic compounds, pesticides and PCBs were not detected in any of the groundwater samples collected from the 59th Street Site (Table 6-4).

Eleven metals were detected in the groundwater samples collected from the Site. Of these compounds, only iron was detected at concentrations that exceeded the NYSDEC Class GA groundwater standards or guidance values (Table 6-4). Aluminum and cobalt were also detected in the samples but no groundwater standards or guidance values exist for these compounds.

7.0 DISCUSSION AND RECOMMENDATION

7.1 Discussion

The overall objective of the Site Investigation was to obtain information sufficient to determine if the 59th Street Site should be included in the Registry, and if so, what the appropriate Site classification should be. The specific objectives of this investigation were to: (1) evaluate the Site to determine if hazardous wastes or substances are present, and if present, to determine if there is a consequential amount, and (2) to determine the degree to which historical waste disposal has contaminated Site groundwater, surface soil and subsurface soil. These objectives were evaluated through the analysis of fill, soil and water samples obtained during the Site Investigation. This section discusses the analytical results presented in Section 6.0 as they relate to these objectives.

7.1.1 *Volatile Organic Compounds (VOCs)*

The surface soil samples collected from the 59th Street Site during the Site Investigation were not analyzed for volatile organic compounds because these contaminants are generally absent in surface soil due to volatilization. Four subsurface soil samples, however, were analyzed for volatile organic compounds. Volatiles organic compounds were not detected in these samples, indicating that VOCs in soil at the 59th Street Site are not a major concern.

Volatiles organic compounds were not detected in any of the groundwater samples collected from the Site. This indicates that VOCs in groundwater at the 59th Street Site are not a major concern.

7.1.2 *Semivolatile Organic Compounds (SVOCs)*

Semivolatile organic compounds were detected in both surface and subsurface soil samples collected from the 59th Street Site. The majority of the these contaminants were polycyclic aromatic hydrocarbons (PAHs). PAHs were also detected in the background soil samples collected during the Site Investigation. In surface soil at the 59th Street Site, benzo(a)anthracene, benzo(a)pyrene, chrysene and dibenzo (a,h)anthracene were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-1). Benzo(a)anthracene, benzo(a)pyrene and dibenzo(a,h)anthracene were also detected in subsurface soil at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-2). Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene and dibenzo(a,h)anthracene were detected in the background samples at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-3). The presence of PAHs in both background and Site soils indicate that these contaminants are likely related to the industrial facilities located north, south and west of the 59th Street Site.

Bis(2-ethylhexyl)phthalate (4 samples) and di-n-octylphthalate (1 sample) were detected in the surface soil samples collected from the 59th Street Site (Table 6-1), while bis(2-ethylhexyl)phthalate (6 samples) and di-n-butylphthalate (3 samples) were detected in the subsurface soil samples (Table 6-2). None of the concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives. In addition, the total SVOC concentrations were significantly below the TAGM 4046 soil cleanup objective (Tables 6-1 and 6-2), indicating that semivolatile organic compounds in soil at the 59th Street Site are not a major concern.

Semivolatiles organic compounds were not detected in any of the groundwater samples collected from the Site. This indicates that SVOCs in groundwater at the 59th Street Site are not a major concern.

7.1.3 *Pesticides*

Several pesticides were detected in both surface and subsurface soil samples collected from the 59th Street Site including BHC, chlordane, DDD, DDE, DDT, dieldrin, endosulfan II, endrin, endrin aldehyde and heptachlor epoxide (Tables 6-1 and 6-2). None of the surface soil concentrations, however, exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-1), while only the concentration of BHC in one subsurface soil sample (SB-12) exceeded the NYSDEC TAGM 4046 soil cleanup objectives (Table 6-2). BHC, DDE and DDT were also detected in the background soil samples collected during the Site Investigation, suggesting that these pesticides may be common throughout this area of Niagara Falls. As a result, pesticides in soil at the 59th Street Site are not a major concern.

Pesticides were not detected in any of the groundwater samples collected from the Site. This indicates that pesticides in groundwater at the 59th Street Site are not a major concern.

7.1.4 *Polychlorinated Biphenyls (PCBs)*

The 1985 NUS investigation of the 59th Street Site revealed that one surface soil sample collected from the Site contained PCBs at a concentration (2,700 µg/kg) that exceeded the NYSDEC TAGM 4046 soil cleanup objective (Table 3-1). Although PCBs were detected in surface soil samples collected during the Site Investigation, none of the concentrations exceeded the NYSDEC TAGM 4046 surface soil cleanup objective (Table 6-1). PCBs were also detected in the subsurface soil samples collected during the Site Investigation, but none of the concentrations exceeded the NYSDEC TAGM 4046 subsurface soil cleanup objective (Table 6-2). These data indicate that PCBs in soil at the 59th Street Site are not a major concern, and that the presence of PCBs above the NYSDEC TAGM 4046 surface soil cleanup objective in the NUS sample is anomalous.

PCBs were not detected in any of the groundwater samples collected from the Site. This indicates that PCBs in groundwater at the 59th Street Site are not a major concern.

7.1.5 *Metals*

Metals were detected in both surface and subsurface soil samples collected from the 59th Street Site during the Site Investigation. Fifteen metals in surface soil and seventeen metals in subsurface soil were detected at concentrations that exceeded the NYSDEC TAGM 4046 soil cleanup objectives. Eleven of these metals in surface soil, and twelve of these metals in subsurface soil, were USEPA priority pollutant metals. The priority pollutant metals most frequently exceeding the soil cleanup objectives (with the number of exceedances and maximum concentrations) include: beryllium (11 samples; 1.1 mg/kg), copper (9 samples; 672 mg/kg), mercury (14 samples; 3.4 mg/kg), nickel (9 samples; 45.8 mg/kg), silver (18 samples; 2.4 mg/kg), thallium (16 samples; 1.0 mg/kg) and zinc (13 samples; 2,000 mg/kg). The high concentrations of barium (750 mg/kg), cadmium (32.0 mg/kg), lead (5,990 mg/kg) and zinc (4,035 mg/kg) detected in NUS soil sample S-3 (Table 3-1) appear to be anomalous.

Eleven metals were detected in the groundwater samples collected from the Site. Only iron, however, was detected at concentrations that exceeded the NYSDEC Class GA groundwater standards or guidance values (Table 6-4). The high concentrations of iron in Site groundwater is likely attributed to the high iron concentrations in Site soil (Tables 6-1 and 6-2). The background soil samples also contained high concentrations of iron (Table 6-3). As a result, metals in groundwater at the 59th Street Site are not a major concern.

7.2 Recommendation

The data obtained during the Site Investigation of the 59th Street Site did not reveal the presence of any sludge or drums at the Site. This suggests that these materials were removed from the Site as reported by NUS in 1985. Although several exceedances of the NYSDEC TAGM 4046 soil cleanup objectives and/or groundwater standards were documented during the Site Investigation, none of the concentrations significantly exceeded the SCGs, with the exception of iron in Site groundwater, which is likely attributed to the high concentrations of iron in Site soils. These data suggest, therefore, that consequential amounts of hazardous wastes or substances are not present at the 59th Street Site. As a result, it is recommended that this Site should not be listed in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites in New York State.

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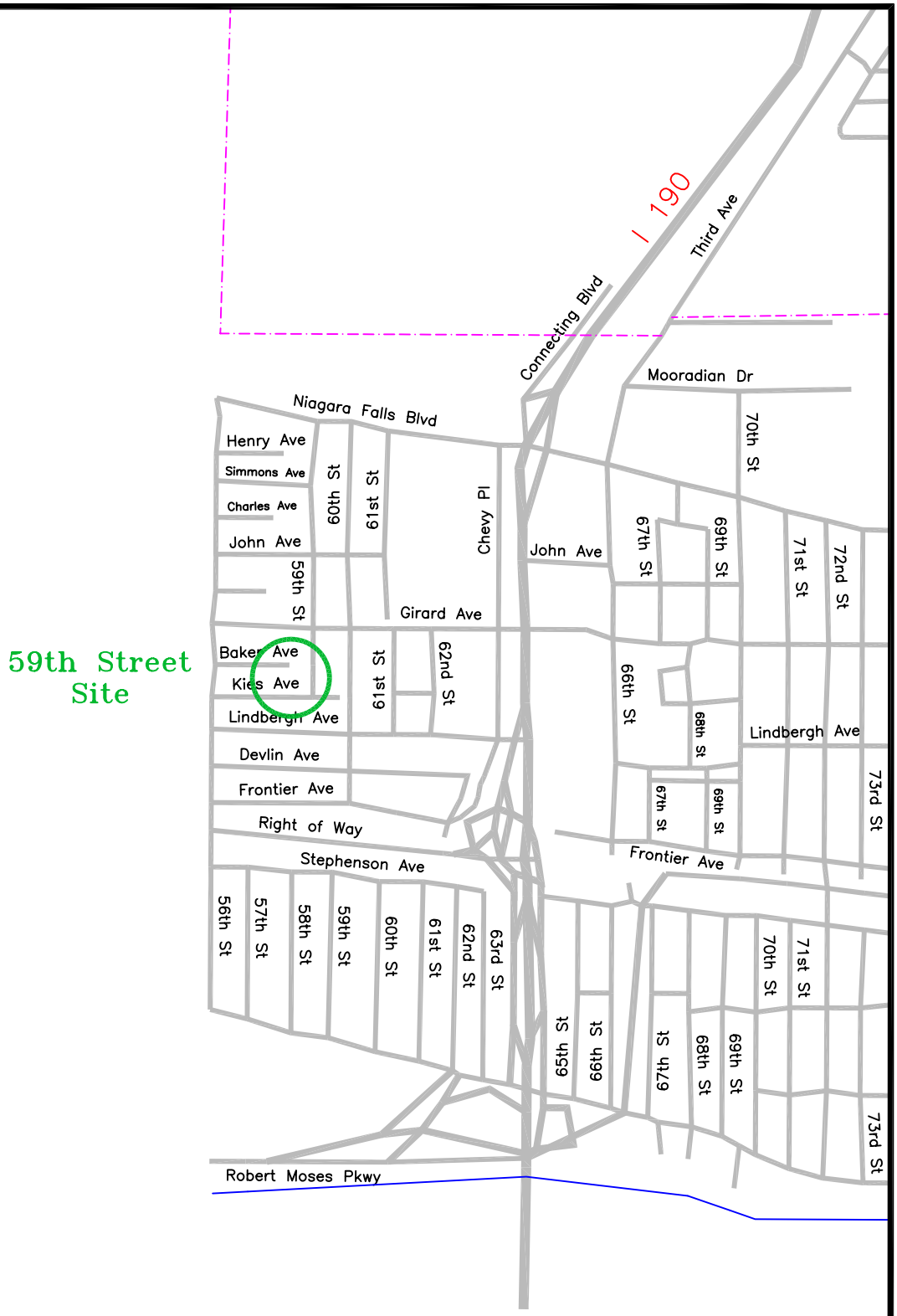


Tonawanda West Quadrangle

Scale Depends on Final Plotted Size

SITE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 02/20/03 DRAWING: Location Map.dwg

SITE: 59TH STREET SITE

FIGURE 1-1

TAX PARCEL	REPUTED OWNER	DEED REFERENCE
160.48-1-22	PEACOCK MATTHEW M &	Liber 2535, Page 212
160.48-1-23	LANSBURY MARY ANN	Liber 3267, Page 119
160.48-1-24	BRADY JAMES JR &	Liber 2837, Page 291
160.48-1-25	BRADY JAMES & MARY	Liber , Page ,
160.48-1-26	BRADY JAMES JR	Liber 2244, Page 270
160.48-1-27	CITY OF NIAGARA FALLS NY	Liber 2024, Page 313
160.48-1-28	MCMANAMY JOSEPH B	Liber 3223, Page 758
160.48-1-29	MCGRATH SHARON L	Liber 2249, Page 236
160.48-1-30	DEVORE JAMES	Liber 3210, Page 741
160.48-1-31	DEVORE JAMES	Liber 2577, Page 125
160.48-1-32	DEVORE JAMES	Liber 2577, Page 125
160.48-1-33	DEVORE JAMES H	Liber 2374, Page 279
160.48-1-34	DEVORE JAMES H	Liber 2362, Page 174
160.48-1-36	BENNETT CARMELLE	Liber 1810, Page 113
160.48-1-50	DEVORE JAMES	Liber 2545, Page 99
160.48-1-51	DEVORE JAMES	Liber 2545, Page 99
160.48-1-52	MCGRATH SHARON L	Liber 2214, Page 180
160.48-1-53	MCGRATH SHARON L	Liber 2214, Page 180
160.48-1-54	MCGRATH SHARON L	Liber 2249, Page 236
160.48-1-55	MCGRATH SHARON L	Liber 2249, Page 236
160.48-1-56	DILAURA JOSEPH M JR	Liber 2351, Page 243
160.48-1-57	DILAURA JOSEPH M JR	Liber 2351, Page 243

PROPERTY BOUNDARY MAP OF THE 59TH STREET SITE

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 1-2

SCALE IN FEET

0 80 160 240

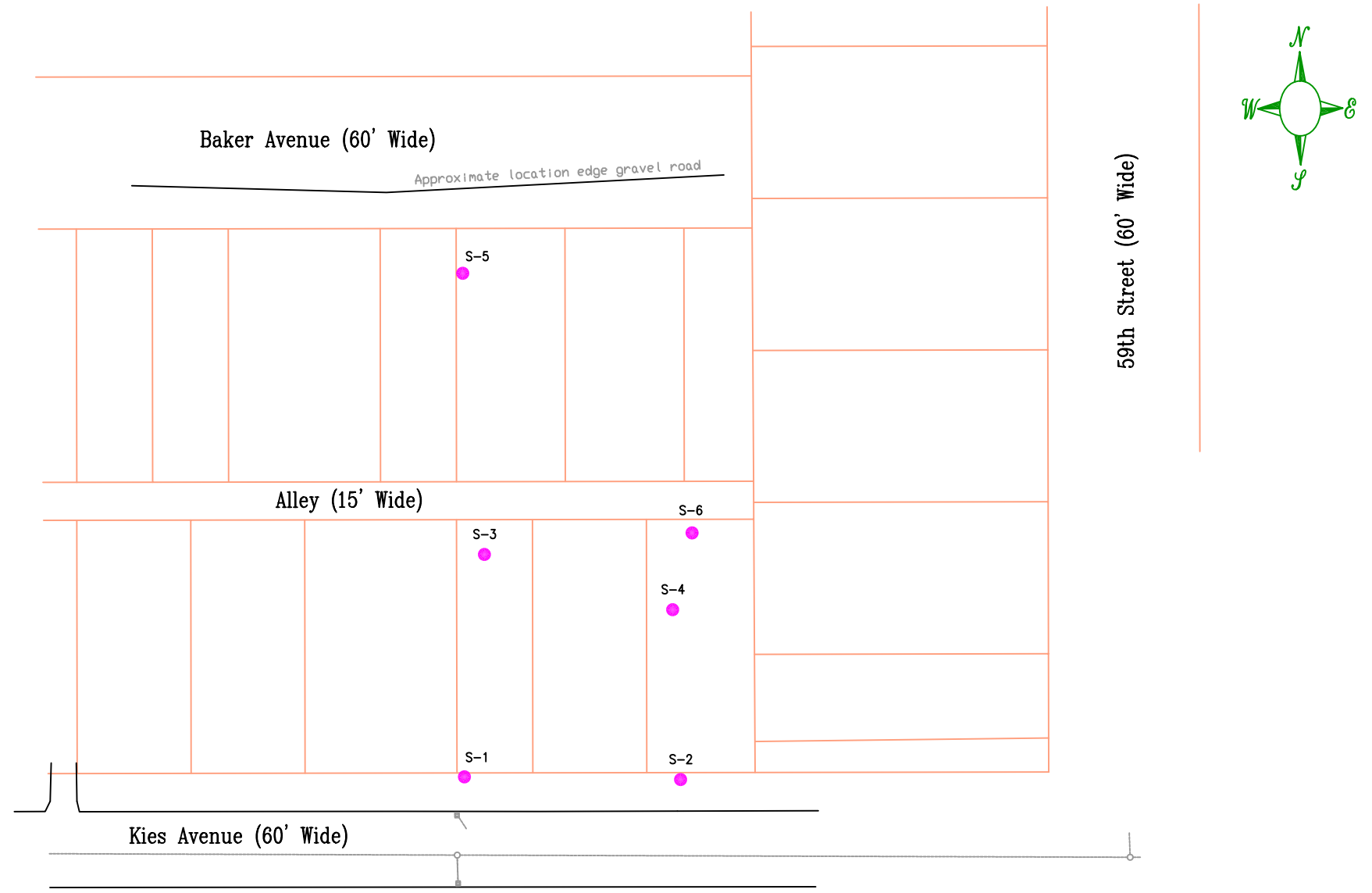
AERIAL PHOTOGRAPH WITH PROPERTY BOUNDARIES

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 11/05/04 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 1-3



LEGEND:

PROPERTY LINE

HISTORIC SOIL SAMPLE LOCATION – NUS CORP.

SCALE IN FEET

0 40 80 120

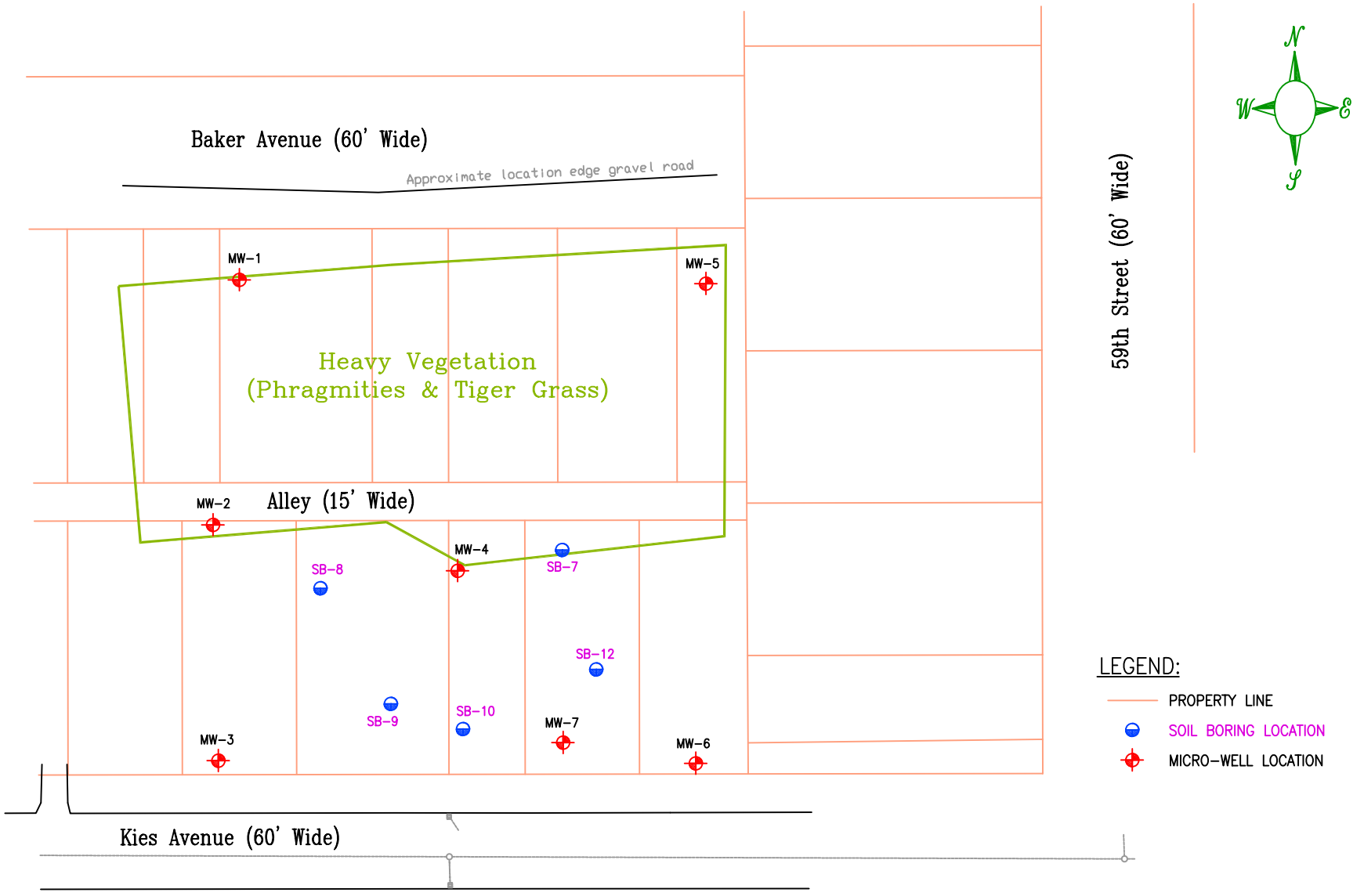
HISTORIC SOIL SAMPLE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 3-1



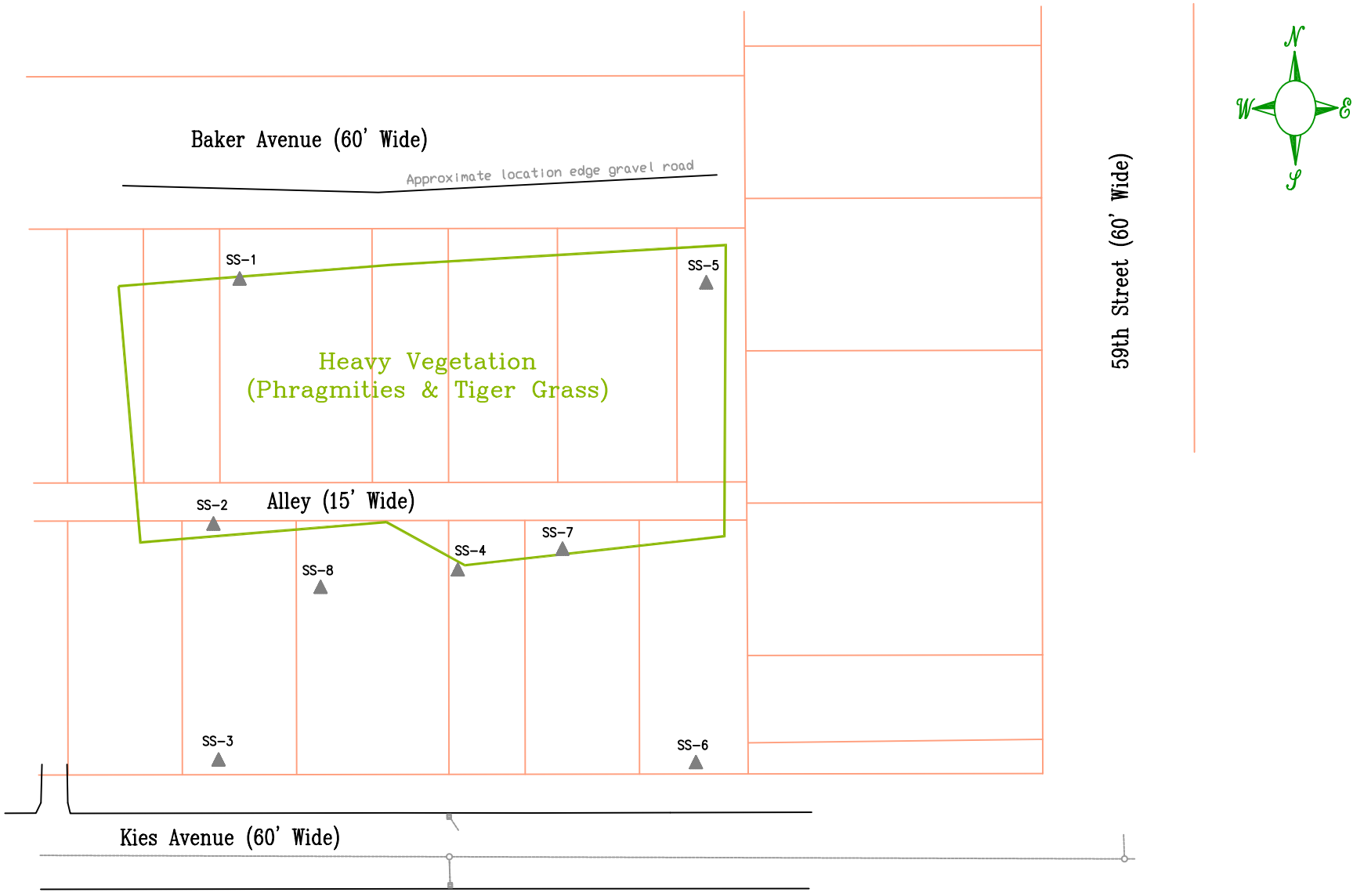
SOIL BORING AND MICRO-WELL LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 4-1



LEGEND:

PROPERTY LINE

SURFACE SOIL SAMPLE LOCATION

SCALE IN FEET

0 40 80 120

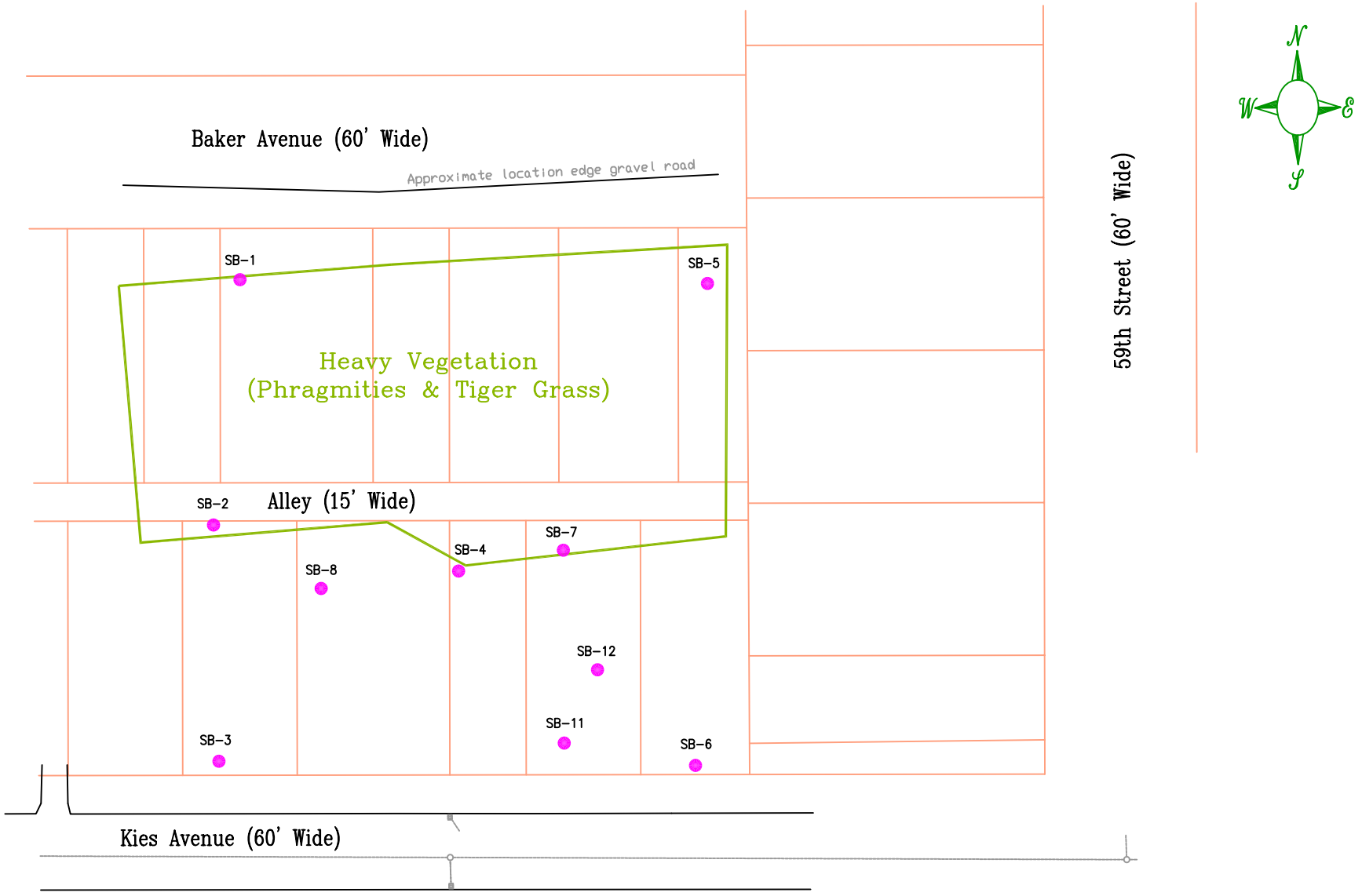
SURFACE SOIL SAMPLE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 4-2



LEGEND:

PROPERTY LINE

SUBSURFACE SOIL SAMPLE LOCATION

SCALE IN FEET

0 40 80 120

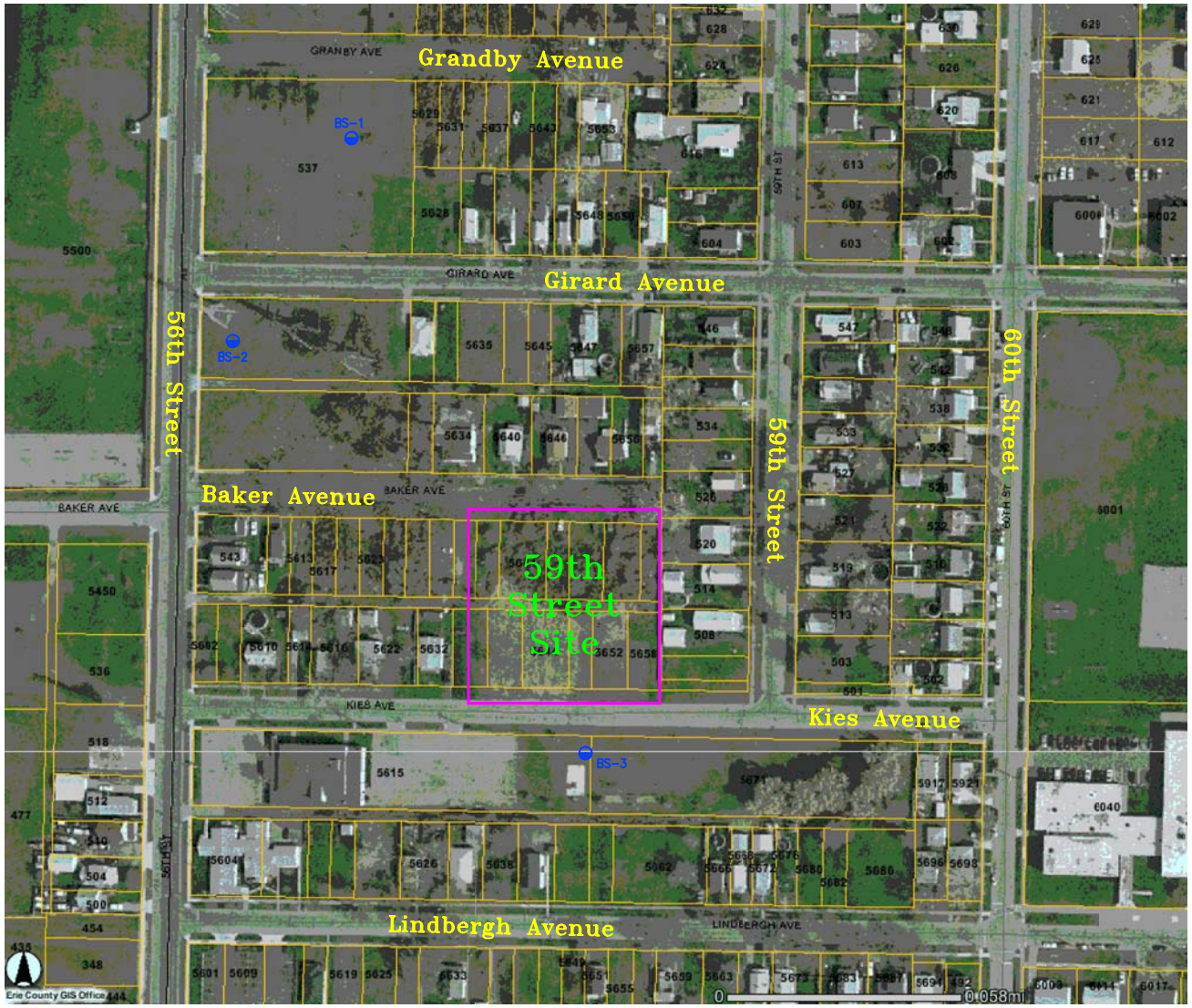
SUBSURFACE SOIL SAMPLE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 4-3



N
W E
S

LEGEND:

PROPERTY LINE

SOIL BORING LOCATION

SCALE IN FEET

0 120 240 360

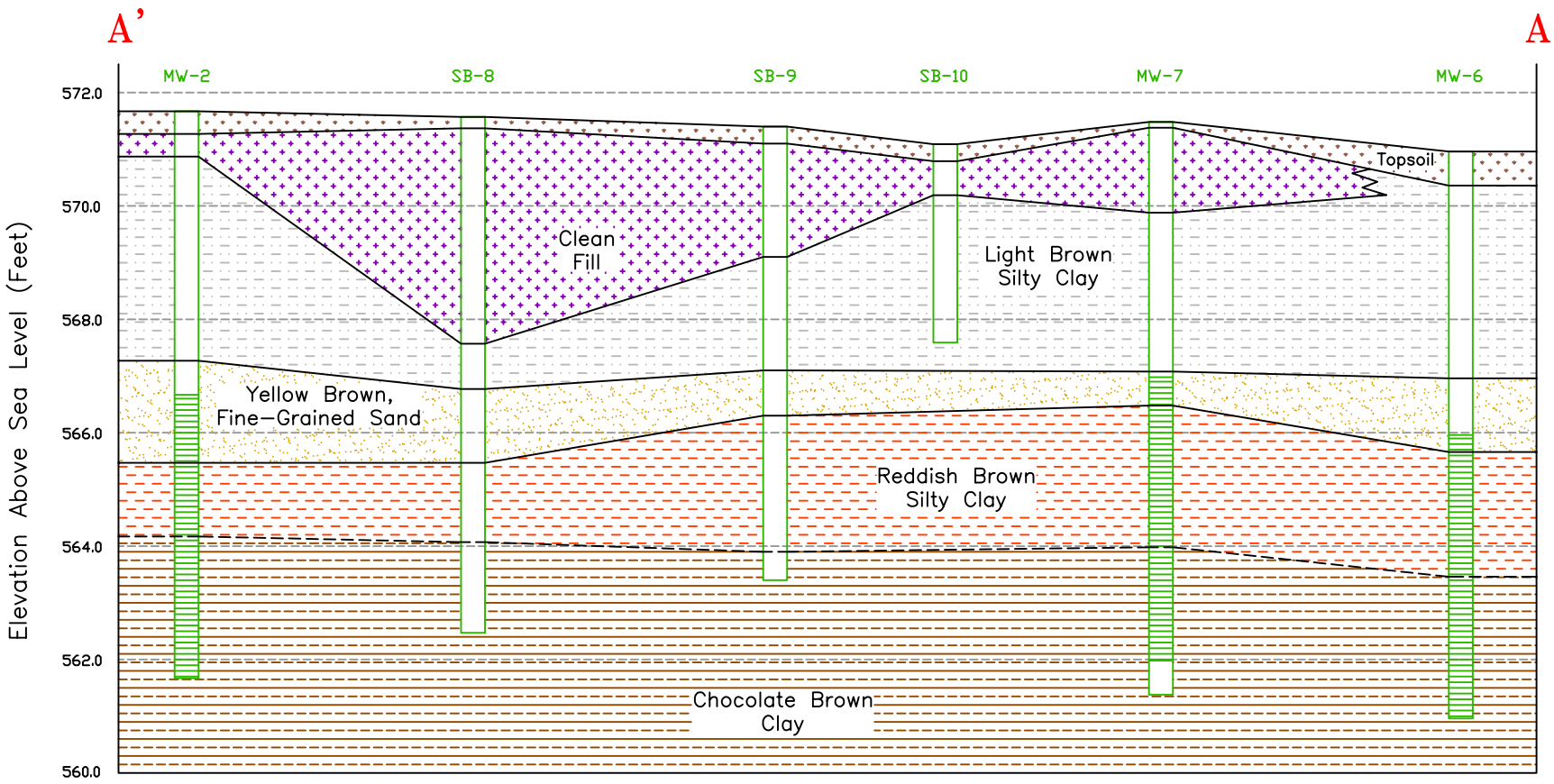
BACKGROUND SOIL SAMPLE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 11/05/04 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 4-4



LEGEND:

- Topsoil
- Clean Fill
- Light Gray Silty Clay
- Yellow Brown, Fine-Grained Sand
- Reddish Brown Silty Clay
- Chocolate Brown Clay
- Screened Interval

0' 5' 10' 15' 20' 25' 50'

Horizontal

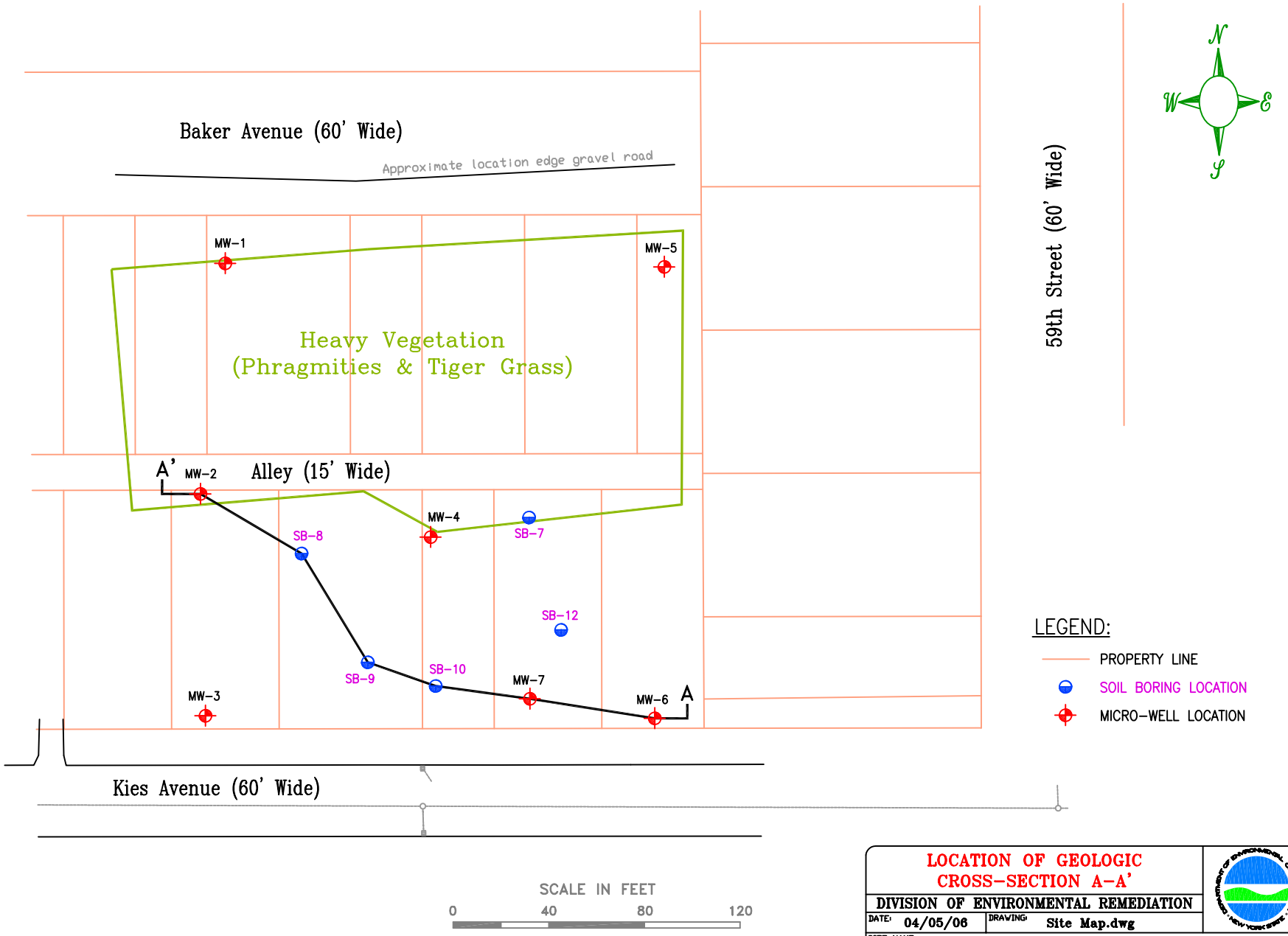
GEOLOGIC CROSS-SECTION A-A'

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 12/17/04 DRAWING: Cross Section.dwg

SITE NAME: 59TH STREET SITE

FIGURE 5-1



LOCATION OF GEOLOGIC CROSS-SECTION A-A'

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 5-2

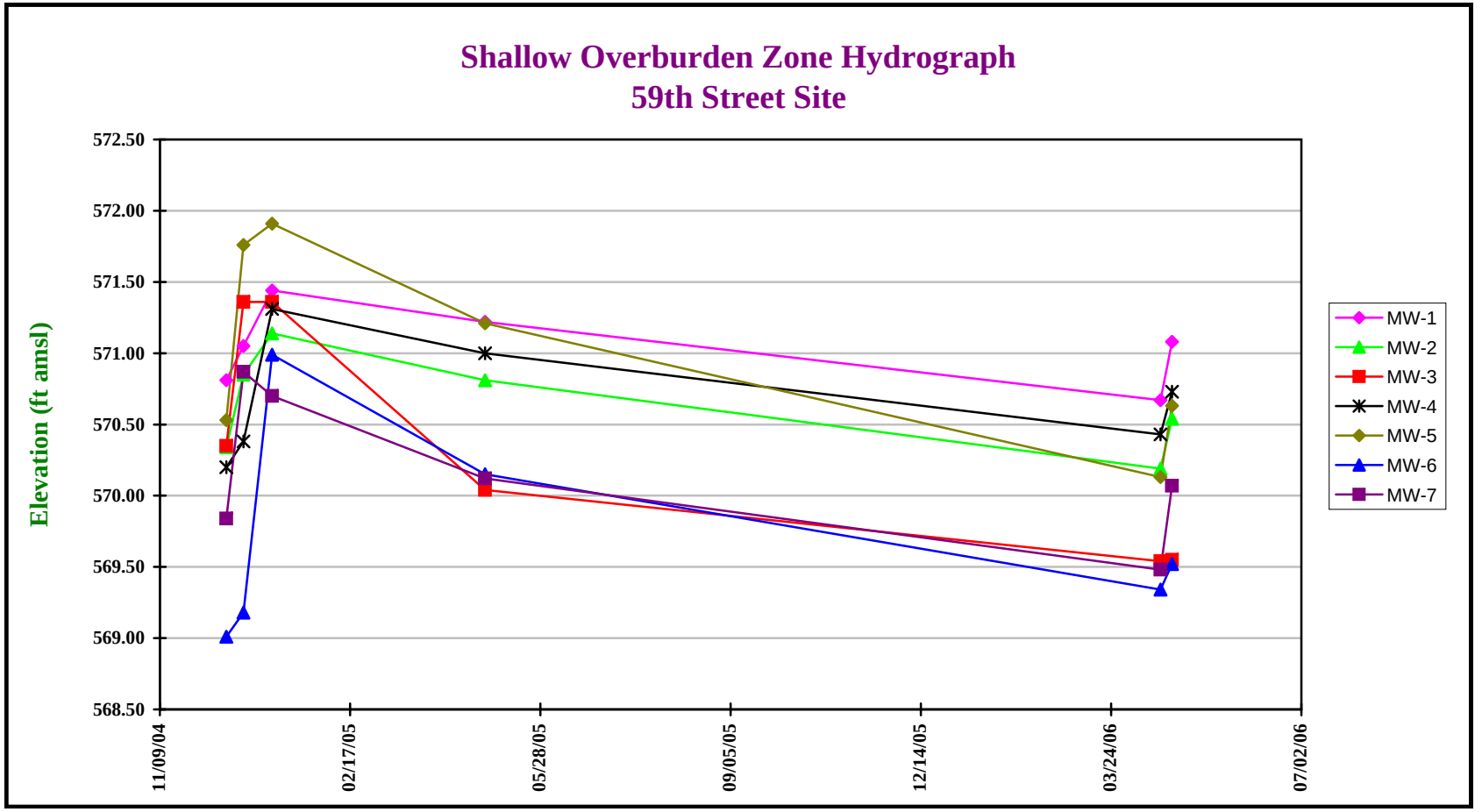
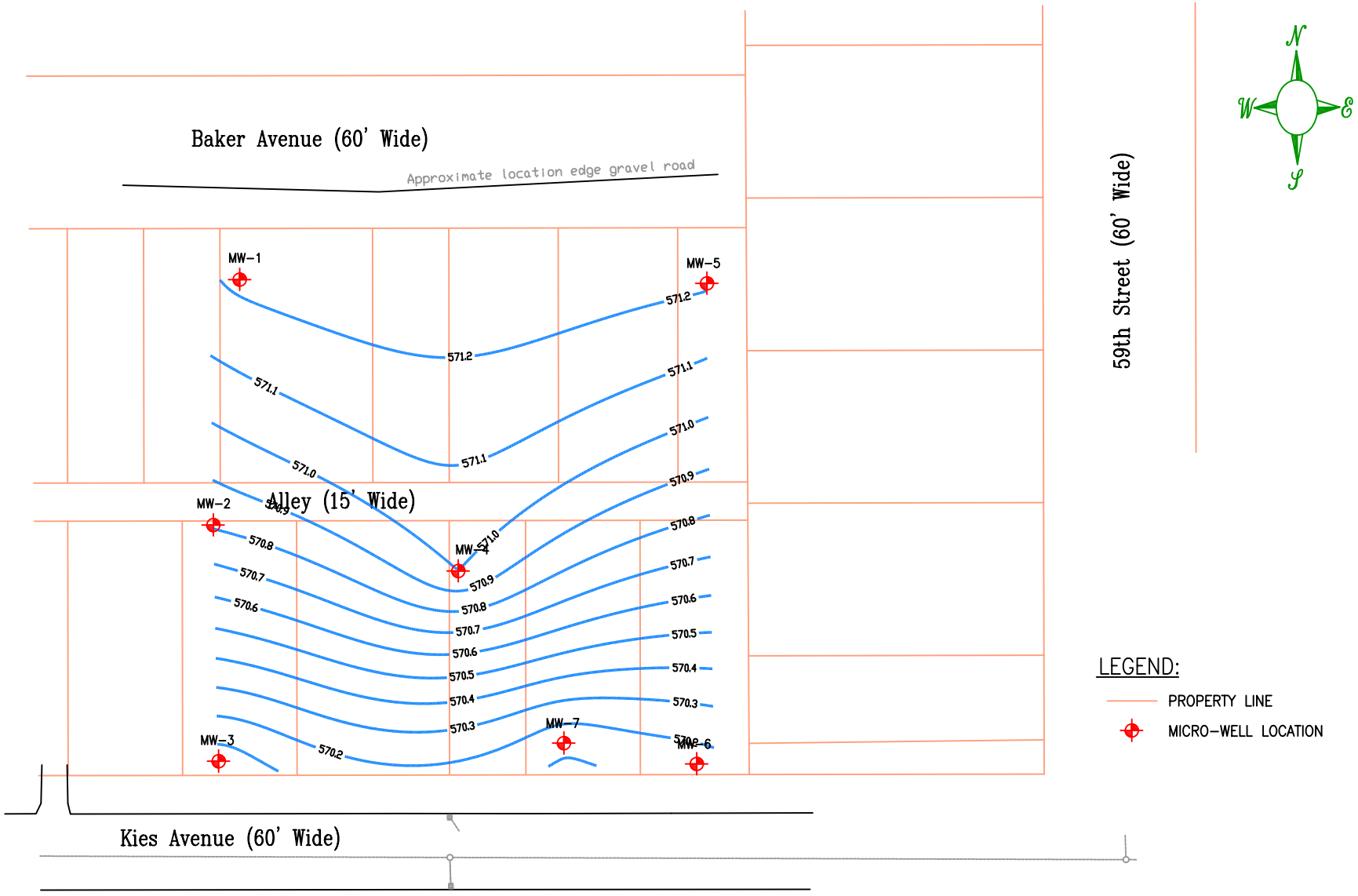


Figure 5-3. Shallow overburden zone hydrograph for the micro-wells installed during the Site Investigation of the 59th Street site.



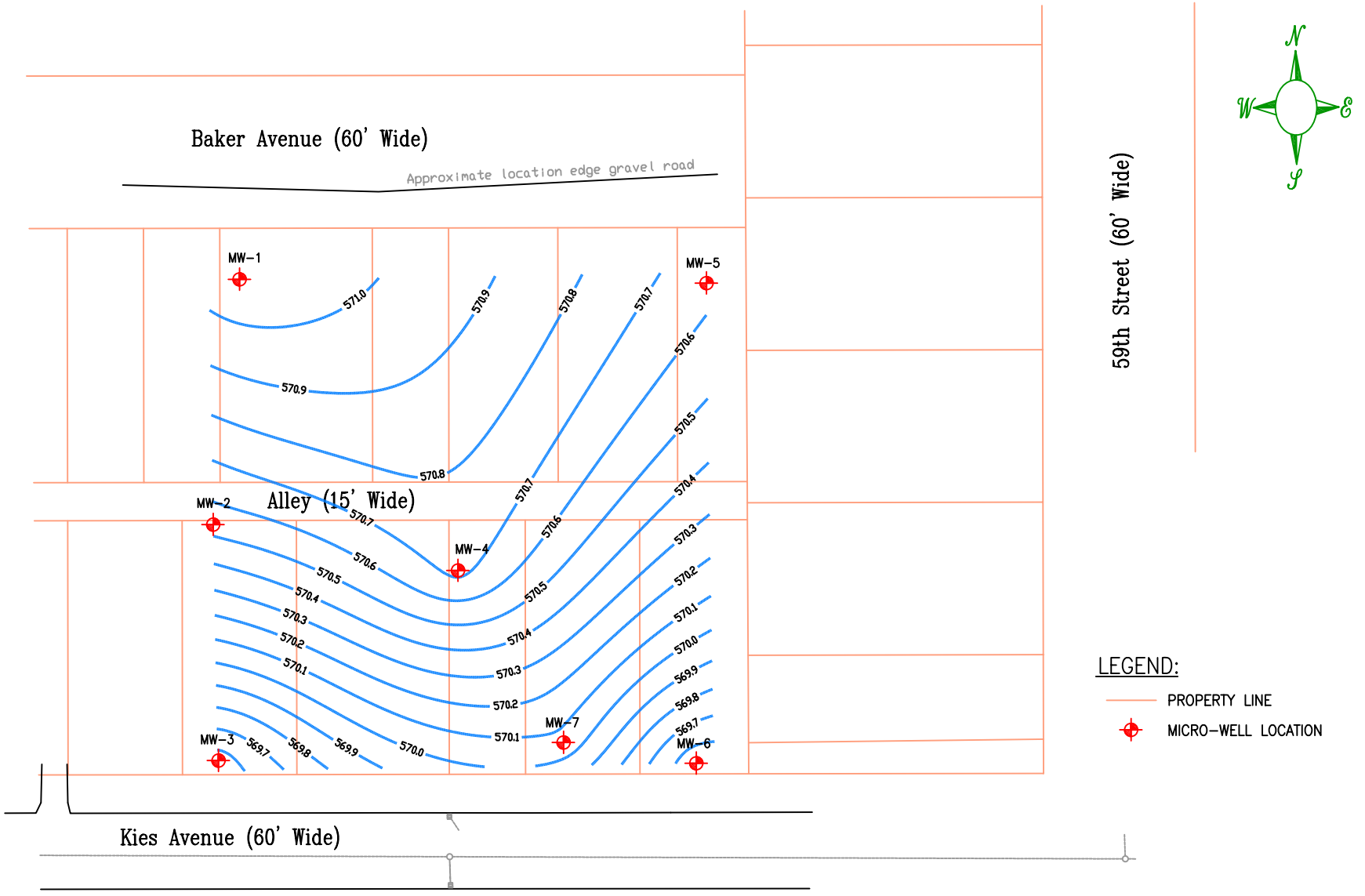
GROUNDWATER CONTOUR MAP
(APRIL 29, 2005)

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 5-4



GROUNDWATER CONTOUR MAP
(APRIL 25, 2006)

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 04/05/06 DRAWING: Site Map.dwg

SITE NAME: 59TH STREET SITE

FIGURE 5-5

Figure 6-1. Photograph of the tiger grass and trees on the northern portion of the 59th Street Site. View looking north. Photograph taken by Glenn May on December 8, 2004.

Figure 6-2. Closeup view of the tiger grass and trees on the northern portion of the 59th Street Site. View looking north. Photograph taken by Glenn May on December 8, 2004.

Figure 6-3. Photograph of the heavily vegetated area of the 59th Street Site. View looking south from Baker Avenue. Photograph taken by Glenn May on December 9, 2004.

Figure 6-4. Photograph of the wild grasses and phragmities on the southeastern portion of the 59th Street Site. View looking north from Kies Avenue. Photograph taken by Glenn May on December 8, 2004.

Figure 6-5. Photograph of the wild grasses and phragmities on the southeastern portion of the 59th Street Site. Micro-well MW-6 is in the center of the photograph. View looking north from Kies Avenue. Photograph taken by Glenn May on December 7, 2004.

Table 3-1.
Analytical Results for Historic Soil Samples Collected from the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	S-1 07/17/85 1.25' - 1.5' Soil	S-2 07/17/85 1.0' - 1.25' Soil	S-3 07/17/85 0.0' - 0.25' Soil	S-4 07/17/85 0.75' - 1.0' Soil	S-5 07/17/85 1.33' - 1.58' Soil	S-6 07/17/85 1.25' - 1.5' Soil
Semivolatile Organic Compounds (µg/kg or ppb)							
Acenaphthene	50,000	**	**			**	J
Anthracene	50,000	**	**	J		**	J
Benzo(a)anthracene	224.0	**	**	**610.0**	J	**	J
Benzo(a)pyrene	61.0	**	**	**620.0**		**	**330.0**
Benzo(b)fluoranthene	1,100	**	**	**1,100**	J	**	
Benzo(g,h,i)perylene	50,000	**	**			**	420.0
Benzo(k)fluoranthene	1,100	**	**		J	**	J
Bis(2-ethylhexyl)phthalate	50,000	**	**	1,900	J	**	850.0
Butylbenzylphthalate	50,000	**	**	7,500		**	
Chrysene	400.0	**	**	**900.0**	J	**	380.0
Dibenzofuran	6,200	**	**	J		**	
1,2-Diphenylhydrazine	NS			560.0		**	
Fluoranthene	50,000	**	**	930.0	J	**	410.0
Hexachlorobenzene	410.0	**	**	J		**	
Indeno(1,2,3-cd)pyrene	3,200	**	**			**	350.0
2-Methylnaphthalene	36,400	**	**	510.0		**	J
4-Methylphenol	900.0	**	**	J		**	
Naphthalene	13,000	**	**	900.0	J	**	J

Table 3-1 (continued).
Analytical Results for Historic Soil Samples Collected from the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	S-1 07/17/85 1.25' - 1.5' Soil	S-2 07/17/85 1.0' - 1.25' Soil	S-3 07/17/85 0.0' - 0.25' Soil	S-4 07/17/85 0.75' - 1.0' Soil	S-5 07/17/85 1.33' - 1.58' Soil	S-6 07/17/85 1.25' - 1.5' Soil
Semivolatile Organic Compounds (continued)							
N-Nitrosodiphenylamine	NS	**	**		J	**	J
Phenanthrene	50,000	**	**	1,400	J	**	360.0
Phenol	30.0	**	**	J		**	
Pyrene	50,000	**	**	1,300	770.0	**	590.0
PCB/Pesticides (µg/kg or ppb)							
PCBs (Total)	1,000 surface 10,000 subsurface	400.0	380.0	**2,700**	720.0		520.0
Inorganic Compounds (mg/kg or ppm)							
Aluminum	SB (12,950)	11,088	10,286	**13,274**	8,326	16,711	12,542
Antimony	SB (ND)						
Arsenic	7.5	J	J	J	J	J	J
Barium	300.0	J	J	**750.0**	J	J	148.0
Beryllium	SB (0.60)						
Cadmium	1.0		**6.1**	**32.0**	**11.0**	**3.5**	
Chromium	SB (27.5)	**	**77.0**	**124.0**	**96.0**	**29.0**	**69.0**
Cobalt	30.0			J		J	J
Copper	25.0	**33.0**	**118.0**	**135.0**	**55.0**	**29.0**	**44.0**
Iron	SB (18,300)	**18,492**	**22,269**	**53,960**	**28,578**	**26,153**	**26,458**
Lead	400.0	156.0	159.0	**5,990**	282.0	**428.0**	243.0

Table 3-1 (continued).
Analytical Results for Historic Soil Samples Collected from the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	S-1 07/17/85 1.25' - 1.5' Soil	S-2 07/17/85 1.0' - 1.25' Soil	S-3 07/17/85 0.0' - 0.25' Soil	S-4 07/17/85 0.75' - 1.0' Soil	S-5 07/17/85 1.33' - 1.58' Soil	S-6 07/17/85 1.25' - 1.5' Soil
Inorganic Compounds (continued)							
Manganese	SB (524.0)	444.0	**870.0**	**2,125**	**937.0**	261.0	**855.0**
Mercury	0.1	**0.39**	**4.3**	**1.1**	**0.6**	**0.16**	**0.5**
Nickel	SB (23.4)	23.0	**31.0**	**74.0**	**46.0**	**31.0**	**47.0**
Selenium	2.0						
Silver	SB (ND)						
Thallium	SB (ND)						
Vanadium	150.0	J	32.0	53.0	J	30.0	39.0
Zinc	SB (89.0)	**512.0**	**481.0**	**4,035**	**964.0**	**114.0**	**641.0**

***** **NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.**
****** **Analysis did not pass QA/QC requirements.**
J **Compound present below the detection limit. The estimated value was not reported.**
NS **No standard or guidance value available.**
SB **Site Background.**
Blanks indicate that the sample was analyzed for the associated compound but it was not detected.
Shaded values equal or exceed the NYSDEC TAGM 4046 soil cleanup objectives.

Table 4-1.
Construction Summary for the Micro-Wells Installed During the Site Investigation of the 59th Street Site.

Well Designation	Ground Surface Elevation (ft. amsl)	Top of Riser Elevation (ft. amsl)	Filter Pack * Interval (ft. bgs)	Filter Pack Interval (ft. amsl)	Well Screen Interval (ft. bgs)	Well Screen Interval (ft. amsl)	Water Bearing Unit Screened
MW-1	571.49	574.37	3.5 to 12.0	567.99 to 559.49	4.5 to 9.5	566.99 to 561.99	Yellow Brown Sand
MW-2	571.67	574.61	4.0 to 12.0	567.67 to 559.67	5.0 to 10.0	566.67 to 561.67	Yellow Brown Sand
MW-3	571.50	571.86	4.0 to 12.0	567.50 to 559.50	5.0 to 10.0	566.50 to 561.50	Yellow Brown Sand
MW-4	571.84	574.75	4.0 to 12.0	567.84 to 559.84	4.5 to 9.5	567.34 to 562.34	Yellow Brown Sand
MW-5	572.89	575.96	4.0 to 12.0	568.89 to 560.89	5.0 to 10.0	567.89 to 562.89	Yellow Brown Sand
MW-6	570.96	573.99	4.0 to 12.0	566.96 to 558.96	5.0 to 10.0	565.96 to 560.96	Yellow Brown Sand
MW-7	571.48	574.42	3.5 to 12.0	567.98 to 559.48	4.5 to 9.5	566.98 to 561.98	Yellow Brown Sand

ft. amsl **Feet referenced to an assumed datum of 500.00 feet above mean sea level.**
ft. bgs **Feet below ground surface.**
***** **The exact interval of the filter pack is not known with certainty due to the difficulty in constructing wells with the direct push technique.**

Table 4-2.
Summary Key for Samples Collected During the Site Investigation of the 59th Street Site.

Lab ID	Sample ID	Date Sampled	Time Sampled	Interval Sampled*	Analytical Parameters	Comments	Table Reference
Surface Soil Samples							
N72201	SS-1	12/07/04	1500	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-1	Table 6-1
N72202	SS-2	12/07/04	1510	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-2	Table 6-1
N72203	SS-3	12/07/04	0900	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-3	Table 6-1
N72204	SS-4	12/07/04	1100	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-4	Table 6-1
N72205	SS-5	12/07/04	1455	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-5	Table 6-1
N72206	SS-6	12/07/04	0855	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-6	Table 6-1
N72207	SS-7	12/07/04	1355	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-7	Table 6-1
N72208	SS-8	12/07/04	1055	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Surface soil collected at soil boring location SB-8	Table 6-1
Subsurface Soil Samples							
N72209	SB-1	12/09/04	1010	5.3' - 6.1'	SVOCs, PCBs, Pesticides, Metals	Yellow brown, fine-grained, sand; native	Table 6-2
N72210	SB-2	12/08/04	0940	0.8' - 1.4'	SVOCs, PCBs, Pesticides, Metals	Light gray, mottled, silty clay; native	Table 6-2
N72211	SB-3	12/08/04	1020	1.2' - 1.9'	SVOCs, PCBs, Pesticides, Metals	Dark brown, clayey silt; native	Table 6-2
N72212	SB-4	12/07/04	1130	0.9' - 1.4'	SVOCs, PCBs, Pesticides, Metals	Dark brown, clayey silt; native	Table 6-2
N72213	SB-5	12/09/04	0905	1.0' - 1.5'	SVOCs, PCBs, Pesticides, Metals	Light gray, mottled, silty clay; native	Table 6-2
N72214	SB-6	12/07/04	1330	0.6' - 2.2'	SVOCs, PCBs, Pesticides, Metals	Light gray, mottled, silty clay; native	Table 6-2
N72215	SB-7	12/08/04	0905	4.0' - 4.8'	SVOCs, PCBs, Pesticides, Metals	Black stained, fine-grained, sand; native	Table 6-2
N72216	SB-8	12/07/04	1045	4.8' - 5.5'	SVOCs, PCBs, Pesticides, Metals	Gray, fine-grained, sand; native	Table 6-2
N72217	SB-11	12/08/04	1255	0.9' - 1.4'	SVOCs, PCBs, Pesticides, Metals	Black stained, fine-grained, sand with slag fragment; fill	Table 6-2
N72218	SB-12	12/08/04	1350	4.0' - 5.6'	SVOCs, PCBs, Pesticides, Metals	Reworked soil with sand, rock fragments and a black, tar-like material; fill	Table 6-2

Table 4-2 (continued).
Summary Key for Samples Collected During the Site Investigation of the 59th Street Site.

Lab ID	Sample ID	Date Sampled	Time Sampled	Interval Sampled*	Analytical Parameters	Comments	Table Reference
Subsurface Soil Samples (Continued)							
N72219	SB-4	12/07/04	1130	8.0' - 10.0'	VOCs	Dark brown clay; native	Table 6-2
N72220	SB-6	12/07/04	0940	4.0' - 5.3'	VOCs	Yellow brown, fine-grained, sand; native	Table 6-2
N72221	SB-7	12/08/04	0900	1.4' - 1.7'	VOCs	Black topsoil with many rootlets and few rock fragments; native	Table 6-2
N72222	SB-7	12/08/04	0910	4.8' - 5.7'	VOCs	Yellow brown, fine-grained, sand; native	Table 6-2
Background Soil Samples							
BS-1	BS-1	04/18/06	1404	0.17' - 0.58'	SVOCs, PCBs, Pesticides, Metals	East of 56th Street between Grandby and Girard Avenues	Table 6-3
BS-2	BS-2	04/18/06	1435	0.17' - 0.5'	SVOCs, PCBs, Pesticides, Metals	East of 56th Street between Baker and Girard Avenues	Table 6-3
BS-3	BS-3	04/18/06	1328	0' - 0.17'	SVOCs, PCBs, Pesticides, Metals	Backyard of Volare' Lodge Italian American Club	Table 6-3
Groundwater Samples							
MW-1	MW-1	04/26/06	1050	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-1	Table 6-4
MW-2	MW-2	04/26/06	1103	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-2	Table 6-4
MW-3	MW-3	04/26/06	1106	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-3	Table 6-4
MW-4	MW-4	04/26/06	1101	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-4	Table 6-4
MW-5	MW-5	04/26/06	1047	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-5	Table 6-4
MW-6	MW-6	04/26/06	1056	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-6	Table 6-4
MW-7	MW-7	04/26/06	1058	N/A	VOCs, SVOCs, Pesticides, PCBs, Metals	Micro well MW-7	Table 6-4

Table 5-1.
Stratigraphic Sequence of the Western New York Area.
Compiled from Buehler and Tesmer (1963) and Brett et al. (1995).

Epoch	Group	Formation	Member
Middle Devonian	Hamilton	Moscow Shale	Windom Shale Kashong Shale
		Ludlowville Formation	Tichenor Limestone Wanakah Shale Ledyard Shale Centerfield Limestone
		Skaneateles Formation	Levanna Shale Stafford Limestone
		Marcellus Shale	Oatka Creek Shale
		Onondaga Limestone	Seneca Limestone Morehouse Limestone Nedrow Limestone Clarence Limestone Edgecliff Limestone
Late Silurian	Salina	Akron Dolostone	
		Bertie Dolostone	Williamsville Dolostone Scajaquada Dolostone Falkirk Dolostone Oatka Dolostone
		Camillus Shale Syracuse Formation Vernon Shale	
Middle Silurian	Lockport	Guelph Dolostone Eramosa Dolostone	
		Goat Island Dolostone	Vinemount Dolostone Ancaster Dolostone Niagara Falls Dolostone
		Gasport Limestone	Pekin Dolostone Gothic Hill Limestone
	Clinton	Decew Dolostone	
		Rochester Shale	Burleigh Hill Shale Lewiston Shale
		Irondequoit Limestone Rockway Dolostone Williamson Shale Merritton Limestone	
		Reynales Limestone	Hickory Corners Limestone
		Neahga Shale	
Early Silurian	Medina	Kodak Sandstone Cambria Shale Thorold Sandstone Grimsby Formation Devils Hole Shale Power Glen Shale Whirlpool Sandstone	
Late Ordovician	Richmond	Queenston Shale Oswego Sandstone	

Table 5-2.
Stratigraphic Summary of Borings Completed During the Site Investigation of the 59th Street Site.
All Depths and Elevations are Measured in Feet.

Boring Number	Ground Surface Elevation	Fill			Light Gray Silty Clay			Yellow Brown Sand			Reddish Brown Silty Clay		
		Depth	Surface Elevation	Thickness	Depth	Surface Elevation	Thickness	Depth	Surface Elevation	Thickness	Depth	Surface Elevation	Thickness
SB-1	571.49	Not Present			0.1	571.39	4.3	4.4	567.09	1.7	6.1	565.39	> 3.9
SB-2	571.67	0.4	571.27	0.4	0.8	570.87	3.6	4.4	567.27	1.8	6.2	565.47	> 3.8
SB-3	571.50	0.0	571.50	1.2	1.9	569.60	2.8	4.7	566.80	1.1	5.8	565.70	> 3.8
SB-4	571.84	0.7	571.14	0.2	1.4	570.44	2.6	4.0	567.84	1.6	5.6	566.24	> 4.3
SB-5	572.89	0.2	572.69	0.6	0.8	572.09	4.5	5.3	567.59	1.7	7.0	565.89	> 4.6
SB-6	570.96	Not Present			0.6	570.36	3.4	4.0	566.96	1.3	5.3	565.66	> 4.4
SB-7	571.50	0.0	571.50	4.0	Not Present			4.0	567.50	1.7	5.7	565.80	> 4.4
SB-8	571.57	0.2	571.37	3.8	4.0	567.57	0.8	4.8	566.77	1.3	6.1	565.47	> 3.0
SB-9	571.40	0.3	571.10	1.6	2.3	569.10	2.0	4.3	567.10	0.8	5.1	566.30	> 2.9
SB-10	571.09	0.3	570.79	0.6	0.9	570.19	> 2.6						
SB-11	571.48	0.1	571.38	1.5	1.6	569.88	2.8	4.4	567.08	0.6	5.0	566.48	> 5.1
SB-12	571.68	0.0	571.68	5.6	Not Present			Not Present			5.6	566.08	> 5.2

Table 5-3.
Groundwater Elevations in Micro-Wells Installed at the 59th Street Site.
(All water levels and elevations measured in feet)

Well Designation	Top of Riser Elevation	12/14/04		12/23/04		01/07/05		04/29/05		04/19/06		04/25/06	
		Depth to Water	Elev.	Depth to Water	Elev.	Depth to Water	Elev.	Depth to Water	Elev.	Depth to Water	Elev.	Depth to Water	Elev.
MW-1	574.37	3.56	570.81	3.32	571.05	2.93	571.44	3.15	571.22	3.70	570.67	3.29	571.08
MW-2	574.61	4.27	570.34	3.76	570.85	3.47	571.14	3.80	570.81	4.42	570.19	4.07	570.54
MW-3	571.86	1.51	570.35	0.50	571.36	0.50	571.36	1.82	570.04	2.32	569.54	2.31	569.55
MW-4	574.75	4.55	570.20	4.37	570.38	3.44	571.31	3.75	571.00	4.32	570.43	4.02	570.73
MW-5	575.96	5.43	570.53	4.20	571.76	4.05	571.91	4.75	571.21	5.83	570.13	5.33	570.63
MW-6	573.99	4.98	569.01	4.81	569.18	3.00	570.99	3.84	570.15	4.65	569.34	4.47	569.52
MW-7	574.42	4.58	569.84	3.55	570.87	3.72	570.70	4.30	570.12	4.94	569.48	4.35	570.07

Shaded values are estimated.

Table 5-4.
Hydraulic Conductivity Test Data for the Shallow Overburden Zone at the 59th Street Site.

Well Number	Date Tested	Hydraulic Conductivity (cm/sec)	Screened Unit	Test Method
MW-3	04/29/05	1.37e-04	Yellow Brown, Fine Grained Sand	Bail Down
"	04/25/06	7.94e-05	" " " " "	" "
MW-4	04/25/06	4.65e-06	Yellow Brown, Fine Grained Sand	Bail Down
MW-5 *	04/25/06	1.45e-05	Yellow Brown, Fine Grained Sand	Bail Down
" **	04/25/06	2.16e-05	" " " " "	" "
MW-7	04/29/05	4.92e-06	Yellow Brown, Fine Grained Sand	Bail Down
"	04/25/06	9.62e-05	" " " " "	" "
Geometric Mean		**2.57e-05**		
Arithmetic Mean		**5.12e-05**		

***** **Early response data.**
****** **Late response data.**

Table 6-1.
Analytical Results for Surface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SS-1 12/07/04 0.0' - 0.17' Topsoil	SS-2 12/07/04 0.0' - 0.17' Topsoil	SS-3 12/07/04 0.0' - 0.17' Soil	SS-4 12/07/04 0.0' - 0.17' Soil	SS-5 12/07/04 0.0' - 0.17' Topsoil	SS-6 12/07/04 0.0' - 0.17' Topsoil	SS-7 12/07/04 0.0' - 0.17' Soil	SS-8 12/07/04 0.0' - 0.17' Topsoil
Semivolatile Organic Compounds (µg/kg or ppb)									
Benzo(a)pyrene	61.0	**270 J**	**140 J**			**260 J**	**220 J**	**98 J**	**730 J**
Benzo(a)anthracene	224.0	**240 J**	180 J			**230 J**	190 J	130 J	**690 J**
Benzo(b)fluoranthene	1,100	240 J	250 J			240 J	270 J	98 J	720 J
Benzo(g,h,i)perylene	50,000	190 J	84 J			230 J	230 J		340 J
Benzo(k)fluoranthene	1,100	220 J	170 J			240 J	120 J	94 J	780 J
Bis(2-ethylhexyl)phthalate	50,000	240 J	60 J			130 J	100 J		
Chrysene	400.0	280 J	290 J			320 J	260 J	140 J	**880 J**
Dibenzo(a,h)anthracene	14.0	**72 J**					**63 J**		**120 J**
Di-n-octylphthalate	50,000		84 J						
Fluoranthene	50,000	480 J	210 J			460 J	380 J	280 J	1,900 J
Indeno(1,2,3-cd)pyrene	3,200	170 J	76 J			190 J	190 J		330 J
Phenanthrene	50,000	290 J	83 J			340 J	180 J	210 J	840 J
Pyrene	50,000	340 J	170 J			440 J	290 J	180 J	1,100 J
Total SVOCs	500,000	3,032 J	1,797 J			3,080 J	2,493 J	1,230 J	8,430 J
PCB/Pesticides (µg/kg or ppb)									
a-BHC	110.0	6.3 J							
Chlordane (total)	540.0		6.2 J		6.0 J				47 J
4,4'-DDD	2,900								20 J

Table 6-1 (continued).
Analytical Results for Surface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SS-1 12/07/04 0.0' - 0.17' Topsoil	SS-2 12/07/04 0.0' - 0.17' Topsoil	SS-3 12/07/04 0.0' - 0.17' Soil	SS-4 12/07/04 0.0' - 0.17' Soil	SS-5 12/07/04 0.0' - 0.17' Topsoil	SS-6 12/07/04 0.0' - 0.17' Topsoil	SS-7 12/07/04 0.0' - 0.17' Soil	SS-8 12/07/04 0.0' - 0.17' Topsoil
PCB/Pesticides (continued)									
4,4'-DDE	2,100				2.5 J	24 J			81 J
4,4'-DDT	2,100			3.8 J	5.0 J	72 J			88 J
Dieldrin	44.0								16 J
Endosulfan II	900.0					21 J			
Heptachlor Epoxide	20.0		9.1 J						13 J
PCBs (Total)	1,000	240 J				460 J	230.0		
Inorganic Compounds (mg/kg or ppm)									
Aluminum	SB (12,950)	**13,200**	**14,900**	8,370	**14,000**	11,500	11,200	**19,600**	**14,500**
Antimony	SB (ND)	**1.4 BN**					**0.85 BN**		
Arsenic	7.5	**9.7**	**8.9**	3.9	**7.5**	**7.9**	6.2	5.7	6.6
Barium	300.0	172.0	142.0	70.8	87.5	291.0	88.3	173.0	160.0
Beryllium	SB (0.60)	**0.66 B**	**1.1**	0.42 B	**0.63 B**	**0.63 B**	0.54 B	**0.96**	**0.71**
Cadmium	1.0	0.83	0.64 B	0.71	0.60 B	**1.2**	**1.5**	0.41 B	0.55 B
Chromium	SB (27.5)	**71.2**	27.0	11.6	16.7	**43.8**	**34.2**	24.8	27.2
Cobalt	30.0	28.7	8.7	5.9 B	10.3	22.7	9.1	12.4	10.5
Copper	25.0	**45.1**	**26.4**	17.0	16.0	**45.4**	**33.0**	24.2	**32.5**
Iron	SB (18,300)	**18,600**	**20,500**	14,200	**23,400**	**19,300**	17,700	**25,600**	**22,200**
Lead	400.0	113.0	82.5	13.9	24.9	**566.0**	126.0	29.8	67.7

Table 6-1 (continued).
Analytical Results for Surface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SS-1 12/07/04 0.0' - 0.17' Topsoil	SS-2 12/07/04 0.0' - 0.17' Topsoil	SS-3 12/07/04 0.0' - 0.17' Soil	SS-4 12/07/04 0.0' - 0.17' Soil	SS-5 12/07/04 0.0' - 0.17' Topsoil	SS-6 12/07/04 0.0' - 0.17' Topsoil	SS-7 12/07/04 0.0' - 0.17' Soil	SS-8 12/07/04 0.0' - 0.17' Topsoil
Inorganic Compounds (continued)									
Manganese	SB (524.0)	**799.0**	**564.0**	**577.0**	**1,010**	**1,120**	**544.0**	**1,450**	499.0
Mercury	0.1	**0.916 N**	**0.836 N**	0.041 N	**0.428 N**	**0.153 N**	**0.513 N**	**3.4 N**	**1.2 N**
Nickel	SB (23.4)	**45.8**	20.3	12.9	22.6	**42.6**	**24.4**	**26.1**	23.2
Selenium	2.0	1.7 B	0.81 B		0.92 B	1.7 B	0.82 B	1.2 B	0.93 B
Silver	SB (ND)	**0.41 B**	**0.29 B**	**0.16 B**	**0.29 B**	**0.41 B**	**0.47 B**	**0.35 B**	**0.55 B**
Thallium	SB (ND)	**0.87 B**	**0.75 B**	**0.41 B**	**0.73 B**		**0.78 B**	**0.68 B**	**0.76 B**
Vanadium	150.0	49.8	28.2	17.0	25.9	60.5	30.7	34.2	30.4
Zinc	SB (89.0)	**288 E**	**154 E**	**242 E**	**164 E**	**308 E**	**304 E**	**121 E**	**159 E**

***** **NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.**
B **Analyte was detected in the associated blank as well as the sample (organics) or value greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).**
E **Estimated concentration due to the presence of interference (inorganics).**
J **Compound reported at an estimated concentration below the sample quantitation limit.**
N **Spike sample recovery or spike analysis is not within quality control limits (inorganics).**
SB **Site Background.**
Blanks indicate that the sample was analyzed for the associated compound but it was not detected.
Shaded values equal or exceed the NYSDEC TAGM 4046 soil cleanup objectives.

Table 6-2.
Analytical Results for Subsurface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SB-1 12/09/04 5.3' - 6.1' Native	SB-2 12/08/04 0.8' - 1.4' Native	SB-3 12/08/04 1.2' - 1.9' Native	SB-4 12/07/04 0.9' - 1.4' Native	SB-4 12/07/04 8.0' - 10.0' Native	SB-5 12/09/04 1.0' - 1.5' Native	SB-6 12/07/04 0.6' - 2.2' Native
Semivolatile Organic Compounds (µg/kg or ppb)								
Anthracene	50,000			48 J		NA		
Benzo(a)pyrene	61.0			**330 J**	**100 J**	″		
Benzo(a)anthracene	224.0			**290 J**	88 J	″	12 BJ	
Benzo(b)fluoranthene	1,100			330 J	87 J	″	13 J	
Benzo(g,h,i)perylene	50,000			130 J	90 J	″		
Benzo(k)fluoranthene	1,100			300 J	83 J	″		
Bis(2-ethylhexyl)phthalate	50,000	31 J	26 J	350 J		″	16 J	
Chrysene	400.0			350 J	120 J	″	13 BJ	
Dibenzo(a,h)anthracene	14.0			**54 J**		″		
Di-n-butylphthalate	8,100	19 J	22 J			″	14 J	
Fluoranthene	50,000			660 J	170 J	″	21 BJ	
Indeno(1,2,3-cd)pyrene	3,200			130 J	74 J	″		
Phenanthrene	50,000			370 J	110 J	″	14 BJ	
Pyrene	50,000			400 J	150 J	″	17 BJ	
Total SVOCs	500,000	50 J	48 J	3,742 J	1,072 J	″	120 J	
PCB/Pesticides (µg/kg or ppb)								
4,4'-DDE	2,100					NA	1.7 J	
4,4'-DDT	2,100					″	2.4 J	

Table 6-2 (continued).
Analytical Results for Subsurface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SB-1 12/09/04 5.3' - 6.1' Native	SB-2 12/08/04 0.8' - 1.4' Native	SB-3 12/08/04 1.2' - 1.9' Native	SB-4 12/07/04 0.9' - 1.4' Native	SB-4 12/07/04 8.0' - 10.0' Native	SB-5 12/09/04 1.0' - 1.5' Native	SB-6 12/07/04 0.6' - 2.2' Native
PCB/Pesticides (continued)								
Endrin	100.0		0.64 J		7.2 J	NA		
Endrin Aldehyde	NS					″	0.94 J	
PCBs (Total)	10,000	24 J		221 J	78 J	″	6.2 J	
Inorganic Compounds (mg/kg or ppm)								
Aluminum	SB (12,950)	5,270	**17,500**	**16,300**	**16,600**	NA	**14,400**	**16,200**
Antimony	SB (ND)					″		
Arsenic	7.5	3.5	6.3	7.1	7.0	″	5.4	5.2
Barium	300.0	28.4	91.3	158.0	121.0	″	56.9	95.9
Beryllium	SB (0.60)	0.29 B	**0.72**	**0.77**	**0.70 B**	″	0.55	**0.79**
Cadmium	1.0	0.23 B	0.35 B	0.61 B	0.49 B	″	0.41 B	0.31 B
Chromium	SB (27.5)	7.6	21.7	**61.2**	**50.0**	″	**29.8**	19.8
Cobalt	30.0	5.2 B	**62.8**	21.4	16.5	″	7.8	11.0
Copper	25.0	13.6	16.9	**33.9**	22.5	″	15.6	17.7
Iron	SB (18,300)	12,400	**29,000**	17,500	16,300	″	17,700	**24,100**
Lead	400.0	5.6	21.1	55.3	43.8	″	38.2	11.0
Manganese	SB (524.0)	457.0	**710.0**	**554.0**	377.0	″	213.0	341.0
Mercury	0.1		**0.112 N**	**0.843 N**	**0.407 N**	″	**0.139 N**	0.019 BN
Nickel	SB (23.4)	12.6	22.8	**42.1**	**32.1**	″	18.9	**26.1**

Table 6-2 (continued).
Analytical Results for Subsurface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SB-1 12/09/04 5.3' - 6.1' Native	SB-2 12/08/04 0.8' - 1.4' Native	SB-3 12/08/04 1.2' - 1.9' Native	SB-4 12/07/04 0.9' - 1.4' Native	SB-4 12/07/04 8.0' - 10.0' Native	SB-5 12/09/04 1.0' - 1.5' Native	SB-6 12/07/04 0.6' - 2.2' Native
Inorganic Compounds (continued)								
Selenium	2.0		1.6 B	1.7 B	1.4 B	NA	0.76 B	0.77 B
Silver	SB (ND)	**0.14 B**	**0.17 B**	**0.22 B**	**0.22 B**	″	**0.16 B**	**0.17 B**
Thallium	SB (ND)	**0.47 B**	**0.98 B**	**0.54 B**	**0.78 B**	″	**0.78 B**	**0.56 B**
Vanadium	150.0	12.7	29.5	47.3	38.3	″	30.5	29.3
Zinc	SB (89.0)	33.3 E	71.7 E	**108 E**	**91.8 E**	″	76.2 E	62.3 E

***** NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.
J Compound reported at an estimated concentration below the sample quantitation limit.
B Analyte detected in the associated blank, as well as in the sample (organics) or the value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).
E Estimated concentration due to the presence of interference (inorganics).
N Spike sample recovery or spike analysis is not within quality control limits (inorganics).
NS No standard or guidance value available.
NA Not analyzed.
SB Site Background.
Blanks indicate that the sample was analyzed for the associated compound but it was not detected.
Shaded values equal or exceed the NYSDEC TAGM 4046 soil cleanup objectives.

Table 6-2 (continued).
Analytical Results for Subsurface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SB-6 12/07/04 4.0' - 5.3' Native	SB-7 12/08/04 1.4' - 1.7' Native	SB-7 12/08/04 4.0' - 4.8' Native	SB-7 12/08/04 4.8' - 5.7' Native	SB-8 12/07/04 4.8' - 5.5' Native	SB-11 12/08/04 0.9' - 1.4' Fill	SB-12 12/08/04 4.0' - 5.6' Fill
Semivolatile Organic Compounds (µg/kg or ppb)								
Benzo(a)pyrene	61.0	NA	NA	**62 J**	NA			**120 J**
Benzo(a)anthracene	224.0	″	″	64 J	″			140 BJ
Benzo(b)fluoranthene	1,100	″	″	65 J	″			160 J
Benzo(g,h,i)perylene	50,000	″	″	61 J	″			
Bis(2-ethylhexyl)phthalate	50,000	″	″	280 J	″		110 J	
Chrysene	400.0	″	″	71 J	″			210 BJ
Fluoranthene	50,000	″	″	100 J	″		53 J	230 BJ
2-Methylnaphthalene	36,400	″	″		″			180 J
Naphthalene	13,000	″	″		″		55 J	110 J
Phenanthrene	50,000	″	″	89 J	″		50 J	240 BJ
Pyrene	50,000	″	″	89 J	″		50 J	180 BJ
Total SVOCs	500,000	″	″	881 J	″		318 J	1,570 J
PCB/Pesticides (µg/kg or ppb)								
a-BHC	110.0	NA	NA		NA			**130.0**
b-BHC	200.0	″	″		″			**230.0**
d-BHC	300.0	″	″		″			6.5 J
g-BHC (Lindane)	60.0	″	″		″			9.2 J
Endrin	100.0	″	″		″	1.7 J		
PCBs (Total)	10,000	″	″	1,700	″		1,100	

Table 6-2 (continued).
Analytical Results for Subsurface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SB-6 12/07/04 4.0' - 5.3' Native	SB-7 12/08/04 1.4' - 1.7' Native	SB-7 12/08/04 4.0' - 4.8' Native	SB-7 12/08/04 4.8' - 5.7' Native	SB-8 12/07/04 4.8' - 5.5' Native	SB-11 12/08/04 0.9' - 1.4' Fill	SB-12 12/08/04 4.0' - 5.6' Fill
Inorganic Compounds (mg/kg or ppm)								
Aluminum	SB (12,950)	NA	NA	9,870	NA	7,570	1,760	9,060
Antimony	SB (ND)	″	″	**2.6 BN**	″		**0.83 BN**	**0.49 BN**
Arsenic	7.5	″	″	**13.4**	″	3.2	2.7	5.5
Barium	300.0	″	″	82.3	″	32.9	17.1 B	117.0
Beryllium	SB (0.60)	″	″	**0.62 B**	″	0.40 B	0.12 B	0.48 B
Cadmium	1.0	″	″	**9.8**	″	0.16 B	**2.1**	0.96
Chromium	SB (27.5)	″	″	**101.0**	″	10.2	18.7	24.7
Cobalt	30.0	″	″	8.9	″	4.9 B	1.5 B	7.6
Copper	25.0	″	″	**146.0**	″	14.1	**26.0**	**672.0**
Iron	SB (18,300)	″	″	**31,800**	″	11,800	9,140	14,700
Lead	400.0	″	″	**695.0**	″	5.5	104.0	96.5
Manganese	SB (524.0)	″	″	**1,430**	″	166.0	329.0	389.0
Mercury	0.1	″	″	**0.531 N**	″	0.018 BN	**0.149 N**	**0.270 N**
Nickel	SB (23.4)	″	″	**36.2**	″	12.4	9.5	**25.3**
Selenium	2.0	″	″	**2.5 B**	″		0.51 B	0.68 B
Silver	SB (ND)	″	″	**2.4**	″	**0.14 B**	**0.44 B**	**0.79 B**
Thallium	SB (ND)	″	″	**0.93 B**	″	**0.57 B**		**1.0**
Vanadium	150.0	″	″	24.4	″	17.7	5.4 B	22.7
Zinc	SB (89.0)	″	″	**2,000 E**	″	34.6 E	**336 E**	**149 E**

Table 6-2 (continued).
Analytical Results for Subsurface Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	SB-6 12/07/04 4.0' - 5.3' Native	SB-7 12/08/04 1.4' - 1.7' Native	SB-7 12/08/04 4.0' - 4.8' Native	SB-7 12/08/04 4.8' - 5.7' Native	SB-8 12/07/04 4.8' - 5.5' Native	SB-11 12/08/04 0.9' - 1.4' Fill	SB-12 12/08/04 4.0' - 5.6' Fill

*	NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.
J	Compound reported at an estimated concentration below the sample quantitation limit.
B	Analyte detected in the associated blank, as well as in the sample (organics) or the value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).
E	Estimated concentration due to the presence of interference (inorganics).
N	Spike sample recovery or spike analysis is not within quality control limits (inorganics).
NA	Not analyzed.
SB	Site Background.
	Blanks indicate that the sample was analyzed for the associated compound but it was not detected.
	Shaded values equal or exceed the NYSDEC TAGM 4046 soil cleanup objectives.

Table 6-3.
Analytical Results for Background Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	BS-1 04/18/06 0.17' - 0.58' Subsoil	BS-2 04/18/06 0.17' - 0.5' RBSC	BS-3 04/18/06 0.0' - 0.17' Topsoil
Semivolatile Organic Compounds (µg/kg or ppb)				
Acenaphthene	50,000	61 J		
Acenaphthylene	41,000	290 J		
Anthracene	50,000	270 J		
Benzo(a)pyrene	61.0	**1,200**	34 J	**380 J**
Benzo(a)anthracene	224.0	**1,300**	36 J	**380 J**
Benzo(b)fluoranthene	1,100	**1,700**	40 J	460 J
Benzo(g,h,i)perylene	50,000	600.0	28 J	270 J
Benzo(k)fluoranthene	1,100	720.0		180 J
Bis(2-ethylhexyl)phthalate	50,000	310 J	87 J	230 J
Butylbenzylphthalate	50,000	46 J		
Carbazole	NS	190 J		
Chrysene	400.0	**1,400**	44 J	**420 J**
Dibenzo(a,h)anthracene	14.0	**210 J**		
Dibenzofuran	6,200	38 J		
Fluoranthene	50,000	2,500	71 J	740 J
Indeno(1,2,3-cd)pyrene	3,200	620.0	25 J	270 J
2-Methylnaphthalene	36,400	29 J		
Naphthalene	13,000	54 J		
Phenanthrene	50,000	830.0	56 J	400 J
Pyrene	50,000	1,700	59 J	550 J
Total SVOCs	500,000	14,068	480.0	4,280
PCB/Pesticides (µg/kg or ppb)				
4,4'-DDE	2,100	66 J	8.5	
4,4'-DDT	2,100	88.0	9.8	
alpha-BHC	110.0	55 J	7.3 J	
beta-BHC	200.0		31.0	
gamma-BHC (Lindane)	60.0		5.2 J	
PCBs (Total)	10,000	290.0		

Table 6-3 (continued).
Analytical Results for Background Soil Samples Collected During the Site Investigation of the 59th Street Site.

Sample Number Date Sampled Sample Depth Sample Type	TAGM 4046 Soil Cleanup Objective *	BS-1 04/18/06 0.17' - 0.58' Subsoil	BS-2 04/18/06 0.17' - 0.5' RBSC	BS-3 04/18/06 0.0' - 0.17' Topsoil
Inorganic Compounds (mg/kg or ppm)				
Aluminum	SB	9,900	15,100	10,800
Antimony	SB			
Arsenic	7.5 or SB	**14.8**	5.6	6.2
Barium	300.0 or SB	254.0	136.0	116.0
Beryllium	0.16 or SB	**0.58**	**0.73**	**0.46**
Cadmium	1.0 or SB	**3.1**	0.44	0.69
Chromium	10.0 or SB	**58.6**	**28.2**	**26.7**
Cobalt	30.0 or SB	24.4	13.4	8.5
Copper	25.0 or SB	**55.6**	**29.2**	19.1
Iron	2,000 or SB	**16,800**	**22,500**	**14,100**
Lead	400.0	318.0	21.7	37.6
Manganese	SB	1,100	600.0	448.0
Mercury	0.1	**0.65**	**0.21**	**0.36**
Nickel	13.0 or SB	**42.9**	**28.3**	**18.4**
Selenium	2.0 or SB			
Silver	SB			
Thallium	SB			
Vanadium	150.0 or SB	40.2	32.7	38.9
Zinc	20.0 or SB	**324.0**	**94.8**	**83.2**

***** **NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.**
RBSC **Reddish brown silty clay.**
J **Compound reported at an estimated concentration below the sample quantitation limit.**
NS **No standard or guidance value available.**
SB **Site Background.**
Blanks indicate that the sample was analyzed for the associated compound but it was not detected.
Shaded values equal or exceed the NYSDEC TAGM 4046 soil cleanup objectives.

Table 6-4.
Analytical Results for Groundwater Samples Collected During the Site Investigation of the 59th Street Site.

Well Number Date Sampled	Groundwater Standards *	MW-1 04/26/06	MW-2 04/26/06	MW-3 04/26/06	MW-4 04/26/06	MW-5 04/26/06	MW-6 04/26/06	MW-7 04/26/06
Inorganic Compounds (µg/L)								
Aluminum	NS	5,600	8,400	8,600	5,500	4,000	10,000	5,100
Antimony	3.0							
Arsenic	25.0							
Barium	1,000	97.0	88.0	67.0	72.0	45.0	67.0	45.0
Beryllium	3.0 G							
Cadmium	5.0							
Chromium	50.0	6.6	11.0	9.8	6.8	4.4	14.0	5.6
Cobalt	NS						4.3	
Copper	200.0		13.0	10.0			16.0	
Iron	300.0	**6,200**	**9,100**	**8,800**	**5,300**	**6,200**	**13,700**	**5,200**
Lead	25.0						5.0	
Manganese	300.0	60.0	93.0	95.0	80.0	60.0	130.0	47.0
Mercury	0.7							
Nickel	100.0		10.0				13.0	
Selenium	10.0							
Silver	50.0							
Thallium	0.5 G							
Vanadium	25.0 G	12.0	20.0	17.0	12.0	10.0	22.0	11.0
Zinc	2,000 G	21.0	33.0	25.0	19.0	16.0	48.0	17.0

Table 6-4 (continued).
Analytical Results for Groundwater Samples Collected During the Site Investigation of the 59th Street Site.

*	NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998.
G	Guidance value.
NS	No standard or guidance value available.
	Blanks indicate that the sample was analyzed for the associated compound but it was not detected.
	Shaded values equal or exceed groundwater standards or guidance values.

APPENDIX A

STRATIGRAPHIC LOGS AND WELL CONSTRUCTION DIAGRAMS

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-1/MW-1
Site Number:	932116	**Date Completed:**	12/09/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.49**				
0.0	1.5' recovery		1			
	0.0'-0.1': Dark brown topsoil with many rootlets. Moist.	571.49				
	0.1'-1.5': Light gray silty clay with dark brown (0.1'-0.6' depth) and orange (0.6'-1.5' depth) mottling. Higher silt content in the upper 1.3' of unit. Moist. NATIVE.	571.39				
4.0	3.7' recovery		2			
	4.0'-4.4': Sample same as above. NATIVE.					
	4.4'-6.1': Yellow brown, fine-grained sand with orange mottling and a few silty clay layers. Mottling decreases with depth. No pebbles. Saturated at 5.2' bgs. NATIVE.	567.09				
	6.1'-8.0': Reddish brown silty clay with orange and gray mottling. No pebbles. Stiff. Moist. NATIVE.	565.39				
8.0	2.0' recovery		3			
	8.0'-8.2': Sample same as above. NATIVE.					
	8.2'-8.6': Yellow brown, fine-grained sand with a trace of orange mottling. No pebbles. Saturated. NATIVE.	563.29				
	8.6'-10.0' Chocolate brown clay with trace reddish brown layering. No pebbles. Very stiff. Moist. NATIVE.	562.89				
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-2/MW-2
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.67**				
0.0	2.6' recovery		1			1.4
	0.0'-0.4': Dark brown silty clay with many rootlets and a few rock fragments.	571.67				
	0.4'-0.8': Concrete fragments. FILL.	571.27				
	0.8'-2.6': Light gray silty clay with orange and brown mottling. Some rootlets. Stiff. Moist. NATIVE.	570.87				
4.0	3.8' recovery		2			
	4.0'-4.4': Sample same as above. NATIVE.					
	4.4'-6.2': Yellow brown, fine-grained sand with orange mottling. No pebbles. Saturated at 5.2' bgs. NATIVE.	567.27				
	6.2'-8.0': Reddish brown silty clay with orange mottling that decreases with depth. Color becomes chocolate brown with depth. Very stiff. Moist. NATIVE.	565.47				1.8
8.0	2.0' recovery		3			
	8.0'-10.0': Chocolate brown clay with trace reddish brown layering. No pebbles or mottling. Very stiff. Moist. NATIVE.	563.67				
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-3/MW-3
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.50**				
0.0	2.5' recovery		1			5.5
	0.0'-1.2': Reddish brown silty clay with many rootlets and rock fragments. Moist. Sharp contact with lower unit. FILL.	571.50				
	1.2'-1.9': Dark brown clayey silt with some fine sand and few rootlets. Moist. NATIVE.	570.30				
	1.9'-2.5': Light gray silty clay with orange mottling. No pebbles. Stiff. Moist. NATIVE.	569.60				
4.0	3.8' recovery		2			
	4.0'-4.7': Sample same as above with fine-grained sand content increasing with depth. NATIVE.					
	4.7'-5.8': Yellow brown, fine-grained sand with orange mottling. Silty clay seam from 5.4'-5.7' bgs. NATIVE.	566.80				
	5.8'-8.0': Reddish brown silty clay with orange and light gray mottling that disappears with depth. Color becomes chocolate brown with depth. Stiff. Moist. NATIVE.	565.70				2.0
8.0	1.6' recovery		3			
	8.0'-9.6': Chocolate brown clay with trace reddish brown layering. No pebbles. Very stiff. Moist. NATIVE.	563.50				
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-4/MW-4
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.84**				
0.0	3.0' recovery		1			0.0
	0.0'-0.7': Dark brown silty clay with many rootlets and some rock fragments.	571.84				
	0.7'-0.9': Rock fragments with black coal fines? FILL.	571.14				
	0.9'-1.4': Dark brown silty clay with rootlets. NATIVE.	570.94				
	1.4'-3.0': Light gray silty clay with orange mottling. No pebbles. Stiff. Moist. NATIVE.	570.44				
4.0	3.7' recovery		2			
	4.0'-5.6': Yellow brown, fine-grained sand with orange mottling. No pebbles. Saturated. NATIVE.	567.84				2.9
	5.6'-8.0': Reddish brown silty clay with orange mottling that disappears with depth. Color becomes chocolate brown with depth. Stiff. Moist. NATIVE.	566.24				3.2
8.0	1.9' recovery		3			
	8.0'-9.9': Chocolate brown clay with no mottling or pebbles. Very stiff. Moist. NATIVE.	563.84				225
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-5/MW-5
Site Number:	932116	**Date Completed:**	12/09/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**572.89**				
0.0	2.3' recovery		1			
	0.0'-0.2': Dark brown topsoil with many rootlets. No pebbles. Moist.	572.89				
	0.2'-0.4': Dark brown silty clay with rootlets and few pebbles. Moist. FILL.	572.69				
	0.4'-0.8': Brick fragments with some soil. FILL.	572.49				
	0.8'-2.3': Light gray silty clay with dark gray (0.8'-1.0' depth) and heavy orange (1.0'-2.3' depth) mottling. Higher silt content than previous borings. Soft. Moist. NATIVE.	572.09				
4.0	3.7' recovery		2			
	4.0'-5.3': Sample same as above. NATIVE.					
	5.3'-7.0': Yellow brown, fine-grained sand with orange mottling and a few silty clay layers. No pebbles. Saturated. NATIVE.	567.59				
	7.0'-8.0': Reddish brown silty clay with orange and black mottling. Stiff. Moist. NATIVE.	565.89				
8.0	2.0' recovery		3			
	8.0'-11.6' Sample same as above grading to chocolate brown clay with no mottling. No pebbles. Stiff. Moist. NATIVE.	564.89				
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-6/MW-6
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**570.96**				
0.0	2.2' recovery		1			
	0.0'-0.1': Dark brown topsoil with many rootlets.	570.96				
	0.1'-0.6': Dark brown silty clay with many rock fragments, rootlets. NATIVE.	570.86				
	0.6'-2.2': Light gray silty clay with yellow brown mottling. No pebbles. Moist. NATIVE.	570.36				1.8
4.0	4.0' recovery		2			
	4.0'-5.3': Yellow brown, fine-grained sand with orange mottling. No pebbles. Saturated. NATIVE.	566.96				1.8
	5.3'-8.0': Reddish brown silty clay with gray mottling that disappears with depth. Color becomes chocolate brown with depth. No pebbles. Stiff. Slightly moist. NATIVE.	565.66				167
8.0	1.7' recovery		3			
	8.0'-9.7': Chocolate brown clay with no pebbles or mottling. Stiff. Slightly moist. NATIVE.	562.96				1.8
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-7
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.50**				
0.0	2.7' recovery		1			
	0.0'-1.4': Brown silty clay with mottling, rootlets and rock fragments. Stiff. Moist. FILL.	571.50				
	1.4'-1.7': Black topsoil-like material with many rootlets and a few rock fragments. FILL.	570.10				48.1
	1.7'-2.7': Black silty clay with sand, one large sandstone fragment (possible foundry sand) and some rootlets. FILL.	569.80				
4.0	3.8' recovery		2			
	4.0'-4.8': Black stained, fine-grained sand with some orange mottling. Moist. NATIVE.	567.50				
	4.8'-5.7': Yellow brown, fine-grained sand with orange mottling. No pebbles. Saturated. NATIVE.	566.70				59.9
	5.7'-8.0': Reddish brown silty clay with light gray mottling. Very stiff. Moist. NATIVE.	565.80				
8.0	2.1' recovery		3			
	8.0'-10.1': Chocolate brown clay with no pebbles or mottling. Stiff. Moist. NATIVE.	563.50				17.9
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-8
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	16.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.57**				
0.0	0.8' recovery		1			2.0
	0.0'-0.2': Dark brown topsoil with many rootlets.	571.57				
	0.2'-0.8': Reddish brown silty clay with rootlets, rock fragments and mottling. FILL.	571.37				
4.0	4.0' recovery		2			
	4.0'-4.8': Light gray silty clay with orange mottling. Moist. NATIVE.	567.57				
	4.8'-6.1': Yellow brown, fine-grained sand with orange mottling. No pebbles. Saturated. NATIVE.	566.77				1.1
	6.1'-8.0': Reddish brown silty clay with mottling that disappears with depth. Color becomes chocolate brown with depth. No pebbles. Stiff. Moist. NATIVE.	565.47				1.5
8.0	1.1' recovery		3			
	8.0'-9.1': Chocolate brown clay. Very stiff. Moist. NATIVE.	563.57				0.6
12.0	0.0' recovery		4			
16.0	BOH=16.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-9
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	8.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.40**				
0.0	0.0'-0.3': Dark brown topsoil with many rootlets.	571.40	1			2.0
	0.3'-1.9': Reddish brown silty clay with rootlets, rock fragments and mottling. FILL.	571.10				
	1.9'-2.3': Black topsoil with rootlets. NATIVE.	569.50				
	2.3'-4.0': Light gray silty clay with orange mottling. No pebbles. NATIVE.	569.10				
4.0	4.0' recovery		2			1.2
	4.0'-4.3': Sample same as above. NATIVE.					
	4.3'-5.1': Yellow brown, fine-grained sand with orange mottling. Saturated. NATIVE.	567.10				
	5.1'-8.0': Reddish brown silty clay with gray mottling that disappears with depth. Color becomes chocolate brown with depth. No pebbles. Stiff. Moist. NATIVE.	566.30				
8.0	BOH=8.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-10
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	4.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.09**				
0.0	3.5' recovery		1			1.9
	0.0'-0.3': Dark brown topsoil with rootlets and pebbles.	571.09				
	0.3'-0.9': Reddish brown silty clay with rock fragments. FILL.	570.79				
	0.9'-1.6': Dark brown silty clay with rootlets and slight mottling that grades to light gray silty clay with orange mottling. NATIVE.	570.19				
	1.6'-3.5': Light gray silty clay with orange mottling. Trace fine-grained, yellow brown sand at bottom of sample. NATIVE.	569.49				
4.0	BOH=4.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-11/MW-7
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	12.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.48**				
0.0	3.2' recovery		1			
	0.0'-0.1': Dark brown silty clay with many rootlets.	571.48				
	0.1'-0.4': Rock fragments. FILL.	571.38				
	0.4'-0.9': Reworked soil with rock fragments, sand and rootlets. FILL.	571.08				
	0.9'-1.4': Sand stained black with slag. FILL.	570.58				
	1.4'-1.6': Dark brown, reworked soil with cinders. Moist. FILL.	570.08				
	1.6'-3.2': Light gray silty clay with orange and dark brown mottling. No pebbles. Stiff. Moist. NATIVE.	569.88				
4.0	3.7' recovery		2			
	4.0'-4.4': Sample same as above. NATIVE.					
	4.4'-5.0': Yellow brown, fine-grained sand with orange mottling. No pebbles. Saturated. NATIVE.	567.08				
	5.0'-8.0': Reddish brown silty clay with orange and light gray mottling that decreases with depth. Color becomes chocolate brown with depth. Very stiff. Moist. NATIVE.	566.48				2.3
8.0	2.1' recovery		3			
	8.0'-10.1': Chocolate brown clay with no mottling or pebbles. Very stiff. Moist. NATIVE.	563.48				
12.0	BOH=12.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

NYSDEC - Region 9 - Division of Environmental Remediation
Stratigraphic Log (Overburden)

Project Name:	59th Street Site	**Hole Designation:**	SB-12
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Logged By:	Glenn M. May	**Drilling Method:**	Direct Push
Total Depth:	16.0 feet	**Sampling Method:**	Macro Core

Depth (ft bgs)	Stratigraphic Description & Remarks	Elevation (ft amsl)	Sample			
			NUMBER	COUNT	N VALUE	HNU
	Ground Surface	**571.68**				
0.0	2.3' recovery		1			
	0.0'-1.0': Reworked brown silty clay with many rootlets and a few pebbles. FILL.	571.68				
	1.0'-1.3': Rock fragments with soil. FILL.	570.68				
	1.3'-2.3': Reworked brown soil with some sand, trace of slag, and rock fragments. FILL.	570.38				
4.0	3.7' recovery		2			
	4.0'-5.6': Reworked soil with sand, many rock fragments and a black tar-like material. Moist to saturated. FILL.	567.68				
	5.6'-8.0': Reddish brown silty clay with orange and light gray mottling that decreases with depth. Color becomes chocolate brown with depth. Very stiff. Moist. NATIVE.	566.08				
8.0	2.8' recovery		3			
	8.0'-10.8': Chocolate brown clay with trace reddish brown layering. No pebbles. Very stiff. Moist. NATIVE.	563.68				
12.0	0.0' recovery		4			
16.0	BOH=16.0' bgs.					

Notes: Measuring Point Elevations May Change: Refer to Current Elevation Table

Grain Size ◯ Water Found ▽ Static Level ▼

MONITORING WELL CONSTRUCTION LOG

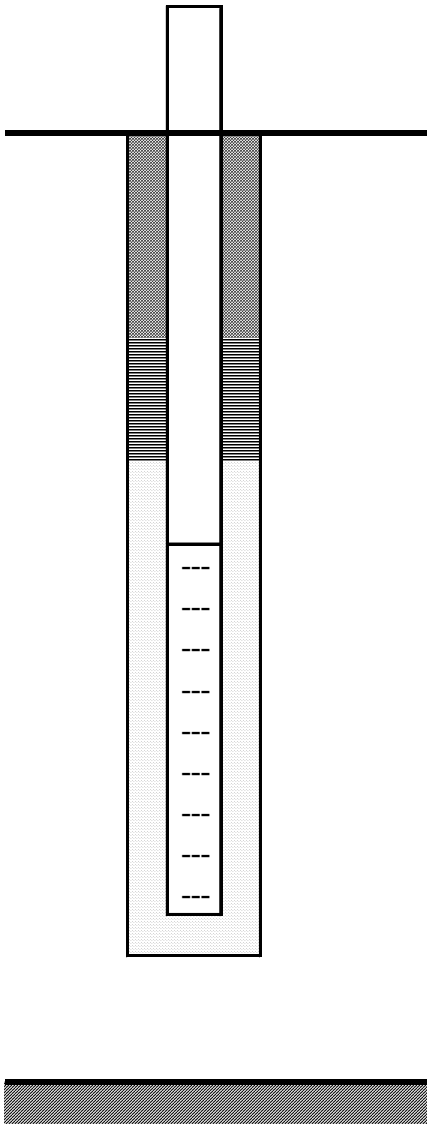
Project Name:	59th Street Site	**Hole Designation:**	MW-1
Site Number:	932116	**Date Completed:**	12/09/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	9.5 feet

Top of Riser: 2.89 ft above ground surface

Top of Seal: 1.0 ft bgs

Top of Filter Pack: 3.5 ft bgs

Top of Screen: 4.5 ft bgs



Bottom of Screen: 9.5 ft bgs

Bottom of Filter Pack: 12.0 ft bgs

MONITORING WELL CONSTRUCTION LOG

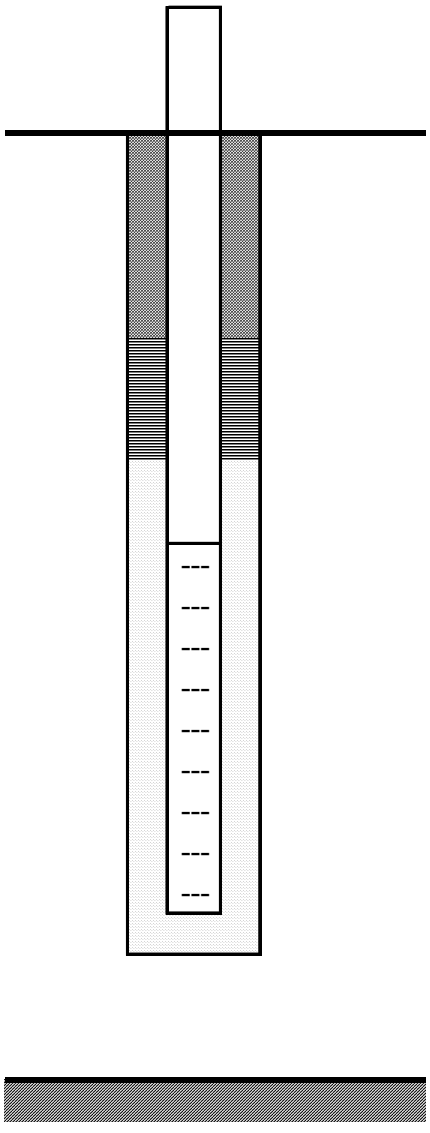
Project Name:	59th Street Site	**Hole Designation:**	MW-2
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	10.0 feet

Top of Riser: 2.90 ft above ground surface

Top of Seal: 1.0 ft bgs

Top of Filter Pack: 4.0 ft bgs

Top of Screen: 5.0 ft bgs



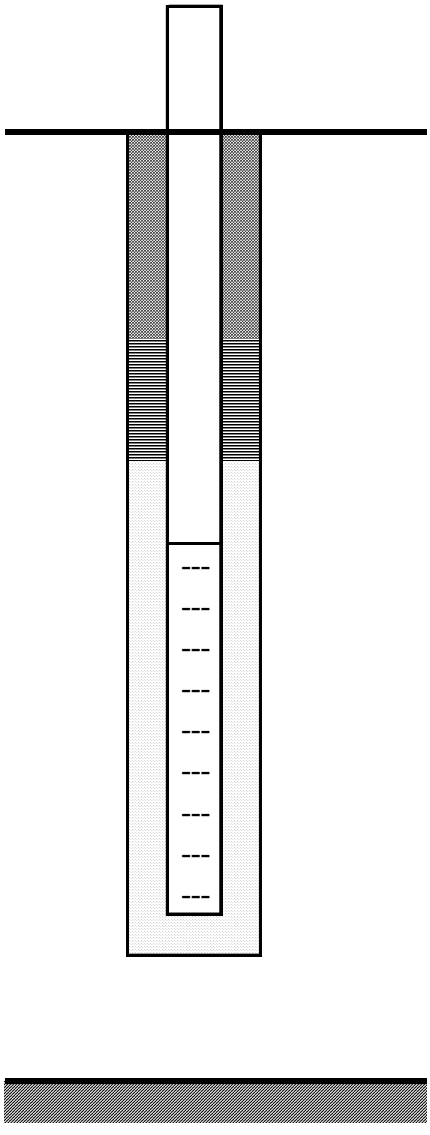
Bottom of Screen: 10.0 ft bgs

Bottom of Filter Pack: 12.0 ft bgs

MONITORING WELL CONSTRUCTION LOG

Project Name:	59th Street Site	**Hole Designation:**	MW-3
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	10.0 feet

Top of Riser: -0.25 ft above ground surface



Top of Seal: 1.0 ft bgs

Top of Filter Pack: 4.0 ft bgs

Top of Screen: 5.0 ft bgs

Bottom of Screen: 10.0 ft bgs

Bottom of Filter Pack: 12.0 ft bgs

MONITORING WELL CONSTRUCTION LOG

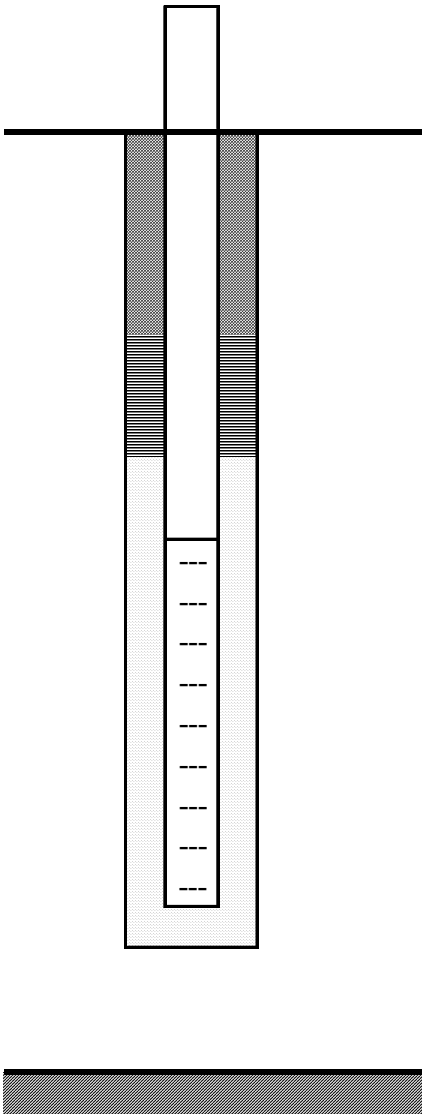
Project Name:	59th Street Site	**Hole Designation:**	MW-4
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	9.5 feet

Top of Riser: 2.91 ft above ground surface

Top of Seal: 1.0 ft bgs

Top of Filter Pack: 4.0 ft bgs

Top of Screen: 4.5 ft bgs



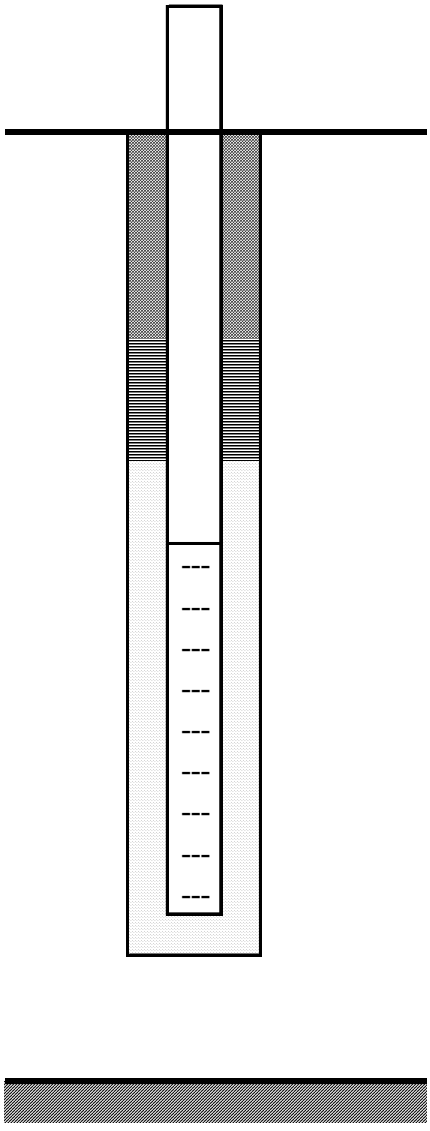
Bottom of Screen: 9.5 ft bgs

Bottom of Filter Pack: 12.0 ft bgs

MONITORING WELL CONSTRUCTION LOG

Project Name:	59th Street Site	**Hole Designation:**	MW-5
Site Number:	932116	**Date Completed:**	12/09/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	10.0 feet

Top of Riser: 3.16 ft above ground surface



Top of Seal: 1.0 ft bgs

Top of Filter Pack: 4.0 ft bgs

Top of Screen: 5.0 ft bgs

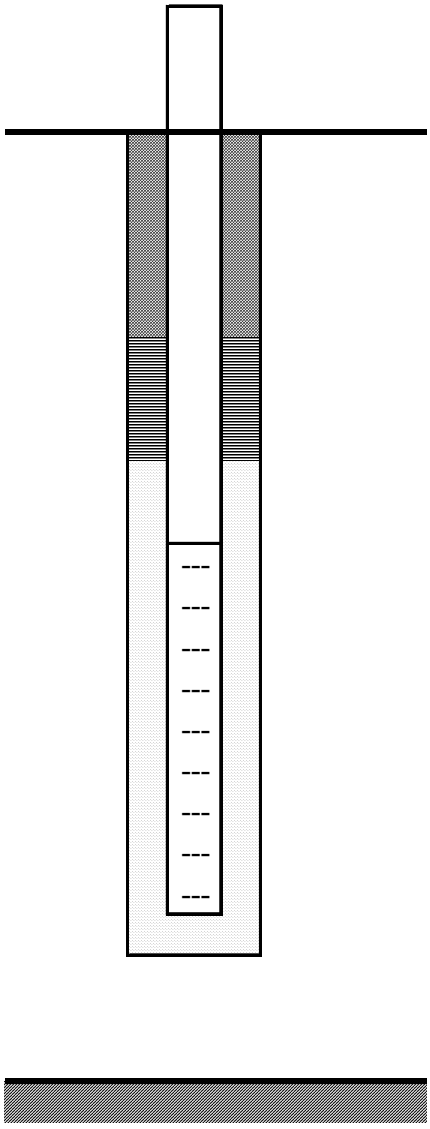
Bottom of Screen: 10.0 ft bgs

Bottom of Filter Pack: 12.0 ft bgs

MONITORING WELL CONSTRUCTION LOG

Project Name:	59th Street Site	**Hole Designation:**	MW-6
Site Number:	932116	**Date Completed:**	12/07/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	10.0 feet

Top of Riser: 2.94 ft above ground surface



Top of Seal: 3.0 ft bgs

Top of Filter Pack: 4.0 ft bgs

Top of Screen: 5.0 ft bgs

Bottom of Screen: 10.0 ft bgs

Bottom of Filter Pack: 12.0 ft bgs

MONITORING WELL CONSTRUCTION LOG

Project Name:	59th Street Site	**Hole Designation:**	MW-7
Site Number:	932116	**Date Completed:**	12/08/04
Location:	Niagara Falls, New York	**Drilling Company:**	C&W Environmental
Screen Type:	PVC	**Casing Type:**	PVC
Screen Diameter:	1.0 inch	**Casing Diameter:**	1.0 inch
Screen Length:	5.0 feet	**Total Well Depth:**	9.5 feet

Top of Riser: 2.90 ft above ground surface

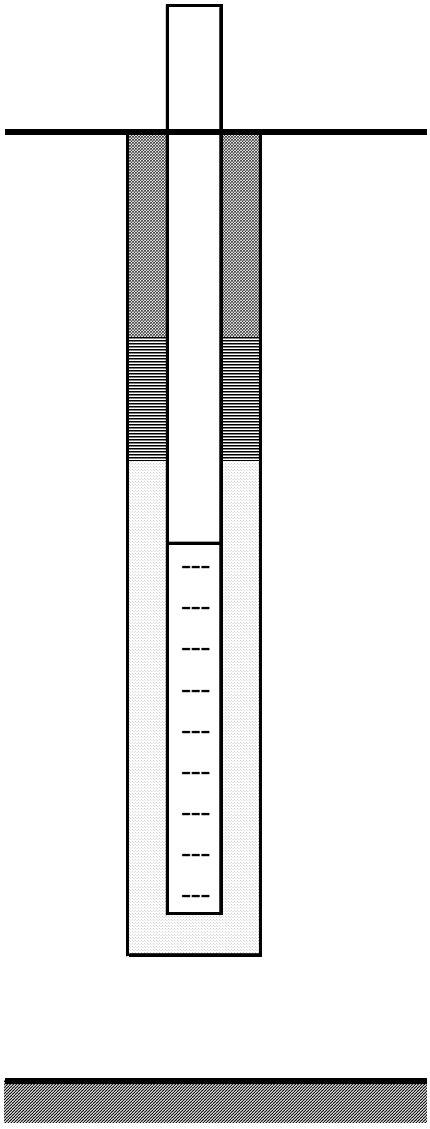
Top of Seal: 1.0 ft bgs

Top of Filter Pack: 3.5 ft bgs

Top of Screen: 4.5 ft bgs

Bottom of Screen: 9.5 ft bgs

Bottom of Filter Pack: 12.0 ft bgs



APPENDIX B

WELL DEVELOPMENT &
PURGE AND SAMPLE LOGS

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19 & 20, 2006	
START DEVELOPMENT: April 19, 2006 at 1105	END DEVELOPMENT: April 20, 2006 at 1312

WELL NUMBER: **MW-1**

1. TOTAL CASING AND SCREEN LENGTH (FT): **11.60**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **3.70**
4. VOLUME OF WATER IN CASING (GAL): **0.32**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **3.24** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.5	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0
DATE	April 19, 2006					April 20, 2006				
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	1105	1211	1252	1402	1532	0903	1007	1102	1213	1312

April 19, 2006: Soft bottom. Purged dry after 1.5 quarts. Very turbid and medium brown in color. A large quantity of very fine grained sand observed in purge container. Hard bottom after purging. Final purge much less turbid than initial purge but still quite turbid.

April 20, 2006: Initial purge very turbid ,but a large quantity of very fine grained sand was not observed in the purge container. Final purge still quite turbid but less than at the start of well development. This well was purged dry 10 times.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19 & 20, 2006	
START DEVELOPMENT: April 19, 2006 at 1023	END DEVELOPMENT: April 20, 2006 at 1309

WELL NUMBER: **MW-2**

1. TOTAL CASING AND SCREEN LENGTH (FT): **11.57**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.42**
4. VOLUME OF WATER IN CASING (GAL): **0.29**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **2.93** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

PARAMETERS	VOLUME PURGED (QUARTS)									
	1.5	1.0	1.0	1.0	1.0	1.0	1.0	0.8	1.0	1.0
DATE	April 19, 2006					April 20, 2006				
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	1023	1137	1248	1400	1503	0854	1002	1100	1211	1309

April 19, 2006: Soft bottom. Purged dry after 1.5 quarts. Very turbid and medium brown in color. A large quantity of very fine grained sand observed in purge container. Hard bottom after purging. Final purge much less turbid than initial purge but still quite turbid.

April 20, 2006: Initial purge very turbid ,but a large quantity of very fine grained sand was not observed in the purge container. Final purge still quite turbid but less than at the start of well development. This well was purged dry 10 times.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19 & 20, 2006	
START DEVELOPMENT: April 19, 2006 at 1018	END DEVELOPMENT: April 20, 2006 at 1306

WELL NUMBER: **MW-3**

1. TOTAL CASING AND SCREEN LENGTH (FT): **10.14**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **2.32**
4. VOLUME OF WATER IN CASING (GAL): **0.32**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **3.21** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

PARAMETERS	VOLUME PURGED (QUARTS)									
	1.5	1.3	1.0	1.0	1.7	1.0	1.0	1.0	1.0	1.0
DATE	April 19, 2006					April 20, 2006				
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	1018	1140	1250	1358	1506	0856	0959	1059	1209	1306

April 19, 2006: Hard bottom. Purged dry after 1.5 quarts. Very turbid and medium brown in color. A small quantity of very fine grained sand observed in purge container. Final purge much less turbid than initial purge but still quite turbid.

April 20, 2006: Initial purge very turbid , with a large quantity of very fine grained sand observed in the purge container. Final purge still quite turbid but less than at the start of well development. This well was purged dry 10 times.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19 & 20, 2006	
START DEVELOPMENT: April 19, 2006 at 1029	END DEVELOPMENT: April 20, 2006 at 1303

WELL NUMBER: **MW-4**

1. TOTAL CASING AND SCREEN LENGTH (FT): **12.00**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.32**
4. VOLUME OF WATER IN CASING (GAL): **0.31**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **3.15** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
DATE	April 19, 2006					April 20, 2006				
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	1029	1134	1246	1356	1500	0851	0957	1056	1207	1303

April 19, 2006: Soft bottom. Purged dry after 1.5 quarts. Very turbid and medium brown in color. A large quantity of very fine grained sand observed in purge container. Hard bottom after purging. Final purge much less turbid than initial purge but still quite turbid.

April 20, 2006: Initial purge very turbid ,but a large quantity of very fine grained sand was not observed in the purge container. Final purge lighter in color and much less turbid than at the start of well development. This well was purged dry 10 times.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19 & 20, 2006	
START DEVELOPMENT: April 19, 2006 at 1110	END DEVELOPMENT: April 20, 2006 at 1316

WELL NUMBER: **MW-5**

1. TOTAL CASING AND SCREEN LENGTH (FT): **11.61**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **5.83**
4. VOLUME OF WATER IN CASING (GAL): **0.24**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **2.37** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

PARAMETERS	VOLUME PURGED (QUARTS)									
	2.0	1.0	1.0	2.0	1.0	1.5	1.0	1.0	1.0	1.0
DATE	April 19, 2006					April 20, 2006				
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	1105	1211	1252	1402	1532	0903	1007	1102	1213	1312

April 19, 2006: Soft bottom. Purged dry after 2.0 quarts. Very turbid and medium brown in color. A large quantity of very fine grained sand observed in purge container. Hard bottom after purging. Final purge still very turbid.

April 20, 2006: Initial purge very turbid ,but a large quantity of very fine grained sand was not observed in the purge container. Final purge just as turbid as at the start of well development. This well was purged dry 10 times.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19, 2006	
START DEVELOPMENT: 0935	END DEVELOPMENT: 1128

WELL NUMBER: **MW-6**

1. TOTAL CASING AND SCREEN LENGTH (FT): **13.08**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.65**
4. VOLUME OF WATER IN CASING (GAL): **0.35**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **3.46** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

PARAMETERS	VOLUME PURGED (QUARTS)									
	1.3	Dry								
DATE	April 19, 2006									
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	0935	1128								

April 19, 2006: Hard bottom. Purged dry after 1.33 quarts. Very turbid and medium brown in color. A large quantity of very fine grained sand observed in purge container. Still dry at 1128 so well development was stopped.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL DEVELOPMENT LOG

SITE NAME: 59th Street Site	SITE NUMBER: 932116
DEVELOPER: Glenn M. May	
DEVELOPMENT DATE: April 19 & 20, 2006	
START DEVELOPMENT: April 19, 2006 at 1008	END DEVELOPMENT: April 20, 2006 at 1259

WELL NUMBER: **MW-7**

1. TOTAL CASING AND SCREEN LENGTH (FT): **12.55**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.94**
4. VOLUME OF WATER IN CASING (GAL): **0.31**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 10 CASINGS: **3.12** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.5	1.3	1.0	1.0	1.7	1.0	1.0	1.0	1.0	1.0
DATE	April 19, 2006					April 20, 2006				
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
TIME	1008	1132	1240	1353	1451	0848	0955	1054	1205	1259

April 19, 2006: Hard bottom. Purged dry after 1.5 quarts. Very turbid and medium brown in color. A large quantity of very fine grained sand observed in purge container. Final purge still very turbid.

April 20, 2006: Initial purge very turbid ,but a large quantity of very fine grained sand was not observed in the purge container. Final purge just as turbid as at the start of well development. This well was purged dry 10 times.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site	SITE NUMBER:	932116
SAMPLER:	Glenn M. May		
PURGE DATE:	April 25, 2006	START PURGE: 1154	END PURGE: 1415
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1050 thru 1811

WELL NUMBER: **MW-1**

1. TOTAL CASING AND SCREEN LENGTH (FT): **11.60**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **3.29**
4. VOLUME OF WATER IN CASING (GAL): **0.34**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 3 CASINGS: **1.02** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	1.0	1.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1154	1240	1415							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process needed to be completed seven times in order to fill all the bottles.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site	SITE NUMBER:	932116
SAMPLER:	Glenn M. May		
PURGE DATE:	April 25, 2006	START PURGE: 1147	END PURGE: 1412
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1103 thru 1813

WELL NUMBER: **MW-2**

1. TOTAL CASING AND SCREEN LENGTH (FT): **11.57**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.07**
4. VOLUME OF WATER IN CASING (GAL): **0.31**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 3 CASINGS: **0.92** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	1.0	1.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1147	1239	1412							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process needed to be completed seven times in order to fill all the bottles.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site	SITE NUMBER:	932116
SAMPLER:	Glenn M. May		
PURGE DATE:	April 25, 2006	START PURGE: 1206	END PURGE: 1413
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1106 thru 1752

WELL NUMBER: **MW-3**

1. TOTAL CASING AND SCREEN LENGTH (FT): **10.14**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **2.31**
4. VOLUME OF WATER IN CASING (GAL): **0.32**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 3 CASINGS: **0.96** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	1.0	1.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1206	1242	1413							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process needed to be completed seven times in order to fill all the bottles.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site	SITE NUMBER:	932116
SAMPLER:	Glenn M. May		
PURGE DATE:	April 25, 2006	START PURGE: 1135	END PURGE: 1410
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1101 thru 1809

WELL NUMBER: **MW-4**

1. TOTAL CASING AND SCREEN LENGTH (FT): **12.00**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.02**
4. VOLUME OF WATER IN CASING (GAL): **0.33**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 3 CASINGS: **0.98** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	1.0	1.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1135	1237	1410							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process needed to be completed seven times in order to fill all the bottles.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site	SITE NUMBER:	932116
SAMPLER:	Glenn M. May		
PURGE DATE:	April 25, 2006	START PURGE: 1312	END PURGE: 1444
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1047 thru 1754

WELL NUMBER: **MW-5**

1. TOTAL CASING AND SCREEN LENGTH (FT): **11.61**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **5.33**
4. VOLUME OF WATER IN CASING (GAL): **0.26**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 3 CASINGS: **0.77** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	1.0	1.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1312	1420	1444							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process needed to be completed seven times in order to fill all the bottles.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site	SITE NUMBER:	932116
SAMPLER:	Glenn M. May		
PURGE DATE:	April 25, 2006	START PURGE: 1130	END PURGE: 1405
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1056 thru 1310

WELL NUMBER: **MW-6**

1. TOTAL CASING AND SCREEN LENGTH (FT): **13.08**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.47**
4. VOLUME OF WATER IN CASING (GAL): **0.35**

#1 - #3 x #2 (Gal/Ft)

VOLUME OF 3 CASINGS: **1.05** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	0.25	0.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1130	1233	1405							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times. During the 3rd purge there was so little water in the well that no water came out of the tubing.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process was only completed twice on this well; due to the slow recovery, only the volatile and metals bottles were filled.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

WELL PURGE AND SAMPLE LOG

SITE NAME:	59th Street Site			SITE NUMBER:	932116
SAMPLER:	Glenn M. May				
PURGE DATE:	April 25, 2006	START PURGE:	1154	END PURGE:	1408
SAMPLE DATE:	April 26, 2006	SAMPLE TIME:	1058 thru 1755		

WELL NUMBER: **MW-7**

1. TOTAL CASING AND SCREEN LENGTH (FT): **12.55**
2. CASING INTERNAL DIAMETER (IN): **1.0**
3. WATER LEVEL BELOW TOP OF CASING (FT): **4.35**
4. VOLUME OF WATER IN CASING (GAL): **0.34**

   #1 - #3 x #2 (Gal/Ft)

   VOLUME OF 3 CASINGS: **1.00** GAL.

WELL ID.	VOL. (GAL/FT)
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469
8"	2.611

	VOLUME PURGED (QUARTS)									
PARAMETERS	1.0	1.0	1.0							
pH										
CONDUCTIVITY (µmhos)										
TURBIDITY (NTU)										
TEMPERATURE (^{O}C)										
Eh										
TIME	1106	1236	1408							

April 25, 2006: Purge water just as turbid as well development water. This well was purged dry 3 times.

April 26, 2006: Water was purged into a dedicated, clean and unpreserved container to allow the fine grained sand to settle to the bottom. Once settled, the clear water was poured into the appropriate sample bottles. This process needed to be completed seven times in order to fill all the bottles.

APPENDIX C

SOIL BORING AND MICRO-WELL COORDINATES

Table C-1.
Summary of Borings Completed at the 59th Street Site.

Soil Boring/ Well Number	Date Completed	Total Boring Depth	NAD 83 Coordinates	
			Northing	Easting
SB-1/MW-1	12/09/04	12.0	1,124,275.49	1,037,413.98
SB-2/MW-2	12/08/04	12.0	1,124,179.23	1,037,401.98
SB-3/MW-3	12/08/04	12.0	1,124,086.34	1,037,402.40
SB-4/MW-4	12/07/04	12.0	1,124,159.46	1,037,497.93
SB-5/MW-5	12/09/04	12.0	1,124,270.81	1,037,597.65
SB-6/MW-6	12/07/04	12.0	1,124,082.02	1,037,590.32
SB-7	12/08/04	12.0	1,124,167.27	1,037,539.76
SB-8	12/07/04	16.0	1,124,152.17	1,037,444.62
SB-9	12/07/04	8.0	1,124,106.68	1,037,472.32
SB-10	12/07/04	4.0	1,124,096.75	1,037,500.64
SB-11/MW-7	12/08/04	12.0	1,124,091.08	1,037,538.24
SB-12	12/08/04	16.0	1,124,120.22	1,037,553.16

*** Horizontal datum: NAD 83/96 Harn (New York west zone 3103).**

APPENDIX D

HYDRAULIC CONDUCTIVITY TEST DATA

Monitoring Well:	**MW-3**
Date Test Performed:	**04/29/05**
Test performed By:	**GMM**
Analysis Performed By:	**GMM**
Checked By:	**GMM**

Test Data

Static Water Level = 1.82

Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	6.60	4.78
2.0	5.80	3.98
3.0	4.70	2.88
4.0	3.95	2.13
5.0	3.40	1.58
6.0	3.03	1.21
7.0	2.77	0.95
8.0	2.58	0.76
10.0	2.34	0.52
23.0	1.96	0.14

Well Configuration

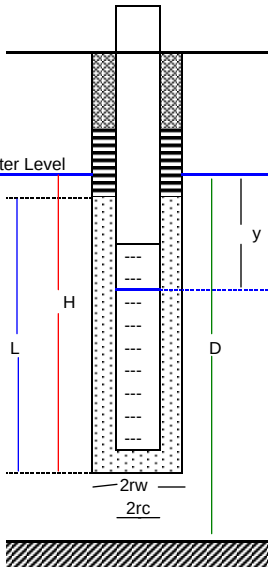
L (ft) =	6.00
Well Depth (ft) =	10.00
H (ft) =	8.18
D (ft) =	8.18
2rw (ft) =	0.167
rw (ft) =	0.084
2rc (ft) =	0.083
rc (ft) =	0.042

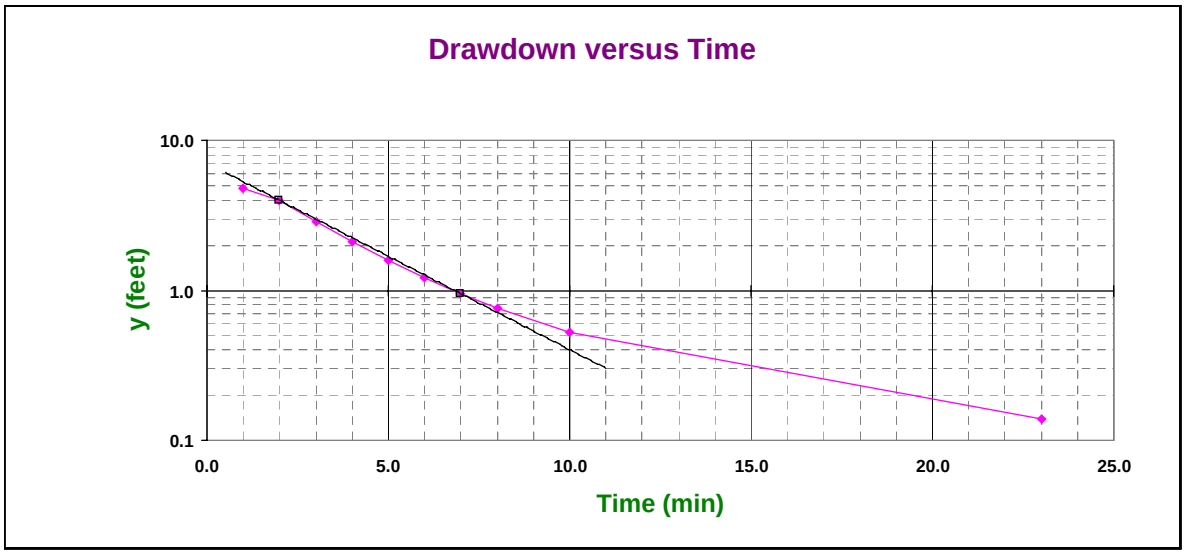
If the water level is entirely within the filter pack

Reff (ft) =	0.057
porosity =	0.3

User Selected Radius

r (ft) = 0.057





From the graph above, select slope

y1 (ft) =	3.98	t1 (min) =	2.0
y2(ft) =	0.95	t2 (min) =	7.0

ln(y1/y2)/(t2-t1) = 0.286515023

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = #NUM!

K =	#NUM!	ft/min =	#NUM!	cm/s
T =	#NUM!	ft^2/min =	#NUM!	cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 71.85629

If H = D then enter dimensionless parameter

C = 3.380

ln (Re/rw) = 3.484661

K =	2.70E-04	ft/min =	1.37E-04	cm/s
T =	2.21E-03	ft^2/min =	3.41E-02	cm^2/s

Monitoring Well: **MW-3**
Date Test Performed: **04/25/06**
Test performed By: **GMM**
Analysis Performed By: **GMM**
Checked By: **GMM**

Test Data		
Static Water Level = 2.31		
Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	9.55	7.24
2.0	8.86	6.55
3.0	8.28	5.97
4.0	7.62	5.31
5.0	7.02	4.71
6.0	6.42	4.11
7.0	5.94	3.63
8.0	5.41	3.10
9.0	4.92	2.61
10.0	4.50	2.19
12.0	3.87	1.56
14.0	3.42	1.11
16.0	3.11	0.80
18.0	2.92	0.61
20.0	2.79	0.48
22.0	2.70	0.39

Well Configuration

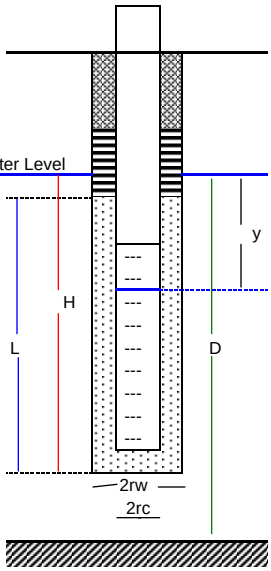
L (ft) = 6.00
Well Depth (ft) = 10.00
H (ft) = 7.69
D (ft) = 7.69
2rw (ft) = 0.167
rw (ft) = 0.084
2rc (ft) = 0.083
rc (ft) = 0.042

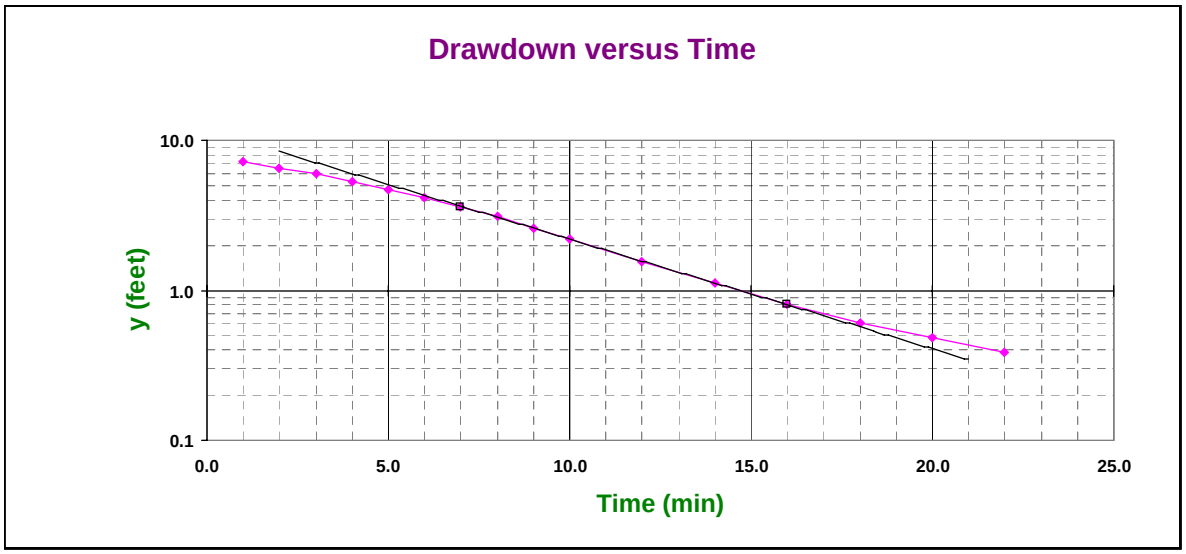
If the water level is entirely within the filter pack

Reff (ft) = 0.057
porosity = 0.3

User Selected Radius

r (ft) = 0.057





From the graph above, select slope

y1 (ft) =	3.63	t1 (min) =	7.0
y2(ft) =	0.80	t2 (min) =	16.0

ln(y1/y2)/(t2-t1) = 0.1680418

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = 4.111663119

K =	0.00019035	ft/min =	9.65E-05	cm/s
T =	0.001463795	ft^2/min =	0.022561	cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 71.85629

If H = D then enter dimensionless parameter

C = 3.380

ln (Re/rw) = 3.445319

K =	1.57E-04	ft/min =	7.94E-05	cm/s
T =	1.21E-03	ft^2/min =	1.86E-02	cm^2/s

Monitoring Well: **MW-4**
Date Test Performed: **04/25/06**
Test performed By: **GMM**
Analysis Performed By: **GMM**
Checked By: **GMM**

Test Data		
Static Water Level = 4.02		
Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	12.23	8.21
2.0	12.14	8.12
3.0	12.07	8.05
4.0	11.99	7.97
5.0	11.92	7.90
6.0	11.84	7.82
7.0	11.77	7.75
8.0	11.71	7.69
9.0	11.63	7.61
10.0	11.56	7.54
15.0	11.21	7.19
25.0	10.53	6.51

Well Configuration

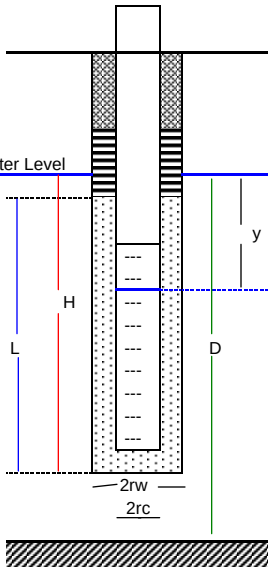
L (ft) = 5.50
Well Depth (ft) = 9.50
H (ft) = 5.48
D (ft) = 5.48
2rw (ft) = 0.167
rw (ft) = 0.084
2rc (ft) = 0.083
rc (ft) = 0.042

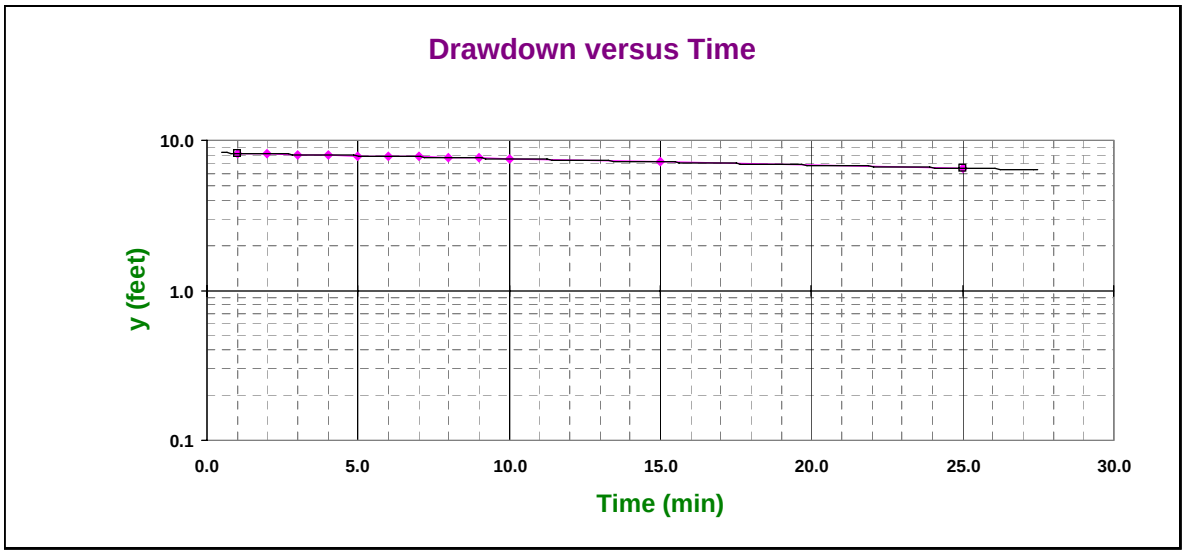
If the water level is entirely within the filter pack

Reff (ft) = 0.057
porosity = 0.3

User Selected Radius

r (ft) = 0.057





From the graph above, select slope

y1 (ft) =	8.21	t1 (min) =	1.0
y2(ft) =	6.51	t2 (min) =	25.0

ln(y1/y2)/(t2-t1) = 0.009667228

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = #NUM!

K =	#NUM!	ft/min =	#NUM!	cm/s
T =	#NUM!	ft^2/min =	#NUM!	cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 65.86826

If H = D then enter dimensionless parameter

C = 3.191

ln (Re/rw) = 3.211813

K =	9.17E-06	ft/min =	4.65E-06	cm/s
T =	5.03E-05	ft^2/min =	7.75E-04	cm^2/s

Monitoring Well: **MW-5**
Date Test Performed: **04/25/06**
Test performed By: **GMM**
Analysis Performed By: **GMM**
Checked By: **GMM**

Test Data		
Static Water Level = 5.33		
Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	12.56	7.23
2.0	12.28	6.95
3.0	12.09	6.76
4.0	11.98	6.65
5.0	11.69	6.36
6.0	11.50	6.17
7.0	11.30	5.97
8.0	11.11	5.78
9.0	10.91	5.58
10.0	10.72	5.39
13.0	10.14	4.81
18.0	9.23	3.90
23.0	8.37	3.04
25.0	8.05	2.72
30.0	7.43	2.10
35.0	6.99	1.66
40.0	6.63	1.30
48.0	6.19	0.86

Well Configuration Static Water Level

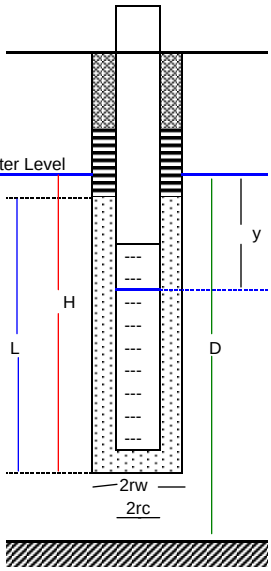
L (ft) = 6.00
Well Depth (ft) = 10.00
H (ft) = 4.67
D (ft) = 4.67
2rw (ft) = 0.167
rw (ft) = 0.084
2rc (ft) = 0.083
rc (ft) = 0.042

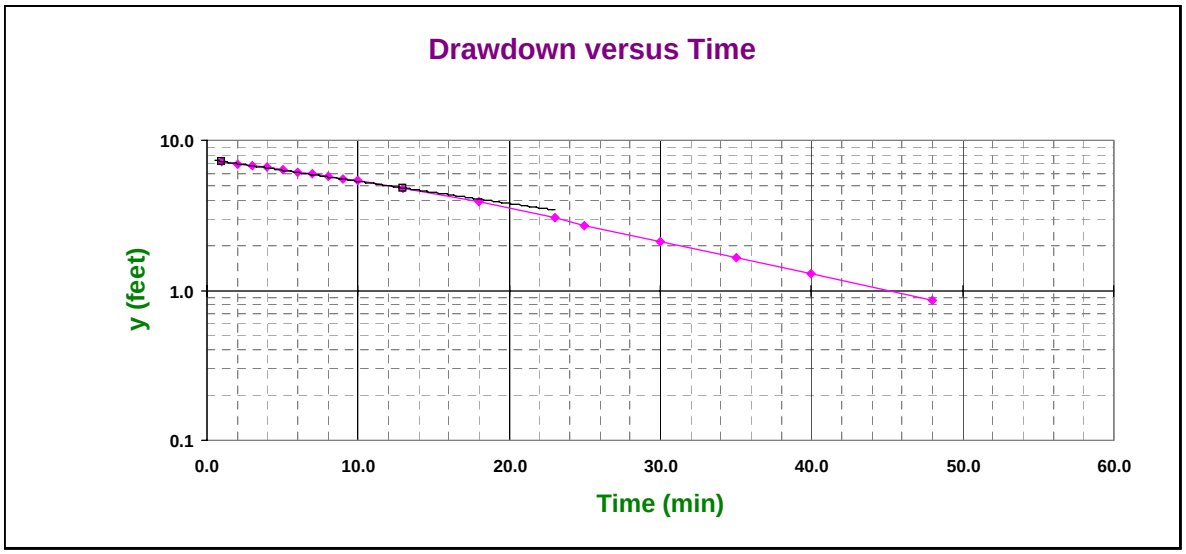
If the water level is entirely within the filter pack

Reff (ft) = 0.057
porosity = 0.3

User Selected Radius

r (ft) = 0.057





From the graph above, select slope

y1 (ft) =	7.23	t1 (min) =	1.0
y2(ft) =	4.81	t2 (min) =	13.0

ln(y1/y2)/(t2-t1) = 0.033961829

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = #NUM!

K =	#NUM!	ft/min =	#NUM!	cm/s
T =	#NUM!	ft^2/min =	#NUM!	cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 71.85629

If H = D then enter dimensionless parameter

C = 3.380

ln (Re/rw) = 3.121161

K =	2.87E-05	ft/min =	1.45E-05	cm/s
T =	1.34E-04	ft^2/min =	2.07E-03	cm^2/s

Monitoring Well: **MW-5**
Date Test Performed: **04/25/06**
Test performed By: **GMM**
Analysis Performed By: **GMM**
Checked By: **GMM**

Test Data		
Static Water Level = 5.33		
Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	12.56	7.23
2.0	12.28	6.95
3.0	12.09	6.76
4.0	11.98	6.65
5.0	11.69	6.36
6.0	11.50	6.17
7.0	11.30	5.97
8.0	11.11	5.78
9.0	10.91	5.58
10.0	10.72	5.39
13.0	10.14	4.81
18.0	9.23	3.90
23.0	8.37	3.04
25.0	8.05	2.72
30.0	7.43	2.10
35.0	6.99	1.66
40.0	6.63	1.30
48.0	6.19	0.86

Well Configuration

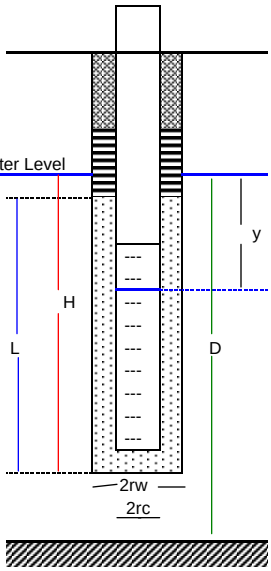
L (ft) = 6.00
Well Depth (ft) = 10.00
H (ft) = 4.67
D (ft) = 4.67
2rw (ft) = 0.167
rw (ft) = 0.084
2rc (ft) = 0.083
rc (ft) = 0.042

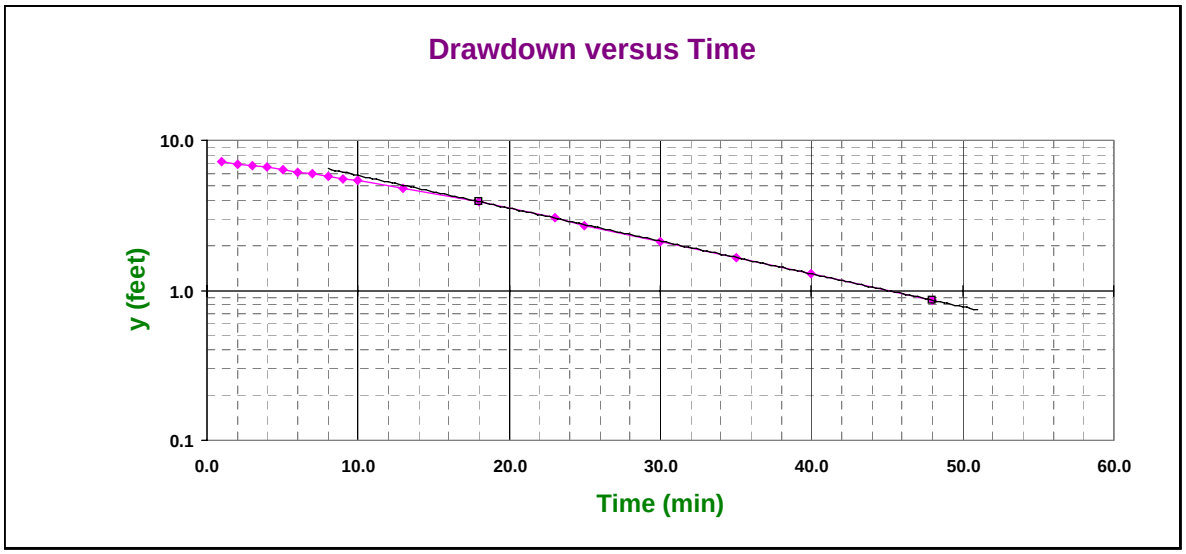
If the water level is entirely within the filter pack

Reff (ft) = 0.057
porosity = 0.3

User Selected Radius

r (ft) = 0.057





From the graph above, select slope

y1 (ft) = 3.90 t1 (min) = 18.0
y2(ft) = 0.86 t2 (min) = 48.0
ln(y1/y2)/(t2-t1) = 0.050393315

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = #NUM!

K = #NUM! ft/min = #NUM! cm/s
T = #NUM! ft^2/min = #NUM! cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 71.85629

If H = D then enter dimensionless parameter

C = 3.380

ln (Re/rw) = 3.121161

K = 4.26E-05 ft/min = 2.16E-05 cm/s
T = 1.99E-04 ft^2/min = 3.07E-03 cm^2/s

Monitoring Well:	**MW-7**
Date Test Performed:	**04/29/05**
Test performed By:	**GMM**
Analysis Performed By:	**GMM**
Checked By:	**GMM**

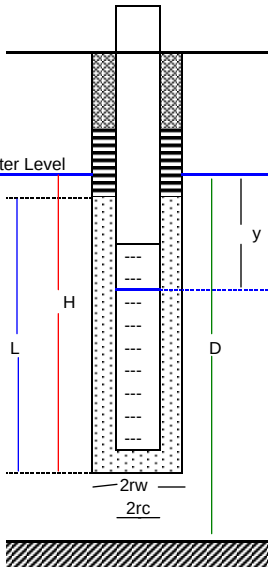
Test Data

Static Water Level = 4.3

Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	12.55	8.25
2.0	12.36	8.06
3.0	12.29	7.99
4.0	12.21	7.91
5.0	12.14	7.84
6.0	12.08	7.78
13.0	11.54	7.24
27.0	10.46	6.16

Well Configuration

L (ft) = 6.00
Well Depth (ft) = 9.50
H (ft) = 5.20
D (ft) = 5.20
2rw (ft) = 0.167
rw (ft) = 0.084
2rc (ft) = 0.083
rc (ft) = 0.042

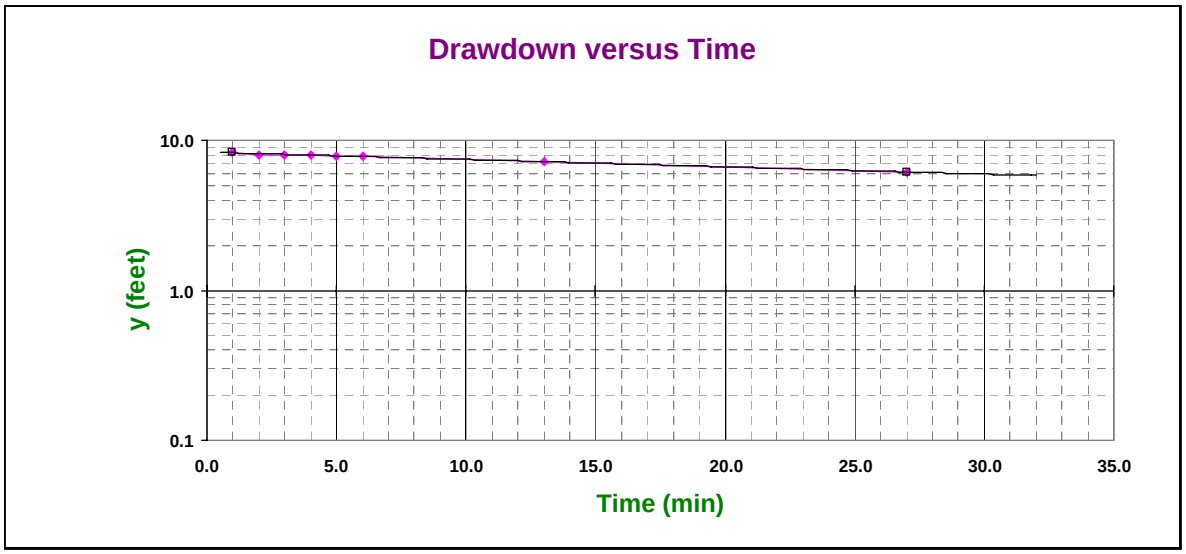


If the water level is entirely within the filter pack

Reff (ft) = 0.057
porosity = 0.3

User Selected Radius

r (ft) = 0.057



From the graph above, select slope

y1 (ft) =	8.25	t1 (min) =	1.0
y2(ft) =	6.16	t2 (min) =	27.0

ln(y1/y2)/(t2-t1) = 0.011236016

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = #NUM!

K =	#NUM!	ft/min =	#NUM!	cm/s
T =	#NUM!	ft^2/min =	#NUM!	cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 71.85629

If H = D then enter dimensionless parameter

C = 3.380

ln (Re/rw) = 3.192021

K =	9.71E-06	ft/min =	4.92E-06	cm/s
T =	5.05E-05	ft^2/min =	7.78E-04	cm^2/s

Monitoring Well: **MW-7**
Date Test Performed: **04/25/06**
Test performed By: **GMM**
Analysis Performed By: **GMM**
Checked By: **GMM**

Test Data		
Static Water Level = 4.35		
Time (min)	Water Level (feet)	Drawdown = y (feet)
1.0	11.04	6.69
2.0	10.25	5.90
3.0	9.53	5.18
4.0	8.86	4.51
5.0	8.17	3.82
6.0	7.50	3.15
7.0	6.87	2.52
8.0	6.38	2.03
9.0	5.97	1.62
10.0	5.65	1.30
15.0	4.78	0.43
17.0	4.63	0.28
19.0	4.53	0.18
20.0	4.51	0.16

Well Configuration

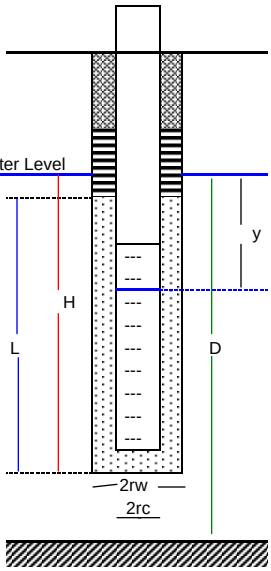
L (ft) = 6.00
Well Depth (ft) = 9.50
H (ft) = 5.15
D (ft) = 5.15
2rw (ft) = 0.167
rw (ft) = 0.084
2rc (ft) = 0.083
rc (ft) = 0.042

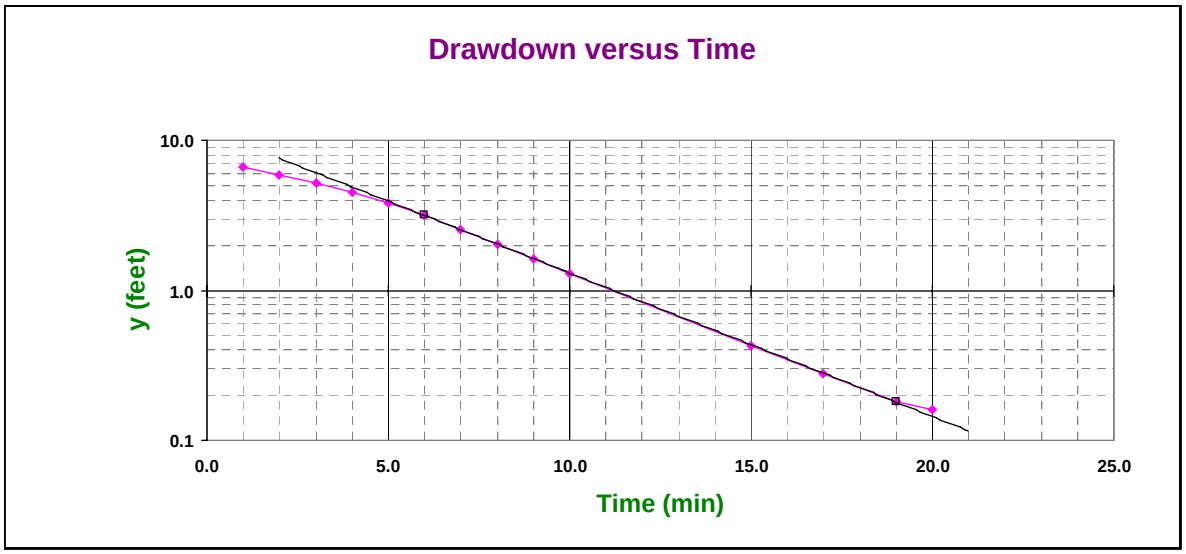
If the water level is entirely within the filter pack

Reff (ft) = 0.057
porosity = 0.3

User Selected Radius

r (ft) = 0.057





From the graph above, select slope

y1 (ft) =	3.15	t1 (min) =	6.0
y2(ft) =	0.18	t2 (min) =	19.0

ln(y1/y2)/(t2-t1) = 0.220169299

If H<D then enter dimensionless parameters

A =
B =
ln (Re/rw) = #NUM!

K =	#NUM!	ft/min =	#NUM!	cm/s
T =	#NUM!	ft^2/min =	#NUM!	cm^2/s

Note:
To obtain dimensionless parameters A, B and C refer to Bouwer and Rice (1976) for the graphical relation with L / rw or refer to the graph and table below.

L / rw = 71.85629

If H = D then enter dimensionless parameter

C = 3.380

ln (Re/rw) = 3.185675

K =	1.90E-04	ft/min =	9.62E-05	cm/s
T =	9.78E-04	ft^2/min =	1.51E-02	cm^2/s

ln L/rw	A	B	C
4	1.713	0.238	0.775
5	1.725	0.238	0.875
6	1.750	0.244	0.950
7	1.775	0.246	1.025
8	1.825	0.250	1.100
9	1.850	0.263	1.150
10	1.875	0.268	1.225
15	2.000	0.303	1.475
20	2.150	0.338	1.700
30	2.400	0.388	2.025
40	2.725	0.450	2.375
50	3.025	0.494	2.675
60	3.325	0.550	3.000
70	3.625	0.613	3.325
80	3.850	0.663	3.600
90	4.075	0.700	3.850
100	4.350	0.750	4.150
150	5.350	0.925	5.600
200	6.025	1.125	6.875
300	6.975	1.500	8.700
400	7.625	1.875	9.850
500	8.125	2.125	10.575
600	8.450	2.338	11.100
700	8.663	2.500	11.525
800	8.850	2.630	11.825
900	9.000	2.750	12.100
1000	9.175	2.850	12.275

DEFINITIONS

L = Length of perforated, screened, or open secion of well through which groundwater enters.
H = vertical distance between the water table elevation and the base of the screen.
D = vertical distance between the water table elevation and the base of the aquifer.
y = vertical distance between water level in the well and the water table elevation of the aquifer.
rw = well radius (radius of the screen plus thickness of the filter pack).
rc = radius of screen or casing if the water level is above the screened portion of the well.
Reff = effective radius over which y is dissipated.