HONEYWELL
Jersey City, New Jersey

FINAL GROUNDWATER INVESTIGATION REPORT
HONEYWELL STUDY AREA 7 SITE

February 2, 2007
HWEL.002.001.11

CONTENTS

Section Page

1 INTRODUCTION 1-1
1.1 OBJECTIVES AND SCOPE 1-1
1.2 REPORT NOMENCLATURE AND ORGANIZATION 1-1

2 SUMMARY OF FIELD INVESTIGATIONS 2-1
2.1 PREVIOUS INVESTIGATIONS 2-1
2.2 COURT–ORDERED INVESTIGATIONS 2-1
2.2.1 Intermediate Zone Investigation 2-1
2.2.1.1 Vertical Aquifer Sampling (VAS) 2-2
2.2.2 Groundwater Discharge Area Investigation 2-2
2.2.2.1 GeoProbe® Sampling 2-3
2.2.2.2 Pore Water Sampling using Peepers 2-3
2.2.2.3 Surface Water Sampling 2-4
2.2.3 Plume Diversion Monitoring Investigation 2-4
2.2.4 Route 440 Investigation 2-5
2.2.5 Deep Overburden Aquifer test 2-5
2.2.6 Land-based Bedrock Investigation 2-6
2.2.6.1 Coring/Packer Testing 2-6
2.2.6.2 Water FLUTe Installations 2-6
2.2.6.3 Preliminary and Extended Bedrock Aquifer Tests 2-7
2.2.7 River-based Bedrock Investigation 2-7
2.2.7.1 Deep River Borings 2-7
2.2.8 Groundwater Sampling 2-8
2.2.9 Water Level Monitoring 2-9

3 HISTORICAL CONDITIONS 3-1
3.1 FORMER MUTUAL CHEMICAL PLANT OPERATIONS 3-1
3.2 TRANSGRESSION OF HACKENSACK RIVER 3-1
3.3 ASSESSMENT OF HISTORIC PUMPING 3-1
3.3.1 NJDEP Well Search 3-2
3.3.2 Sanborn Map Review 3-3
3.4 ASSESSMENT OF FORMER MORRIS CANAL 3-4
3.5 RECENT REMEDIAL ACTIVITIES AT SA-7 3-5

4 OVERBURDEN HYDROGEOLOGY 4-1
4.1 REGIONAL GEOLOGY 4-1
4.2 SHALLOW ZONE (FILL) 4-2
4.2.1 Physical Characteristics 4-2
4.2.2 Groundwater Elevations 4-3
4.2.3 Groundwater Quality 4-3
4.3 MEADOW MAT LAYER 4-4
4.3.1 Physical Characteristics 4-4
4.4 INTERMEDIATE OVERBURDEN ZONE (S-1 AND UPPER S-2 SAND) 4-5

CONTENTS (Continued)

Section Page

4.4.1 Physical Characteristics 4-5
4.4.2 Groundwater Elevations 4-6
4.4.3 Groundwater Quality 4-7
4.5 DEEP OVERBURDEN ZONE (LOWER S-2 AND S-3) 4-8
4.5.1 Physical Characteristics 4-8
4.5.2 Groundwater Elevations 4-8
4.5.3 Groundwater Quality 4-9
4.6 RED CLAY 4-10
4.6.1 Physical Characteristics 4-10
4.7 GLACIAL TILL/ICE-CONTACT DEPOSITS 4-11
4.7.1 Physical Characteristics 4-11
4.7.2 Groundwater Quality 4-11

5 BEDROCK HYDROGEOLOGY 5-1
5.1 REGIONAL BEDROCK GEOLOGY 5-1
5.2 SITE-SPECIFIC BEDROCK GEOLOGY 5-2
5.3 HYDRAULIC CONDUCTIVITY 5-2
5.4 GROUNDWATER ELEVATIONS 5-4
5.5 GROUNDWATER QUALITY 5-5

6 CONCEPTUAL MODEL OF CHROMIUM IN GROUNDWATER 6-1
6.1 THREE-DIMENSIONAL GROUNDWATER FLOW 6-1
6.2 COPR-RELATED SOURCES OF CHROMIUM IN GROUNDWATER 6-2
6.3 PROCESS-RELATED SOURCES OF CHROMIUM IN GROUNDWATER 6-4
6.4 SOURCES OF CHROMIUM IN BEDROCK GROUNDWATER 6-6

APPENDICES

A-1 Water Quality Data

B-1 Boring Logs (provided on CD)

B-2 Monitoring Well Construction Details

C-1 Sanborn Maps (provided on CD)

D-1 Major Ion Analysis

FIGURES

Figure		Follows Section
1.2-1	Conceptual Hydro-stratigraphic Cross-section near SA-7	1
2.2-1	Location of Deep Overburden Wells and Lines of Cross-Section	2
2.2-2	Location of Bedrock Wells and Lines of Cross-Section	2
2.2-3	GeoProbe Sampling Locations	2
2.2-4	Pore-water Sampling Locations (Peepers)	2
2.2-5	Surface Water Sampling Locations	2
3.1-1	Aerial Photo of SA-7 and Vicinity, Circa 1947	3
3.1-2	Mutual Chemical Co. Production Facility Circa 1947	3
3.2-1	Lower Hackensack River and Upper Newark Bay Delineated Shorelines: 1914-1930	3
3.3-1	Location of NJDEP-identified Wells	3
3.3-2	Sanborn Key Map (1896-1898)	3
3.3-3	Sanborn Key Map (1950-1951)	3
3.3-4	Geo-referenced Location of Historic Wells	3
3.4-1	Location of Morris Canal in Jersey City	3
3.4-2	Location of Morris Canal Near SA-7 (1920)	3
3.4-3	Reprint of 1920 Longitudinal Section – Proposed Morris Canal Bridge	3
4.1-1	Regional Geologic Cross-Section Near SA-7	4
4.2-1	Groundwater Elevations - Shallow Zone, December 2006	4
4.2-2	Hexavalent Chromium in Groundwater - Shallow Zone	4
4.2-3	Total Chromium in Groundwater – Shallow Zone	4
4.3-1	Top of Meadow Mat Elevation	4
4.4-1	Groundwater Elevations - Intermediate Zone, December 2006	4
4.4-2	Tidal Lag in Intermediate Zone	4
4.4-3	Tidal Efficiency in Intermediate Zone	4
4.4-4	Hexavalent Chromium in Groundwater – Intermediate Zone	4
4.4-5	Total Chromium in Groundwater – Intermediate Zone	4

FIGURES (Continued)

Figure		Follows Section
4.5-1	Areal Extent of the S-3 Sand	4
4.5-2	Tidal Lag in Deep Zone	4
4.5-3	Tidal Efficiency in Deep Zone	4
4.5-4	Groundwater Elevations - Deep Zone, December 2006	4
4.5-5	Hexavalent Chromium in Groundwater – Deep Zone	4
4.5-6	Total Chromium in Groundwater – Deep Zone	4
4.7-1	Top of Glacial Till/Ice Contact Deposit Elevations	4
4.7-2	Hexavalent Chromium in Pore Water - Ice Contact/Glacial Till Deposits	4
5.1-1	Bedrock Geology Near SA-7	5
5.2-1	Top of Bedrock Elevation	5
5.2-2	Bedrock Geologic Cross-Section A-A'	5
5.2-3	Bedrock Geologic Cross-Section B-B'	5
5.2-4	Bedrock Geologic Cross-Section C-C'	5
5.2-5	Bedrock Geologic Cross-Section D-D'	5
5.2-6	Bedrock Geologic Cross-Section E-E'	5
5.3-1	Drawdown Contours in Upper Bedrock at Conclusion of Aquifer Test	5
5.4-1	Groundwater Elevations – Bedrock, December 2006	5
5.4-2	Tidal Lag in Bedrock	5
5.4-3	Tidal Efficiency in Bedrock	5
5.5-1	Hexavalent Chromium in Groundwater – Bedrock	5
5.5-2	Total Chromium in Groundwater – Bedrock	5
6.0-1	Overburden Geologic Cross-Section A-A'	6
6.0-2	Overburden Geologic Cross-Section B-B'	6
6.0-3	Overburden Geologic Cross-Section C-C'	6
6.0-4	Overburden Geologic Cross-Section D-D'	6

FIGURES (Continued)

Figure		Follows Section
6.3-1	Stratigraphic Cross-section in Source Area	6
6.4-1	Overlay of Deep Overburden Plume on Bedrock Plume	6

TABLES

Table		Page
1.	Hydrostratigraphic Intervals	1-2
2.	Hexavalent Chromium Concentration at 073-MW-1BR	5-7
3.	Vertical Hydraulic Gradients	6-2

		Follows Section
2.2-1	Summary of Vertical Aquifer Sampling (VAS) Borings	2
2.2-2	Summary of Groundwater Discharge Area Investigation	2
2.2-3	Summary of Land-Based Bedrock Investigation	2
2.2-4	Summary of River-Based Bedrock Investigation	2
2.2-5	Summary of Quarterly Groundwater Elevation Data	2
2.2-6	Summary of Tidal Lag and Efficiency Determinations	2
3.3-1	Summary of NJDEP Well Search Data	3
4.2-1	Summary of Hydraulic Conductivity Data in Shallow Zone	4
4.4-1	Summary of Hydraulic Conductivity Data in Intermediate Zone	4
4.5-1	Summary of Hydraulic Conductivity Data in Deep Zone	4
4.7-1	Summary of Hydraulic Conductivity Data Glacial Till/Ice Contact Deposits	4

SECTION 1

INTRODUCTION

1.1 OBJECTIVES AND SCOPE

This Honeywell Study Area 7 (SA-7) Final Groundwater Investigation Report (Final GIR) has been prepared in accordance with the June 30, 2003 Court Order that required Honeywell to "*Test and fully delineate the extent of chromium contamination in the deep groundwater at the Site in order to ensure that this contaminated water does not discharge to the Hackensack River, or flow to any fresh water aquifer that is used as a water supply, or to the bedrock.* The "deep groundwater" has been defined as that which occurs below the meadow mat layer. However, since chromium was also detected in the underlying bedrock, a parallel investigation has been conducted to delineate the extent of contamination in the bedrock. Although the two investigations were originally on separate tracts, recent amendments to the Court Order have merged their respective schedules such that the results from both investigations are provided in this Final GIR.

The purpose of this report is to describe the geology, hydrogeology, and groundwater quality of the deep overburden and bedrock zones within the vicinity of the SA- 7 site. Although groundwater in the shallow zone above the meadow mat layer was not included in the scope of the court-ordered investigation, information regarding this zone has been compiled and included in this Final GIR since it bears on the delineation of the deeper plumes.

The site characterization presented in this report updates the assessment of the deep overburden and bedrock presented in the Preliminary Deep Overburden Groundwater Report (HydroQual, March 2005) and the Groundwater Investigation Report prepared by HydroQual in March 2006. This final GIR forms the foundation for both the deep overburden remedial alternatives analysis (DORAA), and the RAA for the bedrock.

1.2 REPORT NOMENCLATURE AND ORGANIZATION

Throughout this report, various terms are used in reference to the geographic area of investigation and in reference to the various hydro-stratigraphic zones within the subsurface. The term "study area" refers to the entire region of investigation including all of SA-5, SA-6, and SA-7, and the portion of the Hackensack River from the Routes 1 & 9 bridge to Upper Newark Bay. As shown on Figure 1.2-1, the subsurface environment has been defined in terms of both geologic strata, such as the "S-1 Lacustrine Sand", and hydro-stratigraphic intervals such as the "Intermediate Zone". Hydro-stratigraphic intervals are useful for mapping groundwater levels and groundwater quality data and have been defined based on

the position of monitoring well screened intervals. The following hydro-stratigraphic intervals are reference in this report.

Table 1. Hydro-stratigraphic Intervals

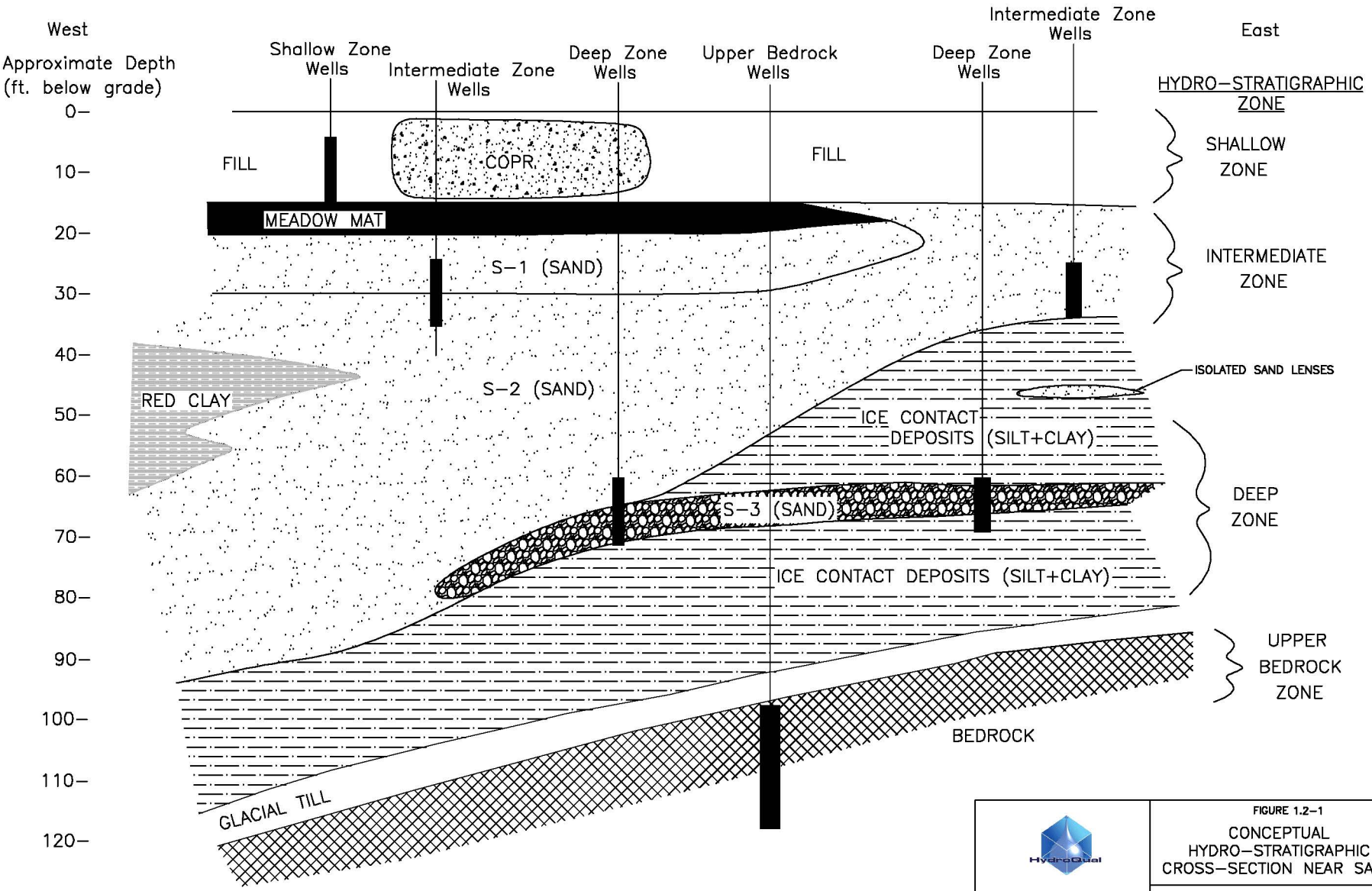
Hydro-stratigraphic Interval	Geologic Strata	Well Screen Interval	Approximate Depth below Grade	Typical Well ID suffix
Shallow Zone	Fill and COPR	Above Meadow Mat	10 to 20 feet	"S" or no suffix
Intermediate Zone	S-1 and upper S-2 Lacustrine Sands	Just below Meadow Mat	20 to 40 feet	"D" or no suffix
Deep Zone	Lower S-2 and S-3 Lacustrine Sands	In S-3 Sand where present, otherwise bottom of S-2.	60 to 90 feet	"T" or no suffix
Bedrock	Top of Bedrock	Upper 20 to 30 feet of bedrock	80 to 130 feet	"BR

It is important to note that although the S-3 Sand directly underlies the S-2 Sand throughout much of the study area, it is overlain by an increasingly thick deposit of silt and clay to the south and east of SA-7. This is due to the relatively steep rise in the top of the Ice Contact deposits east of Route 440. Accordingly, wells screened at the base of the S-2 Sand in this area are quite shallow (approximately 35 feet deep) and have thus been assigned to the Intermediate Zone. Conversely, wells screened in the underlying "buried" portion of the S-3 Sand have been assigned to the Deep Zone.

The remainder of this Final GIR has been organized as follows. Section 2 provides a brief description of the various investigative programs and methods that were used to obtain the field data. Since the scope of the work was often modified through various technical discussions with representatives of the Special Master and ICO (e.g. conference calls, written comments, technical meetings, etc.), documentation of each change to the original Work Plan would be overly complex and thus, a description of the final resolution of the scope is provided for each of the focused investigations that were undertaken.

Section 3 provides a discussion of the historic conditions within the study area that may bear on the assessment of the data. This includes the potential influence of historic pumping, Mutual Chemical Co. plant operations, and the Morris Canal. Sections 4 and 5 describe the groundwater flow and distribution of chromium in the groundwater of each of

the overburden and bedrock zones, respectively. The various maps and cross-sections were prepared using groundwater quality data from the most recent event available for each well. Finally, Section 6 presents the overall conceptual model of groundwater flow and contaminant distribution, including evidence of likely sources.



HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529–5151 F: 529–5728

FIGURE 1.2–1
CONCEPTUAL HYDRO–STRATIGRAPHIC CROSS–SECTION NEAR SA–7

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\FIG_41-2.DWG 02/01/2007 LAYOUT: A-A'

SECTION 2

SUMMARY OF FIELD INVESTIGATIONS

2.1 PREVIOUS INVESTIGATIONS

Previous investigations within Study Area 7 include the sampling of soil, groundwater, surface water and sediment related to the "Roosevelt Drive-In Site" by Geraghty and Miller, Inc. (1983) and Environmental Research and Technology (1984). A remedial investigation (RI) was conducted in the late 1990's by Tetra Tech NUS and documented in a Revised Draft RI Report dated September 2002. Remedial investigations of adjacent Chromite Ore Processing Residue (COPR) sites in Study Areas 5 and 6 were also conducted by Tetra Tech NUS in the late 1990's and documented in various RI reports.

After completion of the original RI's, supplemental groundwater sampling was conducted by Parsons. This work included two rounds; the first was in February and March 2001, and the second in April 2003. More recently, supplemental remedial investigations of the Shallow Zone have been completed for portions of SA-5 and SA-6 by MACTEC Engineering and Consulting, Inc. (Mactec). The results of these investigations are documented in several RI report addenda and remedial action work plans.

2.2 COURT–ORDERED INVESTIGATIONS

The initial scope of the groundwater investigation to be conducted under the 2003 Court Order was identified in a Remedial Action Work Plan prepared by Parsons in 2003. Since then, the scope has evolved to meet the data needs of the project. This has resulted in several smaller, focused investigations aimed at specific locations and/or objectives within the study area (e.g. the plume diversion area, groundwater discharge area, etc.). The following sections provide a brief description of these focused efforts and the various field methods that were employed. To aid in this discussion, the location of overburden and bedrock wells installed during the court-ordered investigation are presented on Figures 2.2-1 and 2.2-2, respectively.

2.2.1 Intermediate Zone Investigation

The objective of this investigation was to determine if hexavalent chromium is present in the Intermediate Zone directly below the meadow mat. This was achieved by obtaining detailed vertical profiles of in-situ groundwater quality using the Vertical Aquifer Sampling (VAS) technique. VAS borings are summarized on Table 2.2-1 and were later employed in other overburden investigations and at selected bedrock well installations across the study area.

2.2.1.1 Vertical Aquifer Sampling (VAS)

Vertical Aquifer Sampling was conducted by advancing a soil boring using standard wet-rotary techniques. A SimulProbe sampler (Photograph 1) was then used to simultaneously collect both soil and pore water samples from selected vertical intervals. Initial VAS borings were sampled continuously from the surface to depth. In later borings, the sampling frequency was reduced due to the time required for sample collection.

Soil samples are collected with the SimulProbe in a similar fashion to a split spoon sampler and pore water samples are collected in a similar fashion to that of a "hydro-punch." The sampler is driven with a 300-pound slide hammer two feet below the bottom of the borehole and soil is collected in 3-inch diameter removable steel sleeves. Once driven, the probe is retracted approximately six inches, exposing a stainless steel screen in the tip. Small diameter tubes connect the screened opening to a 1.5-liter reservoir located above the top of the SimulProbe. The reservoir is sealed before and after pore water sampling by pressurizing the unit with nitrogen via tubing that runs from the surface to the sampler. During sample collection, the nitrogen pressure is released and the static groundwater head allows the reservoir to fill. Fill times range from a few minutes in permeable strata to several hours in fine sands and silts. As expected, sample volumes are often minimal when the SimulProbe is used in silts and clays. Groundwater within the SimuProbe is transferred to a sample container by inserting a dedicated section of tubing into the reservoir and allowing the water to drain out. As shown on Table 2.2-1, the majority of the VAS borings were completed as monitoring wells, using the VAS data to select the screened interval.



Photograph 1. SimulProbe Sampler

2.2.2 Groundwater Discharge Area Investigation

Investigations to delineate the area in which groundwater in the deep overburden plume is discharging to the Hackensack River were conducted during four separate events as summarized on Table 2.2-2. Field techniques included deep VAS borings, GeoProbe® sampling, pore water sampling using "peepers", shallow sediment sampling at locations co-located with peepers, and surface water sampling. Initial sampling locations were chosen on a grid pattern based on the available data. In July 2005 a detailed bathymetric survey of the Hackensack River bottom was conducted by Ocean Surveys Inc. (OSI) which allowed

subsequent sampling locations to be more accurately located in bathymetric depressions. Each of the above field methods is further described below.

2.2.2.1 GeoProbe® Sampling

The objective of the GeoProbe® program was to collect in-situ groundwater samples from the lacustrine deposits just below the soft, organic riverbed muds. As shown on Figure 2.2-3, GeoProbe®samples were collected at 37 locations within the Hackensack river. The GeoProbe® sampling equipment was deployed from a pontoon boat equipped with a tripod, electric cathead, and sampling port (moon-hole) in the deck (Photograph 2).

The water depth was measured using a weighted plate lowered on a rope from the deck of the boat. The GeoProbe® sampler was then placed through the moon hole and pushed by hand through the soft organic mud until the top of the lacustrine deposit was contacted. This contact was readily determined by feel due to the higher density of the lacustrine strata. (At location PW002-600, for example, the sampler was pushed over thirty feet by hand before the solid lacustrine deposits were felt.) The sampler was then driven approximately four to five feet using the slide-hammer attached to the tripod. The sampler tip and internal screen were then held in place using a narrow diameter rod inserted through the outer casing. The outer casing was then pulled up approximately 2.5 feet exposing the stainless steel screen. An in-situ groundwater sample was collected by purging water from the sampler using a peristaltic pump.

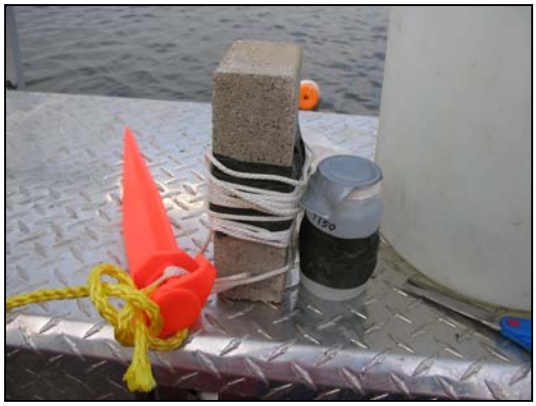


Photograph 2. GeoProbe® Pontoon Boat

2.2.2.2 Pore Water Sampling using Peepers

The objective of this sampling technique was to collect a sample of the interstitial pore water within the soft riverbed sediments near the surface water interface. Nylon-screened diffusion samplers (peepers) were deployed by divers to a depth of approximately six inches below the top of the mud. The samplers (Photograph 3) were constructed by placing a 125-micron nylon mesh over the open end of a 250 ml polypropylene sample container. The mesh is held in place by the container's screw-on lid, modified by drilling out the lid's center section. The peeper is tied to an orange stake set approximately two feet from the sampler. A brick placed approximately ten feet away is used to retain the peeper in the event it is dislodged from the mud prior to retrieval. The peeper is filled with de-

oxyenated, deionized water prior to placement and the nylon screen is covered with tape to keep out river water during handing. The DI water is de-oxygenated by purging with a nitrogen bubbler on the boat.



Photograph 3. "Peeper" Sampler

In the initial phases of investigation, a single sample container was placed at each location by divers, allowed to equilibrate for approximately 14 days, and then retrieved from a boat by snagging the attached sample rope with a grappling hook. In later phases, two containers were placed at each location to allow additional parameters to be analyzed. The sample equilibrium time was increased to 35 days, and the samples were transferred from the peepers to closed-topped containers within an argon atmosphere to reduce oxidation of the sample. As shown on Figure 2.2-4, the most recent investigation used the bathymetric survey to locate twelve peepers at the bottom of the large depression identified northwest of SA-6 north. Six peepers were placed in the northern lobe of the depression and six were placed in the southern lobe. A total of 72 peepers were deployed in the Hackensack River during this investigation.

2.2.2.3 Surface Water Sampling

Surface water samples were collected at 14 locations in the Hackensack River as shown on Figure 2.2-5 and summarized on Table 2.2-2. The samples were obtained by lowering dedicated, polypropylene tubing to the desired depth and withdrawing water using a peristaltic pump. The lower section of the tubing was weighted to counter the effects of flow in the river. The sample tubing was purged for several minutes prior to sample collection. At deeper water locations, two samples were collected; one at mid-depth and one at the bottom of the water column, approximately one foot off the bottom. At shallower locations, only one mid-depth sample was collected.

2.2.3 Plume Diversion Monitoring Investigation

An investigation of the extent of the deep overburden plume near the southeast corner of SA-7 (former bowling alley property) was conducted at the request of the Special Master. The original goal of this investigation was to locate a sentinel monitoring well that can be used to detect changes (diversions) in the deep overburden plume (if any) as a result of the recent installation of the subsurface barrier wall around SA-7. Upon the detection of hexavalent chromium in the initial borings, the goal of the investigation was expanded to

include complete delineation of the deep plume in this area. The investigation was conducted through the advancement of nine VAS borings and the installation of 12 overburden monitoring wells as summarized on Table 2.2-1. Monitoring well screen intervals were selected based on VAS sampling results and the grain size of the material encountered. In general, monitoring wells were screened in both the Intermediate Zone and the Deep Zone. At two locations, wells were also installed with screens between these zones and assigned the suffix "L" for lacustrine.

2.2.4 Route 440 Investigation

The objective of this investigation was to assess the impact of potential source areas east of Route 440 on groundwater quality in the Intermediate and Deep zones. These source areas include COPR used as backfill in the former Morris Canal, and areas associated with the release of sodium chromate at the former Mutual Chemical production facility. The investigation was conducted through the advancement of two VAS borings and the installation of five intermediate and three deep monitoring wells as summarized on Table 2.2-1. A third VAS boring was conducted at the request of Honeywell at the 117-MW-I4 location to obtain soil samples for bench-scale leachability testing as further described in Section 6. Monitoring well screen intervals were selected based on VAS sampling results and the grain size of the material encountered.

Due to both overhead and subsurface utilities that run parallel to the eastern shoulder of Route 440, deep borings could not be conducted directly over the former Morris Canal. As an alternative, access was obtained to conduct borings and install wells on the adjacent Home Depot property. Since this site was capped with a 40 ml LDPE membrane and up to ten feet of clean fill, pre-excavation and booting of the membrane around each boring/well was required. The depth to the membrane at the five locations ranged from 1.9 to 6.0 feet below grade.

2.2.5 Deep Overburden Aquifer test

An aquifer test of the deep overburden beneath SA-7 was conducted in June 2004 by pumping well 115-PW-21 at a constant rate of 35.5 gpm for a period of 48 hours. Well 115-PW-21 was installed specifically for use in this test and is constructed of four inch diameter PVC with a ten foot long well screen set at a depth of 61-71 feet (within the S-3 sand). Water levels were monitored in 30 overburden wells and 3 bedrock wells, many of which were instrumented with pressure transducers and data loggers. Data were corrected for both tidal and barometric influences using antecedent and recovery data. The results are documented in the "Deep Lacustrine Sediments Aquifer Test" (HydroQual, October 2004) and summarized in Section 4.5-1.

2.2.6 Land-based Bedrock Investigation

The overall objective of the bedrock investigation was to delineate the extent of chromium in groundwater within the rock and to determine its hydraulic properties for use in the subsequent Remedial Alternatives Analysis (RAA). The land-based portion of the investigation (i.e. not including borings conducted on the Hackensack River) was conducted in four phases as summarized on Table 2.2-3 and included rock coring/packer testing, conventional monitoring well installations, multi-port Water FLUTe installations, and aquifer testing. Each of these field methods is further described below.

2.2.6.1 Coring/Packer Testing

Rock coring was conducted in three of the bedrock borings drilled during this investigation. These locations were selected in the work plan to provide coverage of the north-easterly dipping beds within the Passaic Formation. A description of the rock core is provided on the boring logs contained in Appendix B. Packer pressure testing was conducted in each of the bedrock borings to quantify the vertical distribution of hydraulic conductivity within the rock. The results were used to identify intervals for subsequent Water FLUTe installations and are summarized in Table 2.2-3

2.2.6.2 Water FLUTe Installations

As summarized in Table 2.2-3, Water FLUTes were installed at 12 locations within the study area. Conventional wet rotary drilling methods were used to advance the borehole through the overburden and set permanent steel casings. An air rotary rig was then used to advance the borehole to total depth; typically 200 feet below the top of rock. Packer pressure tests were completed in the open borehole at ten-foot intervals to measure the hydraulic conductivity of the underlying bedrock. A blank FLUTe liner was then inserted to seal the borehole while the data were reviewed and the depth and length of the sampling intervals were determined. A multi-port sampling system (Water FLUTe) was then custom manufactured by Flexible Liner Underground Technologies Inc. and installed upon removal of the blank liner (Photograph 4). The majority of the Water FLUTe installations consist of three to five sampling ports. Each port is ten to fifteen long and is equipped with a pressure transducer for monitoring the potentiometric heads.



Photograph 4. Water FLUTe Installation

2.2.6.3 Preliminary and Extended Bedrock Aquifer Tests

Preliminary aquifer tests were conducted in shallow bedrock wells 115-MW-203 and 115-MW-216 in June 2004. The objective of these tests was to obtain a preliminary understanding of the hydraulic conductivity, structure, and areal anisotropy of the bedrock. These data were then used in the design of the subsequent, expanded aquifer test conducted in October 2006. The preliminary testing was conducted by pumping well 115-MW-216 at 22.5 gpm for a period of five hours, and well 115-MW-203 at 36 gpm for a period of seven hours. The findings of these tests are documented in the "Updated Preliminary Characterization of the Upper Bedrock Aquifer and Bedrock Aquifer Test Work Plan (HydroQual, March 2005) and indicate that the upper bedrock aquifer behaves as a confined, areally anisotropic aquifer. The direction of maximum hydraulic conductivity was determined to be generally oriented in a North 30 to 35 degrees East direction, which is roughly coincident with the strike of the bedrock. Although preliminary estimates of aquifer properties were made, the effects of boundary conditions could not be fully evaluated since the test was of relatively short duration.

An extended bedrock aquifer test was conducted on October 25, 2006 by pumping well 115-MW-203 at 48 gpm for a period of 30 hours. Water levels were monitored in 18 bedrock wells and 10 overburden wells, the majority of which were instrumented with pressure transducers and data loggers. The data were corrected for both tidal and barometric influences using antecedent and recovery data. The discharged water was routed to temporary storage tanks and treated in the on-site treatment plant. The longer duration of this test compared with the preliminary test allowed boundary conditions to be more fully documented and analyzed. This resulted in somewhat higher estimates of aquifer transmissivity than were calculated from the preliminary tests. The results are documented in the "Results of Expanded Bedrock Aquifer Test (HydroQual, January 2007) and summarized in Section 5.3.

2.2.7 River-based Bedrock Investigation

The river-based bedrock investigation consisted of the collection of 29 GeoProbe® samples (in addition to those collected during the groundwater area discharge investigation) and the advancement and sampling of 25 "deep river borings". The methods used for the collection of the GeoProbe® samples are the same as those described in Section 2.2.2.1. The deep river borings are further described below.

2.2.7.1 Deep River Borings

The objective of the deep river borings was to obtain in-situ samples of groundwater from within the bedrock beneath the river and thus aid in the delineation of the bedrock plume. The borings were advanced using the wet-rotary method by a conventional tire-

mounted drilling rig placed on a large construction barge (Photograph 5). A temporary five-inch diameter steel casing was used to seal off the overburden by driving it into the top of bedrock and grouting it in place. The bedrock was then drilled to the desired depth using a roller bit. In most borings, inflatable packers were used to isolate portions of the open rock hole during sampling. The bedrock was sampled by placing a submersible pump through the rods and into the packer interval. The well was then be purged of approximately three well volumes and the sample collected. At the completion of the sampling, the borehole was backfilled with bentonite grout and the casing removed. A summary of the depth and packer intervals is provided on Table 2.2-4.

Vertical Aquifer Sampling using the SimulProbe was used to sample the pore water in the lacustrine sediments at 5-foot intervals in boring DRB-001 and in 10-foot increments in borings DRB-002 and DRB-007. (Borings DRB-003 through DRB-006 were relocated and given different identification numbers).



Photograph 5. Deep River Borings

However, due to weather-related limitations and the results from the first three borings that indicated chromium was not present in the shallow bedrock, this approach was terminated at subsequent locations. This improved the efficiency of the drilling operations and allowed additional borings to be completed.

2.2.8 Groundwater Sampling

Several groundwater sampling events have been conducted as part of the court-ordered investigation. The first event was in September 2004 and included 41 intermediate and deep overburden wells. The second event was in May 2005 when groundwater samples were collected from available FLUTe wells and conventional bedrock monitoring wells. The third groundwater sampling event was conducted in late December 2005 and early January 2006. This round included the nine plume diversion wells and eight available Phase II bedrock wells. In addition, three deep overburden wells in the vicinity of the bowling alley were sampled to aid in the delineation of the plume in this area.

The most recent and comprehensive sampling event was conducted over a six-month period from July through December, 2006. The objective of this event was to re-sample nearly all of the deep overburden and bedrock wells for use in this Final GIR. This

effort was supplemented by the sampling of many of the shallow wells by Mactec during the spring 2006 event.

2.2.9 Water Level Monitoring

Groundwater levels have been measured manually on a quarterly basis beginning with the July 2004 monitoring round as provided on Table 2.2-5. The elevation of the top of casing reference point of the wells has been determined relative to the NGVD-29 datum by State of New Jersey licensed suveyors. The most recent and comprehensive round was collected on December 18 (overburden wells) and December 19, 2006 (bedrock wells) and is provided on the various figures in Section 4.

To correct the water level for tidal and density effects, tidal studies were conducted to determine the tidal efficiency and lag time of the wells. These were conducted by placing pressure transducers in selected wells and allowing automatic data loggers to record changes in levels due to tides. These data were then compared to the river stage fluctuations recorded on the tide gage at the SA-7 bulkhead. Density was assessed using two different methods. The first method compared the hydrostatic head in a well measured with a pressure transducer to the calculated head in the same well based on the depth to water. The second method involved collecting groundwater samples from selected deep wells near the river and having them analyzed for specific gravity. The results are provided on Table 2.2-6 and the data have been plotted on various figures in Section 4.

TABLE 2.2-1
SUMMARY OF VERTICAL AQUIFER SAMPLING (VAS) BORINGS

Intermediate Zone Investigation	Location Description	Total Depth (ft.)	Sample Frequency	Lab/Field Analysis	Well ID (screen interval)
090-MW-09	Baldwin Steel	90	Continuous	yes/yes	2" (70-75)
115-MW-17	SA7	106	Continuous	yes/yes (from 20 ft)	2" (57-62)
115-MW-19	SA7	90	Continuous	yes/yes (from 20 ft)	2" (79-84)
115-MW-20	SA7	92	Continuous	yes/yes	2" (35.2-40.2)
087-MW-34	Toyota	78	Continuous	yes/yes	2" (65-70)
087-MW-35	DPW	56	Continuous	yes/yes	2" (30-40)
Plume Diversion Area Investigation	**Location Description**	**Total Depth (ft.)**	**Sample Frequency**	**Lab/Field Analysis**	**Well ID (screen interval)**
124-SB-101	Bowling alley parking lot	78	Continuous	yes/yes	None
124-MW-102	Bowling alley parking lot	84	Continuous	yes/yes	124-MW-102D 20.2'-30.2' 124-MW-102T (65'-75")
124-MW-103	Bowling alley parking lot	110.5	Continuous	yes/yes	103D (19.9'-29.9') 103L (45.2'-55.2')
124-MW-104	Bowling alley parking lot	108	Continuous	yes/yes	104D (16.0'-26.3') 104L (33.9'-43.9') 104T (57.9'-68.0')
124-MW-105	Bowling alley parking lot	100	Continuous	yes/yes	105D (14.3'-24.3') 105T (52.4'-62.4')
124-MW-106	Behind Bowling Alley	114	Continuous	yes/yes	106T (67.7'-77.9')
124-MW-107	Between Bowling Alley and 60 Kellogg	106	Continuous	yes/yes	107T (60.3'-70.4')
119-MW-01T	K-Mart	114	None	no/no	(51.9'-61.9')
119-MW-02T	Pathmark/K-Mart	70	None	no/no	(60'-70')

TABLE 2.2-1
SUMMARY OF VERTICAL AQUIFER SAMPLING (VAS) BORINGS

Route 440 Investigation	Location Description	Total Depth (ft.)	Sample Frequency	Lab/Field Analysis	Well ID (screen interval)
117-MW-I1/D1	Home Depot	69	Continuous	no/no	117-MW-I1 (11.8'-21.9") 117-MW-D1 (31.9'-41.9")
117-MW-I2/D2	Home Depot	82	Continuous	no/no	D2 (38.5'-48.5') I2 (18.1'-28.1')
117-MW-I3	Home Depot	42	Continuous to 17, 5 feet	yes/yes	I3 (18.1'-28.3')
117-MW-I4	Home Depot	100	Continuous to 70, 5 feet	yes/yes	I4 (60'-75') S4 (10'-20')
117-MW-I5/D3	Home Depot	82	Continuous to 19, 5 feet	yes/yes	D3 (70'-80') I5 (22'-37')

Bedrock Well Installation Borings	Location Description	Total Depth (ft.)	Sample Frequency	Lab/Field Analysis	Well ID (screen interval)
073-MW-01BR	Degen Oil	119	Continuous to 19 feet, 5 feet	yes/yes	NA
117-MW-03BR	Home Depot	103	Continuous to 50 feet, 5 feet	yes/yes	NA
SA6-MW-05BR	Hudson Mall	81	5 feet	yes/yes	NA
090-MW-07BR	Baldwin Steel	109	Continuous to 17 Feet, 5 feet	yes/yes	NA

TABLE 2.2-2
SUMMARY OF GROUNDWATER DISCHARGE INVESTIGATION
Phase I Investigation (Nov.- Dec., 2004)

GeoProbe Borings	Pore Water (Peeper) Samples	Surface Water Samples	Co-located Sediment Samples
PW001-050	PW001-050		
PW001-300	PW001-300		
PW001-600	PW001-600		
PW002-050	PW002-050		
PW002-300	PW002-300		
PW002-600	PW002-600		
PW002-900	PW002-900		
PW002-1200	PW002-1200		
PW003-050	PW003-050		
PW003-300	PW003-300		
PW003-600	PW003-600		
PW003-900	PW003-900(1)	Note: Deep VAS borings conducted at PW003-200	
PW003-1200	PW003-1200	and PW003-900	
PW004-050	PW004-050		
PW004-300	PW004-300		
PW004-600	PW004-600		
PW004-900	PW004-900		
PW004-1200	PW004-1200		
PW005-050	PW005-050		
PW005-300	PW005-300		
PW005-600	PW005-600		
PW006-050	PW006-050		
PW006-300	PW006-300		
PW006-600	PW006-600		
PW007-050	PW007-050		
PW007-300	PW007-300		
PW008-750			
PW008-900			
PW008-10H			
PW009-050			
PW009-150			
PW009-450			
PW009-750			
PW009-10H			
PW010-050			
PW010-150			
PW010-450			
PW010-750			
PW011-500			

TABLE 2.2-2
SUMMARY OF GROUNDWATER DISCHARGE INVESTIGATION

Phase II Investigation (Apr., 2005)

GeoProbe Borings	Pore Water (Peeper) Samples	Surface Water Samples (# per location)	Co-located Sediment Samples
	PW02A-10H	SW001-300 (1)	SED02A-10H
	PW03A-400	SW001-550 (1)	SED03A-400
	PW03A-600	SW002-300 (1)	SED03A-600
	PW003-750	SW002-12H (2)	SED003-750
	PW03A-900	SW003-050 (1)	SED03A-900
	PW09A-800	SW003-600 (2)	SED09A-800
	PW09A-10H	SW003-750 (2)	SED09A-10H
	PW010-450	SW003-900 (1)	SED010-450
	PW010-550	SW003-15H (2)	SED010-550
	PW010-750	SW004-11H (2)	SED010-750
		SW005-600 (2)	
		SW009-750 (2)	
		SW010-750 (2)	
		SW011-00 (2)	

Phase III Investigation (Apr.- May, 2006)

GeoProbe Borings	Pore Water (Peeper) Samples	Surface Water Samples (# per location)	Co-located Sediment Samples
	PWGDA-SO1		
	PWGDA-SO2		
	PWGDA-SO3		
	PWGDA-SO4		
	PWGDA-SO5		
	PWGDA-SO6		
	PWGDA-NO1		
	PWGDA-NO2		
	PWGDA-NO3		
	PWGDA-NO4		
	PWGDA-NO5		
	PWGDA-NO6		

TABLE 2.2-3
SUMMARY OF LAND-BASED BEDROCK INVESTIGATIONS

Phase I Bedrock Investigation	Location Description	Depth to Bedrock (ft.)	Total Depth (ft.)	Port # (Depth) (feet below grade)	Coring/Packer Testing	Geophysical Logging
073-MW-1BR	Degan Oil	119	329	Port 1 (129'-144') Port 2 (194'-209') Port 3 (249'-264') Port 4 (280'-295') Port 5 (311'-326')	yes/yes	yes
119-MW-2BR	Hovnanian	133	343	Port 1 (148'-163') Port 2 (230'-245') Port 3 (300'-315')	no/yes	yes
117-MW-3BR / 117-MW-8BR	Home Depot	103	314	Port 1 (140'-155') Port 2 (248'-263') (115-125)	yes/yes	yes
119-MW-4BR	Soccer Field	146	357	Port 1 (164'-179') Port 2 (214'-229') Port 3 (299'-314')	no/yes	yes
SA6-MW-5BR	Hudson Mall	81	291	Port 1 (91'-106') Port 2 (139'-154') Port 3 (191'-204') Port 4 (221'-236') Port 5 (266'-281')	no/yes	yes
KP-MW-6BR	Kearny Point	129	340	Port 1 (139'-153') Port 2 (216'-231') Port 3 (324'-339')	yes/yes	yes
090-MW-7BR	Baldwin Steel	109	311	Port 1 (119'-134') Port 2 (162'-177') Port 3 (218'-233')	no/yes	yes

TABLE 2.2-3
SUMMARY OF LAND-BASED BEDROCK INVESTIGATIONS

Phase II Bedrock Investigation	Location Description	Depth to Bedrock (ft.)	Total Depth (ft.)	Port # (Depth) (feet below grade)	Coring/Packer Testing	Geophysical Logging
124-MW-8BR	Kellogg St. (Bowling Alley)	128.5	153	Screened 133'-153'	no/no	no
140-MW-9BR	80 Kellogg St.	121	331	Port 1 (138'-153') Port 2 (207'-222') Port 3 (257'-272')	no/yes	yes
073-MW-10BR	Kellogg St. (Degan Oil)	129.5	340.4	Port 1 (165'-190') Port 2 (212'-227') Port 3 (312'-327')	no/yes	yes
119-MW-11BR	K-MART (Western Well)	129.5	159	open hole none	no/no	no
119-MW-12BR	K-MART (Eastern Well)	124	234	Screened 133'-153'	no/yes	no
079-MW-13BR	Honda Dealer	100.5	308	Port 1 (111'-121') Port 2 (199'-214') Port 3 (269'-284')	no/yes	yes
SA6-MW-14BR	Hudson Mall (Eastern Well)	55	265	Screened 75'-85'	no/yes	yes
SA6-MW-15BR	Hudson Mall (Western Well)	73	103	open hole none	no/no	no

TABLE 2.2-3
SUMMARY OF LAND-BASED BEDROCK INVESTIGATIONS

Phase III Bedrock Investigation	Location Description	Depth to Bedrock (ft.)	Total Depth (ft.)	Number of Sample Ports	Coring/Packer Testing	Geophysical Logging
119-MW-16BR	K-Mart	126	335.5	Port 1 (136'-151') Port 2 (172'-187') Port 3 (232'-247')	no/yes	yes
124-MW-17BR	Kellogg St., Bowling Alley	128.5	338.5	Port 1 (138'-153') Port 2 (322'-337')	no/yes	yes
090-MW-18BR	New Jersey City University (NJCU) by Metro Field	132	339.2	screened 132.7-152.8	no/yes	yes

TABLE 2.2-4
SUMMARY OF RIVER-BASED BEDROCK INVESTIGATION

Phase I Investigation (Nov.- Dec., 2005)

Boring ID	Approximate Water Depth (feet)	Depth to Top of Bedrock from River Bottom (feet)	Total Boring Depth from River Bottom (feet)	Sample Intervals below Top of Rock (ft.)
DRB-01	20	103	123	103 - 123
DRB-02	14	98	118	98 - 118
DRB-07	16	101	121	101 - 121
DRB-08	10	109	129	109 - 129
DRB-09	22	103	123	103 - 123
DRB-10	18	104	124	104 - 124
DRB-11	16	102	122	102 - 122
DRB-12	20	108	128	108 - 128
DRB-13	14	114	194	114 - 154, 114 - 194

GeoProbe Borings PWUNB-001 through PWUNB-032 were conducted.

Phase II Investigation (April - June, 2006)

Boring ID	Approximate Water Depth (feet)	Depth to Top of Bedrock from River Bottom (feet)	Total Boring Depth from River Bottom (feet)	Sample Intervals below Top of Rock (ft.)
DRB-14	8	116	322	122-147, 147-172, 172-197, 197-222, 222-247, 247-272, 272-297, 297-322
DRB-15	13	114	314	114-139, 139-164, 164-189,189-214, 214-239, 239-264, 264-289, 289-314
DRB-16	14	115	315	115-140, 140-165, 165-190, 190-215, 215-240, 240-265, 265-290, 290-315
DRB-17	9	114	264	114-139, 139-164, 164-189,189-214, 214-239, 239-264
DRB-18	8	113	173	113-133, 123-148, 148-173
DRB-19	9	111	196	111-131, 111-171, 171-196
DRB-20	9	106	166	106-126, 116-141, 141-166
DRB-21	11	119	178	119-139, 128-153, 153-178
DRB-23	9	123	163	123-143, 123-163

TABLE 2.2-4
SUMMARY OF RIVER-BASED BEDROCK INVESTIGATION

Phase III Investigation (Oct.- Dec., 2006)

Boring ID	Depth to Rock from Top of Mud (ft.)	Depth to Rock from Top of Mud (ft.)	Total Depth from Top of Mud (ft.)	Sample Intervals below Top of Rock (ft.)
DRB-24	5	123	222	122-147, 147-172, 172-197, 197-222
DRB-25	28	77	127	77-102, 102-127
DRB-26	14	108	164	114-139, 139-164
DRB-27	24	122	174	149-174
DRB-28	40	73	123	73-98, 98-123
DRB-29	34	86	136	86-111, 111-136

GeoProbe Borings PWUNB-032 through PWUNB-037 were conducted.

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	July 8, 2004 Corrected GW Elev. (ft. msl)	October 28, 2004 Corrected GW Elev. (ft. msl)	March 31, 2005 Corrected GW Elev. (ft. msl)	June 14, 2005 Corrected GW Elev. (ft. msl)	August 25, 2005 Corrected GW Elev. (ft. msl)
073-MW-10BR	NA	NA	NA	NA	NA
073-MW-10BR-1	NA	NA	NA	NA	NA
073-MW-10BR-2	NA	NA	NA	NA	NA
073-MW-10BR-3	NA	NA	NA	NA	NA
073-MW-10BR-4	NA	NA	NA	NA	NA
073-MW-10BR-5	NA	NA	NA	NA	NA
073-MW-1BR-1	NA	NA	NA	NA	NA
073-MW-1BR-2	NA	NA	NA	NA	NA
073-MW-1BR-3	NA	NA	NA	NA	NA
073-MW-1BR-4	NA	NA	NA	NA	NA
073-MW-1BR-5	NA	NA	NA	NA	NA
073-MW-BB11	3.04	3.17	3.75	3.20	3.04
073-MW-Y10	3.86	3.71	3.88	3.65	3.35
079-MW-13BR	NA	NA	NA	NA	NA
079-MW-13BR-1	NA	NA	NA	NA	NA
079-MW-13BR-2	NA	NA	NA	NA	NA
079-MW-13BR-3	NA	NA	NA	NA	NA
079-MW-A2	4.31	4.24	4.46	4.13	4.11
079-MW-C6	5.76	5.72	6.45	5.58	5.41
087-MW-001	NA	NA	NA	NA	NA
087-MW-01	3.00	3.15	3.29	3.17	3.00
087-MW-02	3.63	3.87	NA	NA	NA
087-MW-03	3.00	3.31	3.40	3.40	3.19
087-MW-08	1.12	3.72	2.50	2.35	2.13
087-MW-13	-0.83	2.81	0.98	0.84	0.90
087-MW-14	4.95	4.58	4.61	4.25	4.43
087-MW-34	NA	NA	NA	NA	NA
087-MW-35	1.35	3.78	NA	1.91	1.78
087-MW-A26	4.54	4.55	5.16	4.33	4.34
087-MW-A26D	4.46	4.44	4.87	4.37	4.33
087-MW-A26T	4.46	4.44	4.56	4.37	4.29
087-MW-I30	4.55	4.49	4.76	4.58	4.34
087-MW-I30T	3.88	4.23	4.71	4.26	4.05
087-MW-O19	NA	NA	NA	NA	6.95
087-MW-O19D	3.02	3.45	3.27	3.47	3.05
087-MW-O23	5.80	6.60	NA	5.78	5.62
087-MW-O29	4.60	4.66	5.01	4.57	4.46
087-MW-O29D	NA	NA	NA	NA	NA
087-MW-O29T	3.52	4.79	4.18	3.92	3.84
087-MW-S19	NA	NA	NA	NA	NA
087-MW-U28	4.62	6.47	5.75	5.45	5.61
087-MW-W25	4.05	4.66	4.40	4.30	4.49
087-MW-W25D	1.51	3.81	2.27	2.02	2.04
087-MW-W25T	2.70	4.63	3.58	3.89	3.87
087-MW-Y20	3.02	3.78	3.80	2.92	2.84
088-MW-001	NA	NA	NA	NA	NA
088-MW-002	NA	NA	NA	NA	NA

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	July 8, 2004 Corrected GW Elev. (ft. msl)	October 28, 2004 Corrected GW Elev. (ft. msl)	March 31, 2005 Corrected GW Elev. (ft. msl)	June 14, 2005 Corrected GW Elev. (ft. msl)	August 25, 2005 Corrected GW Elev. (ft. msl)
088-MW-15	3.08	3.16	3.42	3.16	3.24
088-MW-G19	7.33	7.43	8.10	7.46	6.37
088-MW-G19T	4.74	5.05	5.10	4.82	4.75
090-MW-07	6.13	6.48	6.59	6.01	6.14
090-MW-09	5.71	5.58	5.73	5.15	5.44
090-MW-10	NA	NA	NA	NA	NA
090-MW-11	NA	NA	NA	NA	NA
090-MW-18BR	NA	NA	NA	NA	NA
090-MW-7BR-1	NA	NA	NA	NA	NA
090-MW-7BR-2	NA	NA	NA	NA	NA
090-MW-7BR-3	NA	NA	NA	NA	NA
090-MW-E1	10.11	10.10	10.77	9.91	9.38
090-MW-F14	11.88	11.76	15.08	11.93	11.18
115-MW-04R(ABAN)	3.26	3.29	3.48	3.33	NA
115-MW-05(ABAN)	3.12	3.16	3.40	2.36	8.16
115-MW-101(ABAN)	3.86	4.52	5.77	NA	NA
115-MW-103	6.47	6.23	6.73	6.60	6.10
115-MW-104(ABAN)	7.76	7.61	8.44	7.66	6.88
115-MW-107	7.86	7.46	8.33	0.57	6.72
115-MW-108	8.90	8.55	9.83	11.68	7.73
115-MW-109(ABAN)	8.85	8.32	9.36	NA	NA
115-MW-115	7.51	7.30	7.97	7.23	6.57
115-MW-118	8.73	8.48	9.58	8.98	10.80
115-MW-119A	9.33	9.00	10.27	8.85	9.30
115-MW-17(ABAN)	1.53	2.00	2.19	3.17	1.90
115-MW-19(ABAN)	4.05	4.00	4.14	4.55	4.72
115-MW-20	3.20	3.25	3.23	3.36	3.05
115-MW-201BR	1.88	4.01	2.76	3.21	2.97
115-MW-202BR(ABAN)	3.04	3.35	3.34	3.29	NA
115-MW-203BR	2.71	4.00	2.47	3.35	2.82
115-MW-204BR(ABAN)	NA	NA	NA	NA	NA
115-MW-205BR(ABAN)	3.89	4.26	4.38	4.29	NA
115-MW-206(ABAN)	8.57	8.04	4.77	7.90	NA
115-MW-206BR	4.62	4.86	9.11	4.76	NA
115-MW-207BR(ABAN)	5.03	5.30	5.25	5.08	NA
115-MW-208BR	5.72	5.95	6.00	5.73	NA
115-MW-209BR(ABAN)	5.70	5.90	5.98	5.72	9.92
115-MW-211BR	4.96	5.07	5.19	3.99	4.72
115-MW-212BR(ABAN)	4.68	4.78	4.93	4.55	NA
115-MW-213BR	3.83	3.91	4.02	NA	NA
115-MW-214BR(ABAN)	2.37	4.08	3.00	3.39	NA
115-MW-215BR	2.09	4.26	2.37	3.58	2.78
115-MW-216BR(ABAN)	5.01	5.22	5.26	5.11	4.89
115-MW-A12T	5.02	5.72	5.14	5.09	NA
115-MW-AA15(ABAN)	3.87	3.39	5.46	5.38	3.06
115-MW-E14	11.79	11.85	14.28	12.29	11.37
115-MW-E14D	4.73	4.69	4.90	4.83	5.37

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	July 8, 2004 Corrected GW Elev. (ft. msl)	October 28, 2004 Corrected GW Elev. (ft. msl)	March 31, 2005 Corrected GW Elev. (ft. msl)	June 14, 2005 Corrected GW Elev. (ft. msl)	August 25, 2005 Corrected GW Elev. (ft. msl)
115-MW-E14T	4.60	4.61	4.78	4.74	5.32
115-MW-E8(ABAN)	8.28	8.07	8.58	NA	8.35
115-MW-E8D(ABAN)	4.59	4.55	4.62	4.65	5.09
115-MW-E8T(ABAN)	4.80	4.79	4.90	NA	5.86
115-MW-K14T(ABAN)	4.49	4.55	4.68	NA	NA
115-MW-O13	8.59	8.18	9.26	8.34	4.39
115-MW-O13D	3.46	3.51	3.46	3.65	3.24
115-MW-U14	7.79	7.60	8.22	NA	6.89
115-MW-U14D(ABAN)	1.41	1.91	1.08	2.16	NA
115-MW-U14T(ABAN)	3.81	3.64	3.91	NA	NA
115-PW-21	4.53	4.51	4.70	4.67	5.11
115-PZ-01	-0.45	NA	NA	NA	NA
115-PZ-02	1.62	NA	NA	NA	NA
115-PZ-03	2.96	NA	NA	NA	NA
115-PZ-04	-0.47	NA	NA	1.90	-0.47
115-PZ-05	1.40	NA	NA	4.48	3.37
115-PZ-06	3.05	NA	NA	4.64	4.26
115-PZ-07	NA	NA	NA	NA	NA
115-PZ-08	NA	NA	NA	NA	NA
115-PZ-A12	7.72	7.57	8.72	7.47	NA
115-PZ-E11	NA	NA	NA	NA	NA
115-PZ-I14	NA	NA	NA	NA	NA
115-PZ-K09	NA	NA	NA	NA	NA
117-MW-10(ABAN)	8.72	8.90	10.06	NA	8.00
117-MW-11(ABAN)	8.82	9.13	10.13	NA	8.12
117-MW-3BR-1	NA	NA	NA	NA	NA
117-MW-3BR-2	NA	NA	NA	NA	NA
117-MW-8BR	NA	NA	NA	NA	NA
117-MW-A14	NA	6.09	NA	NA	NA
117-MW-A5	7.71	8.19	8.32	NA	7.43
117-MW-A62	7.82	8.14	7.82	3.20	7.50
117-MW-A85	6.40	6.59	6.34	3.35	6.29
117-MW-A89	5.65	5.53	-4.17	3.54	5.17
117-MW-A99	7.50	7.70	7.30	NA	7.20
117-MW-D1	NA	NA	NA	NA	NA
117-MW-D2	NA	NA	NA	NA	NA
117-MW-D3	NA	NA	NA	NA	NA
117-MW-I1	NA	NA	NA	NA	NA
117-MW-I2	NA	NA	NA	NA	NA
117-MW-I3	NA	NA	NA	NA	NA
117-MW-I4	NA	NA	NA	NA	NA
117-MW-I5	NA	NA	NA	NA	NA
119-MW-01T	NA	NA	NA	NA	NA
119-MW-02T	NA	NA	NA	NA	NA
119-MW-11BR	NA	NA	NA	NA	NA
119-MW-12BR	NA	NA	NA	NA	NA

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	July 8, 2004 Corrected GW Elev. (ft. msl)	October 28, 2004 Corrected GW Elev. (ft. msl)	March 31, 2005 Corrected GW Elev. (ft. msl)	June 14, 2005 Corrected GW Elev. (ft. msl)	August 25, 2005 Corrected GW Elev. (ft. msl)
119-MW-16BR-1	NA	NA	NA	NA	NA
119-MW-16BR-2	NA	NA	NA	NA	NA
119-MW-16BR-3	NA	NA	NA	NA	NA
119-MW-2BR-1	NA	NA	NA	NA	NA
119-MW-2BR-2	NA	NA	NA	NA	NA
119-MW-2BR-3	NA	NA	NA	NA	NA
119-MW-4BR-1	NA	NA	NA	NA	NA
119-MW-4BR-2	NA	NA	NA	NA	NA
119-MW-4BR-3	NA	NA	NA	NA	NA
120-MW-210	8.75	8.59	NA	NA	NA
120-MW-210BR	5.55	5.75	NA	NA	NA
124-MW-001	NA	NA	NA	NA	NA
124-MW-002	NA	NA	NA	NA	NA
124-MW-06	3.52	3.64	2.94	NA	4.58
124-MW-102D	NA	NA	NA	NA	NA
124-MW-102T	NA	NA	NA	NA	NA
124-MW-103D	NA	NA	NA	NA	NA
124-MW-103L	NA	NA	NA	NA	NA
124-MW-104D	NA	NA	NA	NA	NA
124-MW-104L	NA	NA	NA	NA	NA
124-MW-104T	NA	NA	NA	NA	NA
124-MW-105D	NA	NA	NA	NA	NA
124-MW-105T	NA	NA	NA	NA	NA
124-MW-106T	NA	NA	NA	NA	NA
124-MW-107T	NA	NA	NA	NA	NA
124-MW-17BR-1	NA	NA	NA	NA	NA
124-MW-17BR-2	NA	NA	NA	NA	NA
124-MW-8BR	NA	NA	NA	NA	NA
124-MW-G02D	4.15	4.17	4.17	NA	4.15
124-MW-G02T	4.42	4.58	4.64	NA	4.59
125-MW-L03	5.21	5.00	NA	NA	NA
134-MW-Q08	5.86	5.38	NA	NA	5.34
134-MW-V09	5.20	5.08	5.79	NA	4.48
140-MW-04	4.89	4.67	5.88	NA	4.84
140-MW-06	8.20	8.33	NA	NA	6.50
140-MW-07	6.14	5.53	6.99	NA	5.58
140-MW-9BR	NA	NA	NA	NA	NA
140-MW-9BR-1	NA	NA	NA	NA	NA
140-MW-9BR-2	NA	NA	NA	NA	NA
140-MW-9BR-3	NA	NA	NA	NA	NA
140-MW-P05D	3.18	3.54	1.21	NA	3.14
153-MW-A13	4.37	4.13	4.61	NA	3.74
153-MW-A13T	4.54	3.99	4.32	NA	3.99
153-MW-A15	3.99	3.76	4.04	NA	3.41
154-MW-A01	11.25	11.42	12.45	NA	10.77
154-MW-A05A	11.23	11.37	NA	NA	10.84

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	July 8, 2004 Corrected GW Elev. (ft. msl)	October 28, 2004 Corrected GW Elev. (ft. msl)	March 31, 2005 Corrected GW Elev. (ft. msl)	June 14, 2005 Corrected GW Elev. (ft. msl)	August 25, 2005 Corrected GW Elev. (ft. msl)
154-MW-A06	11.62	11.74	14.96	NA	NA
154-MW-B6A	NA	NA	NA	NA	NA
154-MW-C6A	11.94	14.10	13.40	NA	NA
154-MW-D01	12.24	NA	NA	NA	NA
154-MW-E08	12.77	12.86	14.66	NA	NA
154-MW-F7E	NA	NA	NA	NA	NA
163-MW-CC8	2.49	2.98	2.91	NA	2.37
163-MW-R05	NA	4.51	NA	NA	4.59
163-MW-Y06	7.40	NA	NA	NA	NA
184-MW-001	NA	NA	NA	NA	NA
184-MW-002	NA	NA	NA	NA	NA
184-MW-C02	NA	NA	NA	NA	NA
184-MW-C10	9.71	9.85	10.80	NA	9.13
184-MW-E10	NA	NA	NA	NA	NA
KP-MW-6BR-1	NA	NA	NA	NA	NA
KP-MW-6BR-2	NA	NA	NA	NA	NA
KP-MW-6BR-3	NA	NA	NA	NA	NA
SA6-MW-14BR	NA	NA	NA	NA	NA
SA6-MW-15BR	NA	NA	NA	NA	NA
SA6-MW-5BR-1	NA	NA	NA	NA	NA
SA6-MW-5BR-2	NA	NA	NA	NA	NA
SA6-MW-5BR-3	NA	NA	NA	NA	NA
SA6-MW-5BR-4	NA	NA	NA	NA	NA
SA6-MW-5BR-5	NA	NA	NA	NA	NA
SA6-MW-AA1	3.46	3.71	NA	NA	3.44
SA6-MW-AA1D	5.68	4.57	NA	NA	3.40
SA6-MW-AA1T	5.24	4.53	NA	NA	3.48

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	December 27, 2005 Corrected GW Elev. (ft. msl)	March 9 & 10, 2006 Corrected GW Elev. (ft. msl)	May 25-26, 2006 Corrected GW Elev. (ft. msl)	September 28-29, 2006 Corrected GW Elev. (ft. msl)	December 18-19, 2006 Corrected GW Elev. (ft. msl)
073-MW-10BR	3.02	3.08	NA	NA	NA
073-MW-10BR-1	NA	NA	NA	2.21	3.12
073-MW-10BR-2	NA	NA	NA	2.26	3.02
073-MW-10BR-3	NA	NA	NA	2.42	2.79
073-MW-10BR-4	NA	NA	NA	2.63	4.28
073-MW-10BR-5	NA	NA	NA	3.41	NA
073-MW-1BR-1	3.25	3.23	2.40	2.38	2.94
073-MW-1BR-2	3.47	3.25	2.65	2.98	3.28
073-MW-1BR-3	3.58	3.35	2.81	2.97	3.04
073-MW-1BR-4	3.70	3.36	3.09	3.12	3.69
073-MW-1BR-5	NA	3.46	3.31	3.30	2.98
073-MW-BB11	3.28	3.12	3.67	3.13	3.32
073-MW-Y10	3.81	3.60	3.92	3.49	3.93
079-MW-13BR	6.70	6.36	6.69	NA	NA
079-MW-13BR-1	NA	NA	NA	NA	5.34
079-MW-13BR-2	NA	NA	NA	NA	6.11
079-MW-13BR-3	NA	NA	NA	NA	6.53
079-MW-A2	4.15	3.50	NA	NA	3.42
079-MW-C6	5.85	5.53	5.45	5.38	5.76
087-MW-001	NA	6.48	6.96	6.60	6.70
087-MW-01	2.90	1.90	1.85	1.50	1.45
087-MW-02	NA	2.08	1.97	1.65	1.34
087-MW-03	3.01	1.39	1.23	0.96	0.68
087-MW-08	NA	1.61	1.64	2.80	2.10
087-MW-13	NA	1.34	2.05	2.55	1.58
087-MW-14	4.63	6.36	3.04	NA	5.11
087-MW-34	NA	2.52	2.59	Dry	Dry
087-MW-35	1.71	1.73	1.73	2.02	1.75
087-MW-A26	4.70	3.79	3.62	5.44	4.09
087-MW-A26D	4.45	3.60	3.47	3.36	3.24
087-MW-A26T	4.40	3.58	3.46	3.31	3.19
087-MW-I30	4.42	4.24	4.13	4.28	4.07
087-MW-I30T	4.29	4.02	3.80	NA	3.24
087-MW-O19	8.01	7.04	7.69	7.15	7.25
087-MW-O19D	2.72	2.46	NA	2.14	2.17
087-MW-O23	NA	5.59	5.61	5.67	5.81
087-MW-O29	4.70	4.41	4.25	4.92	4.30
087-MW-O29D	2.59	2.38	2.21	2.40	1.81
087-MW-O29T	3.84	2.72	2.90	NA	2.73
087-MW-S19	NA	NA	NA	NA	NA
087-MW-U28	9.18	NA	5.55	5.86	5.94
087-MW-W25	4.49	4.25	4.37	4.67	4.65
087-MW-W25D	1.90	1.48	1.48	2.05	1.41
087-MW-W25T	3.02	2.01	2.12	2.03	2.16
087-MW-Y20	2.99	2.59	2.94	2.92	2.82
088-MW-001	NA	0.84	3.98	4.57	3.23
088-MW-002	NA	7.02	6.37	6.72	7.73

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	December 27, 2005 Corrected GW Elev. (ft. msl)	March 9 & 10, 2006 Corrected GW Elev. (ft. msl)	May 25-26, 2006 Corrected GW Elev. (ft. msl)	September 28-29, 2006 Corrected GW Elev. (ft. msl)	December 18-19, 2006 Corrected GW Elev. (ft. msl)
088-MW-15	NA	1.22	-3.43	1.91	NA
088-MW-G19	NA	6.55	2.62	7.45	6.41
088-MW-G19T	4.86	4.39	7.57	NA	NA
090-MW-07	6.69	6.46	6.29	NA	6.34
090-MW-09	5.92	5.04	5.01	NA	5.54
090-MW-10	6.16	na	6.05	14.99	7.21
090-MW-11	6.07	5.74	5.86	15.05	7.42
090-MW-18BR	NA	NA	NA	16.36	11.68
090-MW-7BR-1	5.99	5.47	5.64	5.07	4.35
090-MW-7BR-2	6.18	6.09	5.48	5.52	3.87
090-MW-7BR-3	6.34	5.79	5.58	5.67	4.93
090-MW-E1	7.04	6.86	6.87	6.88	6.86
090-MW-F14	12.28	12.29	12.10	11.79	11.97
115-MW-04R(ABAN)	NA	NA	NA	NA	NA
115-MW-05(ABAN)	NA	NA	NA	NA	NA
115-MW-101(ABAN)	NA	NA	NA	NA	NA
115-MW-103	7.66	7.12	8.25	4.88	3.60
115-MW-104(ABAN)	NA	NA	NA	NA	NA
115-MW-107	8.72	8.80	NA	8.52	NA
115-MW-108	NA	NA	NA	NA	8.40
115-MW-109(ABAN)	NA	NA	NA	NA	NA
115-MW-115	8.10	8.33	8.69	8.04	7.08
115-MW-118	7.33	7.75	7.55	5.76	3.35
115-MW-119A	8.87	8.27	4.92	3.28	NA
115-MW-17(ABAN)	1.96	2.52	1.17	1.28	1.50
115-MW-19(ABAN)	3.70	-1.96	-2.07	NA	NA
115-MW-20	2.79	1.82	1.29	1.08	0.74
115-MW-201BR	NA	NA	NA	NA	4.47
115-MW-202BR(ABAN)	NA	NA	NA	NA	NA
115-MW-203BR	NA	NA	NA	NA	1.68
115-MW-204BR(ABAN)	NA	NA	NA	NA	NA
115-MW-205BR(ABAN)	NA	NA	NA	NA	NA
115-MW-206(ABAN)	NA	NA	NA	NA	NA
115-MW-206BR	NA	NA	NA	NA	NA
115-MW-207BR(ABAN)	NA	NA	NA	NA	NA
115-MW-208BR	NA	NA	NA	NA	NA
115-MW-209BR(ABAN)	NA	NA	NA	NA	NA
115-MW-211BR	5.08	4.16	4.22	NA	3.82
115-MW-212BR(ABAN)	NA	NA	NA	NA	NA
115-MW-213BR	NA	NA	NA	NA	NA
115-MW-214BR(ABAN)	NA	NA	NA	NA	NA
115-MW-215BR	NA	NA	NA	NA	0.35
115-MW-216BR(ABAN)	5.10	4.26	4.27	NA	NA
115-MW-A12T	NA	NA	NA	2.58	NA
115-MW-AA15(ABAN)	NA	NA	NA	NA	NA
115-MW-E14	11.85	12.17	9.06	4.08	NA
115-MW-E14D	4.35	-1.68	-1.79	-2.17	NA

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	December 27, 2005 Corrected GW Elev. (ft. msl)	March 9 & 10, 2006 Corrected GW Elev. (ft. msl)	May 25-26, 2006 Corrected GW Elev. (ft. msl)	September 28-29, 2006 Corrected GW Elev. (ft. msl)	December 18-19, 2006 Corrected GW Elev. (ft. msl)
115-MW-E14T	4.21	-1.67	-1.71	NA	NA
115-MW-E8(ABAN)	10.30	5.18	3.97	NA	NA
115-MW-E8D(ABAN)	4.37	-1.83	-2.04	NA	NA
115-MW-E8T(ABAN)	4.46	-0.97	-1.12	NA	NA
115-MW-K14T(ABAN)	NA	NA	NA	NA	NA
115-MW-O13	9.22	9.44	9.71	9.21	8.07
115-MW-O13D	3.02	1.75	1.23	0.99	0.89
115-MW-U14	8.50	8.68	9.06	8.35	7.42
115-MW-U14D(ABAN)	NA	NA	NA	NA	NA
115-MW-U14T(ABAN)	NA	NA	NA	NA	NA
115-PW-21	4.14	NA	NA	NA	NA
115-PZ-01	NA	NA	NA	NA	NA
115-PZ-02	NA	NA	NA	NA	NA
115-PZ-03	NA	NA	NA	NA	NA
115-PZ-04	4.57	3.94	6.37	6.40	6.40
115-PZ-05	5.07	3.99	7.47	4.00	4.30
115-PZ-06	5.08	3.83	6.59	3.60	3.78
115-PZ-07	NA	NA	NA	NA	NA
115-PZ-08	NA	NA	NA	NA	NA
115-PZ-A12	NA	NA	NA	NA	NA
115-PZ-E11	NA	NA	NA	NA	NA
115-PZ-I14	NA	NA	NA	NA	NA
115-PZ-K09	NA	NA	NA	NA	NA
117-MW-10(ABAN)	9.53	9.34	NA	NA	NA
117-MW-11(ABAN)	9.66	9.40	NA	NA	NA
117-MW-3BR-1	6.38	6.01	6.45	8.97	5.74
117-MW-3BR-2	7.22	na	7.25	8.30	6.74
117-MW-8BR	NA	6.11	5.62	5.83	5.82
117-MW-A14	10.43	NA	5.66	NA	5.83
117-MW-A5	NA	8.39	8.12	8.06	8.14
117-MW-A62	8.24	8.20	7.94	8.01	8.23
117-MW-A85	6.57	6.51	6.15	6.29	6.39
117-MW-A89	5.66	5.24	5.11	5.11	4.90
117-MW-A99	7.74	7.70	7.27	7.49	7.65
117-MW-D1	NA	NA	NA	NA	4.09
117-MW-D2	NA	NA	NA	NA	5.36
117-MW-D3	NA	NA	NA	NA	6.49
117-MW-I1	NA	NA	NA	NA	4.13
117-MW-I2	NA	NA	NA	NA	5.86
117-MW-I3	NA	NA	NA	NA	5.73
117-MW-I4	NA	NA	NA	NA	NA
117-MW-I5	NA	NA	NA	NA	8.80
119-MW-01T	NA	NA	NA	NA	3.11
119-MW-02T	NA	NA	NA	NA	3.55
119-MW-11BR	5.53	4.54	4.46	4.52	4.27
119-MW-12BR	2.05	4.11	9.92	5.46	4.42

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	December 27, 2005 Corrected GW Elev. (ft. msl)	March 9 & 10, 2006 Corrected GW Elev. (ft. msl)	May 25-26, 2006 Corrected GW Elev. (ft. msl)	September 28-29, 2006 Corrected GW Elev. (ft. msl)	December 18-19, 2006 Corrected GW Elev. (ft. msl)
119-MW-16BR-1	NA	NA	NA	5.01	4.78
119-MW-16BR-2	NA	NA	NA	4.84	4.76
119-MW-16BR-3	NA	NA	NA	4.84	4.99
119-MW-2BR-1	NA	1.98	2.24	2.62	3.46
119-MW-2BR-2	NA	2.55	2.78	3.21	3.21
119-MW-2BR-3	NA	2.78	2.83	3.41	3.07
119-MW-4BR-1	6.41	5.60	5.08	6.23	5.57
119-MW-4BR-2	NA	4.68	5.08	6.16	5.41
119-MW-4BR-3	6.57	5.58	5.40	6.17	5.79
120-MW-210	NA	NA	NA	NA	NA
120-MW-210BR	NA	NA	NA	NA	NA
124-MW-001	NA	5.27	5.66	5.29	5.33
124-MW-002	NA	6.29	6.46	6.20	5.65
124-MW-06	4.46	1.20	1.77	1.85	1.84
124-MW-102D	3.90	2.95	3.08	3.12	3.08
124-MW-102T	4.58	1.72	1.87	1.63	1.90
124-MW-103D	3.96	2.94	3.13	3.17	3.07
124-MW-103L	NA	1.12	1.82	1.79	1.83
124-MW-104D	4.12	3.32	3.43	3.41	3.36
124-MW-104L	4.56	3.55	3.56	3.53	3.52
124-MW-104T	4.44	2.95	3.05	3.23	3.08
124-MW-105D	3.86	2.96	3.52	3.28	2.99
124-MW-105T	4.26	2.08	2.40	2.95	2.82
124-MW-106T	NA	NA	NA	NA	0.83
124-MW-107T	NA	NA	NA	NA	4.32
124-MW-17BR-1	NA	NA	NA	4.54	4.25
124-MW-17BR-2	NA	NA	NA	4.64	4.23
124-MW-8BR	5.39	4.90	4.33	4.43	4.08
124-MW-G02D	3.87	3.08	3.15	3.21	NA
124-MW-G02T	4.28	2.37	2.28	2.11	3.90
125-MW-L03	NA	NA	NA	NA	NA
134-MW-Q08	6.51	5.92	6.30	5.92	6.44
134-MW-V09	5.44	4.88	5.31	4.99	5.50
140-MW-04	5.15	5.03	5.15	NA	4.60
140-MW-06	NA	5.46	6.69	NA	6.73
140-MW-07	5.52	5.49	5.45	NA	5.50
140-MW-9BR	3.95	4.25	NA	NA	NA
140-MW-9BR-1	NA	NA	NA	3.89	3.62
140-MW-9BR-2	NA	NA	NA	4.31	4.08
140-MW-9BR-3	NA	NA	NA	4.51	4.20
140-MW-P05D	NA	2.52	2.36	NA	2.52
153-MW-A13	4.23	3.85	3.97	3.76	4.10
153-MW-A13T	4.35	4.23	3.90	3.48	3.62
153-MW-A15	1.10	3.45	3.42	3.37	3.22
154-MW-A01	11.82	11.52	11.32	10.99	11.41
154-MW-A05A	11.84	11.53	11.38	10.96	11.40

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-5
Quarterly Groundwater Elevation Data

Well ID	December 27, 2005 Corrected GW Elev. (ft. msl)	March 9 & 10, 2006 Corrected GW Elev. (ft. msl)	May 25-26, 2006 Corrected GW Elev. (ft. msl)	September 28-29, 2006 Corrected GW Elev. (ft. msl)	December 18-19, 2006 Corrected GW Elev. (ft. msl)
154-MW-A06	NA	NA	NA	NA	NA
154-MW-B6A	NA	NA	NA	NA	NA
154-MW-C6A	NA	NA	NA	NA	NA
154-MW-D01	NA	NA	NA	NA	NA
154-MW-E08	NA	NA	NA	NA	NA
154-MW-F7E	NA	NA	NA	NA	NA
163-MW-CC8	2.26	2.26	4.12	2.39	2.40
163-MW-R05	NA	NA	5.33	4.77	4.44
163-MW-Y06	NA	NA	NA	NA	NA
184-MW-001	NA	NA	7.52	NA	8.53
184-MW-002	NA	7.16	7.20	3.66	3.47
184-MW-C02	NA	NA	NA	NA	NA
184-MW-C10	10.33	10.28	10.14	9.83	10.02
184-MW-E10	NA	NA	NA	NA	NA
KP-MW-6BR-1	1.65	1.15	0.71	1.76	NA
KP-MW-6BR-2	1.42	1.22	0.85	1.69	NA
KP-MW-6BR-3	NA	na	0.93	NA	1.96
SA6-MW-14BR	3.63	4.16	4.25	NA	4.76
SA6-MW-15BR	2.43	3.16	3.70	3.52	3.12
SA6-MW-5BR-1	4.11	3.51	3.70	3.39	3.11
SA6-MW-5BR-2	4.52	3.97	4.24	3.73	3.28
SA6-MW-5BR-3	4.79	4.51	4.37	3.99	3.65
SA6-MW-5BR-4	4.83	4.46	4.13	4.07	3.66
SA6-MW-5BR-5	5.09	4.70	4.41	4.23	3.96
SA6-MW-AA1	2.30	3.30	3.82	2.99	2.82
SA6-MW-AA1D	3.60	2.09	2.43	NA	2.01
SA6-MW-AA1T	2.43	2.38	2.61	NA	2.78

NA - Not Available
Vertical Datum: NGVD-29
Data Corrected for Tidal Variations

Table 2.2-6
Tidal Lag and Efficiency Determinations
Honeywell Site 7
Jersey City, NJ

Well	Screened Zone	Tidal Lag (min.)	Efficiency (%)
087-MW-029T	Till-Rock Interface	38	20.7
087-MW-I30T	Till-Rock Interface	93	7.1
073-MW-1BR-1	Rock-Upper	22	38.5
073-MW-1BR-2	Rock-Upper	53	32.1
073-MW-1BR-3	Rock-Upper	11	30.0
073-MW-1BR-4	Rock-Upper	0	25.0
073-MW-1BR-5	Rock-Upper	0	21.8
119-MW-2BR-1	Rock-Upper	21	44.8
119-MW-2BR-2	Rock-Upper	0	33.8
119-MW-2BR-3	Rock-Upper	0	29.9
119-MW-4BR-1	Rock-Upper	0	23.7
119-MW-4BR-2	Rock-Upper	6	25.3
119-MW-4BR-3	Rock-Upper	0	16.6
SA6-MW-5BR-1	Rock-Upper	42	13.2
SA6-MW-5BR-2	Rock-Upper	29	9.1
SA6-MW-5BR-3	Rock-Upper	0	6.2
SA6-MW-5BR-4	Rock-Upper	0	5.2
SA6-MW-5BR-5	Rock-Upper	0	6.7
KP-MW-6BR-1	Rock-Upper	78	14.5
KP-MW-6BR-2	Rock-Upper	72	8.0
KP-MW-6BR-3	Rock-Upper	90	13.6
090-MW-7BR-1	Rock-Upper	NR	NR
090-MW-7BR-2	Rock-Upper	NR	NR
090-MW-7BR-3	Rock-Upper	NR	NR
124-MW-8BR	Rock-Upper	NR	NR
140-MW-9BR-1	Rock-Upper	35	6.8
140-MW-9BR-2	Rock-Upper	3	4.9
140-MW-9BR-3	Rock-Upper	0	5.4
073-MW-10BR-2	Rock-Upper	8	53.5
073-MW-10BR-4	Rock-Upper	0	28.2
073-MW-10BR-5	Rock-Upper	0	11.9
119-MW-11BR	Rock-Upper	NR	NR
119-MW-12BR	Rock-Upper	NR	NR
087-MW-14	Rock-Upper	152	5.0
SA6-MW-14BR	Rock-Upper	92	3.2
SA6-MW-15BR	Rock-Upper	37	17.5
119-MW-16BR-1	Rock-Upper	NR	NR
119-MW-16BR-2	Rock-Upper	NR	NR
119-MW-16BR-3	Rock-Upper	NR	NR
124-MW-17BR-1	Rock-Upper	NR	NR
124-MW-17BR-2	Rock-Upper	20	2.6
115-MW-201BR	Rock-Upper	29	41.1
115-MW-202BR	Rock-Upper	190	7.2
115-MW-203BR	Rock-Upper	25	38.7
115-MW-205BR	Rock-Upper	150	7.4
115-MW-206BR	Rock-Upper	181	2.6
115-MW-207BR	Rock-Upper	501	0.6

Table 2.2-6
Tidal Lag and Efficiency Determinations
Honeywell Site 7
Jersey City, NJ

Well	Screened Zone	Tidal Lag (min.)	Efficiency (%)
115-MW-208BR	Rock-Upper	620	<0.5
115-MW-209BR	Rock-Upper	583	0.5
115-MW-211BR	Rock-Upper	NR	NR
115-MW-212BR	Rock-Upper	294	2.0
115-MW-213BR	Rock-Upper	278	6.1
115-MW-214BR	Rock-Upper	52	30.9
115-MW-215BR	Rock-Upper	15	39.6
115-MW-216BR	Rock-Upper	NR	NR
120-MW-210BR	Rock-Upper	598	<0.5
087-MW-029D	Intermediate	107	15.4
087-MW-13	Intermediate	18	61.5
087-MW-35	Intermediate	22	41.2
087-MW-W25D	Intermediate	22	40.0
088-MW-15	Intermediate	166	0.9
115-MW-17	Intermediate	156	15.3
115-MW-20	Intermediate	285	1.8
124-MW-104D	Intermediate	NR	NR
124-MW-105D	Intermediate	NR	NR
115-MW-E14D	Intermediate	286	0.5
115-MW-E8D	Intermediate	299	<0.5
115-MW-O13D	Intermediate	326	1.7
115-MW-U14D	Intermediate	150	15.9
140-MW-P05D	Intermediate	45	3.6
SA6-MW-AA1D	Intermediate	10	44.1
088-MW-G19T	Deep-Till	150	3.0
087-MW-02	Deep	114	4.6
087-MW-03	Deep	110	4.0
087-MW-08	Deep	3	45.2
087-MW-34	Deep	19	29.1
087-MW-W25T	Deep	40	7.6
115-MW-04	Deep	209	1.1
115-MW-05	Deep	277	<0.5
115-MW-A12T	Deep	201	1.6
115-MW-E14T	Deep	243	0.7
115-MW-E8T	Deep	256	0.7
115-MW-K14T	Deep	180	1.8
115-MW-U14T	Deep	107	<0.5
124-MW-104L	Lacustrine	NR	NR
124-MW-104T	Deep	NR	NR
124-MW-105L	Lacustrine	NR	NR
124-MW-105T	Deep	NR	NR
124-MW-06	Deep	250	0.6
124-MW-G02T	Deep	361	<0.5
SA6-MW-AA1T	Deep	4	34.2

NR = Non-responsive to tidal cycle.

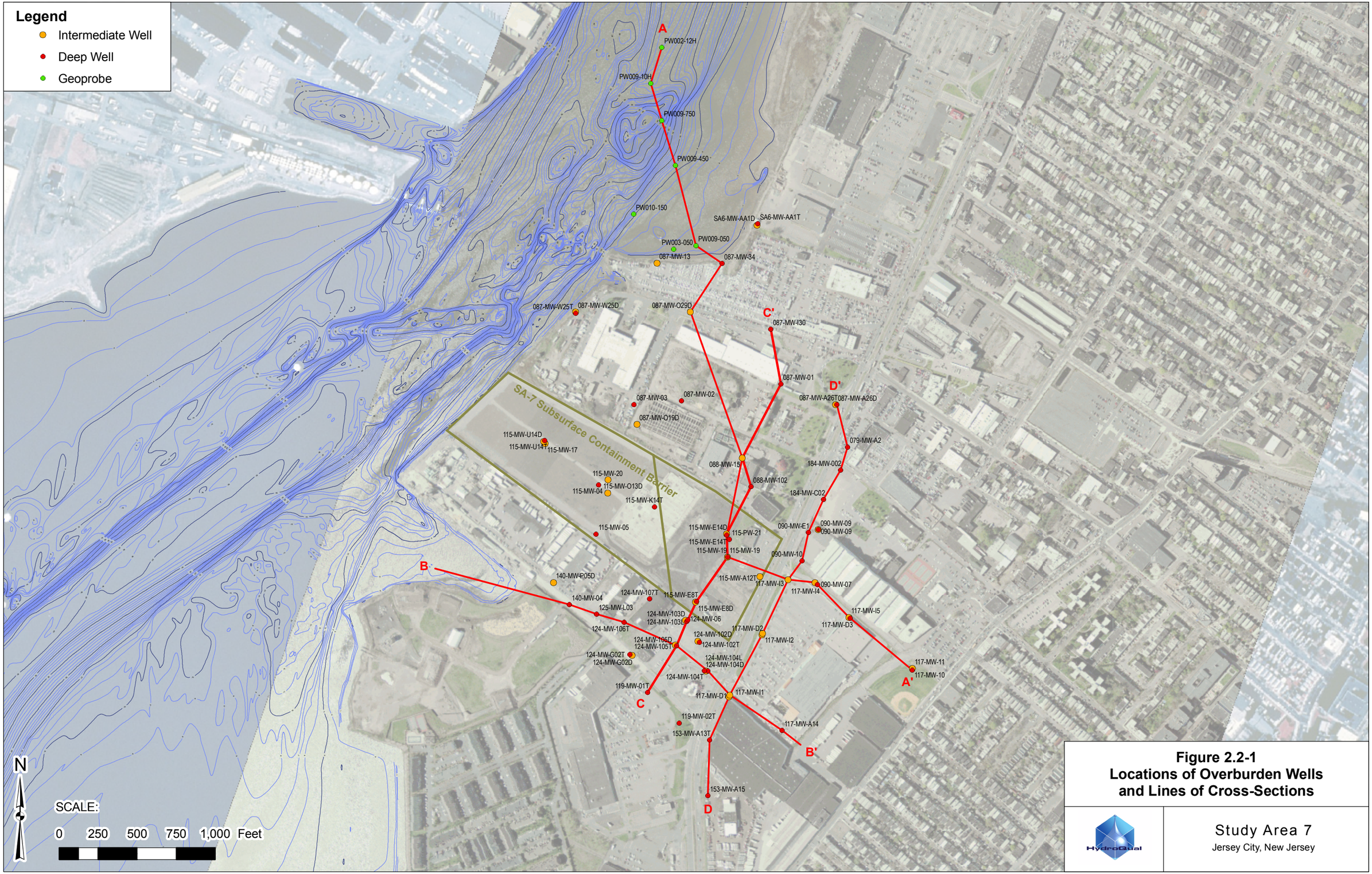


Figure 2.2-1
Locations of Overburden Wells and Lines of Cross-Sections

Study Area 7
Jersey City, New Jersey

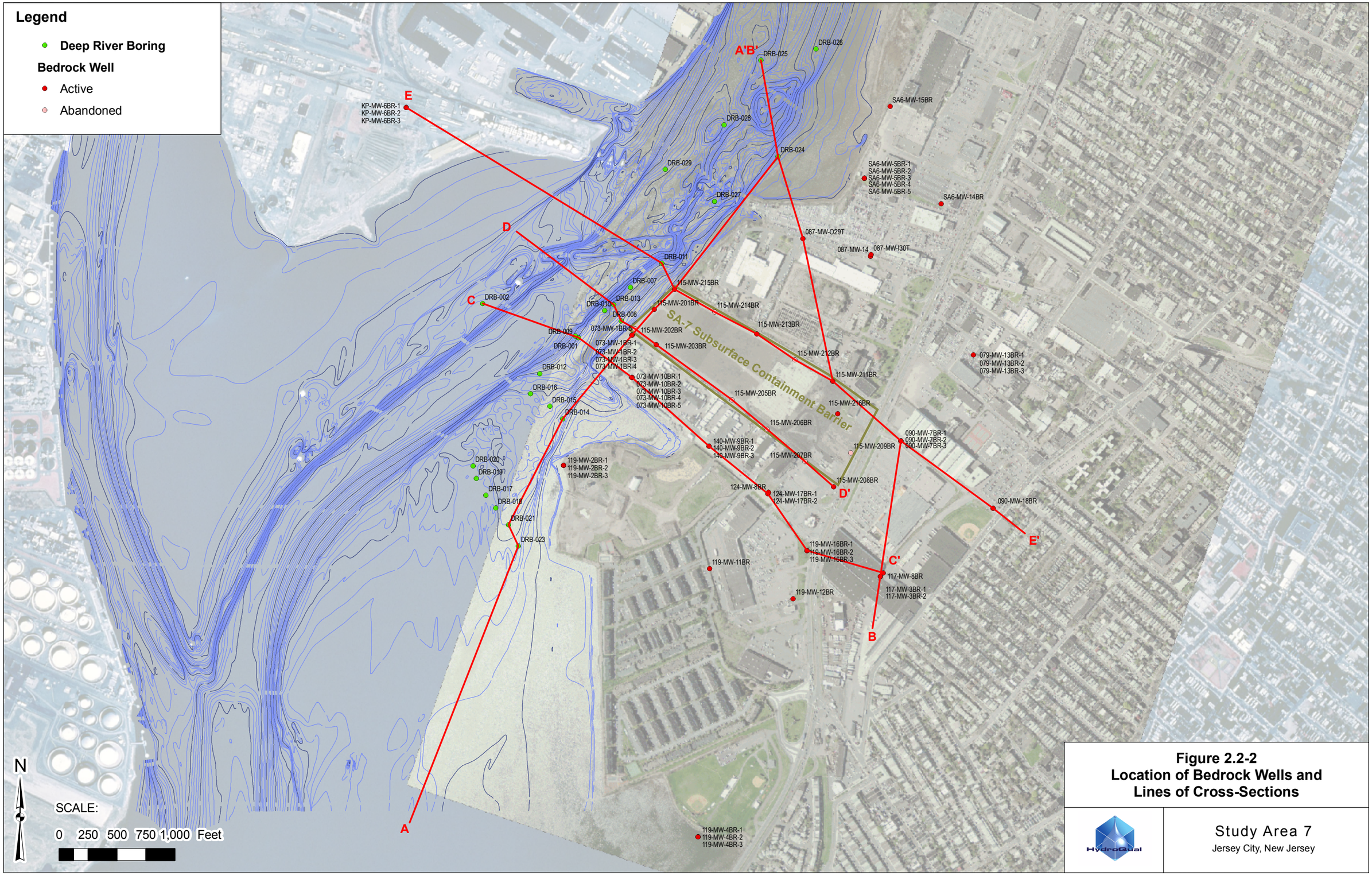


Figure 2.2-2
Location of Bedrock Wells and Lines of Cross-Sections

Study Area 7
Jersey City, New Jersey

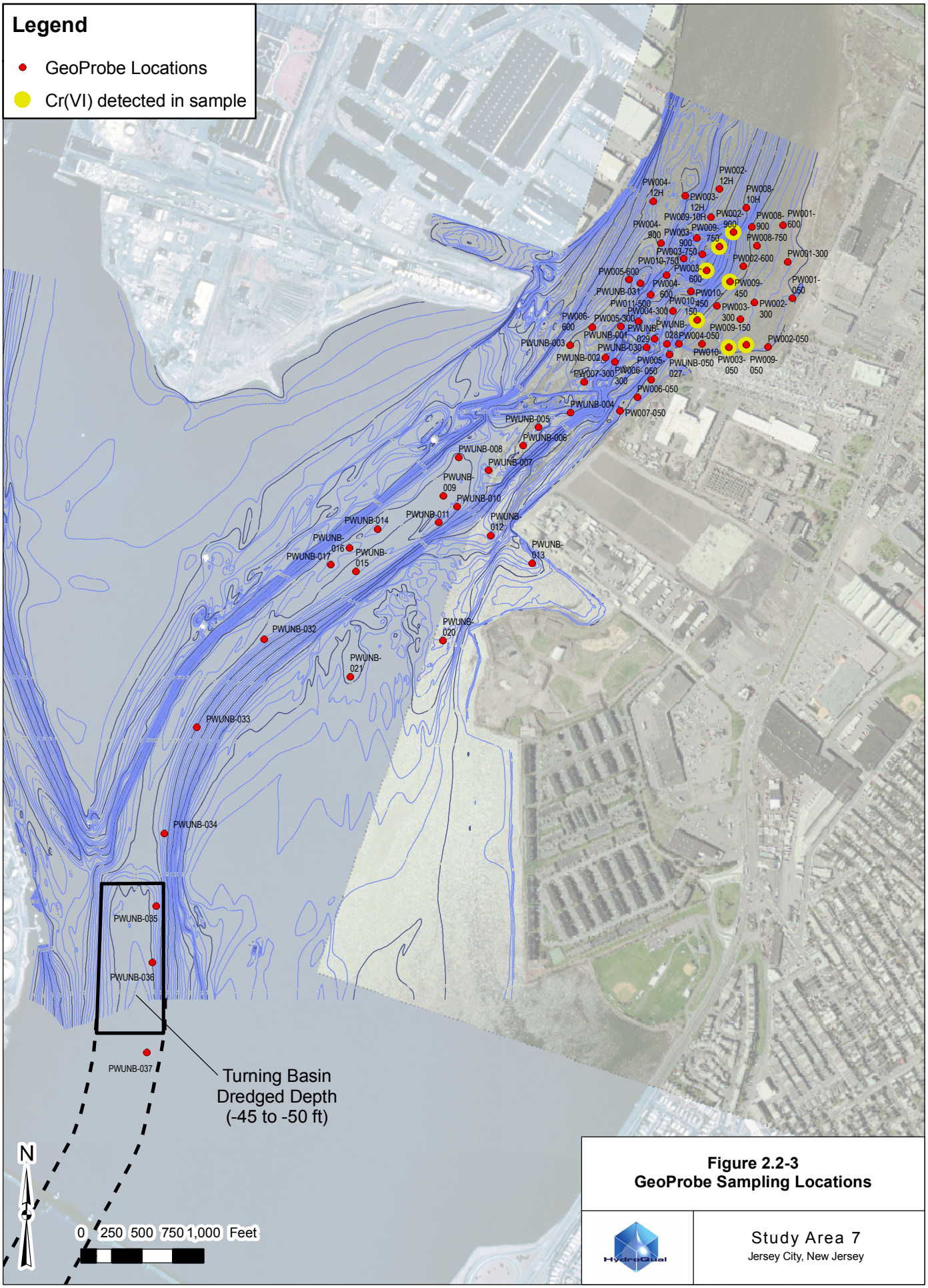
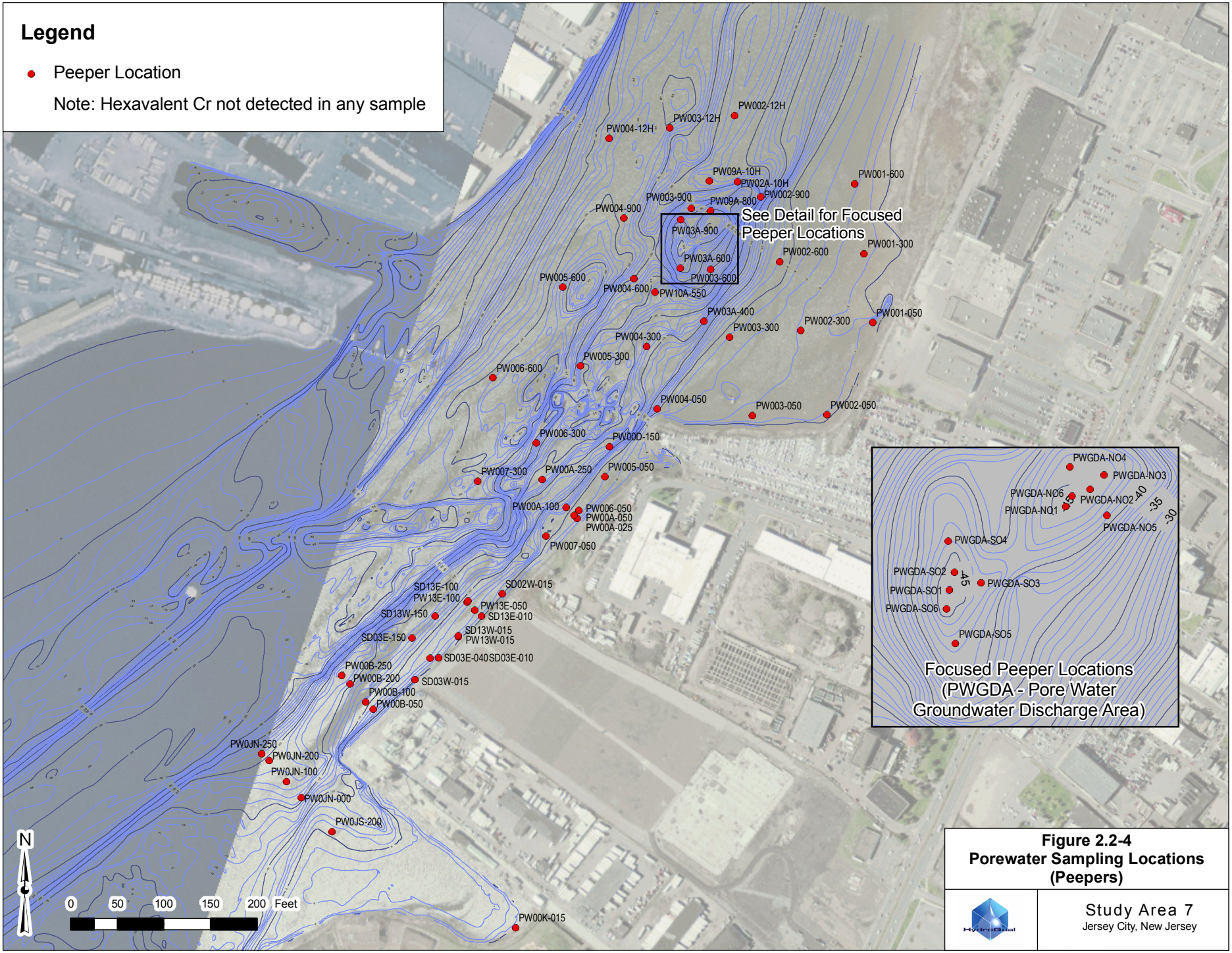


Figure 2.2-3
GeoProbe Sampling Locations

Study Area 7
Jersey City, New Jersey


Legend
Peeper Location
Note: Hexavalent Cr not detected in any sample
PW002-12H
PW003-12H
PW004-12H
PW09A-10H
PW02A-10H
PW002-900
PW09A-800
PW003-900
PW004-900
PW001-600
See Detail for Focused Peeper Locations
PW03A-900
PW001-300
PW002-600
PW03A-600
PW003-600
PW005-600
PW004-600
PW10A-550
PW03A-400
PW001-050
PW002-300
PW003-300
PW004-300
PW005-300
PW006-600
PW004-050
PW003-050
PW002-050
PW006-300
PW00D-150
PW007-300
PW00A-250
PW005-050
PW00A-100
PW006-050
PW00A-050
PW00A-025
PW007-050
SD13E-100
PW13E-100
SD02W-015
PW13E-050
SD13E-010
SD13W-150
SD13W-015
PW13W-015
SD03E-150
SD03E-040
SD03E-010
PW00B-250
PW00B-200
SD03W-015
PW00B-100
PW00B-050
PW0JN-250
PW0JN-200
PW0JN-100
PW0JN-000
PW0JS-200
PW00K-015
PWGDA-NO4
PWGDA-NO3
PWGDA-NO6
PWGDA-NO2
PWGDA-NO1
PWGDA-NO5
PWGDA-SO4
PWGDA-SO2
PWGDA-SO3
PWGDA-SO1
PWGDA-SO6
PWGDA-SO5
-45
-40
-35
-30
Focused Peeper Locations (PWGDA - Pore Water Groundwater Discharge Area)
N
0
50
100
150
200
Feet
Figure 2.2-4
Porewater Sampling Locations (Peepers)
Study Area 7
Jersey City, New Jersey

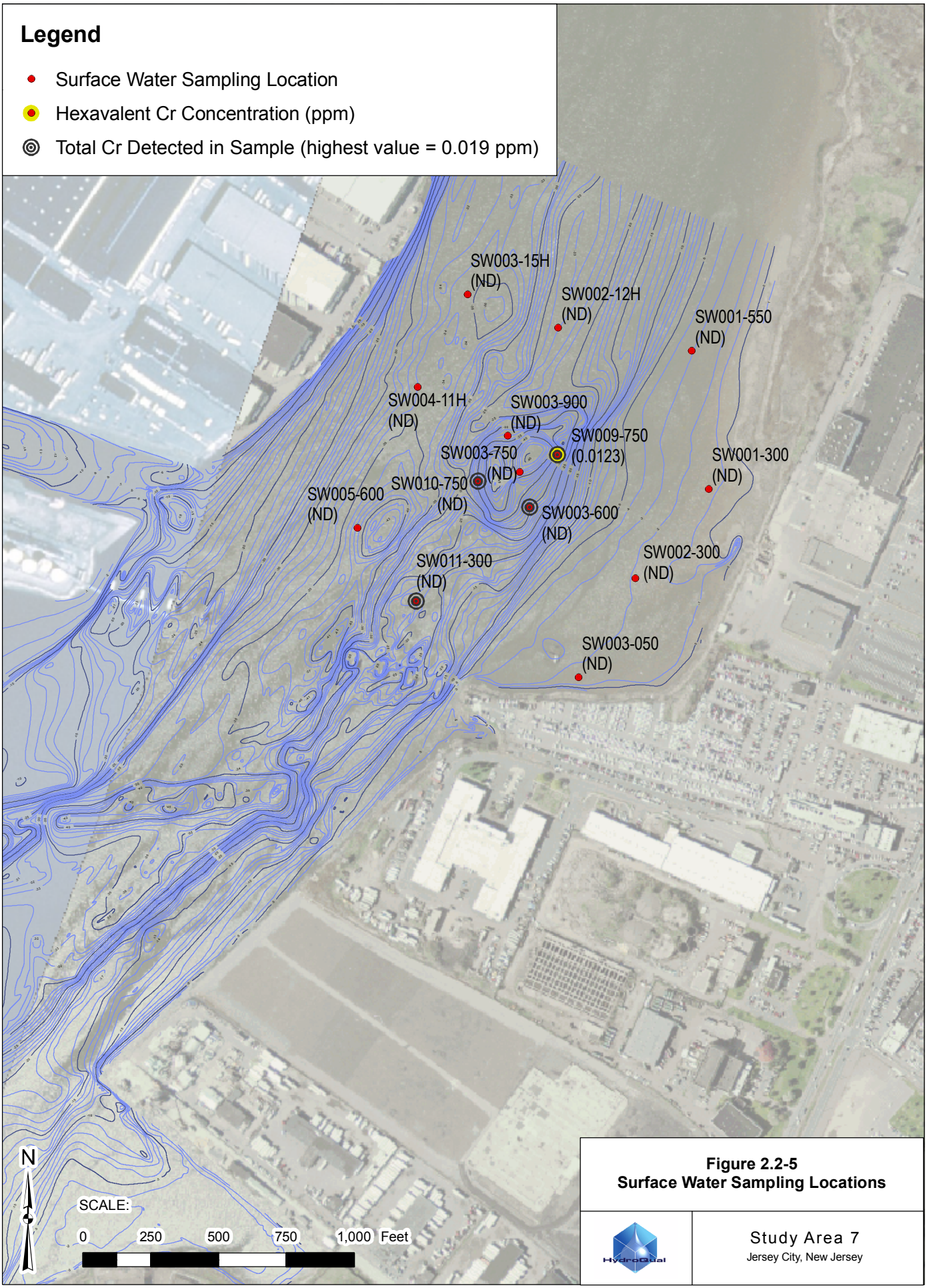


Figure 2.2-5
Surface Water Sampling Locations

Study Area 7
Jersey City, New Jersey

SECTION 3

HISTORICAL CONDITIONS

3.1 FORMER MUTUAL CHEMICAL PLANT OPERATIONS

The former Mutual Chemical Company facility was operated from approximately 1905 to 1954 at the location shown on Figure 3.1-1. Operations consisted of the milling and roasting of chromite ore through kilns and leach systems to produce a crude sodium chromate solution. The crude solution was then "finished" into various solutions of sodium dichromate as well as sodium bichromate dehydrate crystals. The roasted chromite ore was placed in movable railcar boxes equipped with false bottoms for emptying when done, and quenched with a weak yellow quench liquor and then with hot process water. The leached COPR was then transported across Route 440 via overhead sluiceway and used as fill on SA-7.

Figure 3.1-2 is an oblique aerial photo of the plant circa 1947 that has been annotated by HydroQual based on a review of Sanborn maps from this general time period. This information indicates that the crystallization building and warehousing were on the eastern portion of the property whereas the quenching or "wet" operations likely took place on the western side of the property near the furnace buildings. Thus, if liquid from the production of sodium chromate was discharged to the surface due to past house-keeping practices, it likely would have been in this portion of the site.

3.2 TRANSGRESSION OF HACKENSACK RIVER

COPR from the Mutual Chemical plant was transported across Route 440 via overhead sluiceway and used as fill on SA-7. This resulted in the westward transgression of the eastern shoreline of the Hackensack River. Based on a review of Sanborn maps and NOAA Nautical Charts, the shoreline in the late 1800's was approximately 400 feet west of Route 440. As shown on Figure 3.2-1, the shoreline gradually moved west until the late 1920's when bulkheads were established both to the north and south of Droyer's Point, moving the shoreline to a point approximately 2,200 feet west of Route 440. Continued filling during the following 30+ years raised the suface of the fill behind the bulkhead to its present elevation.

3.3 ASSESSMENT OF HISTORIC PUMPING

Historic pumping of groundwater from off-site wells had the potential to influence the direction of groundwater flow in the past, and thus the distribution of chromium in groundwater. To further assess this potential, an attempt was made to identify prior (and/or existing) production wells in the vicinity of SA-7. This was done by obtaining a list of

permitted wells from NJDEP's Bureau of Water Allocation, and by reviewing selected Sanborn fire insurance maps.

3.3.1 NJDEP Well Search

A request for a list of registered groundwater wells within a five-mile radius of the SA-7 site was made of NJDEP Bureau of Water Allocation in 2004. The "Well Record" forms provided by NJDEP were then collated according to the reported "use" of the well into the following categories: monitoring/observation, private/domestic, and commercial/industrial. Since the objective of the search was to identify historic pumping wells that may have influenced groundwater flow, only the commercial/industrial and private/domestic wells were retained for plotting. Figure 3.3-1 shows the locations of all such identified wells within a two-mile radius of the site.

Pertinent information from the Well Record forms have been summarized on Table 3.3-1. However, since errors in the reported coordinate location and/or owner address are relatively common, the results should be viewed with caution. For example, the addresses listed for wells OB-1 and OB-2 are in Bayonne and thus do not match the locations plotted with the coordinates given on the Well Record. OB-1 is reported as a gas station and plots on the grounds of the former Roosevelt Stadium, which was in existence in 1961 when the well was drilled. Although there is a gas station on the corner Danforth and Route 440, it is not clear if this is the site referenced in the well record. Bedrock well R-12 is reported as a chemical company located in Newark, NJ.

The reported data indicate that there are twelve bedrock wells and three overburden wells (including the two mentioned above) within the two-mile radius of the site. The reported yield of the bedrock wells ranged from 0.5 to 450 gpm at the time of installation, but the actual pumping rate and history of operation is not known. Since it is not possible to quantify the impact of these wells on groundwater flow near SA-7, a qualitative assessment was made based on our knowledge of the hydrogeology of the area. With respect to historic bedrock wells, the impact from pumping (drawdown) would be greatest in a direction parallel to the strike of the rock and minimal in a direction perpendicular to the strike. This is due to the anisotropy of the fractures within the bedrock as documented during the recent bedrock aquifer test (refer to Section 5). Considering that the bedrock strikes NE-SW as shown on Figure 3.3-1, only three of the identified bedrock wells had the potential to influenced groundwater flow near SA-7. These are R-1, R-11, and R-4. The wells across the river are perpendicular to strike and too far away, and the wells to the east (e.g. R-2, R-3, and R-5) are likely located on the other side of the diabase sill and thus isolated from the flow system near SA-7. A preliminary reconnaissance of the R-11 location (former Mueller Spaghetti plant?) indicated that it is now the site of a public park containing an operating water fountain, and the R-4 location is an active car wash facility.

Of the three overburden wells identified within the two-mile radius, only well OB-1 is close enough to the study area to have had a potential influence on groundwater levels near SA-7. However, as noted previously, is it possible that the coordinates of this well are in error.

3.3.2 Sanborn Map Review

A search of Sanborn fire insurance maps within a one mile radius of the site was performed in an attempt to identify historic features such as wells, pump houses, or other indications of groundwater withdrawal (or recharge). Maps covering a one-mile radius from SA-7 were obtained from Environmental Data Resources, Inc. (EDR) for two general time periods; the late 1800's and the mid- 1900's. These times were selected based on the number of maps available and the desire to span the time frame that the plant was in production. More recent wells would be covered in the NJDEP well search described above.

A total of 55 maps were available from 1896 through 1898 and 53 maps were available from 1950 and 1951. Figures 3.3-2 and 3.3-3 illustrate the general location and coverage of the maps for each time period. Map images are provided in .PDF format in Appendix C.

A review of these data identified a total of five potential historic wells on the 1896-1898 maps and none on the 1950 and 1951 maps (including those located on the 1896-1898 maps). Three of the "wells" were noted on property belonging to the Mallinckrodt Chemical Company (map number 29), and one "well" was noted on property belonging to the Detwiller & Street Fireworks Manufacturing Company (map number 42). A "Well House" was also noted on map number 42 on the Mutual Chemical Property Company property. The five locations have been geo-referenced to a recent aerial photo on Figure 3.3-4. Since the depth, screened interval, pumping rate, and operational history of the wells is unknown, their impact on groundwater flow can only be speculated. However, based on the geology of this area, the following general conclusions may be drawn.

- The wells would likely have been screened in either the deep overburden (if the S-3 sand was encountered) or the bedrock since the yield of shallower zones would be marginal.
- Pumping from deeper zones would have increased downward vertical gradients in the vicinity of the well and thus decreased the time required for chromium to penetrate into lower zones.
- Depending on which zone was pumped and for how long, the extent of the chromium plume in that zone may have expanded towards the historic pumping well. In the case of the three Mallinchkrodt wells, the plume would have been pulled to the northwest, generally parallel to its natural downgradient flow

direction, and thus additional horizontal expansion due to these wells would have been minimal. In the case of the Detwiller well, the plume may have been pulled slightly to the south.

- If there was an operating well associated with the "well house" on the Mutual Chemical property, the impact of pumping would have been limited to increased downward vertical gradients beneath the source area. The impact of injection or recharge would have been to expand the plume radially from the well in all directions.

3.4 ASSESSMENT OF FORMER MORRIS CANAL

The Morris Canal was completed in 1836 to provide a means of transporting coal from Pennsylvania to New York City. As shown on Figure 3.4-1, the canal was approximately 8 miles long and 40 feet wide, running from the Hackensack River just south of Communipaw Avenue to the Hudson River near Washington Street (Rice). The canal was operated at sea level and was equipped with tide locks at both ends that admitted water at high tide and prevented it from flowing out at low tide. In the vicinity of SA-7, the canal was located on the eastern edge of the present-day Route 440 corridor. Figure 3.4-2 is a reprint from a 1934 drawing illustrating that the canal ran between the highway and the western-most production building on the former Mutual Chemical Company property. This location is coincident with the eastern paved shoulder and right-away along Route 440.

The depth of the canal adjacent to the Mutual Chemical Site is shown on reprints of engineering drawings from 1920. Figure 3.4-3 illustrates a proposed draw bridge to be built over the canal in the vicinity of the overhead sluiceway pipe. The depth of the canal is illustrated on the longitudinal profile and indicates a "high water" elevation of 3.8 feet. Although the datum used on the drawing is unknown, this elevation is close to the high tide elevation currently measured at SA-7 using NGVD-29. This sketch allows the elevation of the canal bottom to be estimated at -0.2 feet (msl) which is on par with the top of the meadow mat. It would seem logical for the canal to have been built on top of the meadow mat since this low permeability layer would have provided a naturally low permeability bottom and reduce leakage from the canal.

Operations on the Morris Canal were discontinued around 1912, the canal was drained in 1924, and reportedly backfilled from 1925 to 1935. In 1990, the City of Bayonne excavated a section of the former canal for installation of a 36-inch diameter sewer line. During this work, it was discovered that COPR was used as part of the backfill and thus the portion of the canal from Carbon Place to Danforth Avenue was placed on the list of Hudson County Chromium Sites by NJDEP and assigned Site #153. A remedial investigation of Site 153 was conducted from 1997 through 1999 by Tetratech as part of the

RI for Study Area 5. The investigation confirmed the presence of COPR above the meadow mat along portions of the former canal.

3.5 RECENT REMEDIAL ACTIVITIES AT SA-7

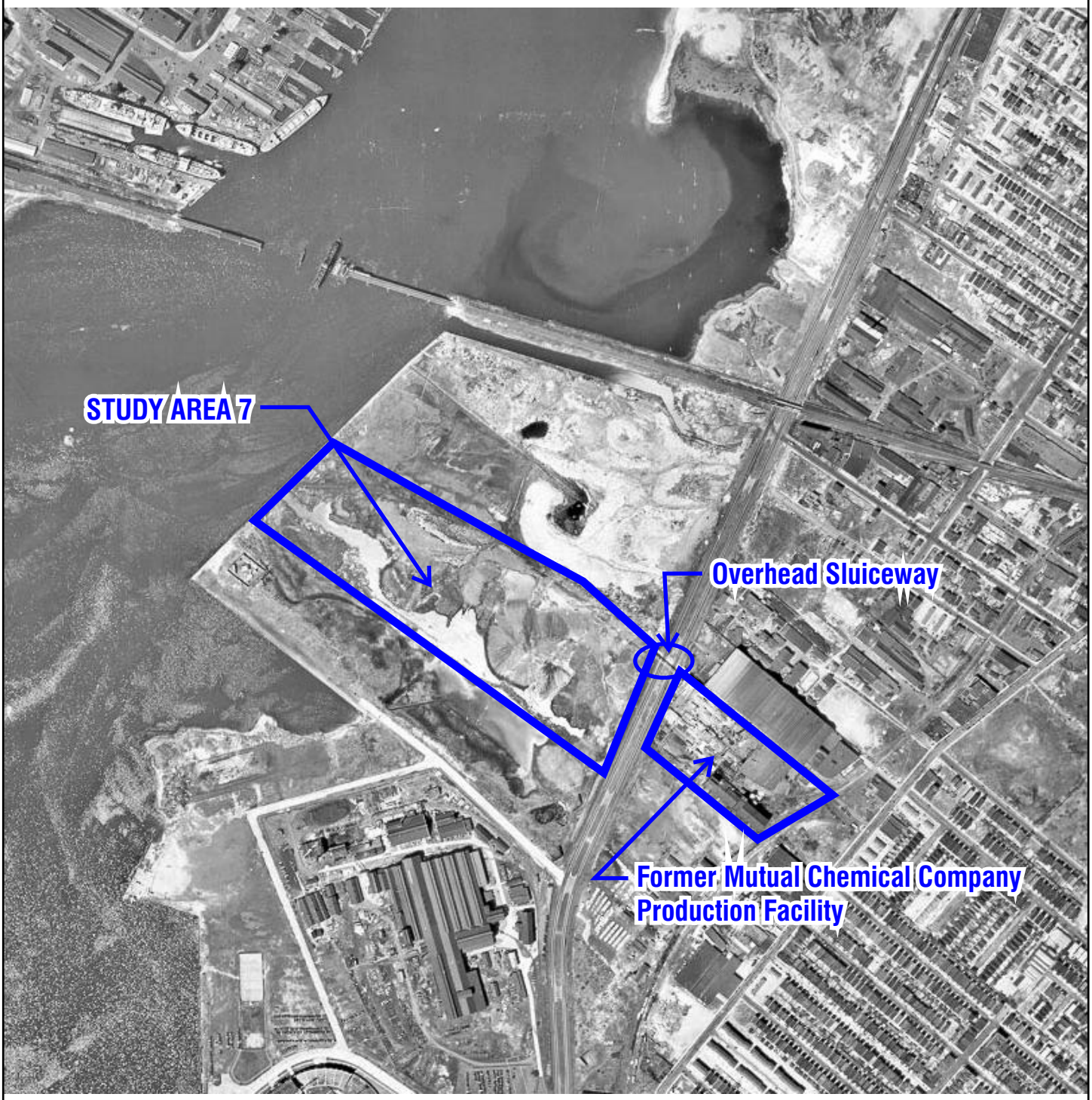
Remedial activities conducted at SA-7 during the past several years have influenced the direction and rate of groundwater flow and thus bear on the characterization of the site's hydrogeology. The three activities having the greatest potential impact include the paving of the western portion of the site, the installation of the subsurface barrier wall, and the groundwater dewatering operations. The paving of the eastern portion of the site has increased the runoff and thus reduced the rate of recharge from the infiltration of precipitation. The impact of this change has not been quantified since the majority of the shallow wells within SA-7 were removed in preparation of construction.

The installation of the subsurface barrier wall was begun in the Summer of 2005 and completed in April 2006. Based on information from MRCE, the effective permeability of the barrier wall ranges from 1×10^{-6} to 1×10^{-8} cm/s. The western portion of the wall is keyed into the Red Clay and ranges from 35 to 60 feet deep. The eastern portion of the wall, including the diagonal cross wall, is keyed into the glacial till/ice contact deposits and is approximately 80 feet deep.

The objective of the deep groundwater dewatering system is to depressurize the head beneath the meadow mat and thus reduce the potential for blowout when the weight of the overlying COPR is removed. To date, only the dewatering system on the eastern portion of the site has been active. The system consists of four pumping wells screened throughout the lacustrine deposits. The system began operation on January 27, 2006 with a combined pumping rater of between 40 and 60 gpm.

TABLE 3.3-1
SUMMARY OF NJDEP WELL SEARCH DATA

Map ID #	NJDEP Well #	Owner	Date Installed	Open Interval (ft. below grade)	Reported Yield (gpm)	Reported Use
R-1	26-43694	Hee Park	Oct. 15, 1996	130'-205'	45	Industrial
R-2	26-56260	Flores Car Wash	May 4, 2000	50'-855'	10	Industrial
R-3	26-1335	Berkeley Industries	April 18, 1956	140'-335'	60	Cooling
R-4	26-38613	Clean Touch Car Wash	Nov. 15, 1994	52'-400'	12	Industrial
R-5	26-1742	Dick's Auto Laundry	Nov. 15, 1957	22'-575'	not reported	Car Wash
R-6	26-3490	CFC Reality	Sept. 17, 1965	19'-565'	0.5	Car Wash
R-7	26-1420	Rutherford & Delaney Holding	July 1, 1956	42'-220'	100	Indust. Cooling
R-8	26-362	John Engelhorn & Sons	May, 1952	122'-500'	450	Cooling
R-9	26-27887	American Ready Mix	Jan. 21, 1992	112'-200'	50+	Industrial
R-10	26-3408	Ronson Metals Corp.	sept. 22, 1965	80'-300'	220	Industrial
R-11	26-4995	C.F. Mueller Co.	March 31, 1981	45'-1000'	25	Domestic
R-12	26-4975	Celanese Chemical co.	April 24, 1981	650'-700'	100	Domestic
OB-1	26-2429	Gas Inc.	June 27, 1961	??-117'	20	Gasoline Station
OB-2	26-3261	Joseph Tirriot	Sept. 1, 1965	??-100'	10	Domestic
OB-3	26-64182	Safety Clean	April 26, 2002	72'-82'	2	Monitoring



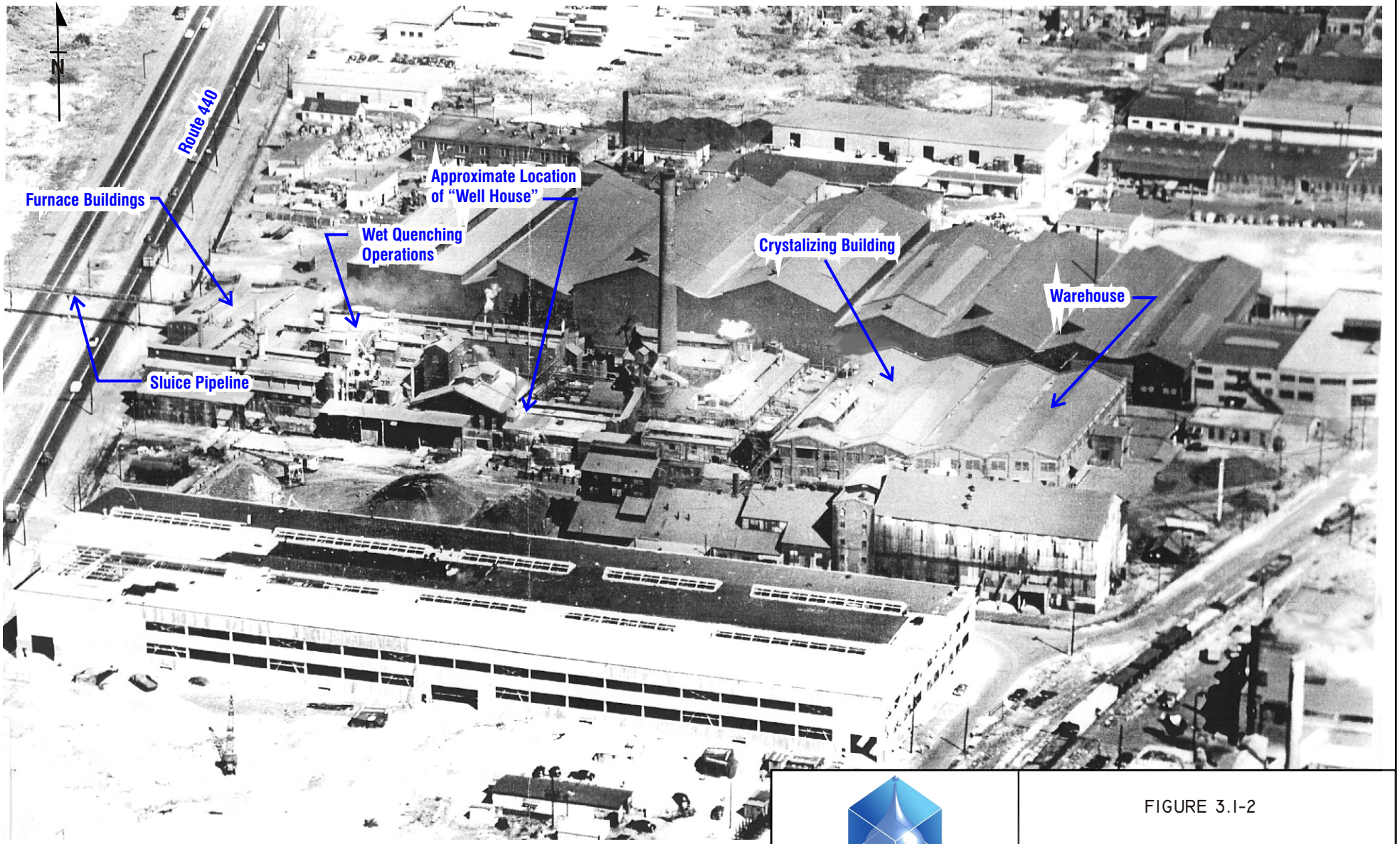
HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.1-1

AERIAL PHOTO OF SA-7
AND VICINITY, CIRCA 1947

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



NOTE: ANNOTATIONS ADDED BY HYDROQUAL BASED ON REVIEW OF SANBORN MAPS AND OTHER HISTORIC DOCUMENTS

N.T.S.

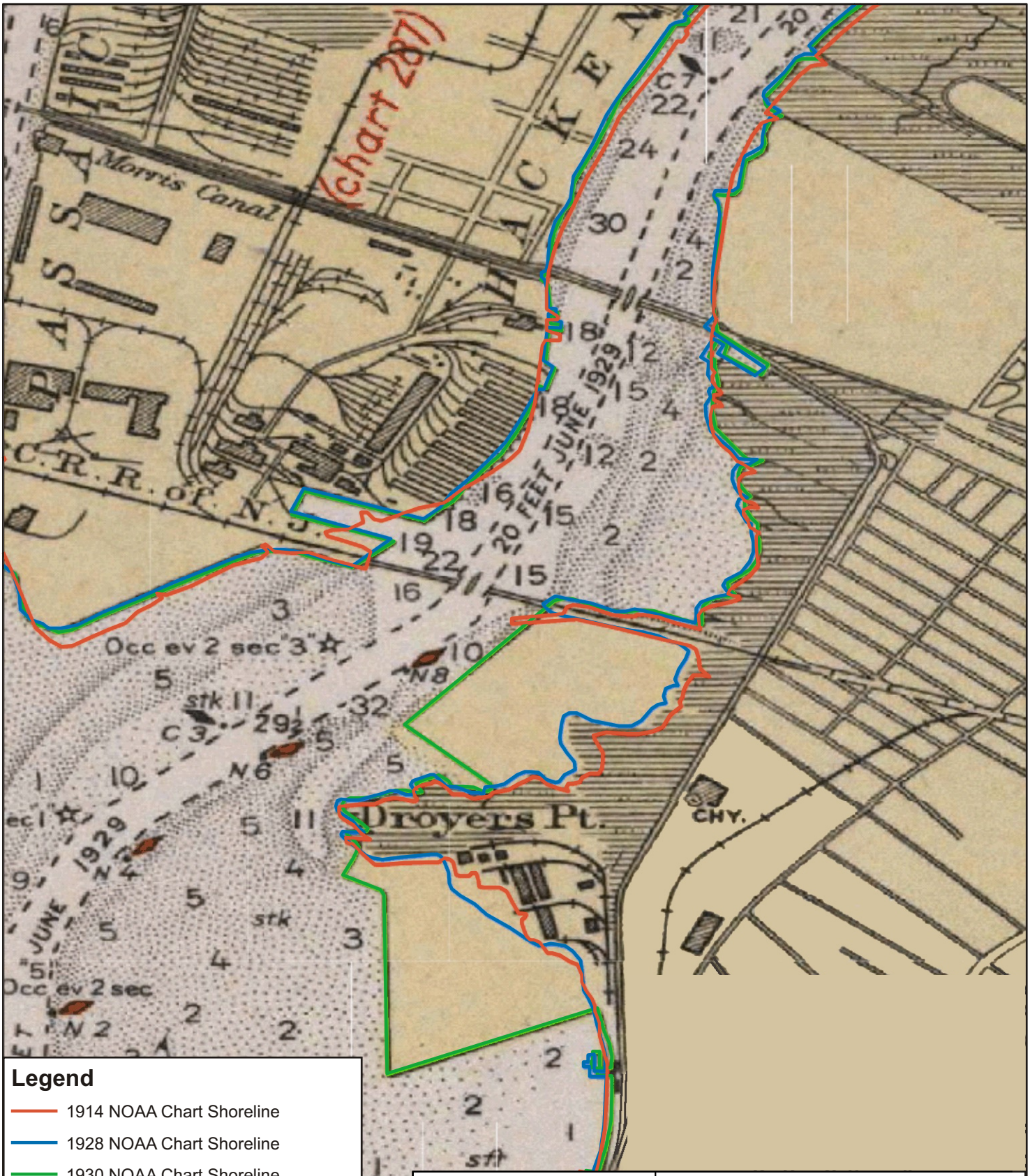
HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.1-2

MUTUAL CHEMICAL COMPANY
PRODUCTION FACILITY CIRCA 1947

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



Legend

- 1914 NOAA Chart Shoreline
- 1928 NOAA Chart Shoreline
- 1930 NOAA Chart Shoreline

0 1,000 2,000 Feet

N

Nautical Chart: NOAA, 1930

FIGURE PROVIDED BY:

ENVIRON

Limno-Tech, Inc.

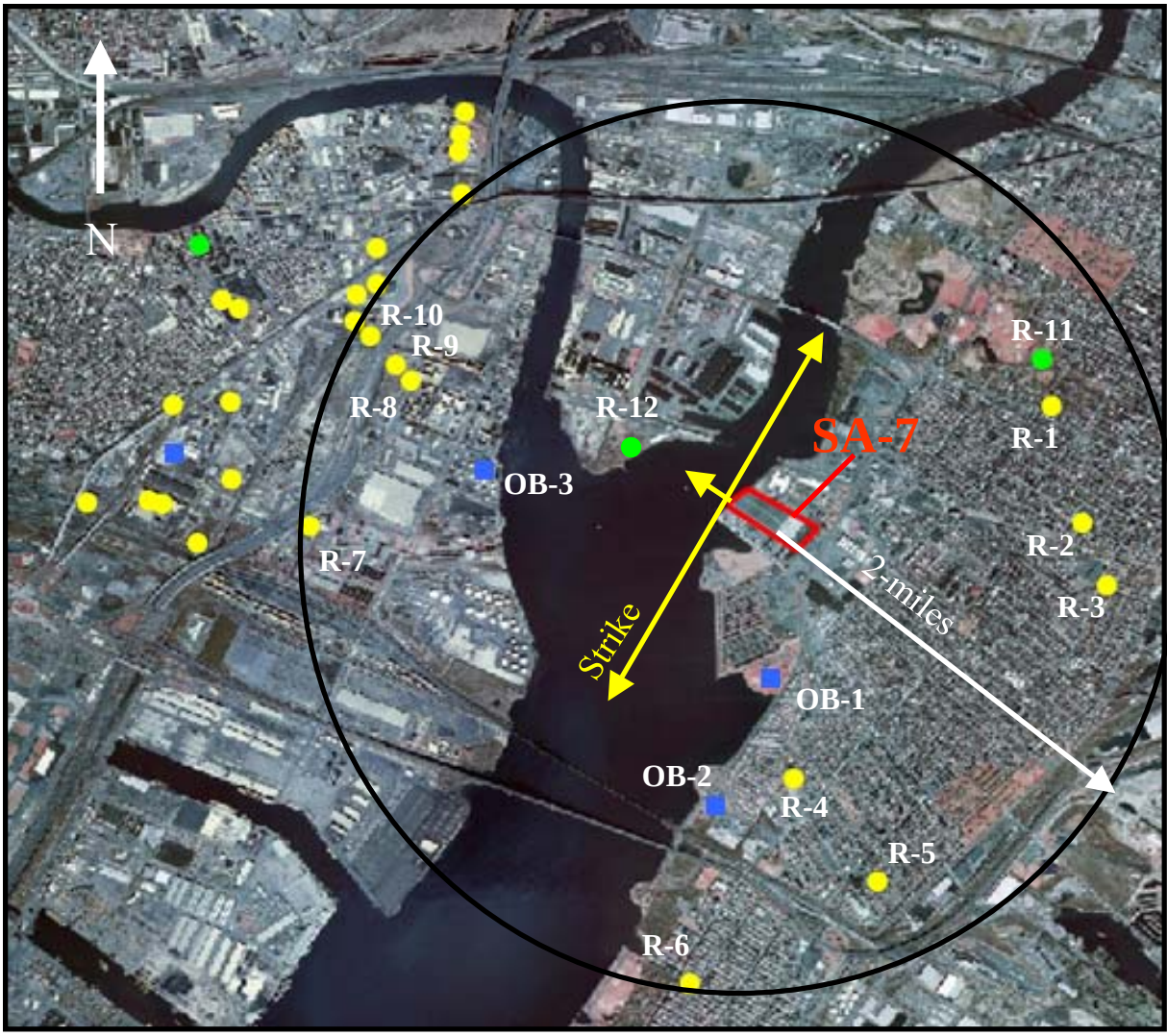
Thursday, July 27, 2006
s:\wmsha\gis\maps\raa_report\template\figureJ-6_1930_NOAA_Chart.mxd

HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.2-1
LOWER HACKENSACK RIVER AND UPPER NEWARK BAY DELINEATED SHORELINES: 1914-1930

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



APPROXIMATE SCALE:

0 1 2
miles

LEGEND

Strike and Dip of Bedrock

Private/Domestic Bedrock

Industrial/commercial bedrock

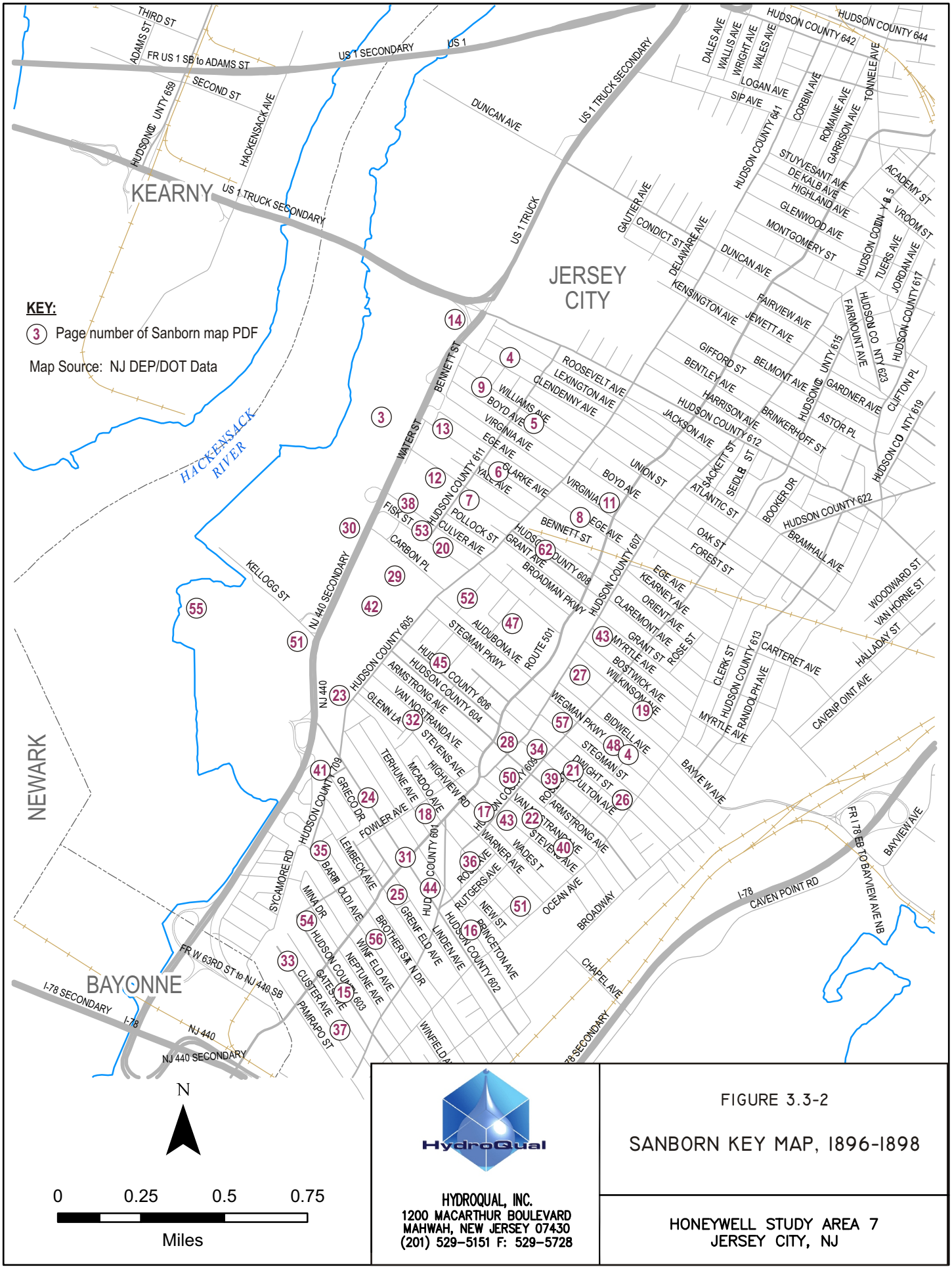
Deep Overburden Well

FIGURE 3.3-1

Location of NJDEP-Identified Wells

Study Area 7
Jersey City, N.J.

HydroQual, Inc.



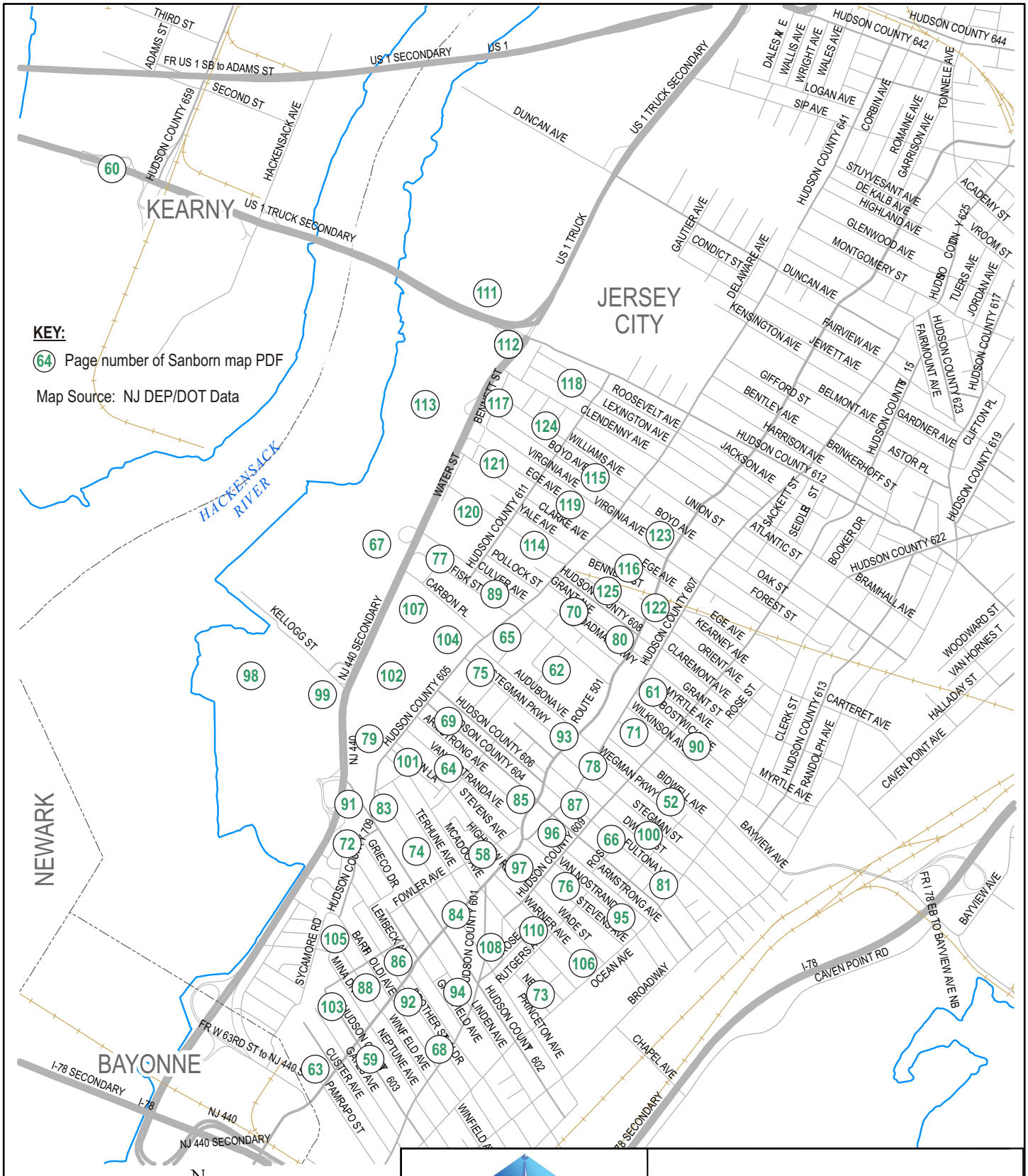
HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.3-2

SANBORN KEY MAP, 1896-1898

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ


KEY:
64 Page number of Sanborn map PDF
Map Source: NJ DEP/DOT Data
KEARNY
JERSEY CITY
NEWARK
BAYONNE
HACKENSACK RIVER
WATER ST
US 1 TRUCK SECONDARY
US 1
DUNCAN AVE
HUDSON COUNTY 659
HACKENSACK AVE
THIRD ST
ADAMS ST
FR US 1 SB to ADAMS ST
SECOND ST
HUDSON COUNTY 641
HUDSON COUNTY 642
HUDSON COUNTY 644
HUDSON COUNTY 625
HUDSON COUNTY 623
HUDSON COUNTY 622
HUDSON COUNTY 619
HUDSON COUNTY 617
HUDSON COUNTY 613
HUDSON COUNTY 612
HUDSON COUNTY 611
HUDSON COUNTY 609
HUDSON COUNTY 607
HUDSON COUNTY 606
HUDSON COUNTY 605
HUDSON COUNTY 604
HUDSON COUNTY 603
HUDSON COUNTY 602
HUDSON COUNTY 601
HUDSON COUNTY 608
NJ 440 SECONDARY
NJ 440
I-78 SECONDARY
I-78
FR W 63RD ST to NJ 440
FR I 78 EB TO BAYVIEW AVE NB
CAVEN POINT RD
ROUTE 501
N
0 0.25 0.5 0.75
Miles
HydroQual
HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728
FIGURE 3.3-3
SANBORN KEY MAP, 1950-1951
HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

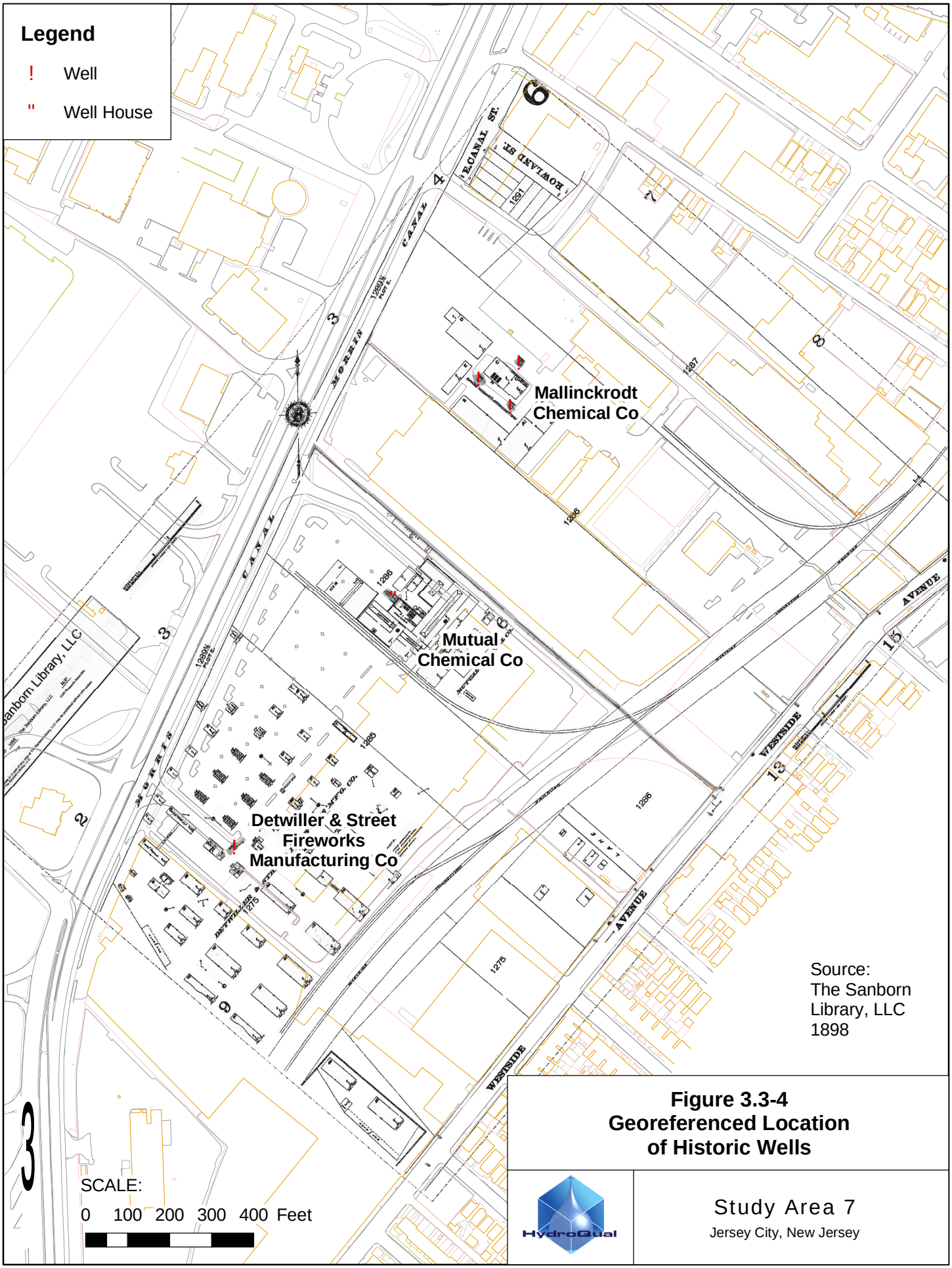
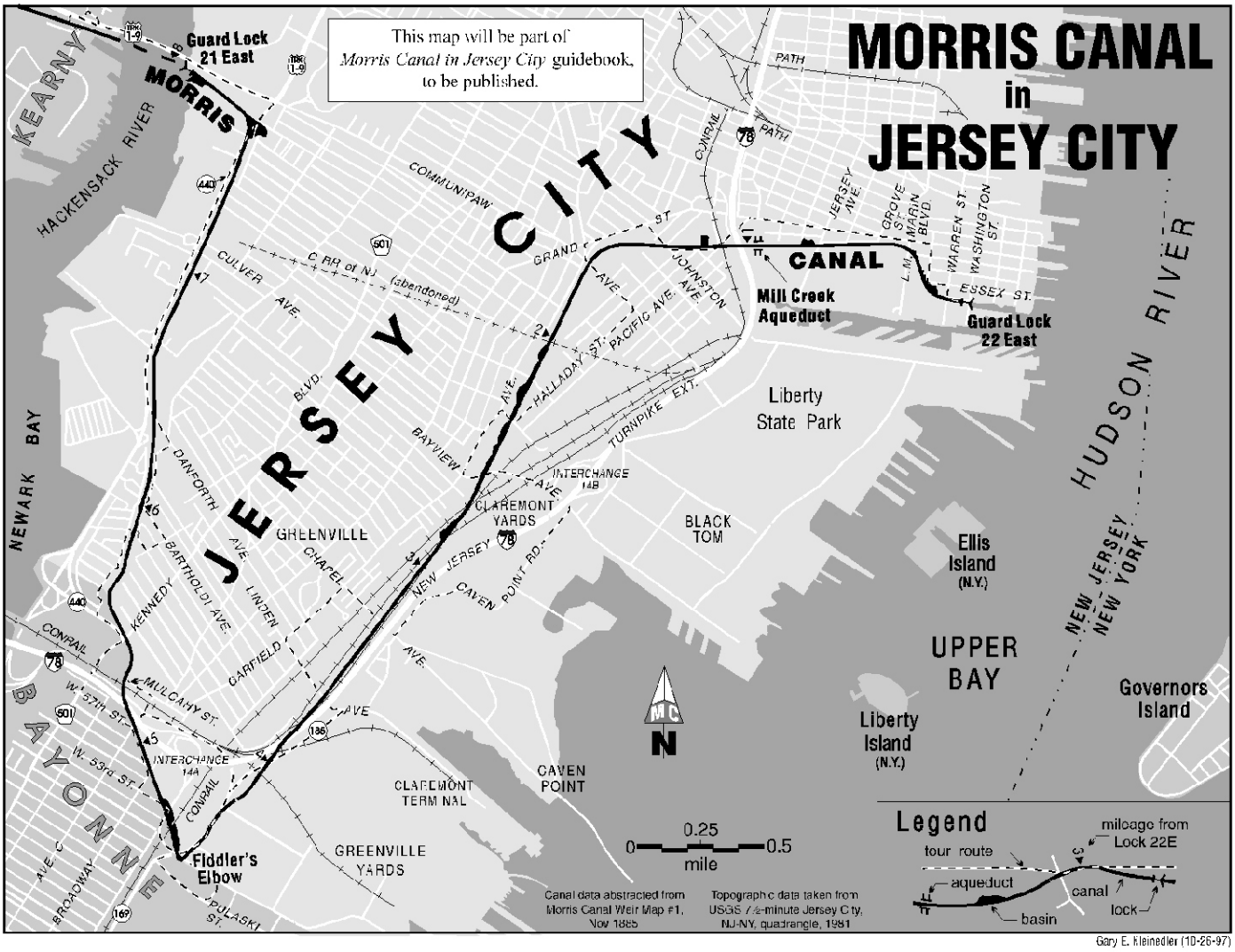


Figure 3.3-4
Georeferenced Location of Historic Wells

HydroQual

Study Area 7
Jersey City, New Jersey



SOURCE: "THE MORRIS CANAL IN JERSEY CITY" (RICE, 1998)

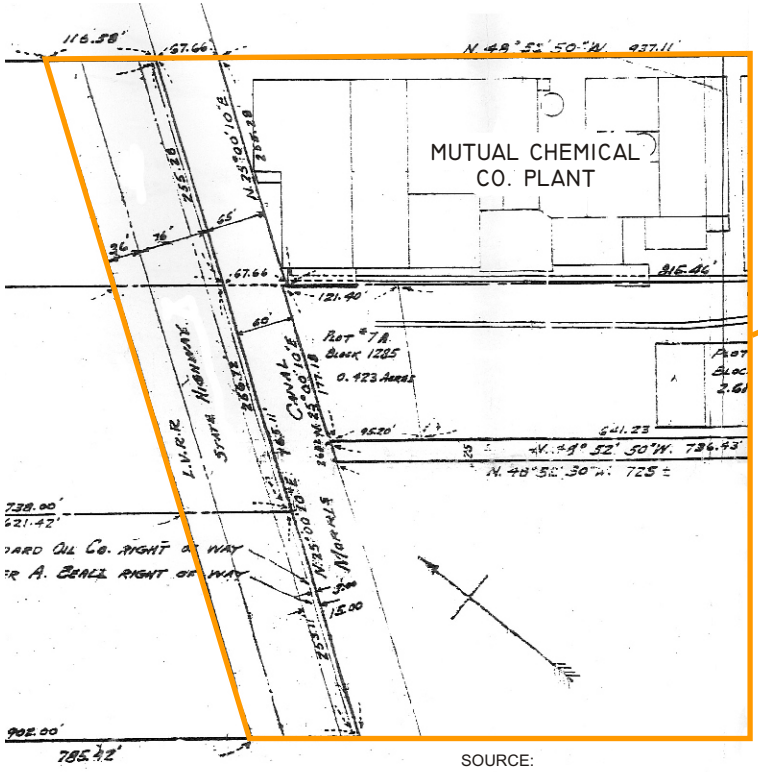
HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.4-1

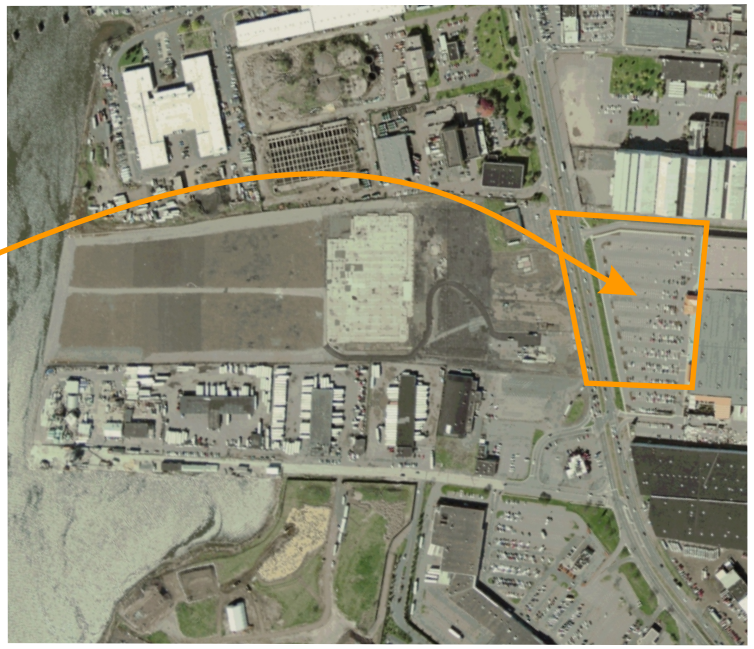
LOCATION OF MORRIS CANAL
IN JERSEY CITY

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



SCALE: 1" = 200'

SOURCE:
MUTUAL CHEMICAL CO. OF AMERICA
PROPERTY PLAN, REVISED 1934.



SCALE: 1" = 900'

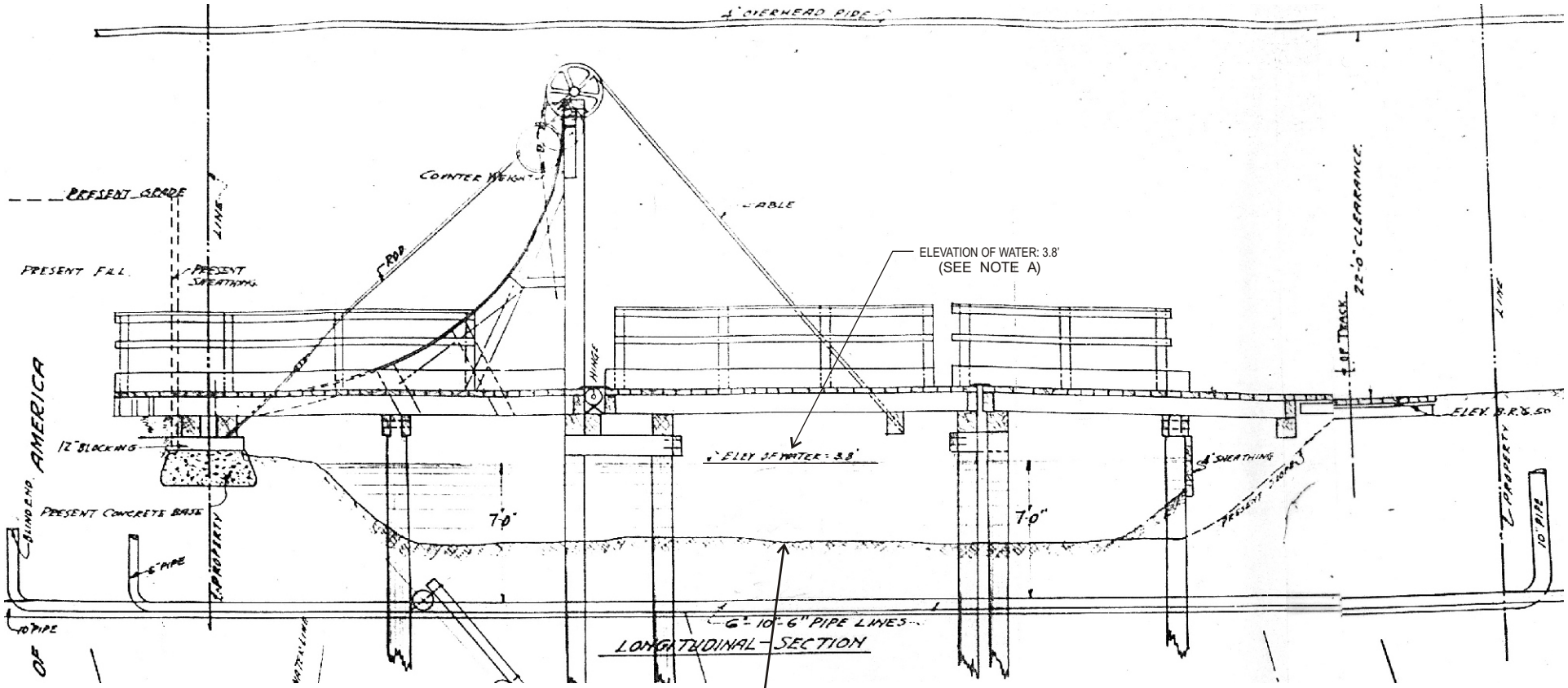
HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.4-2

LOCATION OF MORRIS CANAL
NEAR SA-7

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



NOTE A:

ELEVATION OF WATER	=	3.8' MSL
SCALED DEPTH OF WATER	=	- 4.0'
CALCULATED ELEVATION OF CANAL BOTTOM	=	- 0.20' MSL

SCALE: AS SHOWN

HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 3.4-3

REPRINT OF
1920 LONGITUDINAL SECTION
PROPOSED MORRIS CANAL BRIDGE

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

SECTION 4

OVERBURDEN HYDROGEOLOGY

4.1 REGIONAL GEOLOGY

The regional surficial (overburden) geology is illustrated on the cross-section C-C shown on Figure 4.1-1 which was taken just north of SA-7 (Stone 2002). The cross section illustrates that a basal glacial till unit, the Rahway Till (Qr), overlies bedrock and is on the order of 20 feet thick. The till is described as a dark reddish- brown, dense till containing 5 to 20 percent pebbles, cobbles, or boulders and was laid down by several glacial advances across the area, principally during the Wisconsin glacial period (Nichols, W.D., 1968, Carswell, L.D., 1976).

Overlying the till is the Glacial Lake Bayonne lacustrine deposit (Qrbn). This deposit is approximately 20 feet thick west of the site but thickens to nearly 100 feet and becomes coarser to the east in the vicinity of the Jersey City ridge. The western-most sediments were deposited in the bottom of glacial Lake Bayonne whereas the eastern-most sediments were deposited as high-stage deltas into the lake and are thus not only higher in elevation but also contain lenses of coarser materials. Together, these two deposits form the Glacial Till/Ice Contact deposits identified in the vicinity of SA-7. Stone (2002) describes these deposits as containing isolated lenses of sand and gravel, a feature which has been confirmed by soil borings east of SA-7.

Overlying the Glacial Lake Bayonne deposits are the lacustrine deposits of Glacial Lake Hackensack (Qrhk). These deposits consist of a relatively thick sequence of reddish-brown varved clay west of the Hackensack River. To the east, the sediments coarsen to silt and eventually to fine to medium sand beneath SA-7. In the study area, this deposit correlates to the Red Clay, S-1, S-2, and S-3 strata. The lacustrine deposits are overlain by Tidal Marsh and Estuarine deposits (Qm), otherwise known as the Meadow Mat.

The stratigraphy in the vicinity of SA-7 has been conceptualized on Figure 1.2-1 to illustrate the relationship between the various strata and the hydro-stratigraphic zones used in groundwater level and groundwater quality discussions. As shown on Figure 1.2-1, the shallow stratigraphy near Study Area 7 consists of man-made fill overlying a highly organic deposit of peat and fine-grained sediments (predominantly silt and clay) called the Meadow Mat. The Meadow Mat is present throughout SA-7 and SA-6, but pinches out east of Route 440 (SA-5). The Meadow Mat is underlain by lacustrine deposits of fine sands interlayered with seams of silt and clay. The lacustrine deposits are underlain by stratified ice contact deposits composed primarily of dense silt with occasional lenses of coarse gravel. The ice contact deposits are underlain by glacial till overlying bedrock. A detailed depiction of the

geologic deposits is provided below and illustrated in the various cross-sections presented in Section 6.

4.2 SHALLOW ZONE (FILL)

4.2.1 Physical Characteristics

The majority of the fill within SA-7 consists of 10 to 20 feet of COPR that was placed above the meadow mat during operation of the former Mutual Chemical plant east of Route 440. This fill has now been isolated by the installation of the perimeter subsurface barrier wall and is being removed as part of the court-ordered remedy. As part of the pre-design investigation for the excavation remedy, COPR at SA-7 was categorized into three principle horizons (MRCE, 2004) as follows:

- Horizon A is unsaturated COPR that was likely mixed with soil and compacted as a top layer for construction of the former drive-in. This layer is not continuous across the site.
- Horizon B is black fine to coarse sand sized COPR. This layer has been sub-divided into Horizons B1 and B2, which are located above and below the water table, respectively. Horizon B1 contains small crystals of Cr which appear as "glitter", whereas Horizon B2 contains larger crystals.
- Horizon C is a multi-colored silt and clay layer that contains both COPR and a large amount of calcite that was precipitated from the unstable lime-rich solution used in the extraction process. Since this horizon is of low permeability, it tends to behave as a semi-confining layer, along with the underlying meadow mat, to the underlying lacustrine sand. A thick deposit of Horizon C was found in the northeast corner of the site which likely explains the former mound in the groundwater table in this area.

Beyond the borders of SA-7, the fill primarily consists of silty sand with miscellaneous construction debris such as brick, glass, wood, concrete, etc. COPR is also present beyond SA-7 in relatively minor amounts as described in the various remedial investigations. COPR adjacent to the SA-7 property line (SA-6 north and SA-6 south) likely originated as spill-over from the filling operations on SA-7. Within SA-5, relatively small amounts of COPR were identified on portions of the former Mutual Chemical property (currently occupied by the Home Depot retail store) and on portions of the former Baldwin Steel and MI Holdings sites. COPR was also used in the backfill material for the former Morris Canal. Unlike the COPR at SA-7, the COPR observed on these adjacent properties generally occurs in relatively thin layers and is often mixed with soil and other fill material.

Estimates of the hydraulic conductivity of the Fill on SA-7 are summarized on Table 4.2-1 and are quite variable as would be expected for this material. In 1977, 15 rising-head

slug tests were performed on monitoring wells screened within the COPR and indicate a range from 0.28 to 30 ft/d, with a geometric mean of 4.1 ft/d. In 2003, five single-well (48-hour) pumping tests were conducted and indicate a generally similar range from 0.46 to 49 ft/d, with a geometric mean of 9.4. Lastly, eight variable head tests were conducted during the geotechnical investigation in 2003. Hydraulic conductivity values from these tests ranged from 0.19 to 4.6 ft/d with a geometric mean of 0.9 ft/d.

4.2.2 Groundwater Elevations

The groundwater surface in the Shallow Zone (fill material) measured on December 18, 2006 is depicted on Figure 4.2-1 and illustrates that construction of the subsurface barrier wall around SA-7 has caused significant changes in groundwater flow. Groundwater levels outside of the wall range from approximately 7 feet to 3 feet (msl) with flow away from the wall to the north and south. Within the SA-7 barrier wall, the ongoing excavation and dewatering of the fill has depressed the groundwater surface, especially on the eastern portion of the site, and the former localized mound that reached an elevation of approximately 12 feet msl in the northeastern corner of SA-7, is no longer present. East of Route 440, groundwater elevations range from nearly 12 feet (msl) in the College Towers area to approximately 5 to 7 feet msl along the storm sewers that serve as a line sink to groundwater flow beneath Route 440. Based on a review of available utility maps for the area, a drainage divide in the storm sewer is present just east of SA-7, with flow to both the north and the south from this location.

4.2.3 Groundwater Quality

The distribution of hexavalent and total chromium in the Shallow Zone is depicted on Figures 4.2-2 and 4.2-3, respectively. These maps were prepared using data from the most recent sampling event. For the majority of the wells, the most recent event was from May through July, 2006. For most of the remainder of the wells, including those abandoned during remedial activities, the most recent sampling event was in June 2004, with a few wells dating back to 2003. Both filtered and unfiltered data are provided on each map with the contours based on the unfiltered sample. A comparison of the two maps reveals that the extent of total chromium in the unfiltered samples above the NJDEP Ground Water Quality Criteria (0.07 ppm) is somewhat larger than that for hexavalent chromium, especially east of Route 440. Although the current NJGWQC is specific to total chromium in unfiltered samples, hexavalent chromium concentrations provide a more reliable indicator of the mobile fraction of the plume. This is due to the significant difference in attenuation of the two forms of chromium in the subsurface. Hexavalent chromium is generally unattenuated in groundwater and is thus quite mobile, whereas trivalent chromium is strongly sorbed to soil within the aquifer and is generally considered immobile in groundwater. Since the

turbidity of groundwater samples collected from wells can vary significantly due to factors such as the grain size of the formation, the degree of well development, and the pumping rate, the reported total chromium concentrations can also vary significantly between wells and between sample events. This is demonstrated on Figure 4.2-3 by a comparison of the filtered and unfiltered data in the same sample. In well 117-MW-A99 for example, total chromium in the unfiltered sample is above the NJGWQC of 0.07 mg/l at 0.084 ppm, whereas the concentration in the filtered sample is 0.01 ppm. Figure 4.2-2 reveals that hexavalent chromium is not present in this sample.

The data on Figure 4.2-2 indicate that hexavalent chromium in groundwater within the Shallow Zone is generally limited to the COPR deposit itself and is not mobile in the adjacent soil largely due to the reducing conditions within the Shallow Zone. Concentrations within the COPR at SA-7 range from less than 10 ppm to slightly over 100 ppm with a geometric mean of 13 ppm. This zone has been isolated by the barrier wall and will be removed during implementation of the court-ordered remedy. Outside of the barrier wall, hexavalent chromium concentrations exceed the NJGWQC in the narrow band of COPR along the borders with SA-6 north and SA-6 south, and in isolated portions of SA-5. During the six rounds of sampling dating back to 1997, hexavalent chromium has only been reported in one of the six shallow wells (117-MW-A89) on Site 117. However, recent VAS sampling along the Mutual Chemical/Baldwin Steel property line detected hexavalent chromium in the Shallow Zone at a concentration of 115 ppm, or nearly an order of magnitude higher than the geometric mean at SA-7. This location (117-MW-I4) coincides with the "wet" operations area of the former Mutual Chemical facility as discussed in Section 3.1 and suggests that a different, more potent form of chromium is likely present in the soil in this area as further discussed in Section 6.

Another relatively small plume of chromium has been identified in the shallow groundwater east of the former bowling alley near wells 117-MW-A89 and 153-MW-A13. Since shallow monitoring wells were not able to be installed directly within the former Morris Canal, Shallow Zone groundwater quality in this portion of the site has not been fully documented. However, based on the available data, it is likely that if chromium in groundwater were present, it would be limited to the COPR itself and be relatively low (i.e. 0.1 to 1.0 ppm) in concentration.

4.3 MEADOW MAT LAYER

4.3.1 Physical Characteristics

The meadow mat consists of a highly organic deposit of peat and fine-grained sediments consisting primarily of silt and clay. Figure 4.3-1 illustrates that the meadow mat is present throughout SA-6 and SA-7 and extends east of Route 440 to the western portion

of SA-5. Recent observations during the excavation of COPR down to the meadow mat at SA-7 have confirmed that this layer appears to be uniform and nearly continuous beneath the site. The upper surface of the meadow mat slopes upward from west to east, toward the former shoreline of ancient Glacial Lake Hackensack, where it eventually thins and pinches out. Elevations range from -10 feet (msl) on the west to near +3.0 feet (msl) on the east. The eastern boundary of the meadow mat has been inferred on Figure 4.3-1 from a review of boring logs obtained during this investigation as well as those from remedial investigations of adjacent sites. The RI for the Ryerson Steel/Mutual Site (Enviro-Science, 1997), for example, includes soil descriptions from over one hundred borings located on a 80' by 80' grid across the site. The RI for Site 153 (Morris Canal) includes 20 GeoProbe borings along the route of the former canal. A detailed review of the logs from these borings reveals that the meadow mat is generally present beneath the canal. The majority of the logs report either direct evidence of the meadow mat or poor recovery of the sample from the depth interval at which the layer is expected. This suggests that the meadow mat may have been encountered in the boring but failed to remain in the sampler due to its lack of cohesiveness. This is supported by the discussion in Section 3.4 that indicates the bottom of the former Morris Canal was at an elevation above the meadow mat.

The meadow mat serves as a hydraulically restrictive layer (semi-confining layer) between the Fill and the underlying S-1 and S-2 lacustrine deposits by virtue of the low permeability silts and clays. This is reflected by the mounding of groundwater to elevations in excess of 12 feet msl in the overlying fill beneath SA-7 prior to dewatering. More importantly, the meadow mat also provides a strong reducing environment for the reduction of hexavalent chromium to trivalent chromium. The effectiveness of this layer as a chemical reductant for chromium is evidenced by the general lack of hexavalent chromium in the groundwater of the underlying Intermediate Zone as further discussed in Section 4.4.

4.4 INTERMEDIATE OVERBURDEN ZONE (S-1 AND UPPER S-2 SAND)

4.4.1 Physical Characteristics

The Intermediate Zone is defined by wells screened just below the meadow mat, or at a depth of approximately 20 to 30 feet below grade where the meadow mat is not present. This zone encompasses the S-1 Sand and the upper portion of the S-2 Sand. The S-1 Sand consists of gray, silty fine sand with some medium to coarse sand. The S-1 directly underlies the meadow mat, ranges from about 2 to 8 feet thick, and is somewhat more permeable than the underlying S-2 sand.

As summarized on Table 4.4-1, seven rising-head slug tests were performed in 1997 and 1999 on monitoring wells screened within the S-1. These data indicate a range of hydraulic conductivity from 3.6 ft/d to 66.7 ft/d, with a geometric mean of 8.8 ft/d. In

2003, four single-well (48-hour) pumping tests were conducted and each indicated a range of hydraulic conductivity from 11 ft/d to 16.3 ft/d, with a geometric mean of 13 ft/d. Lastly, two bail-down tests were conducted in temporary drive points installed during the construction of the perimeter bedrock wells. Hydraulic conductivity values from these tests were 1.2 and 9.8 ft/d.

The underlying S-2 Sand consists of brown, fine to medium sand with some silt. Occasional discontinuous layers of clean brown-gray sand are present near the top of the unit, as are fine-grained silt lenses throughout. The thickness of this unit generally increases from east to west and from north to south, and it is vertically bifurcated beneath the western portion of SA-7 by the Red Clay as illustrated in the cross sections provided in Section 6.

As summarized on Table 4.4-1, six rising-head slug tests were performed in 1997 on monitoring wells screened within the S-2. These data indicate a range of hydraulic conductivity from 0.63 to 12.5 ft/d, with a geometric mean of 1.8 ft/d. In 2003, five bail-down tests were conducted in temporary drive points installed during the construction of the perimeter bedrock wells. Hydraulic conductivity values from these tests ranged from 0.9 to 9.8 ft/d with a geometric mean of 5.1 ft/d.

4.4.2 Groundwater Elevations

Figure 4.4-1 depicts groundwater elevations in the Intermediate Zone, just below the meadow mat. These data indicate a relatively steep gradient east of Route 440 and then a shallower gradient from Route 440 to the River. This decrease in gradient is due to the rapid thickening of the S-1 and S-2 sands from east to west in this area. The placement of the subsurface barrier wall through the lacustrine sands has caused groundwater flow in the Intermediate Zone to buildup slightly and move around the wall, both to the north and to the south, as shown by the bending of the 4-foot and 5-foot contours on Figure 4.4-1.

Within the subsurface barrier wall, the operation of the Deep Zone dewatering system at SA-7 has created a depression in the groundwater surface as shown by the closed contours. Elevations throughout the east cell are generally below elevation -3.0 (msl) which indicates that the dewatering system has been successful in depressurizing the head beneath the meadow mat to facilitate excavation of the overlying COPR.

The water level data discussed above were adjusted for the effects of tidal fluctuations of the Hackensack River. Figures 4.4-2 and 4.4-3 illustrate the tidal lag and tidal efficiency, respectively, of water levels within the Intermediate Zone. These plots indicate tidal lags ranging from 10 minutes near the river to over 300 minutes further to the east. Tidal efficiency values range from over 60 percent near the river to less than 1 percent near Route 440. The contours are generally parallel to the river and thus indicate that tidal

influences are relatively uniform along the shoreline. This is in contrast to the data for the Deep Zone which indicates preferential flow to the north.

4.4.3 Groundwater Quality

The extent of hexavalent and total chromium in the Intermediate Zone is shown on Figures 4.4-4 and 4.4-5, respectively. The footprint of the total chromium plume above the NJGWQC of 0.07 ppm is similar in shape, but somewhat larger than the hexavalent plume. Two distinct areas of elevated chromium are evident, one west of Route 440 in the vicinity of the former Mutual Chemical plant and the other east of Route 440 that extends beneath the Hackensack River. Since the Intermediate Zone is a transition zone between the Shallow and Deep Zones, these areas represent the downward and upward vertical migration of the "deep overburden plume", from its source area to its discharge area, respectively.

In the groundwater discharge area, the depression or "hole" in the riverbed surface extends though the Intermediate Zone to an elevation of approximately -45 feet (msl). This provides a pathway for groundwater within the Intermediate and Deep zones to discharge into the river. Data from the GeoProbe investigation has been used to defined the extent of the chromium plume in this area. As shown on Figure 4.4-4, hexavalent chromium concentrations range from non-detect to 218 ppm in the groundwater just below the soft riverbed mud and fit well with concentrations measured in land-based monitoring wells.

To assess the impact of this plume on the overlying sediments and surface water, peeper samplers were placed in the upper six-inches of the riverbed mud. Data from this program are shown on Figure 2.2-4 and indicate that hexavalent chromium was not present in any of the peepers installed in this area (or elsewhere in the River). This indicates that the hexavalent chromium is largely being reduced prior to discharge to the river. Data from the surface water sampling program are shown on Figure 2.2-5 and indicate that a trace level of hexavalent chromium (0.012 ppm) was detected in one sample collected just above the mud and directly over the hole. This indicates that minor, localized discharges of hexavalent chromium from the overburden plume may be occurring in the area.

The large number of non-detect results of hexavalent chromium in the Intermediate Zone shown on Figure 4.4-4 reflects the effectiveness of the meadow mat layer in protecting the underlying lacustrine deposits from the vertical migration of hexavalent chromium through chemical reduction. This is especially evident on the SA-7 site which has both strong downward vertical gradients and elevated hexavalent chomium concentrations in the COPR. Despite these conditions that favor the downward migration of chromium, none of the Intermediate Zone monitoring wells on SA-7 have reported detectable levels of hexavalent chromium. It is noted that although well 115-MW-A12T is shown on the Intermediate Zone maps, its screened interval (40 to 50 feet) is actually between the

Intermediate and Deep Zones and thus the reported hexavalent chromium concentration of 8 ppm does not reflect conditions directly beneath the meadow mat.

4.5 DEEP OVERBURDEN ZONE (LOWER S-2 AND S-3)

4.5.1 Physical Characteristics

The Deep Zone encompasses the lower portion of the S-2 Sand and, where present, the S-3 sand. The lower portion of the S-2 Sand is physically similar to the upper portion described above. The S-3 Sand consists of a significantly more permeable layer of coarse sand and gravel that has been identified beneath a portion of the study area. This unit generally lies at the contact between the overlying S-2 sand and the underlying ice contact lacustrine deposits. However, on the eastern portion of the study area the S-3 sand is overlain by an increasingly thick section of silt and clay (Ice Contact deposits). Wells screened in this "buried" portion of the S-3 Sand (approximately 65 feet deep) have been assigned to the "Deep Zone", whereas wells screened higher up, at the base of the S-2 Sand (approximately 25 feet deep) have been assigned to Intermediate Zone. Figure 4.5-1 illustrates the approximate extent of the S-3 Sand beneath the study area and has been revised from earlier versions based on the results of the Route 440 investigation. The primary revision is the widening of the extent of the S-3 to the east based on borings 117-MW-I3 and I4, and a reassessment of the geotechnical boring logs along the eastern portion of SA-7 that indicate the S-3 Sand, or its equivalent, is present but is thinner and finer-grained in this area.

The hydraulic properties of the Deep Zone were determined from the results of a deep overburden aquifer test. The test was conducted by pumping well 115-PW-21 at a rate of 35.5 gpm for a total of 48 hours, during which water levels were monitored in a total of 34 monitoring wells. This pumping well is screened at a depth of 61-71 feet within the S-3 sand. Barometric changes and tidal fluctuations on the Hackensack River were measured by an on-site barograph and tide gauge and used to adjust measured drawdown values accordingly. As summarized on Table 4.5-1, the average transmissivity for the S-3 sand is calculated at approximately 6,300 gpd/ft, which is equivalent to a hydraulic conductivity of 140 ft/day, assuming a thickness of 6 feet. Further details regarding this aquifer test may be found in the Technical Report, "Deep Lacustrine Sediments Aquifer Test: Honeywell Study Area 7 Jersey City, NJ" (HydroQual, Inc., October 26, 2004).

4.5.2 Groundwater Elevations

Figures 4.5-2 and 4.5-3 illustrate the distribution of tidal lag and tidal efficiency, respectively within this zone. Tidal lag ranges from four minutes near the embayment north of SA-6 to over 350 minutes near the former bowling alley. Tidal efficiency ranges from 34 percent near the embayment to less than one percent near Route 440. The influence of the

S-3 Sand as a direct link between SA-7 and the groundwater discharge area is evident by the orientation of the contours on both maps. These data indicate that the tidal effects are more easily transmitted through the S-3 Sand from the groundwater discharge area in the northern embayment than they are directly from the river west of SA-7. This supports the contention, further discussed below, that the S-3 Sand is the dominant flow zone in the deep overburden and provides a preferential pathway for chromium migration to the north.

Figure 4.5-4 depicts the groundwater elevations in the lower portions of the deep overburden including the S-3 sand. Water level data were adjusted for the effects of tidal fluctuations of the Hackensack River. Prior to the construction of the barrier wall and operation of the groundwater dewatering system, groundwater flow was generally to the west beneath SA-5, turning north-northwest beneath SA-7 and SA-6 north. This change in flow direction was the result of three principal factors; 1) the location and extent of the coarse-grained S-3 sand, 2) the presence of the low permeability Red Clay beneath the western portion of SA-7, and, 3) the depression in the surface of the riverbed sediments north of SA-6. This combination not only limits groundwater flow directly to the west due to the Red Clay, but provides a high-permeability avenue for groundwater to flow towards the riverbed depression. As discussed in Section 4.4-3, the depression reaches an elevation of approximately -45 feet (msl) and thus less head is required for groundwater to discharge to the river in this area.

Currently, the SA-7 dewatering system has created a depression in the groundwater surface as shown by the closed contours on Figure 4.5-4. This depression is somewhat larger than that in the Intermediate Zone since the dewatering wells are screened in this Deep Zone, the S-3 Sand is more permeable than the overlying S-2 Sand, and the Deep zone is closer to the bottom of the subsurface barrier wall. The result is that groundwater is being drawn into the pumping wells from a portion of the study area.

4.5.3 Groundwater Quality

The horizontal extend of hexavalent and total chromium in the Deep Zone is illustrated on Figures 4.5-5 and 4.5-6, respectively. The fact that the general shape and extent of the deep plume mirrors that of the S-3 sand is due to the influence of the S-3 on groundwater flow as previously discussed. Both maps illustrate that concentrations range from approximately 7,000 ppm beneath the former Mutual Chemical plant to over 100 ppm near the groundwater discharge area. The highest concentrations in this plume west of Route 440, are over 500 times greater than the geometric mean of those reported in the COPR at SA-7. This indicates that the source of the deep plume is not COPR, but more likely the result of discharges of more concentrated chromium such as sodium chromate from operations at the plant site as further discussed in Section 6..

Once in the S-3 sand, the elevated concentrations of hexavalent chromium move horizontally to the north-northwest, ultimately discharging to the Hackensack River. As the deep plume approaches the river north of SA-6, it begins to move back up through the Intermediate Zone. This is illustrated on Figure 4.4-4 and is evidenced by the elevated levels of chromium detected in the GeoProbe® borings that were used to sample the groundwater directly beneath the soft, recent riverbed sediments. These borings have allowed the discharge location of the deep plume to be defined beneath the river. Discharge takes place within a localize depression in the riverbed surface as shown by the bathometric contours. The bottom of this depression reaches a depth of over 45 feet and provides an outlet to groundwater flow in the S-3 sand. This scenario is supported by the results of the surface water sampling program as shown in Figure 2.2-5. All four of the sample locations that reported total Cr above the detection limit, and the single sample that reported hexavalent Cr above its detection limit, are located near this depression. Furthermore, each of these detections was from the samples collected at the bottom of the water column directly above the riverbed sediments.

In the vicinity of the "plume diversion area", a portion of the Deep Zone plume is detached from the remainder of the plume as evidenced by the low levels in wells 124-MW-105T and 124-MW-104L and 104T. The horizontal extent of the detached portion has been defined by perimeter wells 124-MW-106T, 124-MW-107T, 124-MW-G02T, 119-MW-01T and 119-MW-02T as shown on Figure 4.5-5. Although the cause of this separation in the extent of the plume is not known, one possible scenario is historic pumping from one or more deep overburden wells to the south. Well OB-1 on Figure 3.3-1, for example, is reported to be an overburden well screened in a sand and gravel layer from 108 to 117 feet below grade. Assuming this well existed at the location shown (see Section 3.3.1 for a discussion about the uncertainty of this location) and was pumped at its reported rate of 20 gpm, its influence may have reached as far north as the plume diversion area and thus could have diverted a portion of the plume to the south. However, since the actual location pumping rate, and pumping history of this well is unknown, its impact cannot be quantified. Furthermore, the boring logs from the plume diversion area indicate that the lacustrine deposits primarily consist of silt and clay and thus groundwater flow is expected to be quite slow. Further discussion regarding potential source areas is provided in Section 6.

4.6 RED CLAY

4.6.1 Physical Characteristics

The red clay unit is described as a red-brown silty clay, with a trace of fine sand. As shown on the cross-sections in Section 6, the Red Clay inter-fingers with the S-2 sand beneath SA-7 and thickens to the north and west. It is noteworthy that the red clay is

generally absent in the vicinity of the deep overburden plume, and was not observed in the groundwater discharge area where the plume has been shown to discharge.

4.7 GLACIAL TILL/ICE-CONTACT DEPOSITS

4.7.1 Physical Characteristics

The Glacial Till/Ice-Contact deposit is composed of two strata of similar composition, but of different origin. The lower portion is glacial till that consists of an unsorted mix of sand, gravel, silt and clay. The till originated from direct glacial deposition and is present in a continuous layer overlying bedrock as well as in discontinuous lenses within the stratified ice contact lacustrine deposits. The upper portion of this unit consists of stratified ice contact/lacustrine deposits of fine sand with inter-layered seams of silt and clay. Unlike the till, the ice contact deposits were deposited by moving water in and around the melting glacial ice. These deposits may be discerned from the glacial till by the fine layering and varves that are characteristic of alluvial deposition. Occasional lenses of coarse sand and gravel have also been observed beneath SA-5. The unit as a whole ranges in thickness from less than 10 feet near the northwest corner of SA-7 to greater than 50 feet beneath SA-5. A structural contour map of the upper surface of the glacial till/ice contact lacustrine deposits is provided on Figure 4.7-1.

Hydraulic conductivity estimates from the glacial till include one slug test, one drive point bail-down test, and nine packer tests. However, many of the packer tests were conducted within different depths of the same borehole, and thus are not representative of spatial variations. Collectively, these data indicate a range of over three orders of magnitude with a geometric mean of 0.10 ft/d. The vertical hydraulic conductivity of these deposits is expected to be somewhat less due to the stratified layering.

4.7.2 Groundwater Quality

Since the glacial till/ice contact deposit is generally considered a low-permeability semi-confining layer, it has not been targeted for sampling through conventional monitoring well installations. However, pore water samples were obtained from this unit during the VAS program and have been compiled on Figure 4.7-2. Since the intent of this figure is to illustrate that a significant amount of chromium mass is present within these low-permeability deposits, only data from silt and clay zones were included on the map. Hexavalent chromium concentrations range from 6,920 in 117-MW-I4 near the former Mutual Chemical Company site to non-detect in selected samples. The footprint of the deep overburden plume has been superimposed on this drawing for reference. These data indicate that a significant amount of chromium is present within the fine-grained layers of the glacial till/ice contact deposits throughout the footprint of the plume. Further

discussion is provided in Section 6 regarding the factors that may have caused this occurrence.

TABLE 4.2-1
SUMMARY OF HYDRAULIC CONDUCTIVITY
Shallow Zone

Well	Test Type	Hydr. Cond. (ft/d)	Analytical Method
073-MW-BB11	Rising-head Slug	3.3	Cooper, 1967
087-MW-O19	Rising-head Slug	6.3	Cooper, 1967
087-MW-O29	Rising-head Slug	3.8	Cooper, 1967
087-MW-A26	Rising-head Slug	10.6	Cooper, 1967
088-MW-G19	Rising-head Slug	2.3	Cooper, 1967
115-MW-O13	Rising-head Slug	2	Cooper, 1967
115-MW-AA15	Rising-head Slug	5.3	Cooper, 1967
115-MW-E14	Rising-head Slug	0.74	Cooper, 1967
115-MW-E8	Rising-head Slug	30	Cooper, 1967
115-MW-U14	Rising-head Slug	21	Cooper, 1967
134-MW-Q8	Rising-head Slug	3	Cooper, 1967
163-MW-R5	Rising-head Slug	29.1	Cooper, 1967
079-MW-C6	Rising-head Slug	0.28	Cooper, 1967
125-MW-L3	Rising-head Slug	2.9	Cooper, 1967
184-MW-C10	Rising-head Slug	2.2	Cooper, 1967
	Geometric Mean:	**4.09**	
115-MW-AA15	48-hr. Pump Test	21	Cooper, 1967
115-MW-U14	48-hr. Pump Test	49	Cooper, 1967
115-MW-O13	48-hr. Pump Test	4.4	Cooper, 1967
115-MW-E14	48-hr. Pump Test	0.46	Cooper, 1967
115-MW-E8	48-hr. Pump Test	35	Cooper, 1967
	Geometric Mean:	**9.39**	
115-MW-103	Var. Head Tests	0.19	DM-7.01
115-MW-107	Var. Head Tests	3.4	DM-7.01
115-MW-115	Var. Head Tests	1.19	DM-7.01
115-MW-118	Var. Head Tests	0.832	DM-7.01
115-MW-119A	Var. Head Tests	4.64	DM-7.01
120-MW-210	Var. Head Tests	0.23	DM-7.01
	Geometric Mean:	**0.94**	

TABLE 4.4-1
SUMMARY OF HYDRAULIC CONDUCTIVITY DATA
Intermediate Zone

S-1 SAND

Well	Test Type	Hydr. Cond. (ft/d)	Analytical Method
087-MW-O19D	Rising-head Slug	66.7	Cooper, 1967
115-MW-O13D	Rising-head Slug	5	Cooper, 1967
115-MW-E14D	Rising-head Slug	4.6	Cooper, 1967
115-MW-E8D	Rising-head Slug	7.2	Cooper, 1967
115-MW-U14D	Rising-head Slug	3.6	Cooper, 1967
124-MW-G02D	Rising-head Slug	11	Cooper, 1967
140-MW-P05D	Rising-head Slug	9.1	Cooper, 1967
	Geometric Mean:	**8.77**	
115-MW-U14D	48-hr. Pump Test	12.8	Cooper, 1967
115-MW-O13D	48-hr. Pump Test	12.8	Cooper, 1967
115-MW-E14D	48-hr. Pump Test	16.3	Cooper, 1967
115-MW-E8D	48-hr. Pump Test	11	Cooper, 1967
	Geometric Mean:	**13.09**	
115-SB-208	Drive Point Bail	1.2	Cooper, 1967
115-SB-213	Drive Point Bail	9.8	Cooper, 1967
	Geometric Mean:	**3.43**	

S-2 SAND

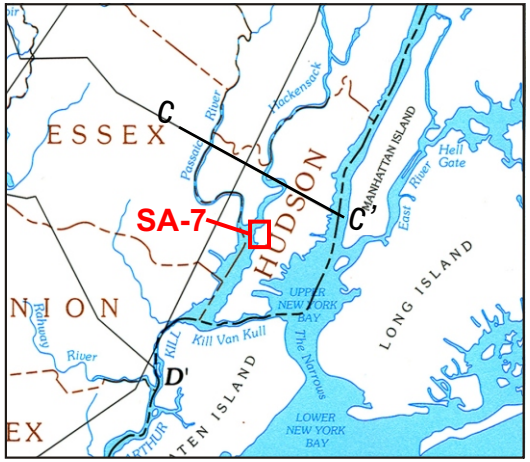
115-MW-A12T	Rising-head Slug	12.5	Hvorslev, 1951
115-MW-E08T	Rising-head Slug	1.2	Hvorslev, 1951
115-MW-E14T	Rising-head Slug	5.3	Hvorslev, 1951
115-MW-K14T	Rising-head Slug	0.63	Hvorslev, 1951
124-MW-G02T	Rising-head Slug	6.7	Hvorslev, 1951
153-MW-A-13T	Rising-head Slug	0.11	Hvorslev, 1952
	Geometric Mean:	**1.82**	
115-SB-202	Drive Point Bail	0.92	Cooper, 1967
115-SB-208	Drive Point Bail	9.8	Cooper, 1967
115-SB-208	Drive Point Bail	9.8	Cooper, 1967
115-SB-213	Drive Point Bail	9.8	Cooper, 1967
115-SB-213	Drive Point Bail	4.2	Cooper, 1967
	Geometric Mean:	**5.15**	

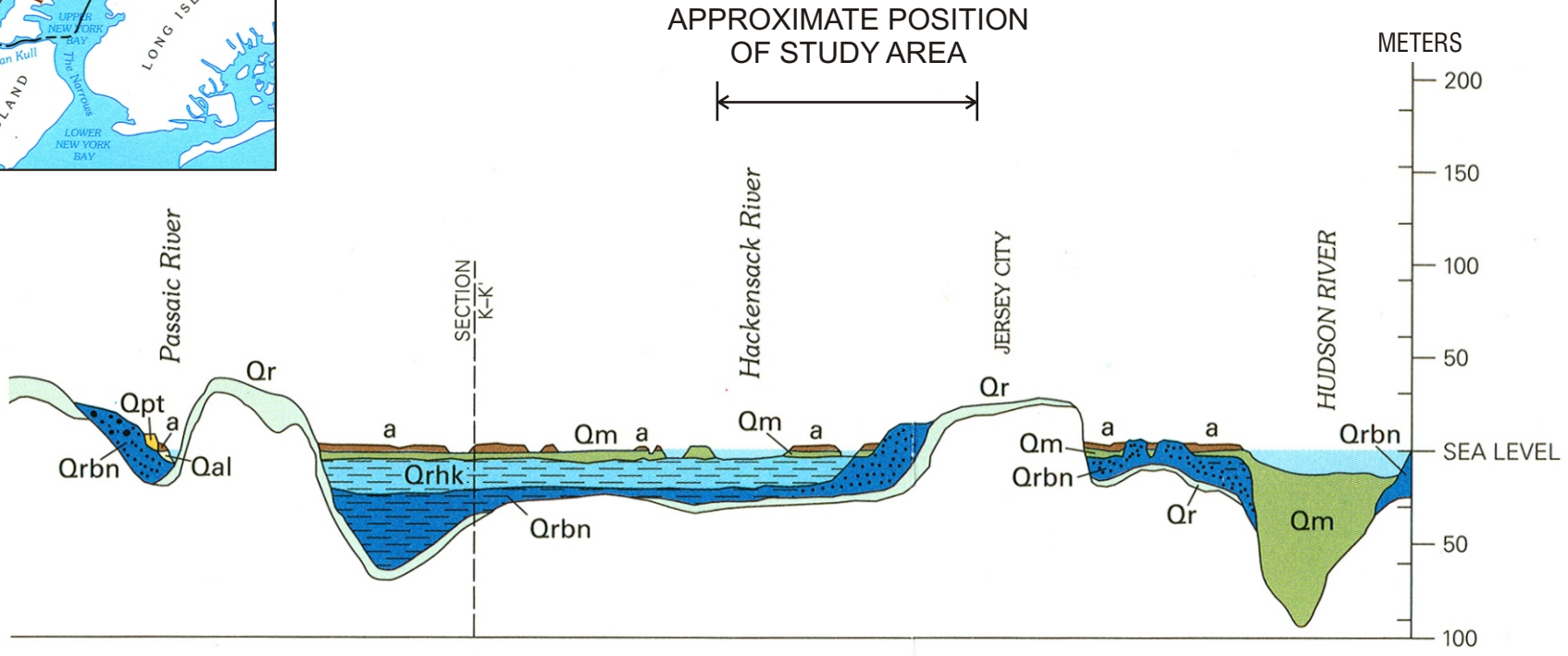
TABLE 4.5-1
SUMMARY OF HYDRAULIC CONDUCTIVITY
DEEP ZONE AQUIFER TEST

Parameter	Calculation Methodology	Calculated Value
Transmissivity of the S-3 Sand	Hantush Time-Drawdown "r/B" Method	6,850 gpd/ft
Transmissivity of the S-3 Sand	DeGlee Distance-Drawdown Method	5,880 gpd/ft
Transmissivity of the S-3 Sand	Average of Above Two Methods	6,300 gpd/ft
Hydraulic Conductivity of S-3 Sand	Average Transmissivity/Aquifer Thickness (assumes 6-foot average thickness)	1,050 gpd/ft2 (140 ft/day)
Storativity of the S-3 Sand	Hantush Time-Drawdown "r/B" Method	1×10^{-4}
Specific Storage of S-3 Sand	Hantush Time-Drawdown "r/B" Method	$1 \times 10^{-5} ft^{-1}$

TABLE 4.7-1
SUMMARY OF HYDRAULIC CONDUCTIVITY DATA
Glacial Till/Ice Contact Deposits

Well	Test Type	Hydr. Cond. (ft/d)	Analytical Method
088-MW-G19T	Rising-head Slug	1.7	Hvorslev, 1951
115-SB-202	Drive Point Bail	0.00071	Cooper, 1967
115-SB-204	Packer Tests	0.085	Hvorslev, 1951
115-SB-206	Packer Tests	0.1	Hvorslev, 1951
115-SB-208	PT - 71-77	0.035	Hvorslev, 1951
115-SB-208	PT - 71-82	0.22	Hvorslev, 1951
115-SB-208	PT - 71-87	0.14	Hvorslev, 1951
115-SB-208	PT - 71-97	0.13	Hvorslev, 1951
115-SB-208	PT - 71-107	0.14	Hvorslev, 1951
115-SB-211	Packer Tests	0.031	Hvorslev, 1951
115-SB-213	Packer Tests	0.23	Hvorslev, 1951
	Geometric Mean: Packer Tests Only	**0.10**	





SECTION C-C'

LEGEND:

- a - Artificial fill
- Qal - Alluvium
- Qm - Tidal marsh and estuarine deposits
- Qpt - Passaic Terrace deposits
- Qr - Rahway Till
- Qrbn - Glacial Lake Bayonne deposits
- Qrhk - Glacial Lake Hackensack deposits, Kill Van Kull Stage

Sedimentary facies in glacial meltwater deposits

- Coarse gravel or sand-and-gravel glaciofluvial facies
- Coarse pebbly sand glaciofluvial facies
- Sand and gravel delta foreset facies; dips shown schematically
- Sandy delta foreset facies; dips shown schematically
- Sand and gravel delta bottomset facies
- Sandy delta bottomset facies
- Fine sand, silt, and clay delta bottomset facies
- Sandy lake-bottom facies
- Silt-clay lake-bottom facies, commonly varved

Taken from: Stone, et.al (2002)

HydroQual
HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 4.1-1

REGIONAL GEOLOGIC CROSS-SECTION NEAR SA-7

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

Legend

Shallow Well

- Active
- Abandoned

Groundwater Elevation (ft msl)

NA: Data Not Available

Groundwater Elevation Contour

(Contour Interval: 1 foot)

Dashed where inferred

SA-7 Subsurface Containment Barrier

SA6-MW-AA1 2.82
087-MW-U28 5.94
087-MW-W25 4.65
087-MW-O29 4.3
087-MW-I30 4.07
115-PZ-06 3.38
115-PZ-03 NA
087-MW-Y20 2.82
115-PZ-05 3.55
115-PZ-02 NA
115-MW-101 NA
087-MW-O23 5.81
087-MW-S19 NA
115-PZ-04 3.78
115-PZ-01 NA
115-MW-AA15 NA
087-MW-A26 4.09
115-MW-104 NA
087-MW-O19 7.25
115-MW-103 3.6
073-MW-BB11 3.32
115-MW-U14 7.42
115-MW-115 7.08
087-MW-001 6.7
079-MW-A2 3.42
184-MW-002 3.47
079-MW-C6 5.76
088-MW-G19 6.41
088-MW-001 3.23
163-MW-CC8 2.4
073-MW-Y10 3.93
115-MW-107 NA
115-MW-108 8.4
115-E5-SI 5
088-MW-102 NA
184-MW-C02 NA
184-MW-E10 NA
115-MW-O13 8.07
115-MW-118 3.35
115-E4-SO 6.8
088-MW-002 7.73
134-MW-V09 5.5
115-MW-109 NA
090-MW-E1 6.86
163-MW-Y06 NA
134-MW-Q08 6.44
115-E6-SO 8.7
115-E5-SI 4.9
115-MW-E14 NA
120-MW-210 NA
090-MW-11 7.415
184-MW-001 8.525
140-MW-06 6.73
115-MW-206 NA
115-E3-SO 9.2
090-MW-10 7.205
184-MW-C10 10.02
163-MW-R05 4.44
115-MW-119A NA
115-PZ-A12 NA
140-MW-07 5.5
115-MW-E8 NA
117-MW-A99 7.65
140-MW-04 4.6
090-MW-8A NA
090-MW-F14 11.97
154-MW-D01 NA
115-E1-SO 5.1
115-E2-SO 8.3
125-MW-L03 NA
124-MW-001 5.33
117-MW-A62 8.23
154-MW-A01 11.41
154-MW-C6A NA
154-MW-E08 NA
124-MW-002 5.65
117-MW-A85 6.39
154-MW-A05A 11.4
117-MW-95 8.14
154-MW-B6A NA
154-MW-A06 NA
117-MW-A89 4.9
117-MW-A14 6.83
153-MW-A13 4.1
153-MW-A15 3.221

N

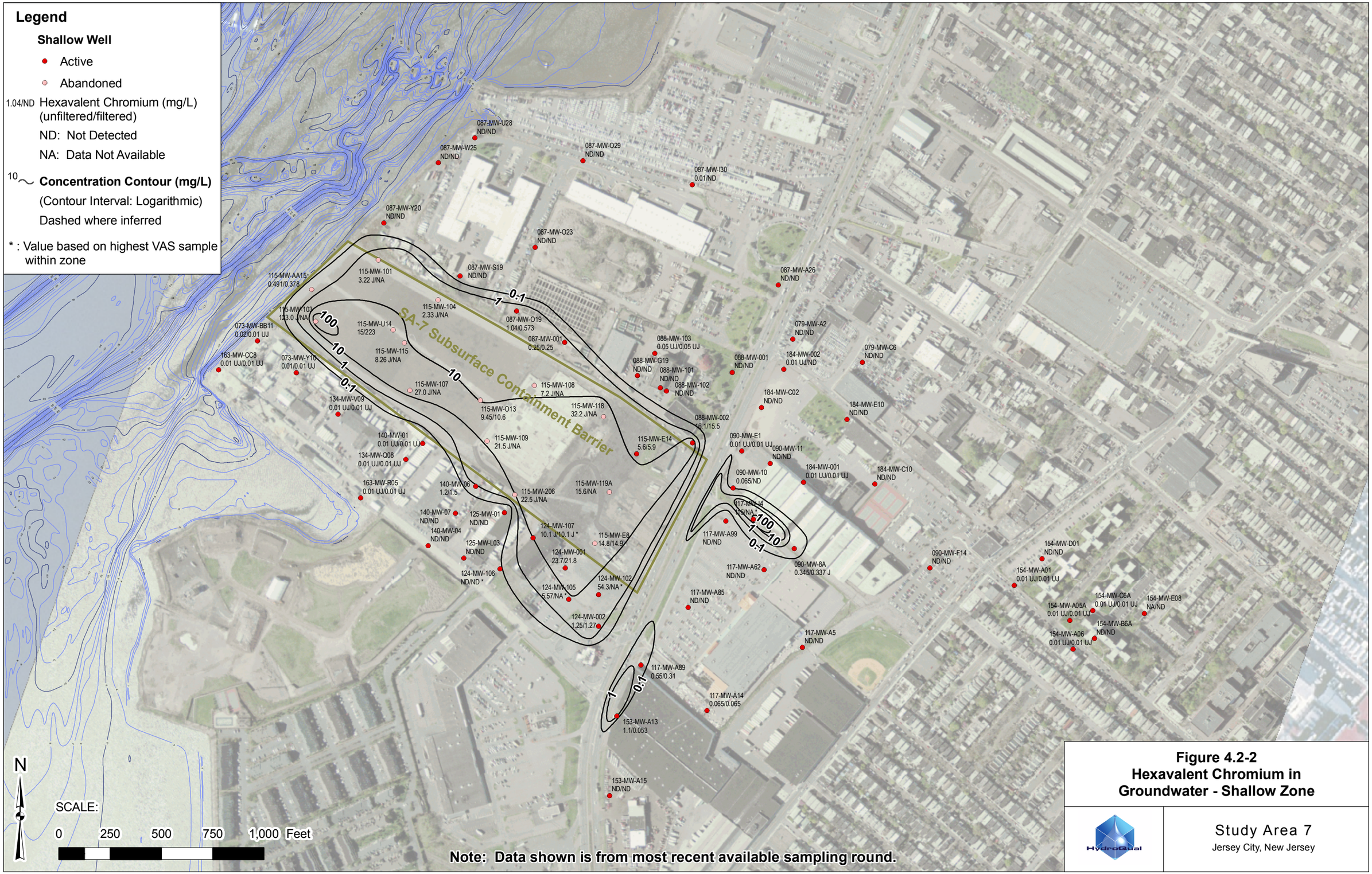
SCALE:

0 250 500 750 1,000 Feet

Figure 4.2-1
Groundwater Elevations - Shallow Zone
December 2006

HydroQual

Study Area 7
Jersey City, New Jersey


Legend
Shallow Well
Active
Abandoned
1.04/ND Hexavalent Chromium (mg/L) (unfiltered/filtered)
ND: Not Detected
NA: Data Not Available
10 Concentration Contour (mg/L)
(Contour Interval: Logarithmic)
Dashed where inferred
* : Value based on highest VAS sample within zone
SA-7 Subsurface Containment Barrier
087-MW-U28 ND/ND
087-MW-W25 ND/ND
087-MW-O29 ND/ND
087-MW-I30 0.01/ND
087-MW-Y20 ND/ND
087-MW-O23 ND/ND
087-MW-S19 ND/ND
087-MW-A26 ND/ND
115-MW-AA15 0.491/0.378
115-MW-101 3.22 J/NA
115-MW-103 123.0 J/NA
115-MW-104 2.33 J/NA
087-MW-O19 1.04/0.573
087-MW-001 0.25/0.25
073-MW-BB11 0.02/0.01 UJ
115-MW-U14 15/223
115-MW-115 8.26 J/NA
163-MW-CC8 0.01 UJ/0.01 UJ
073-MW-Y10 0.01/0.01 UJ
115-MW-107 27.0 J/NA
115-MW-108 7.2 J/NA
134-MW-V09 0.01 UJ/0.01 UJ
115-MW-O13 9.45/10.6
115-MW-118 32.2 J/NA
140-MW-01 0.01 UJ/0.01 UJ
115-MW-109 21.5 J/NA
134-MW-C08 0.01 UJ/0.01 UJ
163-MW-R05 0.01 UJ/0.01 UJ
140-MW-06 1.2/1.5
115-MW-206 22.5 J/NA
115-MW-119A 15.6/NA
140-MW-07 ND/ND
125-MW-01 ND/ND
140-MW-04 ND/ND
125-MW-L03 ND/ND
124-MW-107 10.1 J/10.1 J *
115-MW-E8 14.8/14.9
124-MW-001 23.7/21.8
124-MW-106 ND/ND *
124-MW-105 5.57/NA *
124-MW-102 54.3/NA *
124-MW-002 1.25/1.27
088-MW-103 0.05 UJ/0.05 UJ
088-MW-G19 ND/ND
088-MW-001 ND/ND
088-MW-101 ND/ND
088-MW-102 ND/ND
088-MW-002 16.1/15.5
115-MW-E14 5.6/5.9
079-MW-A2 ND/ND
079-MW-C6 ND/ND
184-MW-002 0.01 UJ/ND
184-MW-C02 ND/ND
184-MW-E10 ND/ND
090-MW-E1 0.01 UJ/0.01 UJ
090-MW-11 ND/ND
090-MW-10 0.065/ND
184-MW-001 0.01 UJ/0.01 UJ
184-MW-C10 ND/ND
117-MW-I4 15/NA *
117-MW-A99 ND/ND
117-MW-A62 ND/ND
090-MW-8A 0.345/0.337 J
090-MW-F14 ND/ND
154-MW-D01 ND/ND
154-MW-A01 0.01 UJ/0.01 UJ
154-MW-C6A 0.01 UJ/0.01 UJ
154-MW-E08 NA/ND
154-MW-A05A 0.01 UJ/0.01 UJ
154-MW-B6A ND/ND
154-MW-A06 0.01 UJ/0.01 UJ
117-MW-A85 ND/ND
117-MW-A5 ND/ND
117-MW-A89 0.55/0.31
117-MW-A14 0.065/0.065
153-MW-A13 1.1/0.053
153-MW-A15 ND/ND
100
10
1
0.1
N
SCALE:
0 250 500 750 1,000 Feet
Note: Data shown is from most recent available sampling round.
Figure 4.2-2
Hexavalent Chromium in Groundwater - Shallow Zone
HydroGlobal
Study Area 7
Jersey City, New Jersey

Legend

Shallow Well

- Active
- Abandoned

5.14/5.66 Total Chromium (mg/L) (unfiltered/filtered)

ND: Not Detected

NA: Data Not Available

10 **Concentration Contour (mg/L)**

(Contour Interval: Logarithmic)

Dashed where inferred

* : Value based on highest VAS sample within zone

Unfiltered total Cr Greater Than 0.07ppm

SA-7 Subsurface Containment Barrier

087-MW-U28 0.0024/ND
087-MW-W25 0.0045/0.0031
087-MW-O29 0.0055/ND
087-MW-I30 0.0032/ND
087-MW-Y20 0.0705/0.0569
087-MW-O23 ND/NA
115-MW-101 3.42/NA
087-MW-S19 0.0413/0.0209
087-MW-A26 0.0062/ND
115-MW-AA15 0.584/0.421
115-MW-104 2.5/NA
115-MW-103 117/NA
115-MW-U14 13.7 J/13.6
115-MW-116 8.16/NA
115-MW-107 25.4/NA
087-MW-O19 1.42/0.0089
087-MW-001 2.97/3.4
088-MW-103 1.11/1.02
073-MW-BB11 0.387/0.0059
163-MW-CC8 0.0913/0.0144
073-MW-Y10 0.0112/0.0056
115-MW-108 7.11/NA
088-MW-G19 0.572/0.229
088-MW-101 0.0329/0.005 B
088-MW-102 0.0295/0.0039 B
088-MW-001 0.0104/ND
079-MW-A2 0.1/0.0163
079-MW-C6 0.0315/ND
184-MW-002 0.073/0.052
184-MW-C02 0.0095 J/0.0027 J
184-MW-E10 0.0079/0.0093
134-MW-V09 0.097/0.0049
115-MW-O13 9.42 J/11.3 J
115-MW-118 52.3/NA
115-MW-109 19.8/NA
140-MW-01 0.0113/ND
134-MW-Q08 0.0067/0.0039
088-MW-002 15.2/14.5
090-MW-E1 0.0276/ND
090-MW-11 0.0051/0.002
140-MW-06 2.18/2.58
115-MW-206 22.4/NA
115-MW-E14 5.14/5.66
090-MW-10 1.57/0.935
184-MW-001 0.0185/ND
184-MW-C10 0.0404/0.0105
163-MW-R05 0.0396/0.011
115-MW-119A 15.8/NA
117-MW-I4 224/NA *
140-MW-07 0.0429/0.0105
125-MW-01 0.607/0.171
124-MW-107 9.56/10.3 *
115-MW-E8 13.6/14.4
117-MW-A99 0.0843/0.01
090-MW-8A 0.38/0.366
090-MW-F14 0.0025/ND
154-MW-D01 ND/0.0016
154-MW-A01 ND/ND
140-MW-04 0.014/0.0063
124-MW-106 20.1/0.042 *
124-MW-001 25.1/21.2
124-MW-103 7.47/6.00 *
125-MW-L03 0.0161/0.0018
124-MW-105 5.17/5.06 *
124-MW-102 NA/NA *
117-MW-A62 0.0963/ND
154-MW-C6A ND/ND
154-MW-E08 NA/0.0021
154-MW-A05A ND/ND
154-MW-B6A 0.0019/0.0026
154-MW-A06 0.0203/0.0106
124-MW-002 4.05/5.18
117-MW-A85 3.64/1.02
117-MW-A5 NA/NA
117-MW-A89 0.784/0.189
117-MW-A14 0.0909/0.086
153-MW-A13 1.09/0.133
153-MW-A15 0.0607/ND

0.1 1 10 100

N

SCALE:

0 250 500 750 1,000 Feet

Note: Data shown is from most recent available sampling round.

Figure 4.2-3
Total Chromium in Groundwater - Shallow Zone

HydroQual

Study Area 7
Jersey City, New Jersey

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\FIG_43-1.DWG 01/10/2007 LAYOUT: LAYOUT1

LEGEND

(-7.4) ELEVATION OF TOP OF MEADOW MAT (FT., MSL)

-10 ELEVATION CONTOUR (FT., MSL) CONTOUR INTERVAL = 2' DASHED WHERE APPROXIMATE

SB-202 (-9.2)
SB-201 (-10.1)
SB-215 (-8)
073-MW-10BR (-7.93)
SB-203 (-8.7)
B-V13 (-7)
115-MW-U14 (-7.2)
SB-214 (-6)
SB-204 (-5.9)
B-R11 (-3.5)
140-MW-9BR (-8.0)
SB-213 (-5.2)
087-MW-08 (-8.9)
087-MW-029 (-8.5)
115-MW-013 (-6.3)
SB-205 (-5.5)
087-MW-02 (-7.2)
SA6-MW-5BR (-7.5)
SA6-MW-15BR (-3.1)
SB-212 (-4)
115-MW-K14T (-6.2)
119-MW-11BR (-5.73)
SB-206 (-1.5)
124-MW-G02 (-1.2)
B-H9 (-4.4)
SB-207 (-1.0)
087-MW-14 (-7.4)
SB-211 (-1.5)
088-MW-15 (-4)
087-MW-01 (-6.1)
115-MW-E14 (-0.8)
SB-216 (-0.8)
124-SB-102 (-1.3)
157-D&M MW3
SA6-MW-14BR (-1.8)
124-SB-104 (-0.5)
SB-210 (+1.8)
119-MW-12BR (+0.3)
157-D&M MW5 (0.0)
115-PZ-A12
115-MW-A12T
090-MW-E1 (+1.0)
184-MW-G02 (+1.5)
153-MW-A13 (NP)
117-MW-I1 (+2.74)
117-MW-I2 (NP)
117-MW-I3 (+2.9)
153-MW-A15 (NP)
090-MW-07-BR (NP)
117-MW-I4 (NP)
APPROXIMATE LIMIT OF MEADOW MAT
079-MW-C6 (NP)
184-MW-E10 (NP)
079-MW-13BR (NP)
117-MW-3BR (+0.8)
117-MW-I5 (+2.1)

-8 -6 -4 -2 0 2 4

0 200 400 800
SCALE IN FEET

HydroQual
HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 4.3-1

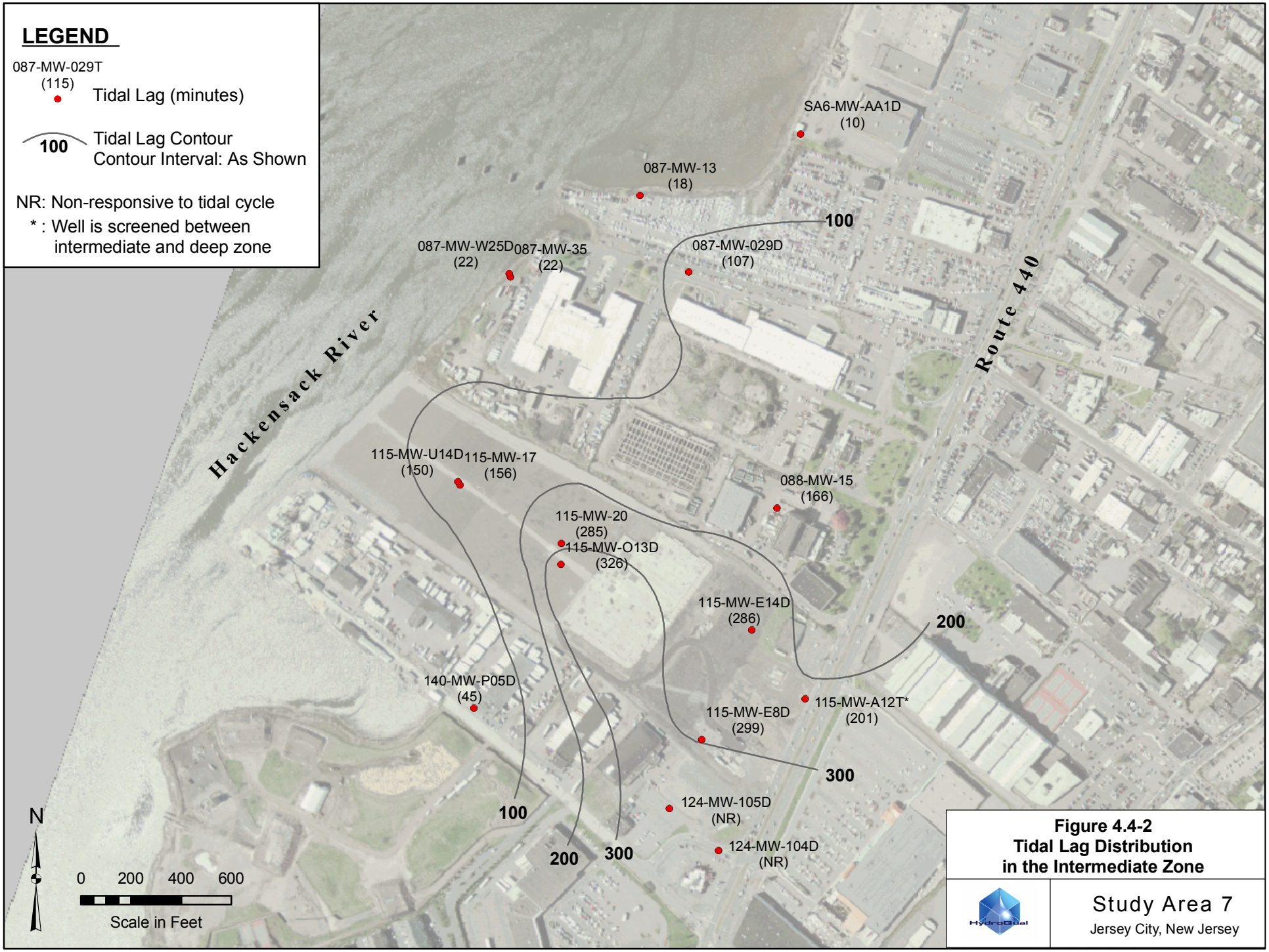
TOP OF MEADOW MAT ELEVATION

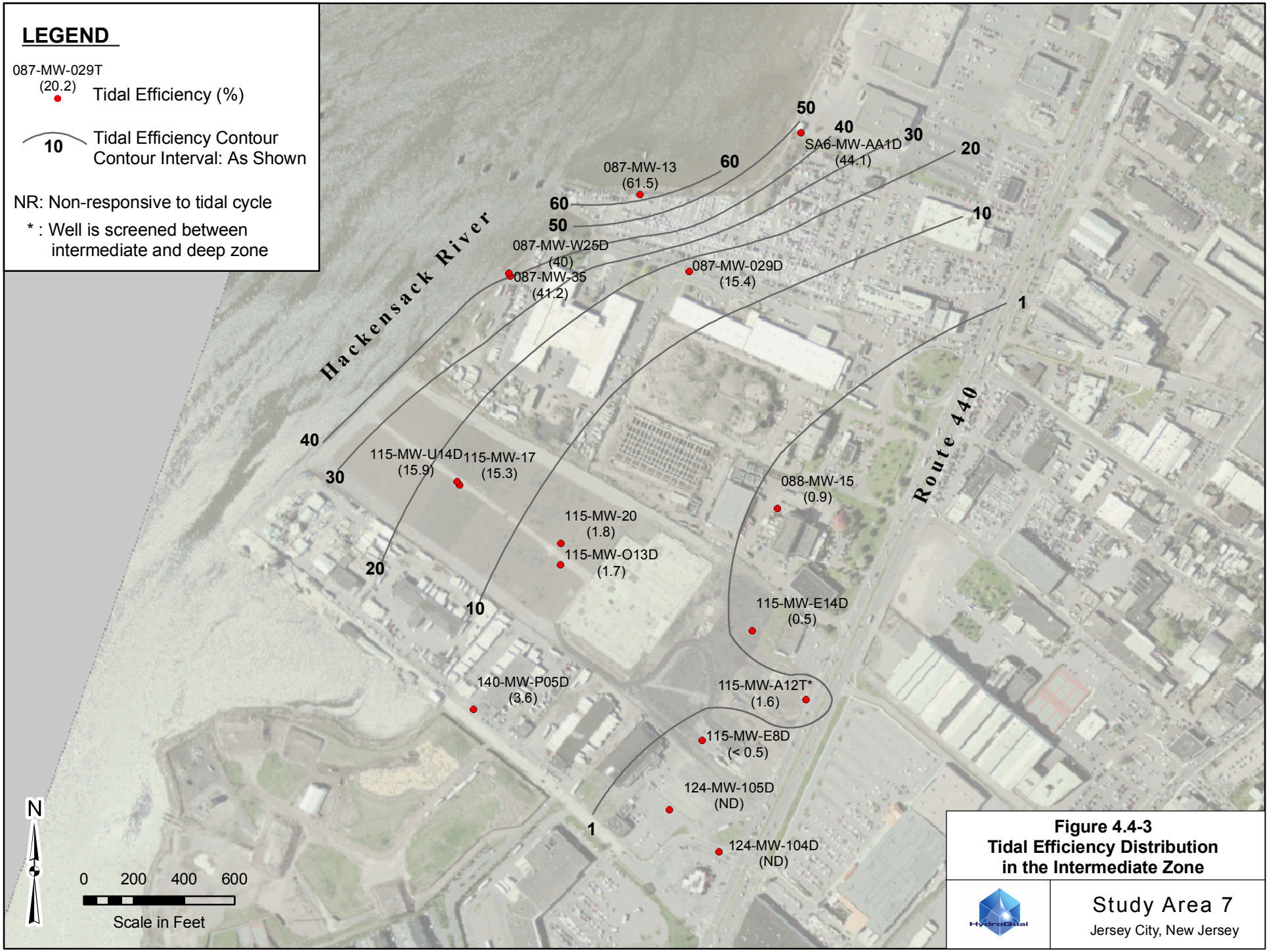
HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



Figure 4.4-1
Groundwater Elevations - Intermediate Zone
December 2006

Study Area 7
Jersey City, New Jersey


LEGEND
087-MW-029T
(115)
Tidal Lag (minutes)
100
Tidal Lag Contour
Contour Interval: As Shown
NR: Non-responsive to tidal cycle
* : Well is screened between intermediate and deep zone
SA6-MW-AA1D
(10)
087-MW-13
(18)
087-MW-W25D
(22)
087-MW-35
(22)
087-MW-029D
(107)
100
Hackensack River
Route 440
115-MW-U14D
(150)
115-MW-17
(156)
088-MW-15
(166)
115-MW-20
(285)
115-MW-O13D
(326)
115-MW-E14D
(286)
200
140-MW-P05D
(45)
115-MW-A12T*
(201)
115-MW-E8D
(299)
300
100
124-MW-105D
(NR)
200
300
124-MW-104D
(NR)
N
0
200
400
600
Scale in Feet
Figure 4.4-2
Tidal Lag Distribution
in the Intermediate Zone
Study Area 7
Jersey City, New Jersey


LEGEND
087-MW-029T
(20.2)
Tidal Efficiency (%)
10
Tidal Efficiency Contour
Contour Interval: As Shown
NR: Non-responsive to tidal cycle
* : Well is screened between intermediate and deep zone
Hackensack River
Route 440
50
40
30
20
10
60
50
40
30
20
10
1
087-MW-13
(61.5)
SA6-MW-AA1D
(44.1)
087-MW-W25D
(40)
087-MW-35
(41.2)
087-MW-029D
(15.4)
115-MW-U14D
(15.9)
115-MW-17
(15.3)
088-MW-15
(0.9)
115-MW-20
(1.8)
115-MW-O13D
(1.7)
115-MW-E14D
(0.5)
140-MW-P05D
(3.6)
115-MW-A12T*
(1.6)
115-MW-E8D
(< 0.5)
124-MW-105D
(ND)
124-MW-104D
(ND)
N
0 200 400 600
Scale in Feet
Figure 4.4-3
Tidal Efficiency Distribution
in the Intermediate Zone
Study Area 7
Jersey City, New Jersey

Legend

- **Geoprobe**

Intermediate Well

- Active
- Abandoned

Hexavalent Chromium (mg/L)

ND: Not Detected

NA: Data Not Available

10 ~ **Concentration Contour (mg/L)**

(Contour Interval: Logarithmic)

Dashed where inferred

* : Well screened between intermediate and deep zones

✚ Fisk Street Neeting Facility

** : Dewatering activity at this location encountered Hexavalent Chromium up to 45 mg/L

*** : Value based on highest VAS sample within zone

PW009-750 126/NA
PW002-900 0.732/NA
PW003-600 218/NA
PW009-450 43/NA
PW010-150 42/NA
SA6-MW-AA1D ND/ND
PW003-050 146/NA
PW009-050 34/NA
100
10
1.0
0.1
087-MW-13 0.57/0.66
45/NA **
087-MW-W25D ND/ND
087-MW-O29D 161/177
087-MW-A26D ND/ND
087-MW-O19D ND/ND
SA-7 Subsurface Containment Barrier
115-MW-17 ND/ND
115-MW-U14D ND/ND
088-MW-15 ND/ND
115-MW-20 ND/ND
115-MW-O13D ND/ND
115-MW-E14D ND/ND
090-MW-09 6.8/NA ***
115-MW-19 1.47/1.05 ***
140-MW-P05D ND/ND
115-MW-A12T 8.04/128 *
117-MW-I3 39/10.3
090-MW-07 41.7/40.1
115-MW-E8D ND/ND
124-MW-103D ND/ND
117-MW-I5 0.77/0.74
124-MW-102D ND/ND
124-MW-105D ND/ND
117-MW-D2 ND/ND
117-MW-I2 1.7/1.4
124-MW-G02D ND/ND
124-MW-104D ND/ND
117-MW-I1 ND/ND
117-MW-D1 0.023/0.034
117-MW-11 ND/ND

N

SCALE:

0 250 500 750 1,000 Feet

Note: Data shown is from most recent available sampling round.

Figure 4.4-4
Hexavalent Chromium in Groundwater - Intermediate Zone

HydroQual

Study Area 7
Jersey City, New Jersey

Legend

Intermediate Well

- Active
- Abandoned

.020/.013 Total Chromium (mg/L) (unfiltered/filtered)

ND: Not Detected

NA: Data Not Available

10 **Concentration Contour (mg/L)**

(Contour Interval: Logarithmic)

Dashed where inferred

Due to high turbidity of geoprobe samples, no comparable total chromium data is available in the river.

* : Well screened between intermediate and deep zones

** : Value based on highest VAS sample within zone

Unfiltered total Cr Greater Than 0.07ppm

SA-7 Subsurface Containment Barrier

087-MW-13 0.7/0.688

087-MW-IV25D 0.005/0.0058

087-MW-35 0.0118/NA

087-MW-O29D 170/186

SA6-MW-AA1D 0.0048 B/NA

087-MW-A26D 0.0592/ND

087-MW-O19D 0.0187/0.0181

115-MW-U14D 0.0019/ND

115-MW-17 0.003/0.0019

088-MW-15 1.17/1.09

115-MW-20 0.0209/0.0134

115-MW-O13D 0.0699/0.0673

090-MW-09 0.38/0.01 **

115-MW-E14D ND/0.0315

115-MW-19 NA/0.077 **

117-MW-I3 12.6/NA

140-MW-P05D 0.036/NA

115-MW-A12T 9.03/12.6 *

115-MW-E8D 0.0119/0.0056

124-MW-103D 0.0212/NA

124-MW-102D 0.0619/NA

117-MW-I2 1.54/1.31

117-MW-I5 0.840/0.758

124-MW-105D 0.0264/NA

117-MW-D2 0.0676/ND

117-MW-11 ND/ND

124-MW-G02D 0.0103/NA

124-MW-104D 0.0246/NA

117-MW-I1 ND/ND

117-MW-D1 0.0305/0.0292

N

SCALE:

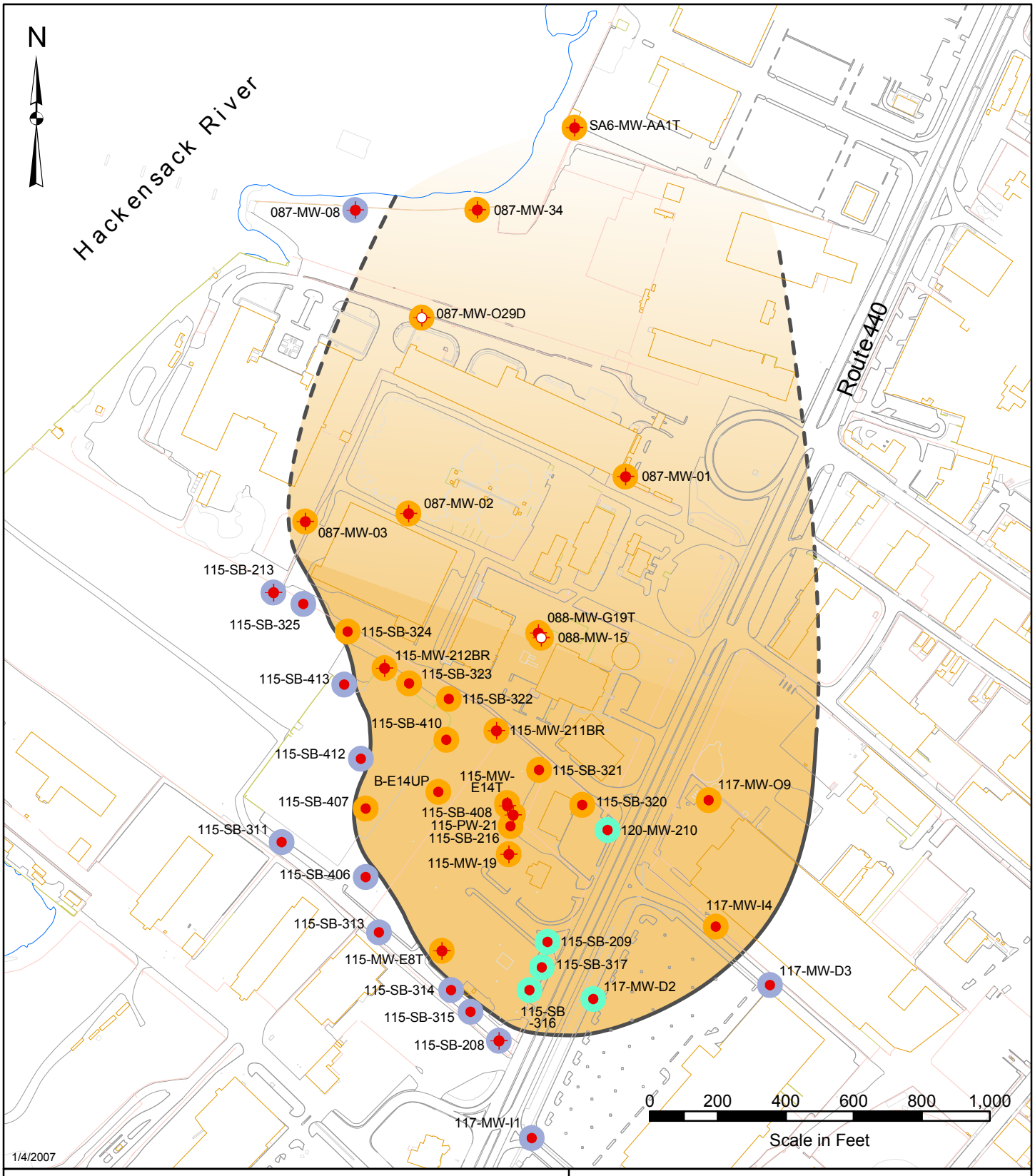
0 250 500 750 1,000 Feet

Note: Data shown is from most recent available sampling round.

Figure 4.4-5
Total Chromium in Groundwater - Intermediate Zone

HydroQual

Study Area 7
Jersey City, New Jersey



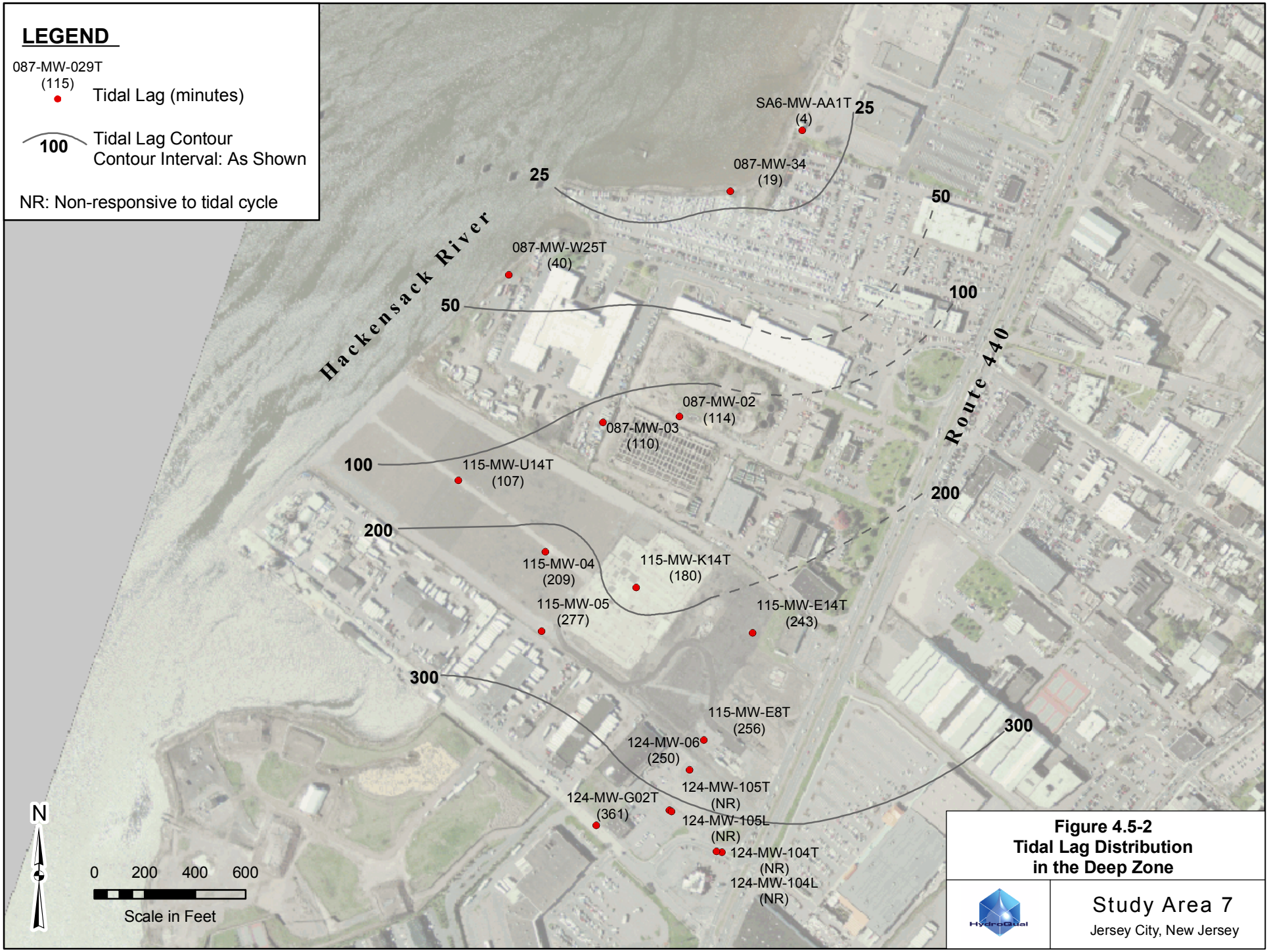
Legend

- Extent of S-3 Sand (dashed where inferred)
- S-3 Sand Present
- S-3 Sand Absent
- S-3 Sand Thin and/or Finer Grained

Figure 4.5-1
Approximate Areal Extent of the S-3 Sand

HydroQual

Honeywell Study Area 7
Jersey City, New Jersey


LEGEND
087-MW-029T
(115)
Tidal Lag (minutes)
100
Tidal Lag Contour
Contour Interval: As Shown
NR: Non-responsive to tidal cycle
SA6-MW-AA1T
(4)
25
087-MW-34
(19)
25
50
087-MW-W25T
(40)
Hackensack River
50
100
Route 440
087-MW-02
(114)
087-MW-03
(110)
100
115-MW-U14T
(107)
200
200
115-MW-04
(209)
115-MW-K14T
(180)
115-MW-05
(277)
115-MW-E14T
(243)
300
115-MW-E8T
(256)
300
124-MW-06
(250)
124-MW-105T
(NR)
124-MW-G02T
(361)
124-MW-105L
(NR)
124-MW-104T
(NR)
124-MW-104L
(NR)
N
0
200
400
600
Scale in Feet
Figure 4.5-2
Tidal Lag Distribution
in the Deep Zone
Study Area 7
Jersey City, New Jersey

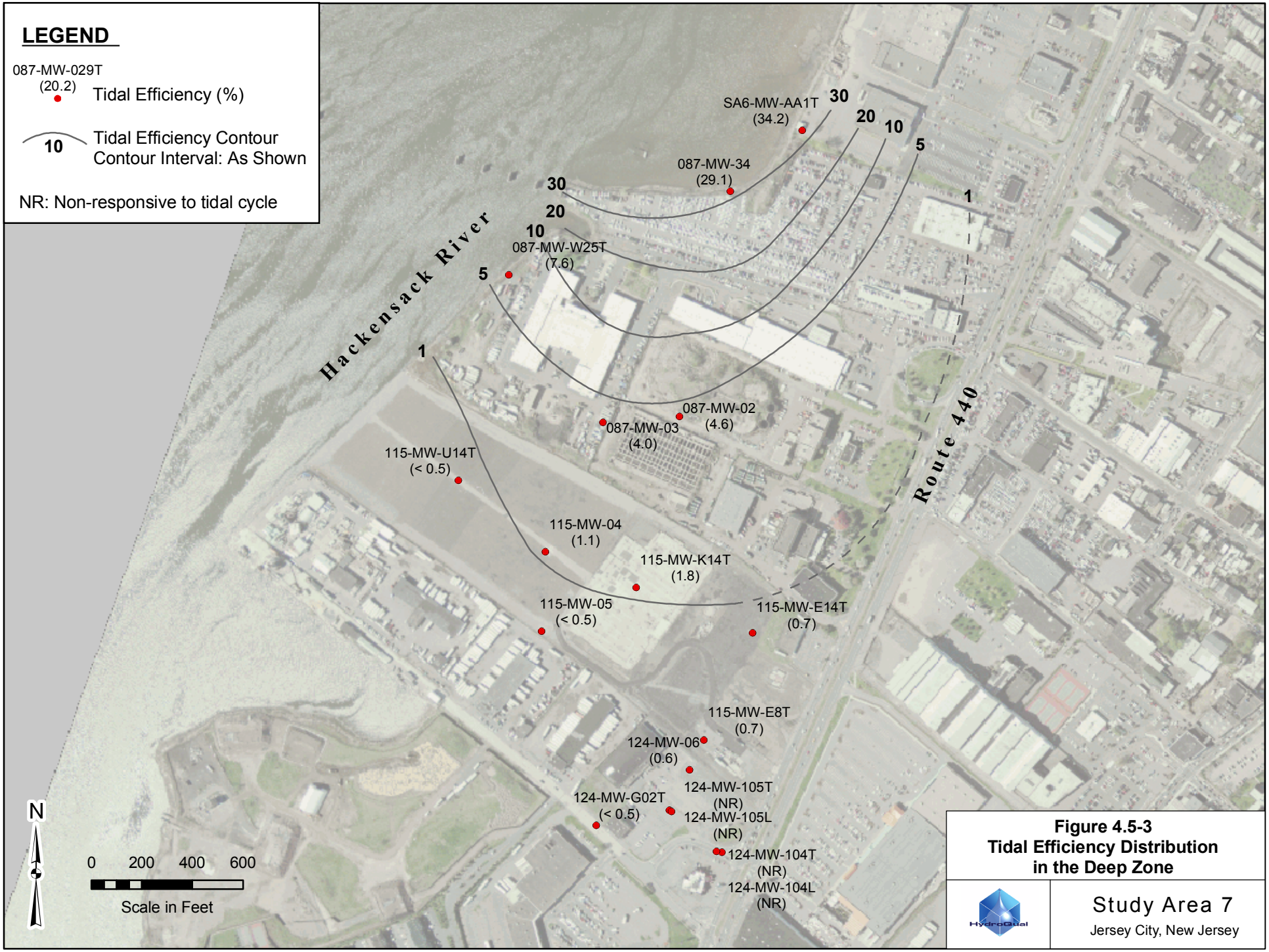


Figure 4.5-3
Tidal Efficiency Distribution in the Deep Zone

Study Area 7
Jersey City, New Jersey

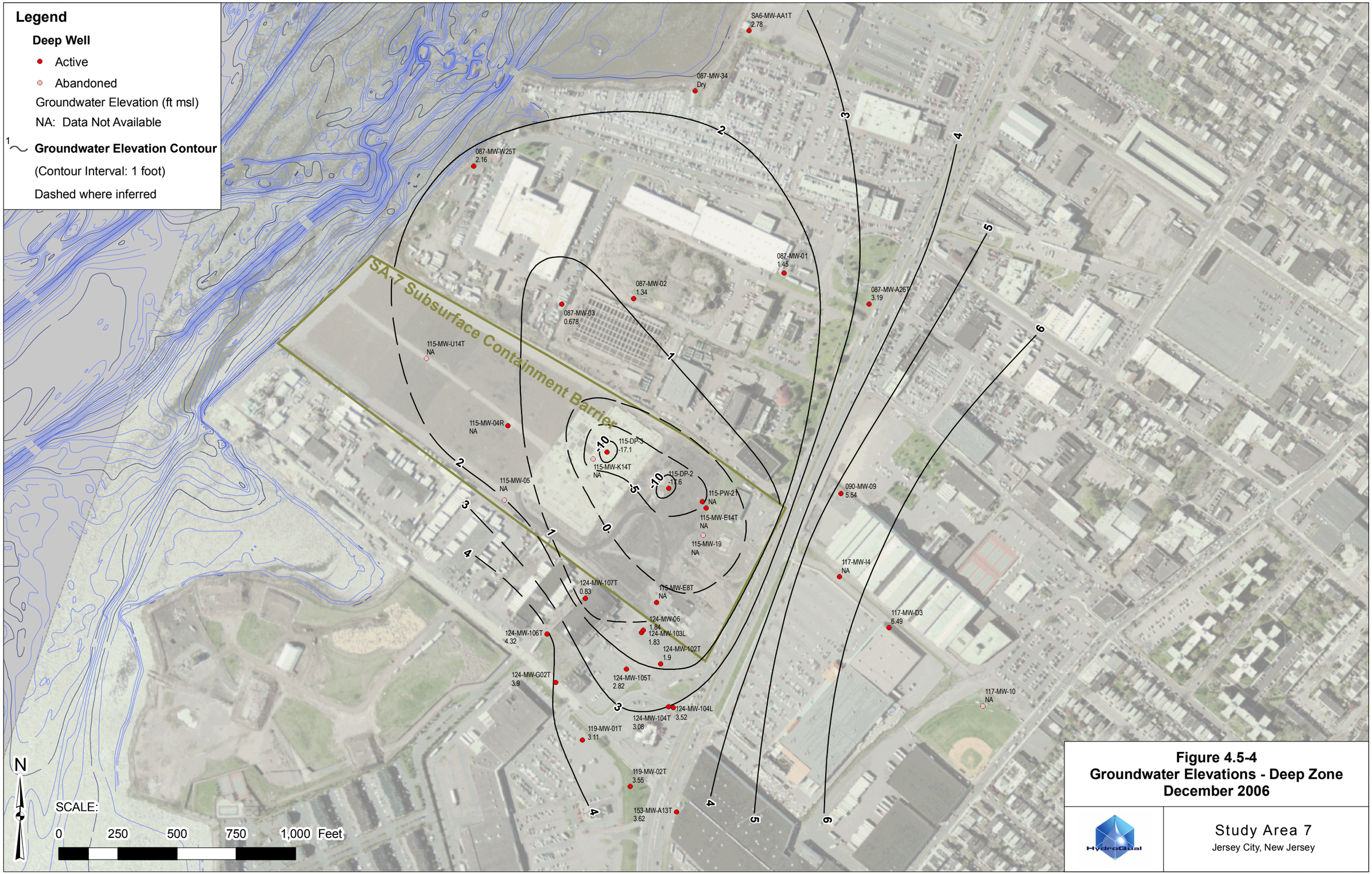


Figure 4.5-4
Groundwater Elevations - Deep Zone
December 2006

Study Area 7
Jersey City, New Jersey

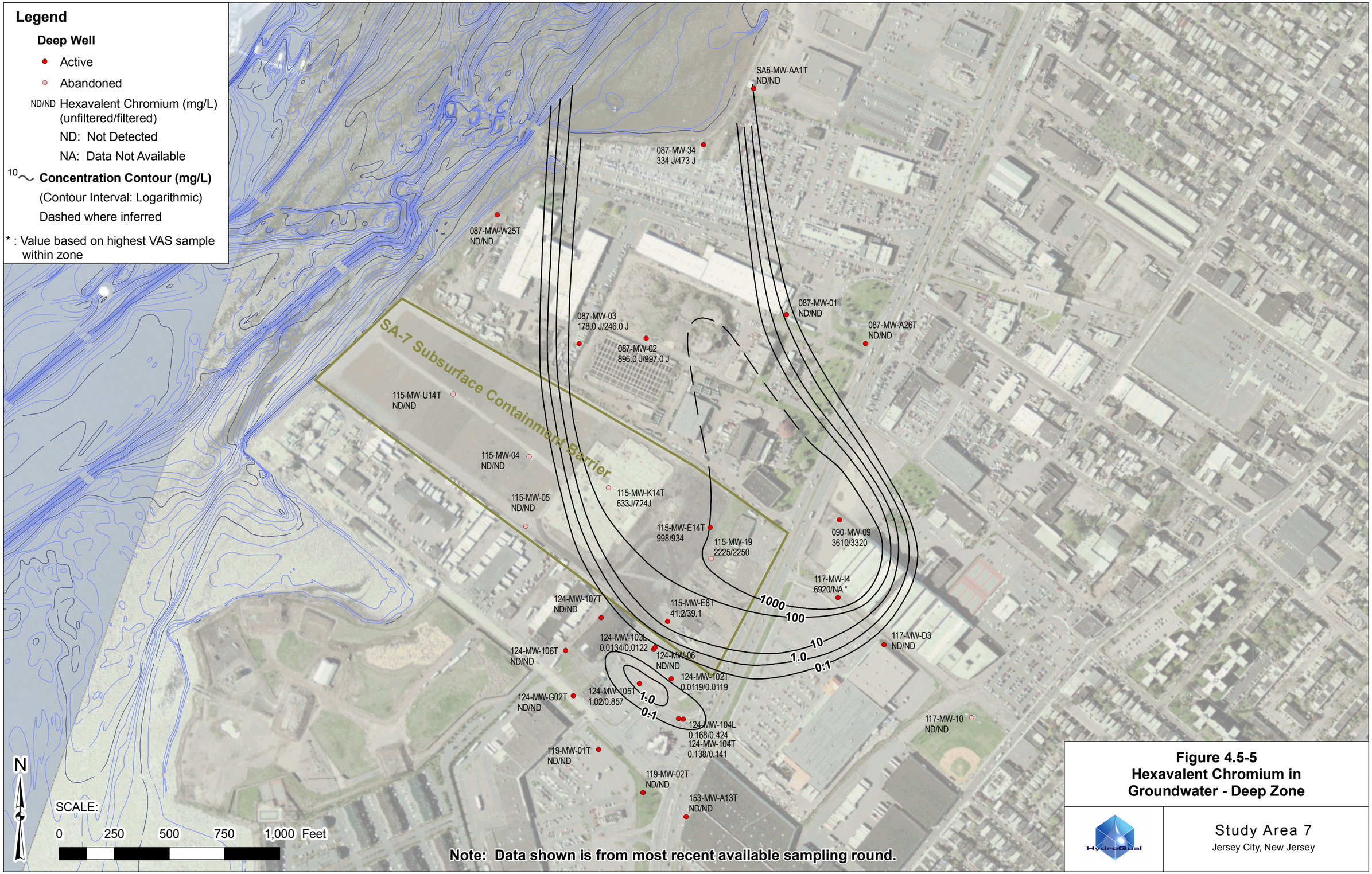


Figure 4.5-5
Hexavalent Chromium in Groundwater - Deep Zone

Study Area 7
Jersey City, New Jersey

Legend

Deep Well

- Active
- Abandoned

275/266 Total Chromium (mg/L) (unfiltered/filtered)

ND: Not Detected

NA: Data Not Available

10 **Concentration Contour (mg/L)**

(Contour Interval: Logarithmic)

Dashed where inferred

* : Value based on highest VAS sample within zone

Unfiltered total Cr Greater Than 0.07ppm

SA-7 Subsurface Containment Barrier

SA6-MW-AA1T
0.0154/0.0108

087-MW-34
275/266

087-MW-W25T
0.0151/NA

087-MW-02
171/NA

087-MW-03
67.1/NA

087-MW-01
0.666/0.498

087-MW-A26T
0.162/NA

115-MW-U14T
ND/ND

115-MW-04
0.0043/0.0016U

115-MW-05
0.0058/0.0026

115-MW-K14T
614/611

115-MW-E14T
874/941

090-MW-09
3400/3170

115-MW-19
2250/2470

117-MW-I4
7330/NA *

124-MW-107T
0.0674/0.0408

115-MW-E8T
38.9/37.7

124-MW-06
0.0816/NA

124-MW-103L
0.0105/NA

124-MW-106T
0.105/0.0766

124-MW-102T
0.0202/NA

124-MW-G02T
0.0238/NA

124-MW-105T
0.232/NA

124-MW-104L
0.251/NA

124-MW-104T
0.0197/NA

117-MW-D3
0.0112/ND

117-MW-10
0.0042/0.0021

119-MW-01T
0.137/0.0129

119-MW-02T
ND/ND

153-MW-A13T
0.0476/ND

0.1, 1, 10, 100, 1000

N

SCALE:

0 250 500 750 1,000 Feet

Note: Data shown is from most recent available sampling round.

Figure 4.5-6
Total Chromium in Groundwater - Deep Zone

HydroQual

Study Area 7
Jersey City, New Jersey

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\FIG_47-1 TOP_TILL.DWG 01/22/2007 LAYOUT: LAYOUT1

(-103.0)*
073-MW-1BR
SB-202
(-106.1)
SB-201
(-97.8)
(-102.7)
SB-215
SB-203 (-97.7)
(-84.0)
087-MW-W25
B-V13
(-92.5)
(-90.0)
115-MW-U14
SB-214 (-86.2)
SB-204
(-89.7)
B-T17
(-78.1)
(-85.1)
SB-213
(-82.4)
087-MW-03
087-MW-08
(-79.9)
115-MW-04
(-79.4)
(-79.1)
SB-205
087-MW-34
(-60.5)
SA6-MW-AA1BR
(-60.6)
(-68.4)
087-MW-02
B-N17
(-73.7)
SB-212
(-66.6)
124-MW-106
(-59.0)
(-73.6)
SB-206
087-MW-130T
(-45.4)
124-MW-G02
(-35)
124-MW-107
(-67.4)
B-H9
(-63.2)
SB-207
(-68.8)
SB-211
(-54.0)
087-MW-01
(-48.6)
119-MW-01
(-28)
(-32)
124-MW-105D
124-MW-06
(-50.2)
115-MW-E08
SB-216
(-56.4)
(-22)
119-MW-02
(-25)
124-MW-104
SB-210 (-39.2)
117-MW-D1
(-28)
117-MW-D2
(-28)
117-MW-I3
(NA)
090-MW-09
(-29.4)
090-MW-07BR
(-27.2)*
117-MW-I4
(-25)
117-MW-3BR
(-28.7)
117-MW-D3
(-27)

-100
-90
-80
-70
-60
-50
-40
-30

LEGEND

(-72) ELEVATION OF TOP OF TILL (FT., MSL)

-40 ELEVATION CONTOUR (FT., MSL) CONTOUR INTERVAL = 10' DASHED WHERE APPROXIMATE

STRUCTURAL CONTOURS WITHIN SA-7 ARE SUPPORTED BY DATA FROM 300- AND 400- SERIES BORING CONDUCTED BY MRCE

0 200 400 800
SCALE IN FEET

HydroQual
HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 4.7-1

TOP OF GLACIAL TILL/ICE-CONTACT DEPOSITS ELEVATION

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

Legend

- VAS Boring
- Soil Boring*

Hexavalent Chromium (mg/L)

ND: Not Detected

NS: Not Sampled

NA: Not Available

Note: Only data from silt and clay samples within glacial till/ice contact deposits are shown.

* : Equivalent GW concentrations calculated from soil data.

088-MW-G19

Depth (ft)	Cr $^{6+}$ (mg/L equivalent) *
65-67	ND
70-72	1349.8
75-77	2182.7
80-82	3812.6
85-87	2103.7
90-92	818.5

087-MW-034

Depth (ft)	Cr^{6+} (mg/l)
70 to 72	431.0
72 to 74	374.0
74 to 76	364.0
76 to 78	NS

087-MW-34

115-MW-K14T

Depth (ft)	Cr $^{6+}$ (mg/L equivalent) *
70-72	ND
75-77	ND
90-92	ND
95-97	1048.3

115-MW-E14D

Depth (ft)	Cr $^{6+}$ (mg/L equivalent) *
70-72	3913.1
75-77	8831.4

090-MW-09

Depth (ft)	Cr^{6+} (mg/l)
44 to 46	ND
46 to 48	ND
48 to 50	ND
50 to 52	NS
52 to 54	ND
54 to 56	ND
56 to 58	0.034
58 to 60	NS
60 to 62	1187
64 to 66	NS
72 to 74	4500
74 to 76	ND
76 to 78	3230
78 to 80	516
80 to 82	506
82 to 84	NS
84 to 86	NS
86 to 88	971
88 to 90	NS

090-MW-7BR

Depth (ft)	Cr^{6+} (mg/l)
25-27	110
30-32	NA
35-37	65
40-42	50
45-47	100
50-52	NA
55-57	325
60-62	600
70-72	>750
75-77	>750
80-82	>750
85-87	>750
90-92	>750
95-97	NA
97-99	NA
100-102	NA
102-104	NA

115-MW-19

Depth (ft)	Cr^{6+} (mg/l)
52 to 54	ND
54 to 56	ND
56 to 58	ND
58 to 60	NS
60 to 62	ND
62 to 64	ND
64 to 66	6.41
76 to 78	2640
78 to 80	3870
80 to 82	5280
82 to 84	6490
84 to 86	>750
86 to 88	>750
88 to 90	NS

115-MW-E8T

Depth (ft)	Cr $^{6+}$ (mg/L equivalent) *
85-87	725.18
88-90	ND

117-MW-I4

Depth (ft)	Cr^{6+} (mg/l)
34-36	59.3
58-60	6,920
60-62	6,580
66-68	3,820
75-77	2,390
80-82	673
85-87	605
90-92	988

Deep Overburden Plume

088-MW-G19

115-MW-K14T

115-MW-E14D

090-MW-09

115-MW-19

090-MW-7BR

117-MW-I4

115-MW-E8T

N

SCALE:

0 250 500 750 1,000 Feet

Figure 4.7-2
Hexavalent Chromium in Pore Water
Glacial Till/Ice Contact Deposits

HydroQual

Study Area 7

Jersey City, New Jersey

SECTION 5

BEDROCK HYDROGEOLOGY

5.1 REGIONAL BEDROCK GEOLOGY

Jersey City is located within the upper portion of the drainage basin for Newark Bay and lies within a glaciated section of the Triassic/Jurassic Basin. The bedrock is principally composed of Upper Triassic to Lower Jurassic age sedimentary rock, known collectively as the Newark Supergroup (Drake, Jr. et al., 1996), and was formed from sediments deposited into a northeast-southwest trending structural basin known as the Newark Basin. In New Jersey, the sedimentary rocks of the Newark Supergroup are composed of reddish-brown arkosic sandstone, mudstone, siltstone, conglomerate and dark gray argillite (Drake, Jr. et al., 1996). These sedimentary units have been intruded by igneous rock, principally diabase, in the form of sills and dikes. These intrusions now generally form ridges such as the Palisades and the Heights in Jersey City.

The Newark Supergroup has been divided into three formations on the basis of lithology. These include a lower unit identified as the Stockton Formation, a middle unit identified as the Lockatong Formation and an upper unit identified as the Brunswick Group. Regional geologic mapping by Drake et al., (1996) indicates that SA-7 is underlain by the (predominantly) arkosic and mudstone units of the Lockatong Formation and the red-brown siltstones and shales of the Passaic Formation (Figure 5.1-1). Regionally, the beds of the Newark Supergroup in the Hackensack River basin generally strike to the northeast and dip at approximately 16 degrees to the west-northwest (Anderson, 1968). A prominent set of vertical joints strikes north 45 degrees east, approximately parallel to the strike of the beds. A secondary set of nearly vertical joints strikes north 75 degrees west, subparallel to the dip of the bedding. Faults, where present, typically strike northeastward and are parallel to, or intersect, the strike of the beds at low angles.

The top of bedrock surface has been mapped by Parillo (1959) and more recently by Stone (2002). Both reports indicate that the bedrock surface is at an elevation of approximately -100 feet relative to mean sea level in the vicinity of SA-7, with a general rise to the west to an elevation of -50 feet on the opposite side of Newark Bay. The mapping by Stone infers a significant depression in the top of rock surface is present south of Kellogg Street. To assess this interpretation, bedrock well 119-MW-12BR was installed as shown on Figure 5.2-1 as further discussed below.

5.2 SITE-SPECIFIC BEDROCK GEOLOGY

The bedrock beneath the study area consists of the Passaic and Lockatong formations which are underlain by the steeply dipping diabase sill. The top of the sill was encountered during the installation of bedrock well 090-MW-18BR at a depth of 254 feet and therefore its sub-crop is calculated to be approximately 1,000 feet further east than that depicted on the regional mapping by Drake (Figure 5.1-1). A structural contour map of the upper surface near SA-7 based on data collected during this investigation is provided on Figure 5.2-1. The map indicates that the rock surface generally slopes from northeast to southwest, with its lowest elevations of approximately -130 feet (msl) located in the vicinity of Degan Oil. It is noteworthy that the depression inferred on Map I-2540-C by Stone (2002) was not confirmed during this investigation; well 119-MW-12BR encountered bedrock at an elevation of -112.7 feet which conforms to the local elevation contours. The position of the various Flute ports along with the reported groundwater elevations and hexavalent chromium results are illustrated on the bedrock geologic cross-sections on Figures 5.2-2 through 5.2-6.

5.3 HYDRAULIC CONDUCTIVITY

As discussed in Section 2.2.6, the hydraulic properties of the bedrock were assessed through an extended bedrock aquifer test by pumping well 115-MW-203 at 48 gpm for a period of 30 hours. Water levels were monitored in 18 bedrock wells and 10 overburden wells, the majority of which were instrumented with pressure transducers and data loggers. The drawdown recorded at the end of the test is shown on Figure 5.3-1 and the results are documented in the "Results of Expanded Bedrock Aquifer Test (HydroQual, January 2007) and are summarized as follows.

1. The bedrock aquifer is characterized by an upper water-bearing zone nominally comprised of the upper 30 to 40 feet of the rock.
2. Within this upper water-bearing zone, there is a belt of high conductivity rock oriented northeast/southwest along the western edge of Study Area 7 as shown on Figure 5.3-1. Well 115-MW-203BR, the pumping well for this aquifer test, lies directly within this high conductivity belt.
3. The rock within the high conductivity band is areally anisotropic. Polar analyses of directional hydraulic conductivities indicate that the areal anisotropy within the band is approximately 15.6 oriented in a north 30° east direction. The equivalent hydraulic conductivity within the belt is 35 feet per day (1.24 x 10^{-2} cm/sec). The hydraulic conductivities in the K_{MAX} and K_{MIN} directions are 140 ft/day (4.91 x 10^{-2} cm/sec) and 8.9 ft/day (3.15 x 10^{-3} cm/sec), respectively. Using a nominal aquifer thickness

of 40 feet, these hydraulic conductivities translate to an equivalent transmissivity of 10,400 gpd/ft and T_{MAX} and T_{MIN} values of 41,000 gpd/ft and 2,630 gpd/ft, respectively.

4. Transmissivities calculated by the Hsieh cross-hole method were corroborated by early-time Theis analyses. The mean value of equivalent transmissivity calculated from the early-time Theis analyses was 9,900 gpd/ft, which comports quite favorably with the value derived from the Hsieh cross-hole method.
5. The storativity of the rock in the high conductivity belt was estimated to be 8.4×10^{-5}. Using a nominal 40 foot aquifer thickness, this storativity yields a specific storage of 2.1×10^{-6} ft^{-1}.
6. Significant boundary effects were observed in all the time-drawdown data within the belt of high conductivity rock. An analysis of those boundary effects indicates that the high conductivity rock is delimited by dual and, in all likelihood, nearly parallel boundaries in relative close proximity to the pumping well. The precise position of the boundaries can only be inferred. However, the belt of high conductivity rock clearly encompasses wells 115-MW-203BR, 073-MW-1BR, 073-MW-10BR, 119-MW-2BR, 115-MW-201BR, 115-MW-215BR, and 115-MW-214BR.
7. The vertical hydraulic conductivity of the rock below the upper water-bearing zone was determined using the Neuman and Witherspoon ratio method. The hydraulic conductivity was found to be variable, but in the range of 1×10^{-5} to 1×10^{-6} cm/sec. In Water FLUTe 073-MW-1BR the vertical hydraulic conductivity declined steadily with depth from approximately 1×10^{-5} cm/sec in the rock immediately below the upper water-bearing zone to 1×10^{-6} cm/sec 150 feet below the upper water-bearing zone.
8. Cross-hole analyses of directional hydraulic conductivities between the pumping well and wells lying east of the belt of high conductivity rock indicate that the hydraulic conductivity in the likely K_{MIN} direction of this rock is 1.6 ft/day (5.63×10^{-4} cm/sec).
9. Seven overburden observation wells were manually monitored during the course of the aquifer test. None of these wells exhibited clearly discernible drawdown attributable to the aquifer test.
10. The tidal method of estimating hydraulic conductivity was evaluated as a means to gain further insight into bedrock aquifer properties and found to be of questionable reliability. The high degree of anisotropy and the complex structure of the bedrock aquifer leads to uncertainties relative to the pathways of tidal influence propagation through the aquifer.

5.4 GROUNDWATER ELEVATIONS

Figure 5.4-1 depicts the groundwater elevations within the shallow (uppermost 20 feet) Bedrock Zone. For the Flute locations, data from the uppermost port has been used in contouring and heads from the deeper ports are shown to illustrate vertical gradients within the bedrock. The contours indicate that the hydraulic gradient within the upper bedrock is generally from southeast to northwest across the study area. Elevations range from over 5 feet msl east of Route 440 to less than 2 feet along the Hackensack River. (The reported elevation of 11.68 in well 090-MW-18BR is under review as this well was recently installed.) Unlike the overburden zones, the direction of groundwater flow within the bedrock is a function of both the hydraulic gradient and the horizontal anisotropy of the bedrock, and is further influenced by the fracture belt shown on Figure 5.3-1. The net result of these factors is a principal direction of flow to the southwest along the fracture belt toward areas of regionally lower head in Upper Newark Bay. Based on the distribution of chromium in the bedrock as discussed below, there is also likely a smaller component of flow to the north toward the deep overburden groundwater discharge area.

The lowest elevation measured within the top of rock in the study area is 2.20 feet (msl) in the Flute well on Kearny Point. Based on the available data, one interpretation is that the regional gradient continues to decline beneath the river to the northwest. This would imply that even lower groundwater elevations exist beyond Kearny Point, presumably due to groundwater pumping. This is unlikely based on the anisotropy of the bedrock as discussed above which would tend to limit the propagation of drawdown in a northwest/southeast direction. Another plausible interpretation is that the elevation of 2.20 feet represents a slight mound beneath Kearny Point (mean water level in the Hackensack River is approximately elevation 1.15 feet, NGVD-29) and that a slight southeasterly gradient is present from Kearny Point back toward the Hackensack River, or more specifically, the groundwater discharge area. This is a more likely scenario, especially considering that the groundwater discharge area is a regional sink to groundwater flow in the overburden and thus a likely sink in the underlying bedrock as well. Due to the inability to install permanent monitoring wells within the river, data were not available to document the actual head in the bedrock in the groundwater discharge area. However, this interpretation is generally supported by the water quality data discussed below and the fact that the vertical gradient at Kearny Point is downward through the bedrock; indicating recharge conditions.

Vertical gradients within the bedrock have been assessed through a comparison of heads from the various sampling ports within the Flute wells. The majority of the Flute wells report increasing heads with depth, indicating upward vertical gradients from the deep rock to the top of rock. This supports a conceptual model in which a relatively permeable

top of rock zone transmits the majority of flow within the rock. Slight downward gradients were reported in the wells at Kearny Point (KP-MW-6BR) and Hovnanian (119-MW-2BR).

Figures 5.4-2 and 5.4-3 illustrate the distribution of tidal lag and tidal efficiency, respectively within the top of Bedrock Zone. Tidal lag ranges from 14 minutes near the SA-7 bulkhead (and near the fracture belt) to over 180 minutes near Route 440. Tidal efficiency ranges from 40 percent near the bulkhead to less than one percent near Route 440. The influence of the fracture belt is evident by the orientation of the contours on both maps.

5.5 GROUNDWATER QUALITY

Figure 5.5-1 illustrates the configuration of hexavalent chromium in the shallow bedrock. The limits of the plume have been defined by both land-based monitoring wells and by temporary deep river borings installed during the various phases of the bedrock investigation. To the south for example, there are eight monitoring well locations that report non-detect for hexavalent chromium including wells along Kellogg Street and on the K-Mart property. It is noteworthy that the undulating shape of the southern boundary coincides with variations in the horizontal hydraulic conductivity of the upper bedrock as determined from the preliminary aquifer testing. For example the plume is shown to have migrated the furthest south within the two most permeable zones; adjacent to and parallel to the bulkhead (aquifer test well 115-MW-203) and just east of the former building slab (aquifer test well 115-MW-216). Conversely, lower concentrations are reported in the intervening area represented by wells 115-MW-204BR and 115-MW-213BR.

To the north and east, the plume has also been defined by non-detected sample results in SA6-MW-15BR, SA6-MW-14BR, and 079-MW-13BR. The limit of the plume in the vicinity of 090-MW-18BR, which reported a hexavalent chromium concentration of 0.23 ppm, has been inferred by extrapolating the 0.1 ppm contour to the east. It is noteworthy, that the bedrock aquifer in this area is bounded by the diabase sill east of this well. To the northwest, the bedrock plume has been defined by a series of deep river borings. These data indicate that the northerly extent of the plume has been drawn towards the deep overburden groundwater discharge area as shown by the northwesterly bulge in the contours. Flow toward this area is likely due to the vertical propagation of depressed heads in the overlying deep and Intermediate Zones into the bedrock.

On the western side of the study area, the bedrock plume is largely controlled by the fracture belt that occurs parallel to the SA-7 bulkhead. A total of 14 deep river borings report non-detect concentrations for hexavalent chromium and define the western limit of the plume. To the southwest, deep river boring transects in the vicinity of Droyers Cove have been used to define the extent of the plume in this area. As shown on Figure 5.5-1, the plume migrates along the fracture belt to the southwest with concentrations declining two

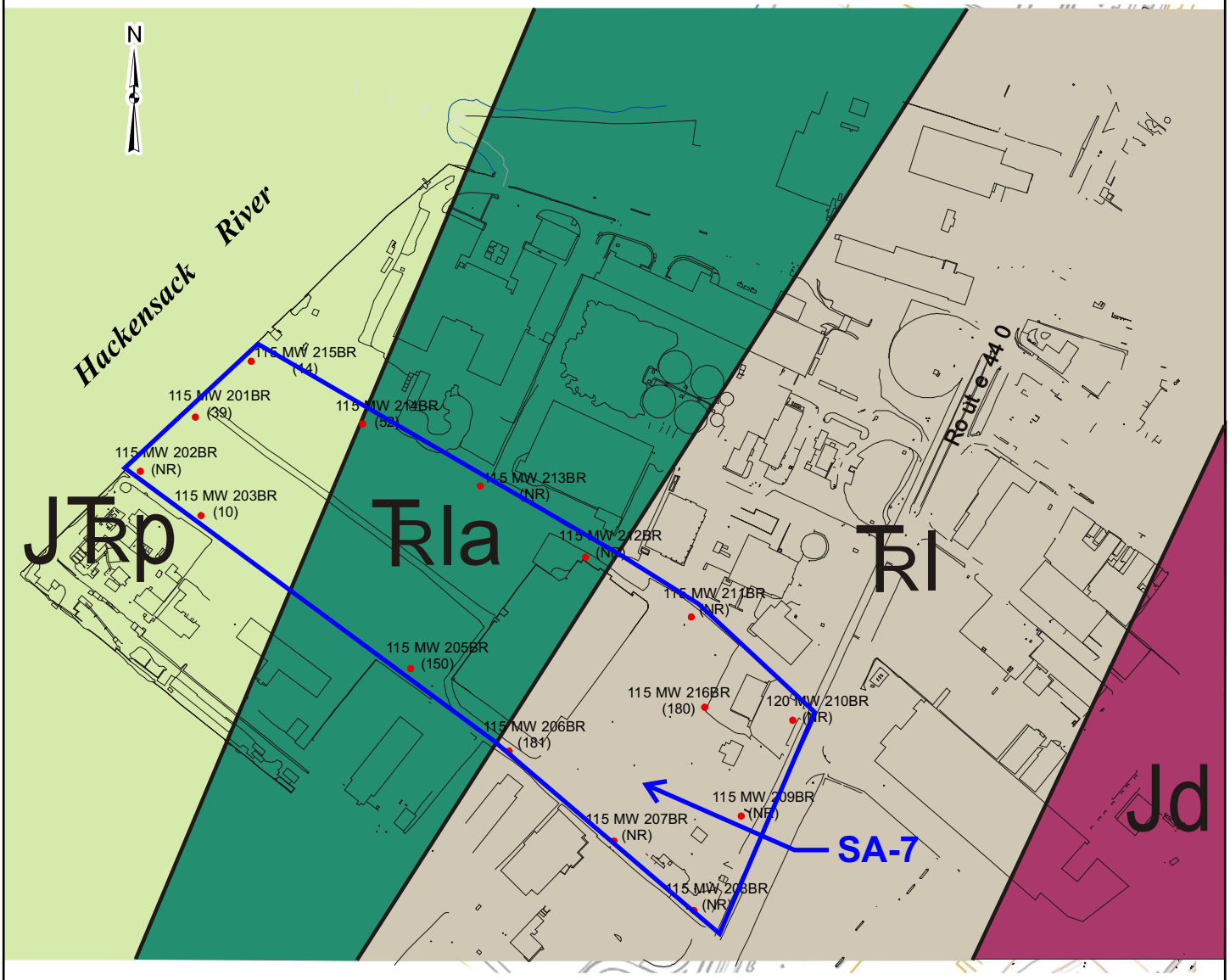
orders of magnitude from over 100 ppm in well 087-MW-14 to 1.7 ppm in DRB-023. Further delineation of the plume to the southwest was precluded by the shallow water within the "flats" along the east shore of the Hackensack River. However, based on the documented decline in concentrations noted above, the 0.1 ppm contour has been extrapolated as shown on Figure 5.5-1.

Total chromium concentrations in the bedrock are depicted on Figure 5.5-2 and indicate a similar, but somewhat larger footprint compared to the hexavalent chromium distribution for the reasons noted in Section 4.2-3. The elevated turbidity in many of the temporary deep river borings has contributed to this apparent expansion of the limits of the plume. The inferred limit of the NJGWQC (0.07 ppm) for total chromium is depicted on Figure 5.5-2. Based on these data, total chromium concentrations are expected to be well below the NJGWQC as the plume departs the study area to the south. From there, groundwater within the bedrock plume must migrate up through more than 80 feet of sediments between the top of rock and the bottom of the navigational channel in Upper Newark Bay.

The vertical distribution of chromium in the bedrock has been assessed through a review of data from the eleven Flute well installations. Of the eleven Flutes, hexavalent chromium was only detected at the following four locations; 090-MW-7BR, 073-MW-1BR, 073-MW-10BR, and SA6-MW-5BR. Of these, only three reported detectable concentrations below the top of rock zone. The three wells are 090-MW-7BR in the source area at the former Mutual Chemical Company, and 073-MW-1BR and 073-MW-10BR located within the fracture belt near Degan Oil. However, caution should be used in the assessment of data from the deeper ports as they have generally low permeability and may reflect residual contamination from well installation. For example, concentrations reported in port 3 of well 073-MW-1BR during the most recent round (August 2, 2006) were significantly lower that those reported during initial round sampled on May 18, 2005, just seven weeks after installation. By comparison, concentrations in the top of rock zone (port 1) remained relatively steady. This suggests that the plume resides in the top of Bedrock Zone and that the deeper concentrations may have been induced during drilling, reaming, and/or Flute installation. Subsequent sampling of the remaining wells is planned and the data will be further evaluated and reported in the RAA report for the bedrock.

Table 2. Hexavalent Chromium Concentration at 073-MW-1BR

SAMPLE ID	CR(VI) 7 WEEKS AFTER INSTALLTION (ppm) (Sampled May 18, 2005)	CR(VI) 70 WEEKS AFTER INSTALLTION (ppm) (Sampled August 2, 2006)
073-MW-1BR (Port 1)	44.6	37.9
073-MW-1BR (Port 2)	4.14	0.082
073-MW-1BR (Port 3)	28.7	ND
073-MW-1BR (Port 4)	0.216	ND
073-MW-1BR (Port 5)	0.122	ND



0 200 400 600

Scale in Feet

Source: Bedrock Geologic Map of Northern New Jersey, Drake, et al., 1996

LEGEND:

JTRp	Passaic Formation
TRla	Lockatong Formation Arkosic Facies
TRl	Lockatong Formation Undifferentiated
Jd	Diabase Sill

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 5.I-I

BEDROCK GEOLOGY
NEAR SA-7

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

Legend

- Deep River Boring

Bedrock Well

- Active
- Abandoned

10 **Bedrock Elevation Contour (msl)**
(Contour Interval: 10)

DRB-025 -105
DRB-026 -121
DRB-028 -113
DRB-024 -128
DRB-029 -120
DRB-027 -127
SA6-MW-15BR -64.6
SA6-MW-5BR -69.1
SA6-MW-14BR -45.8
087-MW-O29T -84
087-MW-14 -61.3
DRB-011 -118
DRB-007 -117
115-MW-215BR -108.7
DRB-002 -112
DRB-013 -126
DRB-010 -122
115-MW-201BR -116
DRB-008 -119
115-MW-214BR -116.7
115-MW-202BR -117.8
DRB-001 -125
088-MW-G19T -78.5
073-MW-1BR -116.8
115-MW-213BR -105.6
079-MW-13BR -88.4
115-MW-203BR -132.5
073-MW-10BR -122.4
115-MW-204BR -129.5
115-MW-212BR -97.1
115-MW-211BR -86.5
DRB-012 -128
DRB-016 -129
115-MW-205BR -118
DRB-015 -127.5
DRB-014 -124
115-MW-216BR -93.8
120-MW-210BR -87.1
115-MW-206BR -109.9
090-MW-7BR -95.7
140-MW-9BR -113.1
115-MW-209BR -96.5
DRB-020 -115
119-MW-2BR-1 -123.9
115-MW-207BR -108.7
DRB-019 -120
DRB-017 -123
115-MW-208BR -105.9
124-MW-8BR -115.4
DRB-018 -121
090-MW-18BR -116.5
DRB-021 -130
DRB-023 -132
119-MW-11BR -118.2
117-MW-3BR -90.1
119-MW-12BR -112.7

-110 -120 -130 -100 -90 -80 -70 -60 -50 -200

Approximate location of -200 ft. msl top of bedrock elevation contour from map I-2540 (Stone, 2002)

N

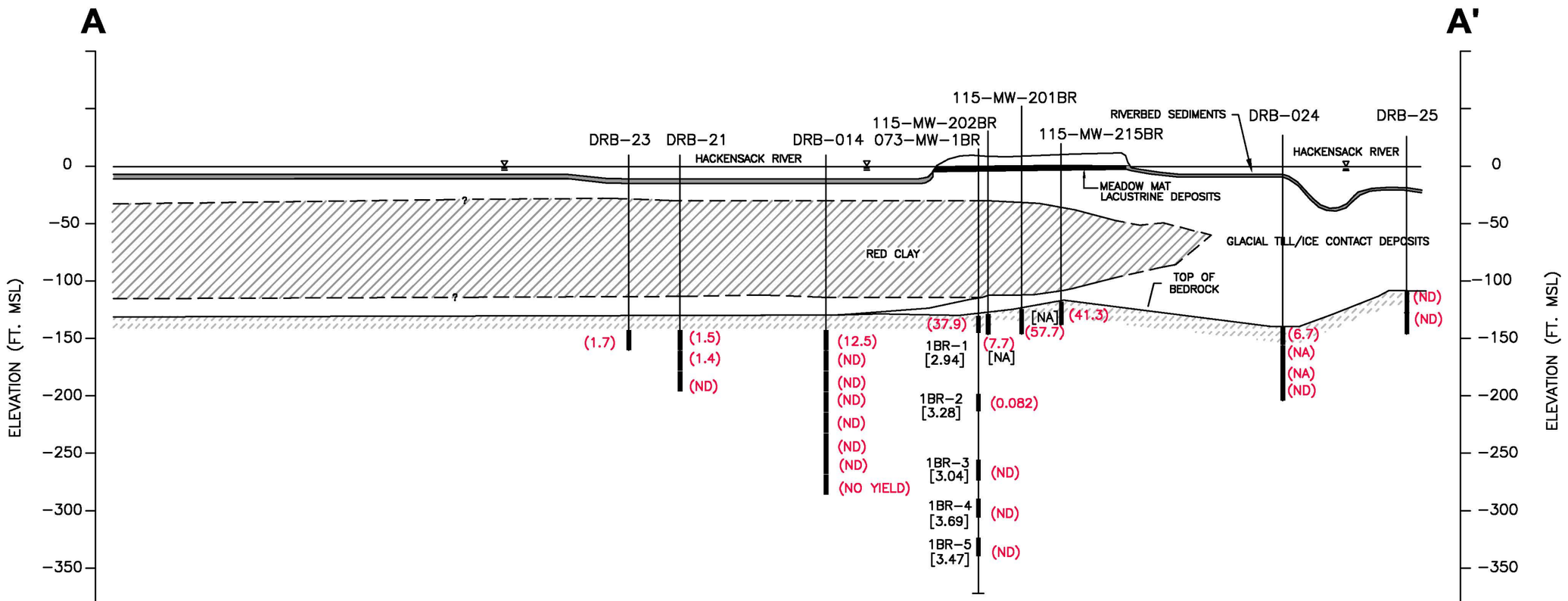
SCALE:
0 250 500 750 1,000 Feet

Figure 5.2-1
Top of Bedrock Elevation

HydroGual

Study Area 7
Jersey City, New Jersey

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\SECTIONS.DWG 01/29/2007 LAYOUT: A-A'

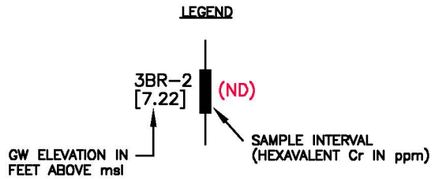


0 1000 2000
HORIZONTAL SCALE: 1"=1000'

0 100 200
VERTICAL SCALE: 1"=100'

VERTICAL EXAGGERATION = 10X

LEGEND





CROSS−SECTION LOCATION MAP

HydroQual
HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529−5151 F: 529−5728

FIGURE 5.2−2

BEDROCK GEOLOGIC CROSS−SECTION A−A'

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\SECTIONS.DWG 01/29/2007 LAYOUT: B-B'

B

B'

117–MW–3BR
117–MW–8BR

090–MW–7BR

115–MW–211BR

87–MW–029T

DRB–024

DRB–25

RIVERBED SEDIMENTS

HACKENSACK RIVER

NAVIGATIONAL CHANNEL

MEADOW MAT

LACUSTRINE DEPOSITS

GLACIAL TILL/ICE CONTACT DEPOSITS

ELEVATION (FT. MSL)

0
–50
–100
–150
–200
–250
–300
–350

[5.82] (ND)
[5.74] (ND)
[6.74] (ND)

[4.35] (446)
[3.87] (46.2)
[4.93] (6.0)

[3.82] (112)

[2.73] (76.7)

(6.7)
(NA)
(NA)
(ND)

(ND)
(ND)

0 400 800
HORIZONTAL SCALE: 1"=400'

0 50 100
VERTICAL SCALE: 1"=50'

VERTICAL EXAGGERATION = 8X

LEGEND

3BR–2
[7.22] (ND)

GW ELEVATION IN FEET ABOVE msl

SAMPLE INTERVAL (HEXAVALENT Cr IN ppm)



CROSS–SECTION LOCATION MAP

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529–5151 F: 529–5728

FIGURE 5.2–3

BEDROCK GEOLOGIC CROSS–SECTION B–B'

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

C

C'

RIVERBED SEDIMENTS

DRB–002

DRB–001
DRB–009

073–MW–10BR

140–MW–9BR

124–MW–17BR
124–MW–8BR

119–MW–16BR

ROUTE 440

117–MW–8BR
117–MW–3BR

HACKENSACK RIVER

FILL

MEADOW MAT

NAVIGATIONAL CHANNEL

LACUSTRINE DEPOSITS

RED CLAY

GLACIAL TILL/ICE CONTACT DEPOSITS

TOP OF BEDROCK

0
−50
−100
−150
−200
−250
−300
−350

ELEVATION (FT. MSL)

[NA] (ND)

[NA] (ND)

[3.30] (10.3)

[3.38] (10.8)

[3.00] (6.4)

[4.42] (1.4)

[NA] (4.6)

[3.62] (ND)

[4.08] (ND)

[4.20] (ND)

8BR
[4.43] (ND)

17BR
(ND) [4.25]

GENERALIZED BEDDING
PLANE DIP
(NORTHWEST AT 16°)

17 BR–1
[4.23] (ND)

[NA] (ND)

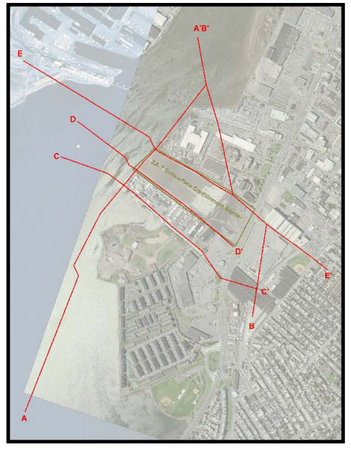
[NA] (ND)

[NA] (ND)

8BR
[5.82] (ND)

3BR–1
[5.74] (ND)

3BR–2
[6.74] (ND)



CROSS–SECTION LOCATION MAP

0 400 800
HORIZONTAL SCALE: 1"=400'

0 50 100
VERTICAL SCALE: 1"=50'

VERTICAL EXAGGERATION = 8X

LEGEND

3BR–2
[7.22] (ND)

GW ELEVATION IN FEET ABOVE msl

SAMPLE INTERVAL (HEXAVALENT Cr IN ppm)

HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529–5151 F: 529–5728

FIGURE 5.2–4

BEDROCK GEOLOGIC
CROSS–SECTION C–C'

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\SECTIONS.DWG 01/29/2007 LAYOUT: C-C''

D

D'

+50
0
−50
−100
−150
−200
−250
−300
−350
ELEVATION (FT. MSL)

HACKENSACK RIVER

DRB−013
DRB−010
DRB−008
073−MW−1BR
115−MW−203BR
115−MW−204BR
115−MW−205BR (Abandoned)
115−MW−206BR (Abandoned)
115−MW−207BR (Abandoned)
115−MW−208BR

ROUTE 440
FILL
MEADOW MAT
LACUSTRINE DEPOSITS
NAVIGATIONAL CHANNEL
RIVERBED SEDIMENTS
RED CLAY
RED CLAY
GLACIAL TILL/ ICE CONTACT DEPOSITS
APPROX. POSITION OF SUBSURFACE CONTAINMENT BARRIER
TOP OF BEDROCK

(ND) [NA] (6.28) (37.9) 1BR−1 [2.94] (11.3) [NA] (0.008) [NA] (0.20) [NA] (8.74) [NA] (0.062) [NA] (0.159)
[NA] (ND)
[NA] (ND)
(0.082) 1BR−2 [3.28]
(ND) 1BR−3 [3.04]
(ND) 1BR−4 [3.69]
(ND) 1BR−5 [3.47]

GENERALIZED BEDDING PLANE DIP (NORTHWEST AT 16°)



CROSS−SECTION LOCATION MAP

0 400 800
HORIZONTAL SCALE: 1"=400'

0 50 100
VERTICAL SCALE: 1"=50'

VERTICAL EXAGGERATION = 8X

LEGEND

3BR−2 [7.22] (ND)

GW ELEVATION IN FEET ABOVE msl

SAMPLE INTERVAL (HEXAVALENT Cr IN ppm)

HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529−5151 F: 529−5728

FIGURE 5.2−5

BEDROCK GEOLOGIC CROSS−SECTION D−D'

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\SECTIONS.DWG 01/29/2007 LAYOUT: D-D'

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GIR\CADD\SECTIONS.DWG 01/29/2007 LAYOUT: E-E'

KEARNY POINT

SA-7

ROUTE 440

E

E'

KP-MW-6BR

115-MW-215BR

115-MW-214BR

115-MW-213BR

115-MW-212BR

115-MW-211BR

DRB-011

120-MW-210BR

090-MW-7BR

90-MW-18BR

RIVERBED SEDIMENTS

HACKENSACK RIVER

NAVIGATIONAL CHANNEL

MEADOW MAT

SAND

SAND

RED CLAY

SAND

TOP OF BEDROCK

MEADOW MAT

APPROX. POSITION OF SUBSURFACE CONTAINMENT BARRIER

LACUSTRINE DEPOSITS

GLACIAL TILL/ICE CONTACT DEPOSITS

GENERALIZED BEDDING PLANE DIP (NORTHWEST AT 15°)

DIABASE SILL

ELEVATION (FT. MSL)

0
−50
−100
−150
−200
−250
−300
−350

6BR-1 [NA/2.2*] (ND)

6BR-2 [NA/2.0*] (ND)

6BR-3 [1.96] (ND)

[NA] (ND)

(41.3)

[NA] (0.775)

[NA] (0.107)

[NA] (2.13)

[3.82] (112)

[NA] (6.95)

7BR-1 [4.35] (446)

7BR-2 [3.87] (46.2)

7BR-3 [4.93] (6.0)

[NA] (0.23)

LEGEND

3BR-2 [7.22] (ND)

GW ELEVATION IN FEET ABOVE msl

SAMPLE INTERVAL (HEXAVALENT Cr IN ppm)

* VALUE IS BASED ON HISTORICALLY OBSERVED GRADIENT



CROSS-SECTION LOCATION MAP

0 500 1000
HORIZONTAL SCALE: 1"=500'

0 62.5 125
VERTICAL SCALE: 1"=62.5'

VERTICAL EXAGGERATION = 8X

FIGURE 5.2-6

BEDROCK GEOLOGIC CROSS-SECTION E-E'

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

N

KP-MW-6BR-1
ND

SA6-MW-15BR
0.43

SA6-MW-5BR-1
0.78

SA6-MW-14BR
ND

087-MW-O29T
1.71

087-MW-I30T
0.56

087-MW-14
0.59

A

B

18.99
115-MW-215BR

19.8
(See Note)
115-MW-201BR

115-MW-214BR

115-MW-202BR

18.64
073-MW-1BR-1

115-MW-203BR

20

15

10

5

1

115-MW-212BR
ND

079-MW-13BR

115-MW-211BR
0.36

073-MW-10BR
18.81

115-MW-216BR
ND

140-MW-9BR
4.14

090-MW-7BR-1
ND

119-MW-2BR-1
7.45

115-MW-207BR

124-MW-17BR
0.79

090-MW-18BR

119-MW-16BR
ND

119-MW-11BR

117-MW-8BR

117-MW-3BR-1

119-MW-12BR
ND

119-MW-4BR-1

Legend

19.11
Bedrock Well or Water Flute
Drawdown in Upper Rock at Conclusion of Aquifer Test (30 Hours)

A A
Alignment of Geologic Sections

5
Drawdown Contours in Upper Rock at Conclusion of Aquifer Test (30 Hours)

High Conductivity Belt in Upper Rock (Boundaries Approximated)

Note: 30 hour drawdown in 115-MW-201BR extrapolated from drawdown observed at 22.35 hours

SCALE:
0 250 500 750 1,000 Feet

Figure 5.3-1
Drawdown Contours in Upper Rock at Conclusion of Aquifer Test

HydroQual

Study Area 7
Jersey City, New Jersey

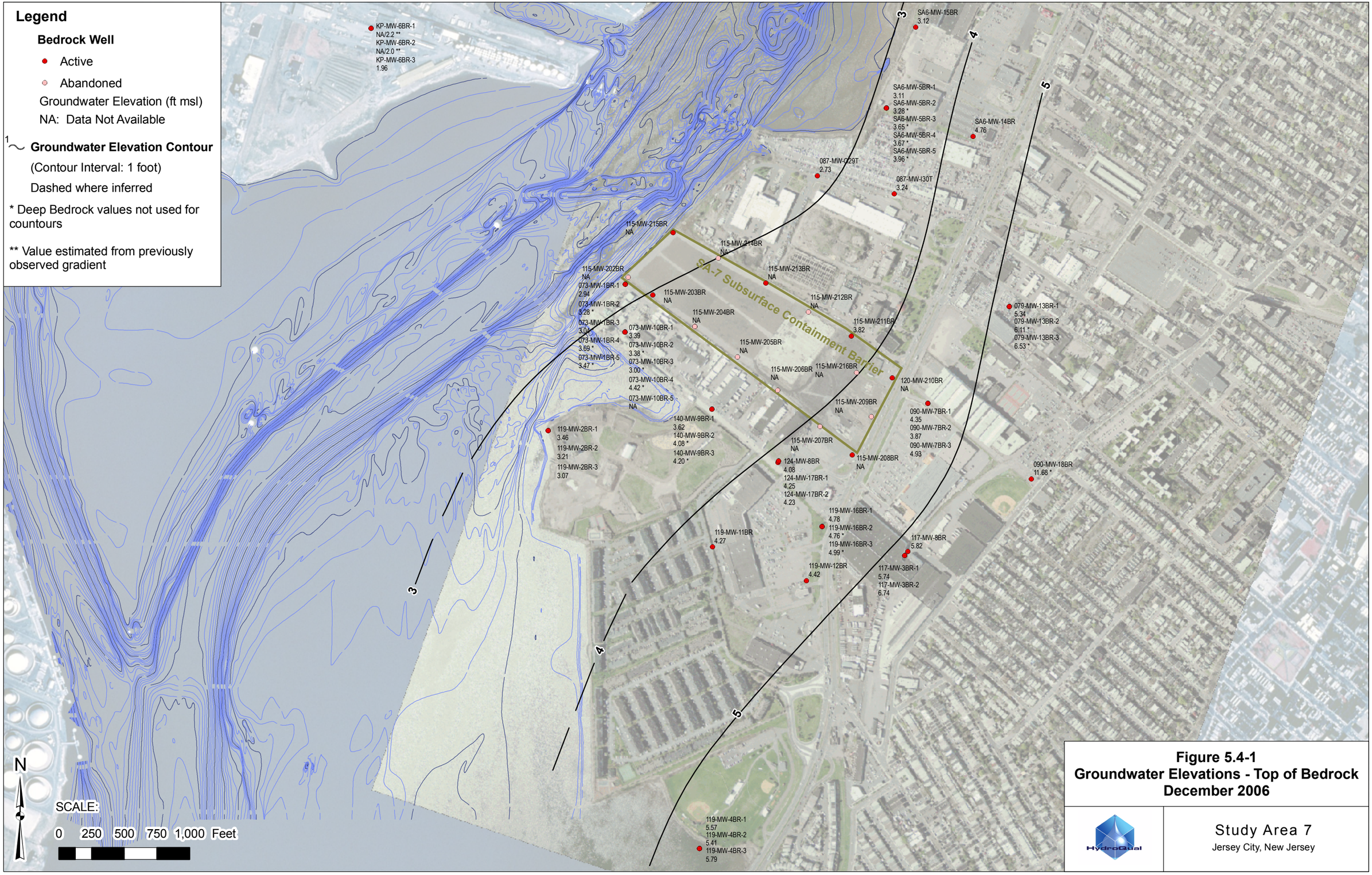
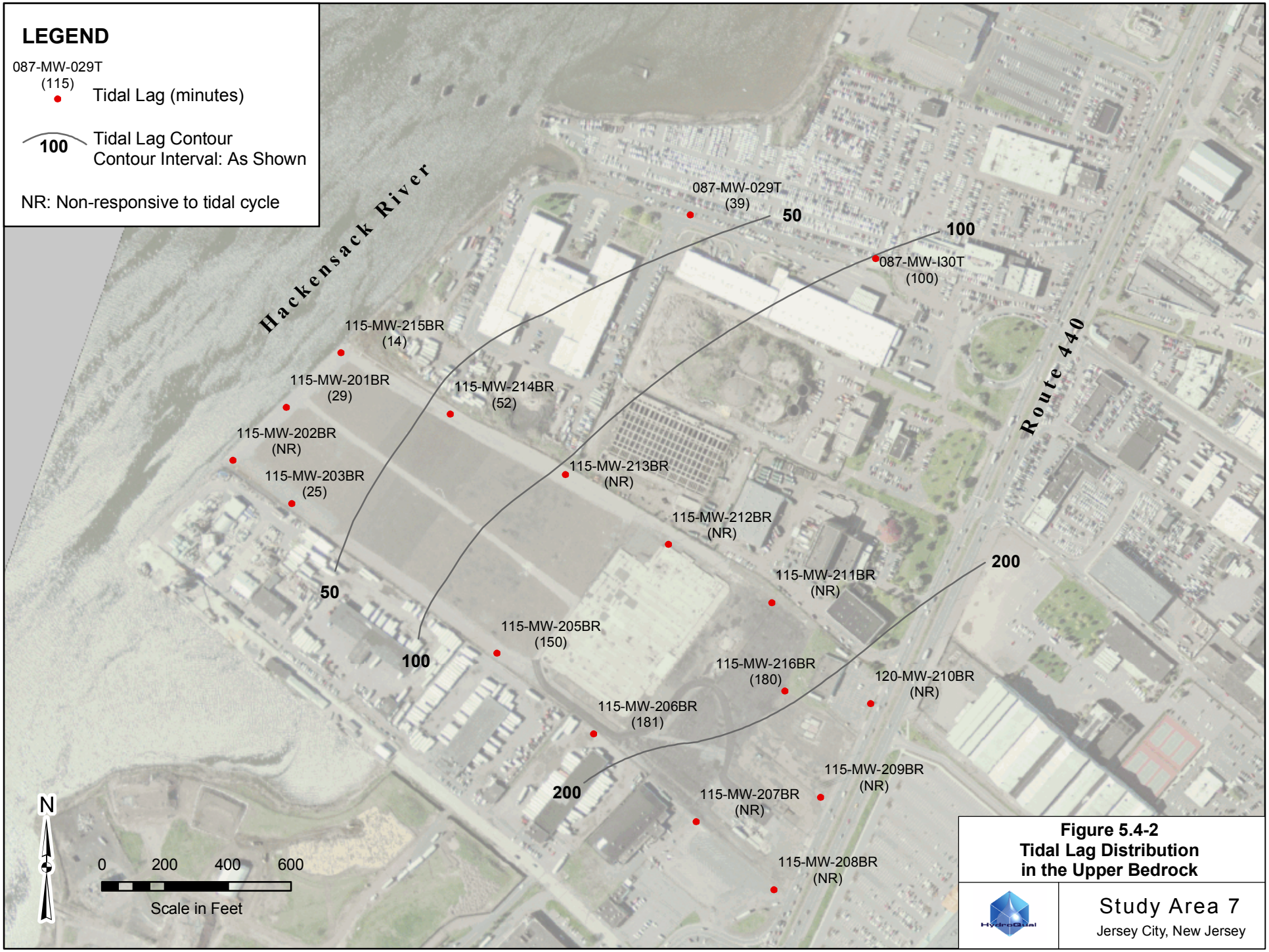
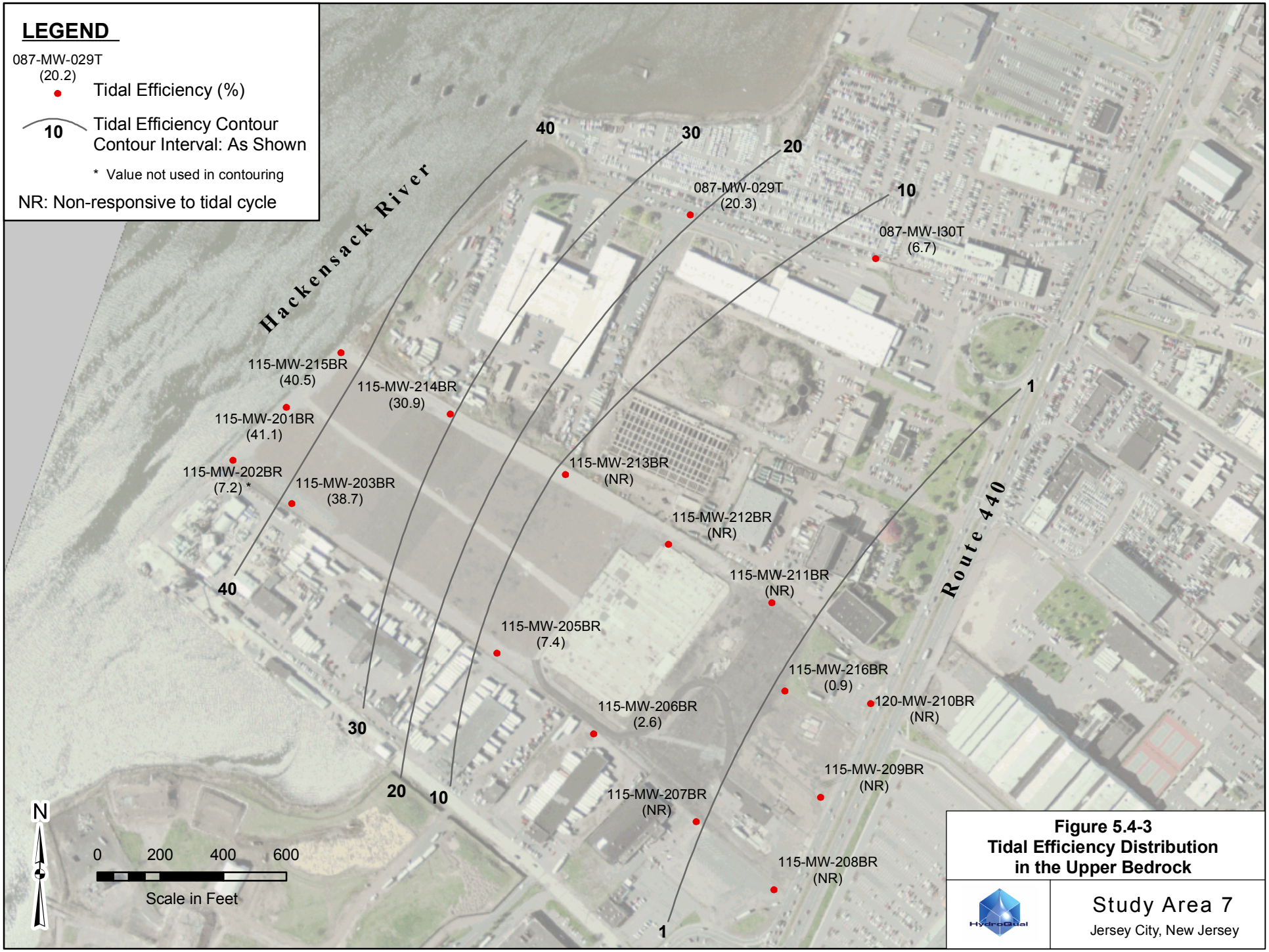


Figure 5.4-1
Groundwater Elevations - Top of Bedrock
December 2006

Study Area 7
Jersey City, New Jersey


LEGEND
087-MW-029T
(115)
Tidal Lag (minutes)
100
Tidal Lag Contour
Contour Interval: As Shown
NR: Non-responsive to tidal cycle
Hackensack River
Route 440
087-MW-029T
(39)
087-MW-I30T
(100)
115-MW-215BR
(14)
115-MW-201BR
(29)
115-MW-214BR
(52)
115-MW-202BR
(NR)
115-MW-203BR
(25)
115-MW-213BR
(NR)
115-MW-212BR
(NR)
115-MW-211BR
(NR)
115-MW-205BR
(150)
115-MW-216BR
(180)
120-MW-210BR
(NR)
115-MW-206BR
(181)
115-MW-209BR
(NR)
115-MW-207BR
(NR)
115-MW-208BR
(NR)
50
100
200
N
0
200
400
600
Scale in Feet
Figure 5.4-2
Tidal Lag Distribution
in the Upper Bedrock
Study Area 7
Jersey City, New Jersey


LEGEND
087-MW-029T
(20.2)
Tidal Efficiency (%)
10
Tidal Efficiency Contour
Contour Interval: As Shown
* Value not used in contouring
NR: Non-responsive to tidal cycle
Hackensack River
Route 440
40
30
20
10
1
087-MW-029T
(20.3)
087-MW-I30T
(6.7)
115-MW-215BR
(40.5)
115-MW-214BR
(30.9)
115-MW-201BR
(41.1)
115-MW-202BR
(7.2) *
115-MW-203BR
(38.7)
115-MW-213BR
(NR)
115-MW-212BR
(NR)
115-MW-211BR
(NR)
115-MW-205BR
(7.4)
115-MW-216BR
(0.9)
120-MW-210BR
(NR)
115-MW-206BR
(2.6)
115-MW-209BR
(NR)
115-MW-207BR
(NR)
115-MW-208BR
(NR)
N
0
200
400
600
Scale in Feet
Figure 5.4-3
Tidal Efficiency Distribution
in the Upper Bedrock
Study Area 7
Jersey City, New Jersey

Legend

- **Deep River Boring**

Bedrock Well

- Active
- Abandoned

1.4/1.4 Hexavalent Chromium (mg/L) (unfiltered/filtered)

ND: Not Detected

NA: Data Not Available

10 **Concentration Contour (mg/L)**

(Contour Interval: Logarithmic)

Dashed where inferred

SA-7 Subsurface Containment Barrier

Approximate Sub-crop of Diabase Sill

N

SCALE:

0 250 500 750 1,000 Feet

Note: Data shown is from most recent available sampling round.

Figure 5.5-1
Hexavalent Chromium in Groundwater - Bedrock Zone

Study Area 7
Jersey City, New Jersey

Legend

- Deep River Boring

Bedrock Well

- Active
- Abandoned

1.4/1.4 Total Chromium (mg/L) (unfiltered/filtered)
ND: Not Detected
NA: Data Not Available

10 **Concentration Contour (mg/L)**
(Contour Interval: Logarithmic)
Dashed where inferred

Unfiltered total Cr Greater Than 0.07ppm

SA-7 Subsurface Containment Barrier

Approximate Sub-crop of Diabase Sill

KP-MW-6BR-1 ND/ND
KP-MW-6BR-2 ND/ND
DRB-025 0.0126/ND
DRB-026 0.0483/ND
SA6-MW-15BR ND/ND
DRB-028 0.204/0.185
DRB-024 5.91/0.00591
DRB-029 1.23/ND
DRB-027 2.19/2.47
SA6-MW-5BR-1 1.01/1.65
SA6-MW-5BR-2 ND/ND
SA6-MW-5BR-3 ND/ND
SA6-MW-5BR-4 ND/ND
SA6-MW-5BR-5 ND/ND
SA6-MW-14BR ND/ND
087-MW-O29T 67.2/76.6
087-MW-I30T 56.4/60.2
087-MW-14 121/130
079-MW-13BR 0.0342/ND
DRB-011 ND/ND
DRB-007 0.0331/ND
DRB-002 0.0918/ND
DRB-013 0.0835/ND
DRB-010 ND/ND
DRB-008 6.74/6.45
DRB-009 0.182/ND
DRB-001 0.136/ND
DRB-012 0.0259/0.0168
DRB-016 0.0865/ND
DRB-015 0.705/0.644
DRB-014 11.8/11.9
115-MW-215BR 38.3/NA
115-MW-201BR 61.2/62.5
115-MW-214BR 0.734/NA
115-MW-213BR 0.144/NA
115-MW-202BR 7.65/NA
115-MW-203BR 12/11.9
115-MW-204BR
115-MW-212BR 1.96/NA
115-MW-211BR 107/102
115-MW-205BR 0.219/NA
115-MW-206BR 8.53/NA
115-MW-216BR 36.8/38.1
073-MW-1BR-1 38/32.1
073-MW-1BR-2 0.0476/0.0438
073-MW-1BR-3 0.0411/0.0382
073-MW-1BR-4 ND/ND
073-MW-1BR-5 ND/ND
073-MW-10BR-1 8.0/8
073-MW-10BR-2 7.94/7.88
073-MW-10BR-3 3.68/4.22
073-MW-10BR-4 1.34/1.38
073-MW-10BR-5 3.86/4.06
140-MW-9BR-1 ND/ND
140-MW-9BR-2 ND/ND
140-MW-9BR-3 ND/ND
115-MW-207BR 0.0689/NA
115-MW-209BR 1.77/NA
090-MW-7BR-1 440/434
090-MW-7BR-2 40.4/40.5
090-MW-7BR-3 4.56/6.43
115-MW-208BR 0.189/NA
090-MW-18BR 0.367/0.345
DRB-020 0.169 J/ND
DRB-019 0.0575/ND
DRB-017 0.069/0.0556
DRB-018 0.0459/ND
DRB-021 1.39/1.36
DRB-023 1.56/1.49
119-MW-2BR-1 ND/NA
119-MW-2BR-2 ND/ND
119-MW-2BR-3 ND/ND
124-MW-8BR 0.0599/ND
124-MW-17BR-1 12/10.9
124-MW-17BR-2 NA/NA
119-MW-16BR-1 ND/ND
119-MW-16BR-2 ND/ND
119-MW-16BR-3 ND/ND
119-MW-11BR 0.0125/ND
119-MW-12BR ND/ND
117-MW-8BR ND/ND
117-MW-3BR-1 ND/ND
117-MW-3BR-2 ND/ND
119-MW-4BR-1 ND/ND
119-MW-4BR-2 ND/ND
119-MW-4BR-3 ND/ND

N

SCALE:
0 250 500 750 1,000 Feet

Note: Data shown is from most recent available sampling round.

Figure 5.5-2
Total Chromium in Groundwater - Bedrock Zone

HydroQual

Study Area 7
Jersey City, New Jersey

SECTION 6

CONCEPTUAL MODEL OF CHROMIUM IN GROUNDWATER

This section presents a conceptual model for the occurrence, movement, and sources of chromium in groundwater throughout the study area. The data presented in Sections 3 through 5 of this report were used to develop this model and provide the rationale for the various conclusions that have been reached. This section begins with a brief discussion of the three-dimensional groundwater flow system and then addresses the three principal groundwater plumes in the Shallow Zone, the Deep Overburden Zone, and the Bedrock. The discussions are supported by the overburden geologic cross-sections shown on Figures 6.0-1 through 6.0-4.

6.1 THREE-DIMENSIONAL GROUNDWATER FLOW

The three-dimensional groundwater flow system within the study area generally follows the typical pattern associated with river discharge environments. That is, flow is horizontally toward the river, with downward vertical gradients in the uplands and upward vertical gradients near and beneath the river. In the vicinity of SA-7 this pattern has been altered to a degree by the relatively complex geology and by man-made influences such as pumping wells, sewers, and the subsurface barrier wall. For example, prior to the barrier wall construction and dewatering operations, groundwater flow in the Deep Zone was re-directed to the north due to the combined presence of the highly permeable S-3 Sand, the Red Clay, and the depression in Hackensack riverbed surface north of the site. Man-made influences such as the sewers beneath Route 440, serve as a local point of discharge for shallow groundwater, resulting in a local reversal of flow. In the Intermediate Zone, the subsurface barrier wall has redirected flow around the wall, whereas in the Deep Zone, the dewatering system has caused groundwater flow to be inward, toward the pumping wells beneath the eastern portion of SA-7. In the bedrock, the upper 20 to 40 feet of the rock is vertically the most prolific flow zone with the fracture belt located along the SA-7 bulkhead controlling the horizontal direction of flow.

Vertically, groundwater flow in the eastern portion of the study area is downward, from the Shallow Zone to the top of bedrock, whereas near the River, flow is upward. This is illustrated on the following table that compares vertical gradients on the Home Depot property with those near the Hackensack River by Hudson Mall.

Table 3. Vertical Hydraulic Gradients

Zone	Home Depot Property		Hudson Mall Property	
	Head (ft., msl)	**Source of Data**	**Head (ft., msl)**	**Source of Data**
Shallow	8.0	Fig 4.2-1 contours	2.82	SA6-MW-AA1
Intermediate	6.34	090-MW-07	2.01	SA6-MW-AAD
Deep	5.5	Fig 4.5-4 contours	2.78	SA6-MW-AAT
Top of Rock	4.35	090-MW-7BR-1	3.11	SA6-MW-5BR-1
Bedrock port 2	3.87	090-MW-7BR-2	3.28	SA6-MW-5BR-2
Bedrock port 3	4.93	090-MW-7BR-3	3.65	SA6-MW-5BR-3
Bedrock port 4			3.67	SA6-MW-5BR-4
Bedrock port 5			3.96	SA6-MW-5BR-5

6.2 COPR-RELATED SOURCES OF CHROMIUM IN GROUNDWATER

The source of chromium in the shallow plume within the study area is principally groundwater in direct contact with COPR and COPR-impacted soil. Furthermore, data collected during this investigation has shown that the shallow plume is separate and distinct from the deep plume. This conclusion is supported by several lines of evidence as follows.

- The horizontal footprint of hexavalent chromium in the Shallow Zone is nearly identical to the known extent of COPR in fill. The lack of mobility of hexavalent chromium beyond COPR-impacted soils is due to the general reducing environment in the fill material created by the underlying meadow mat and has been documented at numerous COPR sites in Hudson County.
- The vertical separation between the shallow and deep overburden plumes is demonstrated by the general lack of detectable chromium in the Intermediate Zone beneath SA-7. As shown on Figure 6.0-1 and 6.0-3, samples collected from the Intermediate Zone directly beneath the meadow mat on SA-7 were not impacted by the overlying COPR despite strong downward vertical hydraulic gradients. This is due to the reductive properties of the meadow mat (i.e., its ability to effectively

convert hexavalent chromium to trivalent chromium) and its low vertical permeability. With respect to the plume diversion area, the Intermediate Zone was again shown to be clean below the meadow mat. Wells 124-MW-102D through 124-MW-104D, for example, are screened between the overlying COPR and the underlying deep plume and did not contain hexavalent chromium (Figure 6.0-2).

- Concentrations of hexavalent chromium in the shallow plume are significantly lower than that in the deep overburden plume (Figure 6.0-3). Both maximum concentrations (123 ppm in the COPR v. 6,920 ppm in the deep plume) and geometric mean concentrations (14 ppm in the COPR v. 751 ppm in the deep plume), differ by a factor of more than fifty.
- A comparison of major ion ratios (Appendix D-1) reveals that with one exception (see discussion in subsequent bullet), a clear separation is evident between groundwater quality in the shallow and deep plumes. For example, a plot of the ratio of calcium to magnesium versus hexavalent chromium, reveals that each of the Shallow Zone samples plot above the 6.5 g/g line, whereas the deeper groundwater samples plot below this line. Since COPR is dominated by high calcium content, many calcium-containing mineral phases are formed during the elevated temperature, high-lime chromate extraction process. The subsequent leaching of calcium from COPR material in groundwater appears to enrich the surrounding pore water with calcium relative to magnesium.
- The vast majority of the shallow plume is underlain by meadow mat, including all of SA-7, SA-6 north and SA6-south. Information obtained from a review of boring logs and from observations made during the excavation of COPR from the east cell documents the presence of a nearly continuous and uniform meadow mat surface.
- With one exception, the few areas in which COPR is not underlain by the meadow mat exhibit minimal impacts to water quality in the Intermediate Zone. This is illustrated at the 117-MW-I1 location on Figures 6.0-2 and 6.0-4 in which chromium was not detected in the Intermediate Zone below the COPR. The one exception is the hexavalent chromium detected in the adjacent wells 117-MW-I2, 117-MW-I3, and 117-MW-I5. The major ion analysis provided in Appendix D-1 indicates that the water quality in the Intermediate Zone contains elevated pH and a calcium/magnesium ratio over 6.5 g/g. This indicates that the Intermediate Zone is currently being impacted by vertical migration of groundwater through the overlying COPR-like material. However, the lines of evidence provided in Section 6.3 below suggests that historically, process-related sources were also present at this location.

6.3 PROCESS-RELATED SOURCES OF CHROMIUM IN GROUNDWATER

In contrast to the COPR-related sources of the shallow plume, the deep overburden plume was likely caused by historic releases of chromate solutions from the various processes at the former Mutual Chemical Company production plant. This conclusion is supported by the following lines of evidence.

- Based on the historical information provided in Section 3, the most likely location of process-related discharges is in the vicinity of Building F, in the northwest corner of the former plant, where the "wet" operations took place. Operations in this area included the quenching of roasted ore in movable railcar boxes equipped with false bottoms. Initial quenching was done with a "weak yellow liquor" which consisted of recycled sodium chromate from prior operations, and then with hot process water. Considering the nature of house-keeping practices at industrial operations in the early 1900's, a liquid-based operation such as this was likely to have resulted in various discharges to the adjacent soils. Although the specific mechanism of such discharges is not known, it is all but inevitable that such discharges would have occurred during the 1905 to 1954 timeframe.

- Discharges of process-related liquids from the former Mutual Chemical plant would have likely included sodium chromate and would have been red or yellow in color, depending on the amount of chromium in solution. The material safety data sheet (MSDS) for sodium chromate, lists its solubility as "substantial" and its density as 2.71. Therefore, once in the soil, the sodium chromate liquid would have been quick to solubilize into the underlying groundwater and move vertically downward with the natural gradients. If sufficient volume were released, the rate of downward migration may have been enhanced both through increased vertical gradients (i.e. mounding), and through density-dependant flow.

- The vertical profile of hexavalent concentrations in pore water adjacent to the wet operations area supports the conceptual model of process-related discharges as put forth above. Figure 6.3-1 illustrates the geology and pore water quality from borings 090-MW-07, 117-MW-I4, and 090-MW-07BR located within close proximity to one another and to the quenching operations. These data indicate that hexavalent chromium is present throughout the entire vertical column from the Shallow Zone to the top of bedrock. Concentrations range from a low of 1.5 ppm to a high of 6,920 ppm. This is the only location within the study area in which such a vertical continuum has been identified. The soil descriptions indicate that the stratigraphy is quite variable over short distances such that

density dependant flow would have likely taken a circuitous path through the overburden on its way from the surface to the top of rock.

- The highest concentrations noted in these borings are at a depth of approximately 65 feet and in contact with the S-3 Sand. The fact that the maximum concentrations were detected in the adjacent silt and clay, rather than in the sand, is likely due to dilution within the more permeable sand. The inverted vertical profile shown on Figure 6.3-1 (i.e. concentrations increasing with depth) is not consistent with a COPR-related, top-down source. Rather, this profile likely reflects the remnants of an historic release of dense, highly concentrated sodium chromate liquid that moved vertically downward though the soil and now principally resides in the low permeability layers. Based on this scenario, it is likely that historic concentrations within the S-3 Sand and throughout the deep plume were significantly higher that those observed today.

The fact that the Shallow and Intermediate Zones in this source area continue to exhibit hexavalent chromium in concentrations in excess of 10 ppm, indicates that residue from past housekeeping practices may still be present in the subsurface. Although a relatively thin layer of COPR-like material was identified in boring 117-MW-I4, it is unlikely, based on the observed impact of similar deposits of COPR in the study area, that this small volume could be solely responsible for the persistence of these elevated concentrations decades after plant operations have ceased. It is more likely that some form of solid-phase residual of the sodium chromate discharges is present within the fill and/or underlying lacustrine deposits.

Similar mechanisms for chromium persistence in groundwater have been suggested at other highly-contaminated sites such as the U.S. Department of Energy (DOE) Hanford Site in southeastern WA (Zachara et al. 2004), and the chrome plating facility at United Chrome Products Corvallis, OR (Palmer and Wittbrodt 1991). For example, Palmer and Wittbrodt (1990) identified $PbCrO_4$(s) (crocite), $PbCrO_4 \cdot H_2O$ (iranite) and K_2CrO_4(s) (tarapacite) in sludge at the United Chrome site and $CaCrO_4$(s) was found at a seepage face in a drainage ditch where there was high evaporation. Utilizing a combination of equilibrium modeling, groundwater flow modeling, monitoring data, and soil leaching studies, Palmer and Wittbrodt (1991) concluded that most of the contaminated groundwater at the site was at equilibrium with $BaCrO_4$ (hashemite). Chromate has also been found to form solid phases with Fe(III). For example, Baron and his co-workers identified $KFe_3(CrO_4)_2(OH)_6$(s) (Baron et al. 1996) and $KFe(CrO_4)_2 \cdot 2H_2O$ (Baron and Palmer 1998) at the United Chrome site. The counter-ions (K^+, Fe^{3+}) contained in these solid phases may come from other mineral phases present in the soil, or from byproducts of the manufacturing process itself. Although conditions at these other sites may differ from that in the SA-7 study area, this

review of the literature supports the possibility that solid-phase chromium minerals may be present.

As part of Honeywell's ACO-driven activities at adjacent sites, a leaching study has been undertaken to further assess the potential for such material to exist in the subsurface. The leaching study follows ASTM-D 4874-95 and is currently underway with the testing of soil from five different horizons as shown on Figure 6.3-1. The study includes the identification of minerals in the soil using x-ray diffraction.

6.4 SOURCES OF CHROMIUM IN BEDROCK GROUNDWATER

The source of the bedrock plume is the vertical migration of chromium through the overlying soils. This conclusion is supported by several lines of evidence as follows.

- VAS borings in the source area, such as 117-MW-I4, have documented elevated levels of hexavalent chromium throughout the vertical soil profile down to the top of bedrock. This suggests that historic process-related discharges made their way directly from the surface to the bedrock in this area. This is further evidenced by the concentrations in the co-located Flute well 090-MW-7BR in which hexavalent chromium concentrations in the top of bedrock are over 400 ppm and extend to a depth of 120 feet below the top of rock at 6 ppm.

- VAS borings downgradient of the source area also document elevated levels of hexavalent chromium in the Glacial Till/Ice Contact deposits between the S-3 sand and the top of bedrock. These data are shown on Figure 4.7-2 and range from over 100 ppm near the River to several thousand ppm beneath SA-7. These data suggest that chromium within the deep overburden plume has moved vertically downward into the bedrock from the S-3 Sand.
- The highest concentrations within the bedrock plume (i.e. the 100 ppm contour) directly underlie the footprint of the deep plume. This is illustrated on Figure 6.4-1 in which the outline of the deep plume, including the Intermediate plume out in the river) has been superimposed over the hexavalent concentration contours from the bedrock plume. The nearly identical match supports the conclusion that vertical migration from the deep plume is the source of the bedrock plume.
- The existence of a bedrock injection well on the former Mutual Chemical property has also been considered. However, the only evidence of a well is the

notation on the 1898 Sanborn map of a "well house" in the central portion of the plant. Despite a concerted effort to find such a well during demolition of the site, no such well was found. Although the presence of a bedrock injection well alone cannot be ruled out, its presence would not materially impact the other conclusions or lines of evidence provided above. For example, the injection of sodium chromate into a deep well would not account for the vertical soil profile noted in 117-MW-I4.

NORTHWEST

A

SOUTHWEST

A'

ELEVATION (ft., msl)

HACKENSACK RIVER

PW–002–12H
PW–002–10H
PW–009–750
PW–009–450
PW–009–50
87–MW–34
87–MW–029
87–MW–029D
87–MW–029T
88–MW–G19
88–MW–15
088–MW–G19T
115–MW–19*
115–MW–E14D
115–MW–E14T
115–PW–21*
117–MW–I4
117–MW–I3
ROUTE 440
117–MW–I5
117–MW–D3
90–MW–07BR
90–MW–07
117–MW–11*
117–MW–10*

0

−50

−100

SOFT, ORGANIC RIVERBED MUD

MEADOW MAT FILL

COPR

COPR–LIKE FILL

S–2 SAND

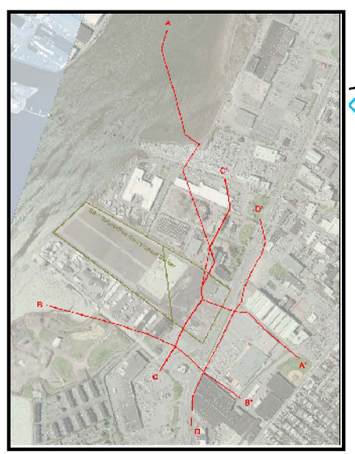
S–3 SAND

GLACIAL TILL/ICE CONTACT LACUSTRINE

BEDROCK

(ND)
(34.6)
(43)
(161)
(5.6)
(39)
(0.77)
(319)
(998)
(2225)
(218)
(334)
(449)
(76.7)
(446)

APPROXIMATE POSITION OF SUBSURFACE CONTAINMENT BARRIER



CROSS–SECTION LOCATION MAP

LEGEND:

- NOT SAMPLED
- LESS THAN 0.1
- 0.1 TO 1.0
- 1 TO 100
- 100 TO 1000
- GREATER THAN 1000
- * ABANDONED

0 400 800
HORIZONTAL SCALE: 1"=400'

0 33.33 66.66
VERTICAL SCALE: 1"=33.33'

VERTICAL EXAGGERATION = 8X

SEAL:

Gary J. DiPippo, P.E. DATE:
NY P.E. LICENSE NO. 065864–1

DATE: 01/15/2008
SCALE: AS SHOWN
CAD FILE NO.:
DESIGNED BY: XX
DRAWN BY: XX
CHECKED BY: XX

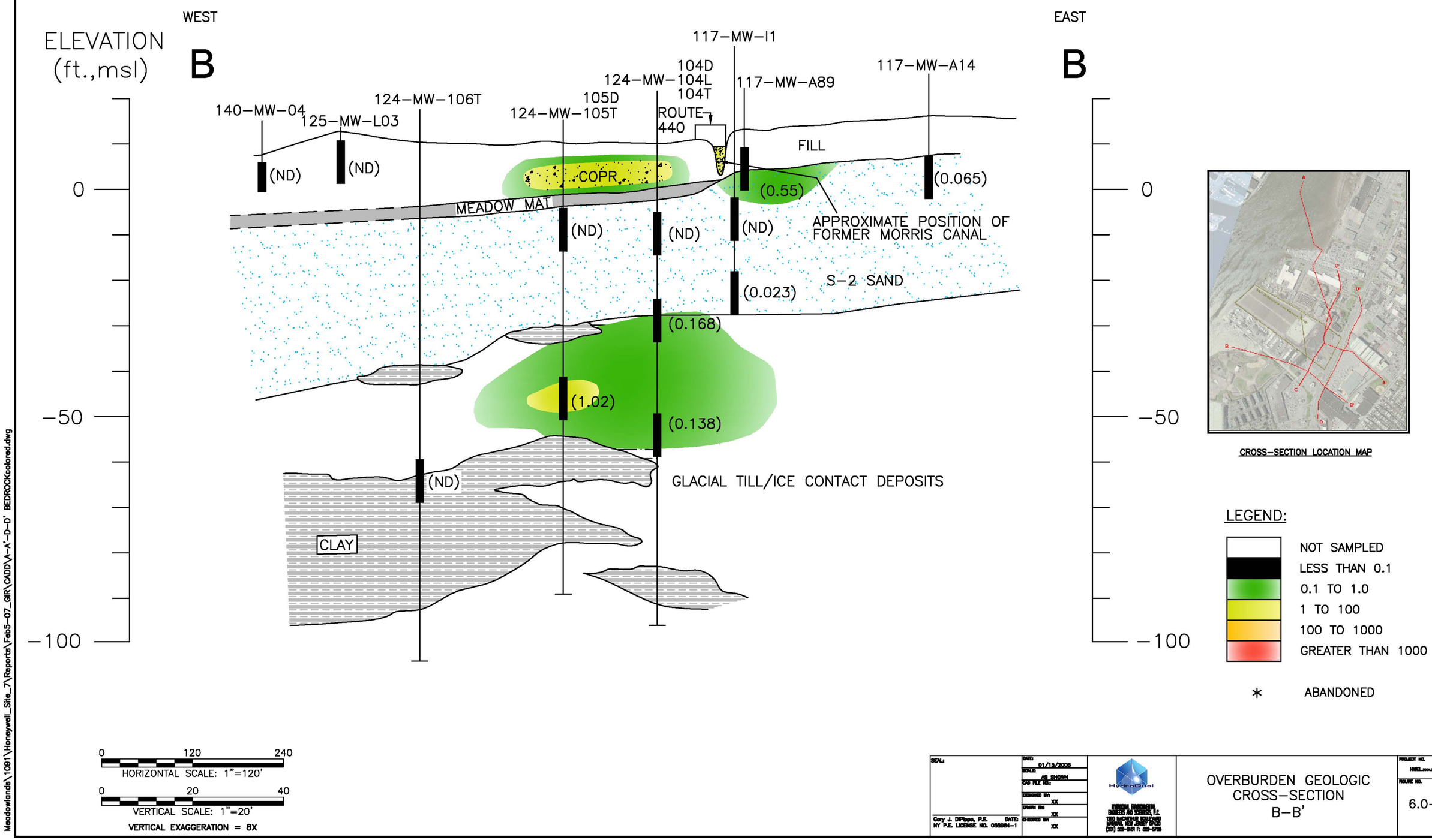
HydroGeoLogic, INCORPORATED
ENGINEERS AND SCIENTISTS, P.A.
1300 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529–5959 F: 529–5728

OVERBURDEN GEOLOGIC CROSS–SECTION A–A'

PROJECT NO.: HWEL.XXX.XXX.XX

FIGURE NO.: 6.0–1

Meadowlands\1091\Honeywell_Site_7\Reports\Feb5–07_GIR\CADD\A–A'–D–D' BEDROCKcolored.dwg



Meadowlands\1091\Honeywell_Site_7\Reports\Feb5-07_GIR\CADD\A-A'-D-D' BEDROCKcolored.dwg

SEAL:

Gary J. DiPippo, P.E. DATE:
NY P.E. LICENSE NO. 055964-1

DATE: 01/15/2006
SCALE: AS SHOWN
CAD FILE NO.:
DESIGNED BY: XX
DRAWN BY: XX
CHECKED BY: XX

HydroQual
HYDROQUAL ENVIRONMENTAL ENGINEERS AND SCIENTISTS, P.C.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

OVERBURDEN GEOLOGIC CROSS-SECTION B-B'

PROJECT NO. HWEL.XXXX.XXX.XX
FIGURE NO. 6.0-2

SOUTH

C

NORTH

C'

ELEVATION (ft.,msl)

0

−50

−100

124−MW−105D
124−MW−105T
114−MW−103D
124−MW−103L
124−MW−06
115−MW−E8
115−MW−E8T
115−MW−19*
115−PW−21
115−MW−E14
115−MW−E14D
115−E14T
88−MW−102
88−MW−G19
88−MW−15
88−MW−G19T
87−MW−01
87−MW−I30
87−MW−I30T
87−MW−I30
119−MW−01T

COPR
COPR
SOIL AND COPR MIX
FILL
MEADOW MAT
S−2 SAND
S−3 SAND
CLAY
GLACIAL TILL/ICE CONTACT DEPOSITS
BEDROCK

(ND)
(14.8)
(5.6)
(ND)
(ND)
(0.01)
(ND)
(ND)
(ND)
(0.0134)
(ND)
(1.02)
(998)
(319)
(41.2)
(ND)
(449)
(60.2)

APPROXIMATE POSITION OF SUBSURFACE CONTAINMENT BARRIER

LEGEND:

- NOT SAMPLED
- LESS THAN 0.1
- 0.1 TO 1.0
- 1 TO 100
- 100 TO 1000
- GREATER THAN 1000

* ABANDONED



CROSS−SECTION LOCATION MAP

0 120 240
HORIZONTAL SCALE: 1"=120'

0 20 40
VERTICAL SCALE: 1"=20'

VERTICAL EXAGGERATION = 8X

SEAL:
Gary J. DiPippo, P.E. DATE:
NY P.E. LICENSE NO. 055964−1

DATE: 01/15/2008
SCALE: AS SHOWN
DSD FILE NO.:
DESIGNED BY: XX
DRAWN BY: XX
CHECKED BY: XX

Honeywell

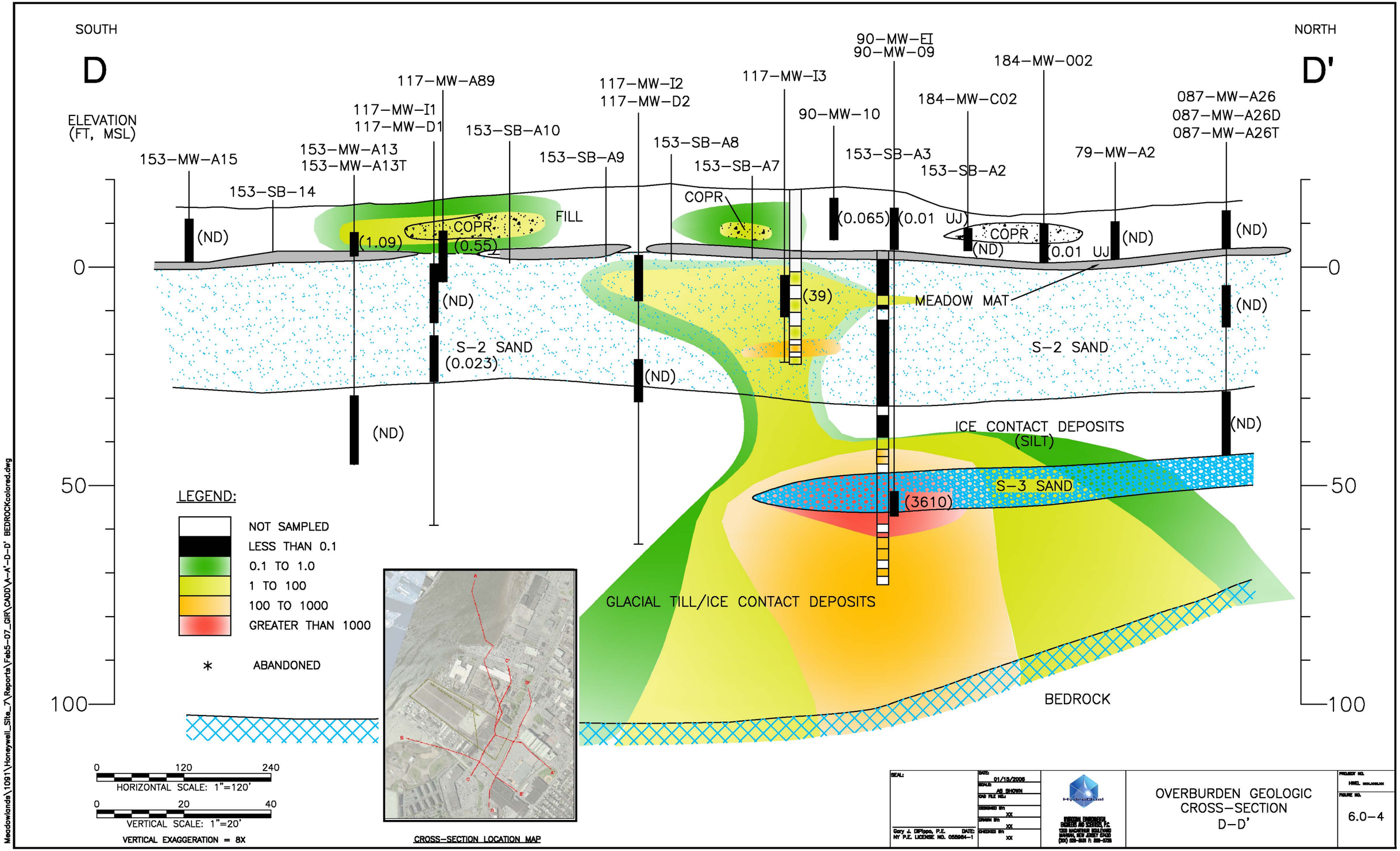
HONEYWELL ENGINEERING SERVICES, P.C.
1349 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529−5151 F: 529−5728

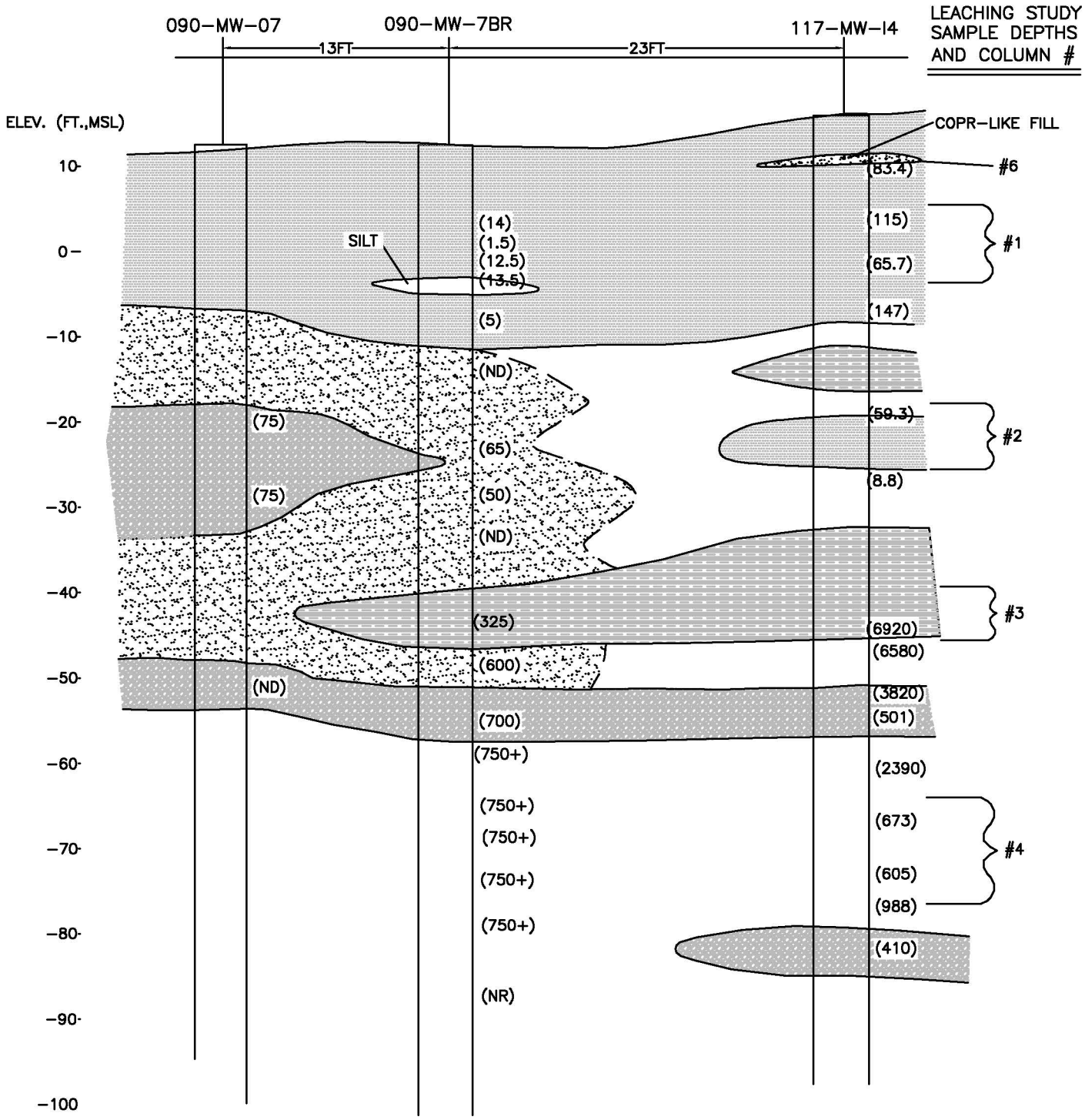
OVERBURDEN GEOLOGIC CROSS−SECTION C−C'

PROJECT NO.
HWEI_MEADOWLANDS

FIGURE NO.
6.0−3

Meadowlands\1091\Honeywell_Site_7\Reports\Feb5−07_GIR\CADD\A−A'−D−D' BEDROCKcolored.dwg


SOUTH
D
NORTH
D'
ELEVATION (FT, MSL)
0
50
100
153-MW-A15
153-SB-14
153-MW-A13
153-MW-A13T
117-MW-I1
117-MW-D1
117-MW-A89
153-SB-A10
153-SB-A9
117-MW-I2
117-MW-D2
153-SB-A8
153-SB-A7
117-MW-I3
90-MW-10
90-MW-EI
90-MW-09
153-SB-A3
184-MW-C02
153-SB-A2
184-MW-002
79-MW-A2
087-MW-A26
087-MW-A26D
087-MW-A26T
(ND)
(1.09)
COPR
(0.55)
FILL
COPR
(0.065)
(0.01 UJ)
COPR
(ND)
(0.01 UJ
(ND)
(ND)
(ND)
(39)
MEADOW MAT
(ND)
S-2 SAND
(0.023)
(ND)
S-2 SAND
(ND)
(ND)
ICE CONTACT DEPOSITS
(SILT)
S-3 SAND
(3610)
GLACIAL TILL/ICE CONTACT DEPOSITS
BEDROCK
LEGEND:
NOT SAMPLED
LESS THAN 0.1
0.1 TO 1.0
1 TO 100
100 TO 1000
GREATER THAN 1000
* ABANDONED
0 120 240
HORIZONTAL SCALE: 1"=120'
0 20 40
VERTICAL SCALE: 1"=20'
VERTICAL EXAGGERATION = 8X
CROSS-SECTION LOCATION MAP
SEAL:
Gary J. DiPippo, P.E. DATE:
NY P.E. LICENSE NO. 055984-1
DATE: 01/15/2005
SCALE: AS SHOWN
CAD FILE NO.:
DESIGNED BY: XX
DRAWN BY: XX
CHECKED BY: XX
HydroQual
OVERBURDEN GEOLOGIC
CROSS-SECTION
D-D'
PROJECT NO.
HWEL
FIGURE NO.
6.0-4
Meadowlands\1091\Honeywell_Site_7\Reports\Feb5-07_GIR\CADD\A-A'-D-D' BEDROCKcolored.dwg



LEGEND

- FINE SAND
- COARSE SAND+GRAVEL
- F-SAND+SILT
- SILT+CLAY
- CLAY

(700) Cr(VI) CONCENTRATION IN GW (MG/L)

HYDROQUAL ENVIRONMENTAL ENGINEERS AND SCIENTISTS, P.C.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

FIGURE 6-3.1

STRATIGRAPHIC CROSS-SECTION IN SOURCE AREA

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

\\MEADOWLANDS\1091\HONEYWELL_SITE_7\REPORTS\FEB5-07_GW\CAD\VA-A'-D-D' BEDROCKCOLORED.DWG 02/01/2007 LAYOUT: FIGURE X

Legend

- Deep River Boring

Bedrock Well

- Active
- Abandoned

Hexavalent Chromium (mg/L)

ND: Not Detected

NA: Data Not Available

Intermediate and Deep Overburden Plume

10 **Concentration Contour (mg/L)**

(Contour Interval: Logarithmic)

Dashed where inferred

SA-7 Subsurface Containment Barrier

N

SCALE:

0 250 500 750 1,000 Feet

Figure 6.4-1
Overlay of Intermediate and Deep Overburden Plume on Bedrock Plume

Study Area 7

Jersey City, New Jersey

SELECTED REFERENCES

Abdullah, M., Barrett, J., and Obrien, P., 1985. The Kinetics of the Reaction of Chromium(III) with L-Cysteine. *Inorganica Chimica Acta-Articles and Letters* **96**, L35-L36.

Carswell, L.D., 1976. Appraisal of Water Resources in the Hackensack River Basin, New Jersey. USGS Water Resources Investigations 76-74. June 1976.

Deakin, D., West, L. J., Stewart, D. I., and Yardley, B. W. D., 2001. The leaching characteristics of chromite ore processing reidue. *Environmental Geochemistry and Health* **23**, 201-206.

Drake, Avery A., Jr., Volkert, Richard A., Monteverde, Donald H., Herman, Gregory C., Houghton, Hugh F., Parker, Ronald A., and Dalton, Richard F., USGS Map I-2540-A, Bedrock Geologic Map of Northern New Jersey,

Eary, L. E. and Rai, D., 1988. Chromate Removal from Aqueous Wastes by Reduction with Ferrous Ion. *Environ. Sci. Technol.* **22**, 972-977.

Farmer, J. G., Graham, M. C., Thomas, R. P., Licona-Manzur, Paterson, E., Campbell, C. D., Geelhoed, J. S., Lumsdon, D. G., Meeussen, J. C. L., Roe, M. J., A., C., Fallick, A. E., and Bewley, R. J. F., 1999. Assessment and Modelling of the Environmental Chemistry and Potential for Remediative Treatment of Chromium-Contaminated Land. *Environmental Geochemistry and Health* **21**, 331-337.

Fendorf, S. E. and Li, G. C., 1996. Kinetics of chromate reduction by ferrous iron. *Environ. Sci. Technol.* **30**, 1614-1617.

GSR 1 - Bedrock Map of the Hackensack Meadowlands, Parrillo, Daniel G., 1959, revised by Kasabach, H.F., 1962, reprinted 1983, 25 p., 2 illus., *Price $5.00*

Hiller, S., Roe, M. J., Geelhoed, J. S., Fraser, A. R., Farmer, J. G., and Paterson, E., 2003. Role of quantitative mineralogical anlaysis in the investigation of sites contaminated by chromite ore processing residue. *Science of the Total Environment* **308**, 195-210.

I-2540-C, Surficial Geologic Map of Northern New Jersey, Stone, Byron D., Stanford, Scott D., and Witte, Ron W., 2002. Scale 1 to 100,000, 11 cross-sections. 3 sheets, size 58x41; 53x41; 48x40; and a 41-page expanatory pamphlet. Price $25.00

James, B. R. and Bartlett, R. J., 1983. Behavior of Chromium in Soils: V. Fate of Organically Complexed Cr(III) Added to Soil. *Journal of Environmental Quality* **12**, 169-172.

Kim, C., Zhou, Q. H., Deng, B. L., Thornton, E. C., and Xu, H. F., 2001. Chromium(VI) reduction by hydrogen sulfide in aqueous media: Stoichiometry and kinetics. *Environ. Sci. Technol.* **35**, 2219-2225.

Nichols, W.D., 1968, Ground-water resources of Essex County, New Jersey: New Jersey Department of Conservation and Economic Development Special Report 28, 56 p.

Rice, Ronald L. "The Morris Canal in Jersey City – This is an introduction to a guidebook, to be published soon, including a walking tour guide." October 2, 1998. 3 January 2007 <http://www.geocities.com/Yosemite/Rapids/4854/walk.htm>

APPENDIX A-1

WATER QUALITY DATA

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-BB11	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10
	Filtered	N	Y	N	Y	N	Y	N	N	Y	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
	Date	8/27/97	8/27/97	6/30/98	6/30/98	4/15/03	4/15/03	7/6/05	7/6/05	7/6/05	7/6/05	7/6/05	8/9/05	8/9/05	5/22/06	5/22/06	10/21/97	10/21/97	6/30/98	6/30/98	4/15/03	4/15/03	7/6/05	7/6/05
BICARBONATE ALKALINITY	mg/l					420									182						410			
CALCIUM	ug/l					131000		200000	185000				70800		237000						49400		44900	
CHLORIDE	mg/l					20.4		402	405				790		3840						150		65.7	
CHROMIUM	ug/l	2990	2090	2340	1750	746	18.4	8100	7160		11.8	9.8	447	7.2	387	5.9	77.4	15.3	13.3	13.4	18.7	14.8	13	
HEXAVALENT CHROMIUM	ug/l	2080	1900	1840	1620	10U	10U	100U	100U	10U		10U	10UJ	10U	20UJ	10UJ	14.2	10.7	10	10	10U	10U	10U	17.1
MAGNESIUM	ug/l					10700		12100	11400				4410		61300						54600		40500	
pH				12.35				7.09	7.11				7.92		7.54J								7.78	
POTASSIUM	ug/l					13500		22200	21300				35300		79400						11000		13200	
SODIUM	ug/l					28000		284000	275000				486000		1610000						102000		57800	
SULFATE	mg/l					14.8		63.3	49				101		490						6.9		5U	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l							19500	17100				1680		1690								62.6U	
ANTIMONY	ug/l							11.6U	11.6U				5.8U		5.8U								5.8U	
ARSENIC	ug/l							6.4U	6.4U				3.2U		3.2U								11.4	
BARIUM	ug/l							695	626				177		544								164	
BERYLLIUM	ug/l							0.6U	0.6U				0.3U		0.3U								0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l							0.8U	0.8U				0.4U		0.4U								0.4U	
CARBONATE ALKALINITY	mg/l					5U									5U						5U			
COBALT	ug/l							3.4U	3.4U				1.7U		1.7U								1.7U	
COPPER	ug/l							28.2	27.6				3.7U		4.3								3.7U	
FERROUS IRON	mg/l												0.27		0.1UJ									
HARDNESS (AS CACO3)	mg/l																							
IRON	ug/l							49800	44700				4730		11100								4140	
Iron, Ferric	mg/l																							
LEAD	ug/l							5.4U	5.4U				2.7U		2.7U								2.7U	
MANGANESE	ug/l							1030	943				194		435								1220	
MERCURY	ug/l							0.14	0.1				0.1U		0.1U								0.1U	
MOLYBDENUM	ug/l																							
NICKEL	ug/l							60.2	58.3				8.6		3.4								2.4U	
NITRATE	mg/l														0.1U									
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l														0.1U									
SELENIUM	ug/l							8.4U	8.4U				4.2U		4.2U								4.2U	
SILVER	ug/l							2.8U	2.8U				1.4U		1.4U								1.4U	
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY						1.003															1.001			
STRONTIUM	ug/l																							
SULFIDE	mg/l							1U	1U				1U		1U								1U	
SULFITE	mg/l																							
THALLIUM	ug/l							9.4J	9.4U				4.7U		4.7U								4.7U	
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l							252	250				202		182								345	
TOTAL DISSOLVED SOLIDS	mg/l					566		1100	1220				2180		8920						694		724	
TOTAL ORGANIC CARBON	mg/l							33.9	33.6				15.8		16.8								8.4	
VANADIUM	ug/l							49.5	43.8				4.7U		4.7U								4.7U	
ZINC	ug/l							39.9	40.6				9.6		7.9								7.7	

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	073-MW-Y10	079-MW-A2	079-MW-A2	079-MW-A2	079-MW-A2	079-MW-A2	079-MW-A2	079-MW-A2	079-MW-A2	079-MW-C6	079-MW-C6	079-MW-C6	079-MW-C6	079-MW-C6	079-MW-C6	079-MW-C6	079-MW-C6	087-MW-01
	Filtered	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Date	7/6/05	8/9/05	8/9/05	8/9/05	8/9/05	5/22/06	5/22/06	10/21/97	10/21/97	7/13/98	7/13/98	4/15/03	4/15/03	7/24/06	7/24/06	10/22/97	10/22/97	7/13/98	7/13/98	4/15/03	4/15/03	7/24/06	7/24/06	6/10/05
BICARBONATE ALKALINITY	mg/l						293						545			576					550			318	
CALCIUM	ug/l		54300	52100			44700						15100		16900	16600					230000		252000	242000	394000
CHLORIDE	mg/l		89.6	85.3			94.6						103			110					38.4			301	
CHROMIUM	ug/l	5.2	21.8	17.6	6.9	7.1	11.2	5.6	17	5.2	6.6	6.8	10.7	6J	321	16.3	7.3	4.5	6.8	2	13.6	1.2J	31.5	10UJ	6840
HEXAVALENT CHROMIUM	ug/l	10U	10UJ	10UJ	10U	10U	10UJ	10UJ	10	10	10	10	10U	10U	50UJ	50UJ	10	10	10	10	10U	10U	50UJ	50UJ	5890
MAGNESIUM	ug/l		42900	41800			34100						22400		23100	23400					32900		33200	31900	367
pH			7.32	7.32			8.11J								6.68								6.61		12.3
POTASSIUM	ug/l		17400	17300			13500						14800		20600	21100					10000		12200	11400	12300
SODIUM	ug/l		69200	76800			75700						213000		244000	256000					27500		47100	42700	230000
SULFATE	mg/l		5.4	5.4			20.6						5U			2.4					175			189	5.4
ALKALINITY, CARBONATE (AS CACO3)	mg/l															576								318	
ALUMINUM	ug/l		160	93			62.6U								7450	200U							1650	200U	1030
ANTIMONY	ug/l		5.8U	5.8U			5.8U								6.0UJ	6.0UJ							6.0UJ	6.0UJ	11.6U
ARSENIC	ug/l		12.1	13.4			9.6								8.0UJ	8.0UJ							8.0UJ	8.0UJ	17.5
BARIUM	ug/l		226	213			138								200U	200U							283	253	347
BERYLLIUM	ug/l		0.3U	0.3U			0.3U								1.9	1.4							6.3	7.2	0.6U
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l		0.4U	0.4U			0.4U								4.0U	4.0U							4.0U	4.0U	0.8U
CARBONATE ALKALINITY	mg/l						5U						5U			5.0U					5U			5.0U	
COBALT	ug/l		3.3	3.1			1.7U								50UJ	50UJ							50UJ	50UJ	3.4U
COPPER	ug/l		3.7U	3.7U			3.7U								83.2	25UJ							30	25UJ	23.7
FERROUS IRON	mg/l		0.16	0.12			0.1UJ									0.44								21.8	
HARDNESS (AS CACO3)	mg/l														160								858		
IRON	ug/l		4880	4350			3120								12200	738							36700	33400	1250
Iron, Ferric	mg/l															0.38								11.9	
LEAD	ug/l		2.7U	2.7U			2.7U								47.1	6.8							12.9	6.5	175
MANGANESE	ug/l		1310	1220			988								1010	918							3890	4480	17.6
MERCURY	ug/l		0.1U	0.1U			0.1U								1.3	0.20U							0.20U	0.20U	0.7
MOLYBDENUM	ug/l																								
NICKEL	ug/l		4.8	3.8			2.6								164	40U							40U	40U	50.6
NITRATE	mg/l						0.1U									0.11U								0.11U	
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l						0.1U									0.010UJ								0.010UJ	
SELENIUM	ug/l		4.2U	4.2U			4.2U								10U	10U							10U	10U	8.4U
SILVER	ug/l		1.4U	1.4U			1.4U								10UJ	10UJ							10UJ	10UJ	2.8U
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY													1.003								1.003				
STRONTIUM	ug/l																								
SULFIDE	mg/l		1U	1U			1U									2.0U								2.0U	1U
SULFITE	mg/l																								
THALLIUM	ug/l		4.7U	4.7U			4.7U								10U	10U							10U	10U	9.4U
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l		378	375			293																		1293
TOTAL DISSOLVED SOLIDS	mg/l		774	770			476						804		810						910		1630		
TOTAL ORGANIC CARBON	mg/l		13.2	14.9			11.5								37.9								6.5		20.3
VANADIUM	ug/l		4.7U	4.7U			4.7U								50U	50U							50U	50U	60.8
ZINC	ug/l		15.2	10.4			15.5								170	20U							65.7	20U	288

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-A26	087-MW-I30	087-MW-I30	087-MW-I30
	Filtered	Y	N	N	Y	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Date	6/10/05	7/12/05	7/12/05	7/12/05	7/12/05	5/15/06	5/15/06	9/3/97	9/3/97	7/7/98	7/7/98	7/7/98	7/7/98	4/22/03	4/22/03	6/9/05	6/9/05	7/13/05	7/13/05	5/15/06	5/15/06	9/3/97	9/3/97	7/6/98
BICARBONATE ALKALINITY	mg/l						126								404						351				
CALCIUM	ug/l		50000	58100			24500								97700		110000		60700		118000				
CHLORIDE	mg/l		69.8	69.7			157								437				190		1060				
CHROMIUM	ug/l	5770	1540	1370	1300	1440	2970	3400	5.5	5.5	2.9	2.9	2.9	2.9	4.6B	2.5B	5.4J	2.8UJ	7.4	3U	6.2	2.8U	5.5	5.5	2.9
HEXAVALENT CHROMIUM	ug/l	5890	50U	115	368	203	250U	250U	10	10	10	10	10	10	10	10	10UJ	10UJ	10U	10U	10U	10U	10	10	10
MAGNESIUM	ug/l		802	712			7550								17200		19600		9790		18500				
pH			11.27	11.58			10.13										6.66		6.73J		7.26				
POTASSIUM	ug/l		16600	17500			16600								17200		25200		18700		25400				
SODIUM	ug/l		222000	227000			348000								278000		371000		147000		552000				
SULFATE	mg/l		10U	10U			100U								7.7		25U		5U		5U				
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l		1170	877			758										170		188		430				
ANTIMONY	ug/l		4.9U	4.9U			12										5.8U		5.8U		9.1				
ARSENIC	ug/l		21.9	20.1			56										3.2U		3.2U		3.2U				
BARIUM	ug/l		211	158			180										873		469		1100				
BERYLLIUM	ug/l		0.1U	0.1U			0.64										0.3U		0.3U		0.3U				
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l		0.5U	0.5U			0.81										0.4U		0.4U		0.4U				
CARBONATE ALKALINITY	mg/l						500								5						5U				
COBALT	ug/l		3.5U	3.5U			3.4U										1.7U		1.7U		1.7U				
COPPER	ug/l		29.4	25.7			29.7										11.8		15.7		57.9				
FERROUS IRON	mg/l						2.5														22.1				
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l		470	170			2760										30500		9600		29200				
Iron, Ferric	mg/l																								
LEAD	ug/l		181	159			151										17.6		12		27				
MANGANESE	ug/l		21.9	13			18.7										539		270		648				
MERCURY	ug/l		0.68	0.53			0.17										0.1U		0.1U		0.1U				
MOLYBDENUM	ug/l																								
NICKEL	ug/l		67.2	57.2			236										2.4U		3.5		2.4U				
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l						1														0.1U				
NITRITE	mg/l																								
SELENIUM	ug/l		4.8U	4.8U			11										4.2U		4.2U		4.4				
SILVER	ug/l		1.2U	1.2U			2.8U										1.4U		1.4U		1.4U				
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY															1.003										
STRONTIUM	ug/l																								
SULFIDE	mg/l		1U	1U			5U										1U		1U		1U				
SULFITE	mg/l																								
THALLIUM	ug/l		4.8U	4.8U			9.4U										4.7U		4.7U		4.7U				
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l		507	524			626										472		296		351				
TOTAL DISSOLVED SOLIDS	mg/l		906	1010			1870								960				614		1670				
TOTAL ORGANIC CARBON	mg/l		143	111			14.7										5.2		10.9		4.9				
VANADIUM	ug/l		86.3	70.8			499										4.7U		4.7U		4.7U				
ZINC	ug/l		296	245			370										72		105		191				

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-I30	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O19	087-MW-O23
	Filtered	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	N
	Date	7/6/98	4/22/03	4/22/03	4/22/03	4/22/03	6/8/05	6/8/05	7/13/05	7/13/05	5/15/06	5/15/06	9/4/97	9/4/97	7/7/98	7/7/98	4/21/03	4/21/03	6/10/05	6/10/05	7/12/05	7/12/05	5/15/06	5/15/06	10/22/97
BICARBONATE ALKALINITY	mg/l		758	747							643				277		364B						435		
CALCIUM	ug/l		32400	30700			52200		40500		43700				85700		153000		51100		112000		113000		
CHLORIDE	mg/l		314	316					472		553				19		40.4J				22.4		11.1		
CHROMIUM	ug/l	2.9	1.1U	1.1U	1.1U	1.1U	21	2.8U	6.8	3U	3.2	2.8U	6250	6400	27.1	24.1	46.2	1.6B	25.6	21.4	18.2	3U	1420	8.9	108
HEXAVALENT CHROMIUM	ug/l	10	10	10U	10	10U	10U	10U	10U	10U	10UJ	10U	5400	6390	10	10	10U	10U	100U	20U	10U	10U	1040	573	10
MAGNESIUM	ug/l		35600	33800			48600		42200		39000				17500		17600		60900		10200		15800		
pH							7.99J		8.12J		8.38								7.98		8.27		7.72		
POTASSIUM	ug/l		48700	47400			61400		56500		55800				6780		5060		19300		4680		8380		
SODIUM	ug/l		317000	319000			355000		356000		363000				54500		36400		810000		61400		61900		
SULFATE	mg/l		5	5U			5U		5U		5U				71.4		643		160		58.8		61.9		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l						3030		459		391				222				393		591		623		
ANTIMONY	ug/l						11.6U		5.8U		8.5								11.6U		4.9U		5.8U		
ARSENIC	ug/l						6.4		3.2U		3.2U								28.8		4.5U		3.2U		
BARIUM	ug/l						4910		4210		3420								638		91.3		80.7		
BERYLLIUM	ug/l						0.6U		0.3U		0.3U								1.9		0.1U		0.3U		
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l						0.8U		0.4U		2U								0.8U		0.5U		0.4U		
CARBONATE ALKALINITY	mg/l		5	5							5U				5		5U						5U		
COBALT	ug/l						3.4U		1.7U		1.7U								3.4U		3.5U		1.7U		
COPPER	ug/l						75.6		20.3		13.8								17.7		8.8		7.7		
FERROUS IRON	mg/l										0.83												0.1U		
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l						2800		540		4700				2000	1320			6810		3360		819		
Iron, Ferric	mg/l																								
LEAD	ug/l						203		35.8		63.1								8.6		2.3		18.3		
MANGANESE	ug/l						115		56.4		89.1								785		355		64		
MERCURY	ug/l						0.54		0.1U		0.1U								0.1U		0.1U		0.1U		
MOLYBDENUM	ug/l																								
NICKEL	ug/l						11.9		4.7		2.4U								4.8U		17.6		22.3		
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l										0.12												0.18		
NITRITE	mg/l																								
SELENIUM	ug/l						8.4U		4.2U		4.2U								8.4U		4.8U		4.2U		
SILVER	ug/l						2.8U		1.4U		1.4U								2.8U		1.2U		1.4U		
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY			1.004	1.0035													1.0029								
STRONTIUM	ug/l																								
SULFIDE	mg/l						1U		1U		1U								1U		1U		1U		
SULFITE	mg/l																								
THALLIUM	ug/l						9.4U		4.7U		4.7U								9.4U		4.8U		4.7U		
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l						675		744		643								734		383		435		
TOTAL DISSOLVED SOLIDS	mg/l		1260	1260					1430		1440						678				436		514		
TOTAL ORGANIC CARBON	mg/l						23.4		34.4		20.9								14		6.5		6.2		
VANADIUM	ug/l						9.4U		4.7U		4.7U								178		2.7		4.7U		
ZINC	ug/l						494		84.6		80.8								13.1		178		95		

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O23	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-O29	087-MW-S19
	Filtered	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Date	10/22/97	7/7/98	7/7/98	4/22/03	4/22/03	6/10/05	6/10/05	7/14/05	7/14/05	5/15/06	5/15/06	9/3/97	9/3/97	7/6/98	7/6/98	4/21/03	4/21/03	6/8/05	6/8/05	7/13/05	7/13/05	5/15/06	5/15/06	10/20/97
BICARBONATE ALKALINITY	mg/l		458		263						321						858B						806		
CALCIUM	ug/l		55900		154000		84800		106000		133000						111000		132000		127000		110000		
CHLORIDE	mg/l		350		2230				1030		1950						896J				818		883		
CHROMIUM	ug/l	18.3	8.6	6.4	15.8	11	366	2.8U	104N	2.8	2.8U		13.1	5.5	2.9	2.9	4.4J	4.3J	5.6	2.8U	4.6	3U	5.5	2.8U	71
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	10	200U	10U	20U	10U	50U	10U	10	10	10	10	10U	10U	10U	10U	20U	10U	50U	10U	10
MAGNESIUM	ug/l		14400		22800		16700		18400		20800						57900		49100		42500		56400		
pH							7.63		7.17		7.93								7.44J		7.42J		7.91		
POTASSIUM	ug/l		23600		16900		22700		22200		21900						66500		58900		48800		73500		
SODIUM	ug/l		303000		1120000		554000		715000		977000						557000		559000		525000		517000		
SULFATE	mg/l		5		5		7		5U		24.4						5U		5U		5U		5U		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l		816				16600		1140		485								188U		131		410		
ANTIMONY	ug/l		--				11.6U		5.8U		5.8U								11.6U		5.8U		5.8U		
ARSENIC	ug/l						28.4		8.5		3.2U								6.4U		5.7		3.4		
BARIUM	ug/l						1850		1980		2280								859		914		597		
BERYLLIUM	ug/l						2.2		0.3U		0.3U								0.9U		0.3U		0.3U		
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l						2.3		0.4U		2U								1.2U		0.4U		2U		
CARBONATE ALKALINITY	mg/l		5		5						5U						5U						5U		
COBALT	ug/l						13.5		1.7U		1.7U								5.1U		1.7U		1.7U		
COPPER	ug/l						228		108		14.3								11.1U		3.7U		6.9		
FERROUS IRON	mg/l										0.91												0.98		
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l		8750	7160			52900		450		30100								320		320		20100		
Iron, Ferric	mg/l																								
LEAD	ug/l						661		62.6		20								5.4U		3.9		6.6		
MANGANESE	ug/l						614		547		784								431		355		577		
MERCURY	ug/l						3		0.32		0.1U								0.1U		0.1U		0.1U		
MOLYBDENUM	ug/l																								
NICKEL	ug/l						62.7		51.4		2.4U								7.2U		2.4U		2.4U		
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l										0.16												0.12		
NITRITE	mg/l																								
SELENIUM	ug/l						8.4U		4.2U		4.2U								12.6U		4.2U		4.2U		
SILVER	ug/l						2.8U		1.4U		1.4U								4.2U		1.4U		1.4U		
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY					1.005												1.0044								
STRONTIUM	ug/l																								
SULFIDE	mg/l						1U		1U		1U								1U		1U		1U		
SULFITE	mg/l																								
THALLIUM	ug/l						9.4U		4.7U		4.7U								9.4U		4.7U		4.7U		
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l						417		386		321								721		705		806		
TOTAL DISSOLVED SOLIDS	mg/l				3370				1940		3590						2330				2120		2230		
TOTAL ORGANIC CARBON	mg/l						11.2		12.6		11.4								9.1		12.4		12.8		
VANADIUM	ug/l						115		5.3		4.7U								14.1U		4.7U		4.7U		
ZINC	ug/l						944		193		88.1								17.4U		8.1		35.7		

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-S19	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28	087-MW-U28
	Filtered	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	Y	N	N	Y	Y	N	Y	N
	Date	10/20/97	7/6/98	7/6/98	4/21/03	4/21/03	6/10/05	6/10/05	7/13/05	7/13/05	9/3/97	9/3/97	7/1/98	7/1/98	4/21/03	4/21/03	4/21/03	4/21/03	6/8/05	6/8/05	6/8/05	6/8/05	7/13/05	7/13/05	5/15/06
BICARBONATE ALKALINITY	mg/l				409B											934B	899B									608
CALCIUM	ug/l				40300		12700		18700							161000	160000			119000	127000			79600		79700
CHLORIDE	mg/l				1920J				705							740J	740J							645		335
CHROMIUM	ug/l	4.5	2.9	6.3	41.3	20.9JB	56.1	37.2	105	62.3	8	5.5	2.9	2.9	6.1B	5.7B	10.7	5.8B	3.8	3.6	2.8U	2.8U	4	3U	2.4
HEXAVALENT CHROMIUM	ug/l	10	10	10	10U	10U	10U	10U	10U	10U	10	10	10	10	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
MAGNESIUM	ug/l				30800		11300		11800							63700	63200			59900	60400			40200		42100
pH							9.05		8.87J											7.55J	7.55J			7.69J		8.28
POTASSIUM	ug/l				38900		24600		28600							36300	35700			38700	40200			31600		29100
SODIUM	ug/l				1280000		575000		596000							538000	553000			670000	719000			583000		295000
SULFATE	mg/l				60.3		8.5		10.4							64.3	62.7			19.3	11.4			8.8		43.2
ALKALINITY, CARBONATE (AS CACO3)	mg/l																									
ALUMINUM	ug/l						153		206											62.6U	62.6U			62.6U		79.8
ANTIMONY	ug/l						5.8U		5.8U											5.8U	5.8U			5.8U		7
ARSENIC	ug/l						4.5		3.2U											3.2U	3.2U			3.2U		3.2U
BARIUM	ug/l						452		529											678	741			456		391
BERYLLIUM	ug/l						0.3U		0.3U											0.3U	0.3U			0.3U		0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l						0.4U		0.4U											0.4U	0.4U			0.4U		2U
CARBONATE ALKALINITY	mg/l				19.8B											5U	5U									5U
COBALT	ug/l						1.7U		1.7U											1.7U	1.7U			1.7U		1.7U
COPPER	ug/l						6.5		16											3.7U	3.7U			3.7U		4.2
FERROUS IRON	mg/l																									0.38
HARDNESS (AS CACO3)	mg/l																									
IRON	ug/l						838		390											6770	6020			3270		2790
Iron, Ferric	mg/l																									
LEAD	ug/l						27.4		37											3.4	2.7U			2.7U		2.7U
MANGANESE	ug/l						11.3		26.4											374	412			262		222
MERCURY	ug/l						0.1U		0.17											0.1U	0.1U			0.1U		0.1U
MOLYBDENUM	ug/l																									
NICKEL	ug/l						6.4		16.2											2.5	2.4U			2.4U		2.4U
NITRATE	mg/l																									
NITRATE AS NITROUS OXIDE	mg/l																									0.13
NITRITE	mg/l																									
SELENIUM	ug/l						4.2U		4.2U											4.2U	4.2U			4.2U		4.2U
SILVER	ug/l						1.4U		1.4U											1.4U	1.4U			1.4U		1.4U
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY					1.0052											1.0045	1.0045									
STRONTIUM	ug/l																									
SULFIDE	mg/l						1U		1U											1U	1U			1U		1U
SULFITE	mg/l																									
THALLIUM	ug/l						4.7U		4.7U											4.7U	4.7U			4.7U		4.7U
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l						577		506											943	938			853		608
TOTAL DISSOLVED SOLIDS	mg/l				2170				1960							2330	2240							2680		1280
TOTAL ORGANIC CARBON	mg/l						9.4		33											6.8	6.1			8.5		7.1
VANADIUM	ug/l						4.7U		6.3											4.7U	4.7U			4.7U		4.7U
ZINC	ug/l						31.6		36.1											37.6	22.9			16.5		34.8

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	087-MW-U28	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-W25	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20
	Filtered	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	N
	Date	5/15/06	10/13/97	10/13/97	10/15/97	10/15/97	7/1/98	7/1/98	7/1/98	7/1/98	4/21/03	4/21/03	6/9/05	6/9/05	7/13/05	7/13/05	5/15/06	5/15/06	10/13/97	10/13/97	10/15/97	10/15/97	10/15/97	10/15/97	10/15/97	7/8/98
BICARBONATE ALKALINITY	mg/l										692B						654									
CALCIUM	ug/l										97100		115000		113000		82200									
CHLORIDE	mg/l										437J				409		257									
CHROMIUM	ug/l	2.8U	4.5	4.5	5.3	4.5	2.9	2.9	2.9	2.9	5.8B	5.3B	1.9J	2.8UJ	5	4	4.5	3.1	42	35.4	34.7	33.1	38.2	32	36
HEXAVALENT CHROMIUM	ug/l	10U	10	10	10	10	10	10	10	10	10U	10U	10UJ	10UJ	10U	10U	10U	10U	10	10	10	10	10	10	10
MAGNESIUM	ug/l										53000		55700		55800		34000									
pH													7.21		7.53J		8.12									
POTASSIUM	ug/l										45800		48900		50900		44500									
SODIUM	ug/l										281000		274000		299000		235000									
SULFATE	mg/l										5U		5U		5U		5U									
ALKALINITY, CARBONATE (AS CACO3)	mg/l																									
ALUMINUM	ug/l												62.6U		62.6U		62.6U									
ANTIMONY	ug/l												5.8U		5.8U		6.6									
ARSENIC	ug/l												5		3.2U		3.2U									
BARIUM	ug/l												910		902		601									
BERYLLIUM	ug/l												0.3U		0.3U		0.3U									
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l												0.4U		0.4U		0.4U									
CARBONATE ALKALINITY	mg/l										5U						5U									
COBALT	ug/l												1.7U		1.7U		1.7U									
COPPER	ug/l												4		3.7U		3.7U									
FERROUS IRON	mg/l																0.42									
HARDNESS (AS CACO3)	mg/l																									
IRON	ug/l												6970		6510		4960									
Iron, Ferric	mg/l																									
LEAD	ug/l												3.5		2.7U		2.7U									
MANGANESE	ug/l												739		742		444									
MERCURY	ug/l												0.1U		0.1U		0.1U									
MOLYBDENUM	ug/l																									
NICKEL	ug/l												2.4U		2.4U		2.4U									
NITRATE	mg/l																									
NITRATE AS NITROUS OXIDE	mg/l																0.14									
NITRITE	mg/l																									
SELENIUM	ug/l												4.2U		4.2U		4.4									
SILVER	ug/l												1.4U		1.4U		1.4U									
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY											1.0036															
STRONTIUM	ug/l																									
SULFIDE	mg/l												1U		1U		1U									
SULFITE	mg/l																									
THALLIUM	ug/l												4.7U		4.7U		4.7U									
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l												686		736		654									
TOTAL DISSOLVED SOLIDS	mg/l										1440				1840		1060									
TOTAL ORGANIC CARBON	mg/l												6		8.8		7.6									
VANADIUM	ug/l												4.7U		4.7U		4.7U									
ZINC	ug/l												9.7		5.8U		15.9									

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	087-MW-Y20	088-MW-01	088-MW-01	088-MW-01	088-MW-01	088-MW-01	088-MW-01	088-MW-01	088-MW-01	088-MW-001	088-MW-001	088-MW-02	088-MW-02	088-MW-02
	Filtered	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N
	Date	7/8/98	7/8/98	7/8/98	4/21/03	4/21/03	6/9/05	6/9/05	7/13/05	7/13/05	5/15/06	5/15/06	6/10/05	6/10/05	7/14/05	7/14/05	5/15/06	5/15/06	5/15/06	5/15/06	7/20/06	7/20/06	6/10/05	6/10/05	7/14/05
BICARBONATE ALKALINITY	mg/l				884B						635						243	224				312			
CALCIUM	ug/l				37000		24000		14400		19400		12000		98400		68300	60700			119000	119000	730000		693000
CHLORIDE	mg/l				374J				201		249				58.2		311	400				52.5			360
CHROMIUM	ug/l	40.9	36	37.9	62.9	53.7	74.5	45.9	73.7	68.8	70.5	56.9	22	14.7	9.9JB	3.9B	7.3	8.8	1.6	1.6U	10.4	10U	15600	16700	18100
HEXAVALENT CHROMIUM	ug/l	10	10	10	10U	10U	10UJ	10UJ	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	50UJ	50UJ	17500J	17400J	19600
MAGNESIUM	ug/l				35000		22200		11600		16400		7250		12800		9720	9020			14400	14400	118		87.2
pH					8.43		9.79J		8.81		9.16		7.02		8.1	8.2					6.98		12.9		12.34
POTASSIUM	ug/l				14800		10300		7660		10000		38900		4360		27300	28300			5950	5970	15000		25100
SODIUM	ug/l				304000		347000		329000		329000		321000		31000		224000	233000			40000	39800	246000		384000
SULFATE	mg/l				50.3		31		48.5		41.5		5U		38.1		69.4	41.3				44.8	10U		16.1
ALKALINITY, CARBONATE (AS CACO3)	mg/l																					313			
ALUMINUM	ug/l						944		840		849		882		160		70.4	82.4			200UJ	200UJ	250		470
ANTIMONY	ug/l						5.8U		7.6		9.6		5.8U		6.6		5.8U	7.1			6.0U	6.0U	12.4		5.8U
ARSENIC	ug/l						83.5		102		43		3.5		3.2U		3.2U	3.2U			8.0UJ	8.0UJ	6.4U		3.2U
BARIUM	ug/l						68.3		34		60.6		60.1		200		203	195			205	204	232		209
BERYLLIUM	ug/l						0.3U		0.3U		1.5U		0.3U		0.3U		0.3U	0.3U			1.0UJ	1.0UJ	0.6U		0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l						0.4U		0.4U		2U		0.4U		1.1		0.4U	0.4U			4.0UJ	4.0UJ	0.8U		0.4U
CARBONATE ALKALINITY	mg/l				5U						103						5U	5U				5.0U			
COBALT	ug/l						1.8		1.7U		1.7U		1.7U		1.7U		1.7U	1.7U			50UJ	50UJ	3.4U		2.1
COPPER	ug/l						64.3		48.4		41.6		4.7		17.8		3.7U	3.7U			25U	25U	7.4U		14.3
FERROUS IRON	mg/l										0.8				0.1U		0.25	0.2				0.10U			0.1U
HARDNESS (AS CACO3)	mg/l																				350				
IRON	ug/l						4380		650		1350		608		647		3950	3500			6430	6320	194		223
Iron, Ferric	mg/l																					6.3			
LEAD	ug/l						63		88.7		43.3		13.8		2.7U		2.7U	3.1			3.4J	3.0UJ	5.4U		8
MANGANESE	ug/l						72		25.7		71		13.9		34.8		141	125			199J	203J	3.4		3.5
MERCURY	ug/l						1.4		0.75		0.19		0.1U		0.1U		0.1U	0.1U			0.20UJ	0.20UJ	0.1U		0.1U
MOLYBDENUM	ug/l																								
NICKEL	ug/l						20.2		20.6		11.9		2.4U		11.2		3.6	3.1			40U	40U	17		25.9
NITRATE	mg/l																					0.11U			
NITRATE AS NITROUS OXIDE	mg/l										0.12						0.12	0.14							
NITRITE	mg/l																					0.010U			
SELENIUM	ug/l						4.2U		4.2U		4.2U		4.2U		4.2U		4.2U	4.2U			10U	10U	8.4U		4.2U
SILVER	ug/l						1.4U		1.4U		1.4U		1.4U		1.4U		1.4U	1.4U			10U	10U	2.8U		1.4U
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY					1.0037																				
STRONTIUM	ug/l																								
SULFIDE	mg/l						2U		17.4		1U		1U		1U		1U	1U				2.0U	1U		1U
SULFITE	mg/l																								
THALLIUM	ug/l						4.7U		4.7U		4.7U		4.7U		4.7U		4.7U	4.7U			10U	10U	9.4U		4.7U
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l						764		692		738		248		256		243	224					2230		1937
TOTAL DISSOLVED SOLIDS	mg/l				1480				1730		1200				506		836	984			506				6640
TOTAL ORGANIC CARBON	mg/l						26.4		27.7		22.2		5.1		6		6.1	6.1			7		11.9		11.8
VANADIUM	ug/l						79.9		134		73.3		5.7		4.7U		4.7U	4.7U			50U	50U	9.4U		8
ZINC	ug/l						127		73.7		71.7		31.6		350		86.4	69.8			349	325	11.6U		50.5

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	088-MW-02	088-MW-02	088-MW-02	088-MW-002	088-MW-002	088-MW-101	088-MW-101	088-MW-101	088-MW-101	088-MW-102	088-MW-102	088-MW-102	088-MW-102	088-MW-103	088-MW-103	088-MW-G19	088-MW-G19	088-MW-G19	088-MW-G19	088-MW-G19	088-MW-G19	088-MW-G19	088-MW-G19	088-MW-G19
	Filtered	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Date	7/14/05	5/15/06	5/15/06	7/20/06	7/20/06	6/9/05	6/9/05	7/14/05	7/14/05	6/9/05	6/9/05	7/14/05	7/14/05	6/10/05	6/10/05	9/4/97	9/4/97	7/7/98	7/7/98	4/22/03	4/22/03	6/10/05	6/10/05	7/14/05
BICARBONATE ALKALINITY	mg/l		5U			5.0U															672				
CALCIUM	ug/l		122000		144000	150000	148000		177000		209000		311000		45600						75800		4610		2010
CHLORIDE	mg/l		832			861			708				1640								486				249
CHROMIUM	ug/l	16200	14700	12800	15200	14500	67.3	4.1	32.9	5B	60	2.8U	29.5	3.9B	1110	1020	152	122	63.5	32.6	5.9J	3.3J	153	52.1	47.9
HEXAVALENT CHROMIUM	ug/l	19000	15300J	14300J	16100	15500	10UJ	10UJ	20U	10U	10UJ	10UJ	20U	10U	50UJ	50UJ	60	82.9	10	10	10	10	10UJ	10UJ	10U
MAGNESIUM	ug/l		1300		5000U	5000U	35700		31700		66200		56600		60100						46000		2280		230
pH			3.7		12.56		7.38		7.04		7.7		7.01		7.75								12.31		12.25
POTASSIUM	ug/l		38100		50500	49200	26700		26600		52400		44400		89900						32900		32900		33000
SODIUM	ug/l		600000		757000	739000	499000		462000		986000		886000		808000						292000		736000		658000
SULFATE	mg/l		67.7			68.7	5U		54.8		5U		9.2		5U						5		14.7		29
ALKALINITY, CARBONATE (AS CACO3)	mg/l					644																			
ALUMINUM	ug/l		1980		2350J	2000J	277		138		424		236		7110								6380		2920
ANTIMONY	ug/l		6.2		6.0U	6.0U	5.8U		5.8U		5.8U		5.8U		11.6U								11.6U		5.8U
ARSENIC	ug/l		3.2U		18.6J	16.2J	3.4		3.2U		3.2U		3.2U		6.4U								23.1		16.4
BARIUM	ug/l		79.8		200U	200U	926		928		1380		2020		213								63.5		9.1
BERYLLIUM	ug/l		0.3U		1.0UJ	1.0UJ	0.3U		0.3U		0.3U		0.3U		2.9								0.6U		0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l		0.4U		4.0UJ	4.0UJ	0.4U		0.4U		0.4U		0.4U		0.8U								0.8U		0.4U
CARBONATE ALKALINITY	mg/l		5U			235															5				
COBALT	ug/l		1.7U		50UJ	50UJ	1.7U		1.7U		1.7U		1.7U		3.4U								3.4U		1.7U
COPPER	ug/l		9.6		25U	25U	11.7		15.5		13.7		20.3		15.7								27.7		6
FERROUS IRON	mg/l		0.1U			0.10U			0.63				2.3												0.1U
HARDNESS (AS CACO3)	mg/l				330																				
IRON	ug/l		664		412	100U	7800		16600		9430		21400		7140								7930		973
Iron, Ferric	mg/l					0.20U																			
LEAD	ug/l		6.4		3.0UJ	3.0UJ	47.5		22.2		50.1		24.1		5.4U								93.1		9.8
MANGANESE	ug/l		9.9		15UJ	15UJ	310		366		445		611		315								289		31.2
MERCURY	ug/l		0.1U		0.20UJ	0.20UJ	0.1U		0.1U		0.1U		0.1U		0.1U								0.59		0.22
MOLYBDENUM	ug/l																								
NICKEL	ug/l		15.2		40U	40U	3.7		5.8		13.8		8.1		13.7								144		88.6
NITRATE	mg/l					0.33																			
NITRATE AS NITROUS OXIDE	mg/l		948																						
NITRITE	mg/l					0.97																			
SELENIUM	ug/l		4.2U		10U	10U	4.2U		4.2U		4.2U		4.2U		8.4U								8.4U		4.2U
SILVER	ug/l		1.4U		10U	10U	1.4U		1.4U		1.4U		1.4U		2.8U								2.8U		1.4U
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																					1.004				
STRONTIUM	ug/l																								
SULFIDE	mg/l		1U			2.0U	1U		1U		1U		1U		20U								1U		1U
SULFITE	mg/l																								
THALLIUM	ug/l		4.7U		10U	10U	4.7U		4.7U		4.7U		4.7U		9.4U								9.4U		4.7U
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l		5U				665		613		902		791		823								1310		1179
TOTAL DISSOLVED SOLIDS	mg/l		2780		2240				1940				4080								1380				2990
TOTAL ORGANIC CARBON	mg/l		15.6		15.3		22.6		16.5		12.4		18.1		41.2								51.3		37.5
VANADIUM	ug/l		37.2		50U	50U	4.7U		4.7U		4.7U		4.7U		429								79.5		50.2
ZINC	ug/l		225		20U	20U	69.9		51.3		87.5		49		17.6								208		39.4

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	088-MW-G19	088-MW-G19	088-MW-G19	090-MW-8A	090-MW-8A	090-MW-8A	090-MW-8A	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-E01	090-MW-F14	090-MW-F14	090-MW-F14
	Filtered	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Date	7/14/05	5/15/06	5/15/06	5/31/05	5/31/05	5/10/06	5/10/06	10/29/97	10/29/97	7/13/98	7/13/98	4/15/03	4/15/03	4/28/05	4/28/05	4/28/05	4/28/05	4/28/05	5/31/05	5/31/05	5/10/06	5/10/06	10/23/97	10/23/97	7/14/98
BICARBONATE ALKALINITY	mg/l		125				44.4						245									173				111
CALCIUM	ug/l		11900				29400						60900		38700	36700						31900				79500
CHLORIDE	mg/l		190				18.9						47									58.8				27.5
CHROMIUM	ug/l	32.3	572	229	514	499	380	366	52.4	14.5	18	6.3	781	695	21	32.1	2.4	3.2	117	2.8U		27.6	1.6U	4.9	4.5	30.7
HEXAVALENT CHROMIUM	ug/l	10U	20U	10U	497	497	345J	337J	10	10	10	10	707	583	10U	10U	10U	10U	10UJ	10U		10UJ	10UJ	10	10	10
MAGNESIUM	ug/l		3140				3750						22000		5770	5470						4560				22800
pH			9.65				7.13								8.34	8.47						8.51				
POTASSIUM	ug/l		28400				4990						6560									7840				3710
SODIUM	ug/l		512000				24100						49900									51900				28600
SULFATE	mg/l		67				63						53.3		5U	5U						5U				204
ALKALINITY, CARBONATE (AS CACO3)	mg/l																									
ALUMINUM	ug/l		8810				62.6U															150				86.9
ANTIMONY	ug/l		15.4				5.8U															5.8U				
ARSENIC	ug/l		17.2				3.2U															3.2U				
BARIUM	ug/l		107				32.3															384				
BERYLLIUM	ug/l		0.32				0.3U															0.3U				
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l		0.8				0.4U															0.4U				
CARBONATE ALKALINITY	mg/l		5U				5U						5U		172	174						5U				5
COBALT	ug/l		4.8				1.7U															1.7U				
COPPER	ug/l		76.9				3.7U															3.7U				
FERROUS IRON	mg/l		1.7				0.1U															0.11				
HARDNESS (AS CACO3)	mg/l						84.3															102				
IRON	ug/l		13300				39.2U								81.2	115						160				251
Iron, Ferric	mg/l																									
LEAD	ug/l		210				2.7U															2.7U				
MANGANESE	ug/l		433				3.6															13.2				
MERCURY	ug/l		0.79				0.1U															0.49				
MOLYBDENUM	ug/l																									
NICKEL	ug/l		97.4				2.4U															2.4U				
NITRATE	mg/l																									
NITRATE AS NITROUS OXIDE	mg/l		372				4.3															0.11				
NITRITE	mg/l																									
SELENIUM	ug/l		6.7				4.2U															4.2U				
SILVER	ug/l		1.4U				1.4U															1.4U				
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY													1.003													
STRONTIUM	ug/l																									
SULFIDE	mg/l		1U				1U								1U	1U						1U				
SULFITE	mg/l																									
THALLIUM	ug/l		4.7U				4.7U															4.7U				
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l		125				44.4															173				
TOTAL DISSOLVED SOLIDS	mg/l		2020				220						418									279				
TOTAL ORGANIC CARBON	mg/l		34.8				1.6								2.5	2.5						3.4				
VANADIUM	ug/l		161				4.7U															4.7U				
ZINC	ug/l		432				5.8U															5.8U				

Table A-1
Shallow Groundwater
Analytical Data

	Location ID	090-MW-F14	090-MW-F14	090-MW-F14	090-MW-010	090-MW-010	090-MW-010	090-MW-010	090-MW-010	090-MW-010	090-MW-010	090-MW-010
	Filtered	Y	N	Y	N	Y	Y	N	N	Y	N	Y
	Date	7/14/98	4/15/03	4/15/03	4/28/05	4/28/05	4/28/05	5/31/05	5/31/05	5/31/05	5/10/06	5/10/06
BICARBONATE ALKALINITY	mg/l		47.5								5U	
CALCIUM	ug/l		145000		241000						151000	
CHLORIDE	mg/l		518								61.8	
CHROMIUM	ug/l	1.7	2.5J	1.1U	4870	4710	5060	5200	5280	5550	1570	935
HEXAVALENT CHROMIUM	ug/l	10	10U	10U	4900	4880	5170	5170	5220	5220	64J	10UJ
MAGNESIUM	ug/l		36200		72.5						268	
pH					12.18						11.78	
POTASSIUM	ug/l		5140								25000	
SODIUM	ug/l		227000								136000	
SULFATE	mg/l		164		13.6						17.3	
ALKALINITY, CARBONATE (AS CACO3)	mg/l											
ALUMINUM	ug/l										1380	
ANTIMONY	ug/l										5.8U	
ARSENIC	ug/l										18.8	
BARIUM	ug/l										105	
BERYLLIUM	ug/l										0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l											
BORON	ug/l											
CADMIUM	ug/l										0.4U	
CARBONATE ALKALINITY	mg/l		5U		723						105	
COBALT	ug/l										1.7U	
COPPER	ug/l										46.4	
FERROUS IRON	mg/l										1.4	
HARDNESS (AS CACO3)	mg/l										431	
IRON	ug/l	47.1			504						1470	
Iron, Ferric	mg/l											
LEAD	ug/l										31.8	
MANGANESE	ug/l										17.1	
MERCURY	ug/l										12.5	
MOLYBDENUM	ug/l											
NICKEL	ug/l										6.8	
NITRATE	mg/l											
NITRATE AS NITROUS OXIDE	mg/l										0.22	
NITRITE	mg/l											
SELENIUM	ug/l										4.2U	
SILVER	ug/l										1.4U	
SPECIFIC CONDUCTANCE	umhos/cm											
SPECIFIC GRAVITY			1.003									
STRONTIUM	ug/l											
SULFIDE	mg/l				1U						1U	
SULFITE	mg/l											
THALLIUM	ug/l										4.7U	
TIN	ug/l											
TITANIUM	ug/l											
TOTAL ALKALINITY	mg/l										555	
TOTAL DISSOLVED SOLIDS	mg/l		1440								735	
TOTAL ORGANIC CARBON	mg/l				5.7						47.2	
VANADIUM	ug/l										21.5	
ZINC	ug/l										65.3	

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	090-MW-011	090-MW-011	090-MW-011	090-MW-011	090-MW-011	090-MW-011	115-MW-101	115-MW-101	115-MW-103	115-MW-103	115-MW-104	115-MW-104	115-MW-107	115-MW-107	115-MW-108	115-MW-108	115-MW-109	115-MW-109	115-MW-115	115-MW-115	115-MW-118	115-MW-118	115-MW-119
Filtered		N	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Date		4/28/05	4/28/05	5/31/05	5/31/05	5/10/06	5/10/06	12/3/03	6/17/04	12/3/03	6/18/04	12/3/03	6/18/04	12/3/03	6/18/04	12/3/03	6/18/04	12/3/03	6/18/04	12/3/03	6/18/04	12/3/03	6/18/04	12/2/03
BICARBONATE ALKALINITY	mg/l					87.3																		
CALCIUM	ug/l	28200				47400		600000		885000		581000		741000		308000		743000		651000		1170000		785000
CHLORIDE	mg/l					23.7		32.7		1060		58.8		55.8		241		189		42.9		151		49
CHROMIUM	ug/l	27.6	5.6	6.7	4.2	5.1	2	3420		117000		2500		25400		7110		19800		8160		52300		15800
HEXAVALENT CHROMIUM	ug/l	10U	10U	10UJ	10U	10UJ	10UJ	3220J		123000J		2330J		27000J		7200J		21500J		8260J		32200J		15600
MAGNESIUM	ug/l	3400				5230		203		2220		111		2670		1130		1200		4830		82500		412
pH		7.61				7.23																		
POTASSIUM	ug/l					7410		20800		25900		13100		10300		13400		12700		5350		17000		5910
SODIUM	ug/l					25100		320000		525000		319000		283000		756000		306000		233000		519000		278000
SULFATE	mg/l	37.6				96.3																		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l					102		862		3070		204		4890		3220		811		6770		69800		461
ANTIMONY	ug/l					5.8U		3.9U		39U		3.9U		7.8U		3.9U		7.8U		3.9U		19.5U		7.8U
ARSENIC	ug/l					3.2U		3.4U		34U		3.4U		6.8U		3.4U		6.8U		5.2		9.9		6.8U
BARIUM	ug/l					82.3		88		69.9		146		249		232		277		405		651		396
BERYLLIUM	ug/l					0.3U		0.1U		1U		0.1U		0.2U		0.1U		0.2U		0.17J		0.54J		0.2U
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l					0.4U		0.4U		4U		0.4U		0.8U		0.4U		0.8U		0.4U		0.8U		0.8U
CARBONATE ALKALINITY	mg/l	84				5U		1390		2140		1980		2610		2460		2460		2280		4540		2380
COBALT	ug/l					1.7U		3.5U		35U		3.5U		7U		10.7		7U		7.3		200		7U
COPPER	ug/l					3.7U		18.1	42.5	27.1	18.5U	4.1	3.7U	14.6	6.3	13.6	8.9	8.9	25.1	16.7	23.6	75.9	3.7U	9.9
FERROUS IRON	mg/l					0.2																		
HARDNESS (AS CACO3)	mg/l					137		2500		3400		2300		3400		3300		4100		3700		4500		2700
IRON	ug/l	3390				2180		328	788	3510	1020	181	39.2U	5630	1630	846	407	918	12000	8520	15300	95800	3400	456
Iron, Ferric	mg/l																							
LEAD	ug/l					2.8		75.2	204	22U	11.5U	5.5	38.4	5.6	5.2	3.1	3.4	4.4U	14.9	11.6	17.9	84.2	7.3	4.4U
MANGANESE	ug/l					278		10		94		5.3		132		17.4		19.8		204		1070		5.8U
MERCURY	ug/l					0.1U		0.1U		0.1U		0.1U		0.13		0.1U		0.1U		0.18		0.35		0.1U
MOLYBDENUM	ug/l																							
NICKEL	ug/l					2.4U		22.1	17.6	207	165	14.2	11.7	21.2	19	95.3	127	44.8	259	38.3	29.9	956	42.4	20.9
NITRATE	mg/l							0.1U		0.12		0.1U		0.1U		0.14		0.26		0.12		0.11		0.1
NITRATE AS NITROUS OXIDE	mg/l					0.56																		
NITRITE	mg/l																							
SELENIUM	ug/l					4.2U		3.9U		39U		3.9U		7.8U		3.9U		7.8U		3.9U		7.8U		7.8U
SILVER	ug/l					1.4U		0.7U		7U		0.7U		1.4U		0.7U		1.4U		0.7U		1.4U		1.4U
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY																								
STRONTIUM	ug/l																							
SULFIDE	mg/l	1U				1U		1U		2.84		12.6		1U		1U		1U		1U		1U		1U
SULFITE	mg/l																							
THALLIUM	ug/l					4.7U		4.4U		44U		4.4U		8.8U		4.4U		8.8U		4.4U		8.8U		8.8U
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l					87.3																		
TOTAL DISSOLVED SOLIDS	mg/l					286		2200		4800		2980		3020		2720		3060		2440		3480		2930
TOTAL ORGANIC CARBON	mg/l	3.3				3.6																		
VANADIUM	ug/l					4.7U		3.9		15U		2.1		5.7		3		3U		27.8		1400		3U
ZINC	ug/l					8.2		119	35.9J	1800	29U	61.3	32.4B	421	9.5B	117	18.7B	308	66.6J	162	48B	1090	13.8B	204

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	115-MW-119A	115-MW-206	115-MW-206	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-AA15	115-MW-DP1	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E14
Filtered		N	N	N	N	N	Y	N	Y	N	N	Y	N	N	Y	N	N	N	N	Y	N	Y	N
Date		6/18/04	12/3/03	6/18/04	10/15/97	7/2/98	7/2/98	7/13/00	7/13/00	3/9/01	6/3/02	6/3/02	4/17/03	4/17/03	4/17/03	4/17/03	6/17/04	3/15/06	8/27/97	7/9/98	7/9/98	7/13/00	7/13/00	3/9/01
BICARBONATE ALKALINITY	mg/l					5								5U						5				
CALCIUM	ug/l		143000			20500		19700	20300	26800			28800							708000		720000	760000	623000
CHLORIDE	mg/l		414			5		42		97.5				36						5		390		5
CHROMIUM	ug/l		22400		84.5	44.8	39.5	38.9	22.7	522	321	167	584		421		146000	8990	9850	9810	9650	10100	9850
HEXAVALENT CHROMIUM	ug/l		22500J		10	37	35.8	19.1		406	154	140		491		378		139000	8360	10400	10900	9890		10100
MAGNESIUM	ug/l		684			76.5		86.7	86.7	122			101J							41.8		86.7	86.7	81.6
pH										12.18														12.51
POTASSIUM	ug/l		29500			36600		36100	37500	29100			27000							2910		2790	2990	1840
SODIUM	ug/l		586000			472000		424000	443000	398000			375000							29800		25200	26200	19900
SULFATE	mg/l					26.3		27.5		22.3				20.4						5		5		6.2
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l		3530			5290		4590	4800	4310										205		181	171	212
ANTIMONY	ug/l		3.9U					3.9	4.2	5.9												3.9	3.9	11.8
ARSENIC	ug/l		3.4U					12.9	13.6	12.4												3.3	3.3	4.6
BARIUM	ug/l		159					23.1	24.1	26.5												522	558	296
BERYLLIUM	ug/l		0.1U					0.2	0.2	0.3												0.2	0.2	0.6
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l		0.4U					0.4	0.4	0.5												0.4	0.4	1
CARBONATE ALKALINITY	mg/l		1370			160		1050		925				100						40		1250		1400
COBALT	ug/l		3.5U					2	2	2.2												2	2	4.4
COPPER	ug/l	7.7	6.8	71				3.4	3.4	2.8							3.1					3.4	3.4	5.6
FERROUS IRON	mg/l																							
HARDNESS (AS CACO3)	mg/l		1650																					
IRON	ug/l	820	697	53500		111	47.1	41.8	41.8	154							98.6			185	47.1	41.8	41.8	90
Iron, Ferric	mg/l																							
LEAD	ug/l	11.6	2.2U	85.7				2.2	2.2	2.6							2.1U					3.3	4.3	5.2
MANGANESE	ug/l		12.4					1.5	1.5	4.9												1.5	1.5	1.6
MERCURY	ug/l		0.1U					0.1	0.1	0.1												0.1	0.1	0.1
MOLYBDENUM	ug/l																							
NICKEL	ug/l	23.4	45.2	628				44.1	45.8	39.1							39.8					2.3	2.3	4.2
NITRATE	mg/l		0.12							0.12														0.85
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l																							
SELENIUM	ug/l		3.9U					4.8	4.8	4.1												4.8	4.8	8.2
SILVER	ug/l		0.7U					1.4	1.4	2.3												1.4	1.4	4.6
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY														1.003										
STRONTIUM	ug/l																							
SULFIDE	mg/l		5.1																					
SULFITE	mg/l																							
THALLIUM	ug/l		4.4U					4.5	4.5	4.8												4.5	4.5	9.6
TIN	ug/l									3.4														6.8
TITANIUM	ug/l									4.7														2.2
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		2440											1220										
TOTAL ORGANIC CARBON	mg/l									14.8														3.2
VANADIUM	ug/l		59.8					23.2	23.8	16												2.6	2.6	8
ZINC	ug/l	24.7B	338	315				5.7	12	5.8							11.9B					5.7	7.7	6.4

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E14	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-E8	115-MW-O13	115-MW-O13	115-MW-O13	115-MW-O13
Filtered		N	N	Y	Y	N	N	Y	N	N	N	Y	N	Y	N	N	N	Y	Y	N	N	Y	N	Y
Date		4/17/03	4/17/03	4/17/03	4/17/03	6/18/04	7/21/06	7/21/06	8/27/97	9/29/97	7/9/98	7/9/98	7/13/00	7/13/00	3/9/01	4/17/03	4/17/03	4/17/03	4/17/03	6/18/04	8/27/97	8/27/97	7/9/98	7/9/98
BICARBONATE ALKALINITY	mg/l		5U					5.0U									5U						5	
CALCIUM	ug/l	526000					935000	951000		746000			892000	878000	851000	772000							679000	
CHLORIDE	mg/l		10					76.1					13		5		15.9						5	
CHROMIUM	ug/l	10500		10700			5140	5660	23300	19300	18800	18900	16800	16000	16100	13600		14400		17500	17700	15100	14900
HEXAVALENT CHROMIUM	ug/l		10500		10500		5600	5900	24400	19800	21000	21200	16000		16500		14800		14900	17500	17300	15500	17300
MAGNESIUM	ug/l	34.8U					5000U	5000U		55.5			86.7	86.7	81.6	34.8U						41.8	
pH							12.12								12.67									
POTASSIUM	ug/l	1790JB					5000U	5000U		2820			3170	2890	2700	2150JB						19900	
SODIUM	ug/l	19900					43000	46000		179000			120000	114000	138000	106000						353000	
SULFATE	mg/l		5U					2.1					5		8780		5U						5	
ALKALINITY, CARBONATE (AS CACO3)	mg/l							2310																
ALUMINUM	ug/l						200U	200U		115			74.6	74.6	163							180		
ANTIMONY	ug/l						6.0UJ	6.0U		2.9			3.9	3.9	11.8									
ARSENIC	ug/l						8.0J	9.1J		6.9			3.3	3.3	4.6									
BARIUM	ug/l	295					762	758		401			404	398	363	336								
BERYLLIUM	ug/l						1.0U	1.0U		0.1			0.2	0.2	0.6									
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l						4.0U	4.0U		0.2			0.4	0.4	1									
CARBONATE ALKALINITY	mg/l		40					797					2320		2400		80					80		
COBALT	ug/l						50UJ	50UJ		0.8			2	2	4.4									
COPPER	ug/l					3.7U	25UJ	25UJ		4.1			3.4	3.4	5.6				3.7U					
FERROUS IRON	mg/l							0.10U																
HARDNESS (AS CACO3)	mg/l						2350																	
IRON	ug/l	28.6U				99	100UJ			38.3			41.8	74.7	90	28.6U			467			47.1	47.1	
Iron, Ferric	mg/l							0.20U																
LEAD	ug/l					6.2	13.3	11.4		2.4			2.2	2.2	5.2				2.3U					
MANGANESE	ug/l	0.54J					15UJ	15UJ		0.6			1.5	1.5	1.6	0.9								
MERCURY	ug/l						0.20UJ	0.20UJ		0.1			0.1	0.1	0.1									
MOLYBDENUM	ug/l																							
NICKEL	ug/l					2.1	40UJ	40UJ		2.9			2.3	2.3	4.2				4.4					
NITRATE	mg/l		0.84J					0.49							0.1		0.21							
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l							0.19																
SELENIUM	ug/l						10U	10U		3.7			4.8	4.8	8.2									
SILVER	ug/l						10UJ	10UJ		1.2			1.4	1.4	4.6									
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY			1.004														1.005							
STRONTIUM	ug/l	738														2950								
SULFIDE	mg/l							2.0U																
SULFITE	mg/l																							
THALLIUM	ug/l						10U	10U		4.3			4.5	4.5	9.6									
TIN	ug/l														6.8									
TITANIUM	ug/l														2.2									
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		1600				2030										2530							
TOTAL ORGANIC CARBON	mg/l		2.8				5.9								2.3		1.9							
VANADIUM	ug/l						50U	50U		2.1			2.6	2.6	8									
ZINC	ug/l					21.6B	20U	20U		14.5			8.9	26.1	6.4				5.8U					

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	115-MW-O13	115-MW-O13	115-MW-O13	115-MW-O13	115-MW-O13	115-MW-O13	115-MW-O13	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	115-MW-U14	117-MW-A14	117-MW-A14	117-MW-A14	117-MW-A14	117-MW-A14	117-MW-A14
Filtered		N	Y	N	Y	N	Y	N	N	Y	N	Y	N	N	Y	N	Y	N	N	N	Y	N	N	N
Date		7/16/98	7/16/98	7/14/00	7/14/00	4/18/03	4/18/03	6/17/04	1/6/99	1/6/99	7/20/99	7/20/99	7/13/00	7/13/00	3/11/01	4/18/03	4/18/03	6/17/04	11/11/97	8/20/98	8/20/98	4/17/03	4/17/03	4/17/03
BICARBONATE ALKALINITY	mg/l	5				5U			5			5				5U							180	170
CALCIUM	ug/l	710000		614000	631000	407000			655000				649000	620000	680000	727000						79600	75600	
CHLORIDE	mg/l	5		93.9		53.3			150			37	31		83.8	31.9							216J	216J
CHROMIUM	ug/l			13400	13600	9420J	11300J		17000	16500	17200	17700	13800	13400	14700	13700J	13600		133	95.6	90		59.3J	
HEXAVALENT CHROMIUM	ug/l			13000		9450	10600		17100	16700	18000	16600	13900		15700	15000	223000		131	83.7	86.2		10U	10U
MAGNESIUM	ug/l	41.8		86.7	86.7	34.8U			89.2				86.7	86.7	81.6	34.8U						14500	13700	
pH															12.66									
POTASSIUM	ug/l	20500		19100	19100	8090			13100				11000	10800	10800	6730						3840J	3510J	
SODIUM	ug/l	368000		342000	333000	185000			532000				370000	370000	413000	379000						132000	121000	
SULFATE	mg/l	5		28.5		7.7			5			5	5		14.7	5U							78.6	78.6
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l	184		565	435				229				1050	1240	163									
ANTIMONY	ug/l			3.9	3.9								3.9	3.9	11.8									
ARSENIC	ug/l			16.6	14.9								3.3	3.3	5									
BARIUM	ug/l			272	273	176J							269	264	283	277								
BERYLLIUM	ug/l			0.2	0.2								0.2	0.2	0.6									
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l			0.4	0.4								0.4	0.4	1									
CARBONATE ALKALINITY	mg/l	2560		2080		80			448			2810	2440		2380	60							5U	5U
COBALT	ug/l			10.5	9.9								3.2	3.5	4.4									
COPPER	ug/l			7.1	6.5			50.8					5.2	5.5	5.6			11						
FERROUS IRON	mg/l																							
HARDNESS (AS CACO3)	mg/l																							
IRON	ug/l	47.1	47.1	64.6	41.8	132		16500	42.6	31.4			41.8	41.8	90	28.6U		261						
Iron, Ferric	mg/l																							
LEAD	ug/l			2.2	2.2			10.5U					2.2	2.2	5.2			6.3U						
MANGANESE	ug/l			1.5	1.5	2.6							1.5	1.5	1.6	0.36U								
MERCURY	ug/l			0.16	0.14								0.1	0.1	0.1									
MOLYBDENUM	ug/l																							
NICKEL	ug/l			53.1	46.9			420					8.6	8.5	9.3			5.7						
NITRATE	mg/l					0.12						0.15			0.16	0.11									
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l											0.2												
SELENIUM	ug/l			4.8	4.8								4.8	4.8	8.2									
SILVER	ug/l			1.4	1.4								1.4	1.4	4.6									
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY						1.004					1.001					1.005							1.003	1.003
STRONTIUM	ug/l					3090										6920								
SULFIDE	mg/l																							
SULFITE	mg/l																							
THALLIUM	ug/l			4.5	4.5								4.5	4.5	9.6									
TIN	ug/l														6.8									
TITANIUM	ug/l														2.2									
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l					1720					2960					2690							714	740
TOTAL ORGANIC CARBON	mg/l					18.3					8.9	9			8.4	7.5								
VANADIUM	ug/l			25.8	18.4								2.6	2.6	8									
ZINC	ug/l			9	6.7			251					5.7	5.7	6.4			22.6B						

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	117-MW-A14	117-MW-A14	117-MW-A14	117-MW-A14	117-MW-A5	117-MW-A5	117-MW-A5	117-MW-A5	117-MW-A5	117-MW-A5	117-MW-A62	117-MW-A62	117-MW-A62	117-MW-A62	117-MW-A62	117-MW-A62	117-MW-A62	117-MW-A62	117-MW-A85	117-MW-A85	117-MW-A85	117-MW-A85	117-MW-A85
Filtered		Y	Y	N	Y	N	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Date		4/17/03	4/17/03	7/19/06	7/19/06	11/12/97	8/20/98	8/20/98	4/17/03	4/17/03	4/17/03	11/12/97	11/12/97	8/19/98	8/19/98	4/17/03	4/17/03	7/19/06	7/19/06	11/11/97	11/11/97	8/20/98	8/20/98	4/14/99
BICARBONATE ALKALINITY	mg/l				240		76.5			60.4						345			362					
CALCIUM	ug/l			172000	170000		46200		352000							74600		92800	90600					1520000
CHLORIDE	mg/l				256		36			87.9J						118J			399					
CHROMIUM	ug/l		46.5J	90.9	86	164	36.2	39.5				1810	22.7	108	9.5	401J	37.1J	96.3	10U	8970	1130	14100	8720	119000
HEXAVALENT CHROMIUM	ug/l	10U	10U	65	65	151	32.4	29.9		10U	10U	10	10	10	10	10U	10U	50UJ	50UJ	10	20	10	10	10
MAGNESIUM	ug/l			26800	27000		7990		33400							20500		19900	19700					8830
pH				6.55														6.99						
POTASSIUM	ug/l			6830J	6870J		1540		11000							25900		47700J	47700J					38500
SODIUM	ug/l			256000J	153000J		23300		85200							82500		255000J	263000J					994000
SULFATE	mg/l				198		76.2			1140						18.5			6.7					
ALKALINITY, CARBONATE (AS CACO3)	mg/l				240														362					
ALUMINUM	ug/l			200U	200U		94.9											200U	200U					311000
ANTIMONY	ug/l			10.3B	11.0B													12.1B	13.3JB					
ARSENIC	ug/l			8.0UJ	8.0UJ													37.2	32					
BARIUM	ug/l			200U	200U													200U	200U					
BERYLLIUM	ug/l			1.0UJ	1.0UJ													1.0UJ	1.0UJ					
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l			4.0U	4.0U													4.0U	4.0U					
CARBONATE ALKALINITY	mg/l				5.0U		76.5			5U						5U			5.0U					
COBALT	ug/l			50U	50U													50U	50U					
COPPER	ug/l			25U	25U													26.7	25U					
FERROUS IRON	mg/l				0.10U														1.7					
HARDNESS (AS CACO3)	mg/l			516														300						
IRON	ug/l			157J	100UJ		49.6	49.6										19400	19200					212000
Iron, Ferric	mg/l				0.20U														17.5					
LEAD	ug/l			3.4B	3.9B													4.6JB	4.8JB					
MANGANESE	ug/l			15U	15U													457	458					
MERCURY	ug/l			0.20U	0.20U													0.20U	0.20U					
MOLYBDENUM	ug/l																							
NICKEL	ug/l			40U	40U													40U	40U					
NITRATE	mg/l				3.6														0.11U					
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l				0.010U														0.010U					
SELENIUM	ug/l			10U	10U													10U	10U					
SILVER	ug/l			10U	10U													10U	10U					
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY										1.004						1.003								1.001
STRONTIUM	ug/l																							
SULFIDE	mg/l				2.0U														2.0U					
SULFITE	mg/l																							
THALLIUM	ug/l			10UJ	10UJ													10UJ	10UJ					
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l			981						1790						612		993						7190
TOTAL ORGANIC CARBON	mg/l			4.6														13.7						2310
VANADIUM	ug/l			50U	50U													50U	50U					
ZINC	ug/l			20U	20U													20U	20U					

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	117-MW-A85	117-MW-A85	117-MW-A85	117-MW-A85	117-MW-A85	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A89	117-MW-A99	117-MW-A99	117-MW-A99	117-MW-A99	117-MW-A99	117-MW-A99	117-MW-A99
Filtered		Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	N	N	Y	N	Y	N
Date		4/14/99	4/18/03	4/18/03	7/18/06	7/18/06	11/11/97	11/11/97	8/21/98	8/21/98	4/15/99	4/15/99	4/15/99	4/15/99	4/17/03	4/17/03	7/18/06	7/18/06	11/11/97	8/19/98	8/19/98	4/15/99	4/15/99	4/17/03
BICARBONATE ALKALINITY	mg/l	420	310			600			128				83.4	81.4	34.6			180					334	
CALCIUM	ug/l	172000	23000		25000U	11100			33300		95200	96400	91700	91100	255000		53200	72400				54000	56600	59400
CHLORIDE	mg/l	5	155			196			160				500	490	1660J			483					570	
CHROMIUM	ug/l	29000	3380J	2760J	3640	1020	1870	1790	122	52.6	31.7	26.3	11.3	10.3	457J	401J	784	189	504	130	17.5	215	3	78.4
HEXAVALENT CHROMIUM	ug/l	10	10U	10U	50U	50U	1750	1720	11.6	10	10	10	10	10	416	416	550	310	10	10	10	10	10	
MAGNESIUM	ug/l	2100	1700		25000U	5000U			2280		2700	2720	3590	3670	3260J		5000U	5910				25700	28400	19300
pH					10.2												8.23							
POTASSIUM	ug/l	33900	12100		25000U	21100			28500		37600	38200	38200	38200	51500		29600	33100				25000	27600	36700
SODIUM	ug/l	917000	306000		407000	373000			137000		217000	220000	232000	233000	888000		312000	330000				333000	387000	282000
SULFATE	mg/l	5	7.7			11.6			64.2				82.2	16.8	185			120					5	
ALKALINITY, CARBONATE (AS CACO3)	mg/l					849												181						
ALUMINUM	ug/l	91600			20600	4400			233		41.9	38.6	30.1	34.4			369	200U				70.9	29.6	
ANTIMONY	ug/l				200	65.6											6.0U	6.0U						
ARSENIC	ug/l				65	33.8											8.0U	8.0U						
BARIUM	ug/l		167J		1000U	200U											200U	200U						
BERYLLIUM	ug/l				5.0U	1.0U											1.0U	1.0U						
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l				20U	4.0U											4.0U	4.0U						
CARBONATE ALKALINITY	mg/l	1860	340			246			24.5				83.4	81.4	5U			5.0U					5	
COBALT	ug/l				250U	50U											50U	50U						
COPPER	ug/l				293	41.8											49.5	25U						
FERROUS IRON	mg/l					0.57												0.10U						
HARDNESS (AS CACO3)	mg/l				152												156							
IRON	ug/l	64500	18200		15800	2320			157	105	2090	2000	2710	2970			632	146				2440	2080	
Iron, Ferric	mg/l					1.8												0.20U						
LEAD	ug/l				194	16											5.4	4.1						
MANGANESE	ug/l		131		122	23.4											109	229						
MERCURY	ug/l				6.9	4.6											0.20U	0.20U						
MOLYBDENUM	ug/l																							
NICKEL	ug/l				200U	40U											40U	40U						
NITRATE	mg/l	0.1	0.1U			0.15U							0.56	0.55				0.69					0.1	
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l	0.88				0.050U							0.26	0.26				0.010U					0.1	
SELENIUM	ug/l				50U	10U											10U	10U						
SILVER	ug/l				50U	10U											10U	10U						
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY			1.003								1	1			1.005							1		
STRONTIUM	ug/l		329																					
SULFIDE	mg/l					2.1												2.0U						
SULFITE	mg/l																							
THALLIUM	ug/l				50U	10U											10U	10U						
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		1330		1760						1120	1190			3650		1160					1270		
TOTAL ORGANIC CARBON	mg/l	811	189		220						13.3	14.8	13.9	12.5			7.4					6.7	6.6	
VANADIUM	ug/l				250	143											50U	50U						
ZINC	ug/l				205	29.8											20U	20U						

Table A-1
Shallow Groundwater
Analytical Data

Location ID		117-MW-A99	117-MW-A99	117-MW-A99	117-MW-A99	117-MW-A99	124-MW-01	124-MW-01	124-MW-01	124-MW-01	124-MW-01	124-MW-01	124-MW-01	124-MW-01	124-MW-02	124-MW-02	124-MW-02	124-MW-02	124-MW-02	124-MW-02	125-MW-01	125-MW-01	125-MW-01	125-MW-01
Filtered	Unit	N	Y	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Date		4/17/03	4/17/03	4/17/03	7/26/06	7/26/06	7/6/05	7/6/05	8/10/05	8/10/05	5/22/06	5/22/06	5/22/06	5/22/06	7/6/05	7/6/05	8/10/05	8/10/05	5/22/06	5/22/06	7/8/05	7/8/05	8/11/05	8/11/05
BICARBONATE ALKALINITY	mg/l	420				240					5U	5U							5U					
CALCIUM	ug/l				30100	31600	429000		395000		349000	334000			109000		93600		58000		439000		352000	
CHLORIDE	mg/l	455				290	140		152		92.6	92.6			51.1		94.9		40.8		157		190	
CHROMIUM	ug/l		82.4		84.3	10	20900	21000	24700	25600	25100	23800	21200	21200	6520	6060	3040	2090	4050	5180	3510	2830	2810	2210
HEXAVALENT CHROMIUM	ug/l	10U		10U	50U	50U	22500	22800	27100	26500	23700	24200	21200	21800	6460	6360	2430	2140	1250	1270	3390	3130	2710	2560
MAGNESIUM	ug/l				9560	10000	178		130		83.2U	114			5630		6060		3570		251		339	
pH					7.98		12.01		12.46		12.13	12.15			11.17		11.14		10.74		12.35		12.34	
POTASSIUM	ug/l				21700J	23200J	10000		10900		7180	6950			2870		3630		3330		25000		32500	
SODIUM	ug/l				205000	209000	119000		107000		54800	53000			52300		95000		74500		307000		353000	
SULFATE	mg/l	28.3				2.2	14.2		14.3		5U	5U			109		114		56.4		5.1		7.2	
ALKALINITY, CARBONATE (AS CACO3)	mg/l					241																		
ALUMINUM	ug/l				200U	200U	956		858		437	433			237		469		398		2160		2770	
ANTIMONY	ug/l				6.0UJ	6.0UJ	11.6U		5.8U		11.6U	11.6U			5.8U		5.8U		5.8U		11.6U		5.8U	
ARSENIC	ug/l				8.0UJ	8.0UJ	6.4U		3.2U		6.4U	6.4U			3.2U		3.2U		6.4U		6.4U		3.2U	
BARIUM	ug/l				200U	200U	148		160		88.9	85			115		143		77.7		645		644	
BERYLLIUM	ug/l				1.0U	1.0U	0.6U		0.3U		0.6U	0.6U			0.3U		0.3U		0.6U		0.6U		0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l				4.0U	4.0U	0.8U		0.4U		0.8U	0.8U			0.4U		0.4U		0.8U		0.4U		0.4U	
CARBONATE ALKALINITY	mg/l	5U				5.0U					54.6	63.1							47.2					
COBALT	ug/l				50U	50U	3.4U		1.7U		3.4U	3.4U			1.7U		2.5		3.4U		3.4U		3.5	
COPPER	ug/l				25U	25U	7.4U		3.7U		7.4U	7.4U			3.7U		5.6		8.6		7.4U		10.8	
FERROUS IRON	mg/l					0.10U					1U	1U							1U				0.1U	
HARDNESS (AS CACO3)	mg/l				130																			
IRON	ug/l				2990	1310	156		137		78.4U	78.4U			39.2U		252		330		98.4		103	
Iron, Ferric	mg/l					1.3																		
LEAD	ug/l				4.4J	3.0UJ	5.4U		2.7U		5.4U	5.4U			2.7U		3.1		9.1		3.3		2.9	
MANGANESE	ug/l				191	195	2.6		2.8		2.4U	2.4U			1.2U		7.1		10.2		2.4U		2.9	
MERCURY	ug/l				0.20UJ	0.20UJ	0.1U		0.1U		0.1U	0.1U			0.1U		0.13		0.42		0.1U		0.1U	
MOLYBDENUM	ug/l																							
NICKEL	ug/l				40U	40U	26.3		27.8		9.9	9.6			9.8		24.9		31		44.7		52.4	
NITRATE	mg/l					0.11U					0.11	0.11							0.59					
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l					0.010U					0.12	0.13							0.12					
SELENIUM	ug/l				10U	10U	8.4U		4.2U		8.4U	8.4U			4.2U		4.2U		8.4U		8.4U		4.2U	
SILVER	ug/l				10U	10U	2.8U		1.4U		2.8U	2.8U			1.4U		1.4U		2.8U		2.8U		1.4U	
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY		1.003																						
STRONTIUM	ug/l																							
SULFIDE	mg/l					2.0U	1U		1U		1U	1U			1U		1U		1U		1U		1U	
SULFITE	mg/l																							
THALLIUM	ug/l				10U	10U	9.4U		4.7U		9.4U	9.4U			4.7U		4.7U		9.4U		9.4U		4.7U	
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l						1140		1060		713	722			110		93.8		104		1517		1160	
TOTAL DISSOLVED SOLIDS	mg/l	1190			658		2600		2750		1210	1090			408		650		435		4530		3630	
TOTAL ORGANIC CARBON	mg/l				6.2		11.5		10.3		4.4	4.7			6.6		12.8		17.7		10.4		11.1	
VANADIUM	ug/l				50U	50U	9.4U		4.7U		9.4U	9.4U			14		20		36.2		13.5		13.2	
ZINC	ug/l				41.2	20U	15.8		16.4		14.2	13.7			5.8U		16.8		53.7		11.6U		11.5	

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	125-MW-01	125-MW-01	125-MW-L3	125-MW-L3	125-MW-L3	125-MW-L3	125-MW-L3	125-MW-L3	134-MW-01	134-MW-01	134-MW-01	134-MW-01	134-MW-01	134-MW-01	134-MW-Q8	134-MW-Q8	134-MW-Q8	134-MW-Q8	134-MW-Q8	134-MW-Q8	134-MW-Q8	134-MW-Q8
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Date		5/22/06	5/22/06	9/3/97	9/3/97	7/10/98	7/10/98	4/16/03	4/16/03	7/7/05	7/7/05	8/12/05	8/12/05	5/23/06	5/23/06	10/14/97	10/14/97	7/8/98	7/8/98	4/15/03	4/15/03	7/7/05	7/7/05	8/12/05
BICARBONATE ALKALINITY	mg/l	268						450						5U						25.7				
CALCIUM	ug/l	43400						109000		633000		659000		724000						154000		71900		
CHLORIDE	mg/l	592						119		77.6		123		132						126		76.8		
CHROMIUM	ug/l	607	171	8.2	5.5	2.4	2.5	16.1	1.8J	10600	10400	9390	9010	11000	10200	11.7	4.8	2.9	2.9	12.5	1.2J	9	3.7	4
HEXAVALENT CHROMIUM	ug/l	10U	10U	10	10	10	10	10U	10U	12000	11900	9990	9840	10500	9470	10	10	10	10	10UJ	10UJ	10U	10U	10U
MAGNESIUM	ug/l	4580						35100		83.2U		621		41.6U						2900J		3470		
pH		6.7								12.46		12.75		12.59								8.48		
POTASSIUM	ug/l	32000						9580		9570		13700		12400						10200		12800		
SODIUM	ug/l	827000						116000		194000		220000		217000						49000		71200		
SULFATE	mg/l	19						66.8		6.2		20U		25.6						294		162		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l	1970								857		1610		387								451		
ANTIMONY	ug/l	5.8U								11.6U		5.8U		5.8U								5.8U		
ARSENIC	ug/l	10.2								6.4U		5.5		3.9								15.5		
BARIUM	ug/l	31.8								283		332		296								27.6		
BERYLLIUM	ug/l	0.3U								0.6U		0.3U		0.3U								0.3U		
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l	0.4U								0.8U		0.4U		0.4U								0.4U		
CARBONATE ALKALINITY	mg/l	5U						5U						43.9						23.8				
COBALT	ug/l	1.7U								3.4U		3.3		1.7U								1.7U		
COPPER	ug/l	7.5								7.4U		9.8		3.7U								3.7U		
FERROUS IRON	mg/l	0.14										0.1U		1U										
HARDNESS (AS CACO3)	mg/l																							
IRON	ug/l	154								78.4U		1590		39.2U								72.9		
Iron, Ferric	mg/l																							
LEAD	ug/l	2.7U								5.4U		6.7		2.7U								2.7U		
MANGANESE	ug/l	7.9								3.2		34.2		1.2U								33.1		
MERCURY	ug/l	0.1U								0.1U		0.13		0.1U								0.1U		
MOLYBDENUM	ug/l																							
NICKEL	ug/l	30.1								9.2		20.3		15.4								2.4U		
NITRATE	mg/l	344												0.17										
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l	0.32												0.39										
SELENIUM	ug/l	4.2U								8.4U		4.2U		4.2U								4.2U		
SILVER	ug/l	1.4U								2.8U		1.4U		1.4U								1.4U		
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY								1.003												1.003				
STRONTIUM	ug/l																							
SULFIDE	mg/l	1U								1U		1U		1U								1U		
SULFITE	mg/l																							
THALLIUM	ug/l	4.7U								9.4U		4.7U		4.7U								4.7U		
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l	268								2030		1960		1682								114		
TOTAL DISSOLVED SOLIDS	mg/l	3540						824		6700		5930		2580						792		25200		
TOTAL ORGANIC CARBON	mg/l	16								5.6		6.7		8.7								4.6		
VANADIUM	ug/l	60.2								9.4U		5.4		4.7U								35.5		
ZINC	ug/l	17.3								11.6U		41.8		84.4								24.7		

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	134-MW-Q08	134-MW-Q08	134-MW-Q08	134-MW-V9	134-MW-V9	134-MW-V9	134-MW-V9	134-MW-V9	134-MW-V9	134-MW-V9	134-MW-V9	134-MW-V09	134-MW-V09	134-MW-V09	134-MW-V09	140-MW-01	140-MW-01	140-MW-01	140-MW-01	140-MW-01	140-MW-01	140-MW-04	140-MW-04
Filtered		N	Y	N	N	Y	N	Y	N	Y	N	Y	N	N	Y	N	N	Y	N	Y	N	Y	N	Y
Date		8/12/05	5/23/06	5/23/06	10/14/97	10/14/97	7/8/98	7/8/98	4/15/03	4/15/03	7/7/05	7/7/05	8/12/05	8/12/05	5/23/06	5/23/06	7/7/05	7/7/05	8/11/05	8/11/05	5/23/06	5/23/06	11/4/97	11/4/97
BICARBONATE ALKALINITY	mg/l			43.1					531						398						5U			
CALCIUM	ug/l	82900		76900					132000		132000			149000	367000		208000		207000		176000			
CHLORIDE	mg/l	80.4		105					142		223			228	1060		74.5		85.7		104			
CHROMIUM	ug/l	20.7	3.9	6.7	475	7.3	168	37.1	223	46.4	1240	10.7	14	.744	97	4.9	78.8	14.8	169	2.8U	11.3	3U	10.4	8.8
HEXAVALENT CHROMIUM	ug/l	10U	10UJ	10UJ	10	10	10	10	10UJ	10UJ	10U	10U	10U	100U	10UJ	10UJ	14J	17.1	10U	10U	10UJ	10UJ	10	10
MAGNESIUM	ug/l	3300		3970					22100		32300			28500	41700		151		425		100			
pH		8.82		7.95							7.18			7.27	7.26		12.35		12.36J		11.98			
POTASSIUM	ug/l	16800		14100					11200		18400			22100	20400		8580		11700J		18900			
SODIUM	ug/l	69400		86700					126000		216000			180000	267000		115000		121000		151000			
SULFATE	mg/l	208		128					44.6		25			36.1	28.5		10.3		13.6		7.8			
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l	484		320							17900			10900	1400		1460		1940		2720			
ANTIMONY	ug/l	5.8U		6.1							5.8U			5.8U	5.8U		5.8U		5.8U		5.8U			
ARSENIC	ug/l	12.7		10.5							30.1			17.6	3.2U		3.5		4.1		9.2			
BARIUM	ug/l	33.1		26.1							424			416	697		183		193		135			
BERYLLIUM	ug/l	0.3U		0.3U							0.93			0.63	0.3U		0.3U		0.3U		0.3U			
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l	0.4U		0.4U							0.4U			0.4U	0.4U		0.4U		0.4U		0.4U			
CARBONATE ALKALINITY	mg/l			167					5U						5U						96.4			
COBALT	ug/l	1.7U		1.7U							13.8			10.2	1.7U		1.7U		1.7U		1.7U			
COPPER	ug/l	4.2		3.7U							219			89.2	25.5		3.7U		6.3		3.7U			
FERROUS IRON	mg/l	0.1U		0.1U										0.1	0.2				0.1UJ		0.1U			
HARDNESS (AS CACO3)	mg/l																							
IRON	ug/l	243		106							72700			38200	10500		213		679		62.9			
Iron, Ferric	mg/l																							
LEAD	ug/l	2.7U		2.7U							96.1			53.2	7		2.7U		4.4		2.7U			
MANGANESE	ug/l	35.9		35.6							3810			4360	5850		4.7		12.6		1.4			
MERCURY	ug/l	0.1U		0.1U							1.1			0.64	0.1U		0.13		0.22		0.1U			
MOLYBDENUM	ug/l																							
NICKEL	ug/l	3.6		3.8							121			99.6	10.4		8.2		13.1		15.8			
NITRATE	mg/l			0.1U											0.1U						0.1U			
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l			0.1U											0.1U						0.1U			
SELENIUM	ug/l	4.2U		4.2U							4.2U			4.2U	4.2U		4.2U		4.2U		4.2U			
SILVER	ug/l	1.4U		1.4U							1.4U			1.4U	1.4U		1.4U		1.4U		1.4U			
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY									1.003															
STRONTIUM	ug/l																							
SULFIDE	mg/l	1U		1U							1U			1U	1U		1U		1U		1U			
SULFITE	mg/l																							
THALLIUM	ug/l	4.7U		4.7U							4.7U			4.7U	4.7U		4.7U		4.7U		4.7U			
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l	108		210							542			458	398		732		720		643			
TOTAL DISSOLVED SOLIDS	mg/l	558		552					854		1880			932	3870		2140		2020		885			
TOTAL ORGANIC CARBON	mg/l	4.5		6							14.4			12.7	11.3		5.2		6.1		8.8			
VANADIUM	ug/l	31.1		18.3							54.6			33.7	6.9		5.8		10.8		4.7U			
ZINC	ug/l	56.2		19.4							2030			848	105		11.2		16.9		7.6			

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-04	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06	140-MW-06
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Date		7/10/98	7/10/98	4/16/03	4/16/03	7/7/05	7/7/05	8/11/05	8/11/05	5/22/06	5/22/06	11/3/97	11/3/97	7/15/98	7/15/98	4/16/03	4/16/03	7/7/05	7/7/05	8/11/05	8/11/05	5/22/06	5/22/06	7/21/06
BICARBONATE ALKALINITY	mg/l			300						205				5		5U						5U		
CALCIUM	ug/l			67200		30300		44600		65700				572000		597000		151000		200000		172000		307000
CHLORIDE	mg/l			436		190		281		391				190		152		95.8		152		267		
CHROMIUM	ug/l	6.2	5.1	5.6J	4.4J	9.6	4.7	11.5	4.6	14	6.3	6720	7320	6520	7090	5010J	4790J	2870	2810	3920	3300	1400	2930	2180
HEXAVALENT CHROMIUM	ug/l	10	10	10U	10U	10U	10U	10U	10U	10U	10U	7460	7460	6320	6940	5270	4910	3330	3180	3740	4740	797	1480	1200
MAGNESIUM	ug/l			5120		3030		3750		6350				209		1420J		483		1290		2330		5000U
pH						6.29		6.53J		7.08								12.14		12.33J		11.63		11.24
POTASSIUM	ug/l			13200		9840		19300J		20100				11900		8890		8880		27300J		22200		20400
SODIUM	ug/l			279000		129000		193000		272000				270000		234000		111000		174000		202000		240000
SULFATE	mg/l			11.5		18.2		18.8		58.2				5		5U		82.4		50U		32.2		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l					324		295		627				248				1540		2940		3060		2450
ANTIMONY	ug/l					5.8U		5.8U		5.8U								5.8U		5.8U		6		6.9J
ARSENIC	ug/l					3.2U		3.2U		3.2U								3.2U		3.2U		3.2U		8.0UJ
BARIUM	ug/l					226		369		468								106		189		122		218
BERYLLIUM	ug/l					0.3U		0.3U		0.3U								0.3U		0.3U		0.3U		1.0U
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l					0.7		0.69		0.56								0.4U		0.4U		0.64		4.0U
CARBONATE ALKALINITY	mg/l			5U						5U				60		80						98.4		
COBALT	ug/l					1.7U		2.2		1.7U								1.7U		3.3		1.7U		50UJ
COPPER	ug/l					5.6		5.3		3.7U								14.9		25.1		20.2		67.3
FERROUS IRON	mg/l							2.4J		0.37										0.1UJ		0.1U		
HARDNESS (AS CACO3)	mg/l																							892
IRON	ug/l					3710		4090		4860				47.1	47.1			1160		3280		3760		2600
Iron, Ferric	mg/l																							
LEAD	ug/l					2.7U		2.7U		2.7U								2.7U		8.5		7.1		12.4
MANGANESE	ug/l					196		272		337								22.9		57		59.4		45.4
MERCURY	ug/l					0.1U		0.1U		0.1U								0.1U		0.11		0.1U		0.20UJ
MOLYBDENUM	ug/l																							
NICKEL	ug/l					6.5		7.2		10.9								26		33.3		20.4		48
NITRATE	mg/l									0.1U												0.28		
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l									0.1U												1.4		
SELENIUM	ug/l					4.2U		4.2U		4.2U								4.2U		4.2U		4.2U		10U
SILVER	ug/l					1.4U		1.4U		1.4U								1.4U		1.4U		1.4U		10UJ
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY				1.003												1.004								
STRONTIUM	ug/l																							
SULFIDE	mg/l					1U		1U		1U								1U		1U		1U		
SULFITE	mg/l																							
THALLIUM	ug/l					4.7U		4.7U		4.7U								5.8		4.7U		4.7U		10U
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l					125		197		205								404		738		812		
TOTAL DISSOLVED SOLIDS	mg/l			1200		605		868		992						2400		1340		2200		945		1070
TOTAL ORGANIC CARBON	mg/l					13.9		12.6		13.2								15.4		18.2		17.9		15.6
VANADIUM	ug/l					4.7U		4.7U		4.7U								16.2		29.2		21.9		50U
ZINC	ug/l					27.1		23.4		21.8								47.4		110		101		81.4

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	140-MW-06	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-07	140-MW-106	140-MW-106	140-MW-106	140-MW-106	140-MW-106	140-MW-106
Filtered		Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	Y	N	N	Y	N	Y	N	Y	N	Y
Date		7/21/06	11/3/97	11/3/97	7/10/98	7/10/98	4/16/03	4/16/03	7/7/05	7/7/05	8/11/05	8/11/05	5/22/06	7/20/06	7/20/06	7/20/06	7/20/06	7/20/06	7/7/05	7/7/05	8/11/05	8/11/05	5/22/06	5/22/06
BICARBONATE ALKALINITY	mg/l	5.0U					195								179			179					266	
CALCIUM	ug/l	375000					36400		37800		37200			52100	51000	52100		51000	88600		89000		57900	
CHLORIDE	mg/l	230					140		115		88.5				88			88	354		335		130	
CHROMIUM	ug/l	2580	36.1	9.7	24.9	5.5	23.2J	8.5J	154	6.9	53.4	2.8U	3U	42.9	10.5	42.9		10.5	17.6	4.8	10.9	3.8	15.7	3.3
HEXAVALENT CHROMIUM	ug/l	1500	10	10	10	10	10U	10U	10U	10U	10U	10U	10U	50UJ	50UJ	50UJ		50UJ	10U	10U	10U	10U	10U	10U
MAGNESIUM	ug/l	5000U					2240J		3680		3920			5850	5700	5850		5700	16200		15600		9220	
pH									7.86		7.79J			7.37		7.37			7.65		7.71J		8.04	
POTASSIUM	ug/l	21100					4960J		9350		11500J			12900	13000	12900		13000	13100		17600J		7440	
SODIUM	ug/l	263000					122000		110000		65200			80500	87500	80500		87500	155000		180000		121000	
SULFATE	mg/l	45.1					9.6		42		25.6				36.1			36.1	13.1		30		32.3	
ALKALINITY, CARBONATE (AS CACO3)	mg/l	1350													180			180						
ALUMINUM	ug/l	672							986		660			352J	200UJ	352J		200UJ	126		62.6U		83	
ANTIMONY	ug/l	9.0J							5.8U		5.8U			6.0U	6.0U	6.0U		6.0U	5.8U		5.8U		5.8U	
ARSENIC	ug/l	8.0J							6.2		5.2			8.0UJ	8.0UJ	8.0UJ		8.0UJ	7.1		8.7		4	
BARIUM	ug/l	246							417		391			378	471		378	471	288		278		157	
BERYLLIUM	ug/l	1.0U							0.3U		0.3U			1.0UJ	1.0UJ	1.0UJ		1.0UJ	0.3U		0.3U		0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l	4.0U							0.6		0.47			4.0UJ	4.0UJ	4.0UJ		4.0UJ	0.4U		0.4U		0.4U	
CARBONATE ALKALINITY	mg/l	458					5U								5.0U			5.0U					5U	
COBALT	ug/l	50UJ							1.7U		6.8			50UJ	50UJ	50UJ		50UJ	1.7U		1.7U		1.7U	
COPPER	ug/l	25UJ							15.9		9.8			25U	25U	25U		25U	3.7U		3.7U		3.7U	
FERROUS IRON	mg/l	0.10U									0.1UJ				0.10U			0.10U			0.1J		0.2	
HARDNESS (AS CACO3)	mg/l													148			148							
IRON	ug/l	100UJ							390		1260			1030	544	1030		544	4530		3450		7450	
Iron, Ferric	mg/l	0.20U													0.54			0.54						
LEAD	ug/l	6.4							26		11.3			4.0J	3.0UJ	4.0J		3.0UJ	2.7U		2.7U		2.7U	
MANGANESE	ug/l	15UJ							126		81.4			116J	122J	116J		122J	511		634		1100	
MERCURY	ug/l	0.20UJ							3.4		1.3			0.3	0.20UJ		0.3	0.20UJ	0.1U		0.1U		0.1U	
MOLYBDENUM	ug/l																							
NICKEL	ug/l	40UJ							27.4		13.4			40U	40U	40U		40U	6.3		2.7		2.6	
NITRATE	mg/l	0.38													0.11U			0.11U					0.1U	
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l	0.37													0.010U			0.010U					0.1U	
SELENIUM	ug/l	10U							4.2U		4.2U			10U	10U	10U		10U	4.2U		4.2U		4.2U	
SILVER	ug/l	10UJ							1.4U		1.4U			10U	10U	10U		10U	1.4U		1.4U		1.4U	
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY							1.003																	
STRONTIUM	ug/l																							
SULFIDE	mg/l	2.0U							1U		1U				2.0U			2.0U	1U		1U		1U	
SULFITE	mg/l																							
THALLIUM	ug/l	10U							4.7U		4.7U			10U	10U	10U		10U	4.7U		4.7U		4.7U	
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l								198		130								218		238		266	
TOTAL DISSOLVED SOLIDS	mg/l						548		625		370			416			416		1150		1020		604	
TOTAL ORGANIC CARBON	mg/l								10.4		4.6			5.2			5.2		8.6		8.8		10.4	
VANADIUM	ug/l	50U							6.1		6.6			50U	50U	50U		50U	4.7U		4.7U		4.7U	
ZINC	ug/l	20U							319		107			268	96.3	268		96.3	21.7		18.9		15.3	

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	153-MW-A13	153-MW-A13	153-MW-A13	153-MW-A13	153-MW-A13	153-MW-A13	153-MW-A13	153-MW-A13	153-MW-A15	153-MW-A15	153-MW-A15	153-MW-A15	153-MW-A15	153-MW-A15	153-MW-A15	153-MW-A15	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N
Date		1/6/99	1/6/99	7/20/99	7/20/99	4/14/03	4/14/03	7/19/06	7/19/06	5/26/99	5/26/99	7/14/99	7/14/99	4/14/03	4/14/03	7/18/06	7/18/06	8/13/97	6/16/98	6/16/98	3/10/03	3/10/03	6/27/03	6/27/03	9/29/03
BICARBONATE ALKALINITY	mg/l					226			334		0		361	285			332								
CALCIUM	ug/l					73000		179000	137000	143000	155000	211000	203000	134000		132000	127000								
CHLORIDE	mg/l					131			340		196		580	508			589								
CHROMIUM	ug/l	1830	207	459	26	1050	892	1090	133	20.2	13.6	24.9	11.8	14.1J	5J	60.7	10U	5.5	2.9	2.9	1.1U	1.1U	0.9U	0.9U	2.2U
HEXAVALENT CHROMIUM	ug/l	1330	571	22.2	10	1110	772	1100	53	10	10	10	10	10U	10U	50U	50U	10	10	10	10U	10U	10U	10U	10U
MAGNESIUM	ug/l					14300		30000	25900	26900	29100	42100	41500	24400		14900	15000								
pH								7.14								6.85									
POTASSIUM	ug/l					7800		14500J	20900J	11800	13500	20300	20000	14400		27300	26800								
SODIUM	ug/l					123000		150000J	174000J	145000	158000	324000	322000	316000		346000	321000								
SULFATE	mg/l					116			89.7		263		194	116			76								
ALKALINITY, CARBONATE (AS CACO3)	mg/l								336								332								
ALUMINUM	ug/l							200U	200U	46.8	59.4	35.6	32.1			223	200U								
ANTIMONY	ug/l							13.1JB	12.3JB							6.0U	6.0U								
ARSENIC	ug/l							8.0UJ	8.0UJ							8.0U	8.0U								
BARIUM	ug/l							200U	200U							225	213								
BERYLLIUM	ug/l							1.0UJ	1.0UJ							1.0U	1.0U								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l							4.0U	4.0U							4.0U	4.0U								
CARBONATE ALKALINITY	mg/l					5U			5.0U		0		5	5U			5.0U								
COBALT	ug/l							50U	50U							50U	50U								
COPPER	ug/l							25U	25U							25U	25U								
FERROUS IRON	mg/l								0.10U								0.26								
HARDNESS (AS CACO3)	mg/l							536								396									
IRON	ug/l							100UJ	100UJ	16700	17900	18400	17700			2610	2830								
Iron, Ferric	mg/l								0.20U								2.6								
LEAD	ug/l							3.7B	4.4JB							7	3.4								
MANGANESE	ug/l							21.4	21.9							215	242								
MERCURY	ug/l							0.20U	0.20U							0.84	0.20U								
MOLYBDENUM	ug/l																								
NICKEL	ug/l							40U	40U							40U	40U								
NITRATE	mg/l								1.2		0.1		0.1				0.11U								
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l								0.010U		0.1		0.1				0.010U								
SELENIUM	ug/l							10U	10U							10U	10U								
SILVER	ug/l							10U	10U							10U	10U								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY						1.003				0		1.002		1.003											
STRONTIUM	ug/l																								
SULFIDE	mg/l								2.0U								2.0U								
SULFITE	mg/l																								
THALLIUM	ug/l							10UJ	10UJ							10U	10U								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l					638		1210		0		1840		1330		1410									
TOTAL ORGANIC CARBON	mg/l							4.4		0	0	5.4	5.3			5.6									
VANADIUM	ug/l							50U	50U							50U	50U								
ZINC	ug/l							20U	20U							20U	20U								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01
Filtered		N	Y	Y	N	N	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	N	N	Y	Y	N
Date		9/29/03	9/29/03	9/29/03	12/18/03	12/18/03	12/18/03	12/18/03	3/8/04	3/8/04	3/8/04	3/8/04	5/19/04	5/19/04	5/19/04	5/19/04	8/5/04	8/5/04	8/5/04	8/5/04	10/13/04	10/13/04	10/13/04	10/13/04	3/29/05
BICARBONATE ALKALINITY	mg/l																								
CALCIUM	ug/l																								
CHLORIDE	mg/l																								
CHROMIUM	ug/l	2.2U	2.2U	5.5	2.8U	2.8U	2.8U	2.8U	1.1UJ	1.1UJ	1.1UJ	1.1UJ	2.1B	3.5B	1.7B	2.6B	2.8U	2.8U	2.8U	2.8U	2.8U	2.8U	2.8U	2.8U	2.8U
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U	10UJ	10UJ	10UJ	10UJ	10U	10U	10U	10U	10UJ	10UJ	10UJ	10UJ	10U	10U	10U	10U	10U	10U	10U	10U	
MAGNESIUM	ug/l																								
pH																									
POTASSIUM	ug/l																								
SODIUM	ug/l																								
SULFATE	mg/l																								
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l																								
ANTIMONY	ug/l																								
ARSENIC	ug/l																								
BARIUM	ug/l																								
BERYLLIUM	ug/l																								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l																								
CARBONATE ALKALINITY	mg/l																								
COBALT	ug/l																								
COPPER	ug/l																								
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l																								
Iron, Ferric	mg/l																								
LEAD	ug/l																								
MANGANESE	ug/l																								
MERCURY	ug/l																								
MOLYBDENUM	ug/l																								
NICKEL	ug/l																								
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l																								
SELENIUM	ug/l																								
SILVER	ug/l																								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																									
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l																								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l																								
TOTAL ORGANIC CARBON	mg/l																								
VANADIUM	ug/l																								
ZINC	ug/l																								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A01	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06
Filtered		Y	N	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	N	Y	N	N	Y
Date		3/29/05	3/31/05	6/28/05	6/28/05	9/13/05	9/13/05	12/22/05	12/22/05	12/22/05	12/22/05	3/9/06	3/9/06	3/9/06	3/9/06	6/14/06	6/14/06	6/14/06	6/14/06	8/13/97	6/16/98	6/16/98	3/24/99	3/24/99	3/24/99
BICARBONATE ALKALINITY	mg/l																									189
CALCIUM	ug/l																							172000	175000	185000
CHLORIDE	mg/l																									242
CHROMIUM	ug/l	2.8U		6.8	3U	20.2	1.6U	3U	3U	3U	3U	6U	6U	6U	6U	3U	3U	3U	3U	263	106	107	123	123	117
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U	10U	20U	10U	10U	10U	10U	10U	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10	109	94.5	89.1	89.1	85
MAGNESIUM	ug/l																						10500	10800	11000
pH																									
POTASSIUM	ug/l																						2670	2500	3060
SODIUM	ug/l																						31800	32700	34700
SULFATE	mg/l																								28.9
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l																						111	81.2	33.2
ANTIMONY	ug/l																								
ARSENIC	ug/l																								
BARIUM	ug/l																								
BERYLLIUM	ug/l																								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l																								
CARBONATE ALKALINITY	mg/l																								5
COBALT	ug/l																								
COPPER	ug/l																								
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l																						220	190	14.8
Iron, Ferric	mg/l																								
LEAD	ug/l																								
MANGANESE	ug/l																								
MERCURY	ug/l																								
MOLYBDENUM	ug/l																								
NICKEL	ug/l																								
NITRATE	mg/l																								0.35
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l																								0.1
SELENIUM	ug/l																								
SILVER	ug/l																								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																									
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l																								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l																								
TOTAL ORGANIC CARBON	mg/l																						2.1	2	
VANADIUM	ug/l																								
ZINC	ug/l																								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06
Filtered		Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Date		3/24/99	1/30/01	1/30/01	1/30/01	1/30/01	3/10/03	3/10/03	6/27/03	6/27/03	9/29/03	9/29/03	12/18/03	12/18/03	3/8/04	3/8/04	5/19/04	5/19/04	8/5/04	8/5/04	10/13/04	10/13/04	3/29/05	3/29/05	3/29/05
BICARBONATE ALKALINITY	mg/l	191			223																			
CALCIUM	ug/l	187000		351000		417000																		
CHLORIDE	mg/l	240			795																			
CHROMIUM	ug/l	117		61.7		72.2	189	98.4	54.7	57.7	3.2J	4.7J	143	147	231J	60.5J	99.1	97.7	57.2	58.5	260	52.2	94.2	92.6	92.8
HEXAVALENT CHROMIUM	ug/l	85	125		69.3		87.1	90.1	60.4	55.3	10U	10U	117J	118J	52.4	51.4	88J	86J	41.4	43.4	36.7	29.9			84.9
MAGNESIUM	ug/l	11200		18800		20700																		
pH																								
POTASSIUM	ug/l	2850		3480		4120																		
SODIUM	ug/l	35100		57800		72500																		
SULFATE	mg/l	29.3			26.7																			
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l	24.1		200		81.6																		
ANTIMONY	ug/l																							
ARSENIC	ug/l																							
BARIUM	ug/l																							
BERYLLIUM	ug/l																							
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l																							
CARBONATE ALKALINITY	mg/l	5			5																			
COBALT	ug/l																							
COPPER	ug/l																							
FERROUS IRON	mg/l																							
HARDNESS (AS CACO3)	mg/l																							
IRON	ug/l	12		667		45																		
Iron, Ferric	mg/l																							
LEAD	ug/l																							
MANGANESE	ug/l																							
MERCURY	ug/l																							
MOLYBDENUM	ug/l																							
NICKEL	ug/l																							
NITRATE	mg/l	0.35			0.1																			
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l	0.1			0.1																			
SELENIUM	ug/l																							
SILVER	ug/l																							
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY			1																					
STRONTIUM	ug/l																							
SULFIDE	mg/l																							
SULFITE	mg/l																							
THALLIUM	ug/l																							
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		1930																					
TOTAL ORGANIC CARBON	mg/l		3.8		3.1																			
VANADIUM	ug/l																							
ZINC	ug/l																							

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A06	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A
Filtered		Y	N	N	N	Y	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N
Date		3/29/05	3/31/05	6/28/05	6/28/05	6/28/05	6/28/05	9/13/05	9/13/05	9/13/05	9/13/05	12/22/05	12/22/05	3/9/06	3/9/06	6/14/06	6/14/06	9/8/99	9/8/99	1/30/01	1/30/01	3/10/03	3/10/03	6/27/03	6/27/03
BICARBONATE ALKALINITY	mg/l																								
CALCIUM	ug/l																		444		415				
CHLORIDE	mg/l																	139000	143000	129000	131000				
CHROMIUM	ug/l	98.2		195	217	3U	3U	133	90.8	24.4	24.9	87.8	16.7	123	75.5	20.3	10.6		126		145	2.5J	2J	1.1J	0.9U
HEXAVALENT CHROMIUM	ug/l	91.5	85.9J	10UJ	10U	10U	10U	25.9	38.7	18.3	17.2	33.9	32.8	67.9	67.3	10UJ	10UJ	4.1	4.1	4	4	10U	10U	10U	10U
MAGNESIUM	ug/l																	10	10	10	10				
pH																		26200	26500	23600	23900				
POTASSIUM	ug/l																								
SODIUM	ug/l																	6600	7370	4810	4960				
SULFATE	mg/l																	51600	51100	56700	57200				
ALKALINITY, CARBONATE (AS CACO3)	mg/l																		11.3		12.1				
ALUMINUM	ug/l																								
ANTIMONY	ug/l																	27.9	37.5	81.6	81.6				
ARSENIC	ug/l																								
BARIUM	ug/l																								
BERYLLIUM	ug/l																								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l																								
CARBONATE ALKALINITY	mg/l																								
COBALT	ug/l																		5		5				
COPPER	ug/l																								
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l																	920	897	663	584				
Iron, Ferric	mg/l																								
LEAD	ug/l																								
MANGANESE	ug/l																								
MERCURY	ug/l																								
MOLYBDENUM	ug/l																								
NICKEL	ug/l																								
NITRATE	mg/l																		0.1		0.1				
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l																		0.1		0.1				
SELENIUM	ug/l																								
SILVER	ug/l																								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																		0.999		0.999					
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l																								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l																	697		670					
TOTAL ORGANIC CARBON	mg/l																	5.7	5.7	5.1	5				
VANADIUM	ug/l																								
ZINC	ug/l																								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-A5A
Filtered		Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N
Date		6/27/03	6/27/03	9/29/03	9/29/03	12/18/03	12/18/03	3/8/04	3/8/04	5/19/04	5/19/04	8/5/04	8/5/04	10/13/04	10/13/04	3/29/05	3/29/05	3/31/05	6/28/05	6/28/05	9/13/05	9/13/05	12/22/05	12/22/05	3/9/06
BICARBONATE ALKALINITY	mg/l																								
CALCIUM	ug/l																								
CHLORIDE	mg/l																								
CHROMIUM	ug/l	0.94J	0.9U	2.2U	2.2U	2.8U	2.8U	1.1UJ	1.1UJ	2.6B	3.8JB	2.8U	2.8U	2.8U	2.8U	2.8U	2.8U		3U	3U	5.4	4.3	3U	3U	6U
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U	10U	10UJ	10UJ	10U	10U	10UJ	10UJ	10U	10U	10U	10U		10U	10U	10U	10U	10U	10U	10U	10U	10UJ
MAGNESIUM	ug/l																								
pH																									
POTASSIUM	ug/l																								
SODIUM	ug/l																								
SULFATE	mg/l																								
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l																								
ANTIMONY	ug/l																								
ARSENIC	ug/l																								
BARIUM	ug/l																								
BERYLLIUM	ug/l																								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l																								
CARBONATE ALKALINITY	mg/l																								
COBALT	ug/l																								
COPPER	ug/l																								
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l																								
Iron, Ferric	mg/l																								
LEAD	ug/l																								
MANGANESE	ug/l																								
MERCURY	ug/l																								
MOLYBDENUM	ug/l																								
NICKEL	ug/l																								
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l																								
SELENIUM	ug/l																								
SILVER	ug/l																								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																									
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l																								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l																								
TOTAL ORGANIC CARBON	mg/l																								
VANADIUM	ug/l																								
ZINC	ug/l																								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-A5A	154-MW-A5A	154-MW-A5A	154-MW-B6A	154-MW-B6A	154-MW-B6A	154-MW-B6A	154-MW-B6A	154-MW-B6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A
Filtered		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N
Date		3/9/06	6/14/06	6/14/06	9/8/99	9/8/99	2/1/01	2/1/01	3/10/03	3/10/03	9/23/98	9/23/98	3/25/99	3/25/99	7/13/99	7/13/99	1/30/01	1/30/01	3/7/03	3/7/03	6/27/03	6/27/03	9/29/03	9/29/03	12/18/03
BICARBONATE ALKALINITY	mg/l										184			5		386		5							
CALCIUM	ug/l					455		279			98800		370000	349000	218000	221000	1530000	340000							
CHLORIDE	mg/l				195000	189000	128000	128000			85			750		395		3280							
CHROMIUM	ug/l	6U	3U	3U		17.5		10.5	1.9J	2.6J	9150	9610	13300	12800	13700	13500	45200	24900	3.3J	3.5J	2.8J	1.7J	2.2U	2.2U	2.8U
HEXAVALENT CHROMIUM	ug/l	10UJ	10UJ	10UJ	4.1	4.1	2.1	2.1	10U	10U	9570	9460	11500	10400	13400	13300	27200	32200	10U	10U	10U	10U	10U	10U	10UJ
MAGNESIUM	ug/l				10	10	10	10			13700		4690	484	5430	1960	29000	40.8							
pH					12300	11800	6150	6210																	
POTASSIUM	ug/l										4240		14200	14000	8260	8030	1260000	1200000							
SODIUM	ug/l				7840	7010	3400	3400			34400		220000	217000	84700	81700	2370000	2370000							
SULFATE	mg/l				7300	7070	6890	7130			31.5			22.7		22.5		38.4							
ALKALINITY, CARBONATE (AS CACO3)	mg/l					49.9		93.2																	
ALUMINUM	ug/l										358		266	78.2	210	46	7030	150							
ANTIMONY	ug/l				52.1	41.8	81.6	81.6																	
ARSENIC	ug/l																								
BARIUM	ug/l																								
BERYLLIUM	ug/l																								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l																								
CARBONATE ALKALINITY	mg/l										38.6			52		52		70							
COBALT	ug/l					5		5																	
COPPER	ug/l																								
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l				21600	21000	421	45			16.4	16.4	17.5	11.4	16	65.2	450	45							
Iron, Ferric	mg/l																								
LEAD	ug/l																								
MANGANESE	ug/l																								
MERCURY	ug/l																								
MOLYBDENUM	ug/l																								
NICKEL	ug/l																								
NITRATE	mg/l					0.1		0.33						1		0.92		6.9							
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l					0.1		0.1						0.15		0.14		0.75							
SELENIUM	ug/l																								
SILVER	ug/l																								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY					1		0.9997								0.999		1.014								
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l																								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l				595		402								1400		5980								
TOTAL ORGANIC CARBON	mg/l				6.6	6.2	2.1	2.1					1.1		1.8	1.9	4.4	2.9							
VANADIUM	ug/l																								
ZINC	ug/l																								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-C6A	154-MW-D01	154-MW-D01
Filtered		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Date		12/18/03	3/8/04	3/8/04	5/19/04	5/19/04	8/5/04	8/5/04	10/13/04	10/13/04	3/29/05	3/29/05	3/31/05	6/28/05	6/28/05	9/13/05	9/13/05	12/22/05	12/22/05	3/9/06	3/9/06	6/14/06	6/14/06	8/13/97	8/13/97
BICARBONATE ALKALINITY	mg/l																								
CALCIUM	ug/l																								
CHLORIDE	mg/l																								
CHROMIUM	ug/l	2.8U	1.1UJ	1.1UJ	3B	3.3B	2.8U	2.8U	2.8U	2.8U	2.8U	2.8U		3U	3U	3.9	3.1	3U	3U	6U	6U	3U	3U	5.5	5.5
HEXAVALENT CHROMIUM	ug/l	10UJ	10U	10U	10UJ	10UJ	10U	10U	10U	10U		10U	10U	10UJ	10UJ	10U	10U	10U	10U	10UJ	10UJ	10UJ	10UJ	10	10
MAGNESIUM	ug/l																								
pH																									
POTASSIUM	ug/l																								
SODIUM	ug/l																								
SULFATE	mg/l																								
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l																								
ANTIMONY	ug/l																								
ARSENIC	ug/l																								
BARIUM	ug/l																								
BERYLLIUM	ug/l																								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l																								
CARBONATE ALKALINITY	mg/l																								
COBALT	ug/l																								
COPPER	ug/l																								
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l																								
Iron, Ferric	mg/l																								
LEAD	ug/l																								
MANGANESE	ug/l																								
MERCURY	ug/l																								
MOLYBDENUM	ug/l																								
NICKEL	ug/l																								
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l																								
SELENIUM	ug/l																								
SILVER	ug/l																								
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																									
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l																								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l																								
TOTAL ORGANIC CARBON	mg/l																								
VANADIUM	ug/l																								
ZINC	ug/l																								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	154-MW-D01	154-MW-D01	154-MW-D01	154-MW-D01	154-MW-D01	154-MW-D01	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-E08	154-MW-F7E	154-MW-F7E	154-MW-F7E	154-MW-F7E	154-MW-F7E	154-MW-F7E	154-MW-F7E
Filtered		N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y
Date		6/16/98	6/16/98	3/10/03	3/10/03	3/10/03	3/10/03	8/13/97	8/13/97	6/16/98	6/16/98	3/25/99	3/25/99	1/29/01	1/29/01	3/7/03	9/23/98	9/23/98	3/24/99	3/24/99	7/13/99	7/13/99	1/29/01	1/29/01
BICARBONATE ALKALINITY	mg/l												146		80					5				5
CALCIUM	ug/l											69700	65200	49400	49600		20500		46000	46000	30100	32100	44700	38600
CHLORIDE	mg/l												210		501					54				55.4
CHROMIUM	ug/l	10.6	2.9	1.4B	1.1U	1.1U	1.6J	5.5	5.5	2.9	2.9	2.2	2.2	3.7	2.1	2.1J	24.5	11.6	11.3	2.2	5.4	3.4	2.1	2.1
HEXAVALENT CHROMIUM	ug/l	10	10	10U	10U	10U	10U	10U	10	10	10	10	10	10	10	10U	10	10	10	10	10	10	10	10
MAGNESIUM	ug/l											14700	13600	5920	5950		2170		2420	428	354	63.5	4150	1230
pH																								
POTASSIUM	ug/l											7040	6710	3100	3070		6490		19600	20500	16600	18100	16800	15800
SODIUM	ug/l											123000	110000	302000	297000		89300		73100	67900	77800	74500	54700	52900
SULFATE	mg/l												17.6		26					50.8				54.4
ALKALINITY, CARBONATE (AS CACO3)	mg/l																							
ALUMINUM	ug/l											57.4	26.3	81.6	81.6		2730		2310	1790	1200	1280	1880	1340
ANTIMONY	ug/l																							
ARSENIC	ug/l																							
BARIUM	ug/l																							
BERYLLIUM	ug/l																							
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l																							
CARBONATE ALKALINITY	mg/l												5		80					195				162
COBALT	ug/l																							
COPPER	ug/l																							
FERROUS IRON	mg/l																							
HARDNESS (AS CACO3)	mg/l																							
IRON	ug/l											8940	8050	385	185		2740	1010	352	40.3	290	20.8	45	45
Iron, Ferric	mg/l																							
LEAD	ug/l																							
MANGANESE	ug/l																							
MERCURY	ug/l																							
MOLYBDENUM	ug/l																							
NICKEL	ug/l																							
NITRATE	mg/l												0.1		0.1					0.1				0.1
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l												0.1		0.1					0.1				0.1
SELENIUM	ug/l																							
SILVER	ug/l																							
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY														0.999							0.999		0.999	
STRONTIUM	ug/l																							
SULFIDE	mg/l																							
SULFITE	mg/l																							
THALLIUM	ug/l																							
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l													766							361		181	
TOTAL ORGANIC CARBON	mg/l											7.2		8.2	7.1				8.9		15.1	15.8	9.7	8.5
VANADIUM	ug/l																							
ZINC	ug/l																							

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05	155-MW-A05
Filtered		N	Y	N	Y	N	N	Y	Y	N	N	Y	N	N
Date		8/11/97	8/11/97	9/22/98	9/22/98	3/5/03	3/5/03	3/5/03	3/5/03	10/30/03	2/26/04	2/26/04	4/13/06	4/13/06
BICARBONATE ALKALINITY	mg/l			5		5U	5U	5U	5U					
CALCIUM	ug/l			418000									105000	110000
CHLORIDE	mg/l			36		190	190	195	195				50.8	50.2
CHROMIUM	ug/l	688	679	1220	1140	826	826	686	686	618	655	227	4290	303
HEXAVALENT CHROMIUM	ug/l	636	564	974	918	716	716	716	716	117J	117J	117J	10U	10U
MAGNESIUM	ug/l			4670									279	41.6U
pH													11.79	11.75
POTASSIUM	ug/l			41700									17300	18800
SODIUM	ug/l			100000									58100	61900
SULFATE	mg/l			1300		307	307	316	316				23.3	22.8
ALKALINITY, CARBONATE (AS CACO3)	mg/l													
ALUMINUM	ug/l			46.7									2940	2640
ANTIMONY	ug/l												5.8U	5.8U
ARSENIC	ug/l												13.6	10.8
BARIUM	ug/l												48.5	41.8
BERYLLIUM	ug/l												0.3U	0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l													
BORON	ug/l													
CADMIUM	ug/l												0.4U	0.4U
CARBONATE ALKALINITY	mg/l			48		61.7	61.7	61.7	61.7					
COBALT	ug/l												1.7U	1.7U
COPPER	ug/l												3.7U	3.7U
FERROUS IRON	mg/l												0.1U	0.1U
HARDNESS (AS CACO3)	mg/l												280	268
IRON	ug/l			33.1	35.6								39.2U	43.2
Iron, Ferric	mg/l													
LEAD	ug/l												2.7U	2.7U
MANGANESE	ug/l												4	1.2U
MERCURY	ug/l												0.1U	0.1U
MOLYBDENUM	ug/l													
NICKEL	ug/l												3.2	3
NITRATE	mg/l													
NITRATE AS NITROUS OXIDE	mg/l													
NITRITE	mg/l													
SELENIUM	ug/l												4.2U	4.2U
SILVER	ug/l												1.4U	1.4U
SPECIFIC CONDUCTANCE	umhos/cm													
SPECIFIC GRAVITY														
STRONTIUM	ug/l													
SULFIDE	mg/l													
SULFITE	mg/l													
THALLIUM	ug/l												4.7U	4.7U
TIN	ug/l													
TITANIUM	ug/l													
TOTAL ALKALINITY	mg/l												366	361
TOTAL DISSOLVED SOLIDS	mg/l					877	877	899	899				602	618
TOTAL ORGANIC CARBON	mg/l												9.6	9.4
VANADIUM	ug/l												6.5	4.7U
ZINC	ug/l												9.6	8.9

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03	155-MW-AA03
Filtered		N	Y	N	Y	N	N	N	N	Y	Y	Y	Y	N	N	Y	N
Date		9/22/98	9/22/98	7/13/99	7/13/99	3/6/03	3/6/03	3/6/03	3/6/03	3/6/03	3/6/03	3/6/03	3/6/03	10/30/03	2/26/04	2/26/04	4/13/06
BICARBONATE ALKALINITY	mg/l	5			119	36.1	36.1	30.9	30.9	25.8	41.2	41.2	25.8				
CALCIUM	ug/l	21600		13400	13000	29600	29600	29600	29600	24400	24300	24300	24400				28300
CHLORIDE	mg/l	29			32.5	225	225	225	225	234	235	235	234				118
CHROMIUM	ug/l	4	2.4	15.8	4.8	1200	1200	1250	1250	1210	1180	1180	1210	1140	127	103	112
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	1060	1060	1050	1050	1190	1230	1230	1190	1190J	111J	93.3J	10U
MAGNESIUM	ug/l	38.9		239	24.7	446J	446J	464J	464J	254J	244J	244J	254J				974
pH																	10.69
POTASSIUM	ug/l	20500		18600	16900	12700	12700	12500	12500	12100	12000	12000	12100				14500
SODIUM	ug/l	50900		52400	49100	135000	135000	135000	135000	142000	140000	140000	142000				89400
SULFATE	mg/l	13.4			9.6	8.6	8.6	9.4	9.4	5U	9	9	5U				9.3
ALKALINITY, CARBONATE (AS CACO3)	mg/l																
ALUMINUM	ug/l	936		1230	423												407
ANTIMONY	ug/l																5.8U
ARSENIC	ug/l																10.6
BARIUM	ug/l																31.2
BERYLLIUM	ug/l																0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l																
BORON	ug/l																
CADMIUM	ug/l																0.4U
CARBONATE ALKALINITY	mg/l	66			80.4	51.6	51.6	51.5	51.5	61.9	41.2	41.2	61.9				
COBALT	ug/l																1.7U
COPPER	ug/l																3.7U
FERROUS IRON	mg/l																0.1U
HARDNESS (AS CACO3)	mg/l																90
IRON	ug/l	98.9	16.4	903	21												47.3
Iron, Ferric	mg/l																
LEAD	ug/l																2.7U
MANGANESE	ug/l																4.7
MERCURY	ug/l																0.1U
MOLYBDENUM	ug/l																
NICKEL	ug/l																2.6
NITRATE	mg/l				0.1												
NITRATE AS NITROUS OXIDE	mg/l																
NITRITE	mg/l				0.1												
SELENIUM	ug/l																4.2U
SILVER	ug/l																1.4U
SPECIFIC CONDUCTANCE	umhos/cm																
SPECIFIC GRAVITY				0.999													
STRONTIUM	ug/l																
SULFIDE	mg/l																
SULFITE	mg/l																
THALLIUM	ug/l																4.7U
TIN	ug/l																
TITANIUM	ug/l																
TOTAL ALKALINITY	mg/l																133
TOTAL DISSOLVED SOLIDS	mg/l			246		558	558	522	522	576	520	520	576				379
TOTAL ORGANIC CARBON	mg/l			9	8.5												8.1
VANADIUM	ug/l																36.2
ZINC	ug/l																5.8U

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-B6	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3
Filtered		N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	Y	N	N	Y	N	Y	N	N	N	Y	Y
Date		10/2/97	10/2/97	9/22/98	9/22/98	3/5/03	3/5/03	3/5/03	3/5/03	10/30/03	2/26/04	2/26/04	2/26/04	2/26/04	4/13/06	10/2/97	10/2/97	9/22/98	9/22/98	3/5/03	3/5/03	3/5/03	3/5/03	3/5/03	3/5/03
BICARBONATE ALKALINITY	mg/l					89	89	87.6	87.6											690	690	690	690	690	685
CALCIUM	ug/l														27300										
CHLORIDE	mg/l					830	830	560	560						15.2					170	170	170	170	165	165
CHROMIUM	ug/l	4.5	4.5	2.4	3.8	138	138	279	279	51.4	1.1U	1.1U	1.1U	1.1U	22.7	4.5	4.5	2.4	2.4	3.2J	6.6J	6.6J	3.2J	1.1U,J	1.1U,J
HEXAVALENT CHROMIUM	ug/l	12.7	13.8	10	10	129	129	16.4	16.4	36J	10UJ	10UJ	10UJ	10UJ	10.5	10	10	10	10	10U	10U	10U	10U	10U	10U
MAGNESIUM	ug/l														4410										
pH															8.16										
POTASSIUM	ug/l														1180										
SODIUM	ug/l														15200										
SULFATE	mg/l					23.6	23.6	18.1	18.1						14.9					35.5	33.9	33.9	35.5	34.7	35.5
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l														418										
ANTIMONY	ug/l														5.8U										
ARSENIC	ug/l														3.2U										
BARIUM	ug/l														41.5										
BERYLLIUM	ug/l														0.3U										
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l														0.4U										
CARBONATE ALKALINITY	mg/l					5U	5U	5U	5U											5U	5U	5U	5U	5U	5U
COBALT	ug/l														1.7U										
COPPER	ug/l														10.8										
FERROUS IRON	mg/l														0.1U										
HARDNESS (AS CACO3)	mg/l														92										
IRON	ug/l														571										
Iron, Ferric	mg/l																								
LEAD	ug/l														6.3										
MANGANESE	ug/l														11.5										
MERCURY	ug/l														0.1U										
MOLYBDENUM	ug/l																								
NICKEL	ug/l														2.4U										
NITRATE	mg/l																								
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l																								
SELENIUM	ug/l														4.2U										
SILVER	ug/l														1.4U										
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																									
STRONTIUM	ug/l																								
SULFIDE	mg/l																								
SULFITE	mg/l																								
THALLIUM	ug/l														4.7U										
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l														104										
TOTAL DISSOLVED SOLIDS	mg/l					1570	1570	1070	1070						186					1080	1020	1020	1080	1000	1010
TOTAL ORGANIC CARBON	mg/l														2.2										
VANADIUM	ug/l														4.7U										
ZINC	ug/l														18.4										

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	155-MW-F3	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-CC8	163-MW-R5	163-MW-R5
Filtered		Y	Y	N	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Date		3/5/03	3/5/03	10/30/03	2/26/04	2/26/04	4/13/06	8/10/05	8/10/05	5/23/06	5/23/06	10/20/97	10/20/97	10/21/97	10/21/97	6/29/98	6/29/98	7/1/98	7/1/98	4/15/03	4/15/03	7/8/05	7/8/05	10/20/97	10/20/97
BICARBONATE ALKALINITY	mg/l	685	690							383										215					
CALCIUM	ug/l						134000	130000		51900										34500		148000			
CHLORIDE	mg/l	165	165				137	2970		1120										561		4230			
CHROMIUM	ug/l	1.1UJ	1.1UJ	1.6U	1.3	3	2.5	9.4	6.1	91.3	14.4	22.2	9	11.9	4.5	10.6	5.8	16.5	12.5	27	33	53	5.7	238	158
HEXAVALENT CHROMIUM	ug/l	10U	10U	10UJ	10UJ	10UJ	10U	10U	10U	10UJ	10UJ	10	10	10	10	10	10	19.8	17.3	10U	10U	10U	10U	10	10
MAGNESIUM	ug/l						30200	205000		73000										30100		287000			
pH							7.52	7.47		7.93												7.85			
POTASSIUM	ug/l						7320	83600		44100										34600		97800			
SODIUM	ug/l						99500	1600000		647000										433000		2170000			
SULFATE	mg/l	35.5	34.7				43.5	346		129										89.2		603			
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l						1330	125U		1420												1260			
ANTIMONY	ug/l						5.8U	11.6U		5.8U												5.8U			
ARSENIC	ug/l						3.2U	6.4U		3.2U												3.2U			
BARIUM	ug/l						211	264		225												583			
BERYLLIUM	ug/l						0.3U	0.6U		0.3U												0.3U			
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l						0.4U	0.8U		0.4U												0.4U			
CARBONATE ALKALINITY	mg/l	5U	5U							5U										5U					
COBALT	ug/l						1.7U	3.4U		1.7U												1.7U			
COPPER	ug/l						9.9	7.4U		6.5												10.5			
FERROUS IRON	mg/l						0.1U	0.1U		0.21															
HARDNESS (AS CACO3)	mg/l						520																		
IRON	ug/l						1610	256		2070												160			
Iron, Ferric	mg/l																								
LEAD	ug/l						2.7U	5.4U		2.7U												2.7U			
MANGANESE	ug/l						1110	83.2		220												320			
MERCURY	ug/l						0.1U	0.1U		0.1U												0.1U			
MOLYBDENUM	ug/l																								
NICKEL	ug/l						3.7	4.8U		4.6												3.5			
NITRATE	mg/l									0.16															
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l									0.1U															
SELENIUM	ug/l						4.2U	8.4U		4.2U												4.2U			
SILVER	ug/l						1.4U	2.8U		1.4U												1.4U			
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY																				1.003					
STRONTIUM	ug/l																								
SULFIDE	mg/l							1U		1U												1U			
SULFITE	mg/l																								
THALLIUM	ug/l						4.7U	9.8		4.7U												4.7U			
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l						525	294		383												203			
TOTAL DISSOLVED SOLIDS	mg/l	1010	1000				828	5250		2260										1350		9850			
TOTAL ORGANIC CARBON	mg/l						5.2	6		13.2												5.9			
VANADIUM	ug/l						4.7U	9.4U		5.8												5.3			
ZINC	ug/l						12	11.6U		12.7												14.7			

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	163-MW-R5	163-MW-R5	163-MW-R5	163-MW-R5	163-MW-R05	163-MW-R05	163-MW-R05	163-MW-R05	163-MW-R05	163-MW-R05	163-MW-Y06	163-MW-Y06	163-MW-Y6	163-MW-Y6	163-MW-Y6	163-MW-Y6	163-MW-Y6	163-MW-Y6	163-MW-Y6	166-MW-001	166-MW-001	166-MW-001	166-MW-001
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	Y
Date		6/29/98	6/29/98	4/15/03	4/15/03	7/8/05	7/8/05	8/10/05	8/10/05	5/23/06	5/23/06	8/10/05	8/10/05	10/20/97	10/20/97	10/21/97	10/21/97	6/30/98	6/30/98	6/30/98	6/30/98	5/10/06	5/10/06	6/29/06	6/29/06
BICARBONATE ALKALINITY	mg/l	354		415						376												168		153	
CALCIUM	ug/l	31600		43500		58000		47800		40900		94300										110000		114000	
CHLORIDE	mg/l	75		50.7		152		299		116		199										393		431	
CHROMIUM	ug/l	78.4	70.1	26.7J	12.2	68.2	6	284	228	39.6	11	9.3	3U	88.5	8.6	14.7	5.8	3.2	2.9	2.9	3.4	6.4	2.2	3.2	2.8U
HEXAVALENT CHROMIUM	ug/l	10	10	12.2JB	10U	10U	10U	10U	10U	10UJ	10UJ	10U	10U	10	10	10	10	10	10	10	10	10U	10U	10UJ	10UJ
MAGNESIUM	ug/l	10200		26500		24200		17400		26100		20100										46300		45200	
pH						7.39		7.8		8		7.98										7.12		7.66	
POTASSIUM	ug/l	7070		8890		13100		14300		12800		17900										14500		15500	
SODIUM	ug/l	154000		103000		108000		221000		121000		128000										157000		147000	
SULFATE	mg/l	10		40.6		22.3		10U		25.8		28.6										73.5		61.2	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l	135				919		264		68.5		95.1										270		82.3	
ANTIMONY	ug/l					5.8U		5.8U		5.8U		5.8U										5.8U		5.8U	
ARSENIC	ug/l					14.5		4.3		10.7		4.8										3.2U		3.2U	
BARIUM	ug/l					174		143		91.2		158										25.7		20.8	
BERYLLIUM	ug/l					0.3U		0.3U		0.3U		0.3U										0.3U		0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l					0.4U		0.4U		0.4U		0.4U										0.4U		0.4U	
CARBONATE ALKALINITY	mg/l	5		5U						5U												5U		5U	
COBALT	ug/l					1.7U		1.7U		1.7U		3.1										1.7U		1.7U	
COPPER	ug/l					38.6		8		4.5		3.7U										3.7U		3.7U	
FERROUS IRON	mg/l							1.2		0.23		0.12													
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l	741	572			5360		2660		3960		2370										300		960	
Iron, Ferric	mg/l																								
LEAD	ug/l					9.5		5.1		2.7U		2.7U										2.7U		2.7U	
MANGANESE	ug/l					629		451		647		295										552		721	
MERCURY	ug/l					0.1U		0.1U		0.1U		0.1U										0.1U		0.1U	
MOLYBDENUM	ug/l																								
NICKEL	ug/l					11.3		11.3		3.7		4.4										2.4U		2.4U	
NITRATE	mg/l									0.1														0.31	
NITRATE AS NITROUS OXIDE	mg/l																					0.12			
NITRITE	mg/l									0.1U														0.1U	
SELENIUM	ug/l					4.2U		4.2U		4.2U		4.2U										4.2U		4.2U	
SILVER	ug/l					1.4U		1.4U		1.4U		1.4U										1.4U		1.4U	
SPECIFIC CONDUCTANCE	umhos/cm																							1820	
SPECIFIC GRAVITY				1.003																					
STRONTIUM	ug/l																								
SULFIDE	mg/l					1U		1U		1U		1U										1U		1U	
SULFITE	mg/l																								
THALLIUM	ug/l					4.7U		4.7U		4.7U		4.7U										4.7U		4.7U	
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l					259		304		376		335										168		153	
TOTAL DISSOLVED SOLIDS	mg/l			534		664		1420		626		816										1170		1220	
TOTAL ORGANIC CARBON	mg/l					5.6		13.6		7.2		7										3.8		3.1	
VANADIUM	ug/l					17.9		50.3		7.8		4.7U										4.7U		4.7U	
ZINC	ug/l					94		40.9		17.2		13.7										13.1		13.1	

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	166-MW-002	166-MW-002	166-MW-002	166-MW-002	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-A8	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5
Filtered		N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N
Date		5/10/06	5/10/06	6/29/06	6/29/06	10/17/97	10/17/97	6/23/98	6/23/98	6/23/98	6/23/98	1/31/01	1/31/01	3/7/03	3/7/03	10/15/97	10/15/97	10/16/97	10/16/97	6/24/98	6/24/98	6/26/98	6/26/98	3/7/03	3/7/03
BICARBONATE ALKALINITY	mg/l	120		92.7									51.4	128	127										1990
CALCIUM	ug/l	187000		275000								144000	136000	144000	139000									314000	314000
CHLORIDE	mg/l	7670		8970									260	257	257										11700
CHROMIUM	ug/l	270	1.8	541	2.8U	4.5	4.5	3.4	2.9	3.9	3.2	2.8	2.8	2.6J	2.6J	11.3	9	9	9	2.9	2.9	2.9	2.9	5.1J	5.1J
HEXAVALENT CHROMIUM	ug/l	10U	10U	10UJ	10UJ	10	10	10	10	10	10	10	10	10U	10U	10	10	10	10	10	10	10	10		10U
MAGNESIUM	ug/l	516000		619000								63700	61100	39500	39900									862000	862000
pH		6.97		7.25																					
POTASSIUM	ug/l	151000		175000								18500	17600	22900	23200									182000J	182000J
SODIUM	ug/l	3880000		4150000								254000	245000	124000	127000									6360000	6360000
SULFATE	mg/l	1120		1180									668	327	327										343
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l	90.6		62.6U								77.4	77.4												
ANTIMONY	ug/l	5.8U		5.8U																					
ARSENIC	ug/l	3.2U		3.2U																					
BARIUM	ug/l	139		168																					
BERYLLIUM	ug/l	0.3U		0.3U																					
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l	0.4U		0.4U																					
CARBONATE ALKALINITY	mg/l	5U		5U									51.4	5U	5U										5U
COBALT	ug/l	1.7U		1.7U																					
COPPER	ug/l	3.7U		3.7U																					
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l	880		8970								29300	27000												
Iron, Ferric	mg/l																								
LEAD	ug/l	2.7U		2.7U																					
MANGANESE	ug/l	975		1190																					
MERCURY	ug/l	0.1U		0.1U																					
MOLYBDENUM	ug/l																								
NICKEL	ug/l	2.4U		2.4U																					
NITRATE	mg/l			0.16									0.1												
NITRATE AS NITROUS OXIDE	mg/l	0.23																							
NITRITE	mg/l			0.1U									0.1												
SELENIUM	ug/l	4.2U		4.2U																					
SILVER	ug/l	1.4U		1.4U																					
SPECIFIC CONDUCTANCE	umhos/cm			25100																					
SPECIFIC GRAVITY												1		1.003	1.003										1.019
STRONTIUM	ug/l																								
SULFIDE	mg/l	1U		1U																					
SULFITE	mg/l																								
THALLIUM	ug/l	4.7U		4.7U																					
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l	120		92.7																					
TOTAL DISSOLVED SOLIDS	mg/l	15200		14800								1570		1050	1030										18800
TOTAL ORGANIC CARBON	mg/l	3.6		3.9								7.9	8												
VANADIUM	ug/l	4.7U		4.7U																					
ZINC	ug/l	5.8U		7.5																					

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C5	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-C7	166-MW-D8	166-MW-D8	166-MW-D8	166-MW-D8	166-MW-D8	166-MW-D8	166-MW-D8R	166-MW-D8R
Filtered		Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y
Date		3/7/03	3/7/03	5/10/06	5/10/06	6/29/06	6/29/06	10/17/97	10/17/97	6/23/98	6/23/98	1/31/01	1/31/01	3/7/03	3/7/03	3/7/03	3/7/03	10/16/97	10/16/97	6/24/98	6/24/98	1/31/01	1/31/01	5/10/06	5/10/06
BICARBONATE ALKALINITY	mg/l		2010	68.9		711							253		232		208						202	1100	
CALCIUM	ug/l	323000	323000	364000		379000						213000	212000	103000	103000	109000	109000					72400	75800	93200	
CHLORIDE	mg/l		11500	7370		4840							800		720		530						77	233	
CHROMIUM	ug/l	5.1J	5.1J	4.8	1.7	3.9	2.8U	19.9	4.5	237	4	791	136	2180	2180	58.9	58.9	76.4	6.4	356	376	670	655	4.7	2.8
HEXAVALENT CHROMIUM	ug/l		10U	10U	10U	20UJ	10UJ	10	10	10	10	10	10		10U		10U	10	10	332	315	598	543	10U	10UJ
MAGNESIUM	ug/l	898000	898000	593000		445000						74800	75400	67100	67100	73200	73200					27000	25500	31400	
pH				7.3		7.54																		6.05	
POTASSIUM	ug/l	194000J	194000J	164000		140000						32600	33000	14500	14500	15500	15500					8970	9430	19900	
SODIUM	ug/l	6590000	6590000	4090000		2810000						392000	395000	281000	281000	318000	318000					55100	56700	97800	
SULFATE	mg/l		331	1030		1720							463		377		346						93.2	244	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l			309		137						77.4	77.4									77.4	77.4	124	
ANTIMONY	ug/l			5.8U		5.8U																		5.8U	
ARSENIC	ug/l			3.2U		3.2U																		3.2U	
BARIUM	ug/l			98.6		66.2																		22	
BERYLLIUM	ug/l			0.3U		0.3U																		0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l			1.9		2.4																		0.4U	
CARBONATE ALKALINITY	mg/l		5U	5U		5U							5		5U		5U						5	5U	
COBALT	ug/l			3.3		6.2																		1.7U	
COPPER	ug/l			12.3		7.5																		3.7U	
FERROUS IRON	mg/l																								
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l			210		47500						18800	16800									601	387	30300	
Iron, Ferric	mg/l																								
LEAD	ug/l			2.7U		2.7U																		2.7U	
MANGANESE	ug/l			2880		3910																		1230	
MERCURY	ug/l			0.1U		0.13																		0.1U	
MOLYBDENUM	ug/l																								
NICKEL	ug/l			11.4		16.3																		15	
NITRATE	mg/l					0.12							0.1										0.8		
NITRATE AS NITROUS OXIDE	mg/l			0.11																				0.1U	
NITRITE	mg/l					0.1U							0.1										0.1		
SELENIUM	ug/l			4.2U		4.2U																		4.2U	
SILVER	ug/l			1.4U		1.4U																		1.4U	
SPECIFIC CONDUCTANCE	umhos/cm					16200																			
SPECIFIC GRAVITY			1.018									1.003			1.004		1.004					1			
STRONTIUM	ug/l																								
SULFIDE	mg/l			1U		1U																		1U	
SULFITE	mg/l																								
THALLIUM	ug/l			4.7U		4.7U																		4.7U	
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l			68.9		711																		1100	
TOTAL DISSOLVED SOLIDS	mg/l		16300	14900		9790						2110			1770		1420					476		900	
TOTAL ORGANIC CARBON	mg/l			2.8		17.5						12.4	11.2									6.4	6.6	5.8	
VANADIUM	ug/l			4.7U		4.7U																		4.7U	
ZINC	ug/l			199		194																		121	

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	166-MW-D8R	166-MW-D8R	166-MW-F10	166-MW-F10	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y
Date		6/29/06	6/29/06	3/7/03	3/7/03	10/16/97	10/16/97	6/24/98	6/24/98	1/31/01	1/31/01	3/7/03	3/7/03	3/7/03	3/7/03	5/10/06	5/10/06	5/10/06	5/10/06
BICARBONATE ALKALINITY	mg/l	71.3		94	92						81		46		46	123	118		
CALCIUM	ug/l	102000		42500	50400					52800	52800	47200	47200	51700	51700	21100	22500		
CHLORIDE	mg/l	288		29	32						80		29		32	260	266		
CHROMIUM	ug/l	20.1	3.1	4.7J	4.1J	4.5	4.5	8.6	7.2	2.8	2.8	5.5J	5.5J	5.7J	5.7J	4.2	6.2	4.5	4.2
HEXAVALENT CHROMIUM	ug/l	10UJ	10UJ	10U	10U	10	10	10	10	10	10		10U		10U	10U	10U	10U	10U
MAGNESIUM	ug/l	34900		13800	16100					24800	25100	15400	15400	16800	16800	14200	14400		
pH		6.81														7.03	7.08		
POTASSIUM	ug/l	22400		5110	5930					8240	8300	6030	6030	6510	6510	10900	10600		
SODIUM	ug/l	123000		28800	35700					65100	65700	31700	31700	34900	34900	227000	227000		
SULFATE	mg/l	265		114	116						97.1		112		123	156	158		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																		
ALUMINUM	ug/l	88								315	77.4					171	336		
ANTIMONY	ug/l	5.8U														5.8U	5.8U		
ARSENIC	ug/l	3.2U														3.2U	3.2U		
BARIUM	ug/l	10.6														6.8	8.4		
BERYLLIUM	ug/l	0.3U														0.3U	0.3U		
BICARBONATE ALKALINITY AS CACO3	mg/l																		
BORON	ug/l																		
CADMIUM	ug/l	0.4U														0.4U	0.4U		
CARBONATE ALKALINITY	mg/l	5U		5U	5U						81		5U		5U	5U	5U		
COBALT	ug/l	1.7U														1.7U	1.7U		
COPPER	ug/l	3.7U														3.7U	3.7U		
FERROUS IRON	mg/l																		
HARDNESS (AS CACO3)	mg/l																		
IRON	ug/l	3600								5910	5000					986	1750		
Iron, Ferric	mg/l																		
LEAD	ug/l	2.7U														2.7U	2.7U		
MANGANESE	ug/l	1270														58	61.5		
MERCURY	ug/l	0.1U														0.1U	0.1U		
MOLYBDENUM	ug/l																		
NICKEL	ug/l	19.9														2.4U	2.4U		
NITRATE	mg/l	0.1U									0.1								
NITRATE AS NITROUS OXIDE	mg/l															0.13	0.13		
NITRITE	mg/l	0.1U									0.1								
SELENIUM	ug/l	4.2U														4.2U	4.2U		
SILVER	ug/l	1.4U														1.4U	1.4U		
SPECIFIC CONDUCTANCE	umhos/cm	1530																	
SPECIFIC GRAVITY				1.003	1.003					1			1.003		1.003				
STRONTIUM	ug/l																		
SULFIDE	mg/l	1U														1U	1U		
SULFITE	mg/l																		
THALLIUM	ug/l	4.7U														4.7U	4.7U		
TIN	ug/l																		
TITANIUM	ug/l																		
TOTAL ALKALINITY	mg/l	71.3														123	118		
TOTAL DISSOLVED SOLIDS	mg/l	940		350	104					473			400		370	854	804		
TOTAL ORGANIC CARBON	mg/l	7.1								3.7	4					5.4	5.9		
VANADIUM	ug/l	4.7U														4.7U	4.7U		
ZINC	ug/l	173														8.7	17.2		

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	166-MW-F8	166-MW-F8	166-MW-F8	166-MW-F8	184-MW-001	184-MW-001	184-MW-001	184-MW-001	184-MW-001	184-MW-001	184-MW-002	184-MW-002	184-MW-002	184-MW-002	184-MW-002	184-MW-002	184-MW-002	184-MW-002	184-MW-C02	184-MW-C02	184-MW-C02	184-MW-C02	184-MW-C02	184-MW-C02
Filtered		N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	N	Y
Date		6/29/06	6/29/06	6/29/06	6/29/06	4/28/05	4/28/05	5/31/05	5/31/05	5/10/06	5/10/06	4/28/05	4/28/05	5/31/05	5/31/05	5/10/06	5/10/06	5/10/06	5/10/06	7/14/98	7/14/98	7/14/98	7/14/98	7/7/99	7/7/99
BICARBONATE ALKALINITY	mg/l	76	83.6							22.8						659	681								453
CALCIUM	ug/l	42000	38300			18100				81500		30600				34500	36600							105000	106000
CHLORIDE	mg/l	415	401							41.8						105	106								70
CHROMIUM	ug/l	2	2.2	2.8U	2.8U	35.1	18.2	33.1	2.8U	18.5	1.6U	245	166	155	160	73	68.3	64.1	52	76.1	70.3	6.9	7.2	18.7	5
HEXAVALENT CHROMIUM	ug/l	10UJ	10UJ	10UJ	10UJ	17.2	17.2	10UJ	10U	10UJ	10UJ	10U	10U	10UJ	10U	10UJ	10UJ	10U	10U	10	10	10	10	10	10
MAGNESIUM	ug/l	37600	33900			2050				8980		17400				11200	11800							9880	9790
pH		7.16	7.06			7.1				6.41		7.59				7.33	7.2								
POTASSIUM	ug/l	14100	12700							3610						34200	36400							13500	13600
SODIUM	ug/l	261000	230000							25600						246000	257000							110000	108000
SULFATE	mg/l	186	182			45.6				190		9.8				5U	6.6								5
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l	119	154							106						142	174							93.6	37.4
ANTIMONY	ug/l	5.8U	5.8U							5.8U						5.8U	5.8U								
ARSENIC	ug/l	3.2U	3.2U							3.2U						3.2U	3.2U								
BARIUM	ug/l	9.1	10.2							76.7						7.9	6.5								
BERYLLIUM	ug/l	0.3U	0.3U							0.3U						0.3U	0.3U								
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l	0.4U	0.4U							0.61						0.4U	0.4U								
CARBONATE ALKALINITY	mg/l	5U	5U			46.1				5U		789				5U	5U								5
COBALT	ug/l	1.7U	1.7U							1.7U						1.7U	1.7U								
COPPER	ug/l	3.7U	3.7U							3.7U						3.7U	3.7U								
FERROUS IRON	mg/l									0.1U						0.22	0.25								
HARDNESS (AS CACO3)	mg/l									267						139	139								
IRON	ug/l	1800	670			469				4650		657				89.9	90.9							18500	17900
Iron, Ferric	mg/l																								
LEAD	ug/l	2.7U	2.7U							3						2.7U	2.7U								
MANGANESE	ug/l	142	126							7510						269	284								
MERCURY	ug/l	0.1U	0.1U							11.4						0.29	0.25								
MOLYBDENUM	ug/l																								
NICKEL	ug/l	2.4U	3.4							2.4U						2.4U	2.4U								
NITRATE	mg/l	0.2	0.23																						0.1
NITRATE AS NITROUS OXIDE	mg/l									5.7						0.12	0.11								
NITRITE	mg/l	0.1U	0.1U																						0.1
SELENIUM	ug/l	4.2U	4.2U							4.2U						4.2U	4.2U								
SILVER	ug/l	1.4U	1.4U							1.4U						1.4U	1.4U								
SPECIFIC CONDUCTANCE	umhos/cm	1810	1830																						
SPECIFIC GRAVITY																								0.999	
STRONTIUM	ug/l																								
SULFIDE	mg/l	1U	1U			1U				1U		1U				1U	1U								
SULFITE	mg/l																								
THALLIUM	ug/l	4.7U	4.7U							4.7U						4.7U	4.7U								
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l	76	83.6							22.8						659	681								
TOTAL DISSOLVED SOLIDS	mg/l	1040	1100							474						900	948							630	
TOTAL ORGANIC CARBON	mg/l	4.4	4.6			3.3				7.4		20.1				46.3	25.9							10.9	10.8
VANADIUM	ug/l	4.7U	4.7U							4.7U						17.8	20.8								
ZINC	ug/l	34.9	18.5							84.2						5.8U	5.8U								

Table A-1
Shallow Groundwater
Analytical Data

Location ID	Unit	184-MW-C02	184-MW-C02	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-C10	184-MW-E10	184-MW-E10	184-MW-E10	184-MW-E10	184-MW-E10	184-MW-E10	SA6-MW-AA1	SA6-MW-AA1	SA6-MW-AA1	SA6-MW-AA1
Filtered		N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y
Date		4/14/03	4/14/03	7/14/98	7/14/98	7/7/99	7/7/99	7/7/99	7/7/99	4/15/03	4/15/03	4/15/03	4/15/03	7/25/06	7/25/06	7/14/98	7/14/98	7/7/99	7/7/99	4/14/03	4/14/03	2/1/01	2/1/01	4/22/03	4/22/03
BICARBONATE ALKALINITY	mg/l	319						123	127	105	107				204				76.8	108			624	591	
CALCIUM	ug/l	128000				85700	88600	89200	89700	209000	213000			125000	131000			75400	76200	65200		170000	160000	121000	
CHLORIDE	mg/l	409						320	325	1840	1820				567				57	69.2			4500	3080	
CHROMIUM HEXAVALENT	ug/l	9.5J	2.7J	7.1	1.7	3.4	3.4	3.4	3.4	1.3J	2J	1.1U	1.1U	40.4	10.5	1.7	1.7	4.1	4.4	7.9J	9.3J	12.6	10.2	15	10.8
CHROMIUM	ug/l	10U	10U	10	10	10	10	10	10	10U	10U	10U	10U	50U	50U	10	10	10	10	10U	10U	10	10	10U	10U
MAGNESIUM	ug/l	12400				9570	10100	10300	10300	23100	23400			23600	24400			8550	8560	5070		96100	90300	86300	
pH														6.86											
POTASSIUM	ug/l	15800				11700	11700	12000	12200	17600	17600			26400J	27500J			4580	4590	2650J		60100	56500	50900	
SODIUM	ug/l	237000				188000	190000	191000	188000	945000	880000			329000	326000			36000	37600	50000		2760000	2690000	1780000	
SULFATE	mg/l	5U						68.2	67.6	55.9	71.8				128				114	107			5	5U	
ALKALINITY, CARBONATE (AS CACO3)	mg/l														204										
ALUMINUM	ug/l					184	36.8	29.1	29.1					200UJ	200UJ			29.1	29.1			81.6	81.6		
ANTIMONY	ug/l													6.0UJ	6.0UJ										
ARSENIC	ug/l													8.0UJ	8.0UJ										
BARIUM	ug/l													246	200U										
BERYLLIUM	ug/l													1.0U	1.0U										
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l													4.0U	4.0U										
CARBONATE ALKALINITY	mg/l	5U						5	5	5U	5U				5.0U				76.8	5U			624	5	
COBALT	ug/l													50U	50U										
COPPER	ug/l													25U	25U										
FERROUS IRON	mg/l														0.10U										
HARDNESS (AS CACO3)	mg/l													406											
IRON	ug/l					231	42.1	16	16					1080	215			536	850			19800	18400		
Iron, Ferric	mg/l														0.22										
LEAD	ug/l													3.0UJ	3.0UJ										
MANGANESE	ug/l													5870	3690										
MERCURY	ug/l													1.4	0.20UJ										
MOLYBDENUM	ug/l																								
NICKEL	ug/l													40U	40U										
NITRATE	mg/l							5.3	5						18.4				4.1				0.1		
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l							0.11	0.11						0.12				0.1				0.1		
SELENIUM	ug/l													10U	10U										
SILVER	ug/l													10U	10U										
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY		1.003				1	1			1.005	1.005							0.999		1.003		1.005		1.007	
STRONTIUM	ug/l																								
SULFIDE	mg/l														2.0U										
SULFITE	mg/l																								
THALLIUM	ug/l													10U	10U										
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l	904				872	854			3280	3440			1350				402		422		6120		5600	
TOTAL ORGANIC CARBON	mg/l					1.8	2	1.8	2					2.7				2.6	2.5			21.8	21.6		
VANADIUM	ug/l													50U	50U										
ZINC	ug/l													27.6	20U										

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	087-MW-13	087-MW-13	087-MW-13	087-MW-13	087-MW-13	087-MW-13	087-MW-13	087-MW-13	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35	087-MW-35
	Filtered	N	N	Y	Y	N	Y	N	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N
	Date	4/24/03	4/24/03	4/24/03	4/24/03	9/13/04	9/13/04	7/25/06	7/25/06	5/18/04	5/18/04	5/18/04	5/19/04	5/19/04	5/19/04	5/19/04	5/20/04	5/20/04	5/20/04	5/20/04	5/20/04	5/20/04	9/10/04	9/10/04	5/16/06
BICARBONATE ALKALINITY	mg/l		54			621			628														5U		5U
CALCIUM	ug/l	74400				79500		77200	78500														108000		13500
CHLORIDE	mg/l		3300			744			2950														1220		1830
CHROMIUM	ug/l	2760		3010		1170	1000	700	688	48.3	74.6	33800	31.4	36.7		11.9	29.3	41.3	3.8		38.5	37.5	13.1	4.1	11.8JB
HEXAVALENT CHROMIUM	ug/l		2280		2960	1180	1090	570	660	50U	50U	36400	10UJ	18.2J	22.3J	10UJ	10U	10U	10U	10U	12.4	10U	10U	10U	
MAGNESIUM	ug/l	162000				167000		165000	168000														12900		3270
pH								8.04																	
POTASSIUM	ug/l	67500				65900		83500J	86400J														112000		131000J
SODIUM	ug/l	1830000				1770000		1910000	1960000														834000		1090000
SULFATE	mg/l		480			377			341														76.4		110
ALKALINITY, CARBONATE (AS CACO3)	mg/l								633																
ALUMINUM	ug/l							200UJ	200UJ																1240
ANTIMONY	ug/l							6.0UJ	6.0UJ																11.6U
ARSENIC	ug/l							8.0UJ	8.0UJ																6.4U
BARIUM	ug/l							200U	200U																58.8
BERYLLIUM	ug/l							1.0U	1.0U																0.6U
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l							4.0U	4.0U																0.8U
CARBONATE ALKALINITY	mg/l		5U			5U			5.0U														710		232
COBALT	ug/l							50U	50U																5.8
COPPER	ug/l							25U	25U																81.6
FERROUS IRON	mg/l								0.10U																0.1UJ
HARDNESS (AS CACO3)	mg/l							886																	
IRON	ug/l							583	345																219J
Iron, Ferric	mg/l								0.35																
LEAD	ug/l							3.0UJ	3.0UJ		2.2U														8.1U
MANGANESE	ug/l							242	231																3.7B
MERCURY	ug/l							0.20UJ	0.20UJ																0.1U
MOLYBDENUM	ug/l																								
NICKEL	ug/l							40U	40U																13.2
NITRATE	mg/l								0.11U																
NITRATE AS NITROUS OXIDE	mg/l																								0.11
NITRITE	mg/l								0.010U																
SELENIUM	ug/l							10U	10U																8.4U
SILVER	ug/l							10U	10U																2.8U
SPECIFIC CONDUCTANCE	umhos/cm									2460	5010		5860		1920	4930	6320	8170							
SPECIFIC GRAVITY			1.0071			1				1	1		1				1	1					1		
STRONTIUM	ug/l																								
SULFIDE	mg/l								2.0U																1U
SULFITE	mg/l																								
THALLIUM	ug/l							10U	10U																9.4U
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l		5620			8060		5660		1770	4170		3910		1240	2790	3950	6850					3250		3740
TOTAL ORGANIC CARBON	mg/l							5.1																	28.4
VANADIUM	ug/l							50U	50U																17.1
ZINC	ug/l							20U	20U																20

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	087-MW-A26D	087-MW-A26D	087-MW-A26D	087-MW-A26D	087-MW-A26D	087-MW-A26D	087-MW-A26D	087-MW-A26D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O19D	087-MW-O29D	087-MW-O29D	087-MW-O29D	087-MW-O29D	087-MW-O29D	087-MW-O29D	087-MW-O29D
	Filtered	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N
	Date	3/21/01	3/21/01	4/22/03	4/22/03	9/9/04	9/9/04	7/20/06	7/20/06	11/3/97	11/3/97	7/7/98	7/7/98	4/21/03	4/21/03	9/13/04	9/13/04	10/5/2006	10/5/2006	3/21/01	3/21/01	4/18/03	4/18/03	4/18/03	4/18/03	9/9/04
BICARBONATE ALKALINITY	mg/l		551	404		490,			622					682B		737			706		572	530	540			400
CALCIUM	ug/l	28100	28300	25800		34600		44100	45400					55700		55600		53100	48900	95900	89800	86500	91100			122000
CHLORIDE	mg/l		375	153		155J			134					904J		1060			1040		875	899	915			1120J
CHROMIUM	ug/l	6.2	6.9	3.9J	3.3J	6.9	5.9	59.2	10U	9	9	7.9	8.7	5.5B	4.5B	17.4	6	18.1	18.7	208000	226000	181000J	182000J	180000J	186000	119000
HEXAVALENT CHROMIUM	ug/l	10	10	10U	10U	10U	10U	50UJ	50UJ	10	10	10	10	10U	10U	10U	10U	250U	250U	209000	222000	185000	764000	195000	107000	142000
MAGNESIUM	ug/l	43900	44500	36000		36600		42800	45800					66700		64000		60700	57100	50900	48800	45400	47200			50700
pH								6.67										7.25								
POTASSIUM	ug/l	33800	33800	20200		20600J		27300	30400					19900		19100		24900J	23100J	56900	60000	48900	49800			37300J
SODIUM	ug/l	308000	306000	147000		157000		182000	199000					733000		770000		706000	684000	1010000	1030000	862000	879000			907000
SULFATE	mg/l		11.4	23.5		10.2			2.0U					211		188			200		671	690	690			582
ALKALINITY, CARBONATE (AS CACO3)	mg/l								624										710							
ALUMINUM	ug/l	121	81.6					2870J	200UJ									280	259	81.6	81.6					
ANTIMONY	ug/l							6.0U	6.0U									6.6	6.0U							
ARSENIC	ug/l							8.0UJ	8.0UJ									20.6JB	19.0JB							
BARIUM	ug/l							435	407									579	549							
BERYLLIUM	ug/l							1.0UJ	1.0UJ									1.1J	1.1J							
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l							4.0UJ	4.0UJ									4.0U	4.0U							
CARBONATE ALKALINITY	mg/l		551	5		5U			5.0U					5U		5U			5.0U		572	5U	5U			5U
COBALT	ug/l							50UJ	50UJ									50U	50U							
COPPER	ug/l							62.8	25U									40.8	42							
FERROUS IRON	mg/l								0.56										1.5							
HARDNESS (AS CACO3)	mg/l							320										451								
IRON	ug/l	2700	2530					8320	4330									5660J	5260J	450	450					
Iron, Ferric	mg/l								3.8										3.8							
LEAD	ug/l							3.0J	3.0UJ									9.7	6.2							
MANGANESE	ug/l							8360J	8860J									830	774							
MERCURY	ug/l							0.20UJ	0.20UJ									0.20U	0.20U							
MOLYBDENUM	ug/l																									
NICKEL	ug/l							40U	40U									40U	40U							
NITRATE	mg/l		0.1						0.11U										0.11U		0.1					
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l		0.1						0.010U										0.010U		0.13					
SELENIUM	ug/l							10U	10U									10U	10U							
SILVER	ug/l							10U	10U									10U	10U							
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY		0.9994		1.003		1								1.0045		1				1.001		1.005	1.005			1
STRONTIUM	ug/l																									
SULFIDE	mg/l								2.0U										2.0U							
SULFITE	mg/l																									
THALLIUM	ug/l							10U	10U									10U	10U							
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l																									
TOTAL DISSOLVED SOLIDS	mg/l	1050		716		1350		833						2630		3170		2600		3130		3520	3540			3260
TOTAL ORGANIC CARBON	mg/l	15	16.3					14.2										64.3		5.5	6.5					
VANADIUM	ug/l							50U	50U									131	134							
ZINC	ug/l							39.7	20U									20U	20U							

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	087-MW-029D	087-MW-029D	087-MW-W25D	087-MW-W25D	087-MW-W25D	087-MW-W25D	087-MW-W25D	087-MW-W25D	087-MW-W25D	087-MW-W25D	088-MW-15	088-MW-15	088-MW-15	088-MW-15	088-MW-15	090-MW-07	090-MW-07	090-MW-07	090-MW-07	090-MW-07	090-MW-07	115-MW-17	115-MW-17	115-MW-17	115-MW-17
	Filtered	Y	N	N	Y	N	Y	N	N	Y	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
	Date	9/9/04	5/16/06	3/20/01	3/20/01	4/21/03	4/21/03	9/10/04	9/10/04	9/10/04	9/10/04	4/25/03	4/25/03	4/25/03	9/10/04	9/10/04	4/15/03	4/15/03	9/13/04	9/13/04	7/24/06	7/24/06	4/22/04	4/22/04	9/7/04	9/7/04
BICARBONATE ALKALINITY	mg/l		426		250	268B		280	280			828			815		107		374			377	5U		359	
CALCIUM	ug/l		113000	250000	250000	255000		233000	238000			38700			44600		57500		76900		117000	116000	312000		328000	
CHLORIDE	mg/l		1190		4400	4110J		4070	3620			1130			1230		82.4		68.9			52.7	4440		6100	
CHROMIUM	ug/l	133000	125000	2.1	2.1	2.1B	3.4B	5.5	5	12.8	5.8	1130J		986	1170	1090	34800	38600	36900	38000	44200	43600	18	7.9	3	1.9
HEXAVALENT CHROMIUM	ug/l	139000		10	10	10U	10U	10U	10U	10U	10U	10U	10U		50U	50U	40000	40300	39100	38100	41700	40100	10U	10U	10U	10U
MAGNESIUM	ug/l		48900	323000	321000	327000		280000	277000			51200			60300		2240J		9360		14100	14300	397000		345000	
pH																					7.47					
POTASSIUM	ug/l		35600J	63100	62100	52800		53700	50600			83800			90700		12300		23000		33500	34900	77900		65600	
SODIUM	ug/l		849000	2460000	2340000	2260000		1900000	1940000			720000			752000		169000		183000		262000	261000	2990000		2710000	
SULFATE	mg/l		342		585	524		478	494			59.4			10U		203		221			433	351		608	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																					378				
ALUMINUM	ug/l		125U	93.9	81.6																200U	200U				
ANTIMONY	ug/l		11.6U																		6.0UJ	6.0UJ				
ARSENIC	ug/l		9.4JB																		68	65.1				
BARIUM	ug/l		24																		200U	200U				
BERYLLIUM	ug/l		0.6U																		1.0U	1.0U				
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l		0.8U																		4.0U	4.0U				
CARBONATE ALKALINITY	mg/l		5U		5	5U		5U	5U			5U			5U		21.8		5U			5.0U	5U		5U	
COBALT	ug/l		3.4U																		50UJ	50UJ				
COPPER	ug/l		7.4U																		25UJ	25UJ				
FERROUS IRON	mg/l		1UJ																			0.10U				
HARDNESS (AS CACO3)	mg/l																				344					
IRON	ug/l		226J	802	680																263	100UJ				
Iron, Ferric	mg/l																					0.20U				
LEAD	ug/l		8.1U																		6.2	7.7				
MANGANESE	ug/l		361																		62	55.2				
MERCURY	ug/l		0.1U																		0.20U	0.20U				
MOLYBDENUM	ug/l																									
NICKEL	ug/l		4.8U																		40U	40U				
NITRATE	mg/l				0.1																	1.0U				
NITRATE AS NITROUS OXIDE	mg/l		0.1U																							
NITRITE	mg/l				0.1																	0.19J				
SELENIUM	ug/l		8.4U																		10U	10U				
SILVER	ug/l		2.8U																		10UJ	10UJ				
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY				1.0044		1.0085		1	1			1.005			1		1.003		1				1.01		1.01	
STRONTIUM	ug/l																									
SULFIDE	mg/l		1U																			2.0U				
SULFITE	mg/l																									
THALLIUM	ug/l		9.4U																		10U	10U				
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l																									
TOTAL DISSOLVED SOLIDS	mg/l		3050	7900		8560		7400	8440			2680			3000		750		960		1230		11200		12300	
TOTAL ORGANIC CARBON	mg/l		4.7	4	3.6																1.9					
VANADIUM	ug/l		9.4U																		50U	50U				
ZINC	ug/l		21.7																		20U	20U				

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	115-MW-20	115-MW-20	115-MW-20	115-MW-20	115-MW-20	115-MW-20	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E14D	115-MW-E8D	115-MW-E8D	115-MW-E8D	115-MW-E8D
	Filtered	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y
	Date	4/21/04	4/21/04	9/9/04	9/9/04	7/26/06	7/26/06	10/31/97	10/31/97	10/31/97	10/31/97	7/16/98	7/16/98	4/13/99	4/13/99	3/8/01	4/16/03	4/16/03	9/8/04	9/8/04	7/21/2006	7/21/2006	10/31/97	10/31/97	7/9/98	7/9/98
BICARBONATE ALKALINITY	mg/l	5U		730			647					439			455		604		1180			790				
CALCIUM	ug/l	104000		87800		100000	93500					13100		13800	14300	20600	18300		32000		21300	21000				
CHLORIDE	mg/l	2350		3670J			3820					150			172	345	301		745			465				
CHROMIUM	ug/l	4	3.2	3.8	4.3	20.9	13.4	775	751	620	623	33.3	5.4	24.6	5.1	16.1	33.2J	22J	86.2	16.3	100UJ	31.5	30.7	29.6	4.2	9.8
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U	10U	50U	50U	577	600	564	542	10	10	10	10	10	10U	10U	10U	10U	50U	50U	10	10	10	10
MAGNESIUM	ug/l	139000		161000		193000	180000					10700		11000	11400	22000	22500		52600		35000	36100				
pH						7.53										7.67					7.33					
POTASSIUM	ug/l	59500		62800J		92200J	87200J					16400		17600	18200	21000	17500		33600		30800	32900				
SODIUM	ug/l	2120000		2090000		2360000	2320000					288000		301000	308000	424000	392000		845000		571000	620000				
SULFATE	mg/l	170		283			324					88.4			73.6	88.4	73		38.7			78.2				
ALKALINITY, CARBONATE (AS CACO3)	mg/l						652															793				
ALUMINUM	ug/l					200U	200U					86.9		116	24.1	81.6					527	200U				
ANTIMONY	ug/l					6.0UJ	6.0UJ									5.9					7.7J	8.6J				
ARSENIC	ug/l					8.0UJ	8.0UJ									5.7					8.0UJ	8.0UJ				
BARIUM	ug/l					200U	200U									105					200U	200U				
BERYLLIUM	ug/l					1.0U	1.0U									0.3					1.0U	1.0U				
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l					4.0U	4.0U									0.5					4.0U	4.0U				
CARBONATE ALKALINITY	mg/l	5U		5U			5.0U					5			5	560	5U		5U			5.0U				
COBALT	ug/l					50U	50U									2.2					50UJ	50UJ				
COPPER	ug/l					25U	25U									2.8					27.8	25UJ				
FERROUS IRON	mg/l						0.59															0.7				
HARDNESS (AS CACO3)	mg/l					1030															1500					
IRON	ug/l					5370	4680					207	125	385	322	1660					4540	4010				
Iron, Ferric	mg/l						4.1															3.5				
LEAD	ug/l					3.0UJ	3.0UJ									2.6					5.9	5.1				
MANGANESE	ug/l					1140	1040									747					453	456				
MERCURY	ug/l					0.20UJ	0.20UJ									0.1					0.20UJ	0.20UJ				
MOLYBDENUM	ug/l																									
NICKEL	ug/l					40U	40U									3.1					40UJ	40UJ				
NITRATE	mg/l						0.11U								0.1	0.1						0.11U				
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l						0.010U								0.1							0.010U				
SELENIUM	ug/l					10U	10U									4.1					10U	10U				
SILVER	ug/l					10U	10U									2.3					10UJ	10UJ				
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY		1		1										0.998			1.004		1							
STRONTIUM	ug/l																									
SULFIDE	mg/l						2.0U															2.0U				
SULFITE	mg/l																									
THALLIUM	ug/l					10U	10U									4.8					10U	10U				
TIN	ug/l															3.4										
TITANIUM	ug/l															2										
TOTAL ALKALINITY	mg/l																									
TOTAL DISSOLVED SOLIDS	mg/l	6620		6400		6520								998			1290		3020		1830					
TOTAL ORGANIC CARBON	mg/l					13								11.6		16.9					26.4					
VANADIUM	ug/l					50U	50U									4					50U	50U				
ZINC	ug/l					20U	20U									6.3					20U	20U				

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	115-MW-E8D	115-MW-E8D	115-MW-E8D	115-MW-E8D	115-MW-E8D	115-MW-E8D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-O13D	115-MW-U14D	115-MW-U14D	115-MW-U14D	115-MW-U14D	115-MW-U14D	115-MW-U14D	115-MW-U14D	115-MW-U14D	115-MW-U14D
	Filtered	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y
	Date	4/13/99	4/13/99	4/16/03	4/16/03	9/8/04	9/8/04	10/31/97	10/31/97	7/9/98	7/9/98	4/13/99	4/13/99	4/16/03	4/16/03	9/10/04	9/10/04	1/6/99	1/6/99	4/14/99	4/14/99	7/20/99	7/20/99	3/8/01	4/16/03	4/16/03
BICARBONATE ALKALINITY	mg/l		357	258		229 J				962			931	1005		980		551			1090		630		580	
CALCIUM	ug/l	4640	4950	3230J		3850				59200		57600	54000	51900		50300		252000		246000	242000			243000	212000	
CHLORIDE	mg/l		125	65.5		68.5				3400			2950	2920		2960		7000			8900		7200	7850	6410	
CHROMIUM	ug/l	7.8	7.1	6.7J	5.2J	11.9	5.6	9	9	8.7	8.7	7.9	8.9	10.9J	8.6J	69.9	67.3	2.9	8.5	3.5	2.2	6.8	6.8	2.1		
HEXAVALENT CHROMIUM	ug/l	10	10	10U	10U	10U	10U	10	10	10	10	10	10	10U	10U	10U	10U	10	10	10	10	10	10	10	10U	10U
MAGNESIUM	ug/l	5640	6120	2570J		2750				139000		128000	120000	122000		106000		418000		419000	415000			476000	447000	
pH																								7.12		
POTASSIUM	ug/l	12500	14000	7510		9310				75700		76000	73300	65100		59800		112000		118000	118000			112000	101000	
SODIUM	ug/l	268000	287000	198000		186000				2070000		2030000	1980000	1700000		1770000		3320000		3570000	3550000			3790000	3650000	
SULFATE	mg/l		129	93.4		80.8				68.8			72.1	59.6		57.4		564			577		565	568	548	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																									
ALUMINUM	ug/l	32.4	33.1							86.9		88.2	49.3					45.1		55.1	24.1			81.6		
ANTIMONY	ug/l																							5.9		
ARSENIC	ug/l																							2.3		
BARIUM	ug/l																							117		
BERYLLIUM	ug/l																							0.3		
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l																							0.5		
CARBONATE ALKALINITY	mg/l		5	23.8		36				962			931	5U		5U		551			5		630	600	5U	
COBALT	ug/l																							2.2		
COPPER	ug/l																							2.8		
FERROUS IRON	mg/l																									
HARDNESS (AS CACO3)	mg/l																									
IRON	ug/l	320	332							5400	4840	4880	4420					8810	9180	14100	13700			16500		
Iron, Ferric	mg/l																									
LEAD	ug/l																							5.2		
MANGANESE	ug/l																							1300		
MERCURY	ug/l																							0.1		
MOLYBDENUM	ug/l																									
NICKEL	ug/l																							2.1		
NITRATE	mg/l		0.1										0.1								0.1		0.1	0.1		
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l		0.1										0.1								0.1		0.1			
SELENIUM	ug/l																							4.1		
SILVER	ug/l																							2.3		
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY		0.998		1.003		1						1.002		1.007		1				1.007		1.007			1.012	
STRONTIUM	ug/l																									
SULFIDE	mg/l																									
SULFITE	mg/l																									
THALLIUM	ug/l																							4.8		
TIN	ug/l																							3.7		
TITANIUM	ug/l																							1.1		
TOTAL ALKALINITY	mg/l																									
TOTAL DISSOLVED SOLIDS	mg/l	880		622		708						6480		5590		5240				14100		14100			12300	
TOTAL ORGANIC CARBON	mg/l	16.4										19.5								10.1		9.5	9.5	10.3		
VANADIUM	ug/l																							4		
ZINC	ug/l																							5		

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	115-MW-U14D	115-MW-U14D	117-MW-11	117-MW-11	117-MW-11	117-MW-11	117-MW-11	117-MW-11	117-MW-D1	117-MW-D1	117-MW-D2	117-MW-D2	117-MW-I1	117-MW-I1	117-MW-I2	117-MW-I2	117-MW-I2	117-MW-I2	117-MW-I3	117-MW-I3	117-MW-I5	117-MW-I5	124-MW-102D	124-MW-102D	124-MW-102D
	Filtered	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	N	Y
	Date	9/7/04	9/7/04	4/23/03	4/23/03	4/23/03	4/23/03	9/13/04	9/13/04	12/21/06	12/21/06	12/21/06	12/21/06	12/21/06	12/21/06	12/21/06	12/21/06	12/21/06	12/21/06	12/22/06	12/22/06	12/21/06	12/21/06	5/18/05	12/28/05	12/28/05
BICARBONATE ALKALINITY	mg/l	576		364				384			33.7		173		2400			6.8	7.3		5U		212	426		
CALCIUM	ug/l	213000			113000			122000		229000	70400	70700	87100	65700	68200	345000	409000	352000	349000	39800	47600	43100	42200	9230	7110	
CHLORIDE	mg/l	6950		77.7				72.9			39.2		75.4		401			756	756		81		87.7	143	80.4	
CHROMIUM	ug/l	1.9	1.6U		1.4J		2.1J	1.6U	1.6U	30.5	29.2	67.6	10U	10U	10U	1540	2550	1170	1310	12600	9960	840	758	135	38.1	4.8J
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U		10U		10U	10U	23	34	10U	10U	10U	10U	1700	1500	1400	1400	39000	10300	770	740	20UJ	10U	10U
MAGNESIUM	ug/l	399000			12000			13400		27900	21800	7950	9600	5950	5830	5000U	5000U	5000U	5000U	5000U	5000U	7190	6960	5510	3370	
pH										10.09		8.11		7.87		13.47	13.47					6.72			8.33J	
POTASSIUM	ug/l	105000			7050			7860		38100	44000	9560	9540	50000U	32400	57500	60500	75900	72500	33600	42800	49800	52400	11800	8510	
SODIUM	ug/l	3400000			67500			56500		109000	112000	140000	130000	283000	291000	512000	533000	546000	521000	483000	488000	88800	90000	259000	197000	
SULFATE	mg/l	544		5U				20.9			381		320		32.4			10U	10U		47.7		70.6	49.6	60.8	
ALKALINITY, CARBONATE (AS CACO3)	mg/l										11.8		5U		5U			597	627		246		5U		5U	
ALUMINUM	ug/l									246	200U	985	200U	213	200U	7200	7010	5830	5810	4380	3620	209	200U			
ANTIMONY	ug/l									6U	6U	6U	6U	6U	6U	6U	6U	6U	6U	6	6U	6U	6U			
ARSENIC	ug/l									8U	8U	13.2	14.6	8U	8U	8U	9.4	8U	8U	13.5	10.3	8U	8U			
BARIUM	ug/l									200U	200U	200U	200U	200U	200U	238	280	242	235	200U	200U	200U	200U			
BERYLLIUM	ug/l									1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U			
BICARBONATE ALKALINITY AS CACO3	mg/l																								329	
BORON	ug/l																									
CADMIUM	ug/l									4U	4U	4U	4U	4U	4U	4U	4U	4U	4U	4U	4U	4U	4U			
CARBONATE ALKALINITY	mg/l	5U		5U				5U			47.3		173		240			1070	1090		1040		212	5U		
COBALT	ug/l									50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U			
COPPER	ug/l									25U	25U	92	25U	25U	25U	45.8	55.1	25U	25U	25U	25U	25U	25U			
FERROUS IRON	mg/l										0.1U		5		0.25			0.1U	0.11		0.1U		0.1U			
HARDNESS (AS CACO3)	mg/l									462		242		170		956	945					105				
IRON	ug/l									277	100U	12900	15900	5750	5450	1240	2060	264	256	1310	100U	351	100U			
Iron, Ferric	mg/l										0.2U		10.9		5.2			0.26	0.2U		0.2U		0.2U			
LEAD	ug/l									3.3	3U	22.1	6.1	3U	3U	8.2	6.6	3U	3U	3.2	3U	3U	3U			
MANGANESE	ug/l									1730	118	3930	4730	677	701	20.1	38.4	15U	15U	15U	15U	729	686			
MERCURY	ug/l									0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U			
MOLYBDENUM	ug/l																									
NICKEL	ug/l									40U	40U	40U	40U	40U	40U	48.5	58.1	40U	40U	40U	40U	40U	40U			
NITRATE	mg/l										0.14		0.11U		0.11U			1U	1U		5.1U		0.67			
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l										0.082		0.01U		0.01U			1.8	1.8		0.43		0.01U			
SELENIUM	ug/l									10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U			
SILVER	ug/l									10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U			
SPECIFIC CONDUCTANCE	umhos/cm									930		624		1660		6360	6360					445				
SPECIFIC GRAVITY		1.01		1.0029				1		1		1		1		1	1					1		1	1	
STRONTIUM	ug/l																									
SULFIDE	mg/l										2U		2U		2U			2U	2U		2U		2U		1U	
SULFITE	mg/l																									
THALLIUM	ug/l									10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U			
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l																									
TOTAL DISSOLVED SOLIDS	mg/l	12100		646				740		753		698		947		2200	2250					448		768	794	
TOTAL ORGANIC CARBON	mg/l									66.8		6.9		12.8		36.8	37.1					1.8				
VANADIUM	ug/l									50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	51.3	50U	50U	50U			
ZINC	ug/l									21.1	20U	73.1	20U	20U	20U	29.7	38.6	20U	20U	27.4	20U	22.8	20U			

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	124-MW-102D	124-MW-103D	124-MW-103D	124-MW-103D	124-MW-103D	124-MW-G103D	124-MW-104D	124-MW-104D	124-MW-104D	124-MW-105D	124-MW-105D	124-MW-105D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D	124-MW-G02D
	Filtered	N	N	N	Y	Y	N	N	Y	N	N	N	Y	N	N	Y	N	Y	N	N	Y	Y	N	Y	N	N
	Date	5/24/06	12/27/05	12/27/05	12/27/05	12/27/05	5/24/06	12/29/05	12/29/05	5/26/06	12/28/05	12/28/05	5/24/06	5/26/99	5/26/99	7/15/99	7/15/99	4/16/03	4/16/03	4/16/03	4/16/03	9/13/04	9/13/04	12/29/05	12/29/05	5/24/06
BICARBONATE ALKALINITY	mg/l	535	275	291			302	208		167			188		0		999	730	720			682		604		631
CALCIUM	ug/l	6950	25100	25700			23300	18300		13700	86000		30300	31200	29800	26500	24800	16200	16100			15700		16200		16500
CHLORIDE	mg/l	226	64.8	65.9			89.5	50.6		45.3	337		550		735		780	454	455			389		332		375
CHROMIUM	ug/l	61.9	32.1	29.6	13.4J	11.6J	21.2	9.2	2.8U	24.6	13.5J	5.6J	26.4	3.4	3.4	4.3	11.4	1.9J	1.9J	2J	2.4J	3.1	1.6U	14.8	7.4	10.3
HEXAVALENT CHROMIUM	ug/l		10UJ	10UJ	10UJ	10UJ		10UJ	10UJ		50U	10U		10	10	10	10	10U	10U	10U	10U	10U	10U	10UJ	10UJ	
MAGNESIUM	ug/l	8770	20700	21700			23600	8040		7290	9910		4950	53700	52200	66400	60600	36400	36300			31500		27600		29700
pH		7.93	8.22J	8.28J			8.33	8.43J		7.93	9.59J		9.85											8.43J		7.98
POTASSIUM	ug/l	14700	22500	23700			21000	8400		9560	35300		22400	42800	42500	44700	42900	29200	29100			25900		28700		26800
SODIUM	ug/l	334000	163000	166000			154000	106000		79100	454000		482000	730000	739000	839000	804000	510000	514000			452000		446000		440000
SULFATE	mg/l	5U	176J	173J			122	59		52.2	52.1		70.8		31.5		27.3	42.9	44.5			47.3		45.7		51.2
ALKALINITY, CARBONATE (AS CACO3)	mg/l										422															
ALUMINUM	ug/l	2180					907			1910			4560	288	29.1	134	29.1									1340
ANTIMONY	ug/l	5.8U					5.8U			5.8U			5.8U													5.8U
ARSENIC	ug/l	3.2U					3.2U			3.8			4.8													3.2U
BARIUM	ug/l	41					82			66.2			33.3													127
BERYLLIUM	ug/l	0.42					0.38			0.3U			0.38													0.44
BICARBONATE ALKALINITY AS CACO3	mg/l										224															
BORON	ug/l																									
CADMIUM	ug/l	0.4U					0.4U			0.4U			0.4U													0.4U
CARBONATE ALKALINITY	mg/l	5U	5U	5U			5U	5U		5U			348		0		999	5U	5U			5U		5U		5U
COBALT	ug/l	1.7U					1.7U			1.7U			1.7U													4.5
COPPER	ug/l	8.4					7.7			5.8			9.5													108
FERROUS IRON	mg/l	1					0.24						0.53													1.1
HARDNESS (AS CACO3)	mg/l																									
IRON	ug/l	2770					816			3340			1610	753	657	2490	2380									3610
Iron, Ferric	mg/l																									
LEAD	ug/l	4.9					2.8			2.7U			2.9													9.3
MANGANESE	ug/l	143					45			2320			41.8													860
MERCURY	ug/l	0.1U					0.1U			0.16			0.1U													1.1
MOLYBDENUM	ug/l																									
NICKEL	ug/l	8.4					5.7			11.9			25.7													15.8
NITRATE	mg/l	0.1					0.11			0.15			0.12		0.1		0.1									0.11
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l	0.1U					0.1U			0.1U			0.1U		0.1		0.1									0.1U
SELENIUM	ug/l	4.2U					4.2U			4.2U			4.2U													4.2U
SILVER	ug/l	1.4U					1.4U			1.4U			1.4U													1.4U
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY			1	1				1			1			0		1.003		1.004	1.004			1		1		
STRONTIUM	ug/l																									
SULFIDE	mg/l	1U	1U	1U			1U	1U		1U	1U		1U												1U		1U
SULFITE	mg/l																									
THALLIUM	ug/l	4.7U					4.7U			4.7U			4.7U													4.7U
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l	535					302			167			536													631
TOTAL DISSOLVED SOLIDS	mg/l	992	756	794			660	379		368	954		1570	0		2270		1760	1320			2010		1290		1370
TOTAL ORGANIC CARBON	mg/l	30.3					6.4			4.3			22.2	0	0	25.2	24.4									24.8
VANADIUM	ug/l	27.2					14.3			4.7U			27													5.4
ZINC	ug/l	29.5					29U			35.1			37													10200

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	140-MW-P05D	140-MW-P05D	140-MW-P05D	140-MW-P05D	140-MW-P05D	140-MW-P05D	140-MW-P05D	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-A2	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-B7
	Filtered	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	Y	N	N
	Date	1/5/99	1/5/99	7/14/99	7/14/99	4/16/03	4/16/03	5/26/06	10/23/97	10/23/97	10/28/97	10/28/97	6/22/98	6/22/98	6/23/98	6/23/98	3/13/03	3/13/03	3/13/03	3/13/03	4/12/06	4/12/06	10/21/97	10/21/97	10/23/97	10/23/97
BICARBONATE ALKALINITY	mg/l	908			958	1320		878									220	220	225	210						
CALCIUM	ug/l	59000		63800	63700	57200		33000									86200	84900	93400	88900	85000					
CHLORIDE	mg/l	2600			2750	2420		1770									145	153	118		121					
CHROMIUM	ug/l	13.9	11.6	12.4	7.2	12.3J	10J	36	72.4	53	4.5	4.5	3.2	3.2	5.3	5.2	17JB	18.6JB	5.5JB	3JB	6.4	1.6UJ	4.5	4.5	4.5	4.5
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	10U	10U		134	62	10	10	10	10	10	10	10U	10U	10U	10U	10U	10U	10	10	10	10
MAGNESIUM	ug/l	133000		145000	142000	136000		75300									25100	24900	24200	23900	20900					
pH								7.73													7.54J					
POTASSIUM	ug/l	75300		73000	73800	60200		54000									6650	6620	5930	5970	6180					
SODIUM	ug/l	1620000		1800000	1850000	1280000		1150000									86400	92000	79200	81700	56200					
SULFATE	mg/l	23.8			24.5	37.7		5U									65.5	65.7	63.9		50.2					
ALKALINITY, CARBONATE (AS CACO3)	mg/l																									
ALUMINUM	ug/l	279		74.9	29.1			864													633					
ANTIMONY	ug/l							5.8U													5.8U					
ARSENIC	ug/l							7.4													3.2U					
BARIUM	ug/l							446													66.5					
BERYLLIUM	ug/l							0.3U													0.3U					
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l							0.4U													0.4U					
CARBONATE ALKALINITY	mg/l	908			958	5U		5U									5U	5U	5U	5U						
COBALT	ug/l							2													1.7U					
COPPER	ug/l							69.7													7.1					
FERROUS IRON	mg/l							1.7																		
HARDNESS (AS CACO3)	mg/l																									
IRON	ug/l	3830	3510	5000	5040			8500													749					
Iron, Ferric	mg/l																									
LEAD	ug/l							19.9													9.2					
MANGANESE	ug/l							184													168					
MERCURY	ug/l							0.1U													0.1UJ					
MOLYBDENUM	ug/l																									
NICKEL	ug/l							10.2													3.2					
NITRATE	mg/l				0.1			0.11																		
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l				0.1			0.1U																		
SELENIUM	ug/l							4.2U													4.2U					
SILVER	ug/l							1.4U													1.4U					
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY				1.003		1.007											1.003	1.002	1.003	1.003						
STRONTIUM	ug/l																									
SULFIDE	mg/l							1U																		
SULFITE	mg/l																									
THALLIUM	ug/l							4.7U													4.7U					
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l							878													204					
TOTAL DISSOLVED SOLIDS	mg/l			5640		5320		3770									622	712	650	640	336					
TOTAL ORGANIC CARBON	mg/l			21	21			20.3													5.6					
VANADIUM	ug/l							22.4													4.7U					
ZINC	ug/l							450													22.8					

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-B7	144-MW-C07	144-MW-C07	144-MW-C07	144-MW-C07	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106
	Filtered	Y	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	N	Y	Y	N	N	Y	Y	N	Y	Y
	Date	10/23/97	10/23/97	6/22/98	6/22/98	6/25/98	6/25/98	3/13/03	3/13/03	5/19/04	5/19/04	4/12/06	4/12/06	8/5/04	12/16/04	12/16/04	12/16/04	12/16/04	12/16/04	9/13/05	9/13/05	9/13/05	9/13/05	11/9/05	11/9/05	12/12/05	12/12/05
BICARBONATE ALKALINITY	mg/l							260	255																	
CALCIUM	ug/l							124000	141000			124000												33800	19200	43300	44700
CHLORIDE	mg/l							1100	1040			155								135	130			112		151	
CHROMIUM	ug/l	4.5	4.5	2.9	2.9	2.9	2.9	5.3JB	3.8JB	3.6B	1.8B	2.2	1.6UJ	181	1410	1450	325	330	221	240	3.5	4.5	26	6.9	80.8	2.9
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	10	10	10U	10U	10UJ	10UJ	10U	10U	89.8	162	170	147	174	10U	10U	10U	10U	10U	10U	10UJ	10UJ
MAGNESIUM	ug/l							78300	87600			20100											969	114	1710	41.6U
pH												7.32J											10.63J		11.69	
POTASSIUM	ug/l							24900	27700			6130											20000	21300	24200	25700
SODIUM	ug/l							553000	585000			50600											179000	195000	175000	178000
SULFATE	mg/l							285	269			50.8											43.9		54	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																									
ALUMINUM	ug/l											100											4890	4960	7210	6670
ANTIMONY	ug/l											5.8U											4.9U	5.8U	5.8U	5.8U
ARSENIC	ug/l											3.2U											19.7	19.4	17.2	12.1
BARIUM	ug/l											82.3											47.3	22.7	47.8	43.5
BERYLLIUM	ug/l											0.3U											0.1U	0.3U	0.3U	0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l																									
BORON	ug/l																									
CADMIUM	ug/l											0.4U											0.5U	0.4U	0.4U	0.4U
CARBONATE ALKALINITY	mg/l							5U	5U																	
COBALT	ug/l											1.7U											3.5U	1.7U	1.7U	1.7U
COPPER	ug/l											6.4											27J	8.3	20.7	3.7U
FERROUS IRON	mg/l																						0.1UJ		0.1U	
HARDNESS (AS CACO3)	mg/l																						120		127	
IRON	ug/l											587											308	50.3	588	39.2U
Iron, Ferric	mg/l																									
LEAD	ug/l											2.7U											20.5	5.6	13	2.7U
MANGANESE	ug/l											1350											41.5	6.8	32.9	1.2U
MERCURY	ug/l											0.1UJ											0.11	0.1U	0.1U	0.1U
MOLYBDENUM	ug/l																									
NICKEL	ug/l											2.4U											5.8	5.3	6.2	4.9
NITRATE	mg/l																						0.14		0.11	
NITRATE AS NITROUS OXIDE	mg/l																									
NITRITE	mg/l																						0.1U		0.1U	
SELENIUM	ug/l											4.2U											4.8U	4.2U	4.2U	4.2U
SILVER	ug/l											1.4U											1.2U	1.4U	1.4U	1.4U
SPECIFIC CONDUCTANCE	umhos/cm																									
SPECIFIC GRAVITY								1.004	1.004																	
STRONTIUM	ug/l																									
SULFIDE	mg/l																						1U			
SULFITE	mg/l																								5U	
THALLIUM	ug/l											4.7U											4.8U	4.7U	4.7U	4.7U
TIN	ug/l																									
TITANIUM	ug/l																									
TOTAL ALKALINITY	mg/l											267											406		333	
TOTAL DISSOLVED SOLIDS	mg/l							2550	2710			578							1890	1010			603		698	
TOTAL ORGANIC CARBON	mg/l											1.2											10		9.2	
VANADIUM	ug/l											4.7U											31.2	33.4	18.7	13.5
ZINC	ug/l											11.2											21.8	9.6	26	5.8U

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C106	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107	144-MW-C107
	Filtered	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	N	Y	N	N	Y	Y
	Date	1/13/06	1/13/06	4/12/06	4/12/06	11/9/05	11/9/05	11/9/05	11/9/05	12/12/05	12/12/05	12/12/05	12/12/05	1/13/06	1/13/06	4/12/06	4/12/06	4/12/06	4/12/06
BICARBONATE ALKALINITY	mg/l																		
CALCIUM	ug/l	39800	36800	44200		45600	45500	32500	35800	77700	79500	76800	55800	83900	84600	87500	90100		
CHLORIDE	mg/l	157		108		97.7	97.5			166	152			212		191	198		
CHROMIUM	ug/l	99.8	4.3	38.5	9	1680	1650	1580	1110	484	507	247	585	118	8.4	55.4	36	2.2	2.4
HEXAVALENT CHROMIUM	ug/l	10UJ	10UJ	10U	10U	1530	1360	1330	1570	186	230	210	197	10UJ	10UJ	10U	10U	10U	10U
MAGNESIUM	ug/l	1500	43.3	1790		10000	9680	10100	10200	14600	14900	14900	13300	17200	17300	17100	17200		
pH		11.67		11.32		8.28J	8.83J			8.51	8.27			8.07		7.8	7.88		
POTASSIUM	ug/l	25700	25700	21800		13300	13100	13100	12200	15100	15400	15800	15400	14200	14200	15000	14600		
SODIUM	ug/l	171000	185000	196000		137000	132000	134000	143000	167000	172000	177000	172000	174000	173000	172000	169000		
SULFATE	mg/l	46.1		55.6		88.8	86.1			68.4	67.6			85.6		75	73.6		
ALKALINITY, CARBONATE (AS CACO3)	mg/l																		
ALUMINUM	ug/l	6740	5730	4670		6390	6210	1810	1570	3200	3480	397	445	782	74.9	519	443		
ANTIMONY	ug/l	5.8U	5.8U	5.8U		4.9U	4.9U	5.8U	5.8U	5.8U	5.8U	5.8U	5.8U	5.8U	5.8U	5.8U	5.8U		
ARSENIC	ug/l	12.7	16.8	19.7		4.9	4.5U	3.2U	4.3	3.2U	3.2U	3.2U	3.2U	5.1	5.1	3.2U	4.1		
BARIUM	ug/l	44.8	36.9	57.7		44.7	43.7	13.8	13.6	68	68.5	33	16.3	83.9	75.4	78.8	78.8		
BERYLLIUM	ug/l	0.3U	0.3U	0.3U		0.1U	0.1U	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U		
BICARBONATE ALKALINITY AS CACO3	mg/l																		
BORON	ug/l																		
CADMIUM	ug/l	0.4U	0.4U	0.4U		0.5U	0.5U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U		
CARBONATE ALKALINITY	mg/l																		
COBALT	ug/l	1.7U	1.7U	1.7U		3.5U	3.5U	1.7U	1.7U	1.7U	1.7U	1.7U	1.7U	1.7U	1.7U	1.7U	1.7U		
COPPER	ug/l	12.8	5.8	30.6		3.1UJ	3.1UJ	3.7U	3.7U	4.6	3.7U	3.7U	3.7U	3.7U	3.7U	3.7U	3.7U		
FERROUS IRON	mg/l	0.26		0.1U		0.1UJ	0.1UJ			0.1U	0.1U			0.15		0.16	0.16		
HARDNESS (AS CACO3)	mg/l	114				180	172			247	263			270					
IRON	ug/l	381	39.2U	651		359	407	39.2U	39.2U	1180	1190	39.2U	39.2U	786	39.2U	1060	1210		
Iron, Ferric	mg/l																		
LEAD	ug/l	10.3	2.7U	25.4		3.3	3.5	2.7U	2.7U	2.8	2.7U	2.7U	2.7U	2.7U	2.7U	2.7U	2.7U		
MANGANESE	ug/l	30.7	1.2U	56.9		115	115	34.3	59.3	343	341	289	78.6	450	440	505	530		
MERCURY	ug/l	0.1U	0.1U	0.1U		0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U		
MOLYBDENUM	ug/l																		
NICKEL	ug/l	5.6	6.7	7		5.4	6.4	3.8	4.2	7.3	7.4	5.8	4.1	5.3	5.5	4.3	3.5		
NITRATE	mg/l	0.1				0.16	0.17			0.16	0.14			0.12					
NITRATE AS NITROUS OXIDE	mg/l																		
NITRITE	mg/l	0.1U				0.1U	0.1U			0.1U	0.1U			0.1U					
SELENIUM	ug/l	4.2U	4.2U	4.2U		4.8U	4.8U	4.2U	4.2U	4.2U	4.2U	4.2U	4.2U	4.2U	4.2U	4.2U	4.2U		
SILVER	ug/l	1.4U	1.4U	1.4U		1.2U	1.2U	1.4U	1.4U	1.4U	1.4U	1.4U	1.4U	1.4U	1.4U	1.4U	1.4U		
SPECIFIC CONDUCTANCE	umhos/cm																		
SPECIFIC GRAVITY																			
STRONTIUM	ug/l																		
SULFIDE	mg/l					1U	1U												
SULFITE	mg/l	5U								5U	5U			5U					
THALLIUM	ug/l	4.7U	4.7U	4.7U		4.8U	4.8U	4.7U	4.7U	4.7U	4.7U	4.7U	4.7U	4.7U	4.7U	4.7U	4.7U		
TIN	ug/l																		
TITANIUM	ug/l																		
TOTAL ALKALINITY	mg/l	342		360		335	328			355	365			326		355	354		
TOTAL DISSOLVED SOLIDS	mg/l	705		648		579	577			758	754			821		600	704		
TOTAL ORGANIC CARBON	mg/l	8.9		6.1		7.8	7.9			8.3	7.7			6.7		6.7	6		
VANADIUM	ug/l	14.4	20.2	29.2		64.9	65.4	54.8	47.1	48.2	52.1	42.6	56.1	16.8	11.6	9.4	8.7		
ZINC	ug/l	15.1	5.8U	39.3		28.3	27.9	13.5	31.8	14.5	12.8	5.8U	5.8U	10.1	5.8U	6.6	5.8U		

Table A-2
Intermediate Groundwater
Analytical Data

	Location ID	144-MW-C19	144-MW-C19	144-MW-C19	144-MW-C19	144-MW-C19	144-MW-C19	144-MW-C19	144-MW-C19
	Filtered	N	Y	N	Y	N	Y	N	Y
	Date	10/10/97	10/10/97	6/23/98	6/23/98	3/13/03	3/13/03	4/12/06	4/12/06
BICARBONATE ALKALINITY	mg/l					315	320		
CALCIUM	ug/l					168000	167000	140000	
CHLORIDE	mg/l					288	287	289	
CHROMIUM	ug/l	206	61.1	189	174	277J	235J	257	214
HEXAVALENT CHROMIUM	ug/l	46.1	38	66.1	83.6	249	241	195	198
MAGNESIUM	ug/l					40700	40400	28800	
pH								7.28J	
POTASSIUM	ug/l					3870J	3830J	4680	
SODIUM	ug/l					100000	98300	122000	
SULFATE	mg/l					60.8	31.2	50.2	
ALKALINITY, CARBONATE (AS CACO3)	mg/l								
ALUMINUM	ug/l							87.4	
ANTIMONY	ug/l							5.8U	
ARSENIC	ug/l							3.2U	
BARIUM	ug/l							102	
BERYLLIUM	ug/l							0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l								
BORON	ug/l								
CADMIUM	ug/l							0.4U	
CARBONATE ALKALINITY	mg/l					5U	5U		
COBALT	ug/l							1.7U	
COPPER	ug/l							3.7U	
FERROUS IRON	mg/l								
HARDNESS (AS CACO3)	mg/l								
IRON	ug/l							161	
Iron, Ferric	mg/l								
LEAD	ug/l							2.7U	
MANGANESE	ug/l							339	
MERCURY	ug/l							0.1UJ	
MOLYBDENUM	ug/l								
NICKEL	ug/l							2.4U	
NITRATE	mg/l								
NITRATE AS NITROUS OXIDE	mg/l								
NITRITE	mg/l								
SELENIUM	ug/l							4.2U	
SILVER	ug/l							1.4U	
SPECIFIC CONDUCTANCE	umhos/cm								
SPECIFIC GRAVITY						1.003	1.003		
STRONTIUM	ug/l								
SULFIDE	mg/l								
SULFITE	mg/l								
THALLIUM	ug/l							4.7U	
TIN	ug/l								
TITANIUM	ug/l								
TOTAL ALKALINITY	mg/l							306	
TOTAL DISSOLVED SOLIDS	mg/l					974	1080	908	
TOTAL ORGANIC CARBON	mg/l							9.6	
VANADIUM	ug/l							7	
ZINC	ug/l							7.8	

Table A-2
Intermediate Groundwater
Analytical Data

Location ID	Unit	144-MW-C3	144-MW-C3	144-MW-C3	144-MW-C3	144-MW-C3	144-MW-C3	144-MW-C3	144-MW-C3	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D	SA6-MW-AA1D
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y
Date		10/27/97	10/27/97	10/30/97	10/30/97	6/23/98	6/23/98	6/24/98	6/24/98	2/1/01	2/1/01	4/22/03	4/22/03	9/9/04	9/9/04	5/16/06	11/28/06	11/28/06
BICARBONATE ALKALINITY	mg/l										584	586		570		560		594
CALCIUM	ug/l									87500	87100	84300		90600		89300	82100	83900
CHLORIDE	mg/l										1370	1520		1040J		1500		1430
CHROMIUM	ug/l	30.7	4.5	4.6	4.5	4.7	2.9	2.9	2.9	3.3	2.6	2.2J	2J	4.1	3.8	4.8B	10U	10U
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	10	10	10	10	10	10	10U	10U	10U	10U		10U	10U
MAGNESIUM	ug/l									91800	92300	118000		119000		111000	109000	111000
pH																	7.05	
POTASSIUM	ug/l									34400	34700	34700		37600J		39600J	47900	49300
SODIUM	ug/l									970000	983000	985000		983000		915000	985000	1030000
SULFATE	mg/l										228	243		223		241		189
ALKALINITY, CARBONATE (AS CACO3)	mg/l																	5U
ALUMINUM	ug/l									81.6	81.6					125U	200U	200U
ANTIMONY	ug/l															11.6U	6U	6U
ARSENIC	ug/l															6.4U	8U	8U
BARIUM	ug/l															105	200U	200U
BERYLLIUM	ug/l															0.6U	1U	1U
BICARBONATE ALKALINITY AS CACO3	mg/l																	
BORON	ug/l																	
CADMIUM	ug/l															0.8U	4U	4U
CARBONATE ALKALINITY	mg/l										584	5		5U		5U		594
COBALT	ug/l															3.4U	50U	50U
COPPER	ug/l															7.4U	25U	25U
FERROUS IRON	mg/l															0.13J		0.18
HARDNESS (AS CACO3)	mg/l																625	
IRON	ug/l									6090	6070					7840J	7190	6810
Iron, Ferric	mg/l																	6.6
LEAD	ug/l															8.1U	3U	3U
MANGANESE	ug/l															1260	1120	1160
MERCURY	ug/l															0.1U	0.2U	0.2U
MOLYBDENUM	ug/l																	
NICKEL	ug/l															4.8U	40U	40U
NITRATE	mg/l										0.1							0.11U
NITRATE AS NITROUS OXIDE	mg/l															0.1U		
NITRITE	mg/l										0.1							0.01U
SELENIUM	ug/l															8.4U	10U	10U
SILVER	ug/l															2.8U	10U	10U
SPECIFIC CONDUCTANCE	umhos/cm																5250	
SPECIFIC GRAVITY										1.0028		1.0051		1			1	
STRONTIUM	ug/l																	
SULFIDE	mg/l															1U		2U
SULFITE	mg/l																	
THALLIUM	ug/l															9.4U	10U	10U
TIN	ug/l																	
TITANIUM	ug/l																	
TOTAL ALKALINITY	mg/l																	
TOTAL DISSOLVED SOLIDS	mg/l									2820		3310		3720		3250	2930	
TOTAL ORGANIC CARBON	mg/l									8.4	9.1					7.3	7.8	
VANADIUM	ug/l															9.4U	50U	50U
ZINC	ug/l															19.2	20U	20U

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-01	087-MW-01D	087-MW-01D	087-MW-01	087-MW-01	087-MW-01D	087-MW-001	087-MW-001	087-MW-02	087-MW-02	087-MW-02	087-MW-02	087-MW-02	087-MW-02	087-MW-02	087-MW-02	087-MW-03
Filtered		N	N	N	Y	Y	Y	N	Y	N	Y	N	N	Y	N	N	Y	Y	N	N	Y	Y	N	N
Parameter		4/25/03	4/25/03	4/25/03	4/25/03	4/25/03	4/25/03	4/25/03	4/25/03	9/9/04	9/9/04	5/16/06	7/20/06	7/20/06	5/2/03	5/2/03	5/2/03	5/2/03	9/10/04	9/10/04	9/10/04	9/10/04	5/16/06	4/24/03
BICARBONATE ALKALINITY	mg/l	434		475						500		306		385	656	656			398	400			674	
CALCIUM	ug/l		16300					16400		18700		12200	22900	23700	86800	85600			47800	46400			94500	280000
CHLORIDE	mg/l	330		336						363J		577		50.7	440	430			203	14.2			665	
CHROMIUM	ug/l		180			144		181	155	288	166	171	666	498	12800J	125000	11000J	10700J	57900	56300	63900	61900	171000	107000
HEXAVALENT CHROMIUM	ug/l	10U		10U	10U		10U			10U	10U		50UJ	50UJ	142000	148000	153000	153000	74500J	89600J	120000J	99700J		
MAGNESIUM	ug/l		5320					5400		8450		1670	9910	10500	89800	87100			28500	27700			94200	379000
pH													10.4											
POTASSIUM	ug/l		7540					7570		10600J		13300J	17100	17000	38900	36700			27500	26300			40300J	54600
SODIUM	ug/l		436000					460000		575000		658000	185000	178000	75200	742000			413000	393000			812000	3440000
SULFATE	mg/l	5U		5U						13.4		5U		17.3	733	818			494	486			345	
ALKALINITY, CARBONATE (AS CACO3)	mg/l													475										
ALUMINUM	ug/l											834	715J	399J									1710	
ANTIMONY	ug/l											14.2B	6.0U	6.0U									11.6U	
ARSENIC	ug/l											92.9	18.7J	14.0J									13.7JB	
BARIUM	ug/l											70.3	200U	200U									52.9	58.5J
BERYLLIUM	ug/l											0.6U	1.0UJ	1.0UJ									0.6U	
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l											0.8U	4.0UJ	4.0UJ									0.8U	
CARBONATE ALKALINITY	mg/l	384		323						410		537		88.8	5U	5U			6	5U			5U	
COBALT	ug/l											3.4U	50UJ	50UJ									3.4U	
COPPER	ug/l											59.9	59.2	43.9									13.9JB	
FERROUS IRON	mg/l											0.16J		0.21									1UJ	
HARDNESS (AS CACO3)	mg/l												90											
IRON	ug/l											2060J	1710	901									5660J	38.7J
Iron, Ferric	mg/l													0.69										
LEAD	ug/l											28.8	163	115									8.1U	
MANGANESE	ug/l											79.1	35.3J	30.8J									641	882
MERCURY	ug/l											3.3	0.49	0.35									0.1U	
MOLYBDENUM	ug/l																							
NICKEL	ug/l											16.9	47.6	40U									39.9	
NITRATE	mg/l													0.11U										
NITRATE AS NITROUS OXIDE	mg/l											0.1U											0.73	
NITRITE	mg/l													0.010U										
SELENIUM	ug/l											8.4U	10U	10U									8.4U	
SILVER	ug/l											2.8U	10U	10U									2.8U	
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY		1.004		1.004						1					1.005	1.0047			1	1				
STRONTIUM	ug/l																							2540
SULFIDE	mg/l											1U		2.0U									1U	
SULFITE	mg/l																							
THALLIUM	ug/l											9.4U	10U	10U									9.4U	
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l	1480		1420						2170		1680	987		2570	2520			2080	1890			3280	
TOTAL ORGANIC CARBON	mg/l											19.4	95.1										6.6	
VANADIUM	ug/l											99.7	77.8	60.1									9.4U	
ZINC	ug/l											58.9	227	144									115	

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	087-MW-03	087-MW-03	087-MW-03	087-MW-03	087-MW-03	087-MW-03	087-MW-03	087-MW-03	087-MW-03	087-MW-08	087-MW-08	087-MW-08	087-MW-08	087-MW-08D	087-MW-08D	087-MW-08D	087-MW-08D	087-MW-08	087-MW-08	087-MW-08	087-MW-34	087-MW-34	087-MW-A26T	087-MW-A26T
Filtered		N	Y	Y	N	N	Y	Y	N	N	N	N	Y	Y	N	N	Y	Y	N	Y	N	N	Y	N	Y
Parameter		4/24/03	4/24/03	4/24/03	9/10/04	9/10/04	9/10/04	9/10/04	5/16/06	5/16/06	4/24/03	4/24/03	4/24/03	4/24/03	4/24/03	4/24/03	4/24/03	4/24/03	9/10/04	9/10/04	5/16/06	9/10/04	9/10/04	3/21/01	3/21/01
BICARBONATE ALKALINITY	mg/l	399			420	415			439	443		58.4				59.4			63		59	725			830
CALCIUM	ug/l				240000	358000			288000	274000	454000				467000				476000		435000	53100		79400	66500
CHLORIDE	mg/l	6600			3870	2830			6340	6350		2150				2150			1250		2100	805			145
CHROMIUM	ug/l		104000		33400	142000	144000	151000	67100	64100	6.6J		2.3J		3.4J		2.5J		2.9	7	88	275000	266000	2.5	5.5
HEXAVALENT CHROMIUM	ug/l	118000		123000	19300	178000J	255000J	246000J				10U		10U		10U		10U	10U	10U		334000J	473000J	10	10
MAGNESIUM	ug/l				311000	325000			359000	348000	98200				101000				91700		84200	31600		38600	31700
pH																									
POTASSIUM	ug/l				42600	35500			48900J	47800J	5360				5560				5620		15600J	53200		11600	11600
SODIUM	ug/l				2820000	2980000			3080000	3160000	564000				589000				564000		543000	950000		394000	437000
SULFATE	mg/l	1380			550	1020			722	722		504				478			430		536	655			223
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l								261	382											10000			117	81.6
ANTIMONY	ug/l								11.6U	11.6U											11.6U				
ARSENIC	ug/l								7.6JB	6.4U											6.4U				
BARIUM	ug/l								31.6	31.6											116				
BERYLLIUM	ug/l								0.6U	0.6U											0.8B				
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l								0.8U	0.8U											0.8U				
CARBONATE ALKALINITY	mg/l	5U			5U	5U			5U	5U		5U				5U			5U		5U	5U			830
COBALT	ug/l								3.4U	3.4U											6.5				
COPPER	ug/l								17.4JB	17.1JB											35JB				
FERROUS IRON	mg/l								1UJ	1UJ											0.1UJ				
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l								467J	760J											19400J			383	379
Iron, Ferric	mg/l																								
LEAD	ug/l								8.1U	8.1U											15.3				
MANGANESE	ug/l								884	853											2060				
MERCURY	ug/l								0.1U	0.1U											0.1U				
MOLYBDENUM	ug/l																								
NICKEL	ug/l								17.9	23.4											58.6				
NITRATE	mg/l	0.1U																							0.1
NITRATE AS NITROUS OXIDE	mg/l								0.1U	0.1U											0.1U				
NITRITE	mg/l																								0.1
SELENIUM	ug/l								8.4U	8.4U											8.4U				
SILVER	ug/l								2.8U	2.8U											2.8U				
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY		1.0113			1	1						1.0054				1.0054			1			1		0.9995	
STRONTIUM	ug/l																								
SULFIDE	mg/l								1U	1U											1U				
SULFITE	mg/l																								
THALLIUM	ug/l								9.4U	9.4U											9.4U				
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l	11700			8380	11300			12600	12500		4980				4920			4410		5090	4280		1390	
TOTAL ORGANIC CARBON	mg/l	4.8							5.1	4.9											2			19.6	22.9
VANADIUM	ug/l								9.4U	9.4U											28.1				
ZINC	ug/l								116U	23.1											101				

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	087-MW-A26T	087-MW-A26T	087-MW-A26T	087-MW-A26T	087-MW-A26T	087-MW-W25T	087-MW-W25T	087-MW-W25T	087-MW-W25T	087-MW-W25T	087-MW-W25T	087-MW-W25T	087-MW-W25T	087-MW-W25T	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T
Filtered		N	Y	N	Y	N	N	N	Y	Y	N	Y	N	Y	N	N	Y	N	N	N	N	Y	N	Y
Parameter		4/22/03	4/22/03	9/9/04	9/9/04	5/16/06	3/20/01	3/20/01	3/20/01	3/20/01	4/21/03	4/21/03	9/10/04	9/10/04	5/16/06	5/18/99	5/18/99	5/27/99	5/27/99	7/14/99	7/14/99	7/14/99	7/14/99	4/18/03	4/18/03
BICARBONATE ALKALINITY	mg/l	560		495		513			40	40	40.6B		5U		44						1280	1320	935	
CALCIUM	ug/l	76700		91400		100000	389000	360000	382000	362000	367000		136000		351000			259000	258000	252000	244000	264000	268000	289000J	
CHLORIDE	mg/l	154		127J		132			1900	1900	1780J		951		1990				833			870	860	950	
CHROMIUM	ug/l	2.8J	1.1U	5.6	4.3	162	2.1	2.1	2.1	2.1	5.2B	1.5B	19.8	7.8	15.1JB	1110000	1100000	1170000	1030000	1210000	1170000	1150000	1120000	797000J	866000
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U	10U		10	10	10	10	10U	10U	10U	10U		1350000	1340000	1230000	1090000	1280000	1290000	1250000	1290000	831000	877000
MAGNESIUM	ug/l	36800		38200		49500	61800	56900	61000	57200	57600		23100		52500			71900	71600	75600	71600	78100	77800	79800	
pH																									
POTASSIUM	ug/l	8510		10500J		13500J	6100	5790	6150	5820	4930J		131000		5240J			66800	49400	71200	67200	65800	62900	27200	
SODIUM	ug/l	267000		209000		198000	812000	803000	827000	794000	677000		417000		669000			1830000	1540000	1880000	1820000	1780000	1750000	1240000	
SULFATE	mg/l	250		227		254			166	160	155		227		168				1180			1150	1070	897	
ALKALINITY, CARBONATE (AS CACO3)	mg/l																								
ALUMINUM	ug/l					1640	81.6	94.5	81.6	81.6					140			175	175	186	207	175	175		
ANTIMONY	ug/l					6.2B									11.6U										
ARSENIC	ug/l					18.5									6.4U										
BARIUM	ug/l					120									67									16.9J	
BERYLLIUM	ug/l					0.3U									0.6U										
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l					0.4U									0.8U										
CARBONATE ALKALINITY	mg/l	5		5U		5U			5	5	5U		24		5U				0			5	5	5U	
COBALT	ug/l					2.2									3.4U										
COPPER	ug/l					59									7.4U										
FERROUS IRON	mg/l					0.23J									0.1UJ										
HARDNESS (AS CACO3)	mg/l																								
IRON	ug/l					13900J	179	209	45	45					274J			847	388	886	966	600	567	28.6U	
Iron, Ferric	mg/l																								
LEAD	ug/l					8.8									8.1U										
MANGANESE	ug/l					2570									796									53.9	
MERCURY	ug/l					0.1U									0.1U										
MOLYBDENUM	ug/l																								
NICKEL	ug/l					105									6.9										
NITRATE	mg/l								0.1	0.1												0.1	0.13	0.1U	
NITRATE AS NITROUS OXIDE	mg/l					0.1U									0.1U										
NITRITE	mg/l								0.1	0.1												0.56	0.55		
SELENIUM	ug/l					4.2U									8.4U										
SILVER	ug/l					1.4U									2.8U										
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY		1.004		1			1.0007	1.0006			1.0048		1					0		1.005	1.006			1.007	
STRONTIUM	ug/l																							2680	
SULFIDE	mg/l					1U									1U										
SULFITE	mg/l																								
THALLIUM	ug/l					4.7U									9.4U										
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l	1300		1310		1040	3480	3510			3900		2700		5130			0		7230	7010			5390	
TOTAL ORGANIC CARBON	mg/l					11.6	1	1.1	1	1.3					1U			0	0	8.1	8	7.6	7.6	4.3	
VANADIUM	ug/l					4.7U									9.4U										
ZINC	ug/l					88.9									32.2										

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	088-MW-G19T	088-MW-G19T	088-MW-G19T	088-MW-G19T	090-MW-09	090-MW-09	090-MW-09	090-MW-09	090-MW-09	090-MW-09	090-MW-09	115-DW-04	115-MW-04	115-MW-04	115-MW-04	115-MW-04	115-MW-04	115-MW-05	115-MW-05	115-MW-05	115-MW-05	115-MW-19	115-MW-19	115-MW-19
Filtered		N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	N	Y	N	Y	N	Y	N	Y	N	Y	N
Parameter		9/10/04	9/10/04	7/19/06	7/19/06	4/26/04	4/26/04	9/14/04	9/14/04	7/25/06	7/25/06	8/10/06	2/13/03	2/26/03	4/16/03	4/16/03	9/7/04	9/7/04	4/16/03	4/16/03	9/10/04	9/10/04	4/23/04	4/23/04	9/10/04
BICARBONATE ALKALINITY	mg/l	650			574	1100		1404			2900	2320			290		288		76	68.8	76		1120		2545
CALCIUM	ug/l	233000		209000	221000	552000		383000		881000	769000	1050000			411000		421000		599000	559000	600000		541000		464000
CHLORIDE	mg/l	968			910	989		700			967	1490			4670		5370		3160	2720	3140		820		1280
CHROMIUM	ug/l	567000	559000	433000	498000	1990000	2630000	1440000	1370000	3400000	3170000	4260000	151		20.4J	18.6J	4.3	1.6U	11.5J	1.9J	5.8	2.6	2490000	2270000	2250000
HEXAVALENT CHROMIUM	ug/l	633000J	769000J	449000	438000	2460000J	2380000J	1528000	1640000	3610000	3320000		131J	10UJ	10U	10U	10U	10U	10U	10U	10U	10U	1688000J	2040000J	2225000
MAGNESIUM	ug/l	60000		59500	63300	70000U		58900		500000U	500000U	139000B			349000		314000		142000	106000	127000		100000		113000
pH				7.89						6.95		6.9													
POTASSIUM	ug/l	20500		22800J	24700J	106200U		41300		500000U	500000U	135000			29400		31500		12800	8840	8650		152000		117000
SODIUM	ug/l	933000		887000J	997000J	1780000		1330000		2780000	2660000	3140000			2070000		2370000		1150000	944000	1040000		3390000		2870000
SULFATE	mg/l	622			625	228		1000			1630	50U			500		496		401	298	319		916		2390
ALKALINITY, CARBONATE (AS CACO3)	mg/l				576						2900														
ALUMINUM	ug/l			1450	200U					20000UJ	20000UJ	6260U													
ANTIMONY	ug/l			60U	150U					600UJ	600UJ	580U													
ARSENIC	ug/l			442	425					4970	4070	320U													
BARIUM	ug/l			200U	200U					20000U	20000U	170U													
BERYLLIUM	ug/l			2.1J	2.0J					100U	100U	30U													
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l			4.0U	4.0U					400U	400U	40U													
CARBONATE ALKALINITY	mg/l	5U			5.0U	5U		5U			5.0U	5U			5U		5U		5U	5U	5U		5U		5U
COBALT	ug/l			50U	50U					5000U	5000U	170U													
COPPER	ug/l			38.9	25U					2500U	2500U	370U													
FERROUS IRON	mg/l				0.10U						0.50U	100U													
HARDNESS (AS CACO3)	mg/l			774						3150		4000													
IRON	ug/l			2500UJ	2500UJ					10000U	10000U	3920U													
Iron, Ferric	mg/l				2.6U						11U														
LEAD	ug/l			75U	75U					300UJ	300UJ	270U													
MANGANESE	ug/l			63.9	24.3					1500U	1500U	489J													
MERCURY	ug/l			0.20U	0.20U					1.6U	1.6U	0.1U													
MOLYBDENUM	ug/l																								
NICKEL	ug/l			40U	40U					4000U	4000U	240U													
NITRATE	mg/l				0.11U						1.4	0.21													
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l				0.086						0.13														
SELENIUM	ug/l			250U	250U					1000U	1000U	420U													
SILVER	ug/l			10U	10U					1000U	1000U	140U													
SPECIFIC CONDUCTANCE	umhos/cm											16200													
SPECIFIC GRAVITY		1				1.01		1							1.01		1.01		1.007	1.007	1		1.01		1.01
STRONTIUM	ug/l																								
SULFIDE	mg/l				2.0U						2.0U	5.1													
SULFITE	mg/l																								
THALLIUM	ug/l			250UJ	250UJ					1000U	1000U	470U													
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l											2320													
TOTAL DISSOLVED SOLIDS	mg/l	4550		3670		10040		6810		11000		15600			9990		11060		318	5190	6560		10020		9500
TOTAL ORGANIC CARBON	mg/l			5.0U						8		10													
VANADIUM	ug/l			1300U	1300U					5000U	5000U	470U													
ZINC	ug/l			500U	500U					2000U	2000U	776B													

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	115-MW-19	115-MW-21	115-MW-21	115-MW-21	115-MW-21	115-PW-21	115-PW-21	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-A12T	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E14T
Filtered		Y	N	N	N	Y	N	Y	N	N	Y	N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y	N
Parameter		9/10/04	4/1/04	6/15/04	9/10/04	9/10/04	10/5/06	10/5/06	1/5/99	4/8/99	4/8/99	7/21/99	7/21/99	3/11/01	4/17/03	4/17/03	9/8/04	9/8/04	1/6/99	1/6/99	4/8/99	4/8/99	7/21/99	7/21/99	4/17/03
BICARBONATE ALKALINITY	mg/l				565			729	347		300		341		360		260		918			893		851	1035
CALCIUM	ug/l				216000		313000	325000	275000	225000	226000	247000	248000	136000	110000		36200		252000		266000	263000	294000	298000	264000
CHLORIDE	mg/l				280			509	650		700		670	272	204		139		500			630		750	646
CHROMIUM	ug/l	2470000	852000	790000	291000	288000	346000	351000	150000	124000	126000	133000	130000	135000	112000	113000	9030	126000	678000	708000	652000	673000	483000	520000	79200
HEXAVALENT CHROMIUM	ug/l	2250000	820000J		319000J	517000J	354000	343000	146000	126000	124000	146000	128000	133000	142000	138000	8040	128000	681000	681000	850000	838000	599000	624000	779000
MAGNESIUM	ug/l				26900		75500	80500	48400	46800	47300	48200	48700	25100	20000		13600		56000		61400	60400	65500	66600	65300
pH							6.58							6.99											
POTASSIUM	ug/l				76600		67300J	71800J	89100	81500	82600	84600	85100	53800	44600		21500		80900		107000	106000	107000	109000	73100
SODIUM	ug/l				545000		1120000	1040000	483000	425000	436000	460000	440000	420000	322000		166000		982000		1000000	1060000	873000	922000	133000
SULFATE	mg/l				935			1620	569		447		427	534	480		96.7		911			957		736	1219
ALKALINITY, CARBONATE (AS CACO3)	mg/l							731																	
ALUMINUM	ug/l						200U	200U	62.3	75.1	24.1	33.4	29.1	81.6					130		80	24.1	47.2	32.9	
ANTIMONY	ug/l						60U	60U						23.6											
ARSENIC	ug/l						603	646						9.2											
BARIUM	ug/l						200U	200U						24	26.1B										41J
BERYLLIUM	ug/l						1.0UJ	1.0UJ						0.3											
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l						4.0U	4.0U						0.5											
CARBONATE ALKALINITY	mg/l				5U			5.0U	5		5		5	380	5U		5U		918			893		851	5U
COBALT	ug/l						50U	50U						2.2											
COPPER	ug/l						25U	25U						2.8											
FERROUS IRON	mg/l							0.20U																	
HARDNESS (AS CACO3)	mg/l						1010																		
IRON	ug/l						2500UJ	1000UJ	445	431	313	352	333	344	507				427	425	456	383	419	401	308
Iron, Ferric	mg/l							1.2U																	
LEAD	ug/l						30U	30U						2.6											
MANGANESE	ug/l						542	543						619	820										751
MERCURY	ug/l						0.20U	0.20U						0.1											
MOLYBDENUM	ug/l																								
NICKEL	ug/l						40U	40U						2.1											
NITRATE	mg/l							0.11U			0.25		0.17	0.16	1.3J							0.1		0.32	0.72J
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l							0.16			0.1		0.1									0.87		0.81	
SELENIUM	ug/l						100U	100U						4.1											
SILVER	ug/l						10U	10U						2.3											
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY					1					0.999		1			1.004		1				1.002		1.002		1.007
STRONTIUM	ug/l														239										733
SULFIDE	mg/l							2.0U																	
SULFITE	mg/l																								
THALLIUM	ug/l						100U	100U						19.2											
TIN	ug/l													3.4											
TITANIUM	ug/l													4.4											
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l				2570		4640			2410		2510			1710		760				4790		4420		5510
TOTAL ORGANIC CARBON	mg/l						2.5			7.9		6.9	7.3	7.8	7						6.7		5.8	5.7	6.1
VANADIUM	ug/l						500U	500U						4											
ZINC	ug/l						200U	200U						12.8											

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E14T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-E8T	115-MW-K14T	115-MW-K14T	115-MW-K14T	115-MW-K14T	115-MW-K14T
Filtered		Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	N	Y	N	N	Y	N	Y	N
Parameter		4/17/03	9/8/04	9/8/04	7/21/2006	7/21/2006	5/18/99	5/18/99	5/27/99	5/27/99	5/27/99	5/27/99	7/21/99	7/21/99	4/16/03	4/16/03	9/8/04	9/8/04	7/26/06	7/26/06	5/18/99	5/18/99	5/27/99	5/27/99	7/21/99
BICARBONATE ALKALINITY	mg/l		650			1420								194	260		180			306					
CALCIUM	ug/l		234000		390000	425000			384000	378000	383000	382000	414000	410000	317000		316000		338000	328000			330000	290000	641000
CHLORIDE	mg/l		741			845					2060	1960		1950	1460		1890			769				2750	
CHROMIUM	ug/l	77100	304000	363000	874000	941000	45500	50100	48200	46400	47000	46900	53000	49000	113000J	117000J	38700	64600	38900	37700	66600	57300	234000	189000	567000
HEXAVALENT CHROMIUM	ug/l	820000	301000	301000	998000	934000	53500	48300	51300	50100	50100	48900	59000	55100	139000	139000	51100	70300	41200	39100	72000	69100	237000	137000	628000
MAGNESIUM	ug/l		50900		102000	111000			87300	84900	85400	84700	90900	91300	76900		79200		72800	71100			125000	122000	169000
pH					6.95														7.34						
POTASSIUM	ug/l		57600		93500	106000			7240	6250	7840	7110	5340	6030	4180J		9220		5050J	5000UJ			50200	51300	45600
SODIUM	ug/l		800000		1640000	1770000			895000	870000	888000	880000	827000	833000	684000		870000		535000	533000			1820000	1740000	2280000
SULFATE	mg/l		1090			2150					375	367		374	500		418			934				519	
ALKALINITY, CARBONATE (AS CACO3)	mg/l					1420														307					
ALUMINUM	ug/l				803	200U			113	48.7	29.1	29.1	128	52					494	200U			165	29.1	292
ANTIMONY	ug/l				150UJ	150UJ													12.1	14.8					
ARSENIC	ug/l				1120	1150													53.6	53.2					
BARIUM	ug/l				200U	200U													200U	200U					
BERYLLIUM	ug/l				2.6	2.6													1.0U	1.0U					
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l				4.0U	4.0U													4.0U	4.0U					
CARBONATE ALKALINITY	mg/l		5U			5.0U					0	0		5	5U		5U			5.0U				0	
COBALT	ug/l				50UJ	50UJ													50U	50U					
COPPER	ug/l				32.4	25UJ													25U	25U					
FERROUS IRON	mg/l					0.10U														0.10U					
HARDNESS (AS CACO3)	mg/l				216														1080						
IRON	ug/l				2500UJ	2500UJ			76.7	96	28	16	112	16					967	104			180	16	217
Iron, Ferric	mg/l					2.6U														0.20U					
LEAD	ug/l				75UJ	75UJ													3.0UJ	3.0UJ					
MANGANESE	ug/l				1140	1210													57.2	16					
MERCURY	ug/l				0.20UJ	0.20UJ													0.20UJ	0.20UJ					
MOLYBDENUM	ug/l																								
NICKEL	ug/l				40UJ	40UJ													40U	40U					
NITRATE	mg/l					1.0U								0.28						1.0U					
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l					0.13								0.12						0.21					
SELENIUM	ug/l				250U	250U													10U	10U					
SILVER	ug/l				250UJ	250UJ													10U	10U					
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY			1.01						0	0			1.001		1.005		1.01						0		1.006
STRONTIUM	ug/l																								
SULFIDE	mg/l					2.0U														2.0U					
SULFITE	mg/l																								
THALLIUM	ug/l				250U	250U													10U	10U					
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l		3680		8140				0	0			4720		3730		4380		2850				0		10000
TOTAL ORGANIC CARBON	mg/l				4.6				0	0	0	0	1	1					1				0	0	4
VANADIUM	ug/l				1300U	1300U													50U	50U					
ZINC	ug/l				500U	500U													20U	20U					

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	115-MW-K14T	115-MW-K14T	115-MW-K14T	115-MW-K14T	115-MW-K14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	115-MW-U14T	117-MW-10	117-MW-10	117-MW-10	117-MW-10	117-MW-10	117-MW-10	117-MW-D3	117-MW-D3	119-MW-01T	119-MW-01T
Filtered		Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y
Parameter		7/21/99	4/18/03	4/18/03	9/10/04	9/10/04	8/9/99	8/10/99	8/10/99	9/9/99	3/9/01	4/16/03	4/16/03	9/7/04	9/7/04	4/23/03	4/23/03	4/23/03	4/23/03	9/13/04	9/13/04	12/21/06	12/21/06	9/12/06	9/12/06
BICARBONATE ALKALINITY	mg/l	599	785		760					142		140		147		384				359			27.4		5.0U
CALCIUM	ug/l	632000	614000		541000		647000			714000	685000	738000		710000			122000			131000		350000	343000	145000	22800
CHLORIDE	mg/l	4050	4170		3670					3500	4080	3610		4290		106				129			644		68.7
CHROMIUM	ug/l	574000	703000	765000	614000	611000	8.2	6.8	6.8	8.2	12.9			1.6U	1.6U		3J		3J	4.2	2.1	11.2	10U	137	12.9
HEXAVALENT CHROMIUM	ug/l	599000	795000	887000	633000J	724000J	10	10	10	10	10	10U	10U	10U	10U	10U		10U		10U	10U	10U	10U	50U	50U
MAGNESIUM	ug/l	166000	213000		201000		184000			199000	204000	226000		210000			12900			13300		59500	58200	5000U	5000U
pH											7.46											8.28		10.66	
POTASSIUM	ug/l	45600	38800		36100		11100			12100	9970	10100		9600			1420J			1290		11400	14100	60100J	49000J
SODIUM	ug/l	2280000	2590000		2460000		1570000			1550000	1710000	1730000		1590000			60400			59200		108000	116000	173000J	84400J
SULFATE	mg/l	746	926		895					515	542	611		544		5U				5U			447		26.4
ALKALINITY, CARBONATE (AS CACO3)	mg/l																						5U		178
ALUMINUM	ug/l	58.2					86.6			55.8	163											1350	200U	2850J	352J
ANTIMONY	ug/l										11.8											6U	8.4	6.0U	6.0U
ARSENIC	ug/l										4.9											8U	8U	8.0UJ	8.0UJ
BARIUM	ug/l		31.5J								60.2											200U	200U	200U	200U
BERYLLIUM	ug/l										0.6											1U	1U	1.0U	1.0U
BICARBONATE ALKALINITY AS CACO3	mg/l																								
BORON	ug/l																								
CADMIUM	ug/l										1											4U	4U	4.0U	4.0U
CARBONATE ALKALINITY	mg/l	609	5U		5U					5	140	5U		5U		5U				5U			28		5.0U
COBALT	ug/l										4.4											50U	50U	50U	50U
COPPER	ug/l										5.6											43.3	25U	27.2	25U
FERROUS IRON	mg/l																						0.1U		0.10U
HARDNESS (AS CACO3)	mg/l																					1080		208	
IRON	ug/l	34.6	95.4J				868			894	1650											1700	100U	3940	100U
Iron, Ferric	mg/l																						0.2U		0.20U
LEAD	ug/l										5.2											4.1	3U	5.7	3.0U
MANGANESE	ug/l		192								2150											655	483	83.9	15U
MERCURY	ug/l										0.1											0.2U	0.2U	0.20U	0.20U
MOLYBDENUM	ug/l																								
NICKEL	ug/l										4.2											40U	40U	88.5	40U
NITRATE	mg/l	0.1	0.1U							0.1	0.1												0.11U		0.11U
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l	0.26								0.1													0.012		0.072
SELENIUM	ug/l										8.2											10U	10U	10U	10U
SILVER	ug/l										4.6											10U	10U	10U	10U
SPECIFIC CONDUCTANCE	umhos/cm																					2370			
SPECIFIC GRAVITY			1.011		1.01		1.004					1.008		1.01		1.0029				1		1		1	
STRONTIUM	ug/l		5040																						
SULFIDE	mg/l																						2U		2.0UJ
SULFITE	mg/l																								
THALLIUM	ug/l										9.6											10U	10U	10U	10U
TIN	ug/l										6.8														
TITANIUM	ug/l										2.2														
TOTAL ALKALINITY	mg/l																								
TOTAL DISSOLVED SOLIDS	mg/l		11200		6400		9060					8310		9920		678				882		1780		794	
TOTAL ORGANIC CARBON	mg/l	3.9	4.5				3.7			3.5	3.6											2.6		12.2	
VANADIUM	ug/l										8											50U	50U	50U	50U
ZINC	ug/l										13											20U	20U	26.3	20U

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	119-MW-02T	119-MW-02T	124-MW-06	124-MW-06	124-MW-06	124-MW-06	124-MW-06	124-MW-06	124-MW-06	124-MW-06	124-MW-102T	124-MW-102T	124-MW-102T	124-MW-102T	124-MW-102T	124-MW-102T	124-MW-103L	124-MW-103L	124-MW-104L	124-MW-104L	124-MW-104L	124-MW-104T	124-MW-104T	124-MW-104T
Filtered		N	Y	N	Y	N	Y	N	Y	N	N	N	N	Y	N	N	Y	N	N	N	Y	N	N	Y	N
Parameter		9/12/06	9/12/06	4/15/03	4/15/03	9/8/04	9/8/04	12/28/05	12/28/05	5/24/06	5/24/06	5/18/05	12/28/05	12/28/05	5/24/06	11/29/06	11/29/06	########	########	12/29/05	12/29/05	5/26/06	12/29/05	12/29/05	5/26/06
BICARBONATE ALKALINITY	mg/l		5.0U	85.2		54				307	287	15.5			54.3		58	5U		213		181	35.5		5U
CALCIUM	ug/l	46100	39800	327000		121000		333000		234000	238000	122000	149000		204000	180000	178000	88000		85000		48300	93100		45000
CHLORIDE	mg/l		39.1	2100		814		1980		1030	1050	218	247		476		374	136		17.8		18.1	138		127
CHROMIUM	ug/l	10U	10U	20.7	20	5	2.8U	4.7J	3.2UJ	81.6	88.1	20.3	12J	9.2J	20.2	15.1	11.6	40.9	8.1J	396	366	251	140	144	19.7
HEXAVALENT CHROMIUM	ug/l	50U	50U	13.2JB	16.3JB	10U	10U	10U	10U			10UJ	11.9	11.9		10U	10U	13.4	12.2	168	424		138	141	
MAGNESIUM	ug/l	5000U	5000U	88100		31200		85600		83400	81900	13000	9730		4650	14000	14600	14500		19100		13200	8280		3260
pH		9.36						8.05J		7.9	7.92		9J		9.6			11.49J		8.38J		8.17	9.04J		9.86
POTASSIUM	ug/l	8800J	8160J	6200		3970		5110J		8070	8060	6030	4400J		6840	5000U	5000U	23500		4670		2250	4450		3760
SODIUM	ug/l	53500J	50100J	873000		319000		848000		558000	550000	97300	72300		187000	141000	137000	242000		63200		52800	93200		74500
SULFATE	mg/l		30.2	183		57.7		170		647	645	152	158		165		232	240J		154		100	181		68.8
ALKALINITY, CARBONATE (AS CACO3)	mg/l		163					5U					5U				5U								
ALUMINUM	ug/l	955J	753J							1560	1800				190	475	200U					1720			674
ANTIMONY	ug/l	6.0U	6.0U							5.8U	5.8U				5.8U	6U	6U					5.8U			5.8U
ARSENIC	ug/l	8.0UJ	8.0UJ							3.2U	3.2U				3.2U	8U	8U					3.2U			4.7
BARIUM	ug/l	200U	200U							51	52				169	225	217					58.7			44.3
BERYLLIUM	ug/l	1.0U	1.0U							0.3U	0.3U				0.3U	1U	1U					0.3U			0.3U
BICARBONATE ALKALINITY AS CACO3	mg/l							101					28.2												
BORON	ug/l																								
CADMIUM	ug/l	4.0U	4.0U							0.4U	0.4U				0.4U	4U	4U					0.4U			0.4U
CARBONATE ALKALINITY	mg/l		51.1	5U		5U				5U	5U	5.2			5U		60.7	24.7		5U		5U	5U		25.8
COBALT	ug/l	50U	50U							1.8	2.5				1.7U	50U	50U					1.7U			1.7U
COPPER	ug/l	25U	25U							11.2	10.4				3.7U	25U	25U					4.8			4.3
FERROUS IRON	mg/l		0.10U							0.1U	0.1U				0.1U		0.2U								
HARDNESS (AS CACO3)	mg/l	108																							
IRON	ug/l	1130	100U							2470	2750				39.2U	624	100U					1820			638
Iron, Ferric	mg/l		0.20U														0.3U								
LEAD	ug/l	3	3.0U							3.8	2.7U				2.7U	4	3U					2.7U			2.7U
MANGANESE	ug/l	15U	15U							472	471				1.4	15U	15U					229			21.8
MERCURY	ug/l	0.20U	0.20U							0.1U	0.1U				0.15	0.2U	0.2U					0.1U			0.1U
MOLYBDENUM	ug/l																								
NICKEL	ug/l	40U	40U							40.7	44.4				2.4U	40U	40U					12.1			12
NITRATE	mg/l		0.11U							0.38	0.38				1.4		2.2					0.51			0.32
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l		0.077							0.1U	0.1U				0.43		0.1					0.1U			0.3
SELENIUM	ug/l	10U	10U							4.2U	4.2U				4.2U	10U	10U					4.2U			4.2U
SILVER	ug/l	10U	10U							1.4U	1.4U				1.4U	10U	10U					1.4U			1.4U
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY		1		1.005		1		1				1	1					1		1			1		
STRONTIUM	ug/l																								
SULFIDE	mg/l		2.0UJ					1U		1U	1U		1U		1U		2U	1.32J		1U		1U	1U		1U
SULFITE	mg/l																								
THALLIUM	ug/l	10U	10U							4.7U	4.7U				4.7U	10U	10U					4.7U			4.7U
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l									307	287				54.3							181			49.5
TOTAL DISSOLVED SOLIDS	mg/l	241		4320		1910		4350		2840	2720	746	844		1510			668		498		374	535		382
TOTAL ORGANIC CARBON	mg/l	1.4								1.4	1.2				1.8							2.5			1.5
VANADIUM	ug/l	50U	50U							6.2	6.4				21.2	50U	50U					4.7U			15.1
ZINC	ug/l	111	20U							37.1	40.3				29U	20U	20U					20.6			17.4

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	124-MW-105T	124-MW-105T	124-MW-105T	124-MW-106T	124-MW-106T	124-MW-107T	124-MW-107T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-G02T	124-MW-103L	124-MW-103L	124-MW-G103L	153-MW-A13T
Filtered		N	Y	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	N
Parameter		12/28/05	12/28/05	5/24/06	10/4/06	10/4/06	10/4/06	10/4/06	5/18/99	5/18/99	5/26/99	5/26/99	7/15/99	7/15/99	4/15/03	4/15/03	9/13/04	9/13/04	12/29/05	12/29/05	5/24/06	12/27/05	12/27/05	12/27/05	5/24/06	5/18/99
BICARBONATE ALKALINITY	mg/l			43		5.0U		5.0U				0		50.5	42.6		48.3		53.6		142	5U		5U	
CALCIUM	ug/l	97000		158000	74200	56500	383000	366000			285000	281000	291000	299000	278000		294000		298000		350000	88000		33100	
CHLORIDE	mg/l	362		550		1020		2730				1960		1970	1720		1160		1670		3160	136		180	
CHROMIUM	ug/l	822	731	232	105	76.6	67.4	40.8	4.4	2.2	3.4	4	3.4	3.4	1.1U	1.1U	1.6U	1.6U	2.8U	2.8U	23.8	40.9	8.1J	10.5	5.5
HEXAVALENT CHROMIUM	ug/l	1020	857		50U	50	50U	50U	10	10	10	10	10	10	10UJ	10UJ	10U	10U	10UJ	10UJ		13.4	12.2		10
MAGNESIUM	ug/l	1380		2760	5000U	5000U	5000U	5000U			66100	63800	67700	69500	56100		58200		55700		143000	14500		442	
pH		10.33J		10.12	11.43		11.93												7.92J		7.76	11.49J		11.34	
POTASSIUM	ug/l	10000		8290	235000	241000	558000	540000			14200	9690	10000	8800	5040		5250		5780		10100	23500		34700	
SODIUM	ug/l	248000		296000	3650000J	723000J	1590000J	1620000J			779000	740000	806000	828000	734000		675000		721000		1800000	242000		265000	
SULFATE	mg/l	193		334		278		416				67		61	43.8		49.7		47.5		268	240J		192	
ALKALINITY, CARBONATE (AS CACO3)	mg/l	24.6				341		903																	
ALUMINUM	ug/l			666	415	200U	1400	263			94	114	29.3	30.9							97.5			1200	
ANTIMONY	ug/l			5.8U	11.4JB	7.8JB	8.6JB	7.0JB													5.8U			5.8U	
ARSENIC	ug/l			3.2U	8.0UJ	8.0UJ	8.0UJ	8.0UJ													5			3.2U	
BARIUM	ug/l			144	200U	200U	412	396													151			78.9	
BERYLLIUM	ug/l			0.3U	1.0UJ	1.0UJ	1.0UJ	1.0UJ													0.3U			0.3U	
BICARBONATE ALKALINITY AS CACO3	mg/l	5U																							
BORON	ug/l																								
CADMIUM	ug/l			0.4U	4.0U	4.0U	4.0U	4.0U													0.4U			0.4U	
CARBONATE ALKALINITY	mg/l			29.2		5.0U		5.0U				0		50.5	5U		5U		5U		5U	24.7		63.9	
COBALT	ug/l			1.7U	50U	50U	50U	50U													1.7U			1.7U	
COPPER	ug/l			6.3	25U	25U	25U	25U													13.4			7.7	
FERROUS IRON	mg/l			0.1U		0.20U		0.20U													0.13			0.1U	
HARDNESS (AS CACO3)	mg/l				192		1030																		
IRON	ug/l			983	137	100U	468	100U			142	63.2	331	297							907			150	
Iron, Ferric	mg/l					0.30U		0.30U																	
LEAD	ug/l			2.7U	3.0U	3.0U	6.1	3.0U													2.7U			2.7U	
MANGANESE	ug/l			32.9	15U	15U	15.7	15U													1320			3.6	
MERCURY	ug/l			0.1U	0.20U	0.20U	0.20U	0.20U													0.1U			0.1U	
MOLYBDENUM	ug/l																								
NICKEL	ug/l			61	40U	40U	40U	40U													14.1			19.6	
NITRATE	mg/l			0.1		0.11U		0.11U				0.1		0.1							0.11			0.11	
NITRATE AS NITROUS OXIDE	mg/l																								
NITRITE	mg/l			0.1U		0.097		0.035				0.1		0.1							0.1U			0.1U	
SELENIUM	ug/l			4.2U	10UJ	10UJ	10UJ	10UJ													4.2U			4.2U	
SILVER	ug/l			1.4U	10U	10U	10U	10U													1.4U			1.4U	
SPECIFIC CONDUCTANCE	umhos/cm																								
SPECIFIC GRAVITY		1									0		1.003		1.005		1		1			1			
STRONTIUM	ug/l																								
SULFIDE	mg/l	1U		1U		2.4		2.0U											1U		1U	1.32J		1U	
SULFITE	mg/l																								
THALLIUM	ug/l			4.7U	10U	10U	10U	10U													4.7U			4.7U	
TIN	ug/l																								
TITANIUM	ug/l																								
TOTAL ALKALINITY	mg/l			72.2																	142			264	
TOTAL DISSOLVED SOLIDS	mg/l	1360		1510	2430		5910				0		3820		3860		3650		3520		6990	668		935	
TOTAL ORGANIC CARBON	mg/l			4.6	7.1		8.7				0	0	1.1	1.1							1.3			9.9	
VANADIUM	ug/l			35.5	50U	50U	62	50.4													4.7U			50.2	
ZINC	ug/l			29U	20U	20U	20U	20U													29U			64.9	

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T	153-MW-A13T
Filtered		Y	N	Y	N	Y	N	Y	N	Y	N	Y
Parameter		5/18/99	5/26/99	5/26/99	7/20/99	7/20/99	4/14/03	4/14/03	9/13/04	9/13/04	7/18/06	7/18/06
BICARBONATE ALKALINITY	mg/l			0		42.2	226		88.2			55
CALCIUM	ug/l		26000	22400			29300		30700		28600	27400
CHLORIDE	mg/l			12.7		11.5	10.9		14.9			11.8
CHROMIUM	ug/l	2.2	3.4	3.4	3.4	3.4	1.1U	1.1J	1.6	1.6U	47.6	10U
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	10	10U	10U	10U	10U	50U	50U
MAGNESIUM	ug/l		3560	3270			3940J		4040		5160	5000U
pH											8.46	
POTASSIUM	ug/l		2890	6280			629J		1150		5000U	5000U
SODIUM	ug/l		14000	20200			7160		14200		7620	8190
SULFATE	mg/l			18		15.9	13.6		18.4			16.3
ALKALINITY, CARBONATE (AS CACO3)	mg/l											55.8
ALUMINUM	ug/l		279	49.8							4490	200U
ANTIMONY	ug/l										6.0U	6.0U
ARSENIC	ug/l										8.0U	8.0U
BARIUM	ug/l										432	405
BERYLLIUM	ug/l										1.0U	1.0U
BICARBONATE ALKALINITY AS CACO3	mg/l											
BORON	ug/l											
CADMIUM	ug/l										4.0U	4.0U
CARBONATE ALKALINITY	mg/l			0		5	5U		5U			5.0U
COBALT	ug/l										50U	50U
COPPER	ug/l										25U	25U
FERROUS IRON	mg/l											0.10U
HARDNESS (AS CACO3)	mg/l										100	
IRON	ug/l		205	16							4430	100U
Iron, Ferric	mg/l											0.20U
LEAD	ug/l										6.4	3.7
MANGANESE	ug/l										112	15U
MERCURY	ug/l										0.20U	0.20U
MOLYBDENUM	ug/l											
NICKEL	ug/l										40U	40U
NITRATE	mg/l			5		5.4						6.4
NITRATE AS NITROUS OXIDE	mg/l											
NITRITE	mg/l			0.36		0.1						0.021
SELENIUM	ug/l										10U	10U
SILVER	ug/l										10U	10U
SPECIFIC CONDUCTANCE	umhos/cm											
SPECIFIC GRAVITY			0		0.998		1.002		1			
STRONTIUM	ug/l											
SULFIDE	mg/l											2.0U
SULFITE	mg/l											
THALLIUM	ug/l										10U	10U
TIN	ug/l											
TITANIUM	ug/l											
TOTAL ALKALINITY	mg/l											
TOTAL DISSOLVED SOLIDS	mg/l		0		155		128		156		146	
TOTAL ORGANIC CARBON	mg/l		0	0	1	1					1.0U	
VANADIUM	ug/l										50U	50U
ZINC	ug/l										24.4	20U

Table A-3
Deep Groundwater
Analytical Data

Location ID	Unit	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T	SA6-MW-AA1T
Filtered		N	N	Y	Y	N	N	Y	N	Y	N	N
Parameter		2/1/01	2/1/01	2/1/01	2/1/01	4/22/03	4/22/03	4/22/03	9/9/04	9/9/04	11/28/06	11/28/06
BICARBONATE ALKALINITY	mg/l			685	703	702			685		716	644
CALCIUM	ug/l	128000	124000	125000	126000		124000		119000		148000	149000
CHLORIDE	mg/l			1440	1450	1440			1420J		1620	1620
CHROMIUM	ug/l	7.4	6.1	6.2	6.3		11.3	8.7J	15.4	10.8	33.4	41.4
HEXAVALENT CHROMIUM	ug/l	10	10	10	10	10U	-	10U	10U	10U	10U	10U
MAGNESIUM	ug/l	120000	117000	121000	122000		131000		123000		161000	158000
pH											6.74	6.74
POTASSIUM	ug/l	39200	37700	38900	38900		44400		43000J		65200	64000
SODIUM	ug/l	962000	945000	957000	978000		870000		858000		993000	1050000
SULFATE	mg/l			291	278	352			299		432	425
ALKALINITY, CARBONATE (AS CACO3)	mg/l										5U	5U
ALUMINUM	ug/l	81.6	81.6	81.6	81.6						765	915
ANTIMONY	ug/l										6U	6U
ARSENIC	ug/l										8U	8U
BARIUM	ug/l										200U	200U
BERYLLIUM	ug/l										1U	1U
BICARBONATE ALKALINITY AS CACO3	mg/l											
BORON	ug/l											
CADMIUM	ug/l										4U	4U
CARBONATE ALKALINITY	mg/l			685	703	5			5U		717	645
COBALT	ug/l										50U	50U
COPPER	ug/l										25U	25U
FERROUS IRON	mg/l										0.15	0.26
HARDNESS (AS CACO3)	mg/l										990	990
IRON	ug/l	6180	5890	5640	5660						4090	4470
Iron, Ferric	mg/l										2.8	2.5
LEAD	ug/l										3U	3U
MANGANESE	ug/l										3210	3170
MERCURY	ug/l										0.2U	0.2U
MOLYBDENUM	ug/l											
NICKEL	ug/l										40U	40U
NITRATE	mg/l			0.1	0.1						0.11U	0.11U
NITRATE AS NITROUS OXIDE	mg/l											
NITRITE	mg/l			0.1	0.1						0.01U	0.01U
SELENIUM	ug/l										10U	10U
SILVER	ug/l										10U	10U
SPECIFIC CONDUCTANCE	umhos/cm										5950	5950
SPECIFIC GRAVITY		1.0019	1.003			1.0053			1		1	1
STRONTIUM	ug/l											
SULFIDE	mg/l										2U	2U
SULFITE	mg/l											
THALLIUM	ug/l										10U	10U
TIN	ug/l											
TITANIUM	ug/l											
TOTAL ALKALINITY	mg/l											
TOTAL DISSOLVED SOLIDS	mg/l	2880	2850			3350			3720		3560	3460
TOTAL ORGANIC CARBON	mg/l	7	7.2	7.3	7.1						6.1	5.6
VANADIUM	ug/l										50U	50U
ZINC	ug/l										20U	20U

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	073-MW-1BR-1	073-MW-1BR-2	073-MW-1BR-3	073-MW-1BR-4	073-MW-1BR-5	073-MW-1BR-1	073-MW-1BR-1	073-MW-1BR-2	073-MW-1BR-2	073-MW-1BR-3	073-MW-1BR-3	073-MW-1BR-4	073-MW-1BR-4	073-MW-1BR-5	073-MW-1BR-5	073-MW-10BR-1	073-MW-10BR-1	073-MW-10BR-2	073-MW-10BR-2	073-MW-10BR-3	073-MW-10BR-3	073-MW-10BR-4	073-MW-10BR-4
Filtered		N	N	N	N	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Parameter		5/18/05	5/18/05	5/18/05	5/18/05	5/18/05	8/2/06	8/2/06	8/2/06	8/2/06	8/2/06	8/2/06	8/2/06	8/2/06	8/2/06	8/2/06	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06
BICARBONATE ALKALINITY	mg/l	77.9	62.8	59.3	13.2	95.8		71.3		80		38.3		27.8		105		66.4		67.4		75.9		85
CALCIUM	ug/l	285000	113000	225000	68700	18000	297000	286000	58300	57700	47400	48400	33200	33900	9190	9450	166000	162000	160000	161000	76100	85900	30100	30200
CHLORIDE	mg/l	1090	478	930	430	112		1110		275		348		263		49.2		617		605		377		175
CHROMIUM	ug/l	45200	4090	27100	222	130	38000	32100	47.6	43.8	41.1	38.2	10U	10U	10U	10U	8020	8000	7810	7880	3680	4220	1340	1380
HEXAVALENT CHROMIUM	ug/l	44600	4140	28700	216	122	37900	37500	62	50U	50U	50U	50U	50U	50U	50U	10300	10400	10800	9900	6400	4600	1400	1400
MAGNESIUM	ug/l	45900	18000	33600	9880	2440	48500	43400	9550	9520	6810	6890	5000U	5000U	5000U	5000U	31600	29300	30600	29300	14500	14900	5000U	5000U
pH							9.66		9.27		9.12		9.22		8.99		8.71		8.33		8.24		8.18	
POTASSIUM	ug/l	12000	4210	7760	3550JB	1770JB	11800	13400	5000U	5000U	5000U	5000U	5000U	5000U	5000U	5000U	5720	5740	5400	5580	5000U	5000U	5000U	5000U
SODIUM	ug/l	518000	244000	473000	276000	143000	552000	530000	180000	181000	238000	234000	218000	225000	129000	131000	261000	253000	257000	260000	180000	208000	152000	150000
SULFATE	mg/l	448	204	375	224	144		385		133		167		186		129		166		166		131		96.8
ALKALINITY, CARBONATE (AS CACO3)	mg/l							73.6		80.6		39.8		28.5		109		66.7		67.7		76.3		85.5
ALUMINUM	ug/l						200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200UJ	200UJ	200UJ	200UJ	713	200UJ	200UJ	200UJ
ANTIMONY	ug/l						17.5J	13.9J	6.0UJ	6.0UJ	6.0UJ	6.0UJ	6.0UJ	6.0UJ	6.0UJ	6.0UJ	6.0U	6.0U	6.0U	6.0U	6.0U	6.0U	6.0U	6.0U
ARSENIC	ug/l						176	210	142	141	18.1	19.7	80.1	93	20.5	34.7	115	113	103	106	117	135	116	119
BARIUM	ug/l						200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U
BERYLLIUM	ug/l						1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l						4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U
CARBONATE ALKALINITY	mg/l	9.9	5U	5U	5U	5U		5.0U		5.0U		5.0U		5.0U		5.0U		5.0U		5.0U		5.0U		5.0U
COBALT	ug/l						50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U
COPPER	ug/l						25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	33.9	25U	25U	25U
FERROUS IRON	mg/l							0.10U		0.10U		0.10U		0.10U		0.10U		0.10U		0.10U		0.10U		0.10U
HARDNESS (AS CACO3)	mg/l						1030		184		141		104		23.5		491		465		352		99	
IRON	ug/l						100UJ	100UJ	100UJ	100UJ	100UJ	100UJ	100UJ	100UJ	100UJ	100UJ	171	194	212	195	852	133	100U	100U
Iron, Ferric	mg/l							0.20U		0.20U		0.20U		0.20U		0.20U		0.20U		0.2		0.20U		0.20U
LEAD	ug/l						3.0UJ	3.0UJ	5.3	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	5.8J	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ
MANGANESE	ug/l						70.4	50.3	244	218	15U	15U	15U	16.1	15U	15U	48.8	42.5	78.6	77.8	77.9	53.7	15U	15U
MERCURY	ug/l						0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ
MOLYBDENUM	ug/l																							
NICKEL	ug/l						40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U
NITRATE	mg/l							0.51U		0.11U		0.11U		0.11U		0.11U		0.11U		0.11U		0.11U		0.11U
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l							0.13		0.010U		0.010U		0.010U		0.010U		0.038		0.035		0.018		0.010U
SELENIUM	ug/l						10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
SILVER	ug/l						10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10U	10U	10U	10U	10U	10U	10U	10U
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY		1	1	1	1	1	1		1		1		1		1		1		1		1		1	
STRONTIUM	ug/l																							
SULFIDE	mg/l							2.0U		2.0U		2.0U		2.0U		2.0U		2.0U		2.0U		2.0U		2.0U
SULFITE	mg/l																							
THALLIUM	ug/l						10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10U	10U	10U	10U	10U	10U	10U	10U
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l	2780	1450	2180	1090	540	2780		705		812		713		363J		1490		1470		1060		511	
TOTAL ORGANIC CARBON	mg/l						4.2		5.1		1.5		4.1		2.2		1.9		1.5		2.1		2.2	
VANADIUM	ug/l						50U	50U	50U	50U	370	312	50U	50U	274	292	50U	50U	50U	50U	133	148	270	283
ZINC	ug/l						20U	20U	20U	20U	20U	20U	20U	20U	20U	20U	94.7	85.4	92.7	89.7	56	31.1	20U	20U

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	073-MW-10BR-5	073-MW-10BR-5	079-MW-13BR	079-MW-13BR	079-MW-13BR	079-MW-13BR-1	079-MW-13BR-1	079-MW-13BR-2	079-MW-13BR-2	079-MW-13BR-3	079-MW-13BR-3	087-MW-14	087-MW-14	087-MW-14	087-MW-14	087-MW-14	087-MW-14	087-MW-14	087-MW-15	087-MW-029T	087-MW-029T	087-MW-029T	087-MW-029T
Filtered		N	Y	N	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	N	N	N	Y	Y
Parameter		8/4/06	8/4/06	2/17/06	8/2/06	8/2/06	11/27/06	11/27/06	11/27/06	11/27/06	11/27/06	11/27/06	4/28/03	4/28/03	4/28/03	4/28/03	5/18/05	7/28/06	7/28/06	5/16/06	8/9/99	8/10/99	8/10/99	9/9/99
BICARBONATE ALKALINITY	mg/l		67.5	52.7		5.0U		85.6		88.3		80	652	303			43.3		33.7	756				195
CALCIUM	ug/l	74600	77600	24000	18000	13200	8400	8210	5000U	5000U	5850	5230	391000	378000			97300	299000	260000	50500	235000			236000
CHLORIDE	mg/l		368	24.3		15.2		13.5		12.6		31					631		1100	1500				1480
CHROMIUM	ug/l	3860	4060	174	34.2	10U	10U	10U	10U	10U	10U	10U	272000J	272000J	301000J	296000J	103000	121000	130000	354	55800	55000	56700	51000
HEXAVALENT CHROMIUM	ug/l	4600	5300	79.6	50UJ	50UJ	10U	10U	10U	10U	10U	10U	302000	299000	326000	339000	122000	127000	130000		51300	116	111	42200
MAGNESIUM	ug/l	12500	12200		5000U	5000U	5000U	5000U	5000U	5000U	5000U	5000U	125000	106000			2220	5000UJ	5000UJ	52000	70600			69000
pH		8.26		9.26J	11.73		6.73		8.74		8.85							11.41						
POTASSIUM	ug/l	5000U	5000U	5610JB	18400	17700	5000U	5000U	5000U	5000U	5430	5000U	39900	37100			58500	49300J	55100J	86600J	30600			29100
SODIUM	ug/l	219000	219000	28200	41500	40700	47900	46900	57600	60900	58300	63500	903000	900000			438000	630000	658000	791000	945000			891000
SULFATE	mg/l		133	21.5		22.9		18.9		18.5		20.2	651	630			208		367	100U				579
ALKALINITY, CARBONATE (AS CACO3)	mg/l		67.7			108		5U		5U		5U							185					
ALUMINUM	ug/l	200UJ	200UJ		324	200U	408	200U	1320	200U	2350	200U						200U	200U	3750	214			27.9
ANTIMONY	ug/l	6.0U	6.9JB		6.0UJ	6.0UJ	6U	6U	6.3	7.2	7.5	6U						39.6	18U	11.6U				
ARSENIC	ug/l	471	552		8.0UJ	8.0UJ	317	312	394	478	695	615						136	137	6.4U				
BARIUM	ug/l	200U	200U		200U	200U	200U	200U	200U	200U	200U	200U						200U	200U	293				
BERYLLIUM	ug/l	1.0UJ	1.0UJ		1.0UJ	1.0UJ	1U	1U	1U	1U	1U	1U						1.0UJ	1.0UJ	1.8				
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l	4.0U	4.0U		4.0U	4.0U	4U	4U	4U	4U	4U	4U						4.0UJ	4.0UJ	0.8U				
CARBONATE ALKALINITY	mg/l		5.0U	15.6		49.6		86.5		89.8		80.6	121	444			173		129	5U				5
COBALT	ug/l	50U	50U		50U	50U	50U	50U	50U	50U	50U	50U						50U	50U	3.4U				
COPPER	ug/l	25U	25U		25U	25U	25U	25U	25U	25U	25U	25U						69.3	25U	28.4JB				
FERROUS IRON	mg/l		0.10U			0.10U		0.2U		0.2U		0.2U							0.10U	2.6J				
HARDNESS (AS CACO3)	mg/l	234			43.1		28		16		40							728						
IRON	ug/l	110	100U		2210	100UJ	396	100U	1100	100U	1950	100U						1020	534	7990J	266			45.7
Iron, Ferric	mg/l		0.20U			0.20U		0.3U		0.3U		0.3U							0.53					
LEAD	ug/l	3.0UJ	3.0UJ		3.0UJ	3.0UJ	3U	3U	3.7	3U	6.9	3U						14.3	9.0U	45.1				
MANGANESE	ug/l	36	36.7	49.2	66.5	15U	17.7	15U	25.8	15U	45	15U						15U	15U	263				
MERCURY	ug/l	0.20UJ	0.20UJ		0.20U	0.20U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U						0.20UJ	0.20UJ	0.1U				
MOLYBDENUM	ug/l																							
NICKEL	ug/l	40U	40U		40U	40U	40U	40U	40U	40U	40U	40U						40U	40U	26.2				
NITRATE	mg/l		0.11U			0.11U		0.11U		0.11U		0.11U							1.0U					0.1
NITRATE AS NITROUS OXIDE	mg/l																			1U				
NITRITE	mg/l		0.011			0.010U		0.01U		0.01U		0.01U							0.14					0.1
SELENIUM	ug/l	10U	10U		10U	10U	10U	10U	10U	10U	10U	10U						10U	10U	8.4U				
SILVER	ug/l	10U	10U		10UJ	10UJ	10U	10U	10U	10U	10U	10U						10U	10U	2.8U				
SPECIFIC CONDUCTANCE	umhos/cm						178		189		217													
SPECIFIC GRAVITY		1		0.99			1		1		1		1.006	1.006			1				1.002			
STRONTIUM	ug/l																							
SULFIDE	mg/l		2.0U	1U		2.0U		2U		2U		2U							2.0U	1U				
SULFITE	mg/l																							
THALLIUM	ug/l	10U	10U		10UJ	10UJ	10U	10U	10U	10U	10U	10U						30UJ	30UJ	9.4U				
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l	888		116	173		150		164		208		4040	3950			1160	2740		2510	4000			
TOTAL ORGANIC CARBON	mg/l	10.3			4.1		7.9		12		16.9							5		32.7	3.7			3.7
VANADIUM	ug/l	510	478		50U	50U	50U	50U	50U	50U	50U	50U						150U	150U	244				
ZINC	ug/l	149	157		20U	20U	20U	20U	34.2	20U	93.7	20U						60UJ	60UJ	66.6				

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	087-MW-029T	087-MW-029T	087-MW-029T	087-MW-029T	087-MW-029T	087-MW-029T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	087-MW-130T	090-MW-7BR	090-MW-7BR	090-MW-7BR-1	090-MW-7BR-2
Filtered		Y	N	Y	N	N	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	N	Y	N	N	N	N
Parameter		4/21/03	9/9/04	9/9/04	5/17/05	7/28/06	7/28/06	8/10/99	8/10/99	9/9/99	9/9/99	9/9/99	9/9/99	4/22/03	4/22/03	9/9/04	9/9/04	5/18/05	7/28/06	7/28/06	9/24/04	9/24/04	5/17/05	5/17/05
BICARBONATE ALKALINITY	mg/l		5U		338B		199					348	348	293		55		347		275			404	120
CALCIUM	ug/l		25400		279000	246000	260000			203000	202000	214000	205000	160000		130000		181000	159000	146000			642000	205000
CHLORIDE	mg/l		883J		1640		1840					1240	1260	1060		897J		1100		1140			1250	663
CHROMIUM	ug/l	66700	174	4.8	65600	67200	76600	64600	67100	80900	81800	83900	80200	60600	65500	25800	29000	81100	56400	60200	55800	46300	380000	88900
HEXAVALENT CHROMIUM	ug/l	66600	10U	10U	62400	76700	83000	134	132	79700	76300	74000	71700	80500U	68500	17300	137000	88500	64100	62400	51200	51200	437000	93900
MAGNESIUM	ug/l		11500		86900	69400J	78100J			75200	77000	81500	78400	62300		46200		70200	64900J	64600J			105000	46100
pH						7.92													7.53					
POTASSIUM	ug/l		73300J		30900	27700J	30900J			35300	35600	38300	34900	26100		40900J		31600	35800J	56000J			29200	13700
SODIUM	ug/l		569000		940000	951000	1040000			813000	826000	831000	826000	598000		477000		774000	678000	717000			581000	261000
SULFATE	mg/l		150		627		584					555	458	693		215		448		377			735	250
ALKALINITY, CARBONATE (AS CACO3)	mg/l						199													277				
ALUMINUM	ug/l					1010	200U			198	262	27.9	58.1						689	200U				
ANTIMONY	ug/l					12U	15												12U	12U				
ARSENIC	ug/l					76.6	78.1												53.2	65.9				
BARIUM	ug/l					200U	200U												200U	200U				
BERYLLIUM	ug/l					1.0UJ	1.0UJ												1.0UJ	1.0UJ				
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l					4.0UJ	4.0UJ												4.0UJ	4.0UJ				
CARBONATE ALKALINITY	mg/l		40		5U		5.0U					5	5	5		130		5U		5.0U			5U	5U
COBALT	ug/l					50U	50U												50U	50U				
COPPER	ug/l					32.5	25U												25.8	25U				
FERROUS IRON	mg/l						0.10U													0.10U				
HARDNESS (AS CACO3)	mg/l					974													730					
IRON	ug/l					1680	350			230	284	87.3	99.7						1470	310				
Iron, Ferric	mg/l						0.35													0.31				
LEAD	ug/l					9.4	6.0U												6.0U	6.0U				
MANGANESE	ug/l					151	113												155	109				
MERCURY	ug/l					0.20UJ	0.20UJ												0.20UJ	0.20UJ				
MOLYBDENUM	ug/l																							
NICKEL	ug/l					40U	40U												50.2	40U				
NITRATE	mg/l						1.0U					0.1	0.1							1.0U				
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l						0.18					0.1	0.1							0.17				
SELENIUM	ug/l					10U	10U												10U	10U				
SILVER	ug/l					10U	10U												10U	10U				
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY			1		1.0055					1.002	1.001			1.005		1		1					1	1
STRONTIUM	ug/l																							
SULFIDE	mg/l						2.0U													2.0U				
SULFITE	mg/l																							
THALLIUM	ug/l					20UJ	20UJ												20UJ	20UJ				
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		1790		4200	3740				3620	3460			2710		1570		2400	2970				3640	1840
TOTAL ORGANIC CARBON	mg/l					3.3				3.5	3.4	3.3	3.4						3.1					
VANADIUM	ug/l					100U	100U												100U	100U				
ZINC	ug/l					45.8JB	40UJ												277J	40UJ				

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	090-MW-7BR-3	090-MW-7BR-1	090-MW-7BR-1	090-MW-7BR-2	090-MW-7BR-2	090-MW-7BR-3	090-MW-7BR-3	090-MW-18BR	090-MW-18BR	090-MW-18BR	090-MW-18BR	090-MW-18BR	090-MW-18BR	15-MW-201BR	15-MW-201BR	115-MW-201BR	115-MW-201BR	115-MW-202BR	115-MW-202BR	115-MW-203BR	115-MW-203BR	115-MW-203BR	115-MW-203BR
Filtered		N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	Y
Parameter		5/17/05	8/3/06	8/3/06	8/3/06	8/3/06	8/3/06	8/3/06	11/29/06	11/29/06	11/29/06	11/29/06	12/22/06	12/22/06	4/15/04	4/15/04	10/3/06	10/3/06	4/15/04	4/15/04	10/3/06	10/3/06	10/3/06	10/3/06
BICARBONATE ALKALINITY	mg/l	91		400		88.2		67.9		5.0U		5U		5U	104			114	5U				39.7	44.4
CALCIUM	ug/l	78000	621000	607000	144000	144000	18000	21200	173000	169000	173000	169000	141000	150000	342000		368000	372000	132000		263000	270000	252000	254000
CHLORIDE	mg/l	399		1090		407		212		55		55		54.3	906			1430	338				1080	1070
CHROMIUM	ug/l	59500	440000	434000	40400	40500	4580	6430	367	345	367	345	230	215	57500	58200	61200	62500	7650	4340	12000	12400	12100	11900
HEXAVALENT CHROMIUM	ug/l	59200	446000	427000	46200	42600	6000	6600	360	340	360	340	230	220	61900	61900	57700	61600	6090	7700	11300	11600	12000	11800
MAGNESIUM	ug/l	14400	120000	117000	35500	35600	5000U	5000U	5000U	5000U	5000U	5000U	5000U	5000U	57800		69100	69700	21900		49800	51100	47400	47800
pH			7.88		8.19		8.6										8.71				9.22	9.22		
POTASSIUM	ug/l	8250	25000U	25000U	7140	7160	5000U	5000U	236000	224000	236000	224000	196000	172000	11700		14700	12700	14800		21000	20400	19200	19800
SODIUM	ug/l	255000	619000	627000	224000	222000	148000	163000	175000	163000	175000	163000	165000	148000	542000		624000	644000	151000		420000	435000	374000	514000
SULFATE	mg/l	179		640		149		51.9		261J		261		253	541			552	104				235	235
ALKALINITY, CARBONATE (AS CACO3)	mg/l			403		88.7		68.3		726		333		5U				115					40.3	45.2
ALUMINUM	ug/l		1000U	1000U	200U	200U	200U	200U	200U	200U	200U	200U	341	255			656	200U			230JB	476	200U	200U
ANTIMONY	ug/l		90U	114	6.0U	6.0U	7.6	6.1	6.0U	6.0U	6U	6U	6U	6U			12U	12U			6.0U	6.1JB	6.0U	6.0U
ARSENIC	ug/l		120U	127	81.2	79.8	213	183	8.0U	8.0U	8U	8U	8U	8U			59.6	76.3			14.9	15.1	14.9	18.1
BARIUM	ug/l		1000U	1000U	200U	200U	200U	200U	200U	200U	200U	200U	200U	200U			200U	200U			200U	200U	200U	200U
BERYLLIUM	ug/l		5.0U	5.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1U	1U	1U	1U			1.0U	1.0U			1.0U	1.0U	1.0U	1.0U
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l		20U	20U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4U	4U	4U	4U			4.0U	4.0U			4.0U	4.0U	4.0U	4.0U
CARBONATE ALKALINITY	mg/l	7.1		5.0U		5.0U		5.0U		333		726		577	2.1			5.0U	156				5.0U	5.0U
COBALT	ug/l		250U	250U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U			50U	50U			50U	50U	50U	50U
COPPER	ug/l		130U	130U	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U			25U	25U			25U	25U	25U	25U
FERROUS IRON	mg/l			0.20U		0.20U		0.20U		0.20U		0.2U		0.1U				0.10U					0.10U	0.10U
HARDNESS (AS CACO3)	mg/l		1720		483		71.3										1050				833	774		
IRON	ug/l		2630	2010	187	188	100U	100U	100U	100U	100U	100U	125	100U			642	200U			358	137JB	100U	100U
Iron, Ferric	mg/l			1.7		0.30U		0.30U		0.30U		0.3U		0.2U				0.30U					0.20U	0.20U
LEAD	ug/l		45U	45U	3.0U	5.1B	4.2B	4.0B	3.0U	3	3U	3	3U	3U			6.0U	6.0U			3.0U	3.0U	3.0U	3.0U
MANGANESE	ug/l		75U	75U	15U	15U	15U	15U	15U	15U	15U	15U	15U	15U			167	139			121	129	123	118
MERCURY	ug/l		0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.2U	0.2U	0.2U	0.2U			0.20U	0.20U			0.20U	0.20U	0.20U	0.20U
MOLYBDENUM	ug/l																							
NICKEL	ug/l		200U	200U	40U	40U	40U	40U	40U	40U	40U	40U	40U	40U			40U	40U			40U	40U	40U	40U
NITRATE	mg/l			0.51U		0.51U		0.11U		0.11U		0.11U		5U				0.15U					0.11U	0.11U
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l			0.14		0.12		0.022		0.049		0.049		0.046				0.13					0.033	0.03
SELENIUM	ug/l		50U	50U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U			20U	20U			10UJ	10UJ	10UJ	10UJ
SILVER	ug/l		50U	50U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U			10U	10U			10U	10U	10U	10U
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY		1													1				1					
STRONTIUM	ug/l																							
SULFIDE	mg/l			2.0U		2.0U		2.0U		2.0U		2U		2U				2.0U					2.0U	2.0U
SULFITE	mg/l																							
THALLIUM	ug/l		150U	150U	10U	10U	10U	10U	10UJ	10UJ	10U	10U	10U	10U			10UJ	10UJ			10UJ	10UJ	10UJ	10UJ
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l	960	3860		1260		496								3400		3360		890		2530	2560		
TOTAL ORGANIC CARBON	mg/l		1.9		1.4		3.7										2.9				5.2	5		
VANADIUM	ug/l		750U	750U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U			100U	100U			50U	50U	50U	50U
ZINC	ug/l		300U	300U	20U	20U	20U	20U	20U	20U	20U	20U	23.6	20U			40U	40U			30.9	20U	20U	20U

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	115-MW-205BR	115-MW-205BR	115-MW-206BR	115-MW-206BR	115-MW-207BR	115-MW-207BR	115-MW-208BR	115-MW-208BR	115-MW-210	115-MW-210	115-MW-211	115-MW-211	115-MW-211	115-MW-211	115-MW-213BR	115-MW-213BR	115-MW-214BR	115-MW-214BR	115-MW-215BR	115-MW-215BR	115-MW-215BR	115-MW-215BR	115-MW-216
Filtered		N	Y	N	Y	N	Y	N	Y	N	N	N	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N
Parameter		4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/13/04	4/13/04	12/3/03	6/18/04	7/31/06	7/31/06	7/31/06	7/31/06	4/16/04	4/16/04	4/16/04	4/16/04	4/16/04	4/16/04	10/3/06	10/3/06	7/31/06
BICARBONATE ALKALINITY	mg/l	5U		5U		5U		25.3						108	111	5U		22.1		88.2			18.3	
CALCIUM	ug/l	95900		83900		76300		18600		2650000		136000	137000	124000	123000	394000		354000		318000		311000	304000	80400
CHLORIDE	mg/l	264		449		306		144		39.7				630	639	1440		907		1310			1140	
CHROMIUM	ug/l	219	216	8320	8530	67.1	68.9	189	187	88700		107000	113000	105000	102000	144	127	734	731	38300	38100	28100	27600	36800
HEXAVALENT CHROMIUM	ug/l	200	198	8740	8740	61.7	59.7	159	159	77900J		112000	118000	121000	113000	107J	105J	775J	775J	41300J	41300J	27100	28300	42700
MAGNESIUM	ug/l	5520		18100		2630		2630		279000		37000J	37900J	33300J	33000J	12000		57600		56300		31300	29400	13000J
pH												9.58	9.58									10.37		9.24
POTASSIUM	ug/l	19100		6160		41600		6760		8050		16200J	16500J	16000J	16200J	19600		7880		7520		39000	36800	9520J
SODIUM	ug/l	126000		216000		177000		80700		520000		411000	415000	423000	424000	617000		380000		532000		500000	471000	228000
SULFATE	mg/l	68.2		104		53.3		19.9						231	229	425		167		448			364	
ALKALINITY, CARBONATE (AS CACO3)	mg/l													118	121								46.8	
ALUMINUM	ug/l									281000		405	498	200U	200U							271	200U	1740
ANTIMONY	ug/l									39U		30U	30U	30U	30U							6.0U	6.0U	6.0U
ARSENIC	ug/l									34U		132	125	126	122							36.5	35	42.6
BARIUM	ug/l									607		200U	200U	200U	200U							200U	200U	200U
BERYLLIUM	ug/l									1U		1.0UJ	1.0UJ	1.0UJ	1.0UJ							1.0U	1.0U	1.0UJ
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l									4U		4.0UJ	4.0UJ	4.0UJ	4.0UJ							4.0U	4.0U	4.0UJ
CARBONATE ALKALINITY	mg/l	160		5U		178		22		9680				9.5	9.5	21		2.1		2.1			22.1	
COBALT	ug/l									1020		50U	50U	50U	50U							50U	50U	50U
COPPER	ug/l									240	89.3	25U	25U	25U	25U							25U	25U	36.8
FERROUS IRON	mg/l													0.10U	0.10U								0.10U	
HARDNESS (AS CACO3)	mg/l									5400		459	476									882		274
IRON	ug/l									269000	118000	730	798	500U	500U							232	100U	1980
Iron, Ferric	mg/l													0.60U	0.60U								0.20U	
LEAD	ug/l									117	67.3	15U	15U	15U	15U							3.0U	3.0U	3.0U
MANGANESE	ug/l									4400		15U	15U	15U	15U							29.5	15U	63.2
MERCURY	ug/l									0.35		0.20UJ	0.20UJ	0.20UJ	0.20UJ							0.20U	0.20U	0.20UJ
MOLYBDENUM	ug/l																							
NICKEL	ug/l									2520	1130	40U	40U	40U	40U							40U	40U	40U
NITRATE	mg/l									0.12				1.0U	1.0U								0.15U	
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l													0.14	0.14								0.12	
SELENIUM	ug/l									39U		10U	10U	10U	10U							10UJ	10UJ	10U
SILVER	ug/l									7U		10U	10U	10U	10U							10U	10U	10U
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY		1		1		1		1								1		1		1				
STRONTIUM	ug/l																							
SULFIDE	mg/l									1U				2.0U	2.0U								2.0U	
SULFITE	mg/l																							
THALLIUM	ug/l									44U		50UJ	50UJ	50UJ	50UJ							10UJ	10UJ	10UJ
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l	726		990		746		299		4860		1790	1810			3910		3410		3410		2790		1030
TOTAL ORGANIC CARBON	mg/l											1.3	1.8									3.4		1.0U
VANADIUM	ug/l									3020		250U	250U	250U	250U							50U	50U	50U
ZINC	ug/l									2890	662	100UJ	100UJ	100UJ	100UJ							20U	20U	20UJ

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	115-MW-216	117-MW-3BR-1	117-MW-3BR-2	117-MW-3BR-1	117-MW-3BR-1	117-MW-3BR-2	117-MW-3BR-2	117-MW-3BR-2	117-MW-3BR-2	117-MW-8BR	117-MW-8BR	117-MW-8BR	117-MW-8BR	117-MW-8BR	117-MW-8BR	119-MW-11BR	119-MW-11BR	119-MW-11BR	119-MW-11BR	119-MW-12BR	119-MW-12BR	119-MW-12BR	119-MW-12BR
Filtered		Y	N	N	N	Y	N	N	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	N
Parameter		7/31/06	5/17/05	5/17/05	8/3/06	8/3/06	8/3/06	8/3/06	8/3/06	8/3/06	5/17/05	5/17/05	8/2/06	8/2/06	8/4/06	8/4/06	1/4/06	1/4/06	8/1/06	8/1/06	1/4/06	1/4/06	6/29/06	9/13/06
BICARBONATE ALKALINITY	mg/l	81.7	351	54.2		134			112	120	5U	5U		6.5			5U			5.0U	80.1			
CALCIUM	ug/l	83000	58400	1830	5100	5000U	5000U	5000U	5000U	5000U	189000	42.5U	316000	284000			9450		80500	79100	636000			26600
CHLORIDE	mg/l	395	19.9	8.8		14.7			10.3	10.4	17.7	5U		12.6			22.7			27.7	19.8			
CHROMIUM	ug/l	38100	17.6	8.9	10U	10U	10U	10U	10U	10U	6.6	8.4	10U	10U			2.8U	2.8U	12.5	10U	1150	2.8U	9.4	10U
HEXAVALENT CHROMIUM	ug/l	44100	10U	10U	50U	50U	50U	50U	50U	50U	10U	10U	50UJ	50UJ	50U	50U	10U	10U	50U	50U	10000U	10U	20UJ	50U
MAGNESIUM	ug/l	16000J	6210	880	5000U	5000U	5000U	5000U	5000U	5000U	218	41.6U	5000U	5000U			301		5000U	5000U	350000			5000U
pH					5.83		7.11	7.11					12.92				10.75J		12.3		9.93J			9.77
POTASSIUM	ug/l	9340J	8950	1130B	5000U	5000U	5000U	5000U	5000U	5000U	40300	403B	44000	40200			27100		36600J	36600J	116000			17600
SODIUM	ug/l	259000	131000	66800	65300	68000	76600	76100	75000	72700	84300	396U	79800	74700			62300		59100J	59100J	52700			37100
SULFATE	mg/l	165	5U	26.4		2.0U			20.3	18.8	42.5	5U		18.8			17			14.2	35			
ALKALINITY, CARBONATE (AS CACO3)	mg/l	82.8				138			135	135				976						332				
ALUMINUM	ug/l	200U			200U	200U	545	391	200U	200U			625	432					859	601				548J
ANTIMONY	ug/l	6.0U			7.7	8.9	7.2	9.2	8.1	8.1			6.0UJ	6.0UJ					6.0UJ	6.0UJ				6.0U
ARSENIC	ug/l	40.3			68.5	78.1	8.0U	8.0U	8.0U	8.0U			8.0UJ	8.0UJ					8.0UJ	8.0UJ				8.0U
BARIUM	ug/l	200U			200U	200U	200U	200U	200U	200U			625	580					259	253				200U
BERYLLIUM	ug/l	1.0UJ			1.0U	1.0U	1.0U	1.0U	1.0U	1.0U			1.0UJ	1.0UJ					1.0UJ	1.0UJ				1.0U
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l	4.0UJ			4.0U	4.0U	4.0U	4.0U	4.0U	4.0U			4.0U	4.0U					4.0U	4.0U				4.0U
CARBONATE ALKALINITY	mg/l	5.0U	5U	82.3		5.0U			22	14.2	69.2	5U		534			96.5			120	5U			
COBALT	ug/l	50U			50U	50U	50U	50U	50U	50U			50U	50U					50U	50U				50U
COPPER	ug/l	25U			25U	25U	25U	25U	25U	25U			25U	25U					33.5	25U				25U
FERROUS IRON	mg/l	0.10U				0.20U			0.20U	0.20U				0.10U						0.10U				
HARDNESS (AS CACO3)	mg/l				9.9		9.9	4.0U					745						190					76
IRON	ug/l	165			101	100U	792	552	100U	100U			105J	100UJ					628	100UJ				100U
Iron, Ferric	mg/l	0.20U				0.30U			0.30U	0.30U				0.20U						0.20U				
LEAD	ug/l	3.0U			12.7JB	13.9JB	7.8JB	5.5B	3.0B	4.3B			3.1J	3.0UJ					3.0U	3.0U				4.3B
MANGANESE	ug/l	15U			15U	15U	20.1	15U	15U	15U			24.5	15U					15U	15U				15U
MERCURY	ug/l	0.20UJ			0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ			0.20U	0.20U					0.20UJ	0.20UJ				0.20U
MOLYBDENUM	ug/l																							
NICKEL	ug/l	40U			40U	40U	40U	40U	40U	40U			40U	40U					40U	40U				40U
NITRATE	mg/l	1.0U				0.11U			0.11U	0.11U				0.11U						0.12				
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l	0.11				0.010U			0.010U	0.010U				0.014						0.13				
SELENIUM	ug/l	10U			10U	10U	10U	10U	10U	10U			10U	10U					10U	10U				10U
SILVER	ug/l	10U			10U	10U	10U	10U	10U	10U			10UJ	10UJ					10UJ	10UJ				10U
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY			1	1							1	1					1				1			
STRONTIUM	ug/l																							
SULFIDE	mg/l	2.0U				2.0U			2.0U	2.0U				2.0U			1U			2.0U	1U			
SULFITE	mg/l																							
THALLIUM	ug/l	10UJ			10U	10U	10U	10U	10U	10U			10UJ	10UJ					10UJ	10UJ				10U
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		780	246	200		206	160			2650	10U	979				452		428		1440			148
TOTAL ORGANIC CARBON	mg/l				7.1		1.0U	1.0U					38.3						1.7					1.0U
VANADIUM	ug/l	50U			50U	50U	50U	50U	50U	50U			50U	50U					50U	50U				50U
ZINC	ug/l	20UJ			20U	20U	44.8	31.1	20U	20U			20U	20U					20U	20U				20U

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	119-MW-12BR	119-MW-16BR-1	119-MW-16BR-1	119-MW-16BR-2	119-MW-16BR-2	119-MW-16BR-3	119-MW-16BR-3	119-MW-2BR	119-MW-2BR	119-MW-2BR	119-MW-2BR-1	119-MW-2BR-2	119-MW-2BR-3	119-MW-2BR-2	119-MW-2BR-2	119-MW-2BR-3	119-MW-2BR-3	119-MW-4BR	119-MW-4BR	119-MW-4BR	119-MW-4BR	119-MW-4BR-1	119-MW-4BR-1
Filtered		Y	N	Y	N	Y	N	Y	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N
Parameter		9/13/06	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06	2/8/05	2/8/05	2/8/05	5/16/05	5/16/05	5/16/05	8/4/06	8/4/06	8/4/06	8/4/06	10/31/05	11/1/05	11/1/05	11/1/05	2/17/06	2/17/06
BICARBONATE ALKALINITY	mg/l	50.3		34		47.7		83.4				64	99.2	95.8		113		114					89.3	99.6
CALCIUM	ug/l	25400	5000U	5000U	5000U	5000U	5000U	5000U				60900	9060	5440	7720	8030	5050	5230					5050	4940
CHLORIDE	mg/l	11.3		47.5		46.9		23.7				229	27.5	16.9		16.5		12.1					18.3	18.4
CHROMIUM	ug/l	10U	10U	10U	10U	10U	10U	10U	9	1.9U	1.9U	2.8U	2.8U	2.8U	10U	10U	10U	10U	112	9	47.7	20.6JB	4.2B	2.9B
HEXAVALENT CHROMIUM	ug/l	50U	50U	50U	50U	50U	50U	50U	10U	10U	10U	10U	10U	10U	50U	50U	50U	50U	10U	20U	50U	50U	10UJ	10UJ
MAGNESIUM	ug/l	5000U	5000U	5000U	5000U	5000U	5000U	5000U				10800	1310	691	5000U	5000U	5000U	5000U						
pH															9.7		9.23						8.72J	8.81J
POTASSIUM	ug/l	17400	33900	34800	15000	16900	5000U	5000U				5510	1650	802	5000U	5000U	5000U	5000U					2210JB	2080JB
SODIUM	ug/l	36800	54400J	54200J	63800J	61700J	73100J	74200J				119000	84200	80900	83000	87400	81000	82200					53900	53700
SULFATE	mg/l	40.3		25.5		28.8		34.1				65.5	75.5	61.5		77		66.4					19.6	19.6
ALKALINITY, CARBONATE (AS CACO3)	mg/l	74.2		83.9		72.6		108								114		115						
ALUMINUM	ug/l	500J	200U	200U	478	200U	3210	3120							200UJ	200UJ	200UJ	200UJ						
ANTIMONY	ug/l	6.0U	6.0U	6.0UJ	6.0U	6.0UJ	6.0U	6.0UJ							6.0U	6.0U	6.0U	6.0U						
ARSENIC	ug/l	8.0U	142	154	403	351	470	507							9.2	17.6	138	179						
BARIUM	ug/l	200U	200U	200U	200U	200U	200U	200U							200U	200U	200U	200U						
BERYLLIUM	ug/l	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U							1.0UJ	1.0UJ	1.0UJ	1.0UJ						
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U							4.0U	4.0U	4.0U	4.0U						
CARBONATE ALKALINITY	mg/l	21.6		43.1		22.5		23.1				5U	9.96	18.8		5.0U		5.0U					13.1	12.1
COBALT	ug/l	50U	50U	50U	50U	50U	50U	50U							50U	50U	50U	50U						
COPPER	ug/l	25U	25U	25U	25U	25U	25U	49							25U	25U	25U	25U						
FERROUS IRON	mg/l	0.10U		0.10U		0.10U		0.10U								0.10U		0.10U						
HARDNESS (AS CACO3)	mg/l		11.4		11.4		11.4								25.7		17.8							
IRON	ug/l	100U	100U	100U	327	100U	3100	3230							100U	100U	100U	100U						
Iron, Ferric	mg/l	0.20U		0.20U		0.20U		3.2								0.20U		0.20U						
LEAD	ug/l	6.4B	3.0U	3.0U	3.0U	3.0U	11.0J	10							3.0UJ	3.0UJ	3.0UJ	3.0UJ						
MANGANESE	ug/l	15U	15U	15U	15U	15U	56.9	60.2							15.2	16	15U	15U					27.6	25.6
MERCURY	ug/l	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U							0.20UJ	0.20UJ	0.20UJ	0.20UJ						
MOLYBDENUM	ug/l																							
NICKEL	ug/l	40U	40U	40U	40U	40U	40U	40U							40U	40U	40U	40U						
NITRATE	mg/l	0.11U		0.11U		0.11U		0.11U								0.11U		0.11U						
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l	0.010U		0.010U		0.010U		0.010U								0.010U		0.010U						
SELENIUM	ug/l	10U	10U	10U	10U	10U	10U	10U							10U	10U	10U	10U						
SILVER	ug/l	10U	10U	10U	10U	10U	10U	10U							10U	10U	10U	10U						
SPECIFIC CONDUCTANCE	umhos/cm																							
SPECIFIC GRAVITY												1	1	1	1		1						0.98	0.98
STRONTIUM	ug/l																							
SULFIDE	mg/l	2.0U		2.0U		2.0U		2.0U								2.0U		2.0U					1U	1U
SULFITE	mg/l																							
THALLIUM	ug/l	10U	10U	10UJ	10U	10UJ	10U	10UJ							10U	10U	10U	10U						
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l		227		213		266					658	194	337	261		249						192	205
TOTAL ORGANIC CARBON	mg/l		4.9		10.2		10.7								1.2		3.4							
VANADIUM	ug/l	50U	50U	50U	50U	50U	50U	50U							50U	50U	50U	50U						
ZINC	ug/l	20U	20U	20U	20U	20U	203	217							20U	20U	20.4	20U						

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	119-MW-4BR-2	119-MW-4BR-3	119-MW-4BR-1	119-MW-4BR-1	119-MW-4BR-2	119-MW-4BR-3	119-MW-4BR-1	119-MW-4BR-1	119-MW-4BR-2	119-MW-4BR-2	119-MW-4BR-3	119-MW-4BR-3	124-MW-17BR	124-MW-17BR	124-MW-17BR-1	124-MW-17BR-1	124-MW-17BR-2	124-MW-17BR-2	124-MW-8BR	124-MW-8BR	124-MW-8BR	124-MW-8BR	140-MW-9BR
Filtered		N	N	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	Y	N	Y	N
Parameter		2/17/06	2/17/06	2/17/06	2/17/06	2/17/06	2/17/06	8/8/06	8/8/06	8/8/06	8/8/06	8/8/06	8/8/06	5/4/06	5/4/06	10/13/06	10/13/06	11/27/06	11/27/06	1/5/06	1/5/06	7/31/06	7/31/06	1/4/06
BICARBONATE ALKALINITY	mg/l	123	78						94.2		107		94				5U		115	5U			25.4	5U
CALCIUM	ug/l	2670	2410					6680J	6990J	5000UJ	5000UJ	5000UJ	5000UJ			16100	14400	5000U	5000U	14700		10000	8540	10100
CHLORIDE	mg/l	19.1	30.3						15.4		13.9		26.3				64.6		15.4	103			89.6	21.6
CHROMIUM	ug/l	2.3B	2.3B	1.9B	1.6U	3.2B	3.1B	10U	10U	10U	10U	10U	10U	68.1	1.6U	10U	10.9	10U	10U	15.9	2.8U	59.9	10U	4.1
HEXAVALENT CHROMIUM	ug/l	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	50U	50U	50U	50U	50U	50U	100U	10U	50U	50U	10U	10U	10U	10U	50U	50U	10U
MAGNESIUM	ug/l							5000UJ	5000UJ	5000UJ	5000UJ	5000UJ	5000UJ			5000U	5000U	5000U	5000U	909		5000UJ	5000UJ	409
pH		9.07J	9.44J					9.2		9.25		9.46						9.27		11.11J		12.63		11.5J
POTASSIUM	ug/l	1870B	2020JB					5000U	5000U	5000U	5000U	5000U	5000U			32600	38500	5000U	5000U	61800		89500J	80000J	44700
SODIUM	ug/l	71700	75300					47000	46900	73200	72200	84900	80200			106000	114000	87500	82300	113000		135000	142000	101000
SULFATE	mg/l	30.5	38.3						16.7		28.9		40.5				34.9		35.4	37.6			30.5	17
ALKALINITY, CARBONATE (AS CACO3)	mg/l								96.8		124		111				24.5		8.2				283	
ALUMINUM	ug/l							200U	200U	416	200U	501	226			765	250	200U	200U			1580	502	
ANTIMONY	ug/l							6.0UJ	7.6J	6.6J	15.0J	6.6J	12.5J			6U	6U	6U	6U			6.8JB	12.1	
ARSENIC	ug/l							119	123	211	199	677	656			740	541	668	479			8.0UJ	8.0UJ	
BARIUM	ug/l							200U	200U	200U	200U	200U	200U			200U	200U	200U	200U			200U	200U	
BERYLLIUM	ug/l							1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ			1U	1U	1U	1U			1.0UJ	1.0UJ	
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l							4.0U	4.0U	4.0U	4.0U	4.0U	4.0U			4U	4U	4U	4U			4.0UJ	4.0UJ	
CARBONATE ALKALINITY	mg/l	12.6	33.4						5.0U		16.3		16.1				204		124	74.9			213	59.6
COBALT	ug/l							50U	50U	50U	50U	50U	50U			50U	50U	50U	50U			50U	50U	
COPPER	ug/l							25UJ	25UJ	25UJ	25UJ	25UJ	25UJ			25U	25U	25U	25U			41	25U	
FERROUS IRON	mg/l								0.10U		0.10U		0.10U				0.1U		0.2U				0.10U	
HARDNESS (AS CACO3)	mg/l							23.8		9.9		9.9				53.2		20				35.3		
IRON	ug/l							100U	100U	409	100U	403	133B			698	100U	100U	100U			1750	100U	
Iron, Ferric	mg/l								0.20U		0.20U		0.20U				0.2U		0.3U				0.20U	
LEAD	ug/l							4	3.0U	9	3.7	13.4	5.9			3U	3U	3U	3U			5.2JB	3.0U	
MANGANESE	ug/l	48.1	15.5					15U	15U	19.4	15U	15U	15U			15U	15U	15U	15U			23.6	15U	
MERCURY	ug/l							0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ			0.2U	0.2U	0.2U	0.2U			0.20UJ	0.20UJ	
MOLYBDENUM	ug/l																							
NICKEL	ug/l							40U	40U	40U	40U	40U	40U			40U	40U	40U	40U			40U	40U	
NITRATE	mg/l								0.11U		0.11U		0.11U				0.11U		0.11U				0.11U	
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l								0.010U		0.010U		0.010U				0.01U		0.01U				0.010U	
SELENIUM	ug/l							10U	10U	10U	10U	10U	10U			10U	10U	10U	10U			10U	10U	
SILVER	ug/l							10U	10U	10U	10U	10U	10U			10U	10U	10U	10U			10U	10U	
SPECIFIC CONDUCTANCE	umhos/cm																	269						
SPECIFIC GRAVITY		0.98	0.98					1		1		1						1		1				1
STRONTIUM	ug/l																							
SULFIDE	mg/l	1U	1U						2.0U		2.0U		2.0U				2U		2U	1U			2.0U	1U
SULFITE	mg/l																							
THALLIUM	ug/l							10U	10U	10U	10U	10U	10U			10U	10U	10U	10U			10UJ	10UJ	
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l	258	246					142		204		238				405		223		444		598		418
TOTAL ORGANIC CARBON	mg/l							3.2		6.3		8.2				12.3		12.4				1.0U		
VANADIUM	ug/l							50U	50U	50U	50U	50U	50U			50U	50U	50U	50U			50U	50U	
ZINC	ug/l							20U	20U	20U	20U	31.0JB	20U			64.6	20U	65.7	20U			22.3J	20UJ	

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	140-MW-9BR	140-MW-9BR	140-MW-9BR	140-MW-9BR	140-MW-9BR-1	140-MW-9BR-1	140-MW-9BR-2	140-MW-9BR-2	140-MW-9BR-3	140-MW-9BR-3	KP-MW-6BR-1	KP-MW-6BR-1	KP-MW-6BR-2	KP-MW-6BR-2	SA6-MW-14BR	SA6-MW-14BR	SA6-MW-14BR	SA6-MW-14BR	SA6-MW-14BR	SA6-MW-15BR	SA6-MW-15BR	SA6-MW-15BR	SA6-MW-15BR
Filtered		Y	N	N	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	Y	N	N
Parameter		1/4/06	4/17/06	4/17/06	4/18/06	10/12/06	10/12/06	10/12/06	10/12/06	10/12/06	10/12/06	8/7/06	8/7/06	8/7/06	8/7/06	1/5/06	1/5/06	8/1/06	8/1/06	11/28/06	1/5/06	1/5/06	8/10/06	8/10/06
BICARBONATE ALKALINITY	mg/l						103		110		115		33.1		54.2	200			255	284	89.3			
CALCIUM	ug/l					6240	6130	5000U	5000U	5000U	5000U	106000	104000	97800	104000	106000		141000	141000	136000	584000		611000	600000
CHLORIDE	mg/l						38.8		9.1		9.9		192		112	377			357	319	2890			
CHROMIUM	ug/l	2.8U	1.8	1.6U	1.6U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	3.4	2.8U	10U	10U	26.2	2.8U	2.8U	10U	10U
HEXAVALENT CHROMIUM	ug/l	10U	10U	10U	10U	50U	50U	50U	50U	50U	50U	50U	50U	50U	50U	10U	10U	50U	50U	22	10U	10U	50U	50U
MAGNESIUM	ug/l					5000U	5000U	5000U	5000U	5000U	5000U	18800	19000	27200	29000	41400		51400	51700	43000	218000		224000	218000
pH							9.31		8.96							8.04J		9.37		9.08	8.12J		7.93	7.93
POTASSIUM	ug/l					5050	5000U	5000U	5000U	5000U	5000U	10900	9450	8140	8320	10100		6610J	6600J	32500	11600		11700J	11300J
SODIUM	ug/l					70700	74500	70300	70500	83400	83500	133000	127000	220000	225000	221000		275000J	283000J	286000	569000		609000	594000
SULFATE	mg/l						27.3		33.6		51.9		323J		619J	262			402	419	164			
ALKALINITY, CARBONATE (AS CACO3)	mg/l						122		113		121		37.6		54.8				255	5U				
ALUMINUM	ug/l					799	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ			200UJ	200UJ	200U			200U	200U
ANTIMONY	ug/l					10.8J	12.1J	12.8J	10.8J	11.3J	12.0J	6.0U	6.0U	6.0U	6.0U			6.0UJ	6.0UJ	6U			6.0UJ	6.0UJ
ARSENIC	ug/l					254J	283J	303J	318J	128J	172J	1280	1300	455	445			8.0UJ	8.0UJ	8U			8.0U	8.0U
BARIUM	ug/l					200U	200U	200U	200U	200U	200U	200U	200U	200U	200U			200U	200U	200U			200U	200U
BERYLLIUM	ug/l					1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0UJ	1.0UJ	1.0UJ	1.0UJ			1.0UJ	1.0UJ	1U			1.0UJ	1.0UJ
BICARBONATE ALKALINITY AS CACO3	mg/l																							
BORON	ug/l																							
CADMIUM	ug/l					4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U			4.0U	4.0U	4U			4.0U	4.0U
CARBONATE ALKALINITY	mg/l						18		5.0U		5.4		5.0U		5.0U	5U			5.0U	285	5U			
COBALT	ug/l					50U	50U	50U	50U	50U	50U	50U	50U	50U	50U			50U	50U	50U			50U	50U
COPPER	ug/l					25U	25U	25U	25U	25U	25U	25U	25U	25U	25U			25U	25U	25U			25U	25U
FERROUS IRON	mg/l						0.10U		0.10U		0.10U		0.20U		0.20U				0.10U	0.1U				
HARDNESS (AS CACO3)	mg/l					17.1		7.6		9.5		291		321				533		525			2190	2540
IRON	ug/l					782	100UJ	100UJ	100UJ	100UJ	100UJ	100U	149JB	174JB	261JB			3540	1020	100U			7840J	5480J
Iron, Ferric	mg/l						0.20U		0.20U		0.20U		0.30U		0.30U				1	0.2U				
LEAD	ug/l					3.9B	3.0U	3.0U	3.0U	3.0U	3.6B	3.0UJ	3.0UJ	3.0UJ	3.0UJ			3.0U	3.0U	3U			3.0UJ	3.0UJ
MANGANESE	ug/l					17.6	15U	15U	15U	15U	15U	150	167	95	97.7			725	709	348			1040	1010
MERCURY	ug/l					0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20UJ	0.20UJ	0.20UJ	0.20UJ			0.20UJ	0.20UJ	0.2U			0.20U	0.20U
MOLYBDENUM	ug/l																							
NICKEL	ug/l					40U	40U	40U	40U	40U	40U	40U	40U	40U	40U			40U	40U	40U			40U	40U
NITRATE	mg/l						0.11U		0.11U		0.11U		0.11U		0.11U				0.11U	0.11U				
NITRATE AS NITROUS OXIDE	mg/l																							
NITRITE	mg/l						0.010U		0.010U		0.010U		0.010U		0.010U				0.010U	0.01U				
SELENIUM	ug/l					10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10U	10U	10U	10U			10U	10U	10U			10U	10U
SILVER	ug/l					10U	10U	10U	10U	10U	10U	10U	10U	10U	10U			10UJ	10UJ	10U			10UJ	10UJ
SPECIFIC CONDUCTANCE	umhos/cm																			1630				
SPECIFIC GRAVITY												1		1		1				1	1		1	1
STRONTIUM	ug/l																							
SULFIDE	mg/l						2.0U		2.0U		2.0U		2.0U		2.0U	1U			2.0U	2U	1U			
SULFITE	mg/l																							
THALLIUM	ug/l					10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10U	10U	10U	10U			10UJ	10UJ	10U			10UJ	10UJ
TIN	ug/l																							
TITANIUM	ug/l																							
TOTAL ALKALINITY	mg/l																							
TOTAL DISSOLVED SOLIDS	mg/l					227		193		202		881		1040		1020		1450		1260	5150		5480	5440
TOTAL ORGANIC CARBON	mg/l					6		4.2		2		25.2		12.1				1.0U		1.8			1.0U	1.0U
VANADIUM	ug/l					50U	50U	50U	50U	50U	50U	50U	50U	50U	50U			50U	50U	50U			50U	50U
ZINC	ug/l					35.4	20U	49.2	21.3	20U	20U	20U	20U	20U	20U			23.7	20U	20U			20U	20U

Table A-4
Bedrock Groundwater
Analytical Data

Location ID	Unit	SA6-MW-15BR	SA6-MW-15BR	SA6-MW-5BR	SA6-MW-5BR	SA6-MW-5BR	SA6-MW-5BR-1	SA6-MW-5BR-2	SA6-MW-5BR-3	SA6-MW-5BR-4	SA6-MW-5BR-5	SA6-MW-5BR-1	SA6-MW-5BR-1	SA6-MW-5BR-2	SA6-MW-5BR-2	SA6-MW-5BR-3	SA6-MW-5BR-3	SA6-MW-5BR-4	SA6-MW-5BR-4	SA6-MW-5BR-5	SA6-MW-5BR-5
Filtered		Y	Y	N	N	N	N	N	N	N	N	N	Y	N	Y	N	Y	N	Y	N	Y
Parameter		8/10/06	8/10/06	7/29/04	7/29/04	7/29/04	5/17/05	5/17/05	5/17/05	5/17/05	5/17/05	10/6/06	10/6/06	10/6/06	10/6/06	10/6/06	10/6/06	10/6/06	10/6/06	10/6/06	10/6/06
BICARBONATE ALKALINITY	mg/l	102	101				221	107	114	107	115		170		110		109		114		117
CALCIUM	ug/l	624000	594000				393000	146000	27600	51900	26900	475000	459000	207000	203000	19300	19400	17700	17100	9140	8390
CHLORIDE	mg/l	2480	2460				1700	390	64	170	91		1850		628		32.2		44.8		8.9
CHROMIUM	ug/l	10U	10U	162	643	196	4570	3.3	1.6U	3.7	2.4	1010	1650	10U	10U	10U	10U	10U	10U	10U	10U
HEXAVALENT CHROMIUM	ug/l	50U	50U	155	409	111	4280	10U	10U	10U	10U	1200	1400	50U	50U	50U	50U	50U	50U	50U	50U
MAGNESIUM	ug/l	229000	219000				148000	50300	9130	18500	7850	169000	159000	72500	71500	6580	6490	5930	5750	5000U	5000U
pH																					
POTASSIUM	ug/l	12000J	11600J				9990	2770JB	1760JB	2800JB	1780JB	12300J	12700J	5000UJ	5000UJ	5000UJ	5000UJ	5000UJ	5000UJ	5000UJ	5000UJ
SODIUM	ug/l	591000	586000				483000	48600	34300	59000	60300	414000	446000	60500	60300	37300	36200	55200	57300	53900	53400
SULFATE	mg/l	192	187				266	15.5	14.9	28	29.2		190		26.4		18.5		24.8		23.9
ALKALINITY, CARBONATE (AS CACO3)	mg/l	102	101										170		111		111		116		120
ALUMINUM	ug/l	200U	200U									200UJ	200U	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ	200UJ
ANTIMONY	ug/l	6.0UJ	6.0UJ									6.0U	6.0U	6.0U	6.0U	6.0U	6.0U	6.0U	15.2	6.0U	6.0U
ARSENIC	ug/l	8.0U	8.0U									12	9.1	8.0U	8.0U	11.5	13.2	45.6	48.7	23.3	21.1
BARIUM	ug/l	200U	200U									355	280	636	640	200U	200U	200U	200U	200U	200U
BERYLLIUM	ug/l	1.0UJ	1.0UJ									1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ	1.0UJ
BICARBONATE ALKALINITY AS CACO3	mg/l																				
BORON	ug/l																				
CADMIUM	ug/l	4.0U	4.0U									4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U
CARBONATE ALKALINITY	mg/l	5.0U	5.0U				5U	5U	5U	5U	5U		5.0U		5.0U		5.0U		5.0U		5.0U
COBALT	ug/l	50U	50U									50U	50U	50U	50U	50U	50U	50U	50U	50U	50U
COPPER	ug/l	25U	25U									25U	25U	25U	25U	25U	25U	25U	25U	25U	25U
FERROUS IRON	mg/l	0.10U	0.10U										0.10U		0.10U		0.10U		0.10U		0.10U
HARDNESS (AS CACO3)	mg/l											1730		774		76.4		72.5		29.4	
IRON	ug/l	1850J	1690J									146J	149J	244	242	138J	151J	100UJ	100UJ	100UJ	100UJ
Iron, Ferric	mg/l	1.9	1.7										0.20U		0.24		0.20U		0.20U		0.20U
LEAD	ug/l	3.0UJ	3.0UJ									3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ
MANGANESE	ug/l	1110	1050									592	535	596	587	97.8	96.7	198	204	15U	15U
MERCURY	ug/l	0.20U	0.20U									0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ	0.20UJ
MOLYBDENUM	ug/l																				
NICKEL	ug/l	40U	40U									40U	40U	40U	40U	40U	40U	40U	40U	40U	40U
NITRATE	mg/l	0.11U	0.11U										0.11U		0.11U		0.11U		0.11U		0.11U
NITRATE AS NITROUS OXIDE	mg/l																				
NITRITE	mg/l	0.010U	0.010U										0.010U		0.010U		0.010U		0.010U		0.010U
SELENIUM	ug/l	10U	10U									10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ
SILVER	ug/l	10UJ	10UJ									10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
SPECIFIC CONDUCTANCE	umhos/cm																				
SPECIFIC GRAVITY							1	1	1	1	1										
STRONTIUM	ug/l																				
SULFIDE	mg/l	2.0U	2.0U										2.0U		2.0U		2.0U		2.0U		2.0U
SULFITE	mg/l																				
THALLIUM	ug/l	10UJ	10UJ									10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
TIN	ug/l																				
TITANIUM	ug/l																				
TOTAL ALKALINITY	mg/l																				
TOTAL DISSOLVED SOLIDS	mg/l						4300	1360	222	518	312	3740		1210		174		207		174	
TOTAL ORGANIC CARBON	mg/l											2.4		1.3		2.1		3.7		1.9	
VANADIUM	ug/l	50U	50U									50U	50U	50U	50U	50U	50U	50U	50U	50U	50U
ZINC	ug/l	20U	20U									20U	20U	20U	20U	20U	20U	20U	20U	20U	20U

Table A-5
Deep River Boring Sample Results
HONEYWELL Study Area 7

Easting	Northing	Approximate Water Depth (ft) (MLW)	Depth to Top of Bedrock from Sediment Surface (ft)	Total Boring Depth (ft)	Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Hex. Cr. Unfiltered (mg/L)	Hex. Cr Filtered (mg/L)	Total Cr Unfiltered (ug/L)	Total Cr Filtered (ug/L)	Conductivity (umhos/cm)	pH (S.U.)	TDS (mg/L)	Filtered Conductivity (umhos/cm)	Filtered pH (S.U.)	Filtered TDS (mg/L)
74 06 24.829	40 42 53.714	20	103	123	**DRB-001**	11/08/05	5 - 7	ND	NA	146	NA	21100	6.78	15000	NA	NA	NA
						11/08/05	10 - 12	ND	NA	173	NA	21100	6.72	14400	NA	NA	NA
						11/08/05	15 - 17	ND	NA	58.3	NA	18600	6.62	11900	NA	NA	NA
						11/08/05	20 - 22	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/08/05	25 - 27	ND	NA	52.6	NA	15900	7.58	11000	NA	NA	NA
						11/09/05	30 - 32	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/09/05	35 - 37	ND	NA	44.8	NA	7840	7.82	4310	NA	NA	NA
						11/09/05	40 - 42	ND	NA	519	NA	7240	8.13	4270	NA	NA	NA
						11/09/05	45 - 47	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/09/05	50 - 52	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/10/05	55 - 57	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/10/05	60 - 62	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/10/05	65 - 67	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/10/05	70 - 72	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/10/05	75 - 77	ND	NA	20.7	NA	2920	8.08	1730	NA	NA	NA
						11/11/05	80 - 82	ND	NA	31.1	NA	2180	8.16	1420	NA	NA	NA
						11/11/05	85 - 87	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/11/05	95 - 97	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/12/05	103 - 123	ND	ND	136	ND	3200	8.1	1880	3070	8.1	1770
						11/12/05	103 - 123 dup	ND	ND	127	ND	3180	8.14	1790	3160	8.13	1750
74 06 35.564	40 42 56.652	14	98	118	**DRB-002**	11/14/05	5 - 7	ND	NA	22.8	NA	21900	7.39	13900	NA	NA	NA
						11/14/05	15 - 17	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/15/05	25 - 27	ND	NA	1230	NA	15400	7.55	9910	NA	NA	NA
						11/16/05	35 - 37	ND	NA	1060	NA	15400	7.78	10800	NA	NA	NA
						11/16/05	45 - 47	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/16/05	55 - 57	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/17/05	65 - 67	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/17/05	75 - 77	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/17/05	85 - 87	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/18/05	98 - 118	ND	ND	91.8	ND	2050	8.29	1150	2070	8.31	1150
						11/18/05	98 - 118 dup	ND	ND	79.5	ND	2100	8.29	1150	2110	8.32	1120

Table A-5
Deep River Boring Sample Results
HONEYWELL Study Area 7

Easting	Northing	Approximate Water Depth (ft) (MLW)	Depth to Top of Bedrock from Sediment Surface (ft)	Total Boring Depth (ft)	Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Hex. Cr. Unfiltered (mg/L)	Hex. Cr Filtered (mg/L)	Total Cr Unfiltered (ug/L)	Total Cr Filtered (ug/L)	Conductivity (umhos/cm)	pH (S.U.)	TDS (mg/L)	Filtered Conductivity (umhos/cm)	Filtered pH (S.U.)	Filtered TDS (mg/L)
					DRB-003	Boring not completed											
					DRB-004	Boring not completed											
					DRB-005	Boring not completed											
					DRB-006	Boring not completed											
74 06 19.000	40 42 57.992	16	101	121	**DRB-007**	11/19/05	10 - 12	ND	NA	22.3	NA	14900	7.34	9320	NA	NA	NA
						11/19/05	20 - 22	ND	NA	33.7	NA	12000	7.49	7290	NA	NA	NA
						11/21/05	30 - 32	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/21/05	40 - 42	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/21/05	50 - 52	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/21/05	60 - 62	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/22/05	70 - 72	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/28/05	80 - 82	ND	NA	NS	NA	NS	NS	NS	NA	NA	NA
						11/28/05	90 - 92	NS	NS	NS	NS	NS	NS	NS	NA	NA	NA
						11/28/05	101- 121	ND	ND	33.1	ND	2140	7.98	1180	2210	7.72	1160
						11/28/05	101 - 121 dup	ND	ND	28.5	ND	2180	7.99	1140	2190	7.99	1240
74 06 20.043	40 42 55.130	10	109	129	**DRB-008**	12/01/05	109 - 129	ND	ND	849	ND	16700	9.26	11300	17300	9.57	11100
						12/01/05	109 - 129	ND	ND	30.7	ND	31000	1.39	12000	17800	8.45	11500
						12/01/05	109 - 129	6.28	5.79	6740	6450	2910	8.21	1650	2960	8.17	1730
						12/01/05	109 - 129 dup	5.9	5.85	6590	6450	2890	8.17	1670	2940	8.19	1770
74 06 25.189	40 42 53.851	22	103	123	**DRB-009**	12/05/05	103 - 123	ND	ND	182	ND	3150	9.62	1670	3040	10	1590
						12/06/05	103 - 123	ND	ND	103	21.8	1740	9.96	858	1770	10.2	896
74 06 21.892	40 42 56.030	18	104	124	**DRB-010**	12/08/05	104 - 124	ND	ND	418	ND	12600	9.33	7780	12600	9.22	7750
						12/09/05	104 - 124	ND	ND	ND	ND	857	8.44	478	1230	8.57	531
						12/09/05	104 - 124 dup	ND	ND	ND	ND	911	8.63	499	1260	8.57	706
74 06 15.465	40 43 00.025	16	102	122	**DRB-011**	12/10/05	102 - 122	ND	ND	199	ND	2080	8.73	1100	1830	8.06	986
						12/10/05	102 - 122	ND	ND	112	ND	1000	8.17	529	997	8.06	521
						12/10/05	102 - 122	ND	ND	ND	ND	1570	7.97	841	1570	7.99	810
						12/10/05	102 - 122 dup	ND	ND	ND	ND	1580	8.02	821	1580	8.02	824
74 06 29.188	40 42 50.663	20	108	128	**DRB-012**	12/15/05	108 - 128	0.0126	0.0154	25.9	16.8	11300	9.8	6880	11500	9.82	6960
						12/15/05	108 - 128 dup	0.014	0.0138	25.3	17.3	11400	9.86	6810	11400	9.82	6900

Table A-5
Deep River Boring Sample Results
HONEYWELL Study Area 7

Easting	Northing	Approximate Water Depth (ft) (MLW)	Depth to Top of Bedrock from Sediment Surface (ft)	Total Boring Depth (ft)	**Station**	Date Sampled	Sample Depth from Sediment Surface (ft)	Hex. Cr. Unfiltered (mg/L)	Hex. Cr Filtered (mg/L)	Total Cr Unfiltered (ug/L)	Total Cr Filtered (ug/L)	Conductivity (umhos/cm)	pH (S.U.)	TDS (mg/L)	Filtered Conductivity (umhos/cm)	Filtered pH (S.U.)	Filtered TDS (mg/L)
74 06 20.878	40 42 56.502	12	114	194	**DRB-013**	12/21/05	114 - 154	ND	ND	156	ND	322	8.42	324	323	8.47	192
						12/21/05	114 - 194	ND	ND	83.5	ND	735	8.24	453	730	8.3	399
						12/21/05	114 - 194 dup	ND	ND	69.8	ND	1080	8.28	645	741	8.28	400
74 06' 26.714	40 42' 46.685	8	116	322	**DRB-014**	5/17/06	297-272	ND	ND	13.2	ND	10300	8.44	6080	NA	NA	NA
						5/17/06	322 - 297	No Yield									
						5/18/06	197-172	ND	ND	38.8	ND	4290	8.18	2980	NA	NA	NA
						5/18/06	222-197	ND	ND	18.5	ND	6660	8.26	4400	NA	NA	NA
						5/18/06	247-222	ND	ND	36.8	ND	13000	8.03	8550	NA	NA	NA
						5/18/06	272-247	ND	ND	89	ND	8050	8.25	5330	NA	NA	NA
						5/19/06	147-122	12.5		11800	11900	12200	8.02	7280	NA	NA	NA
						5/19/06	172 - 147	ND		39.3	ND	1800	8.27	975	NA	NA	NA
74 06' 28.2276	40 42' 47.8152	13	114	314	**DRB-015**	4/19/06	139-114	0.66	0.71	705	644	12700	8.92	7050	NA	NA	NA
						4/25/06	314-289	ND	ND	ND	ND	15800	8.12	10100	NA	NA	NA
						4/26/06	289-264	ND	ND	ND	ND	6640	7.79	3560	NA	NA	NA
						4/27/06	239-214	ND	ND	10	ND	9830	7.56	5210	NA	NA	NA
						4/27/06	264-239	ND	ND	ND	ND	7200	7.68	4270	NA	NA	NA
						4/28/06	139-114										
						4/28/06	164-139	No Yield									
						4/28/06	189-164	ND	ND	ND	ND	12500	7.52	6750	NA	NA	NA
						4/28/06	214-189	ND	ND	ND	ND	16500	7.2	7350	NA	NA	NA
74 06' 30.1644	40 42' 49.1076	14	115	315	**DRB-016**	5/5/06	140-115	ND	ND	86.5	ND	15400	7.42	10300	NA	NA	NA
						5/8/06	265-240	ND	ND	ND	ND	4970	7.81	2430	NA	NA	NA
						5/8/06	290-265	ND	ND	ND	ND	4610	7.63	2280	NA	NA	NA
						5/8/06	315-290	ND	ND	ND	ND	5110	7.85	2690	NA	NA	NA
						5/8/06	315-290 dup	ND	ND	ND	ND	5420	7.87	2880	NA	NA	NA
						5/9/06	165-140	ND		75.5							
						5/9/06	190-165	No Yield									
						5/9/06	215-190	ND		ND		10800	7.85	5450	NA	NA	NA
						5/9/06	240-215	ND		ND		5020	7.75	2930	NA	NA	NA

Table A-5
Deep River Boring Sample Results
HONEYWELL Study Area 7

Easting	Northing	Approximate Water Depth (ft) (MLW)	Depth to Top of Bedrock from Sediment Surface (ft)	Total Boring Depth (ft)	**Station**	Date Sampled	Sample Depth from Sediment Surface (ft)	Hex. Cr. Unfiltered (mg/L)	Hex. Cr Filtered (mg/L)	Total Cr Unfiltered (ug/L)	Total Cr Filtered (ug/L)	Conductivity (umhos/cm)	pH (S.U.)	TDS (mg/L)	Filtered Conductivity (umhos/cm)	Filtered pH (S.U.)	Filtered TDS (mg/L)
74 06' 35.299	40 42' 40.286	9	114	264	**DRB-017**	5/22/06	139-114	0.05	0.053	69	55.6	10800	7.84	6400	NA	NA	NA
						5/24/06	189-164	ND	ND	ND	ND	2620	7.88	1480	NA	NA	NA
						5/24/06	214-189	ND	ND	ND	ND	5580	7.57	3390	NA	NA	NA
						5/24/06	214-189 dup	ND	ND	ND	ND	5830	7.57	3440	NA	NA	NA
						5/24/06	239-214	No Yield									
						5/24/06	264-239	No Yield									
						5/25/06	139-114	ND		10.8	ND	10700	7.67	6740	NA	NA	NA
						5/25/06	164-139	ND		ND	ND	2830	7.6	1630	NA	NA	NA
74 06' 34.06	40 42' 39.09	8	113	173	**DRB-018**	6/2/06	173-148	ND	ND	ND	ND	2210	7.56	1240	NA	NA	NA
						6/2/06	148-123	No Yield									
						6/2/06	133-113	ND	ND	45.9	ND	13700	7.76	7220	NA	NA	NA
74 06' 36.300	40 42' 41.610	9	111	196	**DRB-019**	6/5/06	131-111	ND	ND	57.5	ND	6090	7.67	3520	NA	NA	NA
						6/6/06	111-171	No Yield									
						6/8/06	196 - 171	No Yield									
74 06' 36.84	40 42' 43.012	9	106	166	**DRB-020**	6/13/06	106-126	No Yield									
						6/14/06	141-116	ND	ND	169 J	ND	5960	7.68	3460	NA	NA	NA
						6/14/06	166 - 141 dup	ND	ND	15.6 J	ND	3920	7.65	2020	NA	NA	NA
						6/14/06	166 - 141	ND	ND	13.3 J	ND	3770	7.67	2170	NA	NA	NA
74 06' 32.795	40 42' 37.927	11	119	178	**DRB-021**	6/16/06	139-119	1.5	1.5	1390	1360	12700	7.31	7350	NA	NA	NA
						6/17/06	153-128	1.4	1.5	1570 J	1380	10900	7.75	6360	NA	NA	NA
						6/17/06	178-153	ND	ND	16.9 J	ND	1180	7.88	673	NA	NA	NA
74 06' 38.45	40 42' 44.43		107		**DRB-022**			Boring Not Completed									
74 06' 31.626	40 42' 35.922	9	123	163	**DRB-023**	6/28/06	123-143	No Yield									
						6/29/06	163-123	1.7	1.5	1560	1490	2890	7.94	1600	NA	NA	NA

Table A-5
Deep River Boring Sample Results
HONEYWELL Study Area 7

Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Alkalinity, Carbonate (as CACO3) (mg/l)	Calcium (ug/l)	Chloride Filtered (mg/l)	Magnesium (ug/l)	Potassium (ug/l)	Sodium (ug/l)	Sulfate (mg/l)
DRB-013	12/21/05	114 - 154							
	12/21/05	114 - 194							
	12/21/05	114 - 194 dup							
DRB-014	5/17/06	297-272	81.2	275000	3580J	179000	76700J	1790000	558
	5/17/06	322 - 297							
	5/18/06	197-172	93.9	122000	1310	60400	25300J	410000	208
	5/18/06	222-197	84	153000	2060	114000	46100J	106000	329
	5/18/06	247-222	66.3	291000	4170	223000	94000J	2030000	582
	5/18/06	272-247	81.8	175000	2720	133000	59500J	1450000	418
	5/19/06	147-122	66.3	414000	3470	208000	72400J	1790000	604
	5/19/06	172 - 147	102	73200	412	18800	5770J	221000	75.4
DRB-015	4/19/06	139-114		332000	4710	231000	98000	2040000	642
	4/25/06	314-289	112	470000	5390	273000	116000	2830000	796
	4/26/06	289-264	120	130000	2060	92900J	47300J	1210000	322J
	4/27/06	239-214	116	220000	3200	177000	67500	1720000	474
	4/27/06	264-239	135	96400	2180	119000	53100J	1160000	323
	4/28/06	139-114	60.4	632000	4330	146000	82400J	1990000	657
	4/28/06	164-139							
	4/28/06	189-164	125	323000	4000	211000	88000J	1940000	605
	4/28/06	214-189	123	293000	5360	278000	145000J	2710000	788
DRB-016	5/5/06	140-115	168	285000	5220	305000	116000J	2600000	630
	5/8/06	265-240	129	84100	1480	83100	35900J	879000	304
	5/8/06	290-265	127	70300	1250	71400	28900J	721000	268
	5/8/06	315-290							
	5/8/06	315-290 dup	127	71300	1440	76400	33100J	784000	269
	5/9/06	165-140	101						
	5/9/06	190-165	128	78100	1510	88200	38000J	883000	279
	5/9/06	215-190	74	190000	3450	197000	87700J	1920000	547
	5/9/06	240-215	109	141000	1320	71700	24500J	748000	249

Table A-5
Deep River Boring Sample Results
HONEYWELL Study Area 7

Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Alkalinity, Carbonate (as CACO3) (mg/l)	Calcium (ug/l)	Chloride Filtered (mg/l)	Magnesium (ug/l)	Potassium (ug/l)	Sodium (ug/l)	Sulfate (mg/l)
DRB-017	5/22/06	139-114	58	325000	3280	186000	62300J	1590000	468
	5/24/06	189-164	129	65200	698	37700	15500J	393000	200J
	5/24/06	214-189	129	133000	1810	97200	37200J	951000	304J
	5/24/06	214-189 dup	124	129000	1820	95200	37300J	940000	309J
	5/24/06	239-214							
	5/24/06	264-239							
	5/25/06	139-114	77.4	314000	3320	185000	59400J	1610000J	521J
	5/25/06	164-139	131	50800	738	46000	18600J	439000J	224J
DRB-018	6/2/06	173-148	127	40700	518	28400	11300	312000	105
	6/2/06	148-123							
	6/2/06	133-113	68	407000	4740	287000	91700J	2470000	709
DRB-019	6/5/06	131-111	50.3	171000	1980	108000	38100	624000	305
	6/6/06	111-171							
	6/8/06	196 - 171							
DRB-020	6/13/06	106-126							
	6/14/06	141-116	107	136000	2000	112000	45500	1020000	368
	6/14/06	166 - 141 dup	129	54400	704	36700	14200	351000	276
	6/14/06	166 - 141	134	56800	435	43500	16400	399000	244
DRB-021	6/16/06	139-119	68	344000	4280	247000	78200J	2080000	614
	6/17/06	153-128	62.4	315000	3620	202000	66400	1740000	491
	6/17/06	178-153	114	26700	255	15600	6520	170000	70.9
DRB-022									
DRB-023	6/28/06	123-143							
	6/29/06	163-123	82.9	95600	794	41000	14700J	380000J	146

Table A-5
Deep River Boring Sample Results
Honeywell Study Area 7

Easting	Northing	Approximate Water Depth (ft) (MLW)	Depth to Top of Bedrock from Sediment Surface (ft)	Total Boring Depth (ft)	Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Hex. Cr. Unfiltered (mg/L)	Hex. Cr Filtered (mg/L)	Total Cr Unfiltered (ug/L)	Total Cr Filtered (ug/L)	Conductivity (umhos/cm)	pH (S.U.)	TDS (mg/L)	Filtered Conductivity (umhos/cm)	Filtered pH (S.U.)	Filtered TDS (mg/L)
74 6' 2.38	40 43' 9.07	5	123	222	**DRB-024**	10/9/06	222-197	ND	ND	20.3	ND	15400	7.6	11900	NA	NA	NA
						10/9/06	222-197	ND	ND	17.4	ND	15400	7.6	11400	NA	NA	NA
						10/9/06	197-172	No Yield									
						10/10/06	172-147	No Yield									
						10/10/06	147-122	6.7	6.5	5910	5.91	24500	7.55	14000	NA	NA	NA
74 06' 4.21	40 43' 17.05	28	77	127	**DRB-025**	10/17/06	127 - 102	ND	ND	ND	ND	5890	7.44	3070	NA	NA	NA
						10/17/06	102 - 77	ND	0.017	12.6	ND	11300	6.96	4660	NA	NA	NA
74 05' 58.13	40 43' 18.00	14	108	164	**DRB-026**	10/27/06	164 - 139	ND	ND	48.3	ND	5540	7.95	2630	NA	NA	NA
						10/27/06	139 - 114	ND	ND	16.6	ND	15300	8.6	7910	NA	NA	NA
74 06' 9.55	40 43' 5.19	24	122	174	**DRB-027**	11/6/06	174 - 149	2.5	2.5	2190	2470	12900	9.38	6880	NA	NA	NA
74 6' 10.06	40 43' 14.08	40	73	123	**DRB-028**	11/30/06	123 - 98	No Yield									
						11/30/06	98 -73	0.18	0.19	204	185			3630	NA	NA	NA
74 6' 15.04	40 43' 8.02	34	86	136	**DRB-029**	12/4/06	136 - 111	No Yield									
						12/4/06	111- 86	ND	ND	1230	ND				NA	NA	NA

NA - Not Analyzed
NS - No Sample
ND - Not Detected

Table A-5
Deep River Boring Sample Results
Honeywell Study Area 7

Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Alkalinity, Carbonate (as CACO3) (mg/l)	Calcium (ug/l)	Calcium Filtered (ug/l)	Chloride Filtered (mg/l)	Magnesium (ug/l)	Magnesium Filtered (ug/l)	Potassium (ug/l)	Potassium Filtered (ug/l)	Sodium (ug/l)	Sodium Filtered (ug/l)	Sulfate (mg/l)	Aluminum (ug/l)	Aluminum Filtered (ug/l)	Antimony (ug/l)	Antimony Filtered (ug/l)	Arsenic (ug/l)
DRB-024	10/9/06	222-197	72.6	530000	493000	4800	296000	261000	121000J	101000J	2710000J	2280000J	862	200U	200U	6.0U	6.0U	11.1J
	10/9/06	222-197	71	505000	487000	4890	280000	244000	110000J	89300J	2390000J	2180000J	912	200U	200U	6.0U	6.0U	11.9J
	10/9/06	197-172																
	10/10/06	172-147																
	10/10/06	147-122	92.5	405000	401000	7130	427000	415000	167000J	161000J	3250000	3120000	1130	741J	200U	6.0UJ	6.0UJ	8.0U
DRB-025	10/17/06	127 - 102	90.8	100000	100000	1700	107000	103000	40900	37200	624000	626000	251J	790	200U	6.0UJ	6.0UJ	8.0U
	10/17/06	102 - 77	83.3	92400	96200	2580	157000	165000	63400	69300	1330000	1310000	363J	1460	200U	6.0UJ	6.0UJ	8.0U
DRB-026	10/27/06	164 - 139	102	137000J	133000J	1570	111000J	115000J	37700	34200	681000	752000	223	30400	200U	7.3JB	6.8JB	8.0UJ
	10/27/06	139 - 114	86.5	267000J	314000J	4650	274000J	319000J	107000	126000	2120000	2140000	772	5260	200U	6.0UJ	6.0UJ	8.0UJ
DRB-027	11/6/06	174 - 149																
DRB-028	11/30/06	123 - 98																
	11/30/06	98 -73	45.2	415000	416000	3820	188000	195000	80200J	81800J	1530000	1660000	497	25600	200U	6.0UJ	6.0UJ	13.5
DRB-029	12/4/06	136 - 111																
	12/4/06	111- 86	90.3	1190000	121000	2270	534000	125000	210000	53900	1310000	1210000	314	552000	200U	30U	6.0U	172

Table A-5
Deep River Boring Sample Results
Honeywell Study Area 7

Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Arsenic Filtered (ug/l)	Barium (ug/l)	Barium Filtered (ug/l)	Beryllium (ug/l)	Beryllium Filtered (ug/l)	Bicarbonate Alkalinity Filtered (mg/l)	Cadmium (ug/l)	Cadmium Filtered (ug/l)	CARBONATE ALKALINITY (Filtered)	Cobalt (ug/l)	Cobalt Filtered (ug/l)	Copper (ug/l)	Copper Filtered (ug/l)	Ferrous Iron Filtered (mg/l)	Hardness (CACO3) (mg/l)	Iron (ug/l)
DRB-024	10/9/06	222-197	8.0UJ	327	306	1.0UJ	1.0UJ	72.2	4.0U	4.0U	5.0U	50U	50U	25U	25U	0.20U	2470	3670J
	10/9/06	222-197	8.0UJ	315	292	1.0UJ	1.0UJ	71	4.0U	4.0U	5.0U	50U	50U	25U	25U	0.20U	2530	3580J
	10/9/06	197-172																
	10/10/06	172-147																
	10/10/06	147-122	8.0U	200U	200U	1.0U	1.0U	92	4.0U	4.0U	5.0U	50U	50U	25U	25U	0.10U	2990	2560
DRB-025	10/17/06	127 - 102	8.0U	202	200U	1.0U	1.0U	90.6	4.0U	4.0U	5.0U	50U	50U	25U	25U	0.10U	648	4170
	10/17/06	102 - 77	8.0U	200U	200U	1.0U	1.0U	83.2	4.0U	4.0U	5.0U	50U	50U	57.1	25U	0.10U	903	8420
DRB-026	10/27/06	164 - 139	8.0UJ	485J	338J	3.5J	1.0UJ	102	4.0UJ	4.0UJ	5.0U	50UJ	50UJ	168J	25UJ	0.10U	760	39300J
	10/27/06	139 - 114	8.0UJ	244J	227J	1.0UJ	1.0UJ	85.7	4.0UJ	4.0UJ	5.0U	50UJ	50UJ	37.5J	25UJ	0.10U	1520	13800J
DRB-027	11/6/06	174 - 149																
DRB-028	11/30/06	123 - 98																
	11/30/06	98 -73	8.0U	415	202	2.2	1.0U	44.3	4.0U	4.0U	5.0U	50U	50U	307	25U	0.20U	2040	37600
DRB-029	12/4/06	136 - 111																
	12/4/06	111- 86	8.0U	5740	301	40.7	1.0U	90	20U	4.0U	5.0U	517	50U	6480	25U	0.10U	1850	1130000

Table A-5
Deep River Boring Sample Results
Honeywell Study Area 7

Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Iron Filtered (ug/l)	Iron, Ferric Filtered	Lead (ug/l)	Lead Filtered (ug/l)	Manganese (ug/l)	Manganese Filtered (ug/l)	Mercury (ug/l)	Mercury Filtered (ug/l)	Nickel (ug/l)	Nickel Filtered (ug/l)	Nitrate Filtered (mg/l)	Nitrite Filtered (mg/l)	Nitrogen, Nitrate-Nitrite Filtered (mg/l)	Salinity	Selenium (ug/l)	Selenium Filtered (ug/l)
DRB-024	10/9/06	222-197	649J	0.65	3.0U	3.0U	433	398	0.20U	0.20U	40U	40U	0.34	0.043	0.38	9.4	10UJ	10UJ
	10/9/06	222-197	688J	0.69	3.0U	3.0U	422	389	0.20U	0.20U	40U	40U	0.29	0.037	0.33	9.4	10UJ	10UJ
	10/9/06	197-172																
	10/10/06	172-147																
	10/10/06	147-122	358	0.36	3.0U	3.0U	675	639	0.20U	0.20U	40U	40U	0.44	0.065	0.5	0.5	10U	10U
DRB-025	10/17/06	127 - 102	1150	1.2	3.0U	3.0U	118	98.6	0.20U	0.20U	40U	40U	0.2	0.026	0.23	3.4	10U	10U
	10/17/06	102 - 77	3610	3.6	3.0U	3.0U	298	275	0.20U	0.20U	40U	40U	0.32	0.051	0.37	6.7	10U	10U
DRB-026	10/27/06	164 - 139	242J	0.24	17.5J	3.1J	932J	93.3J	0.20U	0.20U	56.5J	40UJ	0.21	0.029	0.24	3.1	10UJ	10UJ
	10/27/06	139 - 114	169J	0.20U	3.0UJ	3.0UJ	296J	234J	0.20U	0.20U	40UJ	40UJ	0.71	0.074	0.78	9.3	10UJ	10UJ
DRB-027	11/6/06	174 - 149																
DRB-028	11/30/06	123 - 98																
	11/30/06	98 -73	207	0.30U	12.2	5.7JB	1560	286	0.20U	0.20U	54.7	40U	1.5	0.024	1.5J	7.8	10UJ	10UJ
DRB-029	12/4/06	136 - 111																
	12/4/06	111- 86	199	0.2	392	3.0U	29600	670	0.20U	0.20U	1360	40U	0.58	0.074	0.65		50U	10UJ

Table A-5
Deep River Boring Sample Results
Honeywell Study Area 7

Station	Date Sampled	Sample Depth from Sediment Surface (ft)	Silver (ug/l)	Silver Filtered (ug/l)	Sulfide (mg/l)	Thallium (ug/l)	Thallium Filtered (ug/l)	Total Organic Carbon	Vanadium (ug/l)	Vanadium Filtered (ug/l)	Zinc (ug/l)	Zinc Filtered (ug/l)
DRB-024	10/9/06	222-197	10U	10U	2.0U	10UJ	10UJ	1.5	50U	50U	20U	20U
	10/9/06	222-197	10U	10U	2.0U	10UJ	10UJ	1.2	50U	50U	20U	20U
	10/9/06	197-172										
	10/10/06	172-147										
	10/10/06	147-122	10U	10U	2.0U	10UJ	10UJ	1.9	50U	50U	20UJ	20UJ
DRB-025	10/17/06	127 - 102	10U	10U	2.0U	10UJ	10UJ	1.4	50U	50U	20U	20U
	10/17/06	102 - 77	10U	10U	2.0U	10UJ	10UJ	1.6	50U	50U	29.9	20U
DRB-026	10/27/06	164 - 139	10U	10U	2.0U	10UJ	10UJ	1.0U	78.6J	50UJ	91.3J	20UJ
	10/27/06	139 - 114	10U	10U	2.0U	10UJ	10UJ	1.9	50UJ	50UJ	28.8J	20UJ
DRB-027	11/6/06	174 - 149										
DRB-028	11/30/06	123 - 98										
	11/30/06	98 -73	10U	10U	2.0U	10UJ	10UJ	5.0U	62.7	50U	94.1	20U
DRB-029	12/4/06	136 - 111										
	12/4/06	111- 86	50U	10U	2.0U	50U	10U	10U	1200	50U	2900	20U

Table A-6a
GeoProbe Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date	Filtered	Sample Depth Below Top of Mud (ft.)	Riverbed Sediment Thickness (ft.)	Water Depth @ Time of Sampling(ft.)	Cr(VI) (mg/L)	Cr (total) (mg/L)	Conductivity (umhos/cm)	TDS (mg/L)	pH
PW-001-050	687219	603494	PW001-050-110115-1	11/16/04	N	11 - 11.5	7.9	4.7	ND	1.07	14,000	7,910	7.36
PW-001-300	687514	603456	PW001-300-130135-1	11/16/04	N	13 - 13.5	8.1	5.4	ND	0.066	13,200	14,000	7.22
PW-001-600	687815	603416	PW001-600-098128-1	11/16/04	N	9.8 - 12.8	7.2	6	ND	0.454	22,600	12,700	7.15
PW-002-050	686822	603297	PW002-050-120140-1	11/17/04	N	12 -14	7.7	4.8	ND	0.066	13,100	6,520	7.86
PW-002-12H	688109	602900	PW002-12H-106116-1	11/18/04	N	10.6 - 11.6	7.4	23.3	ND	0.096	8,670	5,170	7.49
PW-002-300	687185	603185	PW002-300-101151-1	11/16/04	N	10.1 - 15.1	7.1	2.8	ND	0.155	7,950	4,410	7.48
PW-002-600	687481	603093	PW002-600-346366-1	11/17/04	N	34.6 - 36.6	31.2	10.2	ND	1.44	26,300	17,400	7.15
PW-002-900	687759	603012	PW002-900-100110-1	11/17/04	N	10 - 11	6.4	24	0.732	1.45	8,930	5,350	8.05
PW-003-050	686819	602976	PW003-050-127137-1	11/18/04	N	12.7 - 13.7	8.3	5.4	146	220	7,510	4,770	8.68
PW-003-12H	688056	602622	PW003-12H-100102-1	11/15/04	N	10-10.2	2.4	38.3	ND	0.023	27,500	19,200	7.24
PW-003-300	687156	602879	PW003-300-121131-1	11/18/04	N	12.1 - 13.1	7.7	7.7	ND	0.574	26,600	18,100	7.89
PW-003-600	687447	602796	PW003-600-183193-1	11/19/04	N	18.3 - 19.3	16.3	31.6	218	321	9,560	3,230	8.34
PW-003-750	687574	602770	na	12/18/04	N	na	1	43.2	na	na	na	na	na
PW-003-900	687710	602714	PW003-900-128138-1	11/18/04	N	12.8 - 13.8	7.1	37.2	ND	0.042	27,300	19,100	7.56
PW-004-050	686849	602567	PW004-050-118120-1	11/10/04	N	11.8 - 12	8	4.6	ND	0.105	9,980	5,680	7.72
PW-004-12H	688011	602360	PW004-12H-104114-1	11/19/04	N	10.4 11.4	7.9	31.3	ND	0.134	17,200	11,000	7.06
PW-004-300	687116	602521	PW004-300-089091-1	11/13/04	N	8.9 - 9.1	5.6	23	ND	0.087	12,400	7,810	8.21
PW-004-600	687407	602467	PW004-600-059061-1	11/13/04	N	5.9 - 6.1	2.3	28.3	ND	0.711	24,800	19,600	7.7
PW-004-900	687669	602423	PW004-900-092094-1	11/14/04	N	9.2 - 9.4	5.8	38.5	ND	0.125	28,100	19,400	6.9
PW-005-050	686556	602342	PW005-050-144154-1	11/19/04	N	14.4 - 15.4	5.6	7.6	ND	0.584	7,790	4,910	7.88
PW-005-300	687033	602237	PW005-300-093103-1	11/19/04	N	9.3 - 10.3	1.9	30.6	ND	0.502	26,500	19,000	7.79
PW-005-600	687371	602161	PW005-600-113123-1	11/20/04	N	11.3 - 12.3	2.7	38	ND	0.051	25,200	1,760	7.38
PW-006-050	686412	602231	PW006-050-098100-1	11/11/04	N	9.8 - 10	7.9	3.1	ND	0.173	5,780	3,540	7.2
PW-006-300	686702	602048	PW006-300-082092-1	11/20/04	N	8.2 - 9.2	1.5	33.3	ND	0.038	28,700	19,900	7.74
PW-006-600	686983	601861	PW006-600-110120-1	11/20/04	N	11 - 12	7.3	37.1	ND	0.058	26,200	1,710	7.35
PW-007-050	686302	602089	PW007-050-123133-1	11/21/04	N	12.3 - 13.3	9.2	5.6	ND	0.120	8,030	5,100	7.37
PW-007-300	686536	601796	PW007-300-075085-1	11/21/04	N	7.5 - 8.5	1.6	33.4	ND	0.071	18,700	13,300	7.28
PW-008-10H	687959	603119	PW-008-10H-153168-1	12/17/04	N	15.3 - 16.8	12.8	14	ND	0.106	7,800	4,830	7.74
PW-008-750	687647	603205	PW-008-750-286301-1	12/16/04	N	28.6 - 30.1	26	7.4	ND	0.311	6,500	3,840	7.63
PW-008-900	687799	603163	PW-008-900-253273-1	12/16/04	N	25.3 - 27.2	21.8	8.4	ND	0.348	6,920	4,180	7.54

na - sample not available due to refusal of GeoProbe Sampler
ND - Not Detected

Table A-6a
GeoProbe Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date	Filtered	Sample Depth Below Top of Mud (ft.)	Riverbed Sediment Thickness (ft.)	Water Depth @ Time of Sampling(ft.)	Cr(VI) (mg/L)	Cr (total) (mg/L)	Conductivity (umhos/cm)	TDS (mg/L)	pH
PW-009-050	686841	603118	PW-009-050-125135-1	12/14/04	N	12.5 - 13.5	9.2	5.3	34.6	52.9	4,700	3,040	9.39
PW-009-10H	687880	602830	PW-009-10H-086101-1	12/17/04	N	8.6 - 10.1	6.1	24.6	ND	0.272	17,300	11,100	8.34
PW-009-150	687049	603070	PW-009-150-109119-1	12/15/04	N	10.9 - 11.9	7.9	4.8	ND	0.192	4,940	3,150	7.61
PW-009-450	687354	602986	PW-009-450-233253-1	12/16/04	N	23.3 - 25.3	21	8.5	43	43.8	11,300	6,420	7.23
PW-009-750	687641	602899	PW-009-750-168183-1	12/17/04	N	16.8 - 18.3	14.7	37.7	126	177	17,300	11,800	7.24
PW-010-050	686848	602756	PW-010-050-072082-1	12/14/04	N	7.2 - 8.2	8.2	6.7	ND	0.165	5,440	3,150	7.43
PW-010-150	687043	602719	PW-010-150-089104-1	12/14/04	N	8.9 - 10.4	6.3	5.9	42.2	39.7	4,820	3,040	9.19
PW-010-450	687274	602664	PW-010-450-032047-1	12/16/04	N	3.2 - 4.7	0.6	22.4	ND	0.492	19,800	12,200	7.06
PW-010-750	687544	602606	PW004-050-073088-1	12/18/04	N	7.3 - 8.8	2.8	39.3	ND	0.119	28,600	20,200	7.7
PW-011-500	687246	602340	PW-011-500-110125-1	12/18/04	N	11.0 - 12.5	3.7	27.4	ND	0.182	28,200	19,500	7.43
PW-004-050	686849	602567	PW004-050-118120-1D	11/10/04	N	11.8 - 12	8	na	ND	0.105	9,470	7,100	7.71
PW-002-12H	688109	602900	PW002-12H-106116-1D	11/18/04	N	10.6 - 11.6	7.4	na	ND	0.096	8,510	5,020	7.48
PW-005-600	687371	602161	PW005-600-113123-1D	11/20/04	N	11.3 - 12.3	2.7	na	0.0087	0.047	25,500	1,740	7.39
PW-006-300	686702	602048	PW006-300-082092-1EB	11/20/04	N	8.2 - 9.2	na	na	ND	0.083	13	ND(10)	7.09
PW-007-300	686536	601796	PW007-300-075085-1EB	11/21/04	N	7.5 - 8.5	na	na	ND	0.013	7	ND(10)	7.72
PW-011-500	687246	602340	PW-011-500-110125-1D	12/18/04	N	11.0 - 12.5	4.1	na	ND	0.178	28,300	19,500	7.44
PW-010-750	687544	602606	PW010-750-073088-1EB	12/18/04	N	7.3 - 8.8	na	na	ND	0.017	76	13	8.63
UNB-001	686990.97	602095.62	PWUNB-001-030050-1	12/7/05	N	3-5 ft	1.90	41.9	ND	0.298	21900	13900	7.54
UNB-001	686990.97	602095.62	PWUNB-001-030050-1F	12/7/05	Y	3-5 ft	1.90	41.9	ND	ND	21900	14000	7.48
UNB-002	686736.28	601969	PWUNB-002-030050-1	12/8/05	N	3-5 ft	1.80	44.0	ND	0.179	22400	13300	7.07
UNB-002	686736.28	601969	PWUNB-002-030050-1F	12/8/05	Y	3-5 ft	1.80	44.0	ND	ND	27300	19000	7.56
UNB-003	686837.2	601680.42	PWUNB-003-030050-1	12/6/05	N	3-5 ft	0.40	38.1	ND	0.33	21500	13900	7.03
UNB-003	686837.2	601680.42	PWUNB-003-030050-1F	12/6/05	N	3-5 ft	0.40	38.1	ND	ND	21200	13500	6.93
UNB-004	686286.28	601685.34	PWUNB-004-030050-1	12/8/05	N	3-5 ft	2.80	37.5	ND	0.356	21500	14000	7.5
UNB-004	686286.28	601685.34	PWUNB-004-030050-1F	12/8/05	Y	3-5 ft	2.80	37.5	ND	ND	19200	12400	7.39
UNB-005	686169.54	601424.79	PWUNB-005-030050-1	12/10/05	N	3-5 ft	0.60	35.5	ND	0.441	24600	16900	7.62
UNB-005	686169.54	601424.79	PWUNB-005-030050-1F	12/10/05	N	3-5 ft	0.60	35.5	ND	ND	24600	17000	7.82
UNB-006	686017.62	601297.09	PWUNB-006-030050-1	12/10/05	N	3-5 ft	1.20	38.4	ND	2.58		9440	7.8
UNB-006	686017.62	601297.09	PWUNB-006-030050-1	12/10/05	Y	3-5 ft	1.20	38.4			13800		
UNB-006	686017.62	601297.09	PWUNB-006-030050-1F	12/10/05	N	3-5 ft	1.20	38.4	ND	ND	13400	8420	8.06
UNB-007	685816.53	601014.92	PWUNB-007-030050-1	12/11/05	N	3-5 ft	3.50	32.8	ND	1.24		10400	7.38
UNB-007	685816.53	601014.92	PWUNB-007-030050-1	12/11/05	Y	3-5 ft	3.50	32.8			16900		
UNB-007	685816.53	601014.92	PWUNB-007-030050-1F	12/11/05	N	3-5 ft	3.50	32.8	ND	ND	17100	10600	7.43
UNB-008	685922.73	600771.68	PWUNB-008-030050-1	12/11/05	N	3-5 ft	0.50	32.7	ND	1.36	19400	12800	7.24

na - sample not available due to refusal of GeoProbe Sampler
ND - Not Detected

Table A-6a
GeoProbe Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date	Filtered	Sample Depth Below Top of Mud (ft.)	Riverbed Sediment Thickness (ft.)	Water Depth @ Time of Sampling(ft.)	Cr(VI) (mg/L)	Cr (total) (mg/L)	Conductivity (umhos/cm)	TDS (mg/L)	pH
UNB-008	685922.73	600771.68	PWUNB-008-030050-1F	12/11/05	Y	3-5 ft	0.50	32.7	ND	ND	19900	12900	7.23
UNB-009	685609.98	600648.2	PWUNB-009-030050-1	12/12/05	N	3-5 ft	0.80	37.1	ND	1.18	20600	13800	7.3
UNB-009	685609.98	600648.2	PWUNB-009-030050-1F	12/12/05	Y	3-5 ft	0.80	37.1	ND	0.0296	21300	13900	7.32
UNB-010	685522.96	600760.56	PWUNB-010-030050-1	12/11/05	N	3-5 ft	1.30	36.0	ND	0.575	19900	12800	7.47
UNB-010	685522.96	600760.56	PWUNB-010-030050-1F	12/11/05	Y	3-5 ft	1.30	36.0	ND	ND	21800	14400	7.23
UNB-011	685392.84	600609.4	PWUNB-011-030050-1	12/15/05	N	3-5 ft	0.30	40.7		1.76	26400	17800	7.03
UNB-011	685392.84	600609.4	PWUNB-011-030050-1F	12/15/05	Y	3-5 ft	0.30	40.7	ND	ND	26400	18000	6.82
UNB-012	685285.98	601032.9	PWUNB-012-030050-1	12/6/05	N	3-5 ft	11.40	22.6	ND	0.0926	20500	12600	6.76
UNB-012	685285.98	601032.9	PWUNB-012-030050-1F	12/6/05	N	3-5 ft	11.40	22.6	ND	0.012	20600	12500	6.69
UNB-013	685060.67	601372.19	PWUNB-013-030050-1	12/6/05	N	3-5 ft	23.50	9.5	ND	0.929	13800	8080	7.06
UNB-013	685060.67	601372.19	PWUNB-013-030050-1F	12/6/05	N	3-5 ft	23.50	9.5	ND	ND	13500	7870	6.92
UNB-014	685338.39	600111.95	PWUNB-014-030050-1	12/15/05	N	3-5 ft	0.20	37.5	ND	0.506	24500	15700	7.29
UNB-014	685338.39	600111.95	PWUNB-014-030050-1F	12/15/05	Y	3-5 ft	0.20	37.5	ND	ND	24000	16000	7.74
UNB-015	684992.2	599933.39	PWUNB-015-030050-1	12/18/05	N	3-5 ft			ND	5.83	20300	13600	7.48
UNB-015	684992.2	599933.39	PWUNB-015-030050-1F	12/18/05	Y	3-5 ft			ND	0.0164	22300	14600	7.04
UNB-016	685182.72	599880.74	PWUNB-016-030050-1	12/17/05	N	3-5 ft	0.70	39.1	ND	0.935	19600	12500	7.37
UNB-016	685182.72	599880.74	PWUNB-016-030050-1F	12/17/05	Y	3-5 ft	0.70	39.1	ND	ND	21600	13700	6.87
UNB-017	685048.67	599729.56	PWUNB-017-030050-1	12/18/05	N	3-5 ft			ND	0.816	24300	16100	7.55
UNB-017	685048.67	599729.56	PWUNB-017-030050-1F	12/18/05	Y	3-5 ft			ND	ND	23400	15300	7.47
UNB-020	684429.85	600643.82	PWUNB-020-030050-1	12/15/05	N	3-5 ft	0.90	11.8	ND	0.124	12300	7200	6.77
UNB-020	684429.85	600643.82	PWUNB-020-030050-1D	12/15/05	N	3-5 ft	0.90	11.8	ND	0.797	13200	7870	6.9
UNB-020	684429.85	600643.82	PWUNB-020-030050-1DF	12/15/05	Y	3-5 ft	0.90	11.8	ND	0.0163	12200	7240	6.94
UNB-020	684429.85	600643.82	PWUNB-020-030050-1F	12/15/05	Y	3-5 ft	0.90	11.8	ND	0.017	12600	7170	6.85
UNB-021	684134.96	599888.48	PWUNB-021-030050-1	12/18/05	N	3-5 ft			ND	1.23	17800	12000	7.39
UNB-021	684134.96	599888.48	PWUNB-021-030050-1F	12/18/05	Y	3-5 ft			ND	ND	18300	12000	7.41
UNB-027	686759.83	602492.67	PWUNB-027-030050-1	12/17/05	N	3-5 ft	9.50	9.0	ND	12.8	10900	6550	6.95
UNB-027	686759.83	602492.67	PWUNB-027-030050-1F	12/17/05	Y	3-5 ft	9.50	9.0	ND	0.0128	11500	6940	6.82
UNB-028	686846.01	602471.7	PWUNB-028-030050-1	12/16/05	N	3-5 ft	0.40	19.7	ND	ND	19100	13400	7.6
UNB-028	686846.01	602471.7	PWUNB-028-030050-1F	12/16/05	Y	3-5 ft	0.40	19.7	ND	ND	21300	13500	7.44
UNB-029	686887.71	602370.64	PWUNB-029-030050-1	12/16/05	N	3-5 ft	2.10	27.0	ND	2.29	25500	16800	7.37
UNB-029	686887.71	602370.64	PWUNB-029-030050-1F	12/16/05	Y	3-5 ft	2.10	27.0	ND	ND	25200	16700	7.27
UNB-030	686818.19	602304.02	PWUNB-030-030050-1	12/16/05	N	3-5 ft	0.90	27.3	ND	ND	23300	15900	7.65
UNB-030	686818.19	602304.02	PWUNB-030-030050-1F	12/16/05	Y	3-5 ft	0.90	27.3	ND	1.94	24200	21600	7.37
UNB-031	687342.89	602254.47	PWUNB-031-030050-1	12/8/05	N	3-5 ft	4.80	40.8	ND	0.311	21700	14400	6.88
UNB-031	687342.89	602254.47	PWUNB-031-030050-1F	12/8/05	Y	3-5 ft	4.80	40.8	ND	ND	22000	14100	6.86

na - sample not available due to refusal of GeoProbe Sampler
ND - Not Detected

Table A-6a
GeoProbe Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date	Filtered	Sample Depth Below Top of Mud (ft.)	Riverbed Sediment Thickness (ft.)	Water Depth @ Time of Sampling(ft.)	Cr(VI) (mg/L)	Cr (total) (mg/L)	Conductivity (umhos/cm)	TDS (mg/L)	pH	Alkalinity Carbonate (CACO3) (mg/l)
UNB-032	601610.43	686352.44	UNB-032-046(	10/9/06	N	4.6-6.6 ft	6.6	34.3	ND	1.08				
UNB-032	601610.43	686352.44	NB-032-0460	10/9/06	Y	4.6-6.6 ft	6.6	34.3	ND					
UNB-033	601462.37	686332.97	UNB-033-070(	10/10/06	N	7-9 ft	6.9	34.3	ND	0.171		22500		
UNB-033	601462.37	686332.97	NB-033-0700	10/10/06	Y	7-9 ft	6.9	34.3	ND					
UNB-034	601077.78	686292.27	UNB-034-060(	10/10/06	N	6-8 ft	5.4	35.3	ND	1.43		18900		
UNB-035	602468.83	686842.66	UNB-035-069(	10/10/06	N	6.9-8.9 ft	6.6	38.4	ND	0.155		20900		
UNB-035	602468.83	686842.66	NB-035-0690	10/10/06	Y	6.9-8.9 ft	6.6	38.4	ND	ND				94.1
UNB-036	602370.31	686890.27	UNB-036-024(	10/11/06	N	2.4-4.4 ft	1.4	43.1	ND	0.253		20800		
UNB-036	602370.31	686890.27	NB-036-0240	10/11/06	N	2.4-4.4 ft	1.4	43.1	ND	0.201		18400		
UNB-036	602370.31	686890.27	NB-036-02404	10/11/06	Y	2.4-4.4 ft	1.4	43.1	ND	ND				91.9
UNB-036	602370.31	686890.27	NB-036-0240	10/11/06	Y	2.4-4.4 ft	1.4	43.1	ND	ND				91.4
UNB-037	602304.85	686815.55	UNB-037-040(	10/11/06	N	4-6 ft	3.2	46.1	ND	2.13		19000		

Table A-6a
GeoProbe Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Aluminum (ug/l)	Antimony (ug/l)	Arsenic (ug/l)	Barium (ug/l)	Beryllium (ug/l)	Bicarbonate Alkalinity (mg/l)	Cadmium (ug/l)	Calcium (ug/l)	Chloride (mg/l)	Cobalt (ug/l)	Copper (ug/l)	Ferrous Iron (mg/l)	Hardness (CACO3) (mg/l)	Iron (ug/l)	Iron, Ferric (mg/l)	Lead (ug/l)
UNB-032	352000	63.5	140	2050	20.2		29.8	1060000		310	1030			700000		448
UNB-032																
UNB-033	2260	7.1	8.0U	200U	1.0U		5.5	209000		50U	152		3290	75100		10.7
UNB-033																
UNB-034	880000	30U	206	12400	61		55.9	3600000		840	1700		14100	1180000		742
UNB-035	3730	6.0U	8.0U	200U	1.0U		5.7	198000		50U	125		3110	69200		21.3
UNB-035	200U	6.0U	8.0U	200U	1.0U	94	4.0U	222000	11300	50U	25U	1.3	3500	9600	8.3	3.0U
UNB-036	17500	6.0U	9.7	200U	1.0U		7.4	220000		50U	215		3560	102000		91.2
UNB-036	10800	6.0U	8.7	200U	1.0U		6.8	216000		50U	178		3300	95300		58.4
UNB-036	200U	6.0U	8.0U	200U	1.0U	91.8	4.0U	235000	12200	50U	25U	0.58		5880	5.3	3.0U
UNB-036	200U	6.0U	8.0U	200U	1.0U	91.3	4.0U	229000	12100	50U	25U	4.9		6090	1.2	3.0U
UNB-037	1160000	60U	251	22100	77.3		56.4	4880000		1070	2160		18000	1650000		950

Table A-6a
GeoProbe Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Magnesium (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Nickel (ug/l)	Nitrate (mg/l)	Nitrite (mg/l)	Nitrogen, Nitrate-Nitrite (mg/l)	Potassium (ug/l)	Selenium (ug/l)	Silver (ug/l)	Sodium (ug/l)	Sulfate (mg/l)	Sulfide (mg/l)	Thallium (ug/l)	Vanadium (ug/l)	Zinc (ug/l)
UNB-032	797000	22500	5.4	893				306000	50U	50U	5110000			50U	721	2850
UNB-032																
UNB-033	672000	1230	0.29	109				392000	10U	10U	5950000			10U	50U	646
UNB-033																
UNB-034	1230000	66700	2.8	1960				458000	50U	50U	4750000			50U	1520	5210
UNB-035	634000	1070	0.73	89.6				357000	10U	10U	5400000			10U	50U	574
UNB-035	715000	727	0.20U	40U	0.79	0.1	0.89	390000	10U	10U	5870000	1790	2.0U	10U	50U	20U
UNB-036	732000	1400	1.6	105				371000	10U	10U	5960000			10U	50U	757
UNB-036	670000	1280	1.3	94.2				368000	10U	10U	5880000			10U	50U	740
UNB-036	784000	599	0.20U	40U	2.6	0.089	2.7	448000	10U	10U	6190000	2240	2.0U	10U	50U	20.9
UNB-036	785000	592	0.20U	40U	1.3	0.088	1.4	448000	10U	10U	6380000	2110	2.0U	10U	50U	20U
UNB-037	1400000	92500	1.6U	2380				466000	100U	100U	4210000			100U	2290	6570

Table A-6b
River VAS Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date / Time	Sample Depth Below Top of Mud (ft)	Cr(VI) (mg/L)	Cr(total) (mg/L)	Conductivity (umhos/cm)	TDS (mg/L)	pH
PW-003-900	687712	602726	PW-003-900-055055-3	12/14/2004 9:08	5.5	ND	1.58	24600	17200	7.8
PW-003-900	687712	602726	PW-003-900-105105-3	12/14/2004 10:48	10.5	ND	0.036	27500	17700	7.46
PW-003-900	687712	602726	PW-003-900-155155-3	12/14/2004 13:35	15.5	ND	1.79	21100	14100	8.53
PW-003-900	687712	602726	PW-003-900-205205-3	12/15/2004 9:01	20.5	ND	2.35	14100	na	8.8
PW-003-900	687712	602726	PW-003-900-255255-3	12/15/2004 10:55	25.5	ND	1.28	na	na	na
PW-003-900	687712	602726	PW-003-900-305305-3	12/15/2004 13:00	30.5	ND	0.747	14900	na	8.86
PW-003-900	687712	602726	PW-003-900-355355-3	12/15/2004 15:00	35.5	ND	1.25	14000	na	8.48
PW-003-900	687712	602726	PW-003-900-450450-3	12/16/2004 9:10	45	ND	na	13400	na	8.09
PW-003-200	687053	602911	PW-003-200-115115-3	12/16/2004 14:40	11.5	ND	0.923	9930	5700	7.88
PW-003-200	687053	602911	PW-003-200-165165-3	12/17/2004 8:30	16.5	ND	0.723	na	na	na
PW-003-200	687053	602911	PW-003-200-265265-3	12/17/2004 10:10	26.5	ND	3.21	na	na	na
PW-003-200	687053	602911	PW-003-200-415415-3	12/17/2004 13:45	41.5	ND	0.184	na	na	na
PW-003-200	687053	602911	PW-003-200-510510-3	12/17/2004 15:20	51	ND	0.0242	na	na	na
PW-003-200	687053	602911	PW-003-200-550550-3	12/18/2004 9:05	55	ND	0.972	na	na	na
PW-003-200	687053	602911	PW-003-200-600600-3	12/18/2004 10:35	60	ND	3.66	na	na	na
PW-003-200	687053	602911	PW-003-200-650650-3	12/18/2004 12:15	65	ND	0.694	na	na	na
PW-003-200	687053	602911	PW-003-200-740740-3	12/18/2004 13:45	74	ND	6.12	na	na	na

na - not analyzed due to insufficient sample volume
ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date / Time	Sample Depth Below Top of Mud (ft)	Filtered	Cr(VI) (mg/L)	Chromium (ug/l)	pH	Ferrous Iron (II) (mg/l)	Manganese (ug/l)
PW-001-050	687219	603494	PW-001-050-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-001-300	687514	603456	PW-001-300-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-001-600	687815	603416	PW-001-600-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-002-050	686822	603297	PW-002-050-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-002-050	686822	603297	PW-002-050-005005-4	12/22/04	0.5 - 0.5	N	ND				
PW-002-050	686822	603297	PW-002-050-005005-5	1/10/05	0.5 - 0.5	N	ND				
PW-002-12H	688109	602900	PW-002-12H-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-002-300	687185	603185	PW-002-300-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-002-600	687481	603093	PW-002-600-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-002-900	687759	603012	PW-002-900-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-003-050	686819	602976	PW-003-050-000005-2	12/8/04	0.5 - 0.5	N	ND				
PW-003-050	686819	602976	PW-003-050-005005-4	12/22/04	0.5 - 0.5	N	ND				
PW-003-050	686819	602976	PW-003-050-005005-5	1/10/05	0.5 - 0.5	N	ND				
PW-003-12H	688056	602622	PW-003-12H-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-003-300	687156	602879	PW-003-300-000005-2	12/8/04	0.5 - 0.5	N	ND				
PW-003-600	687447	602796	PW-003-600-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-003-900	687710	602714	PW-003-900-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-004-050	686849	602567	PW-004-050-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-004-12H	688011	602360	PW-004-12H-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-004-300	687116	602521	PW-004-300-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-004-600	687407	602467	PW-004-600-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-004-900	687669	602423	PW-004-900-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-005-050	686556	602342	PW-005-050-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-005-300	687033	602237	PW-005-300-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-005-600	687371	602161	PW-005-600-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-006-050	686412	602231	PW-006-050-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-006-300	686702	602048	PW-006-300-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-006-600	686983	601861	PW-006-600-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-007-050	686302	602089	PW-007-050-000005-2	12/9/04	0.5 - 0.5	N	ND				
PW-007-300	686536	601796	PW-007-300-000005-2	12/7/04	0.5 - 0.5	N	ND				
PW-002-600	687481	603093	PW-002-600-000005-2EB1	12/7/04	0.5 - 0.5	N	ND				
PW-002-600	687481	603093	PW-002-600-000005-2EB2	12/7/04	0.5 - 0.5	N	ND				

ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date / Time	Sample Depth Below Top of Mud (ft)	Filtered	Cr(VI) (mg/L)	Chromium (ug/l)	pH	Ferrous Iron (II) (mg/l)	Manganese (ug/l)
PW-004-050	686849	602567	PW-004-050-000005-2D	12/9/04	0.5 - 0.5	N	ND				
PW010-450			PW010-450-005005-6	4/22/05	0.5 - 0.5	N	ND		7.04		
PW02A-10H	687825	602912	PW02A-10H-005005-6	4/22/05	0.5 - 0.5	N	ND		7.16	0.1U	100
PW03A-400	687225	602768	PW03A-400-005005-6	4/22/05	0.5 - 0.5	N	ND		7.3	0.1U	400
PW03A-600	687453	602667	PW03A-600-005005-6	4/22/05	0.5 - 0.5	N	ND		7.35	0.1U	300
PW03A-900	687661	602669	PW03A-900-005005-6	4/22/05	0.5 - 0.5	N	ND		7.5	0.1U	2100
PW09A-10H	687828	602792	PW09A-10H-005005-6	4/22/05	0.5 - 0.5	N	ND		7.22	0.1U	100
PW09A-800	687699	602796	PW09A-800-005005-6	4/22/05	0.5 - 0.5	N	ND		7.4	0.1U	200
PW10A-550	687350	602558	PW10A-550-005005-6	4/22/05	0.5 - 0.5	N	ND		7.81	0.1U	2100
SD004-250			PW004-250-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD004-250			PW004-250-000005-9W	1/19/06	0.5 - 0.5	Y		4.4B			
SD004-250			PW004-250-000005-9Z	2/1/06	0.5 - 0.5	N					
SD00A-025	686377.14	602222.54	PW00A-025-000005-7	8/25/05	0.5 - 0.5	N		184	7.4	0.100U	
SD00A-025	686377.14	602222.54	PW00A-025-000005-7	8/25/05	0.5 - 0.5	Y	ND	10.0U			
SD00A-050	686390.48	602211.07	PW00A-050-000005-7	8/25/05	0.5 - 0.5	N		32.7	7.21	0.396	
SD00A-050	686390.48	602211.07	PW00A-050-000005-7	8/25/05	0.5 - 0.5	Y	ND	10.0U			
SD00A-100	686424.53	602175.71	PW00A-100-000005-7	8/25/05	0.5 - 0.5	N		254	7.21	0.605	
SD00A-100	686424.53	602175.71	PW00A-100-000005-7	8/25/05	0.5 - 0.5	Y	ND	10.0U			
SD00A-200	686424.53	602175.71	PW00A-200-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD00A-200	686424.53	602175.71	PW00A-200-000005-9W	1/19/06	0.5 - 0.5	Y		5.6			
SD00A-200	686424.53	602175.71	PW00A-200-000005-9Z	2/1/06	0.5 - 0.5	N					
SD00A-250	686543.44	602072.24	PW00A-250-000005-7	8/25/05	0.5 - 0.5	N		214	7.26	0.495	
SD00A-250	686543.44	602072.24	PW00A-250-000005-7	8/25/05	0.5 - 0.5	Y	ND	10.0U			
SD00B-050	685556.74	601346.07	PW00B-050-000005-7	8/23/05	0.5 - 0.5	N		82.8*	7.27	0.100U	
SD00B-050	685556.74	601346.07	PW00B-050-000005-7	8/23/05	0.5 - 0.5	Y	ND	10.0U			
SD00B-100	685587.88	601313.01	PW00B-100-000005-7	8/23/05	0.5 - 0.5	N		942*	6.91	0.785	
SD00B-100	685587.88	601313.01	PW00B-100-000005-7	8/23/05	0.5 - 0.5	Y	ND	18.5			
SD00B-200	685666.24	601246.15	PW00B-200-000005-7	8/24/05	0.5 - 0.5	N		85.9*	7.32	0.100U	
SD00B-200	685666.24	601246.15	PW00B-200-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD00B-250	685701.38	601211.24	PW00B-250-000005-7	8/24/05	0.5 - 0.5	N		19.4*	7.39	0.176	
SD00B-250	685701.38	601211.24	PW00B-250-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD00D-150	686684.85	602361.94	PW00D-150-000005-7	8/25/05	0.5 - 0.5	N		867	7.01	0.945	
SD00D-150	686684.85	602361.94	PW00D-150-000005-7	8/25/05	0.5 - 0.5	Y	ND	10.0U			
SD00D-150	686684.85	602361.94	PW00D-150-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD00D-150	686684.85	602361.94	PW00D-150-000005-9W	1/19/06	0.5 - 0.5	Y		8.8			
SD00D-150	686684.85	602361.94	PW00D-150-000005-9Z	2/1/06	0.5 - 0.5	N					

ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Sulfide, Acid Insoluble (mg/l)	Cadmium (ug/l)	Chloride (mg/l)	Copper (ug/l)	Dissolved Organic Carbon (mg/l)	Dissolved Oxygen (mg/l)	Lead (ug/l)	Mercury (ug/l)	Nickle (ug/l)	Potassium (ug/l)	Silver (ug/l)	Sulfide (mg/l)	Turbidity (NTU)	Zinc (ug/l)
PW-004-050														
PW010-450														
PW02A-10H	2U													
PW03A-400	2.4													
PW03A-600	2U													
PW03A-900	2U													
PW09A-10H	2U													
PW09A-800	2U													
PW10A-550	2U													
SD004-250														
SD004-250		1B		10U			0.37B		20U		0.100B			235
SD004-250				7.3				0.09B						
SD00A-025			12600			2.7						1.00U	55.7	
SD00A-025					1.93									
SD00A-050			14200			1.00U						1.00U	61.5	
SD00A-050					3.6									
SD00A-100			10000			1.2						1.00U	167	
SD00A-100					4.1									
SD00A-200														
SD00A-200		1.1B		10U			2U		20U		0.286B			63.7
SD00A-200				1.2B				0.15B						
SD00A-250			11100			1.00U						1.00U	69.9	
SD00A-250					4.87									
SD00B-050			17500			3.21						3.85	114	
SD00B-050					2.22									
SD00B-100			8190			1.35						1.00U	872	
SD00B-100					4.85									
SD00B-200			13000			2.41						1.00U	132	
SD00B-200					2.16									
SD00B-250			12800			2.2						1.00U	164	
SD00B-250					1.56									
SD00D-150			11300			1.03						1.00U	257	
SD00D-150					3.09									
SD00D-150														
SD00D-150		4.1B		10U			2.04		20U		0.378B			236
SD00D-150				1.6B				0.14B						

ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date / Time	Sample Depth Below Top of Mud (ft)	Filtered	Cr(VI) (mg/L)	Chromium (ug/l)	pH	Ferrous Iron (II) (mg/l)	Manganese (ug/l)
SD00K-015	684617.72	601958.18	PW00K-015-000005-7	8/24/05	0.5 - 0.5	N		167*	7.46	0.515	
SD00K-015	684617.72	601958.18	PW00K-015-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD00K-040			PW00K-040-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD00K-040			PW00K-040-000005-9W	1/19/06	0.5 - 0.5	Y		5U			
SD00K-040			PW00K-040-000005-9Z	2/1/06	0.5 - 0.5	N					
SD02E-075			PW02E-075-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD02E-075			PW02E-075-000005-9W	1/19/06	0.5 - 0.5	Y		6.2			
SD02E-075			PW02E-075-000005-9Z	2/1/06	0.5 - 0.5	N					
SD02W-015	686053.85	601899.83	PW02W-015-000005-5	4/22/05	0.5 - 0.5	N	ND		7.12	0.1U	200J
SD02W-015	686053.85	601899.83	PW02W-015-005005-7	5/12/05	0.5 - 0.5	N	ND		7.12	0.476	1200
SD02W-015	686053.85	601899.83	PW02W-015-005005-8	5/24/05	0.5 - 0.5	N	ND	10U	7.22	0.1U	
SD03E-010	685777.8	601627.14	PW03E-010-000005-5	4/22/05	0.5 - 0.5	N	ND		7.56	0.1U	100J
SD03E-010	685777.8	601627.14	PW03E-010-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD03E-010	685777.8	601627.14	PW03E-010-000005-9W	1/19/06	0.5 - 0.5	Y		5U			
SD03E-010	685777.8	601627.14	PW03E-010-000005-9Z	2/1/06	0.5 - 0.5	N					
SD03E-150	685863.67	601513.67	PW03E-150-000005-5	4/22/05	0.5 - 0.5	N	ND		7.23	0.1U	100J
SD03W-015	685684.16	601526.07	PW03W-015-000005-5	4/22/05	0.5 - 0.5	N	ND		7.67	0.1U	100J
SD03W-015	685684.16	601526.07	PW03W-015-000005-5D	4/22/05	0.5 - 0.5	N	ND		7.62	0.1U	200J
SD03W-015	685684.16	601526.07	PW03W-015-000005-5R	4/22/05	0.5 - 0.5	N	ND		7.74	0.1U	200J
SD0JN-000	685176.72	601036.23	PW0JN-000-000005-7	8/24/05	0.5 - 0.5	N		78.1*	7.26	0.306	
SD0JN-000	685176.72	601036.23	PW0JN-000-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD0JN-100	685245.9	600972.85	PW0JN-100-000005-7	8/24/05	0.5 - 0.5	N		40.4*	6.93	0.705	
SD0JN-100	685245.9	600972.85	PW0JN-100-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD0JN-200	685336.07	600898.65	PW0JN-200-000005-7	8/24/05	0.5 - 0.5	N		26.2*	6.92	0.136	
SD0JN-200	685336.07	600898.65	PW0JN-200-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD0JN-200	685336.07	600898.65	PW0JN-200-000005-7D	8/24/05	0.5 - 0.5	N		26.8*	6.99		
SD0JN-200	685336.07	600898.65	PW0JN-200-000005-7D	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD0JN-200	685336.07	600898.65	PW0JN-200-000005-7R	8/24/05	0.5 - 0.5	N		18.0*	6.96		
SD0JN-200	685336.07	600898.65	PW0JN-200-000005-7R	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD0JN-250	685366	600867.18	PW0JN-250-000005-7	8/24/05	0.5 - 0.5	N		135*			
SD0JN-250	685366	600867.18	PW0JN-250-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD0JS-200	685030.37	601169.29	PW0JS-200-000005-7	8/24/05	0.5 - 0.5	N		17.1*	7.08	0.954	
SD0JS-200	685030.37	601169.29	PW0JS-200-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD13E-010	685957.03	601812.06	PW13E-010-000005-5	4/22/05	0.5 - 0.5	N	ND		7.16	0.1U	100J
SD13E-010	685957.03	601812.06	PW13E-010-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD13E-010	685957.03	601812.06	PW13E-010-000005-9W	1/19/06	0.5 - 0.5	Y		2.9B			
SD13E-010	685957.03	601812.06	PW13E-010-000005-9Z	2/1/06	0.5 - 0.5	N					

ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Sulfide, Acid Insoluble (mg/l)	Cadmium (ug/l)	Chloride (mg/l)	Copper (ug/l)	Dissolved Organic Carbon (mg/l)	Dissolved Oxygen (mg/l)	Lead (ug/l)	Mercury (ug/l)	Nickle (ug/l)	Potassium (ug/l)	Silver (ug/l)	Sulfide (mg/l)	Turbidity (NTU)	Zinc (ug/l)
SD00K-015			11700			1.02						1.00U	311	
SD00K-015					1.67									
SD00K-040														
SD00K-040		2.1B		10U			0.4B		20U		0.111B			115
SD00K-040				1.1B				0.2U						
SD02E-075														
SD02E-075		1B		2U			2U		22.2U		0.542			19.5
SD02E-075				1.9B				0.2U						
SD02W-015	2U													
SD02W-015	2.4													
SD02W-015	2.32													
SD03E-010	2U													
SD03E-010														
SD03E-010		0.5B		10U			2B		20U		0.8U			164
SD03E-010				2				0.2U						
SD03E-150	2U													
SD03W-015	2U													
SD03W-015	2U													
SD03W-015	2U													
SD0JN-000			10200			1.00U						3.57	223	
SD0JN-000					3.6									
SD0JN-100			8930			1.7						1.00U	284	
SD0JN-100					3.6									
SD0JN-200			8600			1.13						1.00U	145	
SD0JN-200					4.82									
SD0JN-200			10700			2.23						1.00U	68.1	
SD0JN-200					3.15									
SD0JN-200			12500			1.71						1.00U	293	
SD0JN-200					3.47									
SD0JN-250			14000									1.00U		
SD0JN-250														
SD0JS-200			8270			1.73						1.00U	140	
SD0JS-200					5.17									
SD13E-010	2U													
SD13E-010														
SD13E-010		1.2B		10U			2U		20U		0.176B			138
SD13E-010				1.8B				0.2U						

ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Northing	Easting	Sample ID	Sample Date / Time	Sample Depth Below Top of Mud (ft)	Filtered	Cr(VI) (mg/L)	Chromium (ug/l)	pH	Ferrous Iron (II) (mg/l)	Manganese (ug/l)
SD13E-050	685982.45	601783.16	PW13E-050-000005-7	8/24/05	0.5 - 0.5	N		41.5*	6.92	0.406	
SD13E-050	685982.45	601783.16	PW13E-050-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD13E-100	686022.28	601753.26	PW13E-100-000005-7	8/24/05	0.5 - 0.5	N		61.4*	7.02	0.815	
SD13E-100	686022.28	601753.26	PW13E-100-000005-7	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD13E-100	686022.28	601753.26	PW13E-100-000005-7D	8/24/05	0.5 - 0.5	N		128*	7.06	0.505	
SD13E-100	686022.28	601753.26	PW13E-100-000005-7D	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD13E-100	686022.28	601753.26	PW13E-100-000005-7R	8/24/05	0.5 - 0.5	N		34.9*	7	0.795	
SD13E-100	686022.28	601753.26	PW13E-100-000005-7R	8/24/05	0.5 - 0.5	Y	ND	10.0U			
SD13E-250	686129.88	601654.83	PW13E-250-000005-7	8/25/05	0.5 - 0.5	N		96	7.57	0.246	
SD13E-250	686129.88	601654.83	PW13E-250-000005-7	8/25/05	0.5 - 0.5	Y	ND	82.5			
SD13W-015	685871.69	601712.2	PW13W-015-000005-5	4/22/05	0.5 - 0.5	N	ND		7.41	0.1U	100J
SD13W-015	685871.69	601712.2	PW13W-015-000005-5D	4/22/05	0.5 - 0.5	N	ND		7.48	0.1U	100J
SD13W-015	685956.95	601613.18	PW13W-015-000005-5R	4/22/05	0.5 - 0.5	N	ND		7.25	0.1U	100J
SD13W-015	685956.95	601613.18	PW13W-015-000005-7	8/23/05	0.5 - 0.5	N		35.8*	7.02	0.226	
SD13W-015	685956.95	601613.18	PW13W-015-000005-7	8/23/05	0.5 - 0.5	Y	ND	10.0U			
SD13W-015	685956.95	601613.18	PW13W-015-000005-9P	1/18/06	0.5 - 0.5	N	ND				
SD13W-015	685956.95	601613.18	PW13W-015-000005-9W	1/19/06	0.5 - 0.5	Y		5U			
SD13W-015	685956.95	601613.18	PW13W-015-000005-9Z	2/1/06	0.5 - 0.5	N					
SD13W-150	685956.95	601613.18	PW13W-150-000005-5	4/22/05	0.5 - 0.5	N	ND		7.24	0.1U	100J
GDA-N01	687622	602793	PWGDA-N01-005005-1	5/31/06	0.5 - 0.5	N	ND	481N	7.8	0.194	
GDA-NO2	687640.7	602819.3	PWGDA-NO2-005005-1	6/1/06	0.5 - 0.5	N	ND	471N	7.54	0.154	
GDA-NO3	687656.3	602834.3	PWGDA-NO3-005005-1	6/1/06	0.5 - 0.5	N	ND	1260N	8.16	0.104	
GDA-NO4	687664.5	602797.4	PWGDA-NO4-005005-1	6/1/06	0.5 - 0.5	N	ND	383N	7.78	0.104	
GDA-NO4	687664.5	602797.4	PWGDA-NO4-005005-1D	6/1/06	0.5 - 0.5	N	ND	359N	7.87	0.104	
GDA-NO5	687612.8	602837.5	PWGDA-NO5-005005-1	6/1/06	0.5 - 0.5	N	ND	314N	7.17	0.154	
GDA-NO6	687633.6	602799.8	PWGDA-NO6-005005-1	6/1/06	0.5 - 0.5	N	ND	230N	7.77	0.124	
GDA-S01	687532.4	602668	PWGDA-S01-005005-1	5/31/06	0.5 - 0.5	N	ND	104N	7.53	0.184	
GDA-S02	687551.7	602673.5	PWGDA-S02-005005-1	5/31/06	0.5 - 0.5	N	ND	121N	7.48	0.100U	
GDA-SO3	687540.4	602702.2	PWGDA-SO3-005005-1	6/1/06	0.5 - 0.5	N	ND	96N	7.54	0.100U	
GDA-S04	687585.2	602666.8	PWGDA-S04-005005-1	5/31/06	0.5 - 0.5	N	ND	166N	7.47	0.891	
GDA-S05	687475.1	602674.7	PWGDA-S05-005005-1	5/31/06	0.5 - 0.5	N	ND	249N	7.31	0.502	
GDA-S06	687512.1	602664.8	PWGDA-S06-005005-1	5/31/06	0.5 - 0.5	N	ND	210N	7.43	0.100U	

ND - Not Detected

Table A-7
Diffused Water (Peeper) Sample Results
Honeywell Study Area 7
Jersey City, New Jersey

Sample Location	Sulfide, Acid Insoluble (mg/l)	Cadmium (ug/l)	Chloride (mg/l)	Copper (ug/l)	Dissolved Organic Carbon (mg/l)	Dissolved Oxygen (mg/l)	Lead (ug/l)	Mercury (ug/l)	Nickle (ug/l)	Potassium (ug/l)	Silver (ug/l)	Sulfide (mg/l)	Turbidity (NTU)	Zinc (ug/l)
SD13E-050			9270			2.5						1.00U	243	
SD13E-050					3.1									
SD13E-100			11800			1.38						1.12	922	
SD13E-100					3.69									
SD13E-100			11400			1.05						1.08	167	
SD13E-100					3.08									
SD13E-100			8670			1.00U						1.00U	459	
SD13E-100					4.82									
SD13E-250			13900			1.00U						1.00U	25.6	
SD13E-250					1.8									
SD13W-015	2U													
SD13W-015	2U													
SD13W-015	2U													
SD13W-015			8190			1.63						1.00U	29.4	
SD13W-015					2.92									
SD13W-015														
SD13W-015		2.8B		10U			2U		20U		0.103B			103
SD13W-015				1.5B				0.2U						
SD13W-150	2U													
GDA-N01										175000		1.00U		
GDA-NO2										165000		1.32		
GDA-NO3										178000		7.37		
GDA-NO4										197000		8.46		
GDA-NO4										198000		4.05		
GDA-NO5										154000		1.00U		
GDA-NO6										177000		1.00U		
GDA-S01										191000		3.89		
GDA-S02										183000		1.00U		
GDA-SO3										189000		1.00U		
GDA-S04										199000		1.44		
GDA-S05										167000		1.00U		
GDA-S06										205000		1.24		

ND - Not Detected

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
087-MW-034

Sample ID	Depth (ft)	pH	Conductivity	Temperature (°C)	Chrome 6+ (mg/L)	Turbidity (ntu)	Soil Type
087-PW-34-020022	20 to 22	9.26	5.62	15.8	0	>1000	SM
087-PW-34-022024	22 to 24	9.65	3.43	17.3	0	>1000	SM
087-PW-34-024026	24 to 26	9.43	1.84	17.3	0	>1000	SM
087-PW-34-026028	26 to 28	9.37	1.8	17.3	1.3	>1000	SM
087-PW-34-028030	28 to 30	8.84	2.35	18.4	50	250	SM
087-PW-34-030032	30 to 32	8.99	2.1	15.8	45	350	SM
087-PW-34-032034	32 to 34	8.52	2.49	17.9	40	170	SM
087-PW-34-034036	34 to 36	8.23	2.99	20.5	55	100	SM
Simulprobe Failure	36 to 38	8.44	2.12	23.4	NA	NA	SM
087-PW-34-038040	38 to 40	7.67	3.28	22.7	60	130	SM
087-PW-34-040042	40 to 42	7.66	3.33	23.7	100	500	ML
087-PW-34-042044	42 to 44	7.62	3.18	15	65	45	SM
087-PW-34-044046	44 to 46	7.64	3.23	18.2	60	95	SM
087-PW-34-046048	46 to 48	7.73	3.41	17.2	40	60	SM
087-PW-34-048050	48 to 50	7.58	3.33	16.9	75	33	SM
087-PW-34-050052	50 to 52	7.61	3.45	17	55	80	SM
No Recovery	52 to 54	NS	NS	NS	NS	NS	ML
087-PW-34-054056	54 to 56	7.5	3.25	14.6	65	500	ML
087-PW-34-056058	56 to 58	8.18	3.14	14.8	30	700	ML
087-PW-34-058060	58 to 60	6.99	3.19	15.2	50	700	SM
087-PW-34-060062	60 to 62	7.57	3.14	16.7	70	450	SM
087-PW-34-062064	62 to 64	7.26	3.43	18.5	65	500	SM
087-PW-34-064066	64 to 66	7.48	3.35	18.9	65	120	SM
087-PW-34-066068	66 to 68	7.46	3.87	18.2	65	120	SM
087-PW-34-068070	68 to 70	7.45	5.03	19	300	190	GP/SM
087-PW-34-070072	70 to 72	8.04	6.95	20	500	500	SM/ML/GP
087-PW-34-072074	72 to 74	7.41	6.33	17.9	550	65	SM/GP
087-PW-34-076-78	74 to 76	7.47	6.52	14.8	400	180	SM/ML/GP
No Recovery	76 to 78	NS	NS	NS	NS	NS	CL/ML
	End of Boring						

NOTE NS - a sample was not recovered from this interval

Summary of Laboratory Results
087-MW-034

Sample ID	Depth (ft)	Spec	TDS (mg/l)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total	Cr Total Filtered	Spec. Grav.
087-PW-34-020022	20 to 22	4,800	7,480	10.0U	10.0U	225	5.5	1.00
087-PW-34-022024	22 to 24	NS	NS	10.0U	NS	NS	NS	NS
087-PW-34-024026	24 to 26	2,390	3,490	10.0U	10.0U	254	12.6	1.00
087-PW-34-026028	26 to 28	1,540	1,640	10,500	8,540	9,980	8,910	1.00
087-PW-34-028030	28 to 30	1,920	1,560	45,700	45,700	43,900	40,200	1.00
087-PW-34-030032	30 to 32	1,310	1,120	36,900	36,400	33,200	33,800	1.00
087-PW-34-032034	32 to 34	2,140	1,510	60,600	60,600	59,100	61,000	1.00
087-PW-34-034036	34 to 36	2,500	1,640	79,700	79,700	77,800	78,800	1.00
Simulprobe Failure	36 to 38	NS	NS	NS	NS	NS	NS	NS
087-PW-34-038040	38 to 40	2,880	1,900	89,800	89,800	90,200	92,400	1.00
087-PW-34-040042	40 to 42	2,770	1,900	98,800	98,800	95,400	102,000	1.00
087-PW-34-042044	42 to 44	2,910	1,770	87,900	78,000	75,900	79,300	1.00
087-PW-34-044046	44 to 46	2,870	1,840	75,500	73,500	75,200	78,600	1.00
087-PW-34-046048	46 to 48	3,290	1,880	96,300	94,800	98,600	100,000	1.00
087-PW-34-048050	48 to 50	2,850	1,840	102,000	101,000	107,000	110,000	1.00
087-PW-34-050052	50 to 52	2,940	2,040	109,000	96,400	117,000	118,000	1.00
No Recovery	52 to 54	NS	NS	NS	NS	NS	NS	NS
087-PW-34-054056	54 to 56	2,950	1,690	85,100	84,000	76,500	75,400	1.00
087-PW-34-056058	56 to 58	NS	NS	39,800	NS	NS	NS	NS
087-PW-34-058060	58 to 60	2,970	1,680	77,500	77,500	73,200	72,700	1.00
087-PW-34-060062	60 to 62	2,930	1,590	76,000	75,500	67,500	72,800	1.00
087-PW-34-062064	62 to 64	3,210	1,930	95,200	95,200	89,800	92,200	1.00
087-PW-34-064066	64 to 66	3,340	1,690	95,700	95,200	88,300	86,500	1.00
087-PW-34-066068	66 to 68	3,710	2,150	1,390,000	1,390,000	123,000	135,000	1.00
087-PW-34-068070	68 to 70	4,790	2,830	272,000	267,000	263,000	256,000	1.00
087-PW-34-070072	70 to 72	NS	NS	431,000	NS	NS	NS	NS
087-PW-34-072074	72 to 74	5,801	3,840	374,000	374,000	804,000	801,000	1.00
087-PW-34-076-78	74 to 76	5,631	3,890	364,000	359,000	760,000	769,000	1.00
No Recovery	76 to 78	NS	NS	NS	NS	NS	NS	NS
	End of Boring							

NOTE NS - a sample was not recovered from this interval

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
087-MW-035

Sample ID	Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Chrome 6+ (mg/L)	Turbidity (ntu)	Soil Type
087-PW-35-030032	30 to 32	11.22	2.9	21.7	0	500	SP
087-PW-35-032034	32 to 34	7.23	5.78	21.2	0	700	SP
087-PW-35-034036	34 to 36	7	6.56	18.9	0	40	SP
087-PW-35-036038	36 to 38	8.84	4.05	21.1	NA	>1000	SM
087-PW-35-038040	38 to 40	10.45	2.4	20.4	NA	400	SP
087-PW-35-040042	40 to 42	9.09	5.45	19.6	NA	34	SM
087-PW-35-042044	42 to 44	8.8	7.96	18.7	0	7.2	ML
087-PW-35-044046	44 to 46	7.7	12.84	20.6	0	250	ML
087-PW-35-046048	46 to 48	NA	NA	NA	NA	NA	ML
087-PW-35-048050	48 to 50	7.95	10.21	20.3	NA	NA	SP
087-PW-35-050052	50 to 52	7.48	11.6	19.7	NA	NA	SP
087-PW-35-052054	52 to 54	9.44	5.14	22.8	NA	NA	SM
087-PW-35-054056	54 to 56	10.31	3.86	22.5	NA	NA	ML
	End of Boring						
NOTE	NS - Sample not recovered from this interval						

Summary of Laboratory Results
087-MW-035

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	TDS (mg/l)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered(ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
087-PW-35-030032	30 to 32	2,460	1,770	<10	<10	48.3	3.9	
087-PW-35-032034	32 to 34	5,010	4,170	<10	<10	74.6		
087-PW-35-034036	34 to 36	5,860	3,910	<10	<10	31.4	9.5	
087-PW-35-036038	36 to 38	NS	NS	NS	18.2	NS	36.7	NS
087-PW-35-038040	38 to 40	1,920	1,240	22.3	20.3	NS	56.4	NS
087-PW-35-040042	40 to 42	4,930	2,790	<10	<10	11.9	11.5	NS
087-PW-35-042044	42 to 44	6,320	3,950	<10	<10	29.3	<1.6	
087-PW-35-044046	44 to 46	8,170	6,850	<10	<10	41.3	<1.6	
087-PW-35-046048	46 to 48	NS	NS	NS		NS	NS	NS
087-PW-35-048050	48 to 50			<10	<10	NS	3.8	NS
087-PW-35-050052	50 to 52	NS	NS	NS	<10	NS	NS	NS
087-PW-35-052054	52 to 54	NS	NS	NS	12.4	NS	38.5	NS
087-PW-35-054056	54 to 56	NS	NS	NS	<10	NS	37.5	NS
	End of Boring							
NOTE	NS - Sample not recovered from this interval							

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
090-MW-09

Sample ID	Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Chrome 6+ (mg/L)	Turbidity (ntu)	Soil Type
090-MW-09-012014	12 to 14						Fill
090-MW-09-014016	14 to 16			cased off			Mat
090-MW-09-016018	16 to 18	8.13	0.57	13.2	0	983	SM
090-MW-09-018020	18 to 20	9.39	0.75	14.6	0	>1000	CL
090-MW-09-020022	20 to 22	6.73	0.46	24.7	0	>1000	SM
090-MW-09-022024	22 to 24	6.53	0.54	16	0	ns	SM
090-MW-09-024026	24 to 26	7	0.46	19.2	0	111	SM
090-MW-09-026028	26 to 28	6.99	0.66	17.9	15	>1000	SM
090-MW-09-028030	28 to 30	9.06	0.66	6.5	0.04	>1000	SM
090-MW-09-030032	30 to 32	NA	ns	ns	ns	ns	SM
090-MW-09-032034	32 to 34	6.78	1.73	1	0.04	>1000	SM
090-MW-09-034036	34 to 36	NA	ns	ns	ns	ns	SM
090-MW-09-036038	36 to 38	6.97	0.33	4.6	0	>1000	SM
090-MW-09-038040	38 to 40	6.95	0.52	5	0.04	>1000	SM
090-MW-09-040042	40 to 42	6.98	0.67	5.8	0	550	SM
090-MW-09-042044	42 to 44	6.09	0.97	4.5	0	>1000	SM
090-MW-09-044046	44 to 46	5.83	1.08	5.3	0	450	ML
090-MW-09-046048	46 to 48	6.08	1.03	5.4	0	>1000	ML
090-MW-09-048050	48 to 50	6.32	0.54	5.4	0	>1000	ML
090-MW-09-050052	50 to 52	NA	ns	ns	ns	ns	ML
090-MW-09-052054	52 to 54	7	0.72	10.6	0	>1000	ML
090-MW-09-054056	54 to 56	5.28	0.8	11.7	0	>1000	ML
090-MW-09-056058	56 to 58	8.65	1.18	11.3	0.02	>1000	ML
090-MW-09-058060	58 to 60	NA	ns	ns	ns	ns	NA
090-MW-09-060062	60 to 62	8.19	2.53	10.7	200	750	CL/ML
090-MW-09-062064	62 to 64	7.09	1.35	10.4	300	>1000	SM
090-MW-09-064066	64 to 66	NA	ns	ns	ns	ns	NA
090-MW-09-066068	66 to 68	6.93	12.07	ns	>750	160	GP
090-MW-09-068070	68 to 70	6.97	12.39	10.6	>750	360	GP
090-MW-09-070072	70 to 72	7.06	17.39	11	>750	>1000	SM
090-MW-09-072074	72 to 74	6.69	19.97	12	>750	860	ML
090-MW-09-074076	74 to 76	NA	ns	ns	ns	ns	ML
090-MW-09-076078	76 to 78	6.73	14.51	8.6	>750	>1000	ML
090-MW-09-078080	78 to 80	7.57	4.81	11.5	500	360	ML
090-MW-09-080082	80 to 82	7.45	4.89	11.7	450	>1000	ML/CL
090-MW-09-082084	82 to 84	NA	ns	ns	ns	ns	CL
090-MW-09-084086	84 to 86	NA	ns	ns	ns	ns	CL
090-MW-09-086088	86 to 88	8.19	8.31	14.9	550	850	ML
090-MW-09-088090	88 to 90	NA	ns	ns	ns	ns	CL
	EOB						

NOTES ns - a sample was not recovered from this interval

Summary of Laboratory Results
090-MW-09

Lab Sample ID		Spec Conductance (umhos/cm)	TDS	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
090-MW-09-012014	12 to 14	ns	ns	ns	1,870	ns	ns	ns
090-MW-09-014016	14 to 16			cased off				
090-MW-09-016018	16 to 18	478.00	260.00	10 U	10 U	358.00	7.40	pend
090-MW-09-018020	18 to 20	718	528	10 U	10 U	380	10	pend
090-MW-09-020022	20 to 22	ns	ns	ns	ns	ns	ns	ns
090-MW-09-022024	22 to 24	ns	ns	ns	ns	ns	ns	ns
090-MW-09-024026	24 to 26	441	224	10 U	10 U	76	6	pend
090-MW-09-026028	26 to 28	ns	ns	ns	6,840	ns	ns	ns
090-MW-09-028030	28 to 30	ns	ns	ns	37	ns	44	ns
090-MW-09-030032	30 to 32	ns	ns	ns	ns	ns	ns	ns
090-MW-09-032034	32 to 34	ns	ns	ns	618	ns	ns	ns
090-MW-09-034036	34 to 36	ns	ns	ns	ns	ns	ns	ns
090-MW-09-036038	36 to 38	445	239	10 U	10 U	94	2.8 U	1.00
090-MW-09-038040	38 to 40	658	323	158	156	285	180	1.00
090-MW-09-040042	40 to 42	589	356	10 U	10 U	33	3	1.00
090-MW-09-042044	42 to 44	ns	ns	ns	ns	ns	ns	ns
090-MW-09-044046	44 to 46	ns	ns	ns	10 U	ns	3	ns
090-MW-09-046048	46 to 48	ns	ns	ns	10 U	ns	5	ns
090-MW-09-048050	48 to 50	ns	ns	ns	10 U	ns	3	ns
090-MW-09-050052	50 to 52	ns	ns	ns	ns	ns	ns	ns
090-MW-09-052054	52 to 54	ns	ns	ns	10 U	ns	3.2 U	ns
090-MW-09-054056	54 to 56	801	486	10 U	10 U	99	2	1.00
090-MW-09-056058	56 to 58	ns	ns	ns	34	ns	ns	ns
090-MW-09-058060	58 to 60	ns	ns	ns	ns	ns	ns	ns
090-MW-09-060062	60 to 62	ns	ns	ns	1,187,000	ns	130,000	ns
090-MW-09-062064	62 to 64	ns	ns	ns	261,000	ns	ns	ns
090-MW-09-064066	64 to 66	ns	ns	ns	ns	ns	ns	ns
090-MW-09-066068	66 to 68	11,900	9,190	2,193,000	1,368,000	1,950,000	2,070,000	ns
090-MW-09-068070	68 to 70	ns	ns	ns	1,297,000	ns	ns	ns
090-MW-09-070072	70 to 72	ns	ns	ns	4,500,000	ns	ns	ns
090-MW-09-072074	72 to 74	18,500	17,400	4,500,000	4,500,000	4,560,000	4,430,000	pend
090-MW-09-074076	74 to 76	ns	ns	ns	ns	ns	ns	ns
090-MW-09-076078	76 to 78	ns	ns	ns	3,230,000	ns	ns	ns
090-MW-09-078080	78 to 80	ns	ns	ns	516,000	ns	ns	ns
090-MW-09-080082	80 to 82	ns	ns	ns	506,000	ns	ns	ns
090-MW-09-082084	82 to 84	ns	ns	ns	ns	ns	ns	ns
090-MW-09-084086	84 to 86	ns	ns	ns	ns	ns	ns	ns
090-MW-09-086088	86 to 88	7,260	6,010	971,000	971,000	ns	ns	pend
090-MW-09-088090	88 to 90	ns	ns	ns	ns	ns	ns	ns
	EOB							

NOTES ns - a sample was not recovered from this interval
pend - result pending

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
115-MW-017

Sample ID	Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Chrome 6+ (mg/L)	Soil Type
115-MW-017-026028	26 to 28	6.24	18.4	12.8	0	SM
115-MW-017-028030	28 to 30	7.87	18.8	11.6	0	SM
115-MW-017-030032	30 to 32	6.28	19.85	8.9	0	ML
115-MW-017-032034	32 to 34	7.49	20	18.3	0	ML
115-MW-017-034036	34 to 36	7.26	20	14.4	0	SM
115-MW-017-036038	36 to 38	6.5	20	14.9	0	SM
115-MW-017-038040	38 to 40	6.16	20	14.4	0	SM
115-MW-017-040042	40 to 42	7.3	20	7.3	0	ML
115-MW-017-043044	43 to 44	7.03	20	9.6	0	ML
115-MW-017-044046	44 to 46		20	9.6	0	SM
115-MW-017-046048	46 to 48	7.6	20	6.8	0	ML
115-MW-017-048050	48 to 50	7.5	20	9.8	0	SM
115-MW-017-050052	50 to 52	7.5	20	9.6	0	ML
115-MW-017-052054	52 to 54	7.5	20	9.6	0	ML
115-MW-017-054056	54 to 56	7.58	19.67	10.7	0	ML
115-MW-017-056058	56 to 58	7.98	10.56	13.8	0	ML
115-MW-017-058060	58 to 60	8	11.6	13.5	0	ML
115-MW-017-060062	60 to 62	7.44	20	13	0	SM/CL
115-MW-017-062064	62 to 64	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-064066	64 to 66	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-066068	66 to 68	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-068070	68 to 70	7.94	8.25	7.4	0	SM
115-MW-017-070072	70 to 72	7.82	8.36	11.2	0	SM
115-MW-017-072074	72 to 74	7.53	7.24	11	0	SM/CL
115-MW-017-074076	74 to 76	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-076078	76 to 78	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-078080	78 to 80	7.44	5.81	7.5	0	CL
115-MW-017-080082	80 to 82	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-082084	82 to 84	7.33	6.55	11.3	0	CL/ML
115-MW-017-084086	84 to 86	7.2	6.25	11.6	0	ML/CL
115-MW-017-086088	86 to 88	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-088090	88 to 90	7.08	5.56	6.1	0	CL
115-MW-017-090092	90 to 92	*ns*	*ns*	*ns*	*ns*	CL
115-MW-017-092094	92 to 94	7.17	8.79	15.3	0	CL
115-MW-017-094096	94 to 96	7.29	10.19	10.2	0	ML
115-MW-017-096098	96 to 98	7.54	12.53	7.8	0	ML
115-MW-017-098100	98 to 100	7.21	13.14	11.2	0	ML
115-MW-017-100102	100 to 102 EOB	7.84	8.27	10.15	0	ML/CL

NOTE ns - a sample was not recovered from this interval

Summary of Laboratory Results
115-MW-017

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	TDS	Cr6 Unfiltered	Cr6 Filtered	Cr Total Unfiltered	Cr Total Filtered	Spec. Grav. @20degC
115-MW-017-026028	26 to 28	*ns*	*ns*	U	*ns*	*ns*	*ns*	*ns*
115-MW-017-028030	28 to 30	18.1	11190	U	U	37.8	2.8	1.006
115-MW-017-030032	30 to 32	20700	11800	U	U	56.7	U	1.01
115-MW-017-032034	32 to 34	20500	11600	U	U	23.3	U	1.01
115-MW-017-034036	34 to 36	20300	1000	U	U	19	U	1.01
115-MW-017-036038	36 to 38	18700	11300	U	U	15.2	U	1.35
115-MW-017-038040	38 to 40	20600	10900	U	U	19.6	U	1.01
115-MW-017-040042	40 to 42	19600	11500	U	U	26.5	U	1.01
115-MW-017-043044	43 to 44	20700	11600	U	U	10.4	U	1.01
115-MW-017-044046	44 to 46	20700	10200	U	U	13.6	U	1.01
115-MW-017-046048	46 to 48	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-048050	48 to 50	*ns*	*ns*	U	*ns*	45.8	*ns*	*ns*
115-MW-017-050052	50 to 52	*ns*	*ns*	U	*ns*	345	*ns*	*ns*
115-MW-017-052054	52 to 54	18400	12500	U	*ns*	17.9	*ns*	1.01
115-MW-017-054056	54 to 56	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-056058	56 to 58	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-058060	58 to 60	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-060062	60 to 62	18600	9720	U	U	29.4	1.6	1.01
115-MW-017-062064	62 to 64	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-064066	64 to 66	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-066068	66 to 68	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-068070	68 to 70	6880	2330	U	U	5.9	1.8	1
115-MW-017-070072	70 to 72	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-072074	72 to 74	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-074076	74 to 76	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-076078	76 to 78	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-078080	78 to 80	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-080082	80 to 82	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-082084	82 to 84	*ns*	*ns*	U	*ns*	U	*ns*	*ns*
115-MW-017-084086	84 to 86	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-086088	86 to 88	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-088090	88 to 90	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-090092	90 to 92	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
115-MW-017-092094	92 to 94	*ns*	*ns*	U	*ns*	U	*ns*	*ns*
115-MW-017-094096	94 to 96	7260	5220	U	U	1360	U	1.36
115-MW-017-096098	96 to 98	*ns*	*ns*	U	*ns*	U	U	*ns*
115-MW-017-098100	98 to 100	*ns*	*ns*	U	U	*ns*	*ns*	*ns*
115-MW-017-100102	100 to 102 EOB	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*

NOTE ns - a sample was not recovered from this interval

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
115-MW-019

Sample ID	Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Chrome 6+ (mg/L)	Soil Type
115-MW-019-020022	20 to 22	9.98	4.54	5.1	0.4	SM
115-MW-019-022024	22 to 24	ns	ns	ns	ns	SM
115-MW-019-024026	24 to 26	9.91	4.56	11.2	0	SM
115-MW-019-026028	26 to 28	7.29	4.52	15.4	0	SM
115-MW-019-028030	28 to 30	7.55	2.07	10.6	0	ML
115-MW-019-030032	30 to 32	8.4	1.34	7.6	0	ML
115-MW-019-032034	32 to 34	ns	ns	ns	ns	ML
115-MW-019-034036	34 to 36	ns	ns	ns	ns	ns
115-MW-019-036038	36 to 38	8.37	1.34	6.8	0.08	SM
115-MW-019-038040	38 to 40	8.05	1.84	5.1	0.02	SM
115-MW-019-040042	40 to 42	7.98	1.83	5.1	0	SM
115-MW-019-042044	42 to 44	7.76	1.66	6.8	0	ns
115-MW-019-044046	44 to 46	8.86	1.86	7	0.02	SM
115-MW-019-046048	46 to 48	6.34	1.59	11	0	SM
115-MW-019-048050	48 to 50	6.41	1.71	10.6	0	GP
115-MW-019-050052	50 to 52	ns	ns	ns	ns	GP
115-MW-019-052054	52 to 54	7.04	2.98	18.6	0	ML
115-MW-019-054056	54 to 56	7.19	5.56	15	0	CL
115-MW-019-056058	56 to 58	7.36	6.36	13.1	0	ML
115-MW-019-058060	58 to 60	ns	ns	ns	ns	GP
115-MW-019-060062	60 to 62	7.67	12	11	0	ML
115-MW-019-062064	62 to 64	7.74	11.84	9.6	0	ML
115-MW-019-064066	64 to 66	8.01	12.19	10.3	15	ML
115-MW-019-066068	66 to 68	7.5	11.7	14.19	200	SM
115-MW-019-068070	68 to 70	7.91	8.9	17.5	250	SM
115-MW-019-070072	70 to 72	6.82	7.3	11.4	250	SM
115-MW-019-072074	72 to 74	8.89	3.66	10	10	GP
115-MW-019-074076	74 to 76	7.4	11.73	19.3	>750	ML
115-MW-019-076078	76 to 78	7.29	19.22	19.2	>750	ML
115-MW-019-078080	78 to 80	7.17	>20	14.1	>750	CL
115-MW-019-080082	80 to 82	7.38	>20	11.6	>750	ML
115-MW-019-082084	82 to 84	7.44	>20	9.4	>750	ML
115-MW-019-084086	84 to 86	8.91	>20	5.1	>750	CL
115-MW-019-086088	86 to 88	8.19	>20	3.14	>750	CL
115-MW-019-088090	88 to 90 EOB	ns	ns	ns	ns	CL

NOTE ns - a sample was not recovered from this interval

Summary of Laboratory Results
115-MW-019

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	TDS	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
115-MW-019-020022	20 to 22	ns	ns	ns	1,050	ns	1,470	ns
115-MW-019-022024	22 to 24	ns	ns	ns	ns	ns	ns	ns
115-MW-019-024026	24 to 26	4,310	1,200	10.0 U	10.0 U	110	7	1
115-MW-019-026028	26 to 28	4,640	620	10.0 U	10.0 U	81.7	7.9	1
115-MW-019-028030	28 to 30	ns	ns	ns	10.0 U	ns	5.1	ns
115-MW-019-030032	30 to 32	ns	ns	ns	ns	ns	ns	ns
115-MW-019-032034	32 to 34	ns	ns	ns	185	ns	ns	ns
115-MW-019-034036	34 to 36	ns	ns	ns	ns	ns	ns	ns
115-MW-019-036038	36 to 38	1,470	972	10.0 U	116	142	77.4	1
115-MW-019-038040	38 to 40	1,440	900	10.0 U	21.8	150	37.6	1
115-MW-019-040042	40 to 42	1,420	1,064	10.0 U	10.0 U	228	7.9	1.01
115-MW-019-042044	42 to 44	1,410	948	10.0 U	10.0 U	103	4.2	1
115-MW-019-044046	44 to 46	ns	ns	ns	ns	ns	ns	ns
115-MW-019-046048	46 to 48	1,310	683	10.0 U	10.0 U	27.9	2.8 U	1
115-MW-019-048050	48 to 50	ns	ns	ns	ns	ns	ns	ns
115-MW-019-050052	50 to 52	ns	ns	ns	ns	ns	ns	ns
115-MW-019-052054	52 to 54	2,540	1,795	10.0 U	ns	824	ns	ns
115-MW-019-054056	54 to 56	ns	ns	ns	ns	ns	ns	ns
115-MW-019-056058	56 to 58	ns	ns	ns	10.0 U	ns	1.6 U	ns
115-MW-019-058060	58 to 60	ns	ns	ns	ns	ns	ns	ns
115-MW-019-060062	60 to 62	ns	ns	ns	10.0 U	ns	ns	ns
115-MW-019-062064	62 to 64	10,500	6,910	10.0 U	10.0 U	13	2.8 U	1
115-MW-019-064066	64 to 66	ns	ns	ns	6,410	ns	ns	ns
115-MW-019-066068	66 to 68	ns	ns	ns	139,000	ns	144,000	ns
115-MW-019-068070	68 to 70	ns	ns	ns	130,000	ns	128,000	ns
115-MW-019-070072	70 to 72	6,290	4,000	37,400	38,400	35,600	37,800	1
115-MW-019-072074	72 to 74	ns	ns	ns	ns	ns	ns	ns
115-MW-019-074076	74 to 76	9,870	8,480	1,450,000	1,450,000	1,410,000	1,490,000	1.01
115-MW-019-076078	76 to 78	1,570	8,980	2,640,000	2,610,000	2,510,000	2,690,000	1.02
115-MW-019-078080	78 to 80	ns	ns	ns	3,870,000	ns	4,030,000	ns
115-MW-019-080082	80 to 82	2,270	16,300	5,280,000	5,280,000	5,230,000	5,410,000	1.02
115-MW-019-082084	82 to 84	2,220	12,200	6,430,000	6,490,000	ns	5,960,000	1.11
115-MW-019-084086	84 to 86	ns	ns	ns	ns	ns	6,510,000	ns
115-MW-019-086088	86 to 88	ns	ns	ns	ns	ns	6,560,000	ns
115-MW-019-088090	88 to 90 EOB	ns	ns	ns	ns	ns	ns	ns

NOTE ns - a sample was not recovered from this interval
Field geologist reports that results from interval 20 to 22 ft may be cross-contaminated from carry over from drilling out the bottom of the casing

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
115-MW-20

Depth	pH	Conductivity	Temperature	Chrome 6+	Soil Type
20 to 22	6.14	7.89	-	0	SP
22 to 24	NA	NA	NA	0	SP
24 to 26	8.19	9.58	11.2	0	SP
26 to 28	8.26	9.24	9.4	0	ML
28 to 30	7.59	10.06	10.6	0	ML
30 to 32	8.36	10.36	11.3	0	SM
32 to 34	NA	NA	NA	0	SM
34 to 36	NA	NA	NA	0	SM
36 to 38	7.58	10.74	11.9	0	SM
38 to 40	7.6	10.62	11	0	SM
40 to 42	7.7	10.2	10.8	0	SM
43 to 44	7.09	11.48	10.8	0	SM
44 to 46	6.36	12.46	10	0	SM
46 to 48	6.5	12.35	10.8	0	SM
48 to 50	8.94	16.73	10.8	0	SM
50 to 52	7.64	16.53	12.3	0	SM
52 to 54	8.9	15.26	8.8	0	SM
54 to 56	Collected				CL
56 to 58	8.89	13.34	13.6	0	CL/SM
58 to 60	Collected				CL
60 to 62	Collected				CL
62 to 64	NA	NA	NA	0	CL
64 to 66	NA	NA	NA	0	CL
66 to 68	8.96	11.63	8.1	0	CL to SM
68 to 70	NA	NA	NA	0	No Recovery
70 to 72	8.63	12.16	7.6	0	SM
72 to 74	8.7	12.18	7.8	0	SM
74 to 76	8.7	12.81	8.9	0	SM
76 to 78	8.3	13.54	7.9	0	SM
78 to 80	8.1	13.67	8.5	0	SM
80 to 82	8.3	13.4	7.9	0	SM
82 to 84	8.17	12.32	8.6	0	SM
84 to 86	8.4	13.6	8.6	0	SM
86 to 88	8.02	15.4	23.1	0	SM
88 to 90	NA	NA	NA	ns	CL
90 to 92	NA	NA	NA	ns	No Recovery
EOB					

NOTE NA - not analyzed

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
Hudson Mall Location SA6-MW-AA1BR

Sample ID	Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Chrome 6+ (mg/L)	Turbidity (ntu)	Soil Type
SA6-MW-AA1BR-	20 to 22	6.93	11.49	24.8	NS	NS	SP
SA6-MW-AA1BR-	25 to 27	11.4	4.72	25	0	NS	ML
SA6-MW-AA1BR-	30 to 32	6.88	8.14	24.8	0	500	ML,SP
SA6-MW-AA1BR-	35 to 37	6.94	5.51	26.8	0	380	CL/ML,SP
SA6-MW-AA1BR-	40 to 42	8.52	4.75	29.8	NS	NS	SP
SA6-MW-AA1BR-	45 to 47	6.88	4.12	31.1	NS	NS	SP
SA6-MW-AA1BR-	50 to 52	6.58	4.5	23.8	0	140	SP
SA6-MW-AA1BR-	55 to 57	NS	NS	NS	NS	NS	SP,GW
SA6-MW-AA1BR-	60 to 62	11.38	3.61	25	NS	NS	GW
SA6-MW-AA1BR-	65 to 67	10.26	6.39	24.3	NS	NS	ML
NS	70 to 72	NS	NS	NS	NS	NS	CL/ML
NS	75 to 77	NS	NS	NS	NS	NS	CL/ML
NS	80 to 82	NS	NS	NS	NS	NS	CL/ML
	EOB						

NOTE NS - Sample not recovered from this interval

Summary of Laboratory Results
Hudson Mall Location SA6-MW-AA1BR

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	TDS (mg/l)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered(ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
SA6-MW-AA1BR-	20 to 22	10,600	7,980	<10	<10	69.8	5.7	NS
SA6-MW-AA1BR-	25 to 27	NS	NS	NS	<10	NS	NS	NS
SA6-MW-AA1BR-	30 to 32	7,580	4,410	<10	<10	29.2	<1.1	NS
SA6-MW-AA1BR-	35 to 37	5,150	3,140	<10	<10	16.0	1.7	NS
SA6-MW-AA1BR-	40 to 42	NS	NS	NS	<10	NS	NS	NS
SA6-MW-AA1BR-	45 to 47	NS	NS	NS	<10	NS	NS	NS
SA6-MW-AA1BR-	50 to 52	4,130	2,780	<10	<10	200.0	9.3	NS
SA6-MW-AA1BR-	55 to 57	NS	NS	NS	30.8	NS	NS	NS
SA6-MW-AA1BR-	60 to 62	NS	NS	NS	12.3	NS	NS	NS
SA6-MW-AA1BR-	65 to 67	NS	NS	NS	<10	NS	NS	NS
NS	70 to 72	NS	NS	NS	NS	NS	NS	NS
NS	75 to 77	NS	NS	NS	NS	NS	NS	NS
NS	80 to 82	NS	NS	NS	NS	NS	NS	NS
	EOB							

NOTE NS - Sample not recovered from this interval

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
Degan Oil Location 073-MW-1BR

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
5-7 feet	NA	NA	NA	NA	NA	SILT
7-9 feet	NA	NA	NA	125	NA	f SAND
9-11 feet	11.08	3.43	34.8	35	22	f SAND
11-13 feet	11.68	4.05	27.2	2	28	mf SAND
13-15 feet	11.6	4.72	26.6	10.5	>1000	f SAND
15-17 feet	NA	NA	NA	1.5	NA	SILT
17-19 feet	NA	NA	NA	1	NA	CLAY
19-21 feet	NA	NA	NA	NA	NA	CLAY / f SAND
25-27	6.76	>20	23.4	ND	300	mf to f SAND
30-32	NA	NA	NA	ND	>999	SILT to f SAND
35-37	NA	NA	NA	ND	500	CLAY/SILT
40-42	NA	NA	NA	ND	>999	CLAY/SILT
45-47	NA	NA	NA	ND	NA	CLAY/SILT
50-52	NA	NA	NA	ND	NA	CLAY
55-57	NA	NA	NA	ND	NA	CLAY
60-62	NA	NA	NA	ND	NA	CLAY
65-67	NA	NA	NA	ND	NA	CLAY
70-72	NA	NA	NA	ND	NA	CLAY
75-77	7.53	2.4	17.1	ND	15	CLAY to SILT
80-82	7.74	1.91	18.2	ND	19	SILT
85-87	NA	NA	NA	ND	NA	CLAY
90-92	NA	NA	NA	ND	NA	CLAY
95-97	NA	NA	NA	ND	>1000	SILT/CLAY
100-102	NA	NA	NA	ND	NA	SILT
105-107	8.24	1.29	18.9	ND	NA	SILT
110-112	NA	NA	NA	ND	NA	SILT/CLAY
115-117	NA	NA	NA	NA	NA	SILT/CLAY
EOB						

NOTE NA - not analyzed

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
Home Depot Location 117-MW-3BR

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
7.5-9.5	7.38	1.32	17.1	ND	NA	SP
10-12	6.26	1.16	19.9	ND	550	SP
12-14	6.19	0.88	20.2	ND	300	SP/OL
14-16	6.34	0.92	21.5	ND	250	SP/SM
16-18	6.37	0.83	23.6	ND	330	SP/SM
18-20	6.21	0.86	18.2	ND	75	ML/SP
20-22	6.31	0.8	18.5	ND	40	SP
22-24	6.46	0.72	19.3	0.05	110	SP
24-26	6.71	0.6	20.4	0.11	120	SP
26-28	6.85	0.67	20.4	0.07	120	SP
28-30	6.73	0.84	24.2	ND	650	SP
30-32	NA	NA	NA	ND	NA	SP
32-34	6.86	1.69	15.2	ND	65	SP
34-36	NA	NA	NA	ND	>1000	SP
36-38	NA	NA	NA	ND	NA	SP
38-40	NA	NA	NA	ND	NA	SP
40-42	NA	NA	NA	ND	NA	SP/ML/SM
42-44	NA	NA	NA	NA	NA	ML
44-46	7.34	0.62	16.5	ND	950	ML
46-48	NA	NA	NA	NA	NA	ML/CL
48-50	NA	NA	NA	ND	>1000	ML/CL
EOB						

NOTE NA - not analyzed

Table A-8
Vertical Aquifer Sampling (VAS) Data

Summary of Field Screening Results
Baldwin Steel Location 090-MW-7BR

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
5-7	NA	NA	NA	NA	NA	SP
7-9	NA	NA	NA	NA	NA	SP
9-11	10.35	1.86	26.7	14	>1000	SP
11-13	10.08	1.28	27.8	1.5	>1000	SP
13-15	9.04	0.62	25.2	12.5	190	SP
15-17	9.32	0.94	25.3	13.5	750	ML
20-22	NA	NA	NA	5	NA	SP
25-27	NA	NA	NA	110	>1000	ML
30-32	NA	NA	NA	NA	NA	ML/SM
35-37	10.48	2.41	26.2	65	500	ML
40-42	11.16	6.15	25.1	50	110	ML
45-47	NA	NA	NA	100	NA	ML
50-52	NA	NA	NA	NA	NA	ML
55-57	NA	NA	NA	325	NA	CL
60-62	9.06	13.83	25	600	>1000	ML/CL
65-67	NA	NA	NA	700	NA	SW/SP
70-72	6.98	17.59	25.5	>750	>1000	ML/CL
75-77	8.06	17.06	32.2	>750	>1000	ML/CL
80-82	9.05	13.55	21.9	>750	>1000	ML
85-87	8.85	14.3	20.8	>750	700	ML
90-92	8.65	10.7	36	>750	750	ML
95-97	NA	NA	NA	NA	NA	ML
97-99	NA	NA	NA	NA	NA	NR
100-102	NA	NA	NA	NA	NA	ML/CL
102-104	NA	NA	NA	NA	NA	ML
EOB						

NOTE NA - not analyzed

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-101

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
5 to 7	NA	NA	NA	NA	NA	SC/SM
7 to 9	11.55	5.53	15.4	35	>1000	COPR
9 to 11	NA	NA	NA	NA	NA	PT
11 to 12	NA	NA	NA	NA	NA	NA
12 to 14	NA	NA	NA	NA	NA	NA
14 to 16	NA	NA	NA	NA	NA	SP/SM
16 to 18	NA	NA	NA	NA	NA	ML
18 to 20	NA	NA	NA	NA	NA	SP
20 to 22	6.99	0.63	10.4	ND	162	SP
22 to 24	7.35	0.93	10	ND	167	ML
24 to 26	7.42	0.80	9.3	ND	275	SP/ML
26 to 28	7.60	0.78	10.5	ND	167	SP
28 to 30	NA	NA	NA	NA	NA	SM
30 to 32	7.37	0.64	10.5	ND	NA	SP/ML
32 to 34	7.73	0.76	10.0	ND	NA	SM
34 to 36	NA	NA	NA	NA	NA	SM
36 to 38	NA	NA	NA	NA	NA	ML
38 to 40	6.91	1.05	11.5	ND	129	SM
40 to 42	6.83	1.05	14.3	ND	157	ML
42 to 44	NA	NA	NA	ND	NA	ML
44 to 46	NA	NA	NA	ND	NA	SM
46 to 48	6.84	1.15	14.7	ND	162	ML
48 to 50	NA	NA	NA	NA	NA	SP
50 to 52	NA	NA	NA	NA	NA	SM
52 to 54	6.92	1.87	16.2	ND	147	SP
54 to 56	7.04	2.43	13	ND	>1000	ML/CL
56 to 58	7.04	2.43	13.1	ND	>1000	CL/ML
58 to 60	7.32	2.65	12.3	ND	>1000	ML
60 to 62	7.96	1.95	14.9	ND	>1000	CL/ML
62 to 64	7.72	1.59	13.1	ND	150	SM
64 to 66	7.33	1.55	13	1	694	CL
66 to 68	7.12	1.73	14.8	1	153	SP/ML
68 to 70	6.93	2.33	13.5	0.23	51	SP
70 to 72	NA	NA	NA	ND	>1000	ML/SM
72 to 74	7.33	2.12	14.1	ND	>1000	SW/SM
74 to 76	NA	NA	NA	NA	NA	CL
76 to 78	7.60	1.07	14	NA	>1000	ML/CL
EOB						

Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-101

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered(ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
124-PW-101-007009	7 to 9	5920	4000		58800		1
124-PW-101-020022	20 to 22	688	50U		141		1
124-PW-101-022024	22 to 24	657	50U		143		1
124-PW-101-024026	24 to 26	901	100U		195		1
124-PW-101-026028	26 to 28	788	50U		85		1
124-PW-101-030032	30 to 32		10U		692		
124-PW-101-032034	32 to 34		10U				
124-PW-101-038040	38 to 40		20U		40		1
124-PW-101-040042	40 to 42		50U		73.7		1
124-PW-101-046048	46 to 48		10U				
124-PW-101-052054	52 to 54		250U				
124-PW-101-054056	54 to 56		50U		2.8U		
124-PW-101-056058	56 to 58		2000U				
124-PW-101-058060	58 to 60		10UJ				
124-PW-101-062064	62 to 64		279R		313		1
124-PW-101-064066	64 to 66		930R		907		1
124-PW-101-066068	66 to 68		844R		1020		1
124-PW-101-068070	68 to 70		479		370		1

Table A-8 Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-102

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
6 to 8	NA	NA	NA	NA	NA	SM (COPR)
8 to 10	11.72	10.94	10.7	8	NA	SM (COPR)
10 to 12	10.09	8.26	10.5	2	108	SM (COPR)
12 to 14	NA	NA	NA	NA	NA	PT
14 to 16	NA	NA	NA	NA	NA	SP
16 to 18	NA	NA	NA	NA	NA	ML/SP
18 to 20	7.74	1.89	16	ND	>1000	
20 to 22	NA	NA	NA	NA	NA	SP
22 to 24	7.52	0.79	13.8	ND	>1000	
24 to 26	9.58	0.85	14.9	ND	>1000	
26 to 28	10.65	1.31	15.6	1.5	>1000	
28 to 30	8.64	0.64	16.0	ND	>1000	SM
30 to 32	NA	NA	NA	NA	NA	ML
32 to 34	8.69	0.74	14.3	ND	>1000	ML
34 to 36	NA	NA	NA	ND	>1000	SP
36 to 38	8.52	0.83	15.6	ND	>1000	ML/SM
38 to 40	NA	NA	NA	NA	NA	ML
40 to 42	NA	NA	NA	NA	NA	SP
42 to 44	8.92	1.06	18.1	ND	>1000	SP
44 to 46	8.39	0.88	15	ND	>1000	ML
46 to 48	7.73	0.74	14.5	ND	334	ML
48 to 50	7.42	0.84	14.5	ND	34	ML
50 to 52	NA	NA	NA	NA	NA	CL
52 to 54	7.12	1.08	13.6	ND	149	SM/SP
54 to 56	7.43	1.53	13.6	ND	258	SM
56 to 58	7.90	2.72	13.5	ND	>1000	ML
58 to 60	NA	NA	NA	NA	NA	
60 to 62	NA	NA	NA	NA	NA	CL
62 to 64	NA	NA	NA	ND	NA	
64 to 66	7.58	3.55	14.3	ND	184	ML/CL
66 to 68	NA	NA	NA	NA	NA	ML
68 to 70	7.45	1.39	16.7	ND	169	CL/ML
70 to 72	7.60	1.12	18.3	ND	104	SP
72 to 74	7.51	1.10	15.4	ND	118	SM/SP
74 to 76	NA	NA	NA	NA	NA	ML
76 to 78	NA	NA	NA	NA	NA	CL
78 to 80	NA	NA	NA	NA	NA	CL/ML
80 to 82	NA	NA	NA	NA	NA	CL
82 to 84	NA	NA	NA	NA	NA	ML/CL
EOB						

Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-102

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
124-PW-102-008010	8 to 10	7430				
124-PW-102-010012	10 to 12	54300				
124-PW-102-018020	18 to 20	10U		13.5		
124-PW-102-022024	22 to 24	50UJ		454		1
124-PW-102-024026	24 to 26	311J		1300		1.01
124-PW-102-026028	26 to 28	1180J		1940		1
124-PW-102-032034	32 to 34	100U		4200		
124-PW-102-036038	36 to 38	27.5J		24.5		
124-PW-102-040042	40 to 42	220J				
124-PW-102-044046	44 to 46	1000UJ		618		1.01
124-PW-102-046048	46 to 48	50UJ		202		1
124-PW-102-048050	48 to 50	10UJ		68.4		1
124-PW-102-068070	68 to 70	10U		37.2		1
124-PW-102-070072	70 to 72	10U		36.3		1
124-PW-102-072074	72 to 74	50U				

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-103

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
6 to 8	NA	NA	NA	NA	NA	
8 to 10	NA	NA	NA	8.5	NA	ML
10 to 12	11.15	10.10	28.1	7	27	
12 to 14	NA	NA	NA	NA	NA	
14 to 16	NA	NA	NA	4	NA	PT/SM
16 to 18	9.71	0.52	21.3	1.5	850	SP/SM
18 to 20	NA	NA	NA	1.5	NA	
20 to 22	9.42	0.80	18.7	3	>1000	SP
22 to 24	9.79	0.83	18.9	2.5	>1000	
24 to 26	8.51	1.06	24.2	ND	>1000	
26 to 28	NA	NA	NA	NA	NA	
28 to 30	8.73	1.19	28.1	ND	>1000	
30 to 32	9.49	1.25	28.1	ND	>1000	SP
32 to 34	8.64	1.37	27.7	ND	>1000	
34 to 36	8.45	1.52	29.0	ND	>1000	
36 to 38	8.22	2.00	25.6	ND	>1000	
38 to 40	8.19	2.02	25.7	ND	>1000	
40 to 42	8.27	2.19	25.5	NA	>1000	
42 to 44	NA	NA	NA	NA	NA	
44 to 46	8.42	1.92	25.9	ND	>1000	
46 to 48	NA	NA	NA	NA	NA	
48 to 50	8.10	1.50	22.2	NA	>1000	
50 to 52	7.68	1.27	21.6	ND	190	SM
52 to 54	8.11	1.29	21.7	ND	>1000	ML
54 to 56	7.27	2.04	21.2	ND	95	SM
56 to 58	7.37	3.20	23.0	ND	600	SM
58 to 60	NA	NA	NA	NA	NA	SM
60 to 62	NA	NA	NA	NA	NA	
62 to 64	7.78	8.79	23.6	ND	NA	
64 to 66	8.37	8.06	25.2	NA	NA	CL
66 to 68	7.76	6.60	24.5	ND	500	CL
68 to 70	NA	NA	NA	ND	>1000	SP
70 to 72	NA	NA	NA	ND	>1000	SP/SM
72 to 74	NA	NA	NA	NA	NA	CL
74 to 76	NA	NA	NA	NA	NA	CL
76 to 78						ML
78 to 80						CL
80 to 82						CL
82 to 84	NA	NA	NA	NA	NA	ML
84 to 86	8.05	0.98	29.3	NA	>1000	CL
86 to 88	8.38	0.41	26.8	ND	>1000	CL
88 to 90	NA	NA	NA	ND	NA	CL
90 to 92	NA	NA	NA	NA	NA	
92 to 94	8.46	0.24	26.3	NA	>1000	ML
94 to 96	8.57	0.20	26.5	NA	>1000	CL/ML
96 to 98	NA	NA	NA	NA	NA	CL
98 to 100	NA	NA	NA	NA	NA	CL
100 to 102	NA	NA	NA	NA	NA	ML
102 to 104	NA	NA	NA	NA	NA	SM
104 to 106	8.07	1.45	25.6	ND	>1000	ML
106 to 108	NA	NA	NA	NA	NA	SM
108 to 110	NA	NA	NA	NA	NA	SM
110 to 112	NA	NA	NA	NA	NA	SM
EOB						

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-103

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
124-PW-103-010012-D	10 to 12		6000		7470	
124-PW-103-014016	14 to 16	2670		1650		
124-PW-103-018020	18 to 20	990	948	2420	834	
124-PW-103-020022	20 to 22	1390	1370	3330	1580	1.01
124-PW-103-022024	22 to 24	1880	1840	5340	2290	1.01
124-PW-103-024026	24 to 26	500U	430	2770	396	1
124-PW-103-028030	28 to 30	500U	10U	1140	36.6	1
124-PW-103-030032d	30 to 32		1950		1320	
124-PW-103-032034	32 to 34	500U	66.5	1050	101	1
124-PW-103-034036	34 to 36	500U	10U	286	4.9	1
124-PW-103-036038	36 to 38	500U	10U	187	2.8U	1
124-PW-103-038040	38 to 40	500U	10U	183	2.8U	1
124-PW-103-040042d	40 to 42		20			
124-PW-103-044046	44 to 46	500U	10U	641	4.7	1
124-PW-103-048050d	48 to 50		10U			
124-PW-103-050052	50 to 52	42	47.1	478	44.8	1
124-PW-103-052054	52 to 54	25.6				
124-PW-103-054056	54 to 56	10U	10U	53.5	1.5JB	1
124-PW-103-056058d	56 to 58		12.3		11.3	
124-PW-103-058060	58 to 60	10U				
124-PW-103-066068	66 to 68	10U				
124-PW-103-086088	86 to 88	250U	10U	172	2.8U	
124-PW-103-092094	92 to 94	20UJ				
124-PW-103-094096	94 to 96	20UJ				
124-PW-103-098100	98 to 100	20UJ				
124-PW-103-104106	104 to 106	10U				

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-104

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
6 to 8	NA	NA	NA	NA	NA	CL (?)
8 to 10	NA	NA	NA	NA	NA	ML
10 to 12	NA	NA	NA	NA	NA	PT
12 to 14	8.26	13.93	28.6	ND	>1000	SM
14 to 16	NA	NA	NA	NA	NA	SP
16 to 18	7.76	0.79	28.5	ND	>1000	SP
18 to 20	8.82	0.70	19.0	ND	>1000	SP
20 to 22	9.08	0.79	23.1	1	>1000	SP
22 to 24	NA	NA	NA	NA	NA	SP
24 to 26	8.93	0.71	26.2	NA	>1000	SP
26 to 28	7.93	0.54	23.7	ND	240	SP
28 to 30	7.84	0.56	24.5	ND	380	ML
30 to 32	7.81	0.52	24.2	ND	450	SP
32 to 34	7.96	0.54	20.2	ND	29	SP/CL
34 to 36	8.06	0.62	22.6	ND	>1000	SP/ML/CL
36 to 38	NA	NA	NA	NA	NA	ML
38 to 40	NA	NA	NA	NA	NA	ML
40 to 42	7.57	0.98	26	ND	170	SP/SM
42 to 44	7.65	0.88	25.4	ND	>1000	ML
44 to 46	NA	NA	NA	NA	NA	ML
46 to 48	7.93	1.61	26.3	NA	NA	SM
48 to 50	7.85	1.48	24.9	ND	>1000	ML
50 to 52	NA	NA	NA	NA	NA	SM
52 to 54	7.74	1.57	27.8	NA	NA	SM/ML
54 to 56	NA	NA	NA	NA	NA	CL
56 to 58	7.94	0.67	29.8	ND	>1000	CL/SM
58 to 60	8.03	0.47	24.5	ND	250	CL/SM
60 to 62	8.04	0.58	25.9	ND	>1000	ML
62 to 64	8.10	1.47	27.9	NA	NA	SM
64 to 66	NA	NA	NA	NA	NA	SP
66 to 68	8.14	0.54	22.8	NA	NA	ML
68 to 70	8.17	0.59	25.1	ND	>1000	ML
70 to 72	8.37	0.74	28.1	NA	NA	ML
72 to 74	NA	NA	NA	NA	NA	CL
74 to 76	NA	NA	NA	NA	NA	CL
76 to 78	8.49	0.23	21.8	ND	>1000	ML/CL
78 to 80	NA	NA	NA	NA	NA	ML
80 to 82	NA	NA	NA	NA	NA	ML
82 to 84	NA	NA	NA	NA	NA	ML
84 to 86	NA	NA	NA	NA	NA	ML
86 to 88	NA	NA	NA	NA	NA	SM
88 to 90	NA	NA	NA	NA	NA	ML/CL
90 to 92	NA	NA	NA	NA	NA	SM
92 to 94	NA	NA	NA	NA	NA	SP
94 to 96	8.54	0.35	23.9	ND	>1000	CL
96 to 98	NA	NA	NA	NA	NA	ML/CL
98 to 100	NA	NA	NA	NA	NA	CL
100 to 102	5.24	0.23	30.1	ND	>1000	CL
102 to 104	NA	NA	NA	NA	NA	CL
104 to 106	7.90	0.48	34.1	NA	NA	TILL/SM
EOB						

Table A-8
Vertical Aquifer Sampling (VAS)
Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-104

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
124-PW-104-012014	12 to 14	1000U	10U		152	
124-PW-104-016018	16 to 18	500U	10U	268	3.2U	1
124-PW-104-018020	18 to 20	643	20.1		23.1	
124-PW-104-020022	20 to 22	500U	440	1210	411	
124-PW-104-024026D	24 to 26		396			
124-PW-104-026028	26 to 28	500U	10U	40.8	1.8J	1
124-PW-104-028030	28 to 30	50U	10U		5.2J	
124-PW-104-030032	30 to 32	50U	10U	65.1	2.9J	1
124-PW-104-032034	32 to 34	37.5	42.7	54.8	50.3	
124-PW-104-034036	34 to 36	145	65.3	244	82.1	
124-PW-104-040042	40 to 42	112	114	218	136	
124-PW-104-042044	42 to 44	123	140	255	161	
124-PW-104-046048D	46 to 48		20U			
124-PW-104-048050D	48 to 50		20U			1
124-PW-104-052054D	50 to 52		10U			
124-PW-104-056058	56 to 58	10U	10U		2.9	
124-PW-104-058060	58 to 60	50U	10U	103	1.6U	
124-PW-104-060062D	60 to 62		10U		3.2U	
124-PW-104-062064D	62 to 64		10U			
124-PW-104-066068	66 to 68	10U				
124-PW-104-068070	68 to 70	50U		4.3		
124-PW-104-070072	70 to 72	50U				
124-PW-104-076078	76 to 78	500UJ	10UJ		1.6U	
124-PW-104-094096	94 to 96	50U				
124-PW-104-100102d	100 to 102		20U			
124-PW-104-104106d	104 to 106		10U			

Table A-8
Vertical Aquifer Sampling (VAS)
Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-105

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
6 to 8	NA	NA	NA	NA	NA	SP/COPR
8 to 10	12.12	8.89	24.4	5.5	100	SC (COPR)
10 to 12	11.98	6.21	24.1	5	33	SP/COPR
12 to 14	NA	NA	NA	NA	NA	PT
14 to 16	9.82	0.68	24.6	2	>1000	
16 to 18	6.83	2.72	24.3	ND	400	SP
18 to 20	6.94	2.23	24.2	ND	380	SP
20 to 22	7.42	2.03	26.7	1	200	SP
22 to 24	NA	NA	NA	NA	NA	SP
24 to 26	7.33	1.89	27.1	NA	>1000	SP
26 to 28	NA	NA	NA	NA	NA	SP
28 to 30	7.31	1.90	23.7	ND	>1000	SP
30 to 32	7.97	1.78	24.3	ND	>1000	ML
32 to 34	8.67	2.29	23.8	NA	NA	SM
34 to 36	NA	NA	NA	NA	NA	SM
36 to 38	NA	NA	NA	NA	NA	ML
38 to 40	7.76	7.18	23.6	ND	>1000	ML
40 to 42	7.10	10.79	23.5	ND	240	SP/ML
42 to 44	7.41	8.34	24.1	NA	>1000	CL
44 to 46	7.27	7.19	27	ND	210	SP/ML/CL
46 to 48	7.59	5.79	25.1	NA	>1000	
48 to 50	7.56	4.19	25.2	ND	330	ML
50 to 52	NA	NA	NA	NA	NA	SM/ML
52 to 54	7.80	2.81	20.7	ND	>1000	ML/CL
54 to 56	7.91	2.69	21.7	ND	190	ML
56 to 58	NA	NA	NA	NA	NA	CL/ML
58 to 60	7.72	2.92	23.3	NA	NA	SM/CL
60 to 62	7.52	3.07	24	ND	40	SM
62 to 64	7.58	2.79	19.1	ND	140	SP/CL
64 to 66	NA	NA	NA	NA	NA	CL
66 to 68	7.85	1.83	23.1	ND	320	CL
68 to 70	7.89	1.24	22.9	ND	600	CL
70 to 72	NA	NA	NA	NA	NA	CL
72 to 74	7.26	1.07	23.2	NA	>1000	CL
74 to 76	NA	NA	NA	NA	NA	ML
76 to 78	NA	NA	NA	NA	NA	ML
78 to 80	NA	NA	NA	NA	NA	ML
80 to 82	9.08	0.72	19.3	ND	>1000	CL
82 to 84	NA	NA	NA	NA	NA	CL
84 to 86	NA	NA	NA	NA	NA	CL
86 to 88	NA	NA	NA	NA	NA	CL
88 to 90	8.23	0.21	22.5	NA	>1000	CL
90 to 92	8.32	0.17	23.1	NA	>1000	CL
92 to 94	8.62	0.20	26.7	NA	>1000	CL
94 to 96	NA	NA	NA	NA	NA	ML
96 to 98	NA	NA	NA	NA	NA	TILL/SM
EOB						

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-105

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
124-PW-105-008010	8 to 10	5570		5060		
124-PW-105-010012	10 to 12	5310	5060	4180	5170	
124-PW-105-014016D	14 to 16		1900			
124-PW-105-016018	16 to 18	200UJ	10UJ	285	19.8	
124-PW-105-018020	18 to 20	100UJ	10UJ	261	10.7	1
124-PW-105-020022	20 to 22	389	566	1270	576	
124-PW-105-024026D	24 to 26		10UJ			
124-PW-105-026028D	26 to 28		868			
124-PW-105-028030	28 to 30	250U	10U	127	12.4	1
124-PW-105-030032D	30 to 32		10U		109	
124-PW-105-032034D	32 to 34		43.3			
124-PW-105-038040D	38 to 40		10U			
124-PW-105-040042	40 to 42	100U	10U	16	1.6U	1
124-PW-105-042044D	42 to 44		10U		2.6	
124-PW-105-044046	44 to 46	100U	10U	21	1.6U	1
124-PW-105-046048	46 to 48	10U				
124-PW-105-048050	48 to 50	100U	10U	25.8	1.6U	1
124-PW-105-052054	52 to 54	10000U	10U	727	1.6U	
124-PW-105-054056	54 to 56	100U	10U	95.9	1.6U	
124-PW-105-058060D	58 to 60		10U		1.6U	
124-PW-105-060062	60 to 62	10U	10U	15.9	1.6U	1
124-PW-105-062064	62 to 64	10U	10U	90.4	1.6U	1
124-PW-105-066068D	66 to 68		10U			
124-PW-105-068070D	68 to 70		10U		1.6U	
124-PW-105-080082D	80 to 82		10U			
124-PW-105-088090D	88 to 90		10U		1.6UJ	
124-PW-105-090092	90 to 92	100000U	10U	181	1.6UJ	1.63
124-PW-105-092094D	92 to 94		10U			

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-106

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
6 to 8	7.33	1.87	20.8	ND	>1000	SP
8 to 10	8.43	1.04	24.3	NA	>1000	SP
10 to 12	6.58	4.79	23.3	ND	200	SM/CL
12 to 14	NA	NA	NA	NA	NA	PT
14 to 16	NA	NA	NA		NA	PT
16 to 18	6.91	5.97	15.1	ND	>1000	PT
18 to 20	NA	NA	NA	NA	NA	SM
20 to 22	NA	NA	NA	NA	NA	ML
22 to 24	8.82	2.49	17.3	ND	350	SP
24 to 26	8.80	2.53	18.2	ND	>1000	SP
26 to 28	7.21	2.81	14.9	ND	>1000	SM/ML
28 to 30	7.50	2.31	15.3	ND	>1000	SP/ML
30 to 32	7.72	2.11	16.7	ND	>1000	SM
32 to 34	NA	NA	NA	NA	NA	SP
34 to 36	7.99	2.44	20.1	NA	>1000	SP
36 to 38	7.49	3.34	18.6	ND	100	ML
38 to 40	7.71	4.28	15.7	ND	>1000	ML
40 to 42	7.36	6.91	15.8	ND	140	ML
42 to 44	NA	NA	NA	NA	NA	ML
44 to 46	7.04	15.49	17.8	ND	170	CL
46 to 48	7.17	16.76	17.3	ND	220	ML
48 to 50	7.27	15.67	18.0	NA	>1000	ML
50 to 52	NA	NA	NA	NA	NA	CL
52 to 54	7.06	8.72	26.6	NA	>1000	ML
54 to 56	7.21	14.85	20.7	ND	950	CL
56 to 58	7.38	12.76	21.2	ND	>1000	CL
58 to 60	NA	NA	NA	NA	NA	NA
60 to 62	7.53	9.22	13.9	ND	370	ML
62 to 64	7.96	8.45	15.9	NA	>1000	ML
64 to 66	NA	MNA	NA	NA	NA	ML
66 to 68	7.75	5.95	17.0	ND	190	ML
68 to 70	8.18	4.40	16.6	ND	>1000	ML
70 to 72	8.29	4.42	16.0	ND	130	ML
72 to 74	7.55	4.48	14.7	ND	190	ML
74 to 76	7.89	3.87	14.9	ND	150	ML
76 to 78	8.09	3.39	15.7	ND	270	CL
78 to 80	NA	NA	NA	NA	NA	ML/CL
80 to 82	7.56	1.76	15.3	ND	40	ML
82 to 84	NA	NA	NA	NA	NA	CL
84 to 86	8.25	1.04	19.1	NA	>1000	CL
86 to 88	NA	NA	NA	NA	NA	CL
88 to 90	NA	NA	NA	NA	NA	NA
90 to 92	8.31	0.68	16.1	NA	NA	
92 to 94	NA	NA	NA	NA	NA	
94 to 96	8.45	0.22	22.9	NA	>1000	
96 to 98	8.49	0.25	22.6	NA	>1000	
98 to 100	NA	NA	NA	NA	NA	
100 to 102	8.43	0.34	15.0	NA	>1000	
102 to 104	8.56	0.50	16.5	NA	>1000	
104 to 106	8.08	2.09	18	NA	NA	CL
110 to 112	NA	NA	NA	NA	NA	SM
112 to 114	NA	NA	NA	NA	NA	SM
EOB						

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-106

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
124-PW-106-006008F	6-8 ft		100U			
124-PW-106-008010	8-10 ft	5000U	5000U	20100	42.2	1.02
124-PW-106-010012	10-12 ft		20U	122	7.2	
124-PW-106-016018F	16-18 ft		10UJ		76.2	
124-PW-106-022024F	22-24 ft		10UJ		28U	
124-PW-106-026028	26-28 ft	250U	10U	47.3	11	
124-PW-106-028030F	28-30 ft		10U			
124-PW-106-030032F	30-32 ft		10U			
124-PW-106-034036F	34-36 ft		10U			
124-PW-106-036038	36-38 ft	100U	10U	24.7	2.8U	
124-PW-106-038040F	38-40 ft		10UJ			
124-PW-106-040042	40-42 ft	100UJ	10UJ	138	1.8	
124-PW-106-044046	44-46 ft	100UJ	10UJ	14.4	1.6U	
124-PW-106-046048F	46-48 ft		10UJ			
124-PW-106-048050F	48-50 ft	10UJ				
124-PW-106-052054F	52-54 ft		10UJ			
124-PW-106-054056F	54-56 ft		10UJ		1.6U	
124-PW-106-056058F	56-58 ft		10UJ		1.6U	
124-PW-106-058060F	58-60 ft		10UJ			
124-PW-106-060062	60-62 ft	50.3J	10U	137	1.6U	
124-PW-106-062064F	62-64 ft		10U			
124-PW-106-066068F	66-68 ft		10U		1.6U	
124-PW-106-068070F	68-70 ft		10U			
124-PW-106-070072F	70-72 ft		10U		1.6	
124-PW-106-072074	72-74 ft	50UJ	10UJ	26.2	2.8U	
124-PW-106-074076	74-76 ft	50UJ	10UJ		2.8U	
124-PW-106-076078	76-78 ft	50UJ	10UJ	37.2	2.8U	
124-PW-106-080082	80-82 ft	10UJ	10UJ	29.4	1.6U	
124-PW-106-084086F	84-86 ft		10UJ			
124-PW-106-090092F	90-92 ft		10UJ			
124-PW-106-094096F	94-96 ft		10UJ		91.6	
124-PW-106-096098F	96-98 ft		10UJ			
124-PW-106-100102F	100-102 ft		10UJ			
124-PW-106-102104F	102-104 ft		10UJ			
124-PW-106-104106F	104-106 ft		10UJ			

Table A-8 Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Roosevelt Bowling Lanes Location 124-MW-107

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
6 to 8	12.12	5.40	20	1.5	300	ML/SM
8 to 10	12.21	10.73	17.5	17.5	45	ML
10 to 12	12.16	11.27	21.8	4.0	29	ML
12 to 14	NA	NA	NA	NA	NA	NA
14 to 16	NA	NA	NA	NA	NA	NA
20 to 22	6.90	4.68	23.8	ND	80	SM
22 to 24	7.15	3.43	25.9	ND	>1000	SP
24 to 26	6.93	3.37	32.2	ND	55	SP
26 to 28	7.04	2.87	31.1	ND	>1000	ML
28 to 30	7.29	3.65	19.7	ND	19	ML
30 to 32	7.35	3.49	21.1	ND	>1000	SP
32 to 34	7.22	4.30	22.3	ND	75	SP
34 to 36	7.69	3.83	24.5	ND	>1000	SP
36 to 38	7.16	7.62	25.6	ND	220	SM/ML
38 to 40	6.98	11.09	29.3	ND	100	SP
40 to 42	7.05	12.19	21.0	ND	380	SM
42 to 44	NA	NA	NA	NA	NA	CL
44 to 46	6.83	19.93	24.4	ND	>1000	ML
46 to 48	7.01	15.36	26.7	ND	650	ML
48 to 50	6.83	19.90	29.5	ND	150	SM/ML
50 to 52	6.93	16.33	27.4	ND	45	CL
52 to 54	7.08	15.56	19.2	ND	29	CL
54 to 56	7.24	13.01	20.6	ND	210	CL
56 to 58	7.24	12.43	25.0	ND	450	SM
58 to 60	7.51	11.24	23.1	ND	140	ML
60 to 62	7.51	10.19	25.4	ND	70	ML
62 to 64	7.44	11.10	24.8	ND	170	ML
64 to 66	7.25	11.87	17.1	ND	90	CL/SM
66 to 68	7.20	12.83	17.7	ND	100	ML
68 to 70	7.22	12.84	19.2	ND	120	SM
70 to 72	7.27	11.57	20.4	ND	170	ML
72 to 74	NA	NA	NA	NA	NA	CL
74 to 76	7.38	10.38	16.4	ND	29	ML
76 to 78	NA	NA	NA	NA	NA	CL
78 to 80	7.22	4.85	19.1	ND	320	ML
80 to 82	NA	NA	NA	NA	NA	CL
82 to 84	7.52	2.60	20.0	ND	500	CL
84 to 86	NA	NA	NA	NA	NA	CL
86 to 88	NA	NA	NA	NA	NA	CL
88 to 90	8.17	1.15	16.5	NA	>1000	ML
90 to 92	8.34	0.64	17.1	NA	>1000	CL/ML
92 to 94	NA	NA	NA	NA	NA	CL
94 to 96	NA	NA	NA	NA	NA	CL
96 to 98	NA	NA	NA	NA	NA	CL
98 to 100	NA	NA	NA	NA	NA	CL
100 to 102	NA	NA	NA	NA	NA	CL
102 to 104	8.17	1.84	18	NA	>1000	SC
104 to 106	7.84	1.25	17.3	ND	85	SM
EOB						

Table A-8 Vertical Aquifer Sampling (VAS)

Summary of Laboratory Results
Roosevelt Bowling Lanes Location 124-MW-107

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	TDS (mg/l)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)
124-PW-107-006008F	6-8 ft				10UJ		2680
124-PW-107-008010F	8-10 ft			10100J	10100J	9560	10300
124-PW-107-010012F	10-12 ft				2270J		
124-PW-107-020022F	20-22 ft			100U	10U	20	14.1
124-PW-107-022024F	22-24 ft			500U	10U	1020	10.9
124-PW-107-024026F	24-26 ft			100U	10U	59.9	10.9
124-PW-107-026028F	26-28 ft			500U	10U	372	8.2
124-PW-107-028030F	28-30 ft			10UJ	10UJ	38.4	9.8
124-PW-107-030032F	30-32 ft			500UJ	10UJ	144	40U
124-PW-107-032034F	32-34 ft			20UJ	10UJ	40.4	8U
124-PW-107-034036F	34-36 ft				10UJ		
124-PW-107-036038F	36-38 ft			50UJ	10UJ	39.1	8U
124-PW-107-038040F	38-40 ft			50UJ	10UJ	44.5	8U
124-PW-107-040042F	40-42 ft			20UJ	10UJ	60.1	8U
124-PW-107-044046F	44-46 ft			250U	10U	103	8.7
124-PW-107-046048F	46-48 ft			50U	10U	82.9	8U
124-PW-107-048050F	48-50 ft			20U	10U	65.8	8U
124-PW-107-050052F	50-52 ft			10U	10U	39.6	8U
124-PW-107-052054F	52-54 ft			20UJ	10UJ	8.1	1.6U
124-PW-107-054056F	54-56 ft				10UJ		8U
124-PW-107-056058F	56-58 ft			100UJ	10UJ	28.4	8U
124-PW-107-058060F	58-60 ft			20UJ	10UJ	21.5	8U
124-PW-107-060062F	60-62 ft			20UJ	10UJ	21.3	8U
124-PW-107-062064F	62-64 ft			20UJ	10UJ	22.6	8U
124-PW-107-064066F	64-66 ft			20UJ	10UJ	11.4	8U
124-PW-107-066068F	66-68 ft			20UJ	10UJ	23.9	8U
124-PW-107-068070F	68-70 ft			20UJ	10UJ	18.8	8U
124-PW-107-070072F	70-72 ft			20UJ	10UJ	95.3	8U
124-PW-107-074076F	74-76 ft			400UJ	10UJ	15.9	1.6U
124-PW-107-078080F	78-80 ft			100UJ	10UJ		1.6U
124-PW-107-082084F	82-84 ft				10UJ		
124-PW-107-088090F	88-90 ft				10U		
124-PW-107-090092F	90-92 ft			5000U	10U		1.6U
124-PW-107-102104F	102-104 ft				10U		
124-PW-107-104106F	104-106 ft			10U	10U	42.3	1.6U

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Home Depot Location 117- MW-I3

Depth (ft)	pH	Temperature (°C)	Cr6+ (mg/L)	ORP (mv)	Soil Type
9 to 11	NA	NA	NA	NA	
13 to 15	NA	NA	NA	NA	CL/ML
20 to 22	12.02	19.2	14	52.1	SM
25 to 27	NA	NA	NA	30	SM
30 to 32	13.03	8.7	8.5	-41.3	SP/SM
35 to 37	7.34	10.2	400	305.1	SP/SM
40 to 42	7.76	10.5	2.5	232	SM/SP

EOB

Summary of Laboratory Results
Home Depot Location 117- MW-I3

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Sulfate (mg/l)
117-MW-I3-020022-1	20-22 ft	19700		53700		40.5
117-MW-I3-025027-1	25-27 ft	29000		52000		58.1
117-MW-I3-030032-1	30-32 ft	11300				
117-MW-I3-035037-1	35-37 ft	333000		287000		1170
117-MW-I3-040042-1	40-42 ft	40700		32700		587

Table A-8
Vertical Aquifer Sampling (VAS)
Summary of Field Screening Results
Home Depot Location 117- MW-I4

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
28 to 30	NA	NA	NA	NA		ML
34 to 36	8.19	120.5	14.1	40		CL
40 to 42	8.07	7.7	14.4	15		ML/SP
46 to 48	NA	NA	NA			ML/CL
52 to 54	NA	NA	NA	NA		CL
58 to 60	6.92	277.7	15	NA		CL
60 to 62	6.87	307.0	13.3	>750		CL/ML
66 to 68	6.88	265.9	12.0	>750		CL/ML/SM
68 to 70	12.39	-89.2	13.3	650		SM/SC
75 to 77	7.57	244.9	11.5	>750		CL/ML
80 to 82	12.14	-64.5	10.5	750		CL
85 to 87	9.45	43.9	11.2	70		CL
90 to 92	8.21	88.5	10.3	600		ML
95 to 97	10.86	14.4	12.6	600		SM
100 to 102 EOB				NA		

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Laboratory Results
Home Depot location 117-MW-I4

Depth	Cr +6	N, Nitrate +Nitrit	N, Nitrate	Fe, Ferrous	N, Nitrite	Alkalinity, Total as CaCO3	Total Organic C	Chloride	Sulfate	Al	Sb	As	Ba	Be	Cd	Ca
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
12'-14'	115	5.1	2.6	<2.0	2.5	267	22.1	93.1	151	161000	268	315	< 2000	< 10	< 40	<50000
16'-18'	65.7								278	1530	77	63.5	< 200	< 1.0	< 4.0	18600
22'-24'	147								79.5	17400	7.8	14.6	256	1.7	< 4.0	20000
34'-36'	59.3	0.31	0.12	< 0.10	0.19	419	6.5	62.7	268	9530	< 30	< 40	< 1000	< 5.0	< 20	56300
40'-42'	8.8								120	5060	< 6.0	< 8.0	< 200	< 1.0	< 4.0	68400
58'-60'	6920															
60'-62'	6580	<5.0	<5.1	1.1	0.23	6180	24.2	2590	3350	37600	12800	<400	<10000	<250	<200	1960000
66'-68'	3820								1610	26400	6950	<800	<20000	<100	<400	774000
68'-70'	501									20300	<120	<40	<1000	<5.0	<20	190000
75'-77'	2390								2620	1200000	301	537	10700	117	48.3	4270000
80'-82'	673								1600	1260	199	470	<2000	<10	<40	795000
85'-87'	605								1930	216000	<12	140	1610	21.6	15.4	2650000
90'-92'	988								1840	1200000	<150	741	13100	129	<100	6670000
95'-97'	410								1700	24300	143	263	<2000	<10	<40	994000

Depth	Cr	Co	Cu	Fe	Pb	Mg	Mn	Hg	Ni	K	Se	Ag	Na	Tl	V	Zn
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
12'-14'	229000	< 500	< 250	142000	87.8	< 50000	405	2.2	< 400	< 50000	< 100	< 100	218000	< 100	< 500	227
16'-18'	56500	< 50	28	1830	24.5	< 5000	37.7	< 0.20	< 40	14200	< 10	< 10	227000	< 10	< 50	29
22'-24'	33100	< 50	129	23700	95.8	11300	2290	< 0.20	41	7940	< 10	< 10	105000	< 10	56.1	114
34'-36'	55600	< 250	180	10100	23.4	< 25000	287	< 0.20	< 200	34300	< 50	< 50	244000	< 50	< 250	131
40'-42'	8440	< 50	50.6	5380	11.4	11800	201	< 0.20	< 40	46800	< 10	< 10	112000	< 10	< 50	39.2
58'-60'																
60'-62'	7330000	<2500	<1300	40100	<150	591000	2210	<0.80	<2000	<250000	<500	<500	5760000	<2500	<2500	<1000
66'-68'	2630000	<5000	<2500	31400	345	<500000	<1500	<0.80	<4000	<500000	<1000	<1000	2450000	<1000	<5000	<2000
68'-70'	413000	<250	<130	25100	67.5	<25000	750	<0.80	<200	47000	<50	<50	608000	<50	<250	189
75'-77'	1390000	784	1840	1780000	1460	999000	79000	<8.0	1920	436000	<100	<100	2050000	<500	2850	4880
80'-82'	594000	<50	<250	<1000	37.7	<50000	75.1	<0.80	<40	<50000	<100	<100	1440000	<100	<500	<200
85'-87'	38500	189	472	284000	231	238000	30700	<8.0	367	104000	<20	<20	1480000	<20	476	997
90'-92'	441000	<1300	2160	1510000	1460	1200000	116000	<8.0	2280	398000	<250	<250	1360000	<500	2630	6830
95'-97'	477000	<50	<250	23800	<30	<50000	1130	<0.80	<40	<50000	<100	<100	1520000	<100	<500	<200

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Home Depot Location 117- MW-D3

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Soil Type
9 to 11	NA	NA	NA	NA	SP
13 to 15	6.93	-37.5	17.0	ND	SP
20 to 22	10.68	-37.0	18.3	1.5	SM
25 to 27	7.10	68.8	18.3	ND	SP
30 to 32	NA	NA	NA	NA	SP
35 to 37	NA	NA	NA	NA	ML/CL
40 to 42	8.47	-260.5	16.8	ND	SP/SM
45 to 47	NA	NA	NA	NA	ML
50 to 52	NA	NA	NA	NA	ML
55 to 57	NA	NA	NA	NA	CL/ML
60 to 62	8.02	-57.8	16.4	ND	ML
65 to 67	NA	NA	NA	NA	CL/ML
70 to 72	8.14	-54	11.7	ND	SM/SP
75 to 77	7.80	-50	11.9	ND	ML
80 to 82	8.19	-35	12.9	ND	ML/SM
EOB					

Summary of Laboratory Results
Home Depot Location 117- MW-D3

Sample ID	Depth (ft)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered (ug/l)	Cr Total Filtered (ug/l)	Sulfate (mg/l)
117-MW-D3-013015-1	13-15 ft	10U		945		221
117-MW-D3-020022-1	20-22 ft	1600J		2130		67.8
117-MW-D3-025027-1	25-27 ft	57J		358		77
117-MW-D3-030032-1	30-32 ft	1100J				
117-MW-D3-035037-1	35-37 ft	2000J				
117-MW-D3-040042-1	40-42 ft	10U		94.7J		75.9
117-MW-D3-060062-1	60-62 ft	10U		36.3J		627
117-MW-D3-070072-1	70-72 ft	10U		17.9		716
117-MW-D3-075077-1	75-77 ft	10U				
117-MW-D3-080082-1	80-82 ft	10U		40.9		24.5

Table A-8
Vertical Aquifer Sampling (VAS)

Summary of Field Screening Results
Hudson Mall Location SA6-MW-5BR

Depth (ft)	pH	Conductivity (mS)	Temperature (°C)	Cr6+ (mg/L)	Turbidity (ntu)	Soil Type
20 to 22	6.93	11.49	24.8	NA	NA	SP
25 to 27	11.40	4.72	25	NA	NA	ML
30 to 32	6.88	8.14	24.8	0	500	ML/SP
35 to 37	6.94	5.51	26.8	0	380	CL/ML/SP
40 to 42	8.52	4.75	29.8	NA	NA	SM
45 to 47	6.88	4.12	31.1	NA	NA	SP
50 to 52	6.58	4.50	23.8	0	140	SP
55 to 57	NA	NA	NA	NA	NA	SP
60 to 62	11.38	3.61	25	NA	NA	GW
65 to 67	10.26	6.39	24.3	NA	NA	ML
70 to 72	NA	NA	NA	NA	NA	CL/ML(till)
75 to 77	NA	NA	NA	NA	NA	CL/ML (till)

Summary of Laboratory Results
Hudson Mall Location SA6-MW-5BR

Sample ID	Depth (ft)	Spec Conductance (umhos/cm)	Cr6 Unfiltered (ug/l)	Cr6 Filtered (ug/l)	Cr Total Unfiltered(ug/l)	Cr Total Filtered (ug/l)	Spec. Grav. @20degC
OSBR-MW-05-020022	20 to 22	10600	10UJ		69.8		
OSBR-MW-05-025027	25 to 27		10UJ				
OSBR-MW-05-030032	30 to 32	7580	10UJ		29.2		
OSBR-MW-05-035037	35 to 37	5150	50UJ		16		1
OSBR-MW-05-040042	40 to 42		10UJ				1
OSBR-MW-05-045047	45 to 47		10UJ				
OSBR-MW-05-050052	50 to 52	4130	20UJ		9.3J		
OSBR-MW-05-055057	55 to 57		30.8J				1
OSBR-MW-05-060062	60 to 62		12.3J				
OSBR-MW-05-065067	65 to 67		10UJ				

APPENDIX B-1

BORING LOGS

(PROVIDED ON CD)

APPENDIX B-2

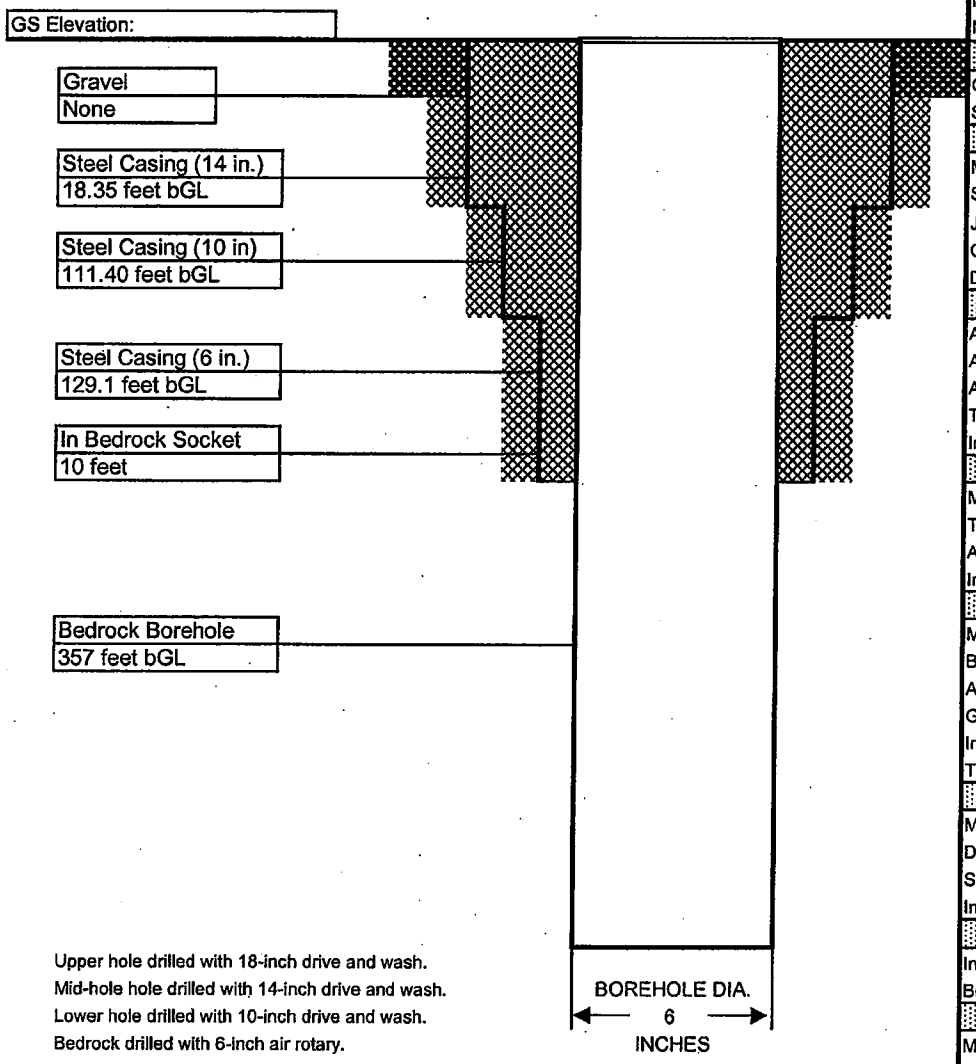
MONITORING WELL CONSTRUCTION DETAILS

Boring and Well Construction Logs

73-MW-1BR
73-MW-3BR
73-MW-10BR
79-MW-13BR
90-MW-7BR
90-MW-18BR
117-MW-D1
117-MW-D2
117-MW-D3
117-MW-I1
117-MW-I2
117-MW-I3
117-MW-I4
117-MW-I5
119-MW-01T
119-MW-02T
119-MW-2BR
119-MW-4BR
119-MW-11BR
119-MW-12BR
119-MW-16BR
124-MW-8BR
124-MW-17BR
124-MW-101
124-MW-102
124-MW-103
124-MW-104
124-MW-105
124-MW-106
124-MW-107
140-MW-9BR
SA6-MW-5BR
SA6-MW-14BR
SA6-MW-15BR
KP-MW-6BR

TRIPLE CASED WELL CONSTRUCTION LOG

WELL NO.:	073-MW-1BR	FACILITY/SITE NAME:	Degen Oil
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B & B Drilling
DATE START:	1-Jul-04	DATE END:	30-Aug-04
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 18-inch drive and wash.
Mid-hole hole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NO, FLUTE WELL
GUARD POSTS	
Material:	Steel, Concrete-Filled
No. & Size:	Three, 3" Diameter
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 129.1 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	NA
Slot Size & Type:	NA
Interval BGS:	NA
SUMP	
Interval BGS:	NA
Bottom Cap:	NA
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	NA

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 1 of 13 **WELL NO.** 073-MW-1BR **Location:** Degen Oil	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 1, 2004 / 1050 (Ground Surface)
Date/Time Finish: July 7, 2004 / 1715 (21 feet)

Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Concrete Surface Material (0-0.7)		
						Gray; cmf GRAVEL, little Clay, little cmf Sand; brick, micaceous grains; loose; wet (0.7-1.5)	GC	
1								
						Dark Gray; cmf SAND, some mf Gravel, trace Silt; hydrocarbon odor; loose; wet (1.5-3.5)	SW	
2								
						Brown; CLAY; very soft; moist (3.5-5.0)		
3								
4							CL	
						Hand dig to 5 feet.		
5	SP	4	1.7	NA	5 to 7	Light Gray; SILT, some mf Sand; white grains throughout; very stiff; moist to wet. COPR present.	ML (COPR)	pH: NA; mS: NA; Temp: NA; ntu. NA
		4						
6		12						
		50/3"						
7	SP	65	1.3	125	7 to 9	Light Gray; f SAND, trace Silt; shell fragments; very dense; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		87						
8		100/2"						
9	SP	40	1.2	35	9 to 11	Gray; f SAND, littsle mf Gravel; dense; saturated.		pH: 11.08; mS: 3.43; Temp: 34.8; ntu. 22
		27						
10		15					SP	
		11						
11	SP	6	1.3	2	11 to 13	Gray; mf SAND, trace f Gravel; medium dense; saturated.		pH: 11.68; mS: 4.05; Temp: 27.2; ntu. 28
		10						
12		8						
		12						
13	SP	7	1.5	10.5	13 to 15	Gray; f SAND, trace c Sand; medium dense; saturated.		pH: 11.60; mS: 4.72; Temp: 26.6; ntu. >1000
		5						
14		7						
		5						
15	SP	1	1.1	1.5	15 to 17	Red Gray; SILT, trace c Sand; soft; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		2					ML	
16		2						
		2						
17	SP	1	1.4	1	17 to 19	Red Gray; CLAY; soft; saturated (17.0-17.9).	CL	pH: NA; mS: NA; Temp: NA; ntu. NA
		2				Black; CLAY; organic odor; soft; saturated (17.9-18.1).		
18		2						
		2					OL	
19	SS	1	2		19 to 21	Black; CLAY; organic odor; soft; saturated (19.0-19.2).		
		3						
20		5						
		3						
21						Drilled to 25 feet.		
22								
23								
24								
25	SP	9	1.3	ND	25 to 27	Gray; fm SAND, trace cmf Gravel; medium dense; saturated (25.0-26.0).	SP	pH: 6.76; mS: >20; Temp: 23.4; ntu. 300
		10						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:
Permanent 14 inch steel casing installed to 18.35 feet.

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	PARSONS DRILLING RECORD PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	BORING/ WELL NO. 073-MW-1BR Sheet 2 of 13 Location: Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 9, 2004 / 1010 (25 feet)
Date/Time Finish: August 4, 2004 / 1300 (129 feet)

Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26		12				Gray; f SAND, and Silt; medium dense; saturated (26.0-26.3).	SM	
		10						
27						Drilled to 30 feet.		
28								
29								
30	SP	10	1.1	ND	30 to 32	Brown; SILT; thin seams of f Sand; very stiff; saturated (30.0-30.8).	ML	pH: NA, mS: NA, Temp: NA, ntu. >1000
		16						
31		10				Brown; f SAND, some Silt; very stiff; saturated (30.8-31.1).	SM	
		8						
32						Drilled to 35 feet.		
33								
34								
35	SP	4	1	ND	35 to 37	Gray Brown; CLAY/SILT; thin seams of f Sand; stiff; saturated.	CL/ML	pH: NA, mS: NA, Temp: NA, ntu. 500
		5						
36		9						
		8						
37						Drilled to 40 feet.		
38								
39								
40	SP	3	1	ND	40 to 42	Brown; CLAY/SILT; very stiff; saturated (40.0-40.7).	CL/ML	pH: NA, mS: NA, Temp: NA, ntu. NA
		5				Brown; SILT; medium stiff; saturated (40.7-41.0).	ML	
41		15						
		20						
42						Drilled to 42 feet.		
43								
44								
45	SP	3	1	ND	45 to 47	Brown; CLAY/SILT; medium stiff; saturated (45.0-45.5).	CL/ML	pH: NA, mS: NA, Temp: NA, ntu. NA
		1				Brown; SILT; medium stiff; saturated (45.5-46.0).	ML	
46		5						
		6						
47						Drilled to 50 feet.		
48								
49								
50	SP	1	2	ND	50 to 52	Red Brown; CLAY, trace c Sand to f Gravel; soft; saturated	CL	pH: NA, mS: NA, Temp: NA, ntu. NA
		WOR						
51		2						
		2						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 3 of 13 073-MW-1BR
Driller:	Ed Blewett		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Expanded Bedrock Investigation	Degen Oil	
Rig Type:	Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 9, 2004 / 1010 (25 feet)
Date/Time Finish: August 4, 2004 / 1300 (129 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
52						Drilled to 55 feet.					
53											
54											
55	SP	1	2	ND	55 to 57	Red Brown; CLAY; soft; saturated.	CL	pH	mS:	Temp:	ntu.
		1						NA	NA	NA	NA
56		1									
		1									
57						Drilled to 60 feet.					
58											
59											
60	SP	1	2	ND	60 to 62	Red Brown; CLAY; trace c Sand to mf Gravel; soft; saturated.	CL	pH	mS:	Temp:	ntu.
		2						NA	NA	NA	NA
61		2									
		3									
62						Drilled to 65 feet.					
63											
64											
65	SP	1	2	ND	65 to 67	Red Brown; CLAY; trace c Sand to f Gravel; soft; saturated.	CL	pH	mS:	Temp:	ntu.
		1						NA	NA	NA	NA
66		2									
		3									
67						Drilled to 70 feet.					
68											
69											
70	SP	1	1.3	ND	70 to 72	Red Brown; CLAY, trace mf Gravel; soft; saturated.	CL	pH	mS:	Temp:	ntu.
		1						NA	NA	NA	NA
71		2									
		2									
72						Drilled to 75 feet.					
73											
74											
75	SP	1	2	ND	75 to 77	Red Brown; CLAY; very soft; saturated (75.0-76.8).	CL	pH	mS:	Temp:	ntu.
		WOR				Red Brown; SILT; very soft; saturated (76.8-77.0).		7.53	2.40	17.1	15
76		1									
		10					ML				
77						Drilled to 80 feet.					

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 4 of 13 073-MW-1BR
Driller:	Ed Blewett		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Expanded Bedrock Investigation	Degen Oil	
Rig Type:	Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 9, 2004 / 1010 (25 feet)
Date/Time Finish: August 4, 2004 / 1300 (129 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SP	6	1.6	ND	80 to 82	Rewd Brown; SILT some Clay; medium stiff; saturated.	ML	pH 7.74 mS: 1.91 Temp: 18.2 ntu. 19
		3						
81		3						
		7						
82						Drilled to 85 feet.		
83								
84								
85	SP	1	2	ND	85 to 87	Red Brown; CLAY, trace f Sand to m Gravel; medium stiff; saturated.	CL	pH NA mS: NA Temp: NA ntu. NA
		2						
86		3						
		6						
87						Drilled to 90 feet.		
88								
89								
90	SP	3	2	ND	90 to 92	Red Brown; CLAY, trace mf Gravel; c Sand seams; stiff; saturated.	CL	pH NA mS: NA Temp: NA ntu. NA
		5						
91		9						
		11						
92						Drilled to 95 feet.		
93								
94								
95	SP	5	2	ND	95 to 97	Red Brown; SILT/CLAY; medium stiff; saturated.	ML/CL	pH NA mS: NA Temp: NA ntu. >1000
		4						
96		3						
		6						
97						Drilled to 100 feet.		
98								
99								
100	SP	16	1	ND	100 to 102	Red Brown; SILT; stiff; saturated.	ML	pH NA mS: NA Temp: NA ntu. NA
		14						
101		8						
		10						
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 073-MW-1BR	Sheet 5 of 13
		Location: Degen Oil	

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	See Daily Report
Date					Date/Time Start:	July 9, 2004 / 1010 (25 feet)
Time					Date/Time Finish:	August 4, 2004 / 1300 (129 feet)
Meas. From					Weight of Hammer	300 Lbs.
					Drop of Hammer	30 Inches
					Type of Hammer	mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SP	14	0.9	ND	105 to 107	Red Brown; SILT, trace f Sand, trace- f Gravel; hard; saturated.	ML	pH 8.24, mS: 1.29, Temp: 18.9, ntu. NA
		19						
106		16						
		31						
107						Drilled to 110 feet	ML/CL	
108								
109								
110	SP	18	1.1	ND	110 to 112	Red Brown; SILT/.CLAY, little cmf Gravel, trace+ cmf Sand; hard; wet (TILL).		pH NA, mS: NA, Temp: NA, ntu. NA
		29						
111		26						
		41						
112						Drilled to 115 feet.		
113								
114								
115	SP	5	2	NA	115 to 117	Red Brown; SILT/.CLAY, little+ cmf Gravel, little- cmf Sand; hard; moist to wet.		pH NA, mS: NA, Temp: NA, ntu. NA
		10						
116		47						
		75						
117						Drlled to 119 feet.		
118								
119	SS	50/0"	0	NA	119 to 121	No Recovery. Very hard drilling at 119 feet.	BEDROCK	
120								
121						Drilled to 129 feet.		
122								
123								
124								
125								
126								
127								
128								
129	C		9.3	NA	129 to 139	Red Brown; fine-grained SANDSTONE; angular to subangular; weathered (129.0-130.1).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLEF

COMMENTS:
Permanent 10" steel casing installed to 111.40 feet. Permanent 6" steel casing installed to 129.1 feet.

Contractor: B&B Drilling Driller: T. Smith, Dave Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 073-MW-1BR	Sheet 6 of 13
		Location: Degen Oil	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: August 16, 2004 / 1230 (129 feet)
Date/Time Finish: August 19, 2004 / 1320 (329 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Light Red Brown; fine-grained SANDSTONE; angular to subrounded; weathered (130.1-132.1).		
131					Gray Brown; fine-grained SANDSTONE; angular to subangular; 45° fracture with reddish brown fracture filling; 133.8 feet; 60° fracture at 134.1 feet (132.1-137.1).		
132					Gray Brown; MUDSTONE/SILTSTONE; whitish fracture and vug fillings (137.1-137.5).		
133					Gray Brown; fine-grained SANDSTONE; angular to subrounded; abundant dark gray, lenticular mudstone inclusions (137.5-138.3).		
134							
135							
136							
137							
138					RQD = 83%		
139	C		9.5	NA	139 to 149 Gray Brown; fine-grained SANDSTONE; subangular; 60° fracture at 140.0 feet; 60° fracture at 141.8 feet; sparse mudstone structures at 142.4-143.0 feet; whitish vug filling at 143.3 feet (139.0-144.6).		
140					Brown; SILTSTONE; calcareous; light gray to whitish patches; thin calcite-filled fractures.(144.6-148.5).		
141							
142							
143							
144							
145							
146							
147							
148					RQD = 85%		
149	C		9.9	NA	149 to 159 Brown; SILTSTONE; calcareous (149.0-150.3).		
150					Light Gray to Red Brown; fine-grained SANDSTONE; weathered at 150.7-150.8; calcareous (150.3-151.9).		
151					Brown; SILTSTONE; fine-grained Sandstone lenses (151.9-152.8).		
152					Light Gray to Brown; fine-grained SANDSTONE; dark gray Siltstone laminations at 153.0-153.4; calcareous (152.8-154.2).		
153					Gray Brown; SILTSTONE; minor fine-grained Sandstone laminations and lenses (154.2-154.9).		
154					Gray Brown; SANDSTONE; brown below 158.0 feet; calcareous (154.9-158.9).		
155							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 7 of 13 073-MW-1BR
Driller:	T. Smith, Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Expanded Bedrock Investigation	Degen Oil	
Rig Type:	Mobile B-57, Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS					Weather: See Daily Report	Location Description:
Water Level					Date/Time Start: August 16, 2004 / 1230 (129 feet)	
Date					Date/Time Finish: August 19, 2004 / 1320 (329 feet)	
Time					Weight of Hammer NA	
Meas. From					Drop of Hammer NA	
					Type of Hammer NA	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
156						Continued from above.		
157								
158						RQD = 98%		
159	C		9.6	NA	159 to 169	Gray Brown; SANDSTONE; subangular to subrounded; calcareous (159.0-159.2). Brown to Gray Brown; SILTSTONE; white calcite veinlets at 159.2-159.8 feet; 30° fracture with light gray fracture-filling at 160.8 feet;light gray calcareous patches at 163.5-164.6 feet (159.2-164.6). Brown; fine-grained SANDSTONE; subangular; calcareous (164.6-164.9). Gray Brown; SILTSTONE; light gray calcareous patches (164.9-165.3). Brown; very fine-grained SANDSTONE; subangular (165.3-165.4). Gray Brown; SILTSTONE (165.4-165-6). Brown; very fine-grained SANDSTONE; subangular (165.6-166.1). Gray Brown; SILTSTONE (166.1-166.6). Brown; very fine-grained SANDSTONE; subangular (166.6-166.7). Gray Brown; SILTSTONE; light gray calcareous patches at 166.7-167.2 feet, white calcite fillings and possible bedding planes dipping 10°-15° at 167.2-167.5 feet, light gray calcareous patches at 167.5-167.9 feet, brown below 167.9 feet (166.7-168.6). RQD = 86%		
160								
161								
162								
163								
164								
165								
166								
167								
168								
169	C		10	NA	169 to 179	Brown to Gray Brown; SILTSTONE; six thin fractures with white fracture filling material (non calcareous) dipping ~20°-25° at 171.8-174.6). Brown; SANDSTONE; subangular to subrounded; weathered; broken up from 174.6-175.0 feet (174.6-175.9). Gray Brown; SANDSTONE; subangular; calcareous cement (175.9-179.0).		
170								
171								
172								
173								
174								
175								
176								
177								
178						RQD = 89%		
179	C		10	NA	179 to 189	Brown to Gray Brown; fine-grained SANDSTONE; subangular to subrounded; calcareous cement (179.0-179.3). Brown to Gray Brown; SILTSTONE; cream-colored mottling at 179.9-181.8 feet; 80° calcite-filled fracture at 184.0 feet; whitish calcareous patches and stringers at 185.0-186.3 feet; 80° calcite-filled fracture		
180								
181								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: T. Smith, Dave Myerchin
Inspector: Mike Wilkinson
Rig Type: Mobile B-57, Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

Weather: See Daily Report
Date/Time Start: August 16, 2004 / 1230 (129 feet)
Date/Time Finish: August 19, 2004 / 1320 (329 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

BORING/ WELL NO. 073-MW-1BR

Location: Degen Oil

Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
182						at 86.0 feet; small cavity at 189.0 feet (179.3-189.0).		
183								
184								
185								
186								
187								
188						RQD = 93%		
189	C		10	NA	189 to 199	Gray Brown; SILTSTONE; cream-colored mottling/cavity fillings; small cavities at 189.0-189.2 feet (189.0-189.7). Brown; very fine-grained SANDSTONE; weathered (189.7-190.0). Gray Brown; SILTSTONE; whitish calcareous zones at 190.9, 191.0, and 191.4-191.8 feet (190.0-192.6). Gray Brown; very fine-grained; SANDSTONE; 60° fractures at 193.3 feet (192.6-194.2). Gray Brown; SILTSTONE (194.2-195.0). Gray Brown; SILTSTONE with very fine-grained Sand; 60° fracture at 196.1 feet (195.0-196.8). Brown; SANDSTONE; angular to subangular; weathered at 198.2-198.7 feet (196.8-199.0).		
190								
191								
192								
193								
194								
195								
196								
197								
198						RQD = 98%		
199	C		10	NA	199 to 201	Brown; fine-grained SANDSTONE; angular to subangular (199.0-200.1). Gray Brown; very fine-grained; SANDSTONE; subangular; calcareous cement; 60° fractures at 202.5 and 202.9 feet (200.1-203.2). Gray Brown; SILTSTONE; white radiating calcite crystals at 206.3 feet; calcareous patches at 208.6-208.8 feet (203.2-209.0).		
200								
201								
202								
203								
204								
205								
206								
207								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: T. Smith, Dave Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-57, Ingersoll Rand T4W	PARSONS DRILLING RECORD PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	BORING/ WELL NO. 073-MW-1BR	Sheet 9 of 13
		Location: Degen Oil	

GROUNDWATER OBSERVATIONS						
Water Level					Weather: See Daily Report Date/Time Start: August 16, 2004 / 1230 (129 feet) Date/Time Finish: August 19, 2004 / 1320 (329 feet)	Location Description:
Date						
Time					Weight of Hammer NA	
Meas. From					Drop of Hammer NA Type of Hammer NA	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above. RQD = 98%		
209	C		9.7	NA	209 to 219 Gray Brown; SILTSTONE (209.0-211.1). Brown; very fine-grained SANDSTONE, trace muscovite; angular to subangular; calcareous cement (211.1-212.5). Gray Brown; SILTSTONE; whitish patches at 212.5 to 212.9 feet and 213.5 to 213.7 feet; fracture at 214.2 feet dips 10°-15° (212.5-214.6). Brown; fine-grained SANDSTONE; angular to subangular; mottled (214.6-216.1). Gray Brown; very fine-grained SANDSTONE; angular to subangular; calcareous cement (216.1-218.7). RQD = 95%		
210							
211							
212							
213							
214							
215							
216							
217							
218							
219	C		8.3	NA	219 to 229 Brown to Gray Brown; very fine to fine-grained SANDSTONE; subangular to subrounded; calcareous cement (219.0-220.2). Gray Brown; SILTSTONE (220.2-223.0). Dark Gray; SILTSTONE; whitish calcareous patches (223.0-224.4). Brown; MUDSTONE; possibly laminated (224.4-227.3). RQD = 60%		
220							
221							
222							
223							
224							
225							
226							
227							
228							
229	C		9	NA	229 to 239 Brown: MUDSTONE; possibly laminated (229.0-232.0). Gray Brown; SILTSTONE; laminated; calcite cavity fillings at 232.9 feet (232.0-233.3). Gray Brown; SILTSTONE; fine-grained Sand laminations; whitish calcite fillings at 233.9 to 234.1 feet (233.3-234.1). Gray Brown; SILTSTONE; with zones of fine-grained Sand; calcareous cement (234.1-235.1). Dark Gray; SILTSTONE; light gray calcareous blebs crosscut by thin calcite veinlets at 236.2-236.7 feet; weakly calcareous cement (235.1-237.8).		
230							
231							
232							
233							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLEF

Contractor: B&B Drilling Driller: T. Smith, Dave Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 073-MW-1BR	Sheet 10 of 13
		Location: Degen Oil	

GROUNDWATER OBSERVATIONS					Weather: See Daily Report Date/Time Start: August 16, 2004 / 1230 (129 feet) Date/Time Finish: August 19, 2004 / 1320 (329 feet) Weight of Hammer NA Drop of Hammer NA Type of Hammer NA	**Location Description:**
Water Level						
Date						
Time						
Meas. From						

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Gray Brown; SILTSTONE, some fine-grained Sand (237.8-238.0).		
235							
236							
237							
238					RQD = 70%		
239	C		9.9	NA	239 to 249 Gray Brown; SILTSTONE, some fine-grained Sand (239.0-239.6).		
240					Gray; SILTSTONE (239.6-240.0). Brown; very fine-grained SANDSTONE, Silty (240.0-240.5). Gray Brown to Dark Gray; SILTSTONE; thin calcite stringer at 242.0 feet (240.5-242.7). Red Brown; very fine-grained SANDSTONE; subangular; calcareous cement (242.7-243.8). Green Gray; fine-grained SANDSTONE; subangular to subrounded; weakly calcareous cement; brown mottling from 245.2 to 246.9 feet; (245.0-248.4). Dark Gray; fine-grained SANDSTONE; cement with honeycomb-like appearance (248.4-248.8). Green Gray; fine-grained SANDSTONE; subangular to subrounded; calcareous cement (248.8-249.0).		
241							
242							
243							
244							
245							
246							
247							
248					RQD = 95%		
249	C		9.6	NA	249 to 259 Green Gray; very fine-grained SANDSTONE; subangular to subrounded (249.0-249.5). Gray Brown; very fine- to fine-grained SANDSTONE; subrounded to rounded (249.5-251.7). Gray Brown; fine-grained SANDSTONE; subangular to subrounded (251.7-252.4). Green Gray; fine-grained SANDSTONE; subangular (252.4-255.6). Light Gray to Gray Brown; very fine- to fine-grained SANDSTONE; subangular (255.6-258.6).		
250							
251							
252							
253							
254							
255							
256							
257							
258					RQD = 96%		
259	C		10	NA	259 to 269 Gray Brown; fine- to medium-grained SANDSTONE; subangular to subrounded; (259.0-259.5).		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLEF

Contractor: B&B Drilling **Driller:** T. Smith, Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 073-MW-1BR Sheet 11 of 13 **Location:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: August 16, 2004 / 1230 (129 feet)
Date/Time Finish: August 19, 2004 / 1320 (329 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
260						Dark Gray; MUDSTONE; almost vertical calcite veinlet at 260.3 to 261.4 feet; calcite veinlets and cavity fillings at 261.6 to 262.4 feet (259.5-265.2). Gray; SILTSTONE; thin calcite veinlets (265.2-266.2). Gray Brown; very fine-grained SANDSTONE; subangular to subrounded; almost vertical calcite veinlets at 266.2 to 267.0 feet (266.2-267.9). Light Gray; very fine-grained SANDSTONE; subangular to subrounded; calcareous cement (267.9-268.7). Light Gray to Gray Brown; fine-grained SANDSTONE; subangular to subrounded; calcareous cement (268.7-269.0).		
261								
262								
263								
264								
265								
266								
267								
268						RQD = 99%		
269	C		9.5	NA	269 to 279	Gray Brown; fine-grained SANDSTONE; subangular to subrounded (269.0-269.4). Light Gray; fine-grained SANDSTONE; subangular to subrounded; calcareous cement (269.4-169.7). Brown to Dark Gray; MUDSTONE/SHALE; convoluted calcareous Sandstone lenses at 274.0-274.7 feet (269.7-274.7). Light Gray to Gray; SILTSTONE; sparse calcite veinlets; calcareous cement below 276.7 feet (274.7-278.7). Light Gray; MUDSTONE; abundant calcareous clasts (278.7-279.0).		
270								
271								
272								
273								
274								
275								
276								
277								
278						RQD = 74%		
279	C		10	NA	279 to 289	Light Gray; MUDSTONE; abundant calcareous clasts (279.0-279.6). Dark Gray; SILTSTONE (279.6-282.9). Gray Brown; fine-grained SANDSTONE; subrounded; weathered zones at 285.3 to 285.5 feet, 285.8 to 286.1 feet, and 286.3 to 286.6 feet; light gray calcareous zones at 285.5 to 285.8 feet and 286.1 to 286.3 feet (282.9-286.6). Dark Gray; SILTSTONE; Sandy at 287.3 to 287.5 feet; calcareous at 287.3 to 288.3 feet (286.6-289.0).		
280								
281								
282								
283								
284								
285								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: T. Smith, Dave Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 12 of 13 **WELL NO.** 073-MW-1BR **Location:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: August 16, 2004 / 1230 (129 feet)
Date/Time Finish: August 19, 2004 / 1320 (329 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
286						Continued from above.		
287								
288								
						RQD = 98%		
289	C		10	NA	289 to 299	Gray; SILTSTONE; calcite-filled veinlets dip ~30° at 289.8 feet, 290.6 feet, and 292.4 feet (289.0-293.0).		
						Darg Gray to Gray Brown; MUDSTONE; granular calcareous lenses and clasts at 293.0 to 294.6 feet and 295.2 to 296.1 feet (293.0-296.2).		
290								
291						Gray; SILTSTONE (296.2-297.5).		
						Brown to Gray Brown; very fine- to fine-grained SANDSTONE; angular to subangular; weathered at 297.6 to 297.9 feet and 298.2 to 298.7 feet (297.5-298.8).		
292								
293						Gray Brown; SILTSTONE; with pockets of Sand (298.8-299.0).		
294								
295								
296								
297								
298								
						RQD = 91%		
299	C		9.9	NA	299 to 309	Gray Brown; SILTSTONE; with pockets of Sand (299.0-299.2).		
						Gray Brown to Dark Gray; SILTSTONE; calcareous; calcite-filled veinlet dips ~30° at 302.4 feet (299.2-304.6).		
300								
						Brown; fine-grained SANDSTONE; subangular; weathered appearance (304.6-304.9).		
301								
						Dark Gray; MUDSTONE; calcareous granular lenses and clasts at 304.9 to 305.8 feet and 308.3 to 309.0 feet (304.9-308.9).		
302								
303								
304								
305								
306								
307								
308								
						RQD = 99%		
309	C		10	NA	309 to 319	Dark Gray; SILTSTONE; calcite vein (1/8" wide) at 310.1 to 311.1 feet dips ~80° (309.0-311.1).		
						Brown to Gray Brown; very fine-grained SANDSTONE; angular to subangular; brown mottling (311.1-313.2).		
310								
						Gray; very fine-grained SANDSTONE; angular to subangular; well cemented (313.2-316.0).		
311								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** T. Smith, Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 073-MW-1BR Sheet 13 of 13 **Location:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: August 16, 2004 / 1230 (129 feet)
Date/Time Finish: August 19, 2004 / 1320 (329 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

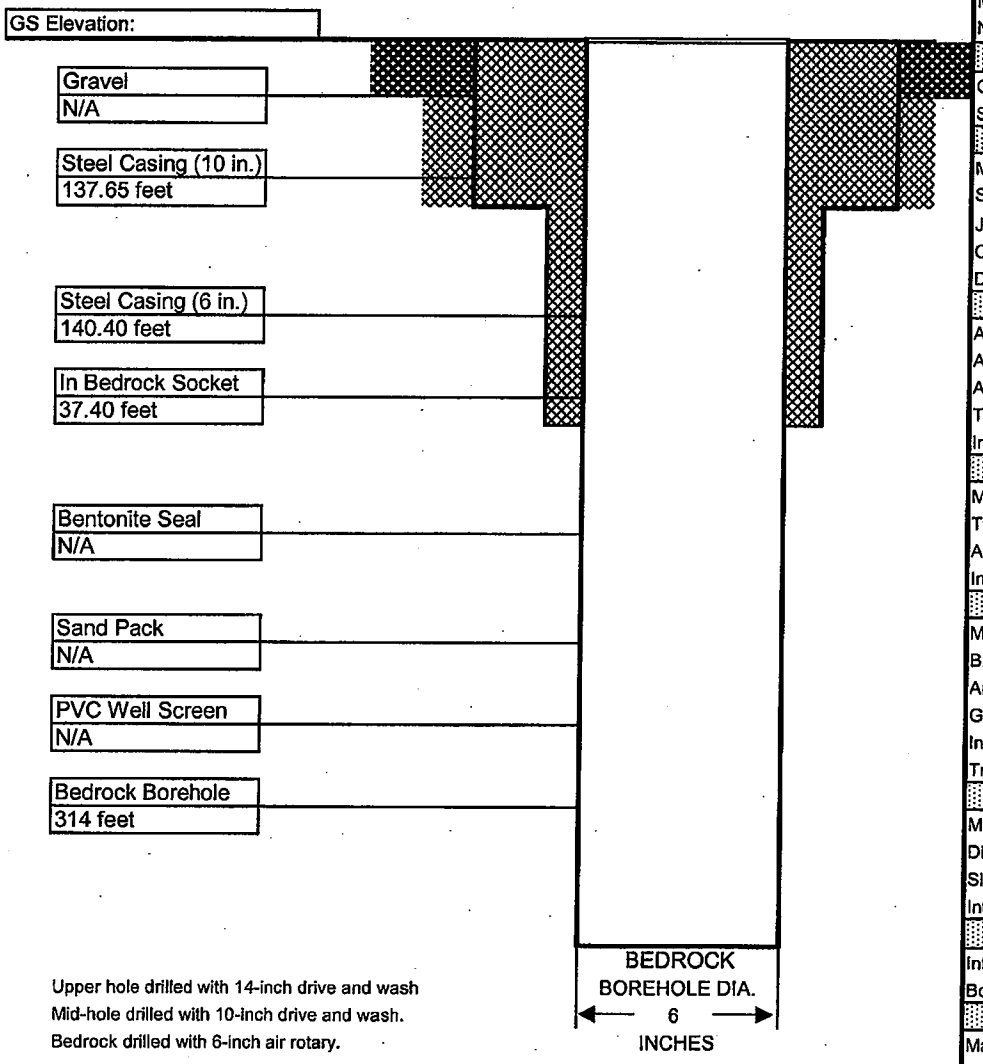
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Gray Brown; very fine- to fine-grained SANDSTONE; angular to subangular (316.0-318.6).		
313					Dark Gray; SILTSTONE (318.6-319.0).		
314							
315							
316							
317							
318							
319					RQD = 100% Drilled to 329 feet.		
320							
321							
322							
323							
324							
325							
326							
327							
328							
329							
330					End of Borehole at 329 feet.		
331							
332							
333							
334							
335							
336							
337							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	117-MW-3BR	FACILITY/SITE NAME:	Home Depot
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	30-Nov-04	DATE END:	17-Dec-04
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Dual Rotary / Bedrock Coring



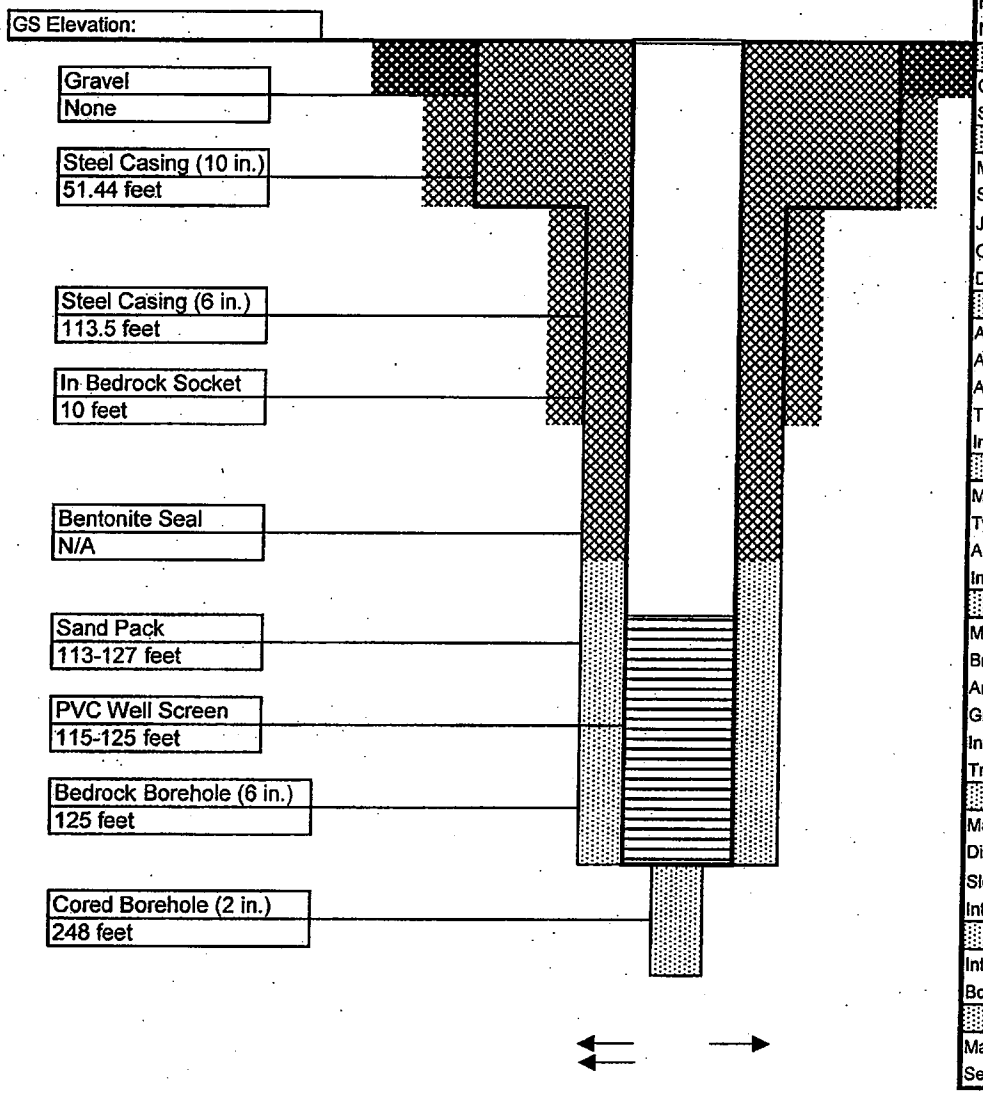
Upper hole drilled with 14-inch drive and wash
Mid-hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Watertight Seal:	YES
Flushmount:	YES
Weep Hole:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	SACRETE
Size:	36" CIRCULAR
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 140.4 FEET
SEAL	
Material:	NONE
Type:	N/A
Amount Used:	N/A
Interval:	N/A
FILTER PACK	
Material:	NONE
Brand Name:	NA
Amount Used:	NA
Grain Size Dist.:	NA
Interval:	NA
Tremied:	NA
SCREEN	
Material:	NONE
Diameter:	NA
Slot Size & Type:	NA
Interval BGS:	NA
SUMP	
Interval BGS:	NONE
Bottom Cap:	NONE
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	NA

Figure C1 5.2

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	117-MW-8BR	FACILITY/SITE NAME:	Home Depot
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	4-Oct-04	DATE END:	29-Dec-04
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	40
Joint Type:	THREADED
O-ring:	YES
Diameter:	2 INCHES
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0-113 feet,127-248 feet
SEAL	
Material:	NONE
Type:	N/A
Amount Used:	N/A
Interval:	N/A
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	NA
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	113-127 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	115-125 FEET
SUMP	
Interval BGS:	NA
Bottom Cap:	NA
BACKFILL PLUG	
Material:	GROUT, 125-248 FEET
Setup/Hydration Time:	5 DAYS

Figure C1 5.2

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 117-MW-3BR

Location: Home Depot

Location Description: Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Weather: October 4, 2004 - Sunny, 56°-72°F; October 5, 2004 - Sunny, 53°-62°F
Date/Time Start: October 4, 2004 / 1230 (Ground Surface)
Date/Time Finish: October 14, 2004 / 1200 (51 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 6	Asphalt Surface Material (0-0.2).		
						Light Brown; f SAND, little+ cmf Gravel; loose; moist (0.2-1.0).	SP	
1						Dark Brown; c GRAVEL; loose; moist (1.0-2.0).	GP	
						Orange; f SAND; loose; moist (2.0-6.0).		
2								
3								
							SP	
4								
5								
						Hand dig to 6 feet.		
6						Drilled to 7.5 feet.		
7								
	SP	8	2.0	ND	7.5 to 9.5	Brown; mf SAND; medium dense; saturated.		pH 7.83 | mS: 1.32 | Temp: 17.1 | ntu. NA
8		8					SP	
		19						
9		23						
						Drilled to 10 feet.		
10	SP	14	1.1	ND	10 to 12	Light Brown; mf SAND; rust color from 10.9-11.1 feet; medium dense; saturated.		pH 6.26 | mS: 1.16 | Temp: 19.9 | ntu. 550
		13						
11		12					SP	
		11						
12	SP	5	1.5	ND	12 to 14	Light Brown; f SAND; dense; saturated (12.0-12.1).	SP/OL	pH 6.19 | mS: 0.88 | Temp: 20.2 | ntu. 300
		15				Dark Gray Brown; CLAY; organic odor; very stiff; wet (12.1-12.2).		
13		18				Gray; mf SAND, trace f Gravel; dense; saturated (12.2-13.5).	SP	
		24						
14	SP	18	1.6	ND	14 to 16	Gray; mf SAND, trace c Gravel; dense; saturated (14.0-14.2).		pH 6.34 | mS: 0.92 | Temp: 21.5 | ntu. 250
		22				Brown; mf SAND, trace cmf Gravel; dense; saturated (14.2-15.0).		
15		23				Red Brown; f SAND, and Silt, trace mf Gravel; hard; saturated (15.0-15.6).	SM	
		28						
16	SP	17	1.7	ND	16 to 18	Brown; mf SAND, little cmf Gravel, trace Silt; dense; saturated (16.0-16.8).	SP	pH 6.37 | mS: 0.83 | Temp: 23.6 | ntu. 330
		18				Red Brown; mf SAND, some- Silt, little+ cmf Gravel; dense; saturated		
17		17				(16.8-17.7).	SM	
		14						
18	SP	12	1.6	ND	18 to 20	Brown; SILT, and- f Sand, little- cmf Gravel; hard; saturated (18.0-18.2).	ML	pH 6.21 | mS: 0.86 | Temp: 18.2 | ntu. 75
		18				Brown to Gray Brown; f SAND; dense; saturated (18.2-19.6).		
19		27						
		27						
20	SP	8	0.9	ND	20 to 22	Gray Brown; f SAND; medium dense; saturated.		pH 6.31 | mS: 0.80 | Temp: 18.5 | ntu. 40
		14						
21		14					SP	
		16						
22	SP	10	1.1	0.05	22 to 24	Gray Brown; mf SAND, trace c Sand to m Gravel; medium dense; saturated .		pH 6.46 | mS: 0.72 | Temp: 19.3 | ntu. 110
		8						
23		9						
		11						
24	SP	7	1.3	0.11	24 to 26	Gray Brown; mf SAND, trace- c Sand to cmf Gravel, trace Silt; medium dense; saturated .		pH 6.71 | mS: 0.60 | Temp: 20.4 | ntu. 120
		9						
25		9						
		9						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech					**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236							**BORING/ WELL NO.** Sheet 2 of 13 117-MW-3BR **Location:** Home Depot				
GROUNDWATER OBSERVATIONS					Weather: October 6, 2004 - Sunny, 46°-64°F October 7, 2004 - Sunny, 52°-74°F Date/Time Start: October 4, 2004 / 1230 (Ground Surface) Date/Time Finish: October 14, 2004 / 1200 (51 feet) Weight of Hammer 300 Lbs. Drop of Hammer 30 Inches Type of Hammer mechanical							**Location Description:** Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.				
Water Level															
Date															
Time															
Meas. From															
Sample Depth	**Sample Type**	**Blows per 6"**	**Rec. (feet)**	**Cr+6 mg/L**	**FIELD IDENTIFICATION OF MATERIAL**							**Soil Classification**	**COMMENTS**		
26	SP	5	1.0	0.07	**26 to 28**	Gray Brown; mf SAND, trace c Sand to f Gravel; medium dense; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		6											6.85	0.67	20.4	120
27		8														
		10														
28	SP	5	1.3	ND	**28 to 30**	Gray Brown; mf SAND, trace c Sand to f Gravel; medium dense; saturated (28.0-28.6).							**pH**	**mS:**	**Temp:**	**ntu.**
		7											6.73	0.84	24.2	650
29		8				Gray Brown; f SAND, trace Silt; medium dense; saturated (28.6-29.3).										
		12														
30	SP	8	0.9	ND	**30 to 32**	Brown to Gray Brown; f SAND, trace m Sand, trace Silt; dense; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		13											NA	NA	NA	NA
31		19														
		19														
32	SP	9	1.4	ND	**32 to 34**	Gray Brown; f SAND; dense; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		16											6.86	1.69	15.2	65
33		21										SP				
		27														
34	SP	7	1.2	ND	**34 to 36**	Gray Brown; f SAND; dense; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		14											NA	NA	NA	>1000
35		19														
		21														
36	SP	5	1.5	ND	**36 to 38**	Light Brown; f SAND; dense; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		13											NA	NA	NA	NA
37		24														
		26														
38	SP	14	1.7	ND	**38 to 40**	Light Brown; f SAND; dense; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		24											NA	NA	NA	NA
39		23														
		27														
40	SP	14	1.5	ND	**40 to 42**	Light Brown; f SAND; very dense; saturated (40.0-40.3).							**pH**	**mS:**	**Temp:**	**ntu.**
		26				Light Brown; SILT, and f Sand; hard; saturated (40.3-41.0).						ML	NA	NA	NA	NA
41		26				Light Brown; f SAND, little Silt; very dense; saturated (41.0-41.5).						SM				
		28														
42	SP	14	1.3	NA	**42 to 44**	Red Brown; SILT; laminated; hard; saturated (42.0-43.0).						ML	**pH**	**mS:**	**Temp:**	**ntu.**
		16				Red Brown; SILT, some Clay; hard; saturated (43.0-43.3).						ML/CL	NA	NA	NA	NA
43		17														
		16														
44	SP	16	1.5	ND	**44 to 46**	Red Brn; SILT, trace+ cmf Gravel, trace f Sand; hard; sat (44.0-44.3).							**pH**	**mS:**	**Temp:**	**ntu.**
		22				Red Brn; SILT, some cmf Sand, little cmf Gravel; hard; sat (44.3-44.8).						ML	NA	NA	NA	NA
45		24				Red Brn; SILT, trace+ cmf Gravel, trace f Sand; hard; sat (44.3-44.8).										
		18														
46	SP	10	1.4	NA	**46 to 48**	Red Brown; SILT, some Clay, trace cmf Gravel; hard; saturated.							**pH**	**mS:**	**Temp:**	**ntu.**
		12											NA	NA	NA	NA
47		19														
		26										ML/CL				
48	SP	21	1.8	ND	**48 to 50**	Red Brown; SILT/CLAY, trace+ cmf Gravel; hard; moist to wet.							**pH**	**mS:**	**Temp:**	**ntu.**
		20											NA	NA	NA	NA
49		17														
		26														
50						Drilled to 55 feet.										
51																

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 117-MW-3BR Sheet 3 of 13

Location: Home Depot

Location Description:
Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 8, 2004 - Sunny, 57°-76°F
October 11, 2004 - Mostly Sunny, 51°-63°F
Date/Time Start: October 18, 2004 / 1330 (51 feet)
Date/Time Finish: October 27, 2004 / 1050 (113 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SP	4	2.0	ND	55 to 57	Red Brown; SILT, little Clay; hard; saturated (55.0-56.3).		pH | mS: | Temp: | ntu.
		17				Red Brown; CLAY/SILT; hard; saturated (56.3-57.0).	ML	NA | NA | NA | >1000
56		21						
		35					CL/ML	
57						Drilled to 60 feet.		
58								
59								
60	SP	11	1.8	NA	60 to 62	Brown; CLAY/SILT; hard; moist to wet.		pH | mS: | Temp: | ntu.
		19					ML/CL	NA | NA | NA | NA
61		21						
		25						
62						Drilled to 65 feet.		
63								
64								
65	SP	4	2.0	NA	65 to 67	Brown; CLAY, trace- cmf Sand to f Gravel; very stiff; moist to wet.		pH | mS: | Temp: | ntu.
		7					CL	NA | NA | NA | NA
66		11						
		16						
67						Drilled to 70 feet.		
68								
69								
70	SP	4	1.3	NA	70 to 72	Brown; CLAY, trace- f Gravel; stiff; moist.		pH | mS: | Temp: | ntu.
		5					CL	NA | NA | NA | NA
71		8						
		11						
72						Drilled to 75 feet.		
73								
74								
75	SP	4	1.3	ND	75 to 77	Brown; CLAY, trace- f Gravel; stiff; moist.		pH | mS: | Temp: | ntu.
		5					CL	NA | NA | NA | NA
76		6						
		9						
77						Drilled to 80 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

PARSONS
DRILLING RECORD

PROJECT NAME:	Expanded Bedrock Investigation
PROJECT NUMBER:	441286-23236

BORING/ WELL NO. 117-MW-3BR — Sheet 4 of 13

Location: Home Depot

Location Description: Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:	October 12, 2004 - Mostly Sunny, 47°-65°F
	October 13, 2004 - Mostly Sunny, 48°-68°F
Date/Time Start:	October 18, 2004 / 1330 (51 feet)
Date/Time Finish:	October 27, 2004 / 1050 (113 feet)
Weight of Hammer	300 Lbs.
Drop of Hammer	30 Inches
Type of Hammer	mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SP	6	1.5	ND	80 to 82	Brown; CLAY, trace+ C Sand to c Gravel; very stiff; moist to wet.		pH: NA; mS: NA; Temp: NA; ntu.: NA
		7					CL	
81		10						
		15						
82						Drilled to 85 feet.		
83								
84								
85	SP	4	1.1	ND	85 to 87	Brown; CLAY, little- cmf Gravel; stiff; moist to wet.		pH: NA; mS: NA; Temp: NA; ntu.: >1000
		7					CL	
86		7						
		11						
87						Drilled to 90 feet.		
88								
89								
90	SP	12	1.0	ND	90 to 92	Brown; CLAY, little+ cmf Sand, trace mf Gravel; very stiff; saturated (90.0-90.8).		pH: NA; mS: NA; Temp: NA; ntu.: NA
		13					CL	
91		15				Brown; CLAY, trace mf Gravel; very stiff; wet (90.8-91.0).		
		18						
92						Drilled to 95 feet.		
93								
94								
95	SS	4	2.0	NA	95 to 97	Brown; CLAY, trace- f Sand to c Gravel; very stiff; moist to wet.		pH: NA; mS: NA; Temp: NA; ntu.: NA
		6					CL	
96		10						
		12						
97						Drilled to 100 feet.		
98								
99								
100	SP	6	0.9	ND	100 to 102	Brown; CLAY; stiff; wet to saturated.		pH: 8.57; mS: 0.30; Temp: 14.4; ntu.: >1000
		6					CL	
101		9						
		12						
102	SS					Drilled to 105.5 feet.		
103						Very hard drilling at 103 feet.	BEDROCK	

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Blewett, Smith, Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech, Mobile B-57, Dual Rotary DR-24	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 5 of 13 **WELL NO.** 117-MW-3BR **Location:** Home Depot

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 14, 2004 - Mostly Cloudy with Light Rain, 56°-63°F
October 18, 2004 - Mix of Sun and Clouds, 46°-60°F
Date/Time Start: November 2, 2004 / 1110 (113 feet)
Date/Time Finish: November 2, 2004 / 1350 (133 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Drilled to 105.5 feet.		
105								
	SS	10	0.1	NA	105.5 to 107	Sandstone and Siltstone rock fragments.		
106		63						
		66						
107						Drilled to 113 feet.		
108								
109								
110								
111								
112								
113	C		2.1	NA	113 to 123	Light Gray; fine-grain SANDSTONE; subangular to rounded (0.4 ft). Brown; SILTSTONE; fracture dips 60°; calcareous (0.8 ft). Dark Gray; SILTSTONE (0.9 ft).		
114								
115								
116								
117								
118								
119								
120								
121								
122						RQD = 9%		
123	C		1.6	NA	123 to 133	Fragments of Brown Siltstone, Light Brown fine-grained Sandstone, Brown fine-grained Sandstone, and Dark Gray Siltstone.		
124								
125								
126								
127								
128								
129								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett, D. Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-61, Dual Rotary DR-24	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 117-MW-3BR Sheet 6 of 13 **Location:** Home Depot

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 19, 2004 - Cloudy with Rain, 49°-56°F
October 21, 2004 - Cloudy, 48°-54°F
Date/Time Start: November 11, 2004 / 1200 (133 feet)
Date/Time Finish: November 17, 2004 / 1045 (220 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
130						Continued from above.		
131								
132						RQD = 0%		
133						Spin temporary 3" casing to 137.5 feet.		
134								
135						Drilling became softer at 135 feet.		
136								
	C		1.1	NA	136.4 to 137.5	Light Brown; fine-grained SANDSTONE; angular to subangular.		
137								
	C		5.5	NA	137.5 to 144.25	Dark Gray; SILTSTONE (137.5-138.1).		
138						Dark Gray; SILTSTONE; light gray Sandy layering; burrows (138.1-138.7).		
139						Light Gray; Sandy SILTSTONE; light brown Sandstone and dark gray Siltstone layering; disturbed bedding (138.7-138.9).		
140						Light Brown; fine-grained SANDSTONE; weathered (138.9-139.0).		
141						Dark Gray; SILTSTONE; light gray to greenish gray discontinuous layering; mottled (139.0-142.8).		
142						Dark Gray to Light Gray; SILTSTONE; cross-bedding (142.8-143.0).		
143						RQD = 64%		
144	C		1.75	NA	144.25 to 146	Dark Gray; SILTSTONE; thin light gray and black discontinuous layering; 75° fracture with non-calcareous fracture filling from 144.75-145.5 feet.		
145						RQD = 100%		
146	C		9.0	NA	146 to 155	Dark Gray; SILTSTONE; parting along bedding planes, bedding planes dip 15°-17° (146.0-146.8).		
147						Light Gray to Gray; SILTSTONE; bedding planes dip 15°-17°; discontinuous bedding at 147.4-147.8 and 148.5-148.6 feet; burrows or mud cracks at 147.0-147.4 and 147.9-148.1 feet; calcareous cement at 148.1-148.3 feet (146.8-148.6).		
148						Dark Gray; SILTSTONE; parting along bedding planes; bedding planes dip 10°, abundant pyrite along bedding planes (148.6-151.8).		
149						Dark Gray; SILTSTONE; discontinuous light gray layering (151.8-153.5).		
150						Light Gray Brown; SILTSTONE; thin dark gray layers at 153.9-154.1 feet; thin medium gray layering throughout; hairline fractures dip 75° at 153.6-153.9 and 154.3-154.7 feet (153.5-155.0).		
151								
152								
153								
154						RQD = 95%		
155	C		10.0	NA	155 to 165	Cream to Light Gray; SILTSTONE; thin discontinuous sandy layering (155.0-156.5).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor: B&B Drilling	**PARSONS**	**BORING/**	Sheet 7 of 13
Driller: Ed Blewett, D. Myerchin	**DRILLING RECORD**	**WELL NO.**	117-MW-3BR
Inspector: Mike Wilkinson	PROJECT NAME: Expanded Bedrock Investigation	**Location:**	
Rig Type: Mobile B-61, Dual Rotary DR-24	PROJECT NUMBER: 441286-23236	Home Depot	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 22, 2004 - Mostly Cloudy, 48°-54°F
October 25, 2004 - Mostly Cloudy, 48°-58°F
Date/Time Start: November 11, 2004 / 1200 (133 feet)
Date/Time Finish: November 17, 2004 / 1045 (220 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Dark Gray; SILTSTONE; parting along bedding planes, pyrite along bedding planes; irregular layering at 156.5-157.5 feet; light gray from 159.5-159.6 feet (156.5-160.5).		
157					Light Gray; Sandy SILTSTONE (160.5-161.3).		
158					Cream to Light Gray; SILTSTONE; light gray above 160.6 feet; gray sandy patches at 162.8-163.5 feet; hairline fracture at 163.5-163.9 feet (161.3-164.2).		
159					Gray to Dark Gray; SILTSTONE; irregular and discontinuous layering (164.2-164.5).		
160					Gray; SILTSTONE; burrows; parting along bedding planes, bedding planes dip ~15°; thin calcite-filled fractures dip ~75° (164.5-165.0).		
161							
162							
163							
164					RQD = 98%		
165	C		9.9	NA	165 to 175 Gray; SILTSTONE; cross-bedding; pyrite along bedding planes; near vertical fracture with calcareous fracture filling from 165.0-165.3 feet (165.0-165.7).		
166					Gray to Dark Gray; Sandy SILTSTONE; discontinuous layering; possible burrows/bioturbation; mottled (165.7-167.3).		
167					Dark Gray; SILTSTONE; thin light gray discontinuous layering at 167.6 and 168.4 feet (167.3-168.9).		
168					Light Gray to Dark Gray; SILTSTONE; cross-bedding; discontinuous layering (168.9-169.9).		
169					Gray to Light Gray; Sandy SILTSTONE; mottled (169.9-171.6).		
170					Dark Gray; SILTSTONE; discontinuous layering (171.6-173.0).		
171					Dark Gray; SILTSTONE; parting along bedding planes; thin irregular light gray layering (173.0-175.0).		
172							
173							
174					RQD = 84%		
175	C		9.9	NA	175 to 185 Light Gray to Dark Gray; SILTSTONE; irregular and discontinuous layering (175.0-177.6).		
176					Gray; Sandy SILTSTONE (177.6-177.8).		
177					Dark Gray to Light Gray; SILTSTONE; cross-bedding; possible rip-up clasts (177.8-179.5).		
178					Dark Gray; SILTSTONE; parting along bedding planes (179.5-179.8).		
179					Dark Gray; Sandy SILTSTONE; irregular layering (179.8-182.5).		
180					Dark Gray; SILTSTONE; thin light gray irregular layering; pyrite and some calcite along bedding planes (182.5-185.0).		
181							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett, D. Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Mobile B-61, Dual Rotary DR-24

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 117-MW-3BR Sheet 8 of 13

Location: Home Depot

Location Description:
Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Weather: October 26, 2004 - Mostly Cloudy, 53°-60°F
October 27, 2004 - Mostly Cloudy, 49°-60°F
Date/Time Start: November 11, 2004 / 1200 (133 feet)
Date/Time Finish: November 17, 2004 / 1045 (220 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
182						Continued from above.		
183								
184								
						RQD = 86%		
185	C		10.3	NA	185 to 195	Light Brown to Light Gray; SILTSTONE; mottled (185.0-185.5). Dark Gray; SILTSTONE; thin (¼") light brown layer at 185.7 feet; Sandy from 186.1-186.4 feet; hairline calcite-filled fracture dipping 75° at 186.0-187.4 feet (185.5-187.8). Dark Gray; SILTSTONE; possible rip-up clasts and burrows/mud cracks below 189.2 feet; Sandy from 187.9-188.2 and 189.3-189.4 feet (187.8-190.0). Dark Gray; SILTSTONE; thin gray irregular Sandy layering; near vertical calcite-filled fracture at 191.7-192.7 feet (190.0-192.7). Gray to Light Gray; SILTSTONE; highly disturbed bedding; Sandy zone at 192.7-192.8 feet is weathered (192.7-193.7). Gray to Dark Gray; SILTSTONE; parting along bedding planes; bedding planes dip ~10° (193.7-195.0).		
186								
187								
188								
189								
190								
191								
192								
193								
194								
						RQD = 83%		
195	C		10.0	NA	195 to 205	Gray to Dark Gray; SILTSTONE; parting along bedding planes; bedding planes dip ~10° (195.0-195.3). Dark Gray; SILTSTONE; light gray clasts; possible small burrows (195.3-195.8). Gray; Sandy SILTSTONE (195.8-196.1). Dark Gray; SILTSTONE; thin irregular layers; calcite-filled fracture dipping 75° at 196.3-196.8 feet (196.1-197.8). Gray; SILTSTONE; irregular Sandy layering (sand appears to be primarily mafic grains); burrows (197.8-198.3). Dark Gray; SILTSTONE; thin light gray irregular and discontinuous layering; burrows at 198.3-198.5 and 200.0-200.4 feet; mud cracks and calcite-filled fracture dipping 75° at 200.6-201.2 feet (198.3-201.9). Gray; SILTSTONE; minor sand grains (201.9-202.5). Dark Gray; SILTSTONE; discontinuous light gray layering and small patches; burrows at 203.5-204.0 feet (202.5-204.0). Dark Gray; SILTSTONE; parting along bedding planes (204.0-205.0).		
196								
197								
198								
199								
200								
201								
202								
203								
204								
						RQD = 100%		
205	C		5.0	NA	205 to 210	Dark Gray; SILTSTONE; cross-bedding; calcite-filled fracture dipping 75° at 205.2-206.0 feet (205.0-206.0). Dark Gray; SILTSTONE; discontinuous light gray layering and possible burrows (206.0-206.4). Dark Gray; SILTSTONE (206.4-207.6). Dark Gray; SILTSTONE; thin light gray discontinuous layering		
206								
207								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: Ed Blewett, D. Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-61, Dual Rotary DR-24	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 9 of 13 **WELL NO.** 117-MW-3BR **Location:** Home Depot	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 2, 2004 - Mostly Cloudy, 48°-58°F
November 11, 2004 - Mostly Cloudy, 44°-60°F
Date/Time Start: December 3, 2004 / 1420 (220 feet)
Date/Time Finish: December 7, 2004 / 1600 (316 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
208						(207.6-210.0).		
209								
						RQD = 100%		
210	C		0.5	NA	210 to 211	Dark Gray; SILTSTONE; thin light gray discontinuous layers; calcite and pyrite lining fractures (210.0-211.0).		
211	C		4.0	NA	211 to 215	Dark Gray; SILTSTONE; thin light gray discontinuous layers; pyrite along bedding planes (211.0-213.1).		
212						Light Gray to Greenish Gray; SILTSTONE, Sandy (213.1-213.5).		
						Gray to Dark Gray; SILTSTONE; thin light gray discontinuous layering; burrows (213.5-214.4).		
213						Dark Gray; SILTSTONE (214.4-215.0).		
214								
215	C		4.8	NA	215 to 220	Green; SILTSTONE (215.0-215.4).		
						Greenish Gray; SILTSTONE, Sandy; dark gray irregular layering (215.4-215.7).		
216						Green; SILTSTONE; irregular layering (215.7-216.6).		
						Dark Gray; SILTSTONE; discontinuous and irregular light gray to greenish gray layering; possible burrows (216.6-218.3).		
217						Greenish Gray; SILTSTONE; irregular layering with patches of light gray Sandy Siltstone (218.3-218.7).		
						Dark Gray; SILTSTONE; (218.7-219.8).		
218								
219								
						RQD = 96%		
220	C		5.5	NA	220 to 226	Dark Gray; SILTSTONE; discontinuous and irregular gray layering (220.0-220.7).		
						Greenish Gray; SILTSTONE; thin irregular dark gray patches and layering (220.7-221.6).		
221						Dark Gray; SILTSTONE; thin irregular light gray to greenish gray layering (221.6-223.1).		
						Greenish Gray SILTSTONE; cross-bedding; burrows at 223.1-223.5 feet (223.1-224.5).		
222						Dark Gray; SILTSTONE; light gray specks and mottles; broken by parallel fractures dipping 70° (224.5-225.5).		
223								
224								
225								
						RQD = 53%		
226	C		6.2	NA	226 to 232	Greenish Gray; SILTSTONE; rust-color staining along fracture dipping 70° (225.8-226.1).		
						Dark Gray SILTSTONE; light gray specks and mottles; two nearly parallel fractures dipping 70° (226.1-227.1).		
227						Gray; SILTSTONE; irregular layering in dark gray matrix (227.1-228.1).		
						Dark Gray; SILTSTONE; thin irregular and discontinuous light gray to light brown layering; thin Sandy Siltstone layers at 230.3-230.9 feet (228.1-232.0).		
228								
229								
230								
231								
						RQD = 90%		
232	C		9.9	NA	232 to 242	Dark Gray; SILTSTONE; thin irregular light gray layering (232.0-232.3).		
						Greenish Gray; SILTSTONE; irregular light gray layering (232.3-232.6).		
233								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett, D. Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Mobile B-61, Dual Rotary DR-24

PARSONS
DRILLING RECORD

BORING/ WELL NO. Sheet 10 of 13 — 117-MW-3BR

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

Location: Home Depot

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 12, 2004 - Rain all day, 44°-48°F
November 15, 2004 - Sunny, 39°-56°F
Date/Time Start: December 3, 2004 / 1420 (220 feet)
Date/Time Finish: December 7, 2004 / 1600 (316 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
234						Gray; SILTSTONE; light gray layering; burrows or mud cracks throughout (232.6-233.8).		
235						Gray to Dark Gray; SILTSTONE; cross-bedded (233.8-236.3).		
236						Dark Gray; SILTSTONE; thin irregular and discontinuous light gray layering (layers become 1-2 inches below 241.0 feet); quartz-filled fracture with minor pyrite at 236.4-237.1 feet dips 80°; fracture at 241.5-241.9 feet dips 80°; rust-colored band (¼") at 241.7 feet (236.3-241.9).		
237								
238								
239								
240								
241								
						RQD = 88%		
242	C		3.5	NA	242 to 245.5	Dark Gray; SILTSTONE; light gray to greenish gray irregular layers at 242.2-242.5, 242.9-243.5, 243.6-243.8, 244.2-244.3, and 244.5-245.3 feet; rust-color staining at 243.2 feet (242.0-245.5).		
243								
244								
245						RQD = 100%		
	C		10.0	NA	245.5 to 255.5	Dark Gray; SILTSTONE; irregular and discontinuous gray layering (245.5-246.1).		
246						Light Green to Dark Green: SILTSTONE; rust-coloring along near vertical hairline fractures; ¼" rust-color band at 247.1 feet; dark green from 246.5-247.1 feet (246.1-247.5).		
247						Gray; SILTSTONE; cross-bedded; broken by quartz-filled near vertical non-planar fractures (247.5-249.8).		
248						Light Gray to Greenish Gray; SILTSTONE; irregular layering with some dark gray matrix; quartz-filled near vertical non-planar fractures (249.8-250.7).		
249						Dark Gray; SILTSTONE; thin irregular and discontinuous light gray layering (sparse); quartz-filled near vertical non-planar fractures to 251.4 feet (250.7-254.4).		
250						Gray; SILTSTONE; cross-bedded (254.4-255.5).		
251								
252								
253								
254								
255						RQD = 98%		
	C		5.2	NA	255.5 to 260.5	Gray; SILTSTONE; cross-bedded (255.5-256.4).		
256						Green; SILTSTONE; dark green to light green at 257.0-257.2 feet; ¼" wide fracture at 257.5-258.5 feet dipping 70° is filled with quartz and weathered clay (256.4-257.9).		
257						Dark Gray; SILTSTONE; greenish to yellowish brown irregular layers at 258.1-258.3 and 258.9-259.1 feet; thin (1") light gray mf Sandstone layer at 259.8-259.9 feet; thin light gray irregular and discontinuous layering throughout (257.9-260.5).		
258								
259								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: Ed Blewett, D. Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-61, Dual Rotary DR-24	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 117-MW-3BR	Sheet 11 of 13
		Location: Home Depot	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 16, 2004 - Mostly Sunny, 45°-58°F
November 17, 2004 - Sunny, 42°-56°F
Date/Time Start: December 3, 2004 / 1420 (220 feet)
Date/Time Finish: December 7, 2004 / 1600 (316 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
260						RQD = 56%		
	C		5.0	NA	260.5 to 265.5	Dark Gray; SILTSTONE; greenish to brown layers at 260.5-262.0 feet; core broken along bedding planes at 260.5-261.5 feet and by quartz- and weathered clay-filled fractures below 262.2 feet (260.5-264.2). Gray; SILTSTONE; cross-bedded (264.2-264.9). Dark Gray; SILTSTONE; highly broken (264.9-265.5).		
261								
262								
263								
264								
265						RQD = 60%		
266	C		10.0	NA	265.5 to 275.5	Dark Gray; SILTSTONE; cross-bedded at 265.5-266.0 feet; anastomosing hairline fractures (265.5-267.2). Light Greenish Gray; very fine-grained SANDSTONE; parallel and criss-crossing hairline fractures dipping 55° and 70° throughout (267.2-270.2). Light Brown; fine-grained SANDSTONE; mottled (270.2-272.3). Greenish Gray; fine-grained SANDSTONE; thin (1"-2") dark gray Siltstone layers at 272.3, 272.6, and 272.9 feet; brown at 274.5-274.8 feet (272.3-275.5).		
267								
268								
269								
270								
271								
272								
273								
274								
275						RQD = 78%		
	C		8.5	NA	275.5 to 284	Greenish Gray to Light Brown; fine-grained SANDSTONE; weathered below 276.7 feet (275.5-279.0). Dark Gray; SILTSTONE; irregular light gray layering at 277.5-278.3 feet; highly fractured and broked below 278.9 feet (279.0-281.7). Light Greenish Gray; very fine-grained SANDSTONE to Sandy SILTSTONE; dark gray Siltstone layer (2") at 282.9 feet; black dendritic stain below 283 feet (281.7-284.0).		
276								
277								
278								
279								
280								
281								
282								
283						RQD = 49%		
284	C		10.0	NA	284 to 294	Greenish Gray; Sandy SILTSTONE; dark gray Siltstone layers at 284.5 (1"), 284.8 (1"), 285.1 (¼") and from 286.9-287.6 feet; highly fractured (284.0-290.4). Light Gray; fine-grained SANDSTONE; well cemented (290.4-291.4).		
285								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett, D. Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Mobile B-61, Dual Rotary DR-24

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 117-MW-3BR Sheet 12 of 13

Location: Home Depot

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 3, 2004 - Mostly Sunny, 39°-47°F
December 6, 2004 - Cloudy with Rain, 36°-40°F
Date/Time Start: December 3, 2004 / 1420 (220 feet)
Date/Time Finish: December 7, 2004 / 1600 (316 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
286						Light Gray to Brownish Gray; fine-grained SANDSTONE to Sandy SILTSTONE; some fracturing; black dendritic stain at 293.7 feet; silica cement (291.4-294.0).		
287								
288								
289								
290								
291								
292								
293						RQD = 64%		
294	C		1.0	NA	294 to 295	Same as above (294.0-295.0). RQD = 0%		
295	C		2.0	NA	295 to 297	Dark Gray; SILTSTONE; irregular light gray layering; calcite- and iron oxide-filled fractures; highly fractured and broken (295.0-297.0). RQD = 20%		
296								
297	C		2.0	NA	297 to 299	Dark Gray; SILTSTONE; irregular and discontinuous light gray layering at 297.0-297.4 feet; highly broken with abundant quartz- and calcite-filled fractures below 297.4 feet (297.0-299.0). RQD = 20 %		
298								
299	C		2.5	NA	299 to 301.5	Gray; fine-grained SANDSTONE; highly fractured with criss-crossing fractures dipping 25° to 75°; some fractures quartz-filled, some with black stain along fracture surface; minor pyrite rosettes (299.0-301.5). RQD = 40%		
300								
301								
	C		4.3	NA	301.5 to 305.8	Gray; fine-grained SANDSTONE; highly fractured with criss-crossing fractures (301.5-305.8).		
302								
303								
304								
305						RQD = 63%		
306	C		1.9	NA	305.8 to 308.5	Gray; fine-grained SANDSTONE; highly fractured with criss-crossing fractures; slickensides (305.8-308.5).		
307								
308						RQD = 0%		
	C		1.5	NA	308.5 to 310	Gray; fine-grained SANDSTONE; highly fractured with criss-crossing fractures (308.5-310.0).		
309						RQD = 0%		
310	C		6.0	NA	310 to 316	Gray; fine-grained SANDSTONE; highly fractured with criss-crossing fractures; ¼" quartz-filled fracture dipping 25° at 310.6 feet, ½" quartz-filled fracture dipping 45° at 313.5 feet (310.0-316.0).		
311								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett, D. Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-61, Dual Rotary DR-24	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 13 of 13 **WELL NO.** 117-MW-3BR **Location:** Home Depot

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 7, 2004 - Cloudy with Rain, 37°-52°F
December 8, 2004 - Sunny, 52°-59°F
Date/Time Start: December 3, 2004 / 1420 (220 feet)
Date/Time Finish: December 7, 2004 / 1600 (316 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 117-MW-3BR is located 54 feet South of the Northeast corner of the Bardwill Industries building and 48 feet West of the building corner by the stairs leading to Polumbo Trucking.

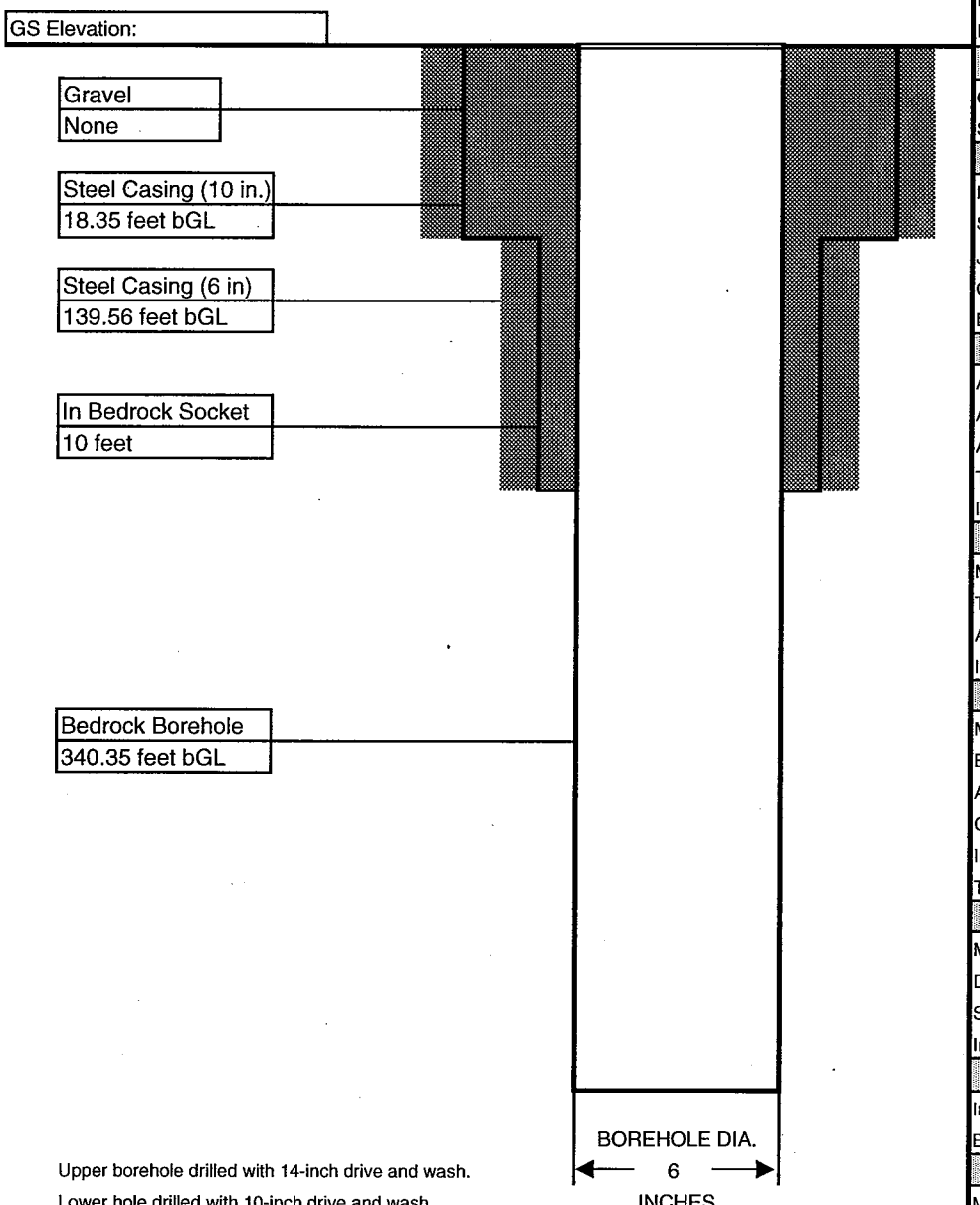
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.		
313							
314							
315							
					RQD = 93%		
316					End of Borehole at 316 feet.		
317							
318							
319							
320							
321							
322							
323							
324							
325							
326							
327							
328							
329							
330							
331							
332							
333							
334							
335							
336							
337							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	073-MW-10BR	FACILITY/SITE NAME:	Degen Oil
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	22-Nov-05	DATE END:	20-Apr-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper borehole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 139.56 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: B&B Drilling **Driller:** Ed Blewett, Pete Lee **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech, Mobile B-57	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** Sheet 1 of 7 **073-MW-10BR** **Location:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 22, 2005 - Cloudy, Rain, 43°F-49°F
November 23, 2005 - Mostly Sunny, 29°F-39°F
Date/Time Start: November 22, 2005 / 0730 (Ground Surface)
Date/Time Finish: December 15, 2005 / 1130 (159.5 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					**0 to 5**	Asphaltic Surface Material (0-0.3).	Asphalt	
						Dark Grayish Brown; cmf SAND, little cmf Gravel, little- Silt; slag present;		
1						loose; moist (0.3-2.5).	SM	
						Light Brown; CLAY; soft; moist (2.5-3.0).		
2						Dark Grayish Brown; cmf SAND, little cmf Gravel, trace Silt; minor wood,		
						slag, and tile: loose; moist to weet (3.0-4.0).	CL	
3						Gray; mf SAND, loose; wet, saturated below 4.5 feet (4.0-5.0).	SW	
4							SP	
						Hand auger to 5 feet for utilities clearance.		
5						Drilled to 6 feet.		
6	SS	9	0		**6 to 8**	No Recovery.		
		8						
7		7						
		8						
8	SS	6	0		**8 to 10**	No Recovery.		
		5						
9		7						
		1						
10	SS	2	0.6		**10 to 12**	Gray; CLAY; organic odor; very soft; saturated 10.0-10.3).	OL	
		1				Dark Gray; f SAND; very loose; saturated (10.3-10.6).	SP	
11		1						
		1						
12	SS	WOR	2.0		**12 to 14**	Gray; CLAY; organic odor; very soft; saturated (12.0-12.5).		
		WOR				Black; CLAY; organic odor; very soft; saturated (12.5-14.0).	OL	
13		1						
		1						
14	SS	1	2.0		**14 to 16**	Black; CLAY; organic odor; soft; saturated (14.0-15.1).		
		1				Greenish Gray; CLAY; organic odor; sparse vegetation; soft;	OL	
15		1				saturated (15.1-16.0).		
		3						
16	SS	2	1.7		**16 to 18**	Greenish Gray; CLAY; shell fragment; medium stiff; saturated.		
		2					CL	
17		3						
		4						
18	SS	2	2.0		**18 to 20**	Greenish Gray; CLAY; sparse vegetation; soft; saturated.		
		1					CL	
19		2						
		9						
20	SS	16	1.8		**20 to 22**	Greenish Gray; CLAY; hard; saturated (20.0-20.5).	CL	
		20				Gray; f SAND; trace Silt; dense; saturated (20.5-21.8).		
21		26					SP	
		22						
22						Drilled to 25 feet.		
23								
24								
25	SS	8	0.6		**25 to 27**	Gray; mf SAND; medium dense; saturated.	SP	
		10						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Pete Lee, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Mobile B-57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 2 of 7
WELL NO. 073-MW-10BR

Location Description:
Degen Oil

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 28, 2005 - Cloudy, Light Rain, 49°F-59°F
November 29, 2005 - Cloudy, 58°F-67°F
Date/Time Start: November 22, 2005 / 0730 (Ground Surface)
Date/Time Finish: December 15, 2005 / 1130 (159.5 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26		11			Continued from above.	SM	
		15					
27					Drilled to 30 feet.		
28							
29							
30	SS	10	0.6		**30 to 32** Red Brown; SILT, little+ f Sand; hard; saturated	ML	
		17					
31		18					
		14					
32					Drilled to 35 feet.		
33							
34							
35	SS	6	1.6		**35 to 37** Red Brown; CLAY/SILT; abundant f Sand laminations; very stiff; saturated.	CL/ML	
		10					
36		11					
		15					
37					Drilled to 40 feet.		
38							
39							
40	SS	13	1.5		**40 to 42** Red Brown; SILT, trace f Sand; hard; saturated.	ML	
		23					
41		22					
		20					
42					Drilled to 45 feet.		
43							
44							
45	SS	5	1.4		**45 to 47** Red Brown; SILT, little Clay; stiff; saturated.	ML	
		6					
46		7					
		11					
47					Drilled to 47 feet.		
48							
49							
50	SS	WOR	2.0		**50 to 52** Red Brown; CLAY, trace- cmf Sand, trace- cmf Gravel (subrounded); stiff; saturated.	CL/ML	
		6					
51		6					
		12					

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Pete Lee, Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 3 of 7 **WELL NO.** 073-MW-10BR **Location Description:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 30, 2005 - Cloudy, Rain, 57°F-60°F
December 1, 2005 - Mix of Sun and Clouds, 39°F-48°F
Date/Time Start: November 22, 2005 / 0730 (Ground Surface)
Date/Time Finish: December 15, 2005 / 1130 (159.5 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Continued from above.		
53								
54								
55	SS	6	1.2		**55 to 57**	Red Brown; SILT; stiff; saturated.	ML	
		7						
56		8						
		10						
57						Drilled to 60 feet.		
58								
59								
60	SS	10	1.1		**60 to 62**	Red Brown; SILT; hard; saturated.	ML	
		24						
61		26						
		31						
62						Drilled to 65 feet.		
63								
64								
65	SS	WOR	2.0		**65 to 67**	Red Brown; CLAY, trace- mf Sand, trace- f Gravel (angular); soft; saturated.	CL	
		WOR						
66		3						
		6						
67						Drilled to 70 feet.		
68								
69								
70	SS	WOR	2.0		**70 to 72**	Red Brown; CLAY, trace- cmf Sand, trace- cmf Gravel (angular); soft; saturated/	CL	
		4						
71		9						
		8						
72						Drilled to 75 feet.		
73								
74								
75	SS	WOR	0.8		**75 to 77**	Red Brown; CLAY, trace- cmf Sand, trace- f Gravel (angular); medium stiff; saturated.	CL	
		3						
76		3						
		5						
77						Drilled to 80 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Pete Lee, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Mobile B-57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 4 of 7
WELL NO. 073-MW-10BR

Location Description:
Degen Oil

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: December 2, 2005 - Mostly Cloudy, 38°F-44°F
December 5, 2005 - Cloudy, 32°F-38°F
Date/Time Start: November 22, 2005 / 0730 (Ground Surface)
Date/Time Finish: December 15, 2005 / 1130 (159.5 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SS	7	0		**80 to 82**	No Recovery.		
		9						
81		14						
		20						
82						Drilled to 85 feet.		
83								
84								
85	SS	16	1.4		**85 to 87**	Red Brown; SILT; very stiff; saturated (85.0-85.7).	ML	
		10				Red Brown; CLAY, trace- cmf Sand, trace- f Gravel; very stiff;		
86		8				saturated (85.7-86.4).	CL	
		9						
87						Drilled to 90 feet.		
88								
89								
90	SS	WOR	2.0		**90 to 92**	Red Brown; SILT, some Clay; laminated; stiff; saturated.	ML	
		4						
91		7						
		15						
92						Drilled to 95 feet.		
93								
94								
95	SS	3	2.0		**95 to 97**	Red Brown; CLAY, some Silt; very stiff; saturated (95.0-96.1).	CL	
		3				Red Brown; SILT; very stiff; saturated (96.1-97.0).		
96		16					ML	
		20						
97						Drilled to 100 feet.		
98								
99								
100	SS	7	2.0		**100 to 102**	Red Brown; CLAY, some Silt; stiff; saturated (100.0-100.3).		
		5				Red Brown; CLAY, trace+ cmf Sand, trace cmf Gravel (angular);	CL	
101		6				stiff; saturated (100.3-102.0).		
		7						
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Pete Lee, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Mobile B-57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 5 of 7
WELL NO. 073-MW-10BR
Location Description: Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 7, 2005 - Sunny, Windy, 26°F-36°F
December 8, 2005 - Sunny, 23°F-34°F
Date/Time Start: November 22, 2005 / 0730 (Ground Surface)
Date/Time Finish: December 15, 2005 / 1130 (159.5 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	21	1.1		**105 to 107**	Red Brown: CLAY, little cmf Sand, little cmf Gravel (subrounded to rounded); hard; saturated.	CL	
		30						
106		49						
		50						
107						Drilled to 110 feet. Drilling became hard at 107 feet.		
108								
109								
110	SS	20	0.4		**110 to 112**	Red Brown: CLAY, little cmf Sand, little cmf Gravel (subrounded to rounded); hard; saturated.	CL	
		26						
111		31						
		44						
112						Drilled to 115 feet.		
113								
114								
115	SS	5	2.0		**115 to 117**	Red Brown; CLAY, trace mf Sand, trace- f Gravel (subrounded); stiff; saturated (115.0-116.4).	CL	
		8						
116		7				Red Brown; CLAY; laminated; stiff; saturated (116.4-117.0).		
		9						
117						Drilled to 120 feet.		
118								
119								
120	SS	8	1.0		**120 to 122**	Red Brown: CLAY; very stiff; saturated.	CL	
		9						
121		9						
		6						
122	SS					Drilled to 125 feet.		
123								
124								
125	SS	28	0.7		**125 to 127**	Red Brown; cmf SAND, some Silt, little cmf Gravel (subrounded); dense; saturated.	SM (TILL)	
		19						
126		28						
		27						
127						Drilled to 130 feet.		
128								
129								
							BEDROCK	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett, Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech, Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 6 of 7 **WELL NO.** 073-MW-10BR **Location Description:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 12, 2005 - Mix of Sun and Clouds, 33°F-38°F
December 13, 2005 - Sunny, 19°F-29°F
Date/Time Start: November 22, 2005 / 0730 (Ground Surface)
Date/Time Finish: December 15, 2005 / 1130 (159.5 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130	SS	100/0.5"			**130 to 132** Dark Brown; very fine-grained SANDSTONE; weathered; in tip of spoon.		
131							
132					Drilled to 133 feet.		
	C		4.5		**133.0-137.6** Red Brown; fine-grained SANDSTONE.		
133							
134							
135							
136							
137					RQD = 88%		
138					Drilled to 139.5 feet.		
139							
	AR				**139.5 to 144.5** Red Brown; very fine-grained Silty SANDSTONE.	BEDROCK	
140							
141							
142							
143							
144							
	AR				**144.5 to 149.5** Red Brown; very fine-grained Silty SANDSTONE.		
145							
146							
147							
148							
149							
	AR				**149.5 to 154.5** Red Brown; Sandy SILTSTONE (95%).. Brown; fine-grained SANDSTONE (5%).		
150							
151							
152							
153							
154							
	AR				**154.5 to 159.5** Brown; medium- to fine-grained SANDSTONE (60%). Red Brown; SILTSTONE (35%). Greenish Gray; SILTSTONE (5%).		
155							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 7 of 14 **WELL NO.** 073-MW-10BR **Location Description:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 14, 2005 - Sunny, 16°F-26°F
December 15, 2005 - Sunny, 20°F-33°F
Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157							
158							
159							
160	AR				**160 to 170** Gray Brown; fine-grained SANDSTONE (85%). Red Brown; SILTSTONE (15%).		
161							
162							
163							
164							
165							
166							
167							
168							
169						BEDROCK	
170	AR				**170 to 180** Gray Brown; fine-grained SANDSTONE (85%). Red Brown; SILTSTONE (15%).		
171							
172							
173							
174							
175							
176							
177							
178							
179							
180	AR				**180 to 190** Gray Brown; fine-grained SANDSTONE (40%). Red Brown; SILTSTONE (60%).		
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 8 of 14
WELL NO. 073-MW-10BR
Location Description: Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 19, 2006 - Sunny, 52°F-75°F
April 20, 2006 - Mostly Sunny, 61°F-78°F
Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.		
183							
184							
185							
186							
187							
188							
189							
190	AR				**190 to 200** Gray Brown to Red Brown; SILTSTONE (80%). Brown to Gray Brown; very fine-grained SANDSTONE (20%).	BEDROCK	
191							
192							
193							
194							
195							
196							
197							
198							
199							
200	AR				**200 to 210** Light Brown; very fine- to fine-grained SANDSTONE (80%). Red Brown; very fine- to fine-grained SANDSTONE (20%).		
201							
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 9 of 14
WELL NO. 073-MW-10BR

Location Description:
Degen Oil

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.		
209							
210	AR				**210 to 220** Red Brown; very fine-grained SANDSTONE (70%). Light Brown; fine-grained SANDSTONE (30%).		
211							
212							
213							
214							
215							
216							
217							
218							
219							
220	AR				**220 to 230** Red Brown; SILTSTONE (70-75%). Dark Brown; very fine-grained SANDSTONE (15-25%). Light Brown; fine-grained SANDSTONE (5-10%).%).	BEDROCK	
221							
222							
223							
224							
225							
226							
227							
228							
229							
230	AR				**230 to 240** Red Brown; SILTSTONE (60%). Dark Brown; very fine-grained SANDSTONE (40%).		
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 10 of 14
WELL NO. 073-MW-10BR

Location Description:
Degen Oil

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.	BEDROCK	
235							
236							
237							
238							
239							
240	AR				**240 to 250** Dark Brown; very fine-grained SANDSTONE (50%). Light Brown; fine-grained SANDSTONE (50%).		
241							
242							
243							
244							
245							
246							
247							
248							
249							
250	AR				**250 to 260** Light Brown; fine-grained SANDSTONE (65%). Dark Brown; very fine-grained SANDSTONE (35%).		
251							
252							
253							
254							
255							
256							
257							
258							
259							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 11 of 14 **WELL NO.** 073-MW-10BR **Location Description:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260	AR				**260 to 270** Gray Brown; very fine-grained SANDSTONE.	BEDROCK	
270	AR				**270 to 280** Gray Brown; fine-grained SANDSTONE (55%). Dark Brown; very fine-grained SANDSTONE (40%). Red Brown; SILTSTONE (5%).		
280	AR				**280 to 290** Gray Brown; fine-grained SANDSTONE.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 12 of 14 **WELL NO.** 073-MW-10BR **Location Description:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.	BEDROCK	
287							
288							
289							
290	AR				**290 to 300** Gray Brown to Dark Brown; fine-grained SANDSTONE (75%). Red Brown; SILTSTONE (25%).		
291							
292							
293							
294							
295							
296							
297							
298							
299							
300	AR				**300 to 310** Gray Brown to Dark Brown; very fine- to fine-grained SANDSTONE.		
301							
302							
303							
304							
305							
306							
307							
308							
309							
310	AR				**310 to 320** Light Brown to Dark Brown; very fine- to fine-grained SANDSTONE.		
311							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 13 of 14 **WELL NO.** 073-MW-10BR **Location Description:** Degen Oil

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.		
313							
314							
315							
316							
317							
318							
319							
320	AR				**320 to 330** Gray Brown to Red Brown; SILTSTONE.	BEDROCK	
321							
322							
323							
324							
325							
326							
327							
328							
329							
330	AR				**330 to 340** Gray Brown to Brown; very fine-grained SANDSTONE (60%).. Red Brown to Gray Brown; SILTSTONE (40%).		
331							
332							
333							
334							
335							
336							
337							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 14 of 14
WELL NO. 073-MW-10BR

Location Description:
Degen Oil

Location Plan:
Well 073-MW-10BR is located 68.5 feet southeast of the southwest corner of the Office Building and 19.7 feet southwest of the southeast corner of the Office Building.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: April 19, 2006 / 1130 (159.5 feet)
Date/Time Finish: April 20, 2006 / 1525 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

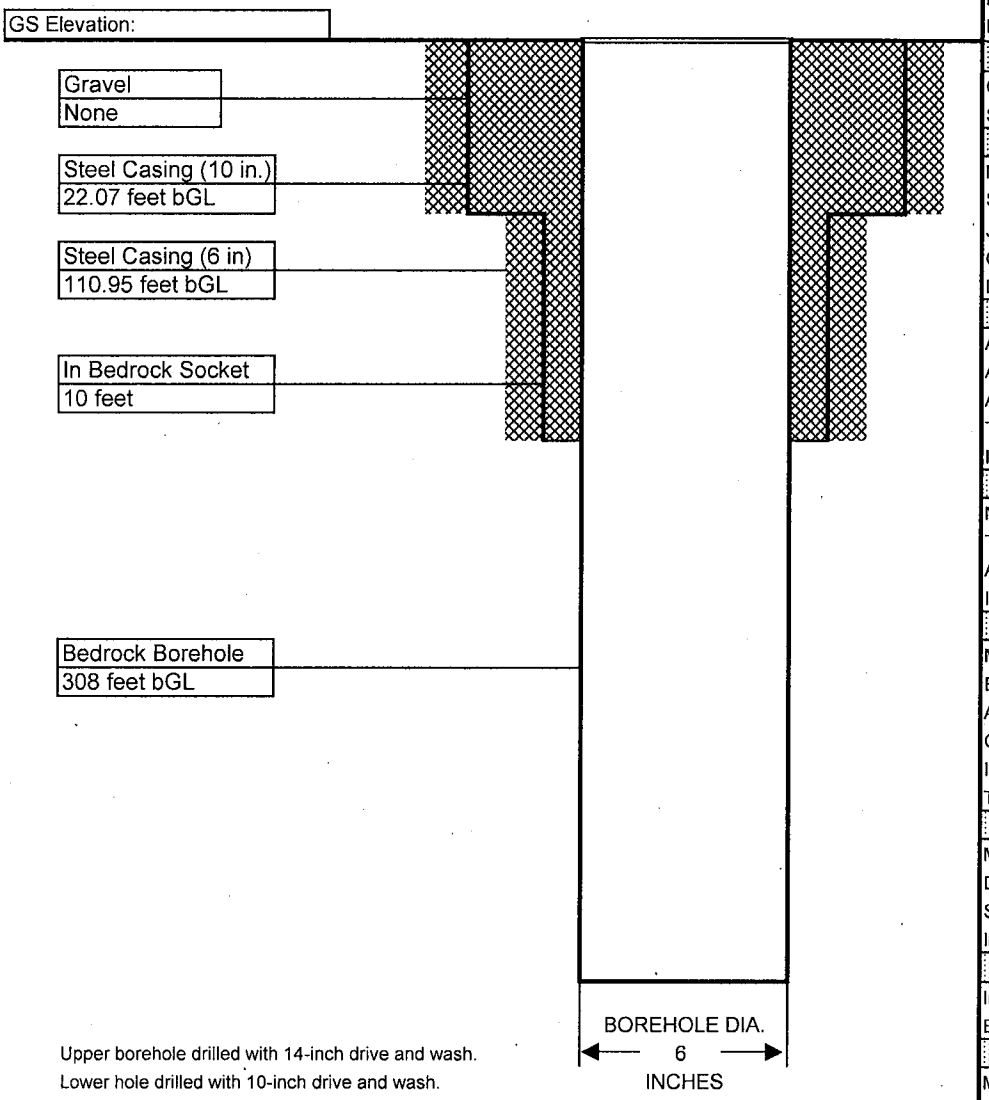
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
338					Continued from above.	BEDROCK	
339							
340					Bottom of borehole at 340 feet.		
341							
342							
343							
344							
345							
346							
347							
348							
349o							
350							
351							
352							
353							
354							
355							
356							
357							
358							
359							
360							
361							
362							
363							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	079-MW-13BR	FACILITY/SITE NAME:	Honda Dealership
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	SGS Drilling
DATE START:	3-Jan-06	DATE END:	15-Sep-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper borehole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" X 24"
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	Yes
Interval:	0 - 110.95 FEET
SEAL	
Material:	None
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: SGS Drilling **Driller:** Bill Petley **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-80	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 1 of 6 **WELL NO.** 079-MW-13BR **Location:** Honda Dealership

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 3, 2006 - Rain, Windy, 37°F-35°F
January 4, 2006 - Mix of Sun and Clouds, 30°F-40°F
Date/Time Start: January 3, 2006 / 1130 (Ground Surface)
Date/Time Finish: January 18, 2006 / 1445 (132.25 feet) September 15, 2006 (308 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 079-MW-13BR is located 88.8 feet east of utility pole 22870 and 99.5 feet northeast of utility pole 28127 in the overflow parking area behind the Honda Dealership.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Asphalt Surface Material (0-0.3).	Asphalt	
						Light Brown; SILT, some+ cmf Sand, trace cmf Gravel; loose; dry (0.3-0.5).		
1						Light Brown; f SAND, trace mc Sand, little cmf Gravel to Cobbles; minor glass; loose; moist (0.5-4.0).		
2						Gray Brown; f SAND, trace m Sand; loose; moist (4.0-5.0).	SP	
3								
4								
						Hand auger to 5 feet for utility clearance.		
5					5 to 6	Drilled to 6 feet.		
6	SS	1	0.1		6 to 8	Light Brown; mf SAND, trace Silt, trace f Gravel; very loose; saturated.		
		WOR						
7		1						
		2					SP	
8	SS	13	1.6		8 to 10	Light Brown; mf SAND, trace Silt, trace f Gravel; dense; saturated (8.0-9.4).		
		16				Light Brown; f SAND, some Silt; dense; saturated (9.4-9.6).		
9		16						
		17						
10	SS	10	1.3		10 to 12	Red Brown; SILT, little f Sand ; very stiff; saturated.		
		11						
11		10					ML	
		14						
12	SS	14	0.9		12 to 14	Red Brown; SILT; hard; saturated.		
		16						
13		16						
		18						
14	SS	14	1.5		14 to 16	Brown; mf SAND; dense; saturated (14.0-15.3).		
		16				Red Brown; mf SAND, little Silt; dense; saturated (15.3-15.5).	SP	
15		18						
		23					SM	
16	SS	13	1.1		16 to 18	Brown; mf SAND, trace cmf Gravel; dense; saturated.		
		16					SP	
17		18						
		25						
18	SS	22	0		18 to 20	No Recovery.		
		29						
19		18						
		25						
20	SS	9	1.0		20 to 22	Red Brown; CLAY/SILT, trace f Gravel; hard; saturated.		
		15						
21		18					CL/ML	
		22						
22	SS	25	1.4		22 to 24	Red Brown; CLAY/SILT, little cmf Gravel (subrounded to subangular); hard; saturated (22.0-22.8).		
		48						
23		45				Red Brown; SILT, little cmf Gravel; hard, saturated (22.8-23.4).	ML	
		47						
24						Drilled to 25 feet.		
25	SS	12	1.6		25 to 27	Red Brown; f SAND, little- Silt; dense; saturated.	SM	
		19						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Additional Weather Reports: December 2, 2005 - Mostly Cloudy, 38°F-44°F
December 5, 2005 - Cloudy, 32°F-38°F

Contractor: SGS Drilling **Driller:** Bill Petley **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-80	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 2 of 6 **WELL NO.** 079-MW-13BR **Location:** Honda Dealership

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 5, 2006 - Mix of Sun and Clouds, 35°F-46°F
January 6, 2006 - Cloudy, 38°F-42°F
Date/Time Start: January 3, 2006 / 1130 (Ground Surface)
Date/Time Finish: January 18, 2006 / 1445 (132.25 feet) September 15, 2006 (308 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 079-MW-13BR is located 88.8 feet east of utility pole 22870 and 99.5 feet northeast of utility pole 28127 in the overflow parking area behind the Honda Dealership.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26						Continued from above.	SM	
27						Drilled to 30 feet.		
28								
29								
30	SS	20	0		30 to 32	No Recovery.		
		32						
31		58						
		100/4"						
32						Drilled to 35 feet.		
33								
34								
35	SS	19	1.4		35 to 37	Red Brown; SILT; hard; saturated (35.0-35.4).	ML	
		28				Red Brown; f SAND, and Silt; very dense; saturated (35.4-36.0).	SM	
36		38				Red Brown; f SAND, trace Silt; very dense; saturated (36.0-36.4).	SP	
		53						
37						Drilled to 40 feet.		
38								
39								
40	SS	34	0		40 to 42	No Recovery.		
		33						
41		38						
		39						
42						Drilled to 45 feet.		
43								
44								
45	SS	23	1.4		45 to 47	Red Brown; SILT; hard; saturated.	ML	
		44						
46		50						
		52						
47						Drilled to 47 feet.		
48								
49								
50	SS	21	1.9		50 to 52	Red Brown; SILT; sparse Clay layers (<¼" thick); hard; saturated.	ML	
		28						
51		31						
		39						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: SGS Drilling Driller: Bill Petley Inspector: Mike Wilkinson Rig Type: Mobile B-80	HYDROQUAL DRILLING RECORD PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	BORING/ WELL NO. Sheet 3 of 6 079-MW-13BR Location: Honda Dealership

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 9, 2006 - Mix of Sun and Clouds, 46°F-56°F
January 10, 2006 - Mostly Sunny, 41°F-48°F
Date/Time Start: January 3, 2006 / 1130 (Ground Surface)
Date/Time Finish: January 18, 2006 / 1445 (132.25 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 079-MW-13BR is located 88.8 feet east of utility pole 22870 and 99.5 feet northeast of utility pole 28127 in the overflow parking area behind the Honda Dealership.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	14	1.5		55 to 57	Red Brown; SILT; Clay layer (⅜" thick) at 55.8 feet; hard; saturated.	ML	
		13						
56		20						
		22						
57						Drilled to 60 feet.		
58								
59								
60	SS	20	1.8		60 to 62	Red Brown; SILT; hard; saturated (60.0-61.0).	ML	
		20				Red Brown; f SAND, little Silt; dense; saturated (61.0-61.3).		
61		21				Red Brown; SILT, trace f Sand; hard; saturated (61.3-61.8).	SM	
		27					ML	
62						Drilled to 65 feet.		
63								
64								
65	SS	14	1.8		65 to 67	Red Brown; f SAND, trace Silt; very dense; saturated (65.0-65.7).	SP	
		23						
66		37				Red Brown; CLAY, little c Sand to mf Gravel (subangular); hard; saturated (65.7-66.8).	CL	
		41						
67						Drilled to 70 feet.		
68								
69								
70	SS	22	0.9		70 to 72	Red Brown; CLAY, trace+ mf Gravel (subangular); hard; saturated.	CL	
		33						
71		45						
		59						
72						Drilled to 75 feet.		
73								
74								
75	SS	18	2.0		75 to 77	Red Brown; CLAY, little- c Sand to mf Gravel (subangular to subrounded); hard; saturated.	CL	
		47						
76		61						
		74						
77						Drilled to 77 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor:	SGS Drilling
Driller:	Bill Petley
Inspector:	Mike Wilkinson
Rig Type:	Mobile B-80

HYDROQUAL DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 079-MW-13BR — Sheet 4 of 6

Location: Honda Dealership

Location Description: Well 079-MW-13BR is located 88.8 feet east of utility pole 22870 and 99.5 feet northeast of utility pole 28127 in the overflow parking area behind the Honda Dealership.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 11, 2006 - Mostly Cloudy, 45°F-52°F; January 12, 2006 - Mostly Sunny, 47°F-60°F
Date/Time Start: January 3, 2006 / 1130 (Ground Surface)
Date/Time Finish: January 18, 2006 / 1445 (132.25 feet) September 15, 2006 (308 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: hydraulic

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SS	32	1.4		80 to 82	Red Brown; SILT; little Clay, trace f Sand, little- mf Gravel (subrounded); hard; saturated (80.0-81.0).	ML	
		35						
81		39				Red Brown; SILT, some cmf Sand, little cmf Gravel (subrounded); hard; saturated (81.0-81.4).		
		42						
82						Drilled to 85 feet.		
83								
84								
85	SS	23	1.2		85 to 87	Red Brown; CLAY; hard; saturated.	CL	
		58						
86		60						
		52						
87						Drilled to 90 feet.		
88								
89								
90	SS	19	0.8		90 to 92	Red Brown; cmf SAND, little Silt, little cmf Gravel (angular to subangular), very dense; saturated.	SM (TILL)	
		17						
91		18						
		30						
92						Drilled to 95 feet.		
93								
94								
95	SS	31	1.1		95 to 97	Red Brown; cmf SAND, little- Silt, little- cmf Gravel (angular to subangular), very dense; saturated.	SM (TILL)	
		72						
96		100/5"						
97						Drilled to 100 feet.		
98								
99								
100	SS	100/5"	0.2		100 to 102	Gray Brown; cmf SAND, little Silt, some- f Gravel (subangular to subrounded); very dense; saturated. Rock in tip of spoon.	SM (TILL)	
101						Bedrock at 100.5 feet.	BEDROCK	
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: SGS Drilling **Driller:** Bill Petley, Jim Lewis **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-80, Driltech T25K2W	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 079-MW-13BR Sheet 5 of 6 **Location:** Honda Dealership	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 17, 2006 - Mostly Cloudy, 29°F-42°F
January 18, 2006 - Rain, Windy, 58°F-62°F
Date/Time Start: January 3, 2006 / 1130 (Ground Surface)
Date/Time Finish: January 18, 2006 / 1445 (132.25 feet) September 15, 2006 (308 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 079-MW-13BR is located 88.8 feet east of utility pole 22870 and 99.5 feet northeast of utility pole 28127 in the overflow parking area behind the Honda Dealership.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.	BEDROCK	
105	C				**105 to 107.3**	Brown; mf-grained SANDSTONE (105.0-105.3). Variegated; cmf- grained SANDSTONE (105.3-106.6). Light Brown; fine-grained SANDSTONE (106.6-106.9). Red Brown; CLAY seam; top ½" very Sandy (106.9-107.2). Dark Gray; cmf-grained SANDSTONE (107.2-107.3).		Recovery = 100% RQD = 87%
106								
107								
108						Drilled to 112 feet.		
109								
110								
111								
112	AR				**112 to 117**	Light Gray; fine-grained SANDSTONE (55%). Dark Gray; SILTSTONE (40%). Brown; fine-grained SANDSTONE (5%).		
113								
114								
115								
116								
117	AR				**117 to 122**	Light Gray; fine-grained SANDSTONE (85%). Light Brown; fine-grained SANDSTONE (10%). Dark Gray; SILTSTONE (5%).		
118								
119								
120								
121								
122	AR				**122 to 127**	Light Gray; fine-grained SANDSTONE (90%). Light Brown; fine-grained SANDSTONE (10%).		
123								
124								
125								
126								
127	AR				**127 to 132**	Light Gray; fine-grained SANDSTONE (50%). Dark Gray; SILTSTONE (40%). Dark Brown; fine-grained SANDSTONE (10%).		
128								
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: SGS Drilling
Driller: Jim Lewis
Inspector: Mike Wilkinson
Rig Type: Driltech T25K2W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 6 of 6
WELL NO. 079-MW-13BR
Location:
Honda Dealership

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: January 3, 2006 / 1130 (Ground Surface)
Date/Time Finish: January 18, 2006 / 1445 (132.25 feet) September 15, 2006 (308 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 079-MW-13BR is located 88.8 feet east of utility pole 22870 and 99.5 feet northeast of utility pole 28127 in the overflow parking area behind the Honda Dealership.

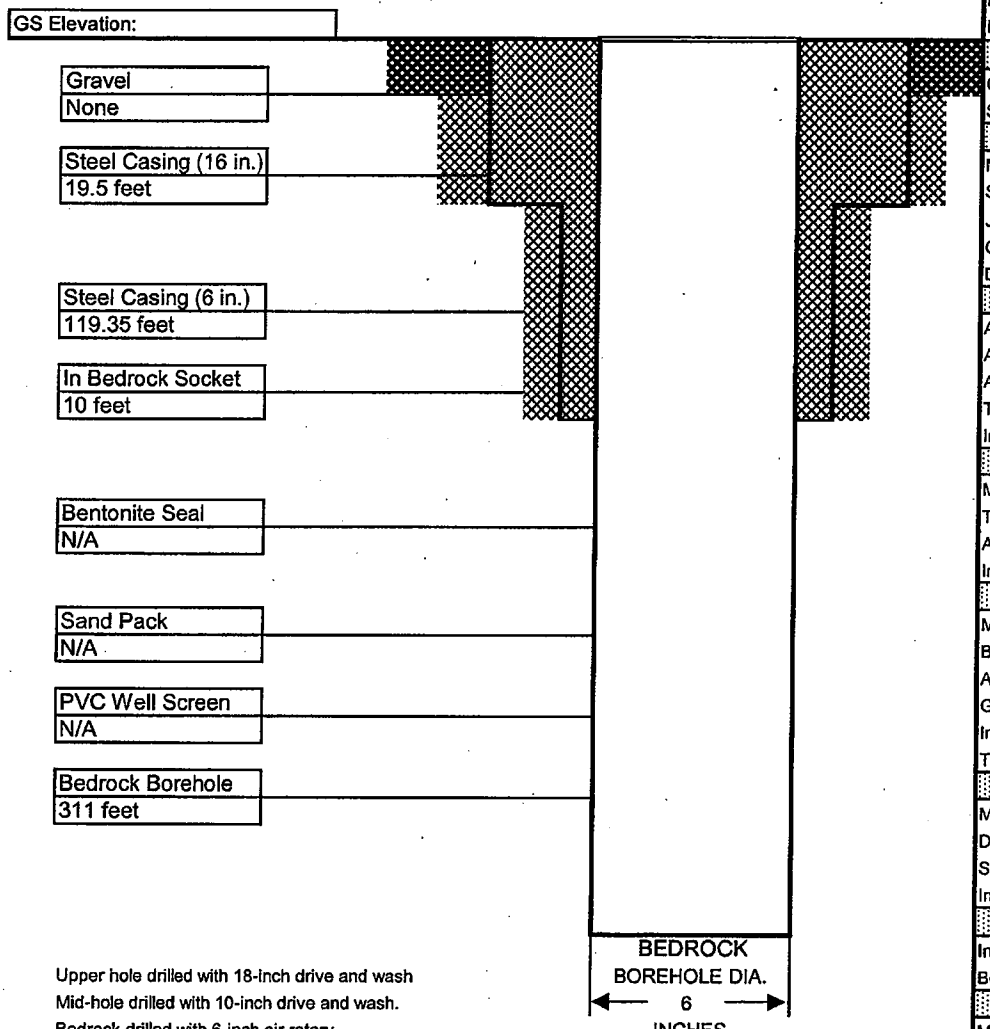
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Continued from above.		
131							
132					Bottom of Original Borehole at 132.25 feet.		
133					Borehole Extended to 308 feet.		
134							
135							
136							
137							
138							
139							
140							
141						BEDROCK	
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	090-MW-7BR	FACILITY/SITE NAME:	Baldwin Steel
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	23-Aug-04	DATE END:	20-Sep-04
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 18-inch drive and wash
Mid-hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	NO, FLUTE WELL
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 119.35 FEET
SEAL	
Material:	NONE
Type:	N/A
Amount Used:	N/A
Interval:	N/A
FILTER PACK	
Material:	NONE
Brand Name:	NA
Amount Used:	NA
Grain Size Dist.:	NA
Interval:	NA
Tremied:	NA
SCREEN	
Material:	NONE
Diameter:	NA
Slot Size & Type:	NA
Interval BGS:	NA
SUMP	
Interval BGS:	NA
Bottom Cap:	NA
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	NA

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 090-MW-7BR Sheet 1 of 12

Location: Baldwin Steel

Location Description: Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 23, 2004 - Sunny, 63°F-83°F
August 24, 2004 - Mostly Sunny, 72°F-80°F
Date/Time Start: August 23, 2004 / 0930 (Ground Surface)
Date/Time Finish: August 27, 2004 / 1430 (19.5 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Hand dig to 5 feet.		
1								
2								
3								
4								
5	SP	5	1	NA	5 to 7	Dark Brown; f SAND, trace f Gravel; dense; wet (5.0-5.3).		pH mS: °C: ntu.
		19				Light Brown; f SAND; dense; wet (5.3-6.0).		NA NA NA NA
6		21						
		16						
7	SP	10	0.7	NA	7 to 9	Light Brown; f SAND; root present; medium dense; moist.		pH mS: °C: ntu.
		10						NA NA NA NA
8		7						
		6						
9	SP	5	1.5	14	9 to 11	Light Brown; f SAND; loose; moist.		pH mS: °C: ntu.
		3					SP	10.35 1.86 26.7 >1000
10		4						
		10						
11	SP	7	1.4	1.5	11 to 13	Brown; mf SAND, trace- c Sand; very dense; saturated (11.0-11.4).		pH mS: °C: ntu.
		16				Light Brown; f SAND, trace- m Sand; very dense; saturated (11.4-12.4).		10.08 1.28 27.8 >1000
12		39						
		53						
13	SP	8	1	12.5	13 to 15	Brown; f SAND; very dense; saturated.		pH mS: °C: ntu.
		37						9.04 0.62 25.2 190
14		26						
		23						
15	SP	13	1	13.5	15 to 17	Red Brown; SILT; very stiff; saturated.	ML	pH mS: °C: ntu.
		13						9.32 0.94 25.3 750
16		14						
		21						
17						Drilled to 20 feet.		pH mS: °C: ntu.
								NA NA NA NA
18								
19								
20		1	1.3	5	20 to 22	Red Brown; f SAND, trace Silt; medium dense; saturated.	SP	pH mS: °C: ntu.
		7						NA NA NA NA
21		11						
		15						
22						Drilled to 25 feet.		
23								
24								
25	SP	7	1.6	110	25 to 27	Red Brown; Silt, trace- f Gravel, little- f Sand; very stiff; saturated.	ML	pH mS: °C: ntu.
		9						NA NA NA >1000

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:
Permanent 16 inch steel casing installed to 19.5 feet.
Permanent 6 inch steel casing installed to 119.35 feet.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 3 of 12 090-MW-7BR
Driller:	Ed Blewett		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Expanded Bedrock Investigation	Baldwin Steel	
Rig Type:	Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 31, 2004 - Cloudy morning/clear afternoon, 71°F-84°F; September 1, 2004 - Mostly Sunny, 66°F-78°F
Date/Time Start: September 1, 2004 / 1405 (19.5 feet)
Date/Time Finish: September 16, 2004 / 1605 (119 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
52					Drilled to 55 feet.		
53							
54							
55	SP	23	1.9	325	55 to 57 Brown; CLAY, trace cmf Gravel; hard; moist.	CL	pH mS: °C: ntu. NA NA NA NA
		26					
56		21					
		32					
57					Drilled to 60 feet.		
58							
59							
60	SP	4	1.4	600	60 to 62 Red Brown; SILT/CLAY; stiff; saturated.	ML/CL	pH mS: °C: ntu. 9.06 13.83 25 >1000
		5					
61		7					
		17					
62					Drilled to 65 feet.		
63							
64							
65	SP	24	1.4	700	65 to 67 Gray Brown; cmf SAND, trace Silt, little+ cmf Gravel; dense; saturated (65.0-66.0).	SW	pH mS: °C: ntu. NA NA NA NA
		21					
66		16			Gray Brown; f SAND; dense; saturated (66.0-66.4).	SP	
		20					
67					Drilled to 70 feet.		
68							
69							
70	SP	24	2	>750	70 to 72 Brown; SILT, trace cmf Gravel; hard; saturated (70.0-71.0).	ML	pH mS: °C: ntu. 6.98 17.59 25.5 >1000
		18					
71		16			Brown; CLAY, trace c Gravel; hard; moist (71.0-72.0).	CL	
		13					
72					Drilled to 75 feet.		
73							
74							
75	SP	22	1.6	>750	75 to 77 Brown; SILT; hard; saturated (75.0-75.6).	ML	pH mS: °C: ntu. 8.06 17.06 32.2 >1000
		24			Brown; CLAY; trace c Gravel; hard; saturated (75.6-76.6).	CL	
76		12					
		13					
77					Drilled to 80 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 4 of 12 **WELL NO.** 090-MW-7BR **Location:** Baldwin Steel	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 2, 2004 - Sunny, 66°F-76°F
September 3, 2004 - Sunny, 68°F-78°F
Date/Time Start: September 1, 2004 / 1405 (19.5 feet)
Date/Time Finish: September 16, 2004 / 1605 (119 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SP	8	1.5	>750	80 to 82	Brown; SILT, little Clay; hard; wet to saturated.	ML	pH 9.05; mS: 13.55; °C: 21.9; ntu. >1000
		11						
81		24						
		20						
82						Drilled to 85 feet.		
83								
84								
85	SP	25	1.6	>750	85 to 87	Brown; SILT, little Clay, trace- cmf Gravel; hard; moist to saturated; clay content increases below 86.0 feet, gray from 85.9-86.1 feet.	ML	pH 8.85; mS: 14.30; °C: 20.8; ntu. 700
		34						
86		16						
		22						
87						Drilled to 90 feet.		
88								
89								
90	SP	14	1.4	>750	90 to 92	Gray to Red Brown; SILT; little Clay, little- cmf Gravel, trace f Sand; hard; moist (90.0-90.8).	ML	pH 8.65; mS: 10.70; °C: 36; ntu. 750
		19						
91		32				Red Brown; SILT, some cmf Sand, some cmf Gravel, trace Clay; hard; saturated (90.8-91.4).		
		46						
92						Drilled to 95 feet.		
93								
94								
95	SS	13			95 to 97	Gray Brown; SILT, little f Sand, little cmf Gravel, trace Clay; hard; saturated.	ML	
		36						
96		38						
		28						
97	SP	100/4"	0	NA	97 to 99	No Recovery.		pH NA; mS: NA; °C: NA; ntu. NA
98								
99						Drilled to 100 feet.		
100	SP	100/3"	0.1	NA	100 to 102	Brown; SILT/CLAY, some mf Sand, little cmf Gravel; hard; saturated. Recovery from tip of spoon.	ML/CL	pH NA; mS: NA; °C: NA; ntu. NA
101								
102	SS	100/5"	0.2		102 to 104	Brown; SILT, some f Sand, little cmf Gravel, trace Clay; hard; saturated.	ML	
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 5 of 12 090-MW-7BR
Driller:	Ed Blewett, D. Myerchin		Location:	
Inspector:	M. Wilkinson, Sal Kokol	PROJECT NAME: Expanded Bedrock Investigation	Baldwin Steel	
Rig Type:	Gus Pech, Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 7, 2004 - Cloudy, Light Rain, 67°F-76°F
September 8, 2004 - Rain in morning/Clear afternoon, 72°F-78°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Drilled to 105 feet.		
105	SS	100/5"	0.2		105 to 107	Gray rock fragment in Sand/Silt matrix.		
106								
107	SS	50	0.8		107 to 109	Red Brown; mf SAND, little Gravel, little+ Silt, trace Clay; very dense; dry.	SM	
		100/5"						
108								
109						Drilled to 110 feet.	BEDROCK	
110	SS	100/1"	0		110 to 112	No Recovery. Bedrock confirmed, based on rock chips.		
111								
112						Drilled to 119 feet.		
113								
114								
115								
116						Drilling less difficult (possibly due to less fractured rock) from 116 to 119 feet.		
117								
118								
119						Light Gray to Gray Brown; fine- to medium-grained SANDSTONE.		
120								
121								
122								
123								
124								
125								
126								
127								
128								
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:
Description of bedrock based on rock chips.

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 6 of 12 **WELL NO.** 090-MW-7BR **Location:** Baldwin Steel

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 9, 2004 - Rain in morning, 73°F-80°F
September 10, 2004 - Mostly Cloudy, 66°F-82°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Continued from above.		
131							
132							
133							
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152					Gray; fine-grained SANDSTONE.		
153							
154					Brown; fine-grained SANDSTONE; weathered.		
155					Light Brown; fine-grained Silty SANDSTONE to Sandy SILTSTONE.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 090-MW-7BR (Sheet 7 of 12) **Location:** Baldwin Steel	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 13, 2004 - Sunny, 66°F-82°F
September 14, 2004 - Partly Sunny, 68°F-74°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157							
158							
159							
160					Light Brown; fine-grained SANDSTONE.		
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171					Red Brown; SILTSTONE.		
172					Light Brown; fine-grained SANDSTONE.		
173							
174							
175							
176							
177							
178							
179					Dark Gray; SILTSTONE.		
180					Fine-grained SANDSTONE.		
181							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 8 of 12 **WELL NO.** 090-MW-7BR **Location:** Baldwin Steel

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 15, 2004 - Cloudy, 66°F-73°F
September 16, 2004 - Partly Sunny, 66°F-80°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.		
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200					Brown; medium-grained SANDSTONE; weathered.		
201					Light Brown; fine-grained SANDSTONE.		
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor: B&B Drilling Driller: Dave Myerchin Inspector: Mike Wilkinson Rig Type: Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 9 of 12 **WELL NO.** 090-MW-7BR **Location:** Baldwin Steel

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 17, 2004 - Cloudy, 70°F-77°F
September 20, 2004 - Sunny, 58°F-70°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor: B&B Drilling Driller: Dave Myerchin Inspector: Mike Wilkinson Rig Type: Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 10 of 12 **WELL NO.** 090-MW-7BR **Location:** Baldwin Steel

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 21, 2004 - Mostly Sunny, 59°F-80°F
September 22, 2004 - Sunny, 59°F-82°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.		
235					Dark Gray; SILTSTONE.		
236							
237							
238							
239							
240					Dark Gray; SHALE.		
241							
242							
243							
244							
245					Green Gray; SILTSTONE.		
246							
247							
248							
249							
250					Dark Gray; SILTSTONE.		
251							
252							
253							
254							
255							
256							
257							
258							
259							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Dave Myerchin
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ Sheet 11 of 12
WELL NO. 090-MW-7BR

Location:
Baldwin Steel

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: September 23, 2004 - Mostly Sunny, 66°F-82°F
September 24, 2004 - Mostly Sunny, 65°F-72°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.		
261							
262							
263							
264							
265							
266							
267							
268							
269							
270							
271							
272							
273							
274							
275							
276							
277							
278							
279							
280							
281							
282							
283							
284							
285							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Dave Myerchin
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. Sheet 12 of 12
090-MW-7BR

Location:
Baldwin Steel

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: September 27, 2004 - Cloudy, 63°F-76°F
September 28, 2004 - Rain, 65°F-70°F
Date/Time Start: September 20, 2004 / 1045 (119 feet)
Date/Time Finish: September 20, 2004 / 1710 (311 feet)
Weight of Hammer: NA
Drop of Hammer: NA
Type of Hammer: NA

Location Description:
Well is located 73.3 feet South of the Southwest corner of the Baldwin Steel building and 26.4 feet West of the NW corner of the transformer pad by the southern boundary fenceline.

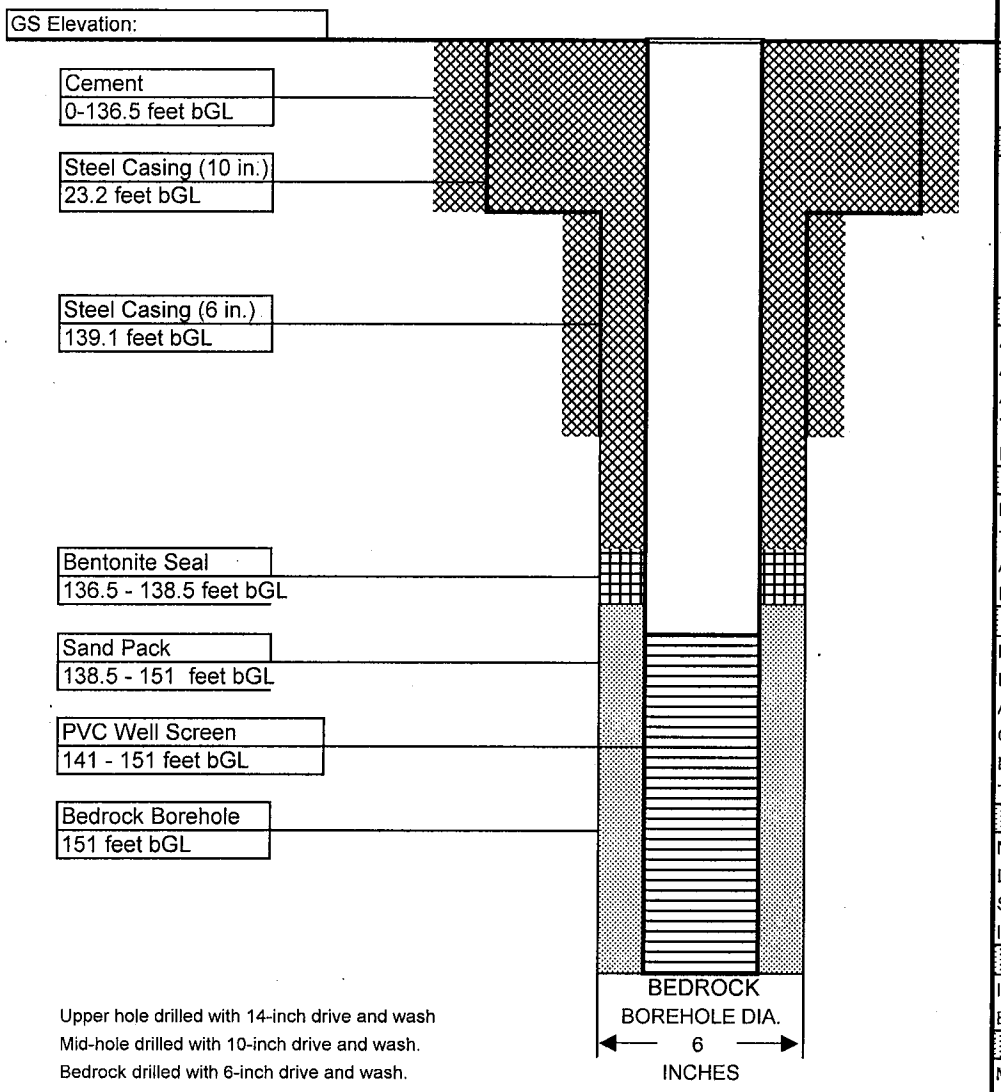
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.		
287							
288							
289							
290							
291							
292							
293							
294							
295							
296							
297							
298							
299							
300					Dark Gray; SHALE.		
301							
302							
303							
304							
305							
306							
307							
308							
309							
310							
311					Bottom of Borehole at 311 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
SP = SIMULPROBE SAMPLER

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	090-MW-18BR	FACILITY/SITE NAME:	New Jersey City University - overflow parking
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Bill Pearson	DRILLING CONTACTO	B&B Drilling
DATE START:	7-Aug-06	DATE END:	1-Sep-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 14-inch drive and wash
Mid-hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Watertight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 136.5 FEET
SEAL	
Material:	BENTONITE
Type:	NA
Amount Used:	NA
Interval:	136.5 - 138.5 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	NA
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	136.5 - 138.5 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2 INCHES
Slot Size & Type:	0.010 INCH
Interval BGS:	132.69-152.79 FEET
SUMP	
Interval BGS:	152.79-153.0 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	NA

Contractor: B&B Drilling
Driller: Mike Kinney
Inspector: Bill Pearson
Rig Type: Mobile B-61

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 1 of 6
WELL NO. 090-MW-18BR

Location:
Jersey City U overflow parking lot, adjacent base-ball field to the east

Location Description:
Well 090-MW-18BR is located on the fifth parking line from West Side Avenue, along the west side of lines.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: August 07, 2006 - H,H,H - 95°F
August 09, 2006 - H,H,H - 98°F
Date/Time Start: August 07, 2006 / 0800 (Ground Surface)
Date/Time Finish: September 01, 2006 / (339 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0	HA		4.0	NA	0 to 4	ASPHALT (0-0.5). Light Brown; mf SAND, little mf Gravel (angular), some Silt; loose; dry (0.5- 4.0)	SM	
4	SS		4.0	NA	4 to 8	Light Brown; mf SAND, little mf Gravel (subrounded); some Silt loose; moist (4.0-5.5). Dark Brown; Silty CLAY, Some f Sand; Soft; moist (5.5 - 6.0). Brown; Clayey SILT, with f Sand; soft; damp (6.0 - 8.0).	SP CL	
8	SS		4.0	NA	8 to 12	Brown; CLAY, some f Sand; med. Dense; moist-damp (8.0 - 10.0). Light Brown; mf SAND; some Clay; loose; moist. (10.0 - 12.0).	SP	
12	SS		1.5	NA	12 to 16	Light Brown mf SAND and COBBLES; some Clay; dense; moist (12 -14). Light Brown SILT and CLAY; little f Sand; trace Cobbles; med. Dense; moist (14 - 16).	SP GP ML CL	
16	SS		0.5	NA	16 to 20	No recovery (16 -18). Red Brown COBBLES and crs Gravel; some Sand; little Silt; very Dense; moist (18 - 20).	GP	
20	SS		3.7	NA	20 to 26	Red Brown f SAND, some Silt; loose - med. Dense; damp (20 - 22). Red Brown SILT and CLAY, trace f Sand; soft; damp (22 - 26).	SM ML CL	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Permanent 10 inch steel casing installed to 23 feet, 2 1/4 inches. Will continue sampling in five foot intervals, beginning at 30 feet.

Contractor: B&B Drilling **Driller:** Mike Kinney **Inspector:** Bill Pearson **Rig Type:** Mobile B-61	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** Sheet 2 of 6 **090-MW-18BR** **Location:** Jersey City U overflow parking lot, adjacent base-ball field to the east

GROUNDWATER OBSERVATIONS							
Water Level					Weather:	August 10, 2006 - Sunny, 90°F	**Location Description:**
Date					Date/Time Start:	August 07, 2006 / 0800 (Ground Surface)	Well 090-MW-18BR is located on the fifth parking line from West Side Avenue, along the west side of lines.
Time					Date/Time Finish:	September 01, 2006 / (339 feet)	
Meas. From					Weight of Hammer	140 Lbs.	
					Drop of Hammer	30 Inches	
					Type of Hammer	hydraulic	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26								
27						Drilled to 30 feet.		
28								
29								
30	SS	4	1.2	NA	**30 to 32**	Red Brown; CLAY, some Silt; soft; damp.	CL	
		7						
31		9						
		12						
32						Drilled to 35 feet.		
33								
34								
35	SS	3	1.5	NA	**35 to 37**	Red Brown; CLAY and SILT; soft; damp.	CL SM	
		7						
36		9						
		15						
37						Drilled to 40 feet.		
38								
39								
40	SS	22	1.2	NA	**40 to 41.8**	Brown; f SAND, some Silt; very dense; moist	SP	
		49						
41		52						
		50/4						
42						Drilled to 45 feet.		
43								
44								
45	SS	38	1.0	NA	**45 to 46.8**	Brown; f SAND, little Silt; very dense; moist to damp.	ML	
		60						
46		64						
		50/4						
47						Drilled to 47 feet.		
48								
49								
50	SS	23	1.0	NA	**50 to 52**	Brown; f SAND, little Silt; very dense; moist to damp.	ML	
		46						
51		46						
		53						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Mike Kinney **Inspector:** Mike Wilkinson **Rig Type:** Mobil B61	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 3 of 6 **WELL NO.** 090-MW-18BR **Location:** Jersey City U overflow parking lot, adjacent base-ball field to the east

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 11, 2006 - Sunny 87°F

Date/Time Start: August 07, 2006 / 0800 (Ground Surface)
Date/Time Finish: September 01, 2006 / (339 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 090-MW-18BR
is located on the fifth parking , along the west side line from West Side Avenue,
along the west side of lines.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	34	1.2	NA	**55 to 57**	Brown; f SAND, trace Silt; very dense; damp	SP	
		53						
56		54						
		58						
57						Drilled to 60 feet.		
58								
59								
60	SS	17	1.0	NA	**60 to 62**	Brown; f SAND, trace Silt; very dense; damp	SP	
		27						
61		27						
		34						
62						Drilled to 65 feet.		
63								
64								
65	SS	20	1.4	NA	**65 to 67**	Red Brown; vf SAND, trace Silt; very dense, saturated. Red Brown; CLAY, little c Sand, little f Gravel; hard; saturated (65.7-66.0).	SP	
		45						
66		57						
		59						
67						Drilled to 70 feet.		
68								
69								
70	SS	25	1.3	NA	**70 to 72**	Red Brown; SILT, and vf Sand ; very dense; saturated.	ML	
		51						
71		67						
		75						
72						Drilled to 75 feet.		
73								
74								
75	SS	35	1.0	NA	**75 to 77**	Red Brown; SILT, some vf Sand; very dense; saturated	ML	
		54						
76		68						
		61						
77								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Mike Kinney **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-61	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 4 of 6 **WELL NO.** 090-MW-18BR **Location:** Jersey City U overflow parking lot, adjacent base-ball field to the east

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 11, 2006 - Sunny 66°-87°F

Date/Time Start: August 07, 2006 / 0800 (Ground Surface)
Date/Time Finish: September 01, 2006 / (339 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 090-MW-18BR
is located on the fifth parking , along the west side line from West Side Avenue,
along the west side of lines.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						drilled to 80 feet		
79								
80	SS	32	0.9	NA	**80 to 82**	Red Brown; SILT, little vf Sand; very dense; saturated.	ML	
		52						
81		13						
		63						
82						Drilled to 85 feet.		
83								
84								
85	SS	30		NA	**85 to 87**	Red Brown; SILT, little vf Sand; very dense; saturated.	ML	
		63	1.3					
86		73						
		98						
87						Drilled to 90 feet.		
88								
89								
90	SS	20		NA	**90 to 92**	Red Brown; SILT; very dense; saturated.	ML	
		41	1.6					
91		57						
		79						
92						Drilled to 95 feet.		
93								
94								
95	SS	6	1.1	NA	**95 to 97**	Red Brown; CLAY; very stiff; saturated (95.0-96.0).		
		9				Red Brown; SILT, some Clay; very dense; saturated (96.0-96.1).	CL	
96		13						
		23					ML	
97'						Drilled to 100 feet.		
98								
99								
100	SS	4	0.8	NA	**100 to 102**	Brown; CLAY; soft; saturated (100 - 100.3)	CL	
		29				Brown; cmf GRAVEL (angular), some cmf Sand, some Silt;	GP	
101		32				very dense; saturated (100.3 - 100.8)		
		28						
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Mike Kinney **Inspector:** Bill Pearson **Rig Type:** Mobile B-61	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 5 of 6 **WELL NO.** 09-MW-18BR **Location:** Jersey City U overflow parking lot, adjacent base-ball field to the east	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 14, 2006 - Sunny, 68°-86°F
Date/Time Start: August 07, 2006 / 0800 (Ground Surface)
Date/Time Finish: September 01, 2006 / (339 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 090-MW-18BR
is located on the fifth parking , along the west side line from West Side Avenue,
along the west side of lines.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						drilled to 105 feet		
105	SS	40		NA	**105 to 107**	Red Brown SILT, some Clay, some Gravel; very dense; damp	ML	
		46	1.0			(105 - 105.5) & (105.9 - 106.1).	SP	
106		50/1				Red Brown cmf SAND, little Silt; dense; damp (105.5 - 105.9)	ML	
107						Drilled to 110 feet		
108								
109								
110	SS	87	1.8	NA	**110 to 112**	Red Brown; mf SAND, and cmf GRAVEL (subrounded)	SP/GP	
		76				some Cobbles, some silt; very dense; damp (110 - 110.8).		
111		82				Red Brown; mf SAND, some cm Gravel (subrounded); very dense;	SP	
		93				moist - damp (110.8 - 111.0)		
112						Drilled to 115 feet.		
113								
114								
115	SS	60	1.5	NA	**115 to 117**	Red Brown f SAND, little Silt, little m Gravel (subrounded);		
		80				very dense; damp.	SP	
116		81						
		108						
117						Drilled to 120 feet.		
118								
119								
120	SS	100/4	0.0	NA	**120 to 122**	No Recovery		
121								
122						Drilled to 125 feet.		
123								
124								
125	SS	100/4	0.1	NA	**125 to 127**	Brown Red; cmf SAND and GRAVEL (angular), little Silt; very		
126						dense; damp.	S P/GP	
127								
						Drilled to 130 feet		
128								
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling
Driller: Mike Kinney
Inspector: Bill Pearson
Rig Type: Mobile B-61

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 6 of 6
WELL NO. 09-MW-18BR

Location:
Jersey City U overflow parking lot, adjacent base-ball field to the east

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: August 15, 2006 - sunny, 85 degrees
Date/Time Start: August 07, 2006 / 0800 (Ground Surface)
Date/Time Finish: September 01, 2006 / (339 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 090-MW-18BR
is located on the fifth parking , along the west side line from West Side Avenue,
along the west side of lines.

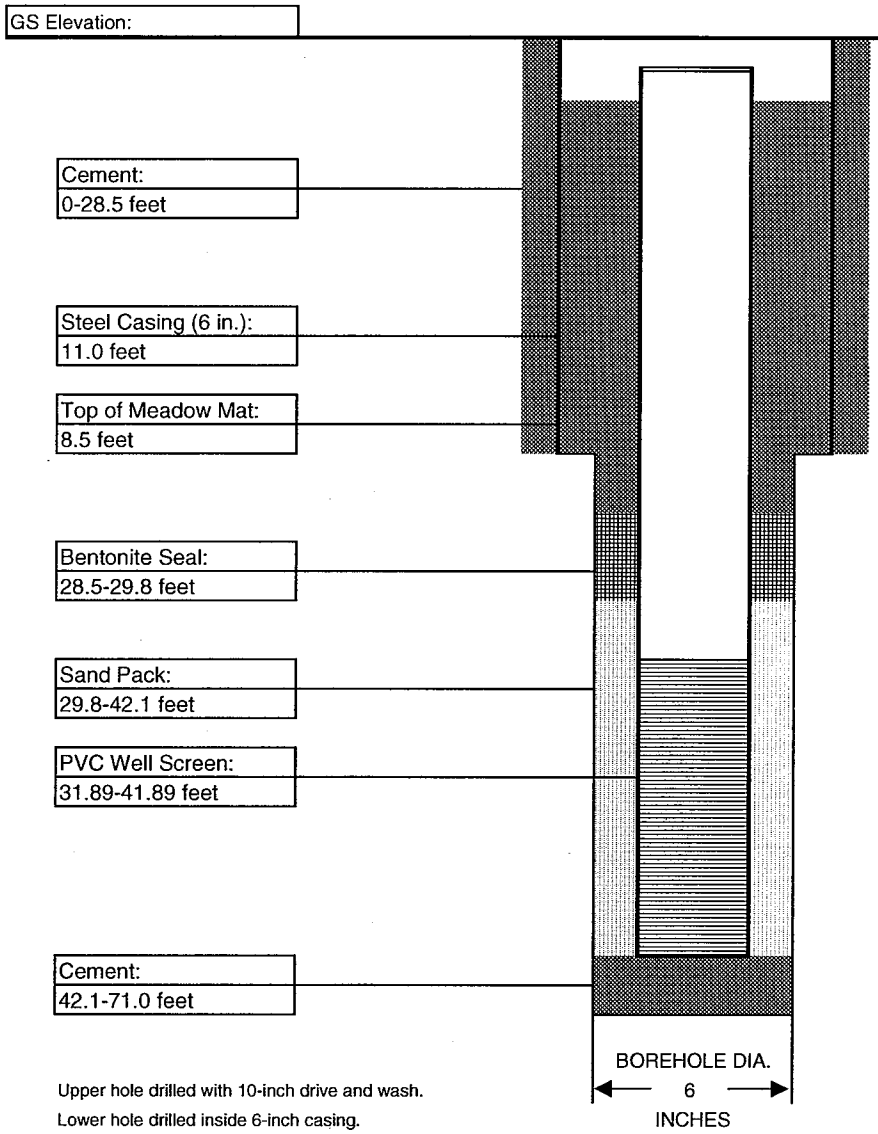
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130	SS	100/4	0.1	NA	**130 - 132** Brown Red; cmf SAND, lttle cmf Gravel (angular), little Silt; very dense; damp	SP	
131							
132	C	NA	2.3	NA	**132 - 137** Dark Brown Siltstone, bioturbation	BEDROCK	
133							
134							
135							
136							
137						BEDROCK	
138							
139							
140							
160							
180							
200							
220							
240							
260							
280							
300							
320							
340					Bottom of bore hole at 339 feet		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Bedrock descriptions are based on rock Cored.

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-D1	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	3-Nov-06	DATE END:	13-Dec-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-28 FEET, 42.1-71.0 FT
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	28.5-29.8 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	29.8-42.1 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	31.89-41.89 FEET
SUMP	
Interval BGS:	41.89-42.10 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

HYDROQUAL
DRILLING RECORD

Contractor:	B&B Drilling
Driller:	Pete Lee
Inspector:	Mike Wilkinson
Rig Type:	Mobile B-57

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 117-MW-D1 Sheet 1 of 3

Location: Home Depot

Location Description:

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 3, 2006 - Mostly Sunny, 37°-46°F
Weather: December 1, 2006 - Cloudy, Windy, 62°-72°F
Date/Time Start: November 3, 2006 / 0905 (Ground Surface)
Date/Time Finish: December 7, 2006 / 1125 (71 feet bGL)
Weight of Hammer: 140 lbs.
Drop of Hammer: 30 inches
Type of Hammer: hydraulic

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					**0 to 1.9**	Brown; mf SAND, trace+ Silt, little cmf Gravel; loose; moist	SP	
1						Fabric and plastic liner at 1.9 feet.		
2					**1.9 to 4**	Hand dig to 4 feet to install 10" casing.		
3								
4					**4 to 5**	Drilled to 5 feet.		
5	SS	8	0.8		**5 to 7**	Dark Gray; cmf SAND, little+ cmf Gravel; slag, possible COPR;	SW	
		13				medium dense; moist (5.0-5.7).		
6		5				Brown; vf-f SAND; medium dense; moist (5.7-5.8).	SP	
		2						
7	SS	1	2.0		**7 to 9**	Light Brown; CLAY-like COPR; layered; very soft; saturated		
		WOR				(7.0-8.6).	CL ? (COPR)	
8		WOR				Black; CLAY; weak organic odor; very soft; saturated (8.6-9.0).		
		1					OL	
9	SS	1	0.1		**9 to 11**	Brown; f SAND; organic odor; medium dense; saturated.		
		WOR						
10		WOR						
		3						
11	SS	4	1.4		**11 to 13**	Brown; f SAND; medium dense; saturated.	SP	
		6						
12		11						
		12						
13	SS	4	1.1		**13 to 15**	Brown to Red Brown; f SAND, trace+ Silt; medium dense;		
		7				saturated.		
14		9						
		9						
15	SS	5	1.2		**15 to 17**	Red Brown; SILT; very stiff; saturated (15.0-15.6).	ML	
		9				Brown; f SAND, trace- Silt; medium dense; saturated (15.6-16.2).		
16		16						
		21						
17	SS	15	1.2		**17 to 19**	Brown; f SAND, trace- Silt; very dense; saturated.		
		25						
18		27						
		30						
19	SS	5	1.3		**19 to 21**	Brown to Red Brown; f SAND, trace Silt; dense; saturated.		
		15						
20		16					SP	
		19						
21	SS	5	1.0		**21 to 23**	Brown; f SAND, trace- Silt; medium dense; saturated.		
		9						
22		10						
		11						
23	SS	8	1.1		**23 to 25**	Brown; f SAND, trace- Silt; thin (<1/4") vf Sand/Silt layers;		
		12				medium dense; saturated.		
24		14						
		16						
25	SS	5	1.0		**25 to 27**	Brown; f SAND; medium dense; saturated.		
		10						

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:

HYDROQUAL
DRILLING RECORD

Contractor:	B&B Drilling	**BORING/ WELL NO.**	Sheet 2 of 3 117-MW-D1
Driller:	Pete Lee	**Location:**	
Inspector:	Mike Wilkinson	PROJECT NAME:	Deep Overburden Well Investigation
Rig Type:	Mobile B-57	PROJECT NUMBER:	HWEL.002.001.02

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 4, 2006 - Mostly Cloudy, 39°-43°F
Weather: December 5, 2006 - Mostly Sunny, Windy, 29°-40°F
Date/Time Start: November 3, 2006 / 0905 (Ground Surface)
Date/Time Finish: December 7, 2006 / 1125 (71 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 inches
Type of Hammer hydraulic

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26		15			Continued from above.		
		16					
27	SS	8	1.1		**27 to 29** Brown; vf SAND; medium dense; saturated.		
		11					
28		19					
		31					
29	SS	25	1.5		**29 to 31** Brown; vf-f SAND; very dense; saturated.		
		35				SP	
30		66					
		65					
31	SS	24	1.2		**31 to 33** Brown; vf-f SAND; very dense; saturated.		
		49					
32		44					
		37					
33	SS	11	1.3		**33 to 35** Brown; vf SAND, trace Silt; very dense; saturated (33.0-34.0).		
		22			Brown to Red Brown; vf SAND, some Silt; very dense;		
34		28			saturated (34.0-34.3).		
		25				SM	
35	SS	13	1.1		**35 to 37** Brown; vf SAND, some Silt; Gravel layer at 36.5 feet; very		
		19			dense; saturated.		
36		60					
		35					
37	SS	11	1.1		**37 to 39** Brown; CLAY, trace+ f Gravel; hard; saturated (37.0-37.4).	CL	
		18			Brown; vf SAND, trace Silt; dense; saturated (37.4-38.1).		
38		22					
		25					
39	SS	18	1.5		**39 to 41** Red Brown; SILT, some vf Sand; hard; saturated.	ML	
		29					
40		26					
		21					
41	SS	16	0.8		**41 to 43** Red Brown; SILT, some vf Sand; hard; saturated (41.0-41.2).		
		20			Red Brown; CLAY, trace+ f Gravel; hard; saturated (41.2-41.8).		
42		40					
		46				CL	
43	SS	11	1.6		**43 to 45** Brown; CLAY, trace f Gravel (rounded); hard; saturated		
		17			(43.0-44.4).		
44		18			Brown; f SAND, trace Silt; dense; saturated (44.4-44.6).		
		27				SP	
45	SS	20	1.4		**45 to 47** Brown; CLAY/SILT, trace- f Gravel; hard; saturated.		
		31				CL/ML	
46		33					
		49					
47	SS	20	1.6		**47 to 49** Brown; CLAY, trace mf Gravel (subrounded); hard; saturated	CL	
		26			(47.0-47.9).		
48		23			Brown; SILT, some vf Sand; hard; saturated (47.9-48.6).		
		29					
49	SS	14	0.2		**49 to 51** Red Brown; SILT, some vf-f Sand; hard; saturated.		
		19				ML	
50		23					
		27					
51	SS	15	1.5		**51 to 53** Red Brown; SILT, little vf Sand; hard; saturated (51.0-51.5).		
		15			Red Brown; CLAY, trace- f Gravel; hard; saturated (51.5-52.5).	CL	

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	**HYDROQUAL**	**BORING/**	Sheet 3 of 3
Driller:	Pete Lee	**DRILLING RECORD**	**WELL NO.**	**117-MW-D1**
Inspector:	Mike Wilkinson	PROJECT NAME: Deep Overburden Well Investigation	**Location:**	Home Depot
Rig Type:	Mobile B-57	PROJECT NUMBER: HWEL.002.001.02		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 6, 2006 - Mostly Sunny, 33°-48°F
Weather: December 7, 2006 - Cloudy, 46°-54°F
Date/Time Start: November 3, 2006 / 0905 (Ground Surface)
Date/Time Finish: December 7, 2006 / 1125 (71 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 inches
Type of Hammer hydraulic

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52		16				Continued from above.		
		21						
53	SS	6	1.5		**53 to 55**	Red Brown; CLAY; vf Sand laminations; very stiff; saturated (53.0-54.4).	CL	
		10						
54		10				Red Brown; vf SAND; medium dense; saturated (54.4-54.5).		
		18					SP	
55	SS	13	1.3		**55 to 57**	Red Brown; SILT, trace f Gravel; vf Sand laminations; very stiff; saturateed.	ML	
		10						
56		15						
		20						
57	SS	10	1.1		**57 to 59**	Brown; vf-f SAND; medium dense; saturated (57.0-57.8).	SP	
		11				Brown; vf SAND, some Silt; medium dense; saturated (57.8-58.1).		
58		15					SM	
		16						
59	SS	11	1.2		**59 to 61**	Brown; SILT, little vf Sand; vf-f Sand layer (2") at 60.0 feet; hard; saturated.	ML	
		18						
60		19						
		20						
61	SS				**61 to 63**	Drilled to 63 feet.		
62								
63	SS	10	1.0		**63 to 65**	Brown; SILT, little vf Sand; very stiff; saturated (63.0-63.3).	ML	
		13				Brown; vf SAND, trace Silt; medium dense; saturated (63.3-63.6).	SP	
64		15					ML	
		23				Brown; SILT, little vf Sand; very stiff; saturated (63.6-64.0).		
65	SS	13	1.1		**65 to 67**	Brown; CLAY, trace f Gravel; hard; saturated.		
		26						
66		32					CL	
		55						
67	SS	5	1.2		**67 to 69**	Brown; CLAY, some cmf Gravel (angular to subangular); hard; saturated.		
		10						
68		27						
		34						
69	SS	9	0		**69 to 71**	No Recovery.		
		14						
70		31						
		37						
71						End of Boring at 71 feet.		
72								
73								
74								
75								
76								
77								

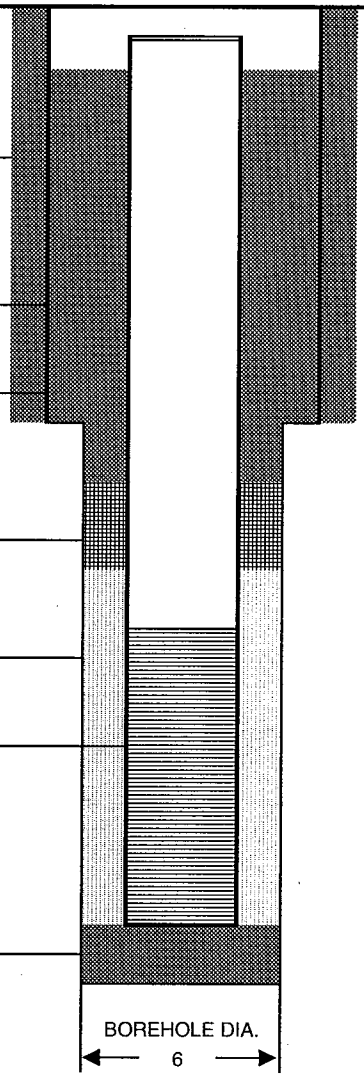
COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-D2	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	2-Nov-06	DATE END:	30-Nov-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

GS Elevation:



Cement: 0-35.5 feet

Steel Casing (6 in.): 25.0 feet

Top of Meadow Mat: 24.0 feet

Bentonite Seal: 35.5-36.5 feet

Sand Pack: 36.5-48.5 feet

PVC Well Screen: 38.5-48.5 feet

Cement: 48.5-82.0 feet

Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-35.5 FEET, 48.5-82.0 F
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	35.5-36.5 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	36.5-48.5 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	38.5-48.5 FEET
SUMP	
Interval BGS:	N/A
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. 117-MW-D2 — Sheet 1 of 4

Contractor: B&B Drilling
Driller: Pete Lee
Inspector: M. Wilkinson, N. Santella
Rig Type: Mobile B-57

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Home Depot

Location Description:

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 2, 2006 - Morning Rain, Sunny Afternoon, 46°-52°F
Weather: November 15, 2006 - Cloudy, 58°-66°F
Date/Time Start: November 2, 2006 / 0950 (Ground Surface)
Date/Time Finish: November 22, 2006 / 0940 (82 feet bGL)
Weight of Hammer: 140 lbs.
Drop of Hammer: 30 Inches
Type of Hammer: hydraulic

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					**0 to 6**	Asphalt Surface Material (0-0.5).	ASPHALT	
						Light Brown; cmf SAND, little cmf Gravel; ceramic, metal, glass,		
1						wood; micaceous neard bottom; medium dense (softer below		
						5.0 feet); medium dense; moist to wet (0.5-6.0).		
2								
							SW	
3								
4								
5								
						Hand dig to fabric and plastic liner at 6.0 feet.		
6							ASPHALT	
7								
						Hand dig to 8 feet to install 10" casing.		
8	SS	3	1.5		**8 to 10**	Dark Brown to Light Brown; f SAND; medium dense; moist.		
		6					SP	
9		7						
		10						
10	SS	2	1.1		**10 to 12**	Gray to Brown; f SAND, little Silt, trace c Sand to f Gravel;		
		9				medium dense; wet.		
11		9						
		9					SM	
12	SS	1	1.0		**12 to 14**	Gray to Brown; f SAND, little Silt, trace f Gravel; loose; wet.		
		2						
13		4						
		4						
14	SS	4	0.1		**14 to 16**	Dark Gray; f SAND, trace+ Silt, trace f Gravel; very loose; saturated.		
		1					SP	
15		2						
		2						
16	SS	2	2.0		**16 to 18**	Dark Gray; CLAY; soft; saturated (16.0-16.7).	CL	
		3				Dark Brown; f SAND, trace+ Silt; dense; saturated (16.7-17.1).		
17		30				Gray Brown; mf SAND; dense; saturated (17.1-18.0).	SP	
		50/4"						
18	SS	10	1.5		**18 to 20**	Brown; SILT; organic odor; hard; saturated (18.0-18.2).	OL	
		50				Red Brown; mf SAND; brown, tan, and gray bands to 1" thick;		
19		63				very dense; saturated (18.2-19.5).		
		63					SP	
20	SS	17	1.4		**20 to 22**	Brown; mf SAND; dark brown bands <1" thick; very dense;		
		18				saturated (20.0-21.2).		
21		33				Light Gray; CLAY-like material, some f Sand; very dense; saturated		
		32				(21.2-21.4). Hach test result (ND) on soil indicates COPR not present.	CL/ML ?	
22	SS	15	1.3		**22 to 24**	Gray; CLAY/SILT-like material, little f Sand, trace Gravel; hard;		
		19				saturated (22.0-22.4).	SW	
23		18				Gray to Brown; cmf SAND; dense, saturated (22.4-22.5).		
		16				Red Brown; SILT, some f Sand; hard; saturated (22.5-23.4).		
24	SS	10	1.1		**24 to 26**	Red Brown; SILT, trace f Sand; very stiff; saturated.	ML	
		10						
25		12						
		14						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Pete Lee
Inspector: N. Santella, G. Llewellyn
Rig Type: Mobile B-57

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 117-MW-D2 Sheet 2 of 4
Location: Home Depot

Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 16, 2006 - Cloudy, 61°-66°F
Weather: November 17, 2006 - Mostly Sunny, Windy, 59°-62°F
Date/Time Start: November 2, 2006 / 0950 (Ground Surface)
Date/Time Finish: November 22, 2006 / 0940 (82 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26	SS	10	1.0		**26 to 28**	Brown; f SAND; dense; saturated (26.0-26.6). Red Brown; vf SAND; dense; saturated (26.6-27.0).	SP	
		17						
27		14						
		18						
28	SS	12	1.0		**28 to 30**	Red Brown; f SAND; dense; saturated (28.0-28.8). Red Brown; F SAND, little Silt; dense; saturated (28.8-29.0).		
		15						
29		18					SM	
		16						
30	SS	14	1.2		**30 to 32**	Red Brown; f SAND; very dense; saturated (30.0-30.2).	SP	
		25				Red Brown; vf SAND, and Silt; very dense; saturated (30.2-31.2).		
31		26					SM	
		20						
32	SS	10	0.8		**32 to 34**	Red Brown; f SAND; medium dense, saturated.		
		10					SP	
33		10						
		6						
34	SS	4	0.8		**34 to 36**	Red Brown; vf SAND; some Silt; medium dense; saturated.		
		5					SM	
35		8						
		8						
36	SS	8	0.9		**36 to 38**	Red Brown; f SAND, trace- c Sand; Silty Sand layer at 36.3-36.5 feet; medium dense; saturated.		
		6						
37		9						
		13						
38	SS	7	1.1		**38 to 40**	Red Brown; mf SAND; dense; saturated.		
		13						
39		21					SP	
		23						
40	SS	7	1.0		**40 to 42**	Brown; f SAND; medium dense; saturated (40.0-40.4). Orange Brown; f SAND, trace Silt; medium dense; saturated (40.4-41.0).		
		9						
41		16						
		18						
42	SS	7	1.2		**42 to 44**	Light Brown; f SAND; medium dense; saturated (42.0-42.2). Red Brown; vf SAND/SILT; medium dense; saturated (42.2-43.2).		
		10						
43		10					SP/ML	
		12						
44	SS	4	1.3		**44 to 46**	Red Brown; vf SAND, some Silt; medium dense; saturated.		
		8					SM	
45		7						
		12						
46	SS	7	1.2		**46 to 48**	Red Brn; SILT, trace- c Sand to f Gravel; possible laminations; 1" Silt/Clay layer at 46.7 feet; very stiff; saturated (46.0-47.0).	ML	
		9						
47		9				Red Brown; f SAND, trace Sand to mf Gravel; medium dense; saturated (47.0-47.2).	SP	
		13						
48	SS	5	1.2		**48 to 50**	Red Brown; SILT, some f Sand, trace c Sand; very stiff; saturated (48.0-48.2).		
		15						
49		15				Red Brown; SILT, trace c Sand, trace f Gravel; very stiff; saturated (48.2-49.2).		
		21					ML	
50	SS	12	1.1		**50 to 52**	Red Brown; SILT, little vf Sand, trace mf Gravel; very stiff; saturated.		
		30						
51		25						
		25						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. 117-MW-D2 — Sheet 3 of 4

Location: Home Depot

Location Description:

Contractor: B&B Drilling
Driller: Pete Lee
Inspector: N. Santella, G. Llewellyn
Rig Type: Mobile B-57

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Weather: November 20, 2006 - Sunny, 40°-44°F
Weather: November 21, 2006 - Sunny, 33°-43°F
Date/Time Start: November 2, 2006 / 0950 (Ground Surface)
Date/Time Finish: November 22, 2006 / 0940 (82 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52	SS	4	1.0		52 to 54	Red Brown; SILT, trace Clay, little vf Sand, trace Gravel; hard; saturated.	ML	
		16						
53		32						
		36						
54	SS	20	1.0		54 to 56	Red Brown; SILT, trace Clay, some- vf Sand, little c Sand to f Gravel (angular); hard; saturated.		
		14						
55		18						
		24						
56	SS	13	1.4		56 to 58	Brown; SILT, trace+ vf Sand, trace Gravel; hard; saturated.		
		27						
57		32						
		39						
58	SS	16	1.0		58 to 60	Brown; SILT, trace vf Sand; hard; saturated.		
		23						
59		23						
		31						
60	SS	14	0.7		60 to 62	Red Brown; SILT, trace vf Sand, trace Clay; very stiff; saturated.		
		22						
61		40						
		41						
62	SS	16	1.1		62 to 64	Brown; SILT, trace vf Sand, trace f Gravel, trace Clay; hard; saturated.		
		86						
63		55						
		46						
64	SS	20	1.3		64 to 66	Brown; SILT, little Clay; hard; saturated.		
		24						
65		22						
		44						
66	SS	16	1.0		66 to 68	Red Brown; SILT/CLAY, trace cmf Sand to f Gravel; hard saturated.	ML/CL	
		21						
67		40						
		48						
68	SS	21	1.3		68 to 70	Red Brown; SILT, some vf Sand, trace- c Sand; hard; saturated.	ML	
		28						
69		33						
		40						
70	SS	18	1.3		70 to 72	Red Brown; SILT/CLAY, trace c Sand to mf Gravel; hard; saturated (70.0-70.4).	ML/CL	
		30						
71		46				Red Brown; vf SAND, and Silt, trace- m Gravel; very dense; saturated (70.4-71.3).	SM	
		54						
72	SS	16	1.2		72 to 74	Red Brown; f SAND, trace Silt; very dense; sat (72.0-72.5).	SP	
		27				Red Brown; SILT, some f Sand; hard; saturated (72.5-72.7).	ML	
73		31				Red Brown; SILT/CLAY, trace mf Sand; thin dark brown to orange brown layering; hard; saturated (72.7-73.2).	ML/CL	
		35						
74	SS	14	0		74 to 76	No Recovery.		
		33						
75		43						
		66						
76	SS	38	0.7		76 to 78	Red Brown; SILT, some vf Sand; hard; saturated.	ML	
		63						
77		84						
		103						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	HYDROQUAL DRILLING RECORD	BORING/ WELL NO.	Sheet 4 of 4 117-MW-D2
Driller:	Pete Lee		Location:	
Inspector:	N. Santella	PROJECT NAME: Deep Overburden Well Investigation	Home Depot	
Rig Type:	Mobile B-57	PROJECT NUMBER: HWEL.002.001.02		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Weather:
Date/Time Start: November 2, 2006 / 0950 (Ground Surface)
Date/Time Finish: November 22, 2006 / 0940 (82 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

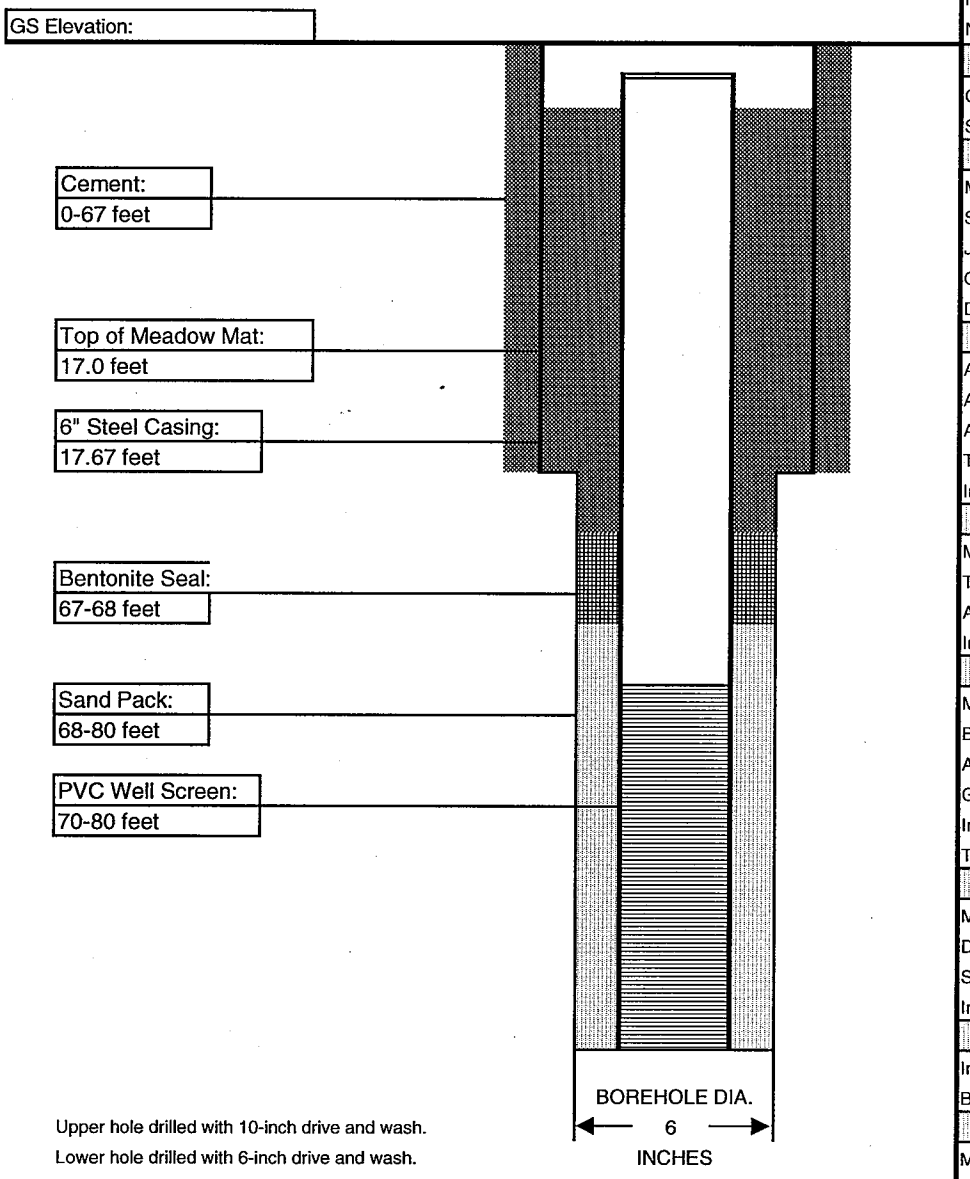
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78	SS	44	1.3		**78 to 80** Red brown; SILT, some f Sand; hard; saturated.	ML	
		76					
79		95					
		130					
80	SS	64	1.0		**80 to 82** Red Brown; SILT, and vf Sand; hard; saturated.		
		17					
81		128					
		146/3"					
82					End of Boring at 82 feet.		
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-D3	FACILITY/SITE NAME:	Home Depot
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	1-Nov-06	DATE END:	28-Nov-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-67 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	67-68 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	68-80 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	70-80 FEET
SUMP	
Interval BGS:	NA
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** Sheet 1 of 4 117-MW-D3 **Location:** Home Depot	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 1, 2006 - Mostly Sunny, 59°-64°F
Weather: November 10, 2006 - Sunny, 55°-65°F
Date/Time Start: November 1, 2006 / 1130 (Ground Surface)
Date/Time Finish: November 20, 2006 / 1425 (82 feet bGL)
Weight of Hammer: 300 lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 3.5	Asphalt and Trap Rock (0-0.9). Brown; cmf SAND, little+ cmf Gravel; red brick, tile, styrofoam; medium dense to dense; moist (0.9-3.5).	Asphalt	
1								
2							SW	
3						Hand dig to fabric and plastic liner at 3.5 feet.		
4						Hand dig to 5 feet to install 10"casing.		
5	SS	30	1.3		5 to 7	Concrete and Red Brick (5.0-5.5). Light Brown; f SAND; coal, slag at 5.9-6.3 feet; dense; moist (5.5-6.3).	Concrete	
		31						
6		5						
		6						
7	SS	5	1.5		7 to 9	Light Brown; f SAND; coal, slag at 7.0-7.3 feet; medium dense; wet.		
		6						
8		5						
		4						
9	SP	4	1.2	NA	9 to 11	Light Brown; f SAND; medium dense; wet.		pH: NA; mS: NA; Temp: NA
		6						
10		10						
		15						
11	SS	6	1.2		11 to 13	Brown; f SAND; black streak at 11.7 feet, bright green at 11.7-12.2 feet; dense; saturated.	SP	
		12						
12		23						
		31						
13	SP	16	1.3	ND	13 to 15	Green to Brown; f SAND; very dense; saturated (13.0-14.1). Gray; mf SAND; very dense; saturated (14.1-14.3).		pH: 6.93; mV: -37.5; Temp: 17.0
		24						
14		31						
		33						
15	SS	2	1.2		15 to 17	Gray; mf SAND; medium dense; saturated (15.0-16.0). Golden Yellow; f SAND; Silt layer 0.5" thick at 16.1 feet; medium dense; saturated (16.0-16.2).		
		5						
16		10						
		18						
17	SS	7	1.5		17 to 19	Black to Dark Gray; SILT/CLAY; weak organic odor; very stiff; saturated (17.0-17.5). Gray; f SAND, trace Silt; medium dense; saturated (17.5-18.2). Lt Brown; f SAND, little Silt; medium dense; saturated (18.2-18.5).	OL SP SM	
		13						
18		17						
		20						
19								
20	SP	6	1.1	1.5	20 to 22	Brown; f SAND, little Silt, trace mf Gravel; very dense; saturated.	SM	pH: 10.68; mV: -37.0; Temp: 18.3
		17						
21		33						
		31						
22						Drilled to 25 feet.		
23								
24								
25	SP	8	1.0	ND	25 to 27	Red Brown; vf-f SAND, trace Silt; dense; saturated.	SP	pH: 7.10; mV: 68.8; Temp: 18.3
		12						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.**	Sheet 2 of 4 **117-MW-D3** **Location:** Home Depot

GROUNDWATER OBSERVATIONS						
Water Level					Weather: November 14, 2006 - Cloudy, 55°-62°F	**Location Description:**
Date					Weather: November 16, 2006 - Cloudy, 61°-66°F	
Time					Date/Time Start: November 1, 2006 / 1130 (Ground Surface)	
Meas. From					Date/Time Finish: November 20, 2006 / 1425 (82 feet bGL)	
					Weight of Hammer 300 lbs.	
					Drop of Hammer 30 Inches	
					Type of Hammer mechanical	

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS		
26		19				Continued from above.	SP			
		23								
27						Drilled to 30 feet.				
28										
29										
30	SP	18	1.0	NA	**30 to 32**	Red Brown; vf-f SAND, trace+ Silt; dense; saturated.	SP	**pH:** NA	**mV:** NA	**Temp:** NA
		57								
31		100/6"								
32						Drilled to 35 feet.				
33										
34										
35	SP	11	1.2	NA	**35 to 37**	Red Brown; SILT, trace- mf Gravel (subangular); hard; saturated.	ML	**pH:** NA	**mV:** NA	**Temp:** NA
		33								
36		28								
		30								
37						Drilled to 40 feet.				
38										
39										
40	SP	8	0.8	ND	**40 to 42**	Red Brn; CLAY/SILT, little- cmf Gravel; hard; sat (40.0-40.5).	CL/ML	**pH:** 8.47	**mV:** -260.5	**Temp:** 16.8
		21				Red Brown; mf SAND, trace- Silt, trace- c Sand to f Gravel; very dense; saturated (40.5-40.6).	SP/SM			
41		31								
		50/4"				Red Brown; vf SAND, some Silt; hard; saturated (40.6-40.8).				
42						Drilled to 45 feet.				
43										
44										
45	SP	11	0.7	NA	**45 to 47**	Red Brown; SILT, trace mf Gravel; f Sand laminations; very stiff; saturated.	ML	**pH:** NA	**mV:** NA	**Temp:** NA
		12								
46		18								
		48								
47						Drilled to 50 feet.				
48										
49										
50	SP	25	1.3	NA	**50 to 52**	Red Brown; SILT, trace cmf Gravel (subrounded); hard; saturated.	ML	**pH:** NA	**mV:** NA	**Temp:** NA
		37								
51		48								
		53								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

HYDROQUAL
DRILLING RECORD

Contractor:	B&B Drilling	**BORING/ WELL NO.**	Sheet 3 of 4 117-MW-D3
Driller:	Ed Blewett	**Location:**	
Inspector:	M. Wilkinson, N. Santella	PROJECT NAME:	Deep Overburden Well Investigation
Rig Type:	Gus Pech	PROJECT NUMBER:	HWEL.002.001.02
		Location Description:	Home Depot

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 17, 2006 - Mostly Sunny, Windy, 59°-62°F
Weather: November 20, 2006 - Sunny, 40°-44°F
Date/Time Start: November 1, 2006 / 1130 (Ground Surface)
Date/Time Finish: November 20, 2006 / 1425 (82 feet bGL)
Weight of Hammer 300 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet		
53								
54								
55	SP	19	1.7	NA	55 to 57	Red Brown; CLAY/SILT, little cmf Gravel (subrounded to rounded); hard; saturated.	CL/ML	pH: NA, mV: NA, Temp: NA
		28						
56		39						
		45						
57						Drilled to 55 feet		
58								
59								
60	SP	5	1.4	ND	60 to 62	Red Brown; SILT; laminated; hard; saturated.	ML	pH: 8.02, mV: -57.8, Temp: 16.4
		18						
61		30						
		50/5"						
62						Drilled to 55 feet		
63								
64								
65	SP	8	1.3	NA	65 to 67	Red Brown; CLAY/SILT; little cmf Gravel, trace c Sand; hard; saturated.	CL/ML	pH: NA, mV: NA, Temp: NA
		17						
66		21						
		39						
67						Drilled to 55 feet		
68								
69								
70	SP	16	1.3	ND	70 to 72	Red Brown; f SAND, and Silt; thin Clay layers at 70.2-71.1 feet; very dense; saturated (70.0-71.1).	SM	pH: 8.14, mV: -54, Temp: 11.7
		23						
71		36				Red Brown; f SAND, very dense; saturated (71.1-71.3).	SP	
		50/4"						
72						Drilled to 55 feet		
73								
74								
75	SP	42	1.6	ND	75 to 77	Red Brown; SILT, trace cmf Sand, trace+ cmf Gravel; thin Sand layer at 75.2 feet; very dense; saturated.	ML	pH: 7.80, mV: -50, Temp: 11.9
		35						
76		34						
		39						
77						Drilled to 55 feet		

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor:	B&B Drilling	HYDROQUAL DRILLING RECORD	BORING/ WELL NO.	Sheet 4 of 4 117-MW-D3
Driller:	Ed Blewett		Location:	
Inspector:	Nick Santella	PROJECT NAME: Deep Overburden Well Investigation	Home Depot	
Rig Type:	Gus Pech	PROJECT NUMBER: HWEL.002.001.02		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: May 12, 2006 - Mostly Cloudy, Morning Rain, 58°-66°F
Weather: May 15, 2006 - Cloudy, 51°-60°F
Date/Time Start: November 1, 2006 / 1130 (Ground Surface)
Date/Time Finish: November 20, 2006 / 1425 (82 feet bGL)
Weight of Hammer 300 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

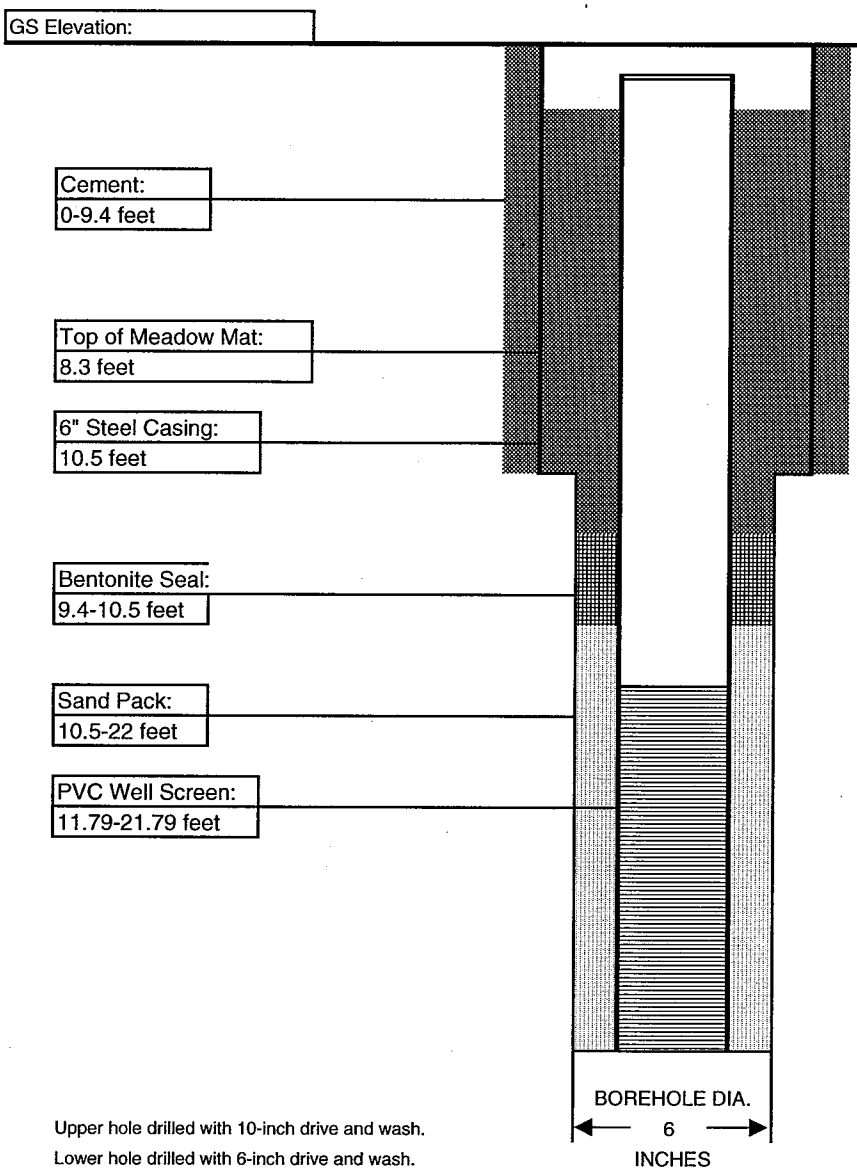
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78					Continued from above.		
79							
80	SP	13	1.4	ND	**80 to 82** Red Brown; SILT, some cmf Gravel, trace cmf Sand; dense;	ML/SM	**pH:** 8.19 **mV:** -35 **Temp:** 12.9
		16			saturated (80.0-80.3).		
81		15			Red Brown; f SAND, some Silt; dense; saturated (80.3-80.5).	ML/CL	
		25			Red Brn; SILT/CLAY, trace f Gravel; dense; sat (80.5-81.4).		
82					End of Boring at 82 feet.		
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-I1	FACILITY/SITE NAME:	Home Depot
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	11-Dec-06	DATE END:	13-Dec-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-9.4 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	9.4-10.5 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	10.5-22.0 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	11.79-21.79 FEET
SUMP	
Interval BGS:	21.79-22.0 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. 117-MW-I1 Sheet 1 of 1

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Nick Santella
Rig Type: Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Home Depot

Location Description:

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 11, 2006 - Mostly Cloudy, 47°-56°F
Weather: December 12, 2006 - Partly Cloudy, 44°-50°F
Date/Time Start: December 11, 2006 / 1015 (Ground Surface)
Date/Time Finish: December 12, 2006 / 1200 (22 feet bGL)
Weight of Hammer: 140 lbs.
Drop of Hammer: 30 inches
Type of Hammer: mechanical

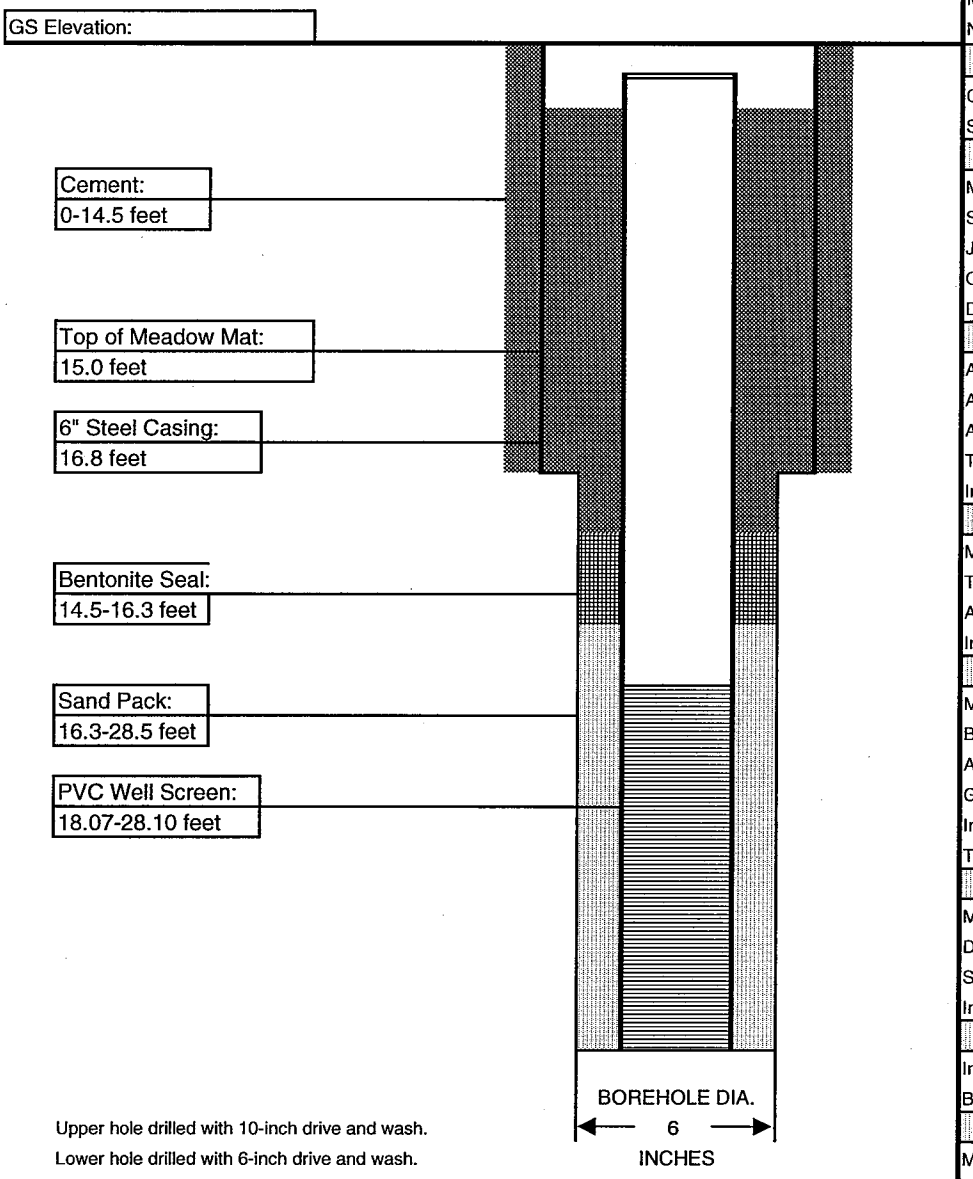
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					See the soil boring log for adjacent well 117-MW-D1 for soil descriptions.			
1								
2								
3								
4								
5								
6								
7	SS	1	1.5		7 to 9	Beige; CLAY-like; possible COPR; very soft; saturated (7.0-8.3).	CL ?	
		WOR				Black; CLAY; organic odor; very soft; saturated (8.3-8.5).	COPR ?	
8		WOR						
		WOR					OL	
9	SS	1	1		9 to 11	Black to Olive Brown; CLAY; organic odor; very soft; saturated (9.0-9.7).	CL	
		WOR						
10		WOR				Dark Brown; f SAND; very loose; saturated (9.7-10.2).	SP	
		5						
11						Drilled to 22 feet.		
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22						End of Boring at 22 feet.		
23								
24								
25								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-I2	FACILITY/SITE NAME:	Home Depot
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	28-Nov-06	DATE END:	30-Nov-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-14.5 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	14.5-16.3 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	16.3-28.5 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	18.07-28.10 FEET
SUMP	
Interval BGS:	28.10-28.31 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Nick Santella Rig Type: Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/** Sheet 1 of 2 **WELL NO.** 117-MW-I2 **Location:** Home Depot	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 28, 2006 - Partly Sunny, 52°-64°F
Weather: November 29, 2006 - Cloudy, 52°-59°F
Date/Time Start: November 28, 2006 / 0945 (Ground Surface)
Date/Time Finish: November 29, 2006 / 1215 (28.5 feet bGL)
Weight of Hammer: 140 lbs.
Drop of Hammer: 30 inches
Type of Hammer: mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					See the soil boring log for adjacent well 117-MW-D2 for soil descriptions.			
15	SS	WOR	1.9		**15 to 17**	Black; CLAY; minor roots; organic odor; very soft; saturated (15.0-16.4). Dark Brown; mf SAND, trace Silt/Clay; medium dense; saturated (16.4-16.9).	OL	
		WOR						
16		1						
		5						
17	SS	2	1.0		**17 to 19**	Dark Brown; mf SAND, trace Silt/Clay; medium dense; saturated.	SP	
		4						
18		8						
		12						
19						Drilled to 28.5 feet.		
25								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Nick Santella
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 117-MW-I2 Sheet 2 of 2
Location: Home Depot

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Weather:
Date/Time Start: November 28, 2006 / 0945 (Ground Surface)
Date/Time Finish: November 29, 2006 / 1215 (28.5 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26					Drilled to 28.5 feet.		
27					See the soil boring log for adjacent well 117-MW-D2 for soil descriptions.		
28							
29					End of Boring at 28.5 feet.		
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							

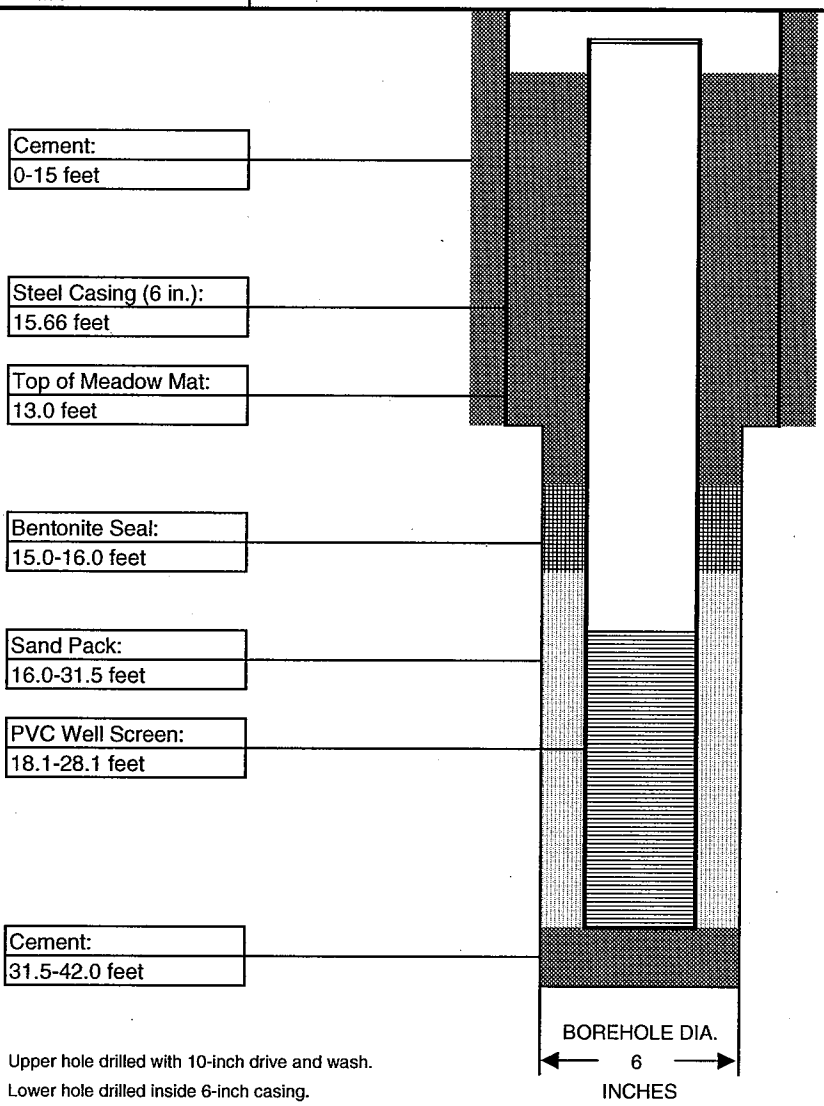
COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-I3	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	3-Nov-06	DATE END:	14-Dec-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

GS Elevation:



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-15 FEET, 31.5-42.0 FT
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	15.0-16.0 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	16.0-31.5 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	18.1-28.1 FEET
SUMP	
Interval BGS:	28.10-28.31 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

HYDROQUAL
DRILLING RECORD

Contractor:	B&B Drilling	**BORING/ WELL NO.**	Sheet 1 of 2 117-MW-I3
Driller:	Ed Blewett	**Location:**	
Inspector:	Mike Wilkinson		Home Depot
Rig Type:	Gus Pech		
PROJECT NAME:	Deep Overburden Well Investigation		
PROJECT NUMBER:	HWEL.002.001.02		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 2, 2006 - Morning Rain, Afternoon Sun, 46°-52°F
Weather: November 29, 2006 - Cloudy, 52°-59°F
Date/Time Start: November 3, 2006 / 0905 (Ground Surface)
Date/Time Finish: December 7, 2006 / 1125 (71 feet bGL)
Weight of Hammer: 300 lbs.
Drop of Hammer: 30 inches
Type of Hammer: mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 3	Dk Brown: SILT, little vf Sand, trace mf Gravel; soft; moist (0-0.5).		
						Lt Brn: SILT, some vf-f Sand, little cmf Gravel; soft; moist (0.5-1.2).	ML	
1						Light Brown: SILT/CLAY, little cmf Gravel; soft; moist (1.2-2.0).		
						Light Brown: cmf SAND, little cmf Gravel, trace Silt; red brick;		
2						dense; moist (2.0-3.0).	SW	
						Fabric and plastic liner at 3 feet.		
3					3 to 5			
4								
						Hand dig to 5 feet to install 10" casing.		
5	SS	4	1.3		5 to 7	Black to Dark Brown; cmf SAND, little cmf Gravel, trace Silt; wood,		
		4				slag, coal, cement; loose; moist.		
6		4					SW	
		4						
7	SS	3	0.7		7 to 9	Black; cmf SAND, some- cmf Gravel, trace+ Silt; slag, cement;		
		2				very loose; saturated.		
8		1						
		3						
9	SP	5	0		9 to 11	No Recovery.		pH: ORP: Temp: NA NA NA
		4						
10		5						
		5						
11	SS	2	0.2		11 to 13	Dark Brown; f SAND, little Silt; black stain at top of section;		
		2				very loose; saturated.	SP	
12		1						
		2						
13	SP	2	0.1	NA	13 to 15	Dark Brown; CLAY/SILT; organic odor; soft; saturated.		pH: ORP: Temp: NA NA NA
		3					CL/ML	
14		1						
		1						
15	SS	1	1.1		15 to 17	Dark Brown to Brown; f SAND, trace Silt; hydrocarbon odor;		
		4				loose; saturated.	SP	
16		5						
		9						
17						Drilled to 20 feet.		
18								
19								
20	SP	43	1.4	14	20 to 22	Red Brown; vf SAND, little+ Silt; very dense; saturated.		pH: ORP: Temp: 12.02 52.10 19.2
		76					SM	
21		48						
		80/4"						
22						Drilled to 25 feet.		
23								
24								
25	SP	11	1.4	30	25 to 27	Red Brown; vf SAND, little+ Silt; very dense; saturated.	SM	pH: ORP: Temp: NA NA NA
		26						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Cushing **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.**	Sheet 2 of 2 **117-MW-I3** **Location:** Home Depot

GROUNDWATER OBSERVATIONS						
Water Level					Weather: December 1, 2006 - Cloudy, Windy, 62°-72°F Weather: December 4, 2006 - Mostly Cloudy, 39°-43°F Date/Time Start: November 3, 2006 / 0905 (Ground Surface) Date/Time Finish: December 7, 2006 / 1125 (71 feet bGL) Weight of Hammer 300 lbs. Drop of Hammer 30 inches Type of Hammer hydraulic	**Location Description:**
Date						
Time						
Meas. From						

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		30				Continued from above.	SM	
		33						
27						Drilled to 30 feet.		
28								
29								
30	SP	9	1.0		**30 to 32**	Brown; f SAND; medium dense; saturated (30.0-30.5).	SP	
		12				Red Brown; f SAND, little Silt; medium dense; saturated		
31		10				(30.5-31.0).	SM	
		14						
32						Drilled to 35 feet.		
33								
34								
35	SP	11	0.4		**35 to 37**	Brown; f SAND, trace Silt; dense; saturated (35.0-36.2).	SP	
		30				Red Brown; CLAY, some Silt, little cm Gravel; f Sand		
36		13				laminations; hard; saturated (36.2-36.4).	SM	
		13						
37						Drilled to 40 feet.		
38								
39								
40	SP	11	1.4		**40 to 42**	Red Brown; vf SAND, little Silt; dense; saturated (40.0-40.4).	SM	
		14				Red Brown; vf SAND, trace- Silt; dense; saturated (40.4-41.4).		
41		23					SP	
		29						
42						End of Boring at 42 feet.		
43								
44								
45								
46								
47								
48								
49								
50								
51								

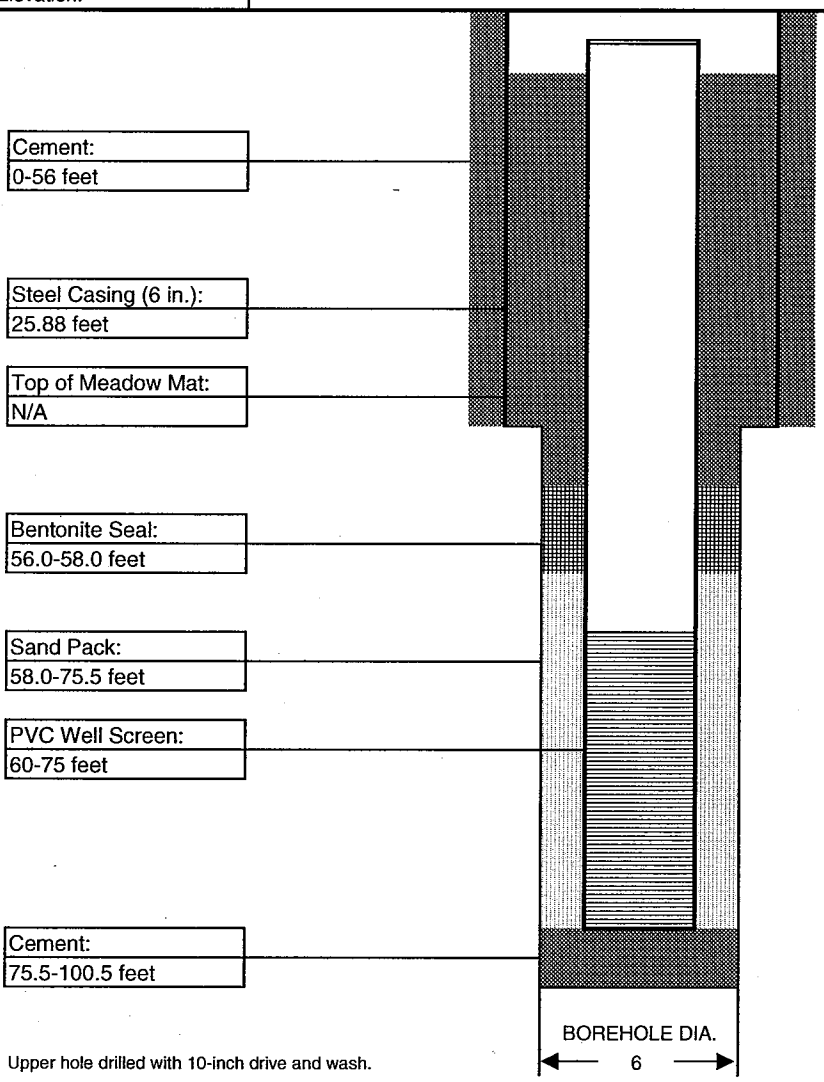
COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-I4	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	6-Dec-06	DATE END:	28-Dec-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

GS Elevation:



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-56 FEET, 75.5-100.5 FT
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	56.0-58.0 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	58.0-75.5 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	60-75 FEET
SUMP	
Interval BGS:	N/A
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

HYDROQUAL
DRILLING RECORD

BORING/WELL NO. 117-MW-14 — Sheet 1 of 4

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Home Depot

Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: December 7, 2006 - Cloudy, 46°-54°F
Weather: December 8, 2006 - Mostly Sunny, Windy, 20°-32°F
Date/Time Start: December 7, 2006 / 0830 (Ground Surface)
Date/Time Finish: December 21, 2006 / 0915 (100.5 feet bGL)
Weight of Hammer: 300 lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
0					**0 to 3** Topsoil (0-1.7). Asphalt (1.7-2.2). Trap Rock (2.2-3.0).	Topsoil	
1						Asphalt	
2					Fabric and plastic liner at 3.0 feet.	Trap Rock	
3	SS	6	1.2		**3 to 5** Red Brick (3.0-3.7). Dark Brown; cmf SAND, trace f Gravel; wood, paper; thin layer of yellowish COPR; medium dense; moist (3.7-4.2).	Debris	
		7					
4		7				SW COPR	
		8					
5	SS	4	0.6		**5 to 7** Yellow to Green to Orange to Brown (variegated); cmf SAND, little mf Gravel; moist. COPR present.		
		7					
6		60/2"			Concrete with rebar at 6.2 feet.		
7					**7 to 10** Drilled to 10 feet. Cuttings include red brick, wood, and metal shavings.		
8						Debris	
9							
10	SP	14	1.5	NA	**10 to 12** Brown; f SAND, trace Silt; medium dense; saturated (10.0-10.3). Black; f SAND; sparse whitish grains, possible COPR; medium dense; saturated (10.3-10.6). Brown; mf SAND, trace Silt; medium dense; saturated (10.6-11.5).	SP/COPR ?	pH: NA mV: NA Temp: NA
		15					
11		11					
		10					
12	SP	4	1.2	NA	**12 to 14** Brown; mf SAND, trace Silt; medium dense; saturated.		pH: 10.90 mV: 76.7 Temp: 14.0
		10					
13		17					
		29				SP	
14	SS	12	0.9		**14 to 16** Brown; mf SAND, trace Silt; sparse clear crystalline grains; dense; saturated.		
		34					
15		70					
		72					
16	SP	19	1.4	55	**16 to 18** Brown; mf SAND, trace- m Gravel, trace Silt; dense; saturateed (16.0-16.9). Brown; vf SAND, trace Silt; dense; saturated (16.9-17.4).		pH: 10.73 mV: 64.3 Temp: 13.1
		13					
17		31					
		39					
18	SS	17	1.5		**18 to 20** Red Brown; vf SAND, little- Silt; dense; saturated.		
		22					
19		24					
		30				SM	
20	SS	19	1.4		**20 to 22** Red Brown; vf SAND, some Silt; dense; saturated.		
		22					
21		26					
		32					
22	SP	22	1.1	65	**22 to 24** Red Brown; SILT, and vf Sand, trace mf Gravel (rounded); vf Sand layers; very dense; saturated.		pH: 8.75 mV: 154.4 Temp: 12.1
		23				ML	
23		27					
		41					
24	SS	12	1.5		**24 to 26** Brown; vf SAND, trace+ Silt; very dense; saturated (24.0-24.8). Red Brown; SILT, little vf Sand; hard; saturated (24.8-25.5).	SP	
		23					
25		27				ML	
		39					

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Additional Weather: December 19, 2006 - Mix of Sun and Clouds, 41°-48°F
December 20, 2006 - Sunny, 41°-46°F
December 21, 2006 - Mix of Sun and Clouds, 40°-51°F

Contractor: B&B Drilling	**HYDROQUAL**	**BORING/**	Sheet 2 of 4
Driller: Ed Blewett	**DRILLING RECORD**	**WELL NO.**	117-MW-I4
Inspector: Mike Wilkinson	PROJECT NAME: Deep Overburden Well Investigation	**Location:**	
Rig Type: Gus Pech	PROJECT NUMBER: HWEL.002.001.02	Home Depot	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 11, 2006 - Mostly Cloudy, 47°-56°F
Weather: December 12, 2006 - Cloudy, 44°-50°F
Date/Time Start: December 7, 2006 / 0830 (Ground Surface)
Date/Time Finish: December 21, 2006 / 0915 (100.5 feet bGL)
Weight of Hammer 300 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26	SS	58	0.8		**26 to 28** Red Brown; SILT, little c Gravel (subrounded); hard; saturated (26.0-26.5). Red Brown; SILT, hard; saturated (26.5-26.8).	ML	
		22					
27		23					
		15					
28	SP	6	0.8	NA	**28 to 30** Red Brown; CLAY; stiff; saturated.	CL	pH: NA mV: NA Temp: NA
		7					
29		7					
		10					
30	SS	3	1.7		**30 to 32** Brown; CLAY; very stiff; saturated (30.0-30.4). Brown; SILT; very stiff; saturated (30.4-31.7).	ML	
		10					
31		12					
		16					
32	SS	13	1.1		**32 to 34** Red Brown; SILT; very stiff; saturated (32.0-32.4). Red Brown; CLAY; very stiff; saturated (32.4-33.1).	CL	
		14					
33		9					
		11					
34	SP	10	1.4	40	**34 to 36** Brown; CLAY, little cmf Gravel; hard; saturated (34.0-34.8). Brown; f SAND, some Silt; dense; saturated (34.8-35.1). Brown; f SAND, trace Silt; dense; saturated (35.1-35.4).	CL	pH: 8.19 mV: 120.5 Temp: 14.1
		11					
35		23				SM	
		79					
36	SS	9	1.2		**36 to 38** Brown; f SAND, trace Silt; very dense; saturated.	SP	
		26					
37		31					
		41					
38	SS	10	1.4		**38 to 40** Brown; f SAND, trace- Silt; dense; saturated (38.0-38.7). Brown; SILT;and vf Sand; laminated; hard; saturated (38.7-39.4).	ML	
		19					
39		17					
		26					
40	SP	12	1.4	15	**40 to 42** Brown; f SAND, trace Silt; c Gravel at 40.8-41.0 feet; dense; saturated (40.0-41.0). Brown; SILT, and vf Sand; hard; saturated (41.0-41.4).	SP	pH: 8.07 mV: 7.7 Temp: 14.4
		14					
41		25				ML	
		30					
42	SS	9	0.9		**42 to 44** Brown; SILT/CLAY, little cmf Sand, trace f Gravel; stiff; saturated.	ML/CL	
		6					
43		7					
		15					
44	SS	6	1.5		**44 to 46** Red Brown; SILT, some Clay, little cmf Gravel (subangular to subrounded); hard; saturated.		
		12					
45		19					
		23					
46	SP	9	1.8		**46 to 48** Red Brown; SILT/CLAY, little cmf Gravel (rounded); very stiff; saturated.		pH: NA mV: NA Temp: NA
		11					
47		16					
		28					
48	SS	12	1.5		**48 to 50** Red Brown; CLAY, trace cmf Gravel (subrounded to rounded); hard; saturated.	CL	
		14					
49		22					
		23					
50	SS	12	1.4		**50 to 52** Red Brown; CLAY, trace cmf Gravel (subangular to rounded); hard; saturated.		
		14					
51		19					
		22					

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** 117-MW-I4	Sheet 3 of 4
		Location: Home Depot	

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	December 13, 2006 - Cloudy, Rain, 52°-56°F
Date					Weather:	December 14, 2006 - Mostly Sunny, 51°-59°F
Time					Date/Time Start:	December 7, 2006 / 0830 (Ground Surface)
Meas. From					Date/Time Finish:	December 21, 2006 / 0915 (100.5 feet bGL)
					Weight of Hammer	300 lbs.
					Drop of Hammer	30 Inches
					Type of Hammer	mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS		
52	SP	6	1.1	NA	**52 to 54**	Red Brown; CLAY, trace- mf Gravel (subrounded); hard; saturated.		pH: NA	mV: NA	Temp: NA
		15								
53		49								
		48								
54	SS	11	1.5		**54 to 56**	Red Brown; CLAY, trace- mf Gravel (rounded); hard; saturated.				
		14								
55		19								
		36								
56	SS	13	1.6		**56 to 58**	Red Brown; CLAY, trace- cmf Gravel (subangular to subrounded); hard; saturated.	CL			
		17								
57		25								
		36								
58	SP	14	1.7	NA	**58 to 60**	Red Brown; CLAY, trace- mf Gravel (subangular to subrounded); hard; saturated.		pH: 6.92	mV: 277.7	Temp: 15
		28								
59		41								
		47								
60	SP	23	1.7	>750	**60 to 62**	Red Brown; CLAY, trace- f Gravel; hard; saturated (60.0-60.5). Red Brown; SILT; hard; saturated (60.5-61.7).		pH: 6.87	mV: 307.0	Temp: 13.3
		32								
61		55					ML			
		90								
62	SS	27	1.4		**62 to 64**	Red Brown; SILT; scattered laminations; hard; saturated (62.0-63.3). Red Brown; CLAY; hard; saturated (63.3-63.4).				
		36								
63		33								
		37					CL			
64	SS	15	1.4		**64 to 66**	Red Brown; SILT; laminated; greenish yellow liquid present; thin (<1/4") gray layers; Clayey Silt layers; very stiff; saturated.	ML			
		12								
65		15								
		24								
66	SP	14	1.2	>750	**66 to 68**	Brown; SILT/CLAY, trace- f Gravel; hard; saturated (66.0-66.6). Brown; mf SAND, trace Silt; greenish yellow liquid present; very dense; saturated (66.6-67.2).	ML/CL	pH: 6.88	mV: 265.9	Temp: 12.0
		31								
67		34								
		32								
68	SP	41	0.8	650	**68 to 70**	Brown; mf SAND, some Silt/Clay, some- cmf Gravel (angular to subrounded); very dense; saturated.	SM/SC	pH: 12.39	mV: -89.2	Temp: 13.3
		36								
69		40								
		36								
70						Drilled to 75 feet.				
71										
72										
73										
74										
75	SP	10	2.0	>750	**75 to 77**	Red Brown; CLAY, trace- cmf Gravel (subangular to subrounded); hard; saturated (75.0-75.3). Red Brown; SILT; hard; saturated (75.3-76.0). Red Brn; CLAY, trace- f Gravel; hard; saturated (76.0-77.0).	CL	pH: 7.57	mV: 244.9	Temp: 11.5
		38					ML			
76		41					CL			
		50								
77										

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	**HYDROQUAL**	**BORING/** Sheet 4 of 4
Driller:	Ed Blewett	**DRILLING RECORD**	**WELL NO.** 117-MW-I4
Inspector:	Mike Wilkinson	PROJECT NAME: Deep Overburden Well Investigation	**Location:** Home Depot
Rig Type:	Gus Pech	PROJECT NUMBER: HWEL.002.001.02	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: December 15, 2006 - Partly Sunny, 44°-61°F
Weather: December 18, 2006 - Mostly Cloudy, 56°-63°F
Date/Time Start: December 7, 2006 / 0830 (Ground Surface)
Date/Time Finish: December 21, 2006 / 0915 (100.5 feet bGL)
Weight of Hammer 300 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

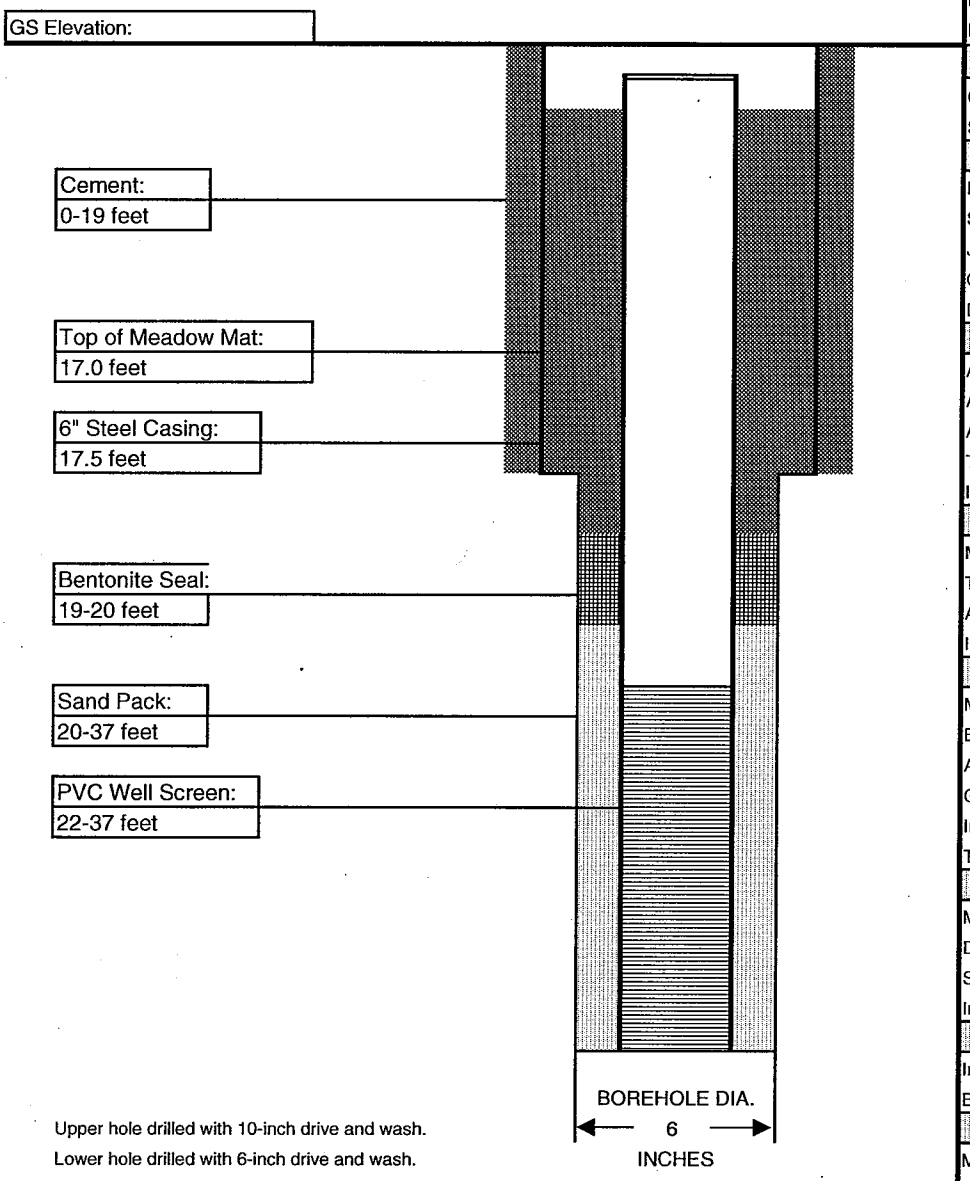
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Drilled to 80 feet.		
79								
80	SP	5	1.4	750	**80 to 82**	Red Brown; CLAY; very stiff; saturated.		**pH:** 12.14 **mV:** -64.5 **Temp:** 10.5
		9					CL	
81		12						
		22						
82						Drilled to 85 feet.		
83								
84								
85	SP	8	1.7	70	**85 to 87**	Red Brown; CLAY; hard; saturated (85.0-85.5).	CL	**pH:** 9.45 **mV:** 43.9 **Temp:** 11.2
		30				Red Brown; SILT, little Clay; laminated; hard; saturated		
86		57				(85.5-86.7).	ML	
		50/3"						
87						Drilled to 90 feet.		
88								
89								
90	SP	21	1.7	600	**90 to 92**	Red Brown; SILT, little Clay; laminated; hard; saturated.		**pH:** 8.21 **mV:** 88.5 **Temp:** 10.3
		53					ML	
91		58						
		56						
92						Drilled to 95 feet.		
93								
94								
95	SP	41	1.2	600	**95 to 97**	Red Brown; f SAND, little+ Silt, some cmf Gravel (very		**pH:** 10.86 **mV:** 14.4 **Temp:** 12.6
		30				angular); very dense; saturated.	SM	
96		50						
		32						
97						Drilled to 100 feet.		
98								
99								
100	SP	150/3"	0	NA	**100 to 102**	No Recovery.		
						End of Boring at 100.5 feet.		
101								
102								
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	117-MW-I5	FACILITY/SITE NAME:	Home Depot
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	22-Nov-06	DATE END:	28-Nov-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-19 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	19-20 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	20-37 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	22-37 FEET
SUMP	
Interval BGS:	N/A
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. 117-MW-15 Sheet 1 of 2

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Nick Santella
Rig Type:	Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Home Depot

Location Description:

Weather: November 22, 2006 - Sunny, 38°-45°F
Weather: November 27, 2006 - Partly Sunny, 52°-64°F
Date/Time Start: November 22, 2006 / 0810 (Ground Surface)
Date/Time Finish: November 27, 2006 / 1230 (37 feet bGL)
Weight of Hammer: 140 lbs.
Drop of Hammer: 30 inches
Type of Hammer: mechanical

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0								
					See the soil boring log for adjacent well 117-MW-D3 for soil descriptions.			
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15	SS	11	1.5		15 to 17	Brown to Black, variegated; mf SAND; Silty Sand from 16.3-16.5 feet; dense; saturated.	SP	
		20						
16		21						
		22						
17	SS	9	1.4		17 to 19	Dark Gray; SILT, organic odor, hard; saturated (17.0-17.1).	OL/SP	
		17				Gray; mf SAND; dense; saturated (17.1-17.5).	SP	
18		20				Red Brown; mf SAND; dense; saturated (17.5-18.0).	SM	
		26				Red Brown; mf SAND, some Silt; dense; saturated (18.0-18.4).		
19								
20								
21								
22								
23								
24								
25								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Nick Santella
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. Sheet 2 of 2
117-MW-15

Location:
Home Depot

Location Description:

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Weather:
Date/Time Start: November 22, 2006 / 0810 (Ground Surface)
Date/Time Finish: November 27, 2006 / 1230 (37 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26					Drilled to 37 feet. See the soil boring log for adjacent well 117-MW-D3 for soil descriptions.		
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37					End of Boring at 37 feet.		
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							

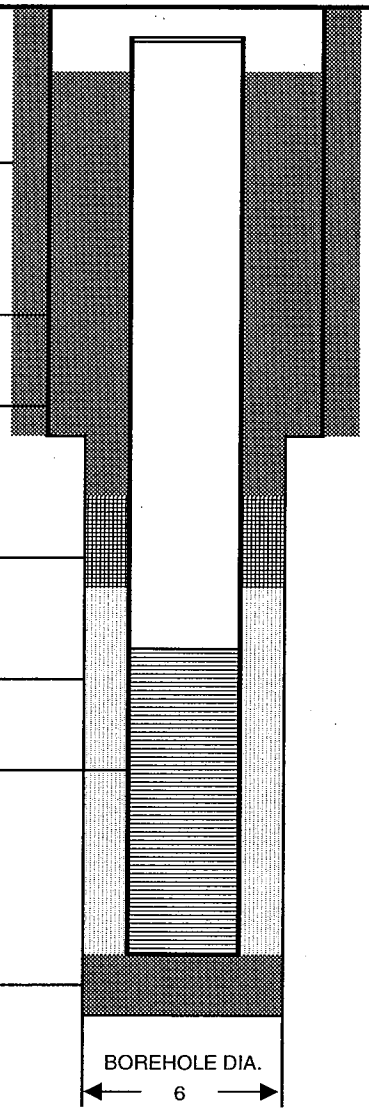
COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	119-MW-01T	FACILITY/SITE NAME:	K-Mart
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson/Bill Pearson	DRILLING CONTACTC	B&B Drilling
DATE START:	26-Jul-06	DATE END:	31-Aug-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

GS Elevation:



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-48 and 61.9-114.0 FE
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	48-50 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	50-61.9 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	51.9-61.9 FEET
SUMP	
Interval BGS:	NO
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/** Sheet 1 of 5 **WELL NO.** 119-SB-01 **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 26, 2006 - Hazy and Humid, 72°-87°F
Weather: August 1, 2006 - Sunny, Humid, 79°-98°F
Date/Time Start: July 26, 2006 / 0820 (Ground Surface)
Date/Time Finish: August 8, 2006 / 1200 (114 feet bGL)
Weight of Hammer: 140 lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:

Located 86.0 feet west of utility pole E68605 JC and 156.4 feet east of the northeast corner of the Pathmark building.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					**0 to 5**	Brown: SILT, some f Sand, trace cm Sand to mf Gravel; glass; roots in top 0.2 feet; soft; moist (0-1.0). Brown to Dark Brown; SILT, trace+ mf Sand, trace mf Gravel; slag, glass; moist (1.0-2.5). Brown; CLAY; very soft; moist (2.5-2.7). Dark Gray; CLAY; roots; very soft; moist (2.7-3.0). Gray; CLAY; very soft; moist (3.0-5.0). Wet Sand and slag mixed with Gray Clay at 5.0 feet. Hand auger to 5 feet for utility clearance.	ML / CL	
1								
2								
3								
4								
5					**5 to 6**	Drilled to 6 feet.		
6	SS		0		**6 to 8**	No Recovery.		
7								
8	SS	7	0.5		**8 to 10**	Dark Gray; cmf SAND, little mf Gravel; coal; medium dense; saturated.	SW	
		7						
9		5						
10	SS	2						
		4	0.5		**10 to 12**	Gray to Brown; PEAT; organic odor; soft; saturated.	PT	
11		1						
12	SS	1						
		2	1.4		**12 to 14**	Dark Brown; PEAT; very soft; saturated (12.0-13.3). Gray; f SAND, some Silt; very loose; saturated (13.3-13.4).	SM	
13		WOR						
14	SS	1	1.2		**14 to 16**	Gray to Brown; f SAND, some Silt, little cmf Gravel (rounded); loose; saturated.		
		1						
15		2						
16	SS	3	1.3		**16 to 18**	Brown; f SAND, trace Silt, trace- f Gravel; medium dense; saturated.	SP	
		4						
17		8						
18	SS	5	1.3		**18 to 20**	Brown; mf SAND, little cmf Gravel (rounded), trace Silt; f Sand layer from 18.4-18.7 feet; dense; saturated.		
		8						
19		14						
20	SS	18	0.8		**20 to 22**	Red Brown; f SAND, little Silt; medium dense; saturated.	SM	
		7						
21		15						
22	SS	19	1.1		**22 to 24**	Red Brown; vf SAND, little Silt; medium dense; saturated.		
		21						
23		10						
24	SS	13	1.0		**24 to 26**	Red Brown; vf SAND, little Silt; medium dense; saturated.		
		14						
25		16						
		11						
		17						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/** Sheet 2 of 5 **WELL NO.** 119-SB-01 **Location:** K-Mart	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 2, 2006 - Sunny, Humid, 83°-98°F
Weather: August 3, 2006 - Sunny, Humid, 83°-98°F
Date/Time Start: July 26, 2006 / 0820 (Ground Surface)
Date/Time Finish: August 8, 2006 / 1200 (114 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 86.0 feet west of utility pole E68605 JC and 156.4 feet east of the northeast corner of the Pathmark building.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26	SS	8	1.3		**26 to 28**	Red Brown; vf SAND, little Silt; medium dense; saturated (26.0-26.5).	SM	
		10						
27		14				Red Brown; SILT; very stiff; saturated (26.5-27.3).		
		19						
28	SS	14	1.5		**28 to 30**	Red Brown; SILT; hard; saturated.	ML	
		22						
29		24						
		27						
30	SS	14	1.4		**30 to 32**	Red Brown; vf SAND, trace Silt; very dense; saturated.	SP	
		25						
31		30						
		32						
32	SS	11	1.4		**32 to 34**	Red Brown; vf SAND, trace Silt; very dense; saturated.		
		27						
33		32						
		34						
34	SS	21	1.5		**34 to 36**	Red Brown; vf SAND, trace Silt; very dense; saturated.		
		21						
35		23						
		22						
36	SS	11	1.1		**36 to 38**	Red Brown; vf SAND; Silty Sand at 36.1-36.3 feet; dense; saturated.		
		12						
37		18						
		31						
38	SS	11	1.5		**38 to 40**	Red Brown; SILT; hard; saturated.	ML	
		23						
39		17						
		10						
40	SS	7	1.4		**40 to 42**	Red Brown; SILT; hard; saturated.		
		11						
41		14						
		31						
42	SS	24	1.5		**42 to 44**	Red Brown; SILT; hard; saturated.		
		37						
43		32						
		24						
44	SS	5	2.0		**44 to 46**	Red Brown; CLAY; f Sand laminations below 45.2 feet; stiff; saturated.	CL	
		4						
45		7						
		15						
46	SS	3	1.5		**46 to 48**	Red Brown; SILT/CLAY; abundant f Sand laminations; stiff; saturated.	ML/CL	
		5						
47		8						
		11						
48	SS	6	1.7		**48 to 50**	Red Brown; SILT, little Clay; abundant f Sand laminations; very stiff; saturated.	ML	
		6						
49		10						
		14						
50	SS	6	1.3		**50 to 52**	Red Brown; SILT, little Clay; laminated; f Sand layer from 50.2-50.4 feet; very stiff; saturated.		
		9						
51		13						
		16						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

HYDROQUAL
DRILLING RECORD

BORING/ Sheet 3 of 5
WELL NO. 119-SB-01

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: August 4, 2006 - Partly Cloudy, Humid, 78°-88°F
Weather: August 7, 2006 - Mix of Clouds and Sun, Humid, 76°-86°F
Date/Time Start: July 26, 2006 / 0820 (Ground Surface)
Date/Time Finish: August 8, 2006 / 1200 (114 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 86.0 feet west of utility pole E68605 JC and 156.4 feet east of the northeast corner of the Pathmark building.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52	SS	7	1.2		**52 to 54**	Red Brown; vf SAND, little Silt; medium dense; saturated.	SM	
		7						
53		10						
		13						
54	SS	10	1.3		**54 to 56**	Red Brown; vf SAND, little Silt; med dense; sat (54.0-54.6).		
		15				Red Brown; f SAND, medium dense; saturated (54.6-54.8).	SP/ML	
55		11				Red Brown; SILT; very stiff; saturated (54.8-55.0).	CL	
		13				Red Brown; CLAY; very stiff; saturated (55.0-55.3).		
56	SS	5	1.3		**56 to 58**	Red Brown; SILT; stiff; saturated.		
		6						
57		8						
		6						
58	SS	7	1.1		**58 to 60**	Red Brown; SILT; very stiff; saturated.	ML	
		8						
59		10						
		12						
60	SS	8	1.3		**60 to 62**	Red Brown; SILT, little Clay, trace cmf Sand, trace cmf Gravel (subangular); very stiff; saturated.		
		14						
61		14						
		13						
62	SS	7	1.3		**62 to 64**	Red Brown; CLAY, trace cmf Sand, trace- f Gravel (rounded); medium dense; saturated.		
		11						
63		13						
		21						
64	SS	6	1.4		**64 to 66**	Red Brown; CLAY, trace Sand, trace- mf Gravel (subangular; to subrounded); very stiff; saturated.		
		11						
65		13						
		24						
66	SS	11	1.6		**66 to 68**	Red Brown; CLAY, trace- Sand, trace cmf Gravel (subangular); hard; saturated.		
		16						
67		49						
		29						
68	SS	12	1.9		**68 to 70**	Brown; CLAY, trace- Sand; trace cmf Gravel (subrounded); hard; saturated.		
		17						
69		27						
		42					CL	
70	SS	8	1.5		**70 to 72**	Brown; CLAY, trace- Sand; trace- mf Gravel (subangular to subrounded); hard; saturated.		
		22						
71		29						
		48						
72	SS	12	0.8		**72 to 74**	Brown; CLAY, trace Sand, little cmf Gravel (subrounded); hard; saturated.		
		23						
73		44						
		50/4"						
74	SS	11	1.5		**74 to 76**	Brown; CLAY, trace- Sand, trace- f Gravel (subangular to subrounded); hard; saturated.		
		17						
75		33						
		40						
76	SS	6	1.7		**76 to 78**	Brown; CLAY, trace- cmf Sand, trace- cmf Gravel (subrounded); hard; saturated.		
		13						
77		20						
		27						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. Sheet 4 of 5
119-SB-01

Location: K-Mart

Location Description:
Located 86.0 feet west of utility pole E68605 JC and 156.4 feet east of the northeast corner of the Pathmark building.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: August 8, 2006 - Sunny, 74°-87°F
Weather:
Date/Time Start: July 26, 2006 / 0820 (Ground Surface)
Date/Time Finish: August 8, 2006 / 1200 (114 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78	SS	10	2.0		**78 to 80**	Red Brown; CLAY, trace- f Gravel (subangular to subrounded); hard; saturated.		
		14						
79		25						
		31						
80	SS	5	1.5		**80 to 82**	Red Brown; CLAY, trace-cm f Gravel (subrounded); hard; saturated.		
		15						
81		20						
		27						
82	SS	11	2.0		**82 to 84**	Red Brown; CLAY, trace cmf Sand, trace- cmf Gravel (subangular); hard; saturated.	CL	
		19						
83		22						
		32						
84	SS	7	1.4		**84 to 86**	Red Brown; CLAY, trace c Sand to c Gravel (subangular to subrounded); hard; saturated.		
		13						
85		34						
		18						
86	SS	11	0		**86 to 88**	No Recovery.		
		54						
87		37						
		46						
88	SS	9	1.8		**88 to 90**	Red Brown; CLAY, tracemf Gravel; hard; saturated.		
		15						
89		26						
		42						
90	SS	17	0.9		**90 to 92**	Red Brown; CLAY, trace- c Sand to f Gravel (subrounded); hard; saturated.		
		18						
91		22						
		34						
92	SS	7	1.7		**92 to 94**	Red Brown; CLAY, trace- c Sand to f Gravel (subangular to subrounded); very stiff; saturated.		
		11						
93		16						
		22						
94	SS	8	2.0		**94 to 96**	Red Brown; CLAY, trace c Sand to cmf Gravel (subangular to subrounded); hard; saturated.		
		16						
95		20						
		31					CL	
96	SS	7	1.7		**96 to 98**	Red Brown; CLAY, trace- c Sand to mf Gravel (subangular to subrounded); very stiff; saturated.		
		12						
97		17						
		24						
98	SS	8	2.0		**98 to 100**	Red Brown; CLAY, trace c Sand; very stiff; saturated.		
		12						
99		11						
		19						
100	SS	5	1.5		**100 to 102**	Red Brown; CLAY; very stiff; saturated.		
		9						
101		12						
		13						
102	SS	7	1.7		**102 to 104**	Red Brown; CLAY; laminated; stiff; saturated.		
		6						
103		6						
		8						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. 119-SB-01 Sheet 5 of 5

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:
Weather:
Date/Time Start: July 26, 2006 / 0820 (Ground Surface)
Date/Time Finish: August 8, 2006 / 1200 (114 feet bGL)
Weight of Hammer 140 lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Located 86.0 feet west of utility pole E68605 JC and 156.4 feet east of the northeast corner of the Pathmark building.

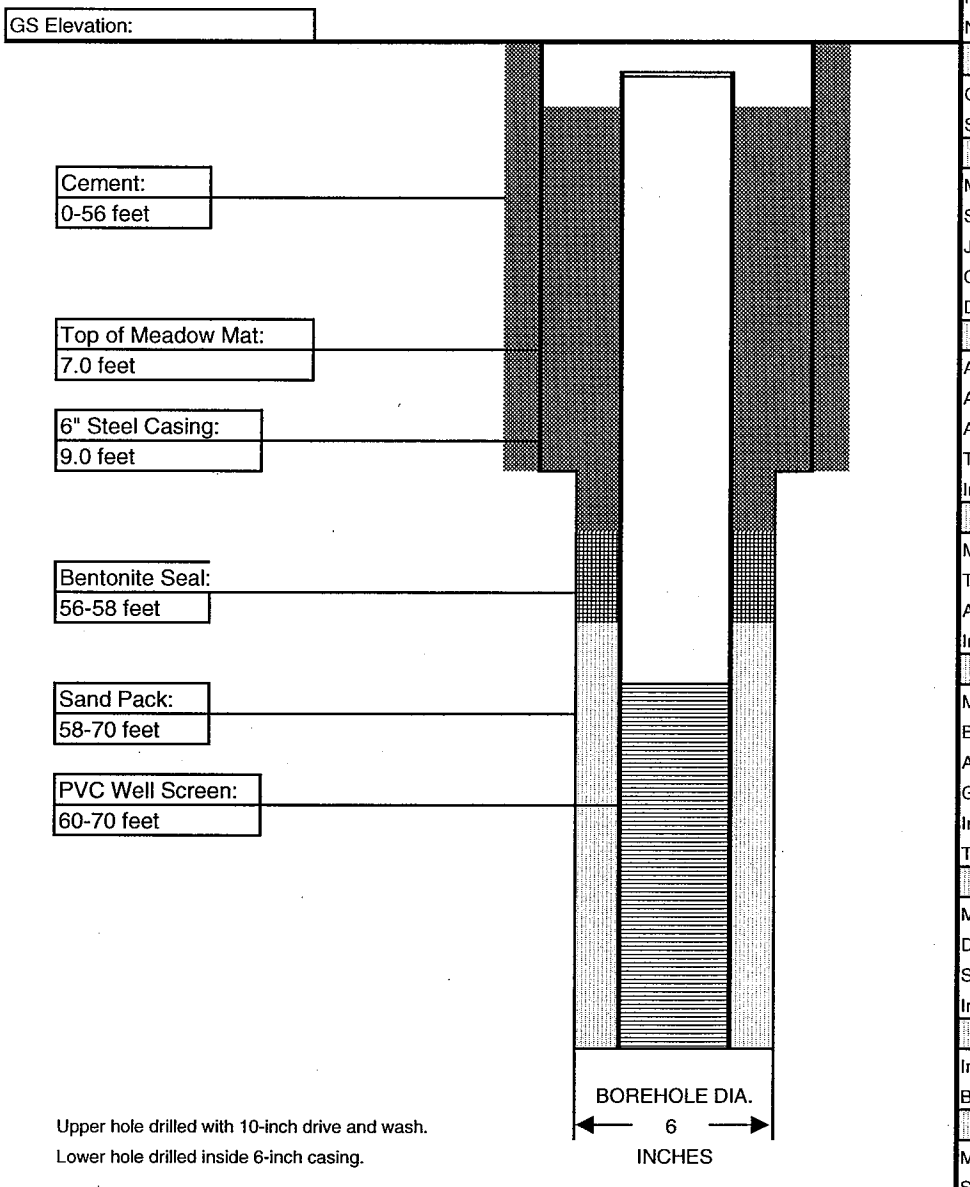
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104	SS	8	2.0		**104 to 106**	Red Brown; CLAY, some cmf Sand, trace cmf Gravel (angular to subangular); stiff; saturated (104.0-105.6).	CL	
		10						
105		5				Red Brown; CLAY; laminated; stiff; saturated (105.6-105.9).		
		27				Red Brown; CLAY, little+ cmf Sand to f Gravel (105.9-106.0).		
106	SS	14	0.9		**106 to 108**	Brown; vf SAND, little Silt, little c Sand to c Gravel (angular to subrounded); very dense; saturated.		
		26						
107		21						
		22						
108	SS	17	0.4		**108 to 110**	Red Brown; f SAND, little c Sand to mf Gravel (subangular to subrounded); very dense; saturated.	SP	
		33						
109		100/4"						
110	SS	28	1.0		**110 to 112**	Red Brown; vf-f SAND, trace Silt, little c Sand to cmf Gravel (angular to subrounded); very dense; saturated.		
		81						
111		89						
		100/5"						
112	SS	45	0.2		**112 to 114**	Red Brown; cmf SAND, little Silt, little mf Gravel (angular to rounded; very dense; saturated.	TILL SM	
		100/3"						
113								
114						End of Borehole at 114 feet.		
115								
116								
117								
118								
119								
120								
121								
122								
123								
124								
125								
126								
127								
128								
129								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	119-MW-02T	FACILITY/SITE NAME:	K-Mart
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson/Bill Pearson	DRILLING CONTACTC	B&B Drilling
DATE START:	17-Aug-06	DATE END:	21-Aug-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-56 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	56-58 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	58-70 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	60-70 FEET
SUMP	
Interval BGS:	NO
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

Contractor: B&B Drilling
Driller: Mike Kinney
Inspector: Bill Pearson
Rig Type: Mobile B-61

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Deep Overburden Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ Sheet 1 of 3
WELL NO. 119-SB-02

Location: K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 17, 2006 - Sunny, 72°F-84°F
August 18, 2006 - Cloudy, 74°F-84°F
Date/Time Start: August 17, 2006 / 0830 (Ground Level)
Date/Time Finish: August 21, 2006 / 1445 (70 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-02T is located 44.5 feet west of utility pole E69952 JC and 84.0 feet northwest of utility pole A69921 JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0						Drilled to 9 feet.		
1						See the soil boring log for adjacent well 119-MW-16BR for soil descriptions.		
2								
3								
4								
5								
6								
7	SS	1	0.7		7 to 9	Dark Brown; PEAT; very soft; saturated.	PT (MEADOW MAT)	
		1						
8		1						
		2						
9	SS	1	1.4		9 to 11	Dark Brown; mf SAND; loose; saturated.	SP	
		3						
10		4						
		11						
11						Drilled to 70 feet.		
12						See the soil boring log for adjacent well 119-MW-16BR for soil descriptions.		
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEO PROBE

Contractor:	B&B Drilling	**HYDROQUAL**	**BORING/** Sheet 2 of 3
Driller:	Mike Kinney	**DRILLING RECORD**	**WELL NO.** 119-SB-02
Inspector:	Bill Pearson	PROJECT NAME: Honeywell Deep Overburden Investigation	**Location:** K-Mart
Rig Type:	Mobile B-61	PROJECT NUMBER: HWEL.002.001.02	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 21, 2006 - Sunny, 69°F-84°F

Date/Time Start: August 17, 2006 / 0830 (Ground Level)

Date/Time Finish: August 21, 2006 / 1445 (70 feet)

Weight of Hammer NA

Drop of Hammer NA

Type of Hammer NA

Location Description:

Well 119-MW-02T is located 44.5 feet west of utility pole E69952 JC and 84.0 feet northwest of utility pole A69921 JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26					Drilled to 70 feet.		
27					See the soil boring log for adjacent well 119-MW-16BR for soil descriptions.		
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** Mike Kinney **Inspector:** Bill Pearson **Rig Type:** Mobile B-61	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/** Sheet 3 of 3 **WELL NO. 119-SB-02** **Location:** K-Mart	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: August 17, 2006 / 0830 (Ground Level)
Date/Time Finish: August 21, 2006 / 1445 (70 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-02T is located 44.5 feet west of utility pole E69952 JC and 84.0 feet northwest of utility pole A69921 JC.

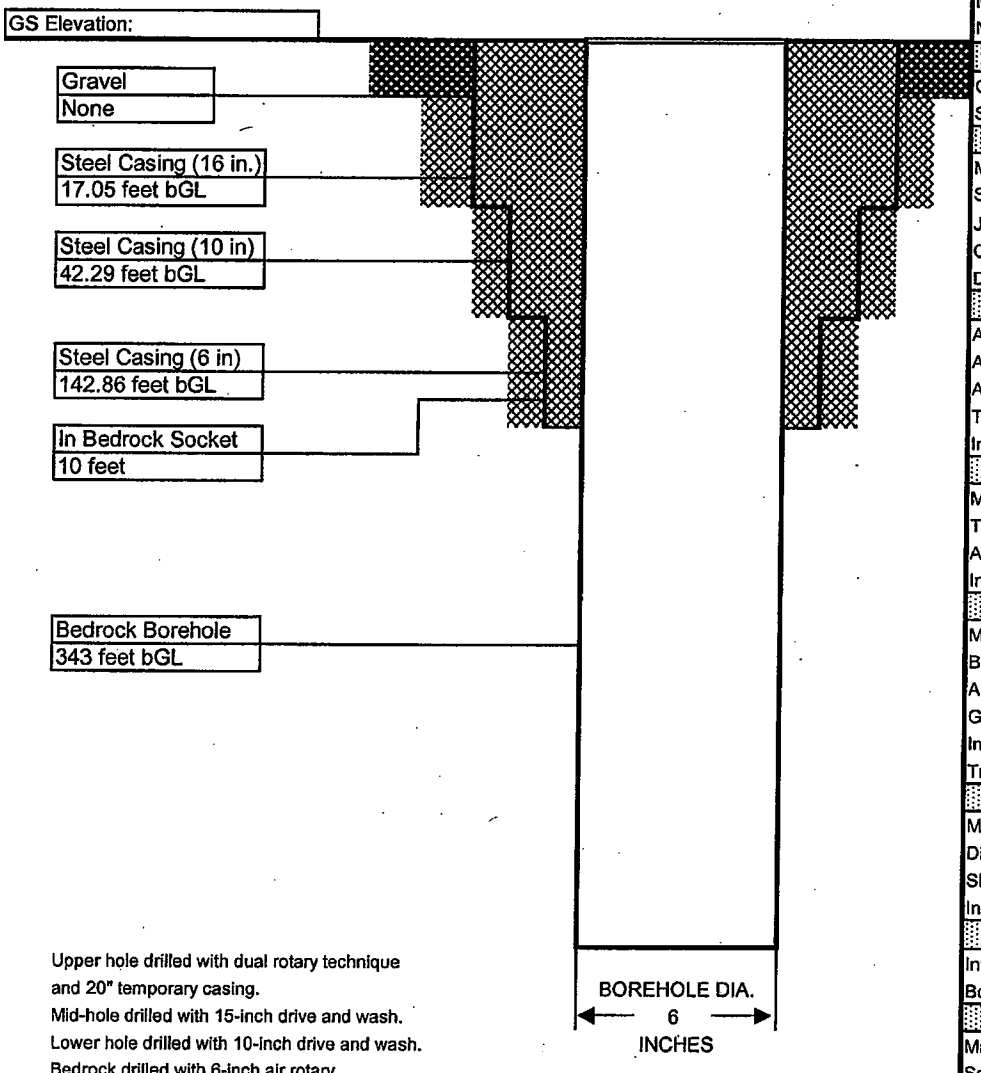
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
52					Drilled to 70 feet. See the soil boring log for adjacent well 119-MW-16BR for soil descriptions.		
53							
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70					End of Borehole at 70 feet.		
71							
72							
73							
74							
75							
76							
77							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

TRIPLE CASED WELL CONSTRUCTION LOG

WELL NO.:	119-MW-2BR	FACILITY/SITE NAME:	Hovnanian
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	4-Jan-05	DATE END:	2-Feb-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with dual rotary technique and 20" temporary casing.
Mid-hole drilled with 15-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Weep hole:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	36" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	Yes
Interval:	0 - 142.8 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	N/A
Setup/Hydration Time:	N/A

Figure C1 5.2

Contractor: PARSONS Driller: Ed Blewett, Doug Myerchin Inspector: Mike Wilkinson Rig Type: Gus Pech, Foremost Dual Rotary (DR-24)	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** Sheet 1 of 14 **119-MW-2BR** **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 4, 2005 - Cloudy and Damp, 47°-49°F
January 5, 2005 - Rain, 42°-35°F
Date/Time Start: January 4, 2005 / 1240 (Ground Level)
Date/Time Finish: January 7, 2005 / 1300 (18 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 8	Rip Rap; 3-4 inch Gravel (0-4.5 feet).		
1								
2								
3								
4								
						Drilled to 8 feet.		
5								
6								
7								
8	SS	4	0.1	NA	8 to 10	Gray; cmf SAND, trace f Gravel; loose; saturated.	SW	
		5						
9		4						
		3						
10	SS	4	0	NA	10 to 12	No Recovery.		
		3						
11		4					NR	
		2						
12	SS	3	0	NA	12 to 14	No Recovery.		
		3					NR	
13		3						
		3						
14	SS	3	0.1	NA	14 to 16	Gray; cmf SAND, very loose; saturated.		
		1					SW	
15		3						
		4						
16	SS	1	2	NA	16 to 18	Dark Brown; PEAT; organic odor; soft; wet to saturated.		
		2					PT	
17		2						
		2						
18						Drilled to 20 feet.		
19								
20	SS	4	1.5	NA	20 to 22	Gray; mf SAND, trace Silt; loose; saturated.		
		4					SP	
21		4						
		2						
22						Drilled to 25 feet.		
23								
24								
25	SS	11	1	NA	25 to 27	Gray; f SAND, trace- cm Sand; dense; saturated.	SP	
		21						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor: PARSONS **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 2 of 14 **WELL NO.** 119-MW-2R **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 6, 2005 - Cloudy with Rain, 34°-39°F
January 7, 2005 - Mostly Cloudy, 39°-45°F
Date/Time Start: January 10, 2005 / 1200 (18 feet)
Date/Time Finish: January 28, 2005 / 1500 (143 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26		18			Continued from above.	ML	
		19					
27					Drilled to 30 feet.		
28							
29							
30	SS	12	0	NA	30 to 32 No Recovery.	NR	
		19					
31		16					
		23					
32					Drilled to 35 feet.		
33							
34							
35	SS	11	1.2	NA	35 to 37 Brown; SILT, trace Clay; hard; saturated.	ML	
		13					
36		18					
		31					
37					Drilled to 40 feet.		
38							
39							
40	SS	5	2	NA	40 to 42 Brown; CLAY, some Silt; stiff; saturated.	CL	
		6					
41		7					
		8					
42					Drilled to 45 feet.		
43							
44							
45	SS	2	2	NA	45 to 47 Brown; CLAY, little Silt; soft; saturated.	CL	
		1					
46		2					
		3					
47					Drilled to 50 feet.		
48							
49							
50	SS	4	1.1	NA	50 to 52 Brown; CLAY, little Silt; stiff; saturated.	CL	
		6					
51		6					
		8					

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: PARSONS	PARSONS DRILLING RECORD	BORING/ WELL NO. 119-MW-2BR	Sheet 3 of 14
Driller: Ed Blewett		Location:	
Inspector: Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hovnanian.	
Rig Type: Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 10, 2005 - Mostly Cloudy, 41°-50°F
January 11, 2005 - Mostly Cloudy, 37°-38°F
Date/Time Start: January 10, 2005 / 1200 (18 feet)
Date/Time Finish: January 28, 2005 / 1500 (143 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	3	2	NA	55 to 57	Brown; CLAY, trace- f Gravel; stiff; saturated.	CL	
		4						
56		5						
		8						
57						Drilled to 60 feet.		
58								
59								
60	SS	6	1.7	NA	60 to 62	Brown; SILT, little Clay; very stiff; saturated.	ML	
		10						
61		12						
		19						
62						Drilled to 65 feet.		
63								
64								
65	SS	5	2	NA	65 to 67	Brown; CLAY, trace- f Gravel; stiff; saturated.	CL	
		6						
66		7						
		9						
67						Drilled to 70 feet.		
68								
69								
70	SS	6	2	NA	70 to 72	Brown; CLAY, trace- f Gravel; hard; saturated (70.0-71.6).		
		18				Brown; SILT, little Clay; hard; saturated (71.6-72.0).	CL	
71		39						
		27					ML	
72						Drilled to 75 feet.		
73								
74								
75	SS	6	2	NA	75 to 77	Brown; CLAY, little Silt, trace- f Gravel; very stiff; saturated.	CL	
		6						
76		10						
		11						
77						Drilled to 80 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: PARSONS **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 4 of 14 **WELL NO.** 119-MW-2BR **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 12, 2005 - Cloudy with Rain, 39°-48°F
January 13, 2005 - Thick Fog, Clearing by Noon, 42°-58°F
Date/Time Start: January 10, 2005 / 1200 (18 feet)
Date/Time Finish: January 28, 2005 / 1500 (143 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78					Continued from above.		
79							
80	SS	6	2	NA	**80 to 82** Brown; CLAY, little Silt; f Sand laminations; very stiff; saturated.	CL	
		9					
81		10					
		17					
82					Drilled to 85 feet.		
83							
84							
85	SS	7	2	NA	**85 to 87** Brown; CLAY; medium stiff; saturated.	CL	
		4					
86		1					
		3					
87					Drilled to 90 feet.		
88							
89							
90	SS	6	2	NA	**90 to 92** Red Brown; CLAY, trace- cmf Gravel; stiff; saturated.	CL	
		6					
91		8					
		13					
92					Drilled to 95 feet.		
93							
94							
95	SS	6	1.1	NA	**95 to 97** Red Brown; CLAY, trace- cmf Gravel; very stiff; saturated.	CL	
		7					
96		11					
		11					
97					Drilled to 100 feet.		
98							
99							
100	SS	9	2	NA	**100 to 102** Red Brown; CLAY; little- cmf Gravel; very stiff; saturated.	CL	
		6					
101		10					
		11					
102					Drilled to 105 feet.		
103							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor:	PARSONS
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. Sheet 5 of 14 — **119-MW-2BR**

Location: Hovnanian.

Location Description: Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 14, 2005 - Rain, 59°-35°F
January 17, 2004 - Cloudy, 24°-28°F
Date/Time Start: January 10, 2005 / 1200 (18 feet)
Date/Time Finish: January 28, 2005 / 1500 (143 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	8	2	NA	105 to 107	Red Brown; CLAY, little cmf Gravel; hard; saturated.	CL	
		15						
106		22						
		34						
107						Drilled to 110 feet.		
108								
109								
110	SS	18	1.4	NA	110 to 112	Red Brown; CLAY, some Silt, little cmf Gravel; hard; saturated.	CL	
		23						
111		43						
		31						
112						Drilled to 115 feet.		
113								
114								
115	SS	1	1	NA	115 to 117	Red Brown; CLAY; very stiff; saturated.	CL	
		9						
116		16						
		20						
117						Drilled to 120 feet.		
118								
119								
120	SS	28	1.5	NA	120 to 122	Red Brown; CLAY; hard; saturated (120.0-120.7). Red Brown; CLAY, little cmf Gravel, little cmf Sand; hard; saturated (120.7-121.5).	CL	
		44						
121		24						
		23						
122								
123								
124								
125	SS	33	0.8	NA	125 to 127	Red Brown; mf SAND, some Clay, little cmf Gravel; very dense; saturated.	SC	
		63						
126		88						
		100/1"						
127						Drilled to 130 feet.		
128								
129								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor:	PARSONS
Driller:	B&B Drilling
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech, Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. Sheet 6 of 14 — **119-MW-2BR**

Location: Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 18, 2005 - Partly Cloudy, 12°-20°F
January 19, 2005 - Mostly Cloudy with Snow, 19°-28°F
Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
130	SS	150/5"	0.3	NA	130 to 132	Red Brown; cmf SAND, little Clay, little- cmf Gravel; very dense; saturated.	SC	
131								
132						Drilled 135 feet.		
133						Drilling became very hard at 133 feet.	BEDROCK	
134								
135	SS	100/0"	0	NA	135 to 137	No Recovery.		
136								
137						Drilled to 140 feet.		
138								
139								
140	SS	100/2.5"	0.15		140 to 142	Dark Gray; SILTSTONE; weathered, parting along platy surfaces.		
141								
142						Drilled to 143 feet.		
143	AR				143 to 146	Gray Brown; fine-grained SANDSTONE (60-70%). Light Greenish Gray; SILTSTONE (30-40%).		
144								
145								
146						Drilled to 150 feet.		
147								
148								
149								
150	AR				150 to 160	Red Brown; SILTSTONE.		
151								
152								
153								
154								
155								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: PARSONS **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 7 of 14 **WELL NO.** 119-MW-2BR **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 20, 2005 - Partly Sunny, 24°-34°F
January 21, 2005 - Mostly Cloudy, 12°-20°F
Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157							
158							
159							
160	AR				160 to 170 Red Brown; SILTSTONE.	BEDROCK	
161							
162							
163							
164							
165							
166							
167							
168							
169							
170	AR				170 to 180 Red Brown; SILTSTONE (90%). Brownish Orange, fine-grained SANDSTONE (10%).		
171							
172							
173							
174							
175							
176							
177							
178							
179							
180	AR				180 to 190 Dark Brown; fine-grained SANDSTONE.		
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: PARSONS	PARSONS DRILLING RECORD	BORING/ WELL NO. 119-MW-2BR	Sheet 8 of 14
Driller: Dave Myerchin		Location: Hovnanian.	
Inspector: Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation		
Rig Type: Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS					Weather: January 24, 2005 - Partly Cloudy, 10°-24°F January 25, 2005 - Mostly Cloudy, 21°-31°F Date/Time Start: February 2, 2005 / 0950 (143 feet) Date/Time Finish: February 2, 2005 / 1400 (343 feet) Weight of Hammer NA Drop of Hammer NA Type of Hammer NA	Location Description: Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.
Water Level						
Date						
Time						
Meas. From						

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.	BEDROCK	
183							
184							
185							
186							
187							
188							
189							
190	AR				190 to 200 Dark Brown; fine-grained SANDSTONE.		
191							
192							
193							
194							
195							
196							
197							
198							
199							
200	AR				200 to 210 Dark Brown; Sandy SILTSTONE.		
201							
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: PARSONS **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 9 of 14 **WELL NO.** 119-MW-2BR **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: January 26, 2005 - Cloudy, 35°-38°F
January 27, 2005 - Sunny, 10°-18°F
Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.		
209							
210	AR				**210 to 220** Dark Brown to Red Brown; SILTSTONE.		
211							
212							
213							
214							
215							
216							
217							
218							
219							
220	AR				**220 to 230** Dark Brown; SILTSTONE.	BEDROCK	
221							
222							
223							
224							
225							
226							
227							
228							
229							
230	AR				**230 to 240** Dark Brown; fine-grained SANDSTONE (75%). Light Greenish Gray; fine-grained SANDSTONE (20%). Dark Brown; SILTSTONE (5%).		
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	PARSONS
Driller:	Dave Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

Weather: January 28, 2005 - Sunny, 5°-20°F

Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

BORING/ WELL NO. 119-MW-2BR — Sheet 10 of 14

Location:
Hovnanian.

Location Description:
Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.		
235							
236							
237							
238							
239							
240	AR				240 to 250 Light Pinkish Brown; medium- to fine-grained SANDSTONE.	BEDROCK	
241							
242							
243							
244							
245							
246							
247							
248							
249							
250	AR				250 to 260 Dark Brown; fine-grained SANDSTONE (90%). Dark Brown; SILTSTONE (10%).		
251							
252							
253							
254							
255							
256							
257							
258							
259							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: PARSONS
Driller: Dave Myerchin
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 119-MW-2BR
Sheet 11 of 14

Location:
Hovnanian.

Location Description:
Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260	AR				**260 to 270** Dark Brown; fine-grained SANDSTONE.	BEDROCK	
261							
262							
263							
264							
265							
266							
267							
268							
269							
270	AR				**270 to 280** Dark Brown; fine-grained SANDSTONE (90%). Dark Brown; SILTSTONE (10%).		
271							
272							
273							
274							
275							
276							
277							
278							
279							
280	AR				**280 to 290** Dark Brown; fine-grained SANDSTONE (85%). Dark Gray Brown; SILTSTONE (15%).		
281							
282							
283							
284							
285							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	PARSONS
Driller:	Dave Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 119-MW-2BR **Sheet** 12 of 14

Location: Hovnanian.

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Weather:

Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.	BEDROCK	
287							
288							
289							
290	AR				290 to 300 Light Pinkish Brown to Light Brown; fine-grained SANDSTONE		
291							
292							
293							
294							
295							
296							
297							
298							
299							
300	AR				300 to 310 Light Pinkish Brown to Dark Brown; fine-grained SANDSTONE.		
301							
302							
303							
304							
305							
306							
307							
308							
309							
310	AR				310 to 320 Dark Brown; fine-grained SANDSTONE (90%). Dark Brown; SILTSTONE (10%).		
311							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: PARSONS Driller: Dave Myerchin Inspector: Mike Wilkinson Rig Type: Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 13 of 14 **WELL NO.** 119-MW-2BR **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.		
313							
314							
315							
316							
317							
318							
319							
320	AR				**320 to 330** Gray Brown; medium- to fine-grained SANDSTONE.	BEDROCK	
321							
322							
323							
324							
325							
326							
327							
328							
329							
330	AR				**330 to 340** Gray; medium- to fine-grained SANDSTONE.		
331							
332							
333							
334							
335							
336							
337							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: PARSONS **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 14 of 14 **WELL NO.** 119-MW-2BR **Location:** Hovnanian.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: February 2, 2005 / 0950 (143 feet)
Date/Time Finish: February 2, 2005 / 1400 (343 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan

Well 119-MW-2BR is located 1280 feet Southwest of the Southwest corner of Site 115 and 1660 feet West of the Southwest corner of the concrete foundation at Site 115.

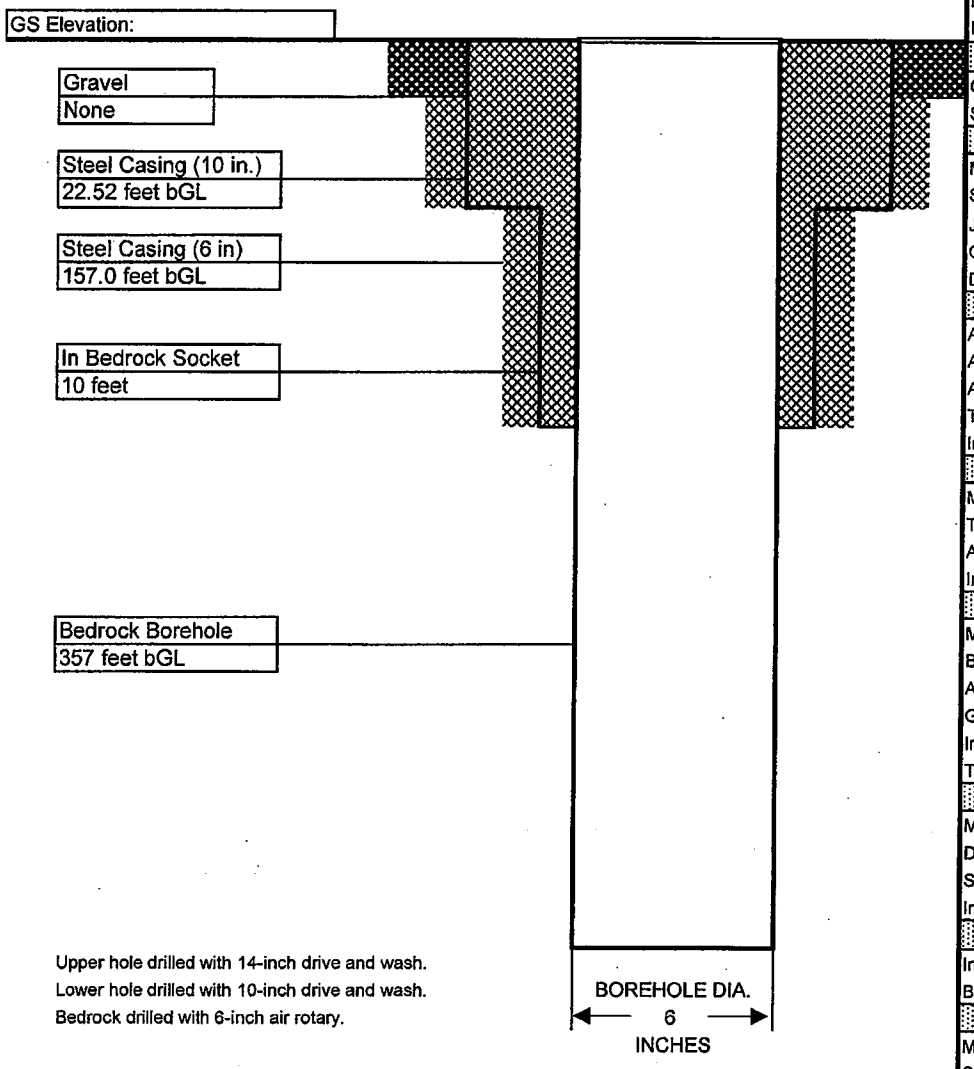
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
338					Continued from above.		
339							
340	AR				**340 to 343** Gray; fine-grained SANDSTONE.	BEDROCK	
341							
342							
343					End of Borehole at 343 feet.		
344							
345							
346							
347							
348							
349							
350							
351							
352							
353							
354							
355							
356							
357							
358							
359							
360							
361							
362							
363							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	119-MW-4BR	FACILITY/SITE NAME:	NJCU Soccer Field
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B & B Drilling
DATE START:	20-Dec-05	DATE END:	16-Dec-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NO
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 157.0 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: B&B Drilling **Driller:** Tim Smith, Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Geoprobe 5400, Mobile B57, Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 1 of 14 **WELL NO.** 119-MW-4BR **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 20, 2005 - Mostly Cloudy, 68°F-84°F
September 26, 2005 - Cloudy, 70°F-80°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Light Grey; SILT, some- cmf Sand, trace cmf Gravel; very soft; dry (0-0.5).	ML	
1						Light Brown; SILT, some- cmf Sand, trace cmf Gravel; metal, glass, ceramic; very soft; dry (0.5-1.0).		
2						Brown; cmf SAND, some Silt, trace f Gravel; metal, glass; very loose; dry to moist (1.0-3.5).	SM	
3						Dark Grey; cmf SAND, little, mf Gravel, trace Silt; metal, glass; very loose; moist (3.5-5.0).		
4								
5	GP		3.0		5 to 8	Dark Grey to Red Brown; cmf SAND, little+ cmf Gravel, trace Silt; metal and glass (abundant); loose; wet, saturated at 7.5 feet.		
6								
7								
8	GP		2.0		8 to 12	Black; cmf SAND, little+ cmf Gravel; abundant glass; loose; saturated.		
9								
10								
11							SW	
12	GP		1.6		12 to 16	Black; cmf SAND, little f gravel; abundat glass, metal; loose; saturated.		
13								
14								
15								
16	GP		1.5		16 to 20	Black; cmf SAND, little f Gravel; abundant glass, metal; loose; saturated. Organic material in tip of spoon.		
17								
18								
19								
20	GP		4.0		20 to 24	Black; CLAY; organic odor; very soft; saturated.		
21								
22								
23							OL	
24								
25	SS	1	0.9		25 to 27	Greenish Grey; CLAY; ogranic odor; soft; saturated.		
		1						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEO PROBE

COMMENTS:

Contractor:	B&B Drilling
Driller:	Tim Smith, Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-4BR **Sheet** 2 of 14

Location: NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 30, 2005 - Sunny, 51°F-68°F
October 3, 2005 - Sunny, 61°F-82°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		1				Continued from above.	OL	
		1						
27						Drilled to 30 feet.		
28								
29								
30	SS	1	1.2		30 to 32	Grey; f SAND, trace+ Silt; loose; saturated (30.0-31.0).	SP	
		1				Grey; SILT, trace f Sand; medium stiff; saturated (31.0-31.2)		
31		7					ML	
		13						
32						Drilled to 35 feet.		
33								
34								
35	SS	7	1.5		35 to 37	Red Brown; SILT, little Clay; Sand layer 0.5" thick at 35.7 feet;		
		4				medium stiff; saturated.	ML	
36		4						
		6						
37						Drilled to 40 feet.		
38								
39								
40	SS	5	1.3		40 to 42	Red Brown; SILT, little Clay; very stiff; saturated (40.0-41.0).	ML	
		10				Red Brown; CLAY/SILT; very stiff; saturated (41.0-41.3).		
41		7					CL/ML	
		12						
42						Drilled to 45 feet.		
43								
44								
45	SS	4	1.5		45 to 47	Red Brown; CLAY/SILT; stiff; saturated.		
		5					CL/ML	
46		8						
		8						
47						Drilled to 50 feet.		
48								
49								
50	SS	3	1.7		50 to 52	Red Brown; CLAY, little Silt; very stiff; saturated (50.0-51.0).	CL	
		10				Red Brown; f SAND, little Silt; medium dense; saturated		
51		14				(51.0-51.7).	SM	
		17						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor:	B&B Drilling
Driller:	Tim Smith, Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME:	Honeywell Flute Bedrock Investigation
PROJECT NUMBER:	HWEL.002.001.03

BORING/ WELL NO. 119-MW-4BR Sheet 3 of 14

Location: NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:	October 4, 2005 - Mostly Sunny, 66°F-80°F
	October 5, 2005 - Sunny, 63°F-78°F
Date/Time Start:	September 20, 2005 / 0920 (Ground Level)
Date/Time Finish:	October 24, 2005 / 1300 (357 feet)
Weight of Hammer	140 Lbs.
Drop of Hammer	30 Inches
Type of Hammer	hydraulic

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	9	1.8		55 to 57	Red Brown; CLAY; medium stiff; saturated.	CL	
		3						
56		5						
		6						
57						Drilled to 60 feet.		
58								
59								
60	SS	4	1.7		60 to 62	Red Brown; CLAY; hard; saturated (60.0-61.2).	CL	
		9				Red Brown; SILT; hard; saturated (61.2-61.7).		
61		26					ML	
		27						
62						Drilled to 65 feet.		
63								
64								
65	SS	2	2.0		65 to 67	Red Brown; CLAY; medium stiff; saturated; laminated.	CL	
		3						
66		6						
		6						
67						Drilled to 70 feet.		
68								
69								
70	SS	2	2.0		70 to 72	Red Brown; CLAY, some Silt, trace- c Sand to f Gravel;		
		2				f Sand laminations; medium stiff; saturated.	CL	
71		3						
		6						
72						Drilled to 75 feet.		
73								
74								
75	SS	4	0		75 to 77	No recovery.		
		4						
76		10						
		12						
77						Drilled to 80 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor: B&B Drilling Driller: Tim Smith, Ed Blewett Inspector: Mike Wilkinson Rig Type: Mobile B57, Gus Pech	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** Sheet 4 of 14 **119-MW-4BR** **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 6, 2005 - Mostly Cloudy, 64°F-78°F
October 11, 2005 - Cloudy, Showers, 58°F-62°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SS	11	1.1		80 to 82	Red Brown; SILT/CLAY, trace mf Gravel (rounded), trace cmf Sand; very stiff; saturated.	ML/CL	
		10						
81		14						
		29						
82						Drilled to 85 feet.		
83								
84								
85	SS	12	1.8		85 to 87	Red Brown; CLAY, trace c Gravel (subrounded), trace c Sand; f Sand laminations; hard; saturated.	CL	
		20						
86		30						
		27						
87						Drilled to 90 feet.		
88								
89								
90	SS	7	1.7		90 to 92	Red Brown; CLAY, trace c Sand to m Gravel (subrounded); f Sand to Silt laminations; very stiff; saturated.	CL	
		14						
91		16						
		16						
92						Drilled to 95 feet.		
93								
94								
95	SS	8	1.0		95 to 97	Red Brown; CLAY, trace cmf Sand, trace- f Gravel (subangular to rounded); hard; saturated.	CL	
		13						
96		20						
		25						
97						Drilled to 100 feet.		
98								
99								
100	SS	4	2.0		100 to 102	Red Brown; CLAY;stiff; saturated (100.0-101.4). Red Brown; SILT, little Clay; stiff; saturated (101.4-102.0).	CL ML	
		6						
101		7						
		18						
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor:	B&B Drilling
Driller:	Tim Smith, Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-4BR Sheet 5 of 14

Location:
NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 12, 2005 - Cloudy, Rain, 50°F-58°F
October 13, 2005 - Rain, Windy, 56°F-62°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	2	2.0		105 to 107	Red Brown; CLAY; medium stiff; saturated.	CL	
		3						
106		4						
		6						
107						Drilled to 110 feet.		
108								
109								
110	SS	WOR	2.0		110 to 112	Red Brown; CLAY; Silt laminations at 110.0-110.4 feet; soft; saturated.	CL	
		WOR						
111		4						
		4						
112						Drilled to 115 feet.		
113								
114								
115	SS	WOR	2.0		115 to 117	Red Brown; CLAY; f Sand to Silt laminations; very soft; saturated.	CL	
		WOR						
116		WOR						
		6						
117						Drilled to 120 feet.		
118								
119								
120	SS	WOR	2.0		120 to 122	Red Brown; CLAY, trace- f Gravel (subrounded to rounded); f Sand to Silt laminations; very soft; saturated.	CL	
		WOR						
121		WOR						
		WOR						
122						Drilled to 125 feet.		
123								
124								
125	SS	49	0.9		125 to 127	Red Brown; f SAND, some Silt, trace c Sand to c Gravel (rounded to angular); very dense; saturated.	SM (TILL)	
		64						
126		100/3"						
127						Drilled to 130 feet.		
128								
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** Tim Smith, Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Mobile B57, Gus Pech	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 119-MW-4BR Sheet 6 of 14 **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 14, 2005 - Showers, 58°F-64°F
October 17, 2005 - Mix of Sun and Clouds, 54°F-66°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
130	SS	51	1.1		130 to 132	Red Brown; cmf SAND, little Silt, some cmf Gravel (subrounded to angular); very dense; saturated.	SM (TILL)	
		115						
131		108						
		120						
132						Drilled 135 feet.		
133								
134								
135	SS	167	0.5		135 to 137	Red Brown; cmf SAND, some Silt; cmf Gravel (subrounded to subangular); very dense; saturated.	SM (TILL)	
		100/1"						
136								
137						Drilled to 140 feet.		
138								
139								
140	SS	97	0.3		140 to 142	Red Brown; cmf SAND, little Silt, little cmf Gravel; very dense; saturated.	SM (TILL)	
		100/2"						
141								
142						Drilled to 145 feet.		
143								
144								
145	SS	111	0.5		145 to 147	Red Brown; cmf SAND, little Silt, and cmf Gravel (subangular); very dense; saturated.	SM (TILL)	
		100/2"						
146						Bedrock at 146 feet.	BEDROCK	
147						Drilled to 150 feet.		
148								
149								
150	SS	100/0"	0.0		150 to 152	No recovery.		
151								
152						Drilled to 155 feet.		
153							BEDROCK	
154								
155	SS	100/0"	0.0		155 to 157	No recovery.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** D. Myerchin, J. Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 7 of 14 **WELL NO.** 119-MW-4BR **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 18, 2005 - Mostly Sunny, 54°F-70°F
October 21, 2005 - Mostly Cloudy, 48°F-58°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157	AR				**157 to 167** Tan; fine-grained SANDSTONE; rounded to well rounded grains.		
158							
159							
160							
161							
162							
163							
164							
165							
166					Abundant water production from 166-171 feet.		
167	AR				**167 to 177** Very Light Brown; fine-grained SANDSTONE; rounded to well rounded grains.	BEDROCK	
168							
169							
170							
171							
172							
173							
174							
175							
176							
177	AR				**177 to 187** Greyish Brown; fine-grained SANDSTONE; rounded to well rounded grains.		
178							
179							
180	AR						
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** D. Myerchin, J. Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 8 of 14 **WELL NO.** 119-MW-4BR **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 24, 2005 - Cloudy, 43°F-55°F
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
182						Continued from above.		
183								
184								
185								
186								
187	AR				187 to 197	Very Light Brown; fine-grained SANDSTONE; rounded to well rounded grains (95%). Black; SILTSTONE (5%).	BEDROCK	
188								
189								
190								
191								
192								
193								
194								
195								
196								
197	AR				197 to 207	Tan; fine-grained SANDSTONE; rounded to well rounded grains.		
198								
199								
200								
201								
202								
203								
204								
205								
206								
207	AR				207 to 217	Tan to Light Brown; fine-grained SANDSTONE; rounded to well rounded grains (90%).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** D. Myerchin, J. Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 9 of 14 **WELL NO.** 119-MW-4BR **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Dark Grey; SILTSTONE (10%).	BEDROCK	
209							
210							
211							
212							
213							
214							
215							
216							
217	AR				217 to 220 Light Gray to Brown; fine-grained SANDSTONE.		
218							
219							
220	AR				220 to 227 Dark Grey; SILTSTONE.		
221							
222							
223							
224							
225							
226							
227	AR				227 to 237 Dark Grey; SILTSTONE.		
228							
229							
230							
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: D. Myerchin, J. Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 10 of 14
WELL NO. 119-MW-4BR
Location: NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.	BEDROCK	
235							
236							
237	AR				**237 to 247** Dark Grey; SILTSTONE (95%). Light Grey SILTSTONE (5%).		
238							
239							
240							
241							
242							
243							
244							
245							
246							
247	AR				**247 to 257** Dark Grey; SILTSTONE (65-70%). Light Grey; SILTSTONE (30-35%). Rock chips indicate Dark Grey and Light Grey Siltstones are present as alternating layers.		
248							
249							
250							
251							
252							
253							
254							
255							
256							
257	AR				**257 to 267** Dark Grey; SILTSTONE.		
258							
259							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** D. Myerchin, J. Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 11 of 14 **WELL NO.** 119-MW-4BR **Location:** NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.	BEDROCK	
261							
262							
263							
264							
265							
266							
267	AR				267 to 277 Dark Grey; SILTSTONE (85-90%). Grey; SILTSTONE (10-15%).		
268							
269							
270							
271							
272							
273							
274							
275							
276							
277	AR				277 to 287 Dark Grey; SILTSTONE.		
278							
279							
280							
281							
282							
283							
284							
285							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	B&B Drilling
Driller:	D. Myerchin, J. Myerhoffer
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. Sheet 12 of 14 — **119-MW-4BR**

Location: NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description: Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.		
287	AR				287 to 297 Dark Grey; SILTSTONE.		
297	AR				297 to 307 Dark Grey; SILTSTONE (90%) Grey; SILTSTONE (10%). Rock chips indicate Dark Grey and Light Grey Siltstones are present as alternating layers.	BEDROCK	
307	AR				307 to 317 Dark Grey; SILTSTONE (40%). Light Grey; SILTSTONE (60%). Dark Grey from ~307-313 feet, Light Grey from ~313-317 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	B&B Drilling
Driller:	D. Myerchin, J. Myerhoffer
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-4BR — Sheet 13 of 14

Location: NJCU Athletic Field (Soccer Field).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer: NA
Drop of Hammer: NA
Type of Hammer: NA

Location Description: Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.	BEDROCK	
313							
314							
315							
316							
317	AR				317 to 327 Dark Grey; SILTSTONE (50%). Light Grey; SILTSTONE (50%).		
318							
319							
320							
321							
322							
323							
324							
325							
326							
327	AR				327 to 337 Dark Grey; SILTSTONE (75-80%). Grey; SILTSTONE (20-25%).		
328							
329							
330							
331							
332							
333							
334							
335							
336							
337	AR				337 to 347 Dark Grey; SILTSTONE (65-70%). Gray; SILTSTONE (30-35%).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	B&B Drilling
Driller:	D. Myerchin, J. Myerhoffer
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-4BR Sheet 14 of 14

Location:
NJCU Athletic Field (Soccer Field).

Location Description:
Well 119-MW-4BR is located 96 feet southeast of the southeast corner of the baseball announcers booth and 154 feet west of the westernmost support for the football scoreboard at the NJCU Athletic Field.

Weather:

Date/Time Start: September 20, 2005 / 0920 (Ground Level)
Date/Time Finish: October 24, 2005 / 1300 (357 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
338					Continued from above.		
339							
340							
341							
342							
343							
344							
345							
346							
347	AR				347 to 357 Light Grey; SILTSTONE (55-60%). Dark Grey; SILTSTONE (40-45%).	BEDROCK	
348							
349							
350							
351							
352							
353							
354							
355							
356							
357					Bottom of Borehole at 357 feet.		
358							
359							
360							
361							
362							
363							

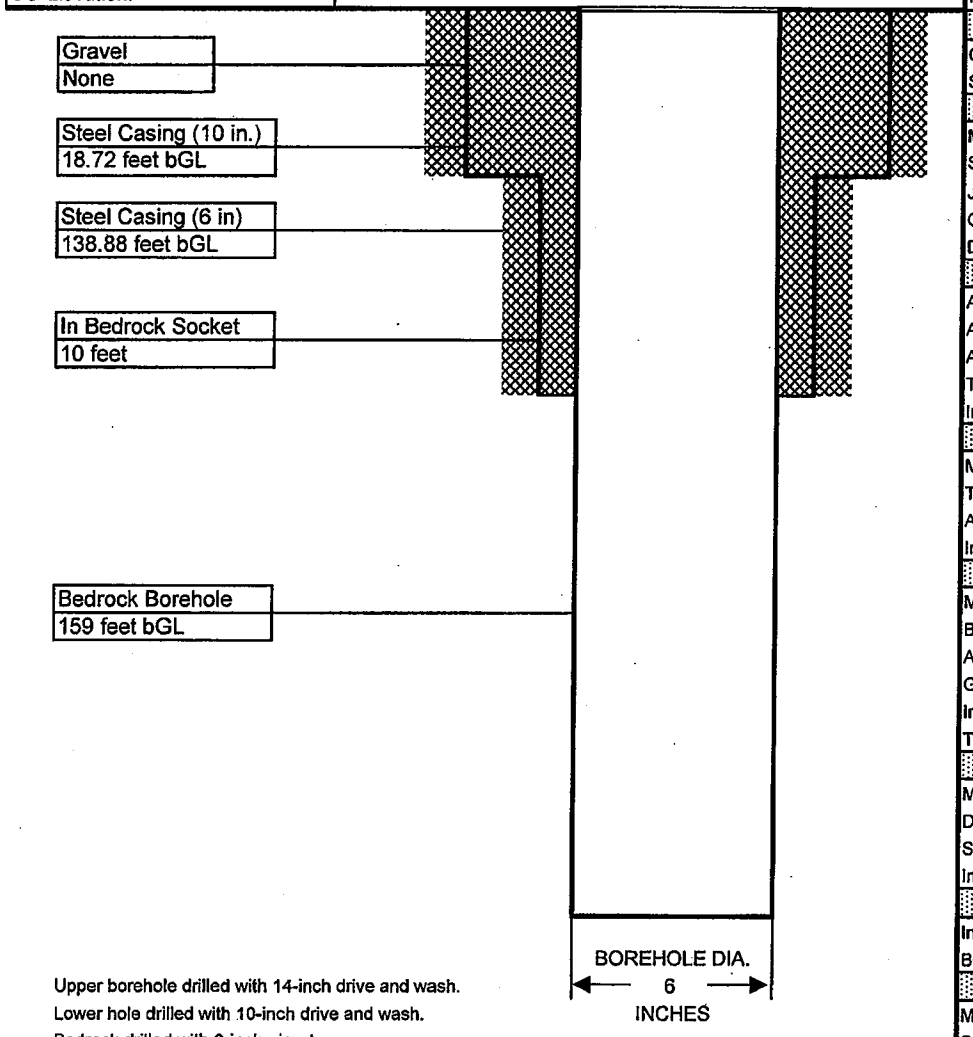
SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	119-MW-11BR	FACILITY/SITE NAME:	K-Mart
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	11-Nov-05	DATE END:	19-Dec-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary

GS Elevation:



Upper borehole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 138.9 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: B&B Drilling
Driller: Tim Smith, Tom Jaust, Ed Blewett
Inspector: Nick Santella/ Mike Wilkinson
Rig Type: Mobile B61, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-11BR Sheet 1 of 7
Location: K-Mart

Location Description:
Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

Weather: November 11, 2005 - Sunny, 41°F-50°F
November 14, 2005 - Sunny, 59°F-64°F
Date/Time Start: November 11, 2005 / 0745 (Ground Surface)
Date/Time Finish: December 13, 2005 / 1140 (159 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Asphalt (0-0.3).	Asphalt	
						Tray Rock (0.3-0.6).	ML/CL	
1						Tan; CLAY/SILT, some cmf Sand, trace f Gravel (rounded to subrounded); wood, coal; loose; moist (0.6-1.5).		
						Dark Brown; SILT; some cmf Sand, trace f Gravel; brick fragments; loose; moist (1.5-2.3).	ML	
2						Concrete (2.3-3.0).	Concrete	
						Dark Brown; SILT, some cmf Sand, trace f Gravel; brick fragments; loose; wet (3.0-5.0).		
3						Hand auger to 5 feet for utility clearance.	ML	
4								
5	SS	2	1.1		5 to 7	Black; cmf SAND, little mf Gravel; medium dense; moist; saturated at 6.8'; slag, coal.		
		7						
6		8						
		8					SW	
7	SS	3	0.8		7 to 9	Black; cmf SAND, little+ mf Gravel (angular to subrounded); medium dense; saturated.		
		5						
8		7						
		7						
9	SS	2	1.1		9 to 11	Light Grey; CLAY; stiff; saturated (9.0-9.3)	CL	
		6				Grey; mf SAND, trace f Gravel; medium dense, saturated; slag (fill) (9.3-10.1).		
10		6						
		4						
11	SS	1	1.3		11 to 13	Grey; cmf SAND, trace f Gravel, loose, saturated, slag (fill) (11.0-11.4).		
		3				Grey Brown; mf SAND, loose, saturated (11.4-12.3).	SW	
12		4						
		2						
13	SS	WOR	0.8		13 to 15	Grey Brown; f SAND, little Clay; loose; saturated (13.0-13.4).		
		2				Grey; cmf SAND, loose; saturated (13.4-13.8).		
14		3						
		4						
15	SS	WOR	0.0		15 to 17	No recovery.		
		WOR						
16		1						
		1						
17	SS	WOR	1.2		17 to 19	Brown; PEAT (17.0-18.1).	PT	
		1				Grey; CLAY;soft; saturated (18.1-18.2).		
18		2					CL	
		3						
19						Drill to 20 feet.		
20	SS	1	0.8		20 to 22	Brown; PEAT (21.2-21.4).	PT	
		1				Brown; CLAY; organic odor; medium stiff; saturated (21.4-21.7).	CL	
21		4				Grey; f SAND; saturated (21.7-22.0).		
		13					SP	
22						Drill to 23 feet.		
23	SS	1	1.8		23 to 25	Olive Grey; CLAY, trace f Sand; stiff; saturated (23.0-24.6).		
		5				Olive Grey; mf SAND, little Clay; medium dense; saturated (24.6-24.8).	CL	
24		8						
		9					SC	
25						Drill to 30 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Additional Weather Reports: December 2, 2005 - Mostly Cloudy, 38°F-44°F
December 5, 2005 - Cloudy, 32°F-38°F

Contractor: B&B Drilling
Driller: Dave Myerchin, Ed Blewett
Inspector: Nick Santella
Rig Type: Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-11BR Sheet 2 of 7
Location: K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 15, 2005 - Cloudy, 53°F-60°F
November 16, 2005 - Cloudy, 62°F-70°F
Date/Time Start: November 11, 2005 / 0745 (Ground Surface)
Date/Time Finish: December 13, 2005 / 1140 (159 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26						Continued from above.		
27						Drilled to 30 feet.		
28								
29								
30	SS	8	0.7		30 to 32	Olive Grey; SILT, trace f Sand; f Sand laminations; very stiff; saturated.	ML	
		11						
31		14						
		18						
32						Drilled to 35 feet.		
33								
34								
35	SS	8	1.6		35 to 37	Grey Brown; SILT, little Clay; Clay layers; f Sand laminations; very stiff; saturated.	ML	
		13						
36		17						
		31						
37						Drilled to 40 feet.		
38								
39								
40	SS	11	1.3		40 to 42	Grey Brown; SILT, trace Clay; hard; saturated (40.0-40.2). Brown; SILT, some- f Sand; Silt/Clay layers (0.02 feet thick); hard; saturated (40.2-41.3).	ML	
		14						
41		17						
		22						
42						Drilled to 45 feet.		
43								
44								
45	SS	8	1.9		45 to 47	Red Brown; SILT, trace Clay; f Sand laminations; very stiff; saturated.	ML	
		8						
46		10						
		17						
47						Drilled to 47 feet.		
48								
49								
50	SS	13	0.1		50 to 52	Red Brown; CLAY; trace- m Gravel; very stiff; saturated.	CL	
		10						
51		11						
		11						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Dave Myerchin, Ed Blewett **Inspector:** Nick Santella **Rig Type:** Mobile B57, Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** **WELL NO.** 119-MW-11BR **Location:** K-Mart	Sheet 3 of 7

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 17, 2005 - Sunny, 41°F-48°F
November 18, 2005 - Mostly Sunny, 33°F-44°F
Date/Time Start: November 11, 2005 / 0745 (Ground Surface)
Date/Time Finish: December 13, 2005 / 1140 (159 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	3	1.2		55 to 57	Red Brown; CLAY; stiff; saturated (55.0-56.0).	CL	
		9				Red Brown; CLAY, little Silt; stiff; saturated (55.0-56.0).		
56		13						
		11						
57						Drilled to 60 feet.		
58								
59								
60	SS	1	2.0		60 to 62	Red Brown; CLAY, trace- cmf Sand; soft; saturated.	ML	
		1						
61		3						
		9						
62						Drilled to 65 feet.		
63								
64								
65	SS	4	0.6		65 to 67	Red Brown; SILT, some Clay, trace f Gravel; grey Clay layers 0.02-0.03 feet thick; sparse f Sand laminations; stiff; saturated.	ML	
		6						
66		7						
		9						
67						Drilled to 70 feet.		
68								
69								
70	SS	10	1.4		70 to 72	Red Brown; SILT, little Clay, trace Gravel; Sandy Silt layers at 70.4-70.5 feet; stiff; saturated.	ML	
		11						
71		10						
		16						
72						Drilled to 75 feet.		
73								
74								
75	SS	5	1.7		75 to 77	Red Brown; SILT; some Clay, trace f Gravel; very stiff; saturated.	ML	
		7						
76		16						
		19						
77						Drilled to 77 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Dave Myerchin, Ed Blewett
Inspector: Nick Santella
Rig Type: Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-11BR Sheet 4 of 7

Location: K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 21, 2005 - Mostly Cloudy, 46°F-55°F
November 22, 2005 - Cloudy with Rain, 43°F-49°F
Date/Time Start: November 11, 2005 / 0745 (Ground Surface)
Date/Time Finish: December 13, 2005 / 1140 (159 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SS	19	1.0		80 to 82	Red Brown; CLAY; trace- c Sand, trace- cmf Gravel; hard; saturated.	CL	
		18						
81		25						
		33						
82						Drilled to 85 feet.		
83								
84								
85	SS	12	0.4		85 to 87	Red Brown; CLAY, some Silt, trace cmf Sand; hard; saturated.	CL	
		29						
86		29						
		36						
87						Drilled to 90 feet.		
88								
89								
90	SS	9	1.2		90 to 92	Red Brown; CLAY, some Silt, trace cmf Sand, trace cmf Gravel (subangular to subrounded); hard; saturated.	CL	
		16						
91		25						
		35						
92						Drilled to 95 feet.		
93								
94								
95	SS	8	1.2		95 to 97	Red Brown; CLAY, little Silt, trace- cmf Sand, trace f Gravel; very stiff; saturated.	CL	
		9						
96		13						
		22						
97						Drilled to 100 feet.		
98								
99								
100	SS	12	1.2		100 to 102	Red Brown; CLAY, little Silt, trace cmf Sand; very stiff; saturated 100.0-100.6).	CL	
		14						
101		22				Red Brown; SILT, little Clay, trace cmf Sand, trace f Gravel; hard; saturated (100.6-101.2).	ML	
		27						
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Dave Myerchin, Ed Blewett **Inspector:** Nick Santella **Rig Type:** Mobile B57, Gus Pech	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 119-MW-11BR	Sheet 5 of 7 **Location:** K-Mart

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	November 28, 2005 - Cloudy, 49°F-59°F November 29, 2005 - Cloudy, 58°F-67°F
Date					Date/Time Start:	November 11, 2005 / 0745 (Ground Surface)
Time					Date/Time Finish:	December 13, 2005 / 1140 (159 feet)
Meas. From					Weight of Hammer	300 Lbs.
					Drop of Hammer	30 Inches
					Type of Hammer	hydraulic

Location Description:

Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	9	2.0		105 to 107	Red Brown; CLAY; very stiff; saturated (105.0-105.5).	CL	
		15				Red Brown; SILT; very stiff; saturated (105.5-105.7).	SP	
106		13				Red Rrown; f SAND; med dense; saturated (105.7-106.0).	CL	
		17				Red Brown; CLAY; very stiff; saturated (106.0-107.0).		
107						Drilled to 110 feet. Drilling became hard at 107 feet.		
108								
109								
110	SS	4	2.0		110 to 112	Red Brown; CLAY, trace cmf Sand, trace- f Gravel; (subrounded); Silt layers present; very stiff; saturated.	CL	
		8						
111		8						
		12						
112						Drilled to 115 feet.		
113								
114								
115	SS	WOR	2.0		115 to 117	Red Brown; CLAY, some Silt; alternating greyish and red brown layers; stiff; saturated.	CL	
		4						
116		7						
		8						
117						Drilled to 120 feet.		
118								
119								
120	SS	1	2.0		120 to 122	Red Brown; CLAY; sparse Silt laminations; stiff; saturated (120.0-121.4).	CL	
		2						
121		9				Red Brown; CLAY/SILT, some- cmf Sand, little- c Gravel (subangular to subrounded); stiff; saturated (121.4-122.0).	CL/ML	
		20						
122						Drilled to 125 feet.		
123								
124								
125	SS	29	0.5		125 to 127	Red Brown; cmf SAND, some Clay/Silt, little f Gravel (subangular); very dense; saturated.	SC/SM (TILL)	
		34						
126		100/4"						
127						Drilled to 130 feet.		
128								
129								
						Very hard drilling at 129.5 feet.	BEDROCK	

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Ed Blewett, Dave Myerchin **Inspector:** Nick Santella / Mike Wilkinson **Rig Type:** Gus Pech, Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 6 of 7 **WELL NO.** 119-MW-11BR **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 30, 2005 - Cloudy with Rain, 57°F-60°F
December 1, 2005 - Mix of Sun and Clouds, 39°F-48°F
Date/Time Start: November 11, 2005 / 0745 (Ground Surface)
Date/Time Finish: December 13, 2005 / 1140 (159 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130	C		3.1		**130 to 135** Red Brown; SILTSTONE. RQD = 52%	BEDROCK	
131							
132							
133							
134							
135					Drilled to 139 feet.		
136							
137							
138							
139	AR				**139 to 144** Tan; fine-grained SANDSTONE.		
140							
141							
142							
143							
144	AR				**144 to 149** Tan; fine-grained SANDSTONE (75%). Dark Brown; fine- to coarse-grained SANDSTONE (25%).		
145							
146							
147							
148							
149	AR				**149 to 154** Tan; fine-grained SANDSTONE (50%). Dark Gray; SILTSTONE (50%).		
150							
151							
152							
153							
154	AR				**154 to 159** Dark Gray; very fine-grained Silty SANDSTONE.		
155							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Dave Myerchin, Ed Blewett **Inspector:** Nick Santella **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 119-MW-11BR Sheet 7 of 7 **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 30, 2005 - Cloudy with Rain, 57°F-60°F
December 1, 2005 - Mix of Sun and Clouds, 39°F-48°F
Date/Time Start: November 11, 2005 / 0745 (Ground Surface)
Date/Time Finish: December 13, 2005 / 1140 (159 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 119-MW-11BR is located 68.4 feet west of the building corner just northwest of the loading dock at the rear of K-Mart and 59.9 feet north of utility pole A70090JC.

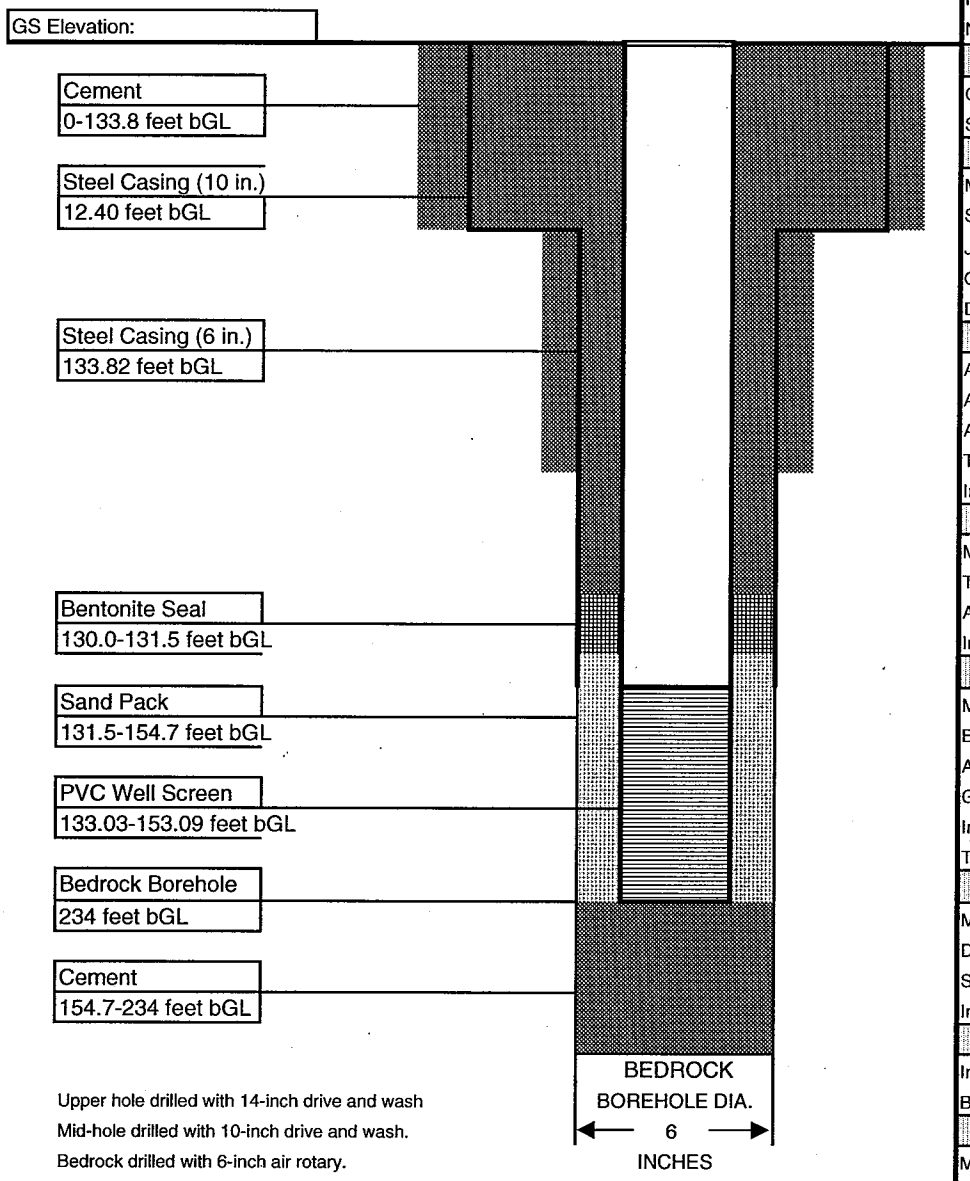
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.	BEDROCK	
157							
158							
159					Bottom of Borehole at 159 feet.		
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	119-MW-12BR	FACILITY/SITE NAME:	K-Mart
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	7-Nov-05	DATE END:	16-Aug-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 14-inch drive and wash
Mid-hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Watertight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 130.0 FEET
SEAL	
Material:	BENTONITE
Type:	NA
Amount Used:	NA
Interval:	130.0-131.5 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	NA
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	131.5-154.7 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2 INCHES
Slot Size & Type:	0.010 INCH
Interval BGS:	133.03-153.09 FEET
SUMP	
Interval BGS:	153.09-153.30 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 119-MW-12BR Sheet 1 of 9

Location: K-Mart

Location Description:
Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Weather: November 4, 2005 - Sunny, 55°F-70°F
November 7, 2005 - Sunny, 56°F-62°F
Date/Time Start: November 4, 2005 / 0830 (Ground Surface)
Date/Time Finish: December 14, 2005 / 1000 (154 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Drilled to 5 feet.		
1								
2						Concrete from 2.0-2.7 feet.	Concrete	
3								
4								
5	SS	5	0.9		5 to 7	Dark Gray; cmf SAND, little f Gravel; medium dense; wet (5.0-5.2).	SW	
		8				Dark Gray to Light Gray; mf SAND, medium dense; wet (5.2-5.9).		
6		8						
		11						
7	SS	5	0.7		7 to 9	Light Gray; mf SAND, trace c Sand to f Gravel; medium dense, wet.		
		6						
8		9					SP	
		14						
9	SS	9	0.5		9 to 11	Light Gray; mf SAND; medium dense; wet.		
		9						
10		10						
		4						
11	SS	2	1.7		11 to 13	Dark Brown; PEAT; soft; moist (11.0-12.4).		
		2				Gray; f SAND, little+ Silt; soft; saturated (12.4-12.7).	PT	
12		2						
		2					SM	
13						Drilled to 20 feet		
14								
15								
16								
17								
18								
19								
20	SS	15	0.3		20 to 22	Light Brown; mf SAND, little cmf Gravel (rounded), trace Silt;		
		22				dense; saturated.	SP	
21		18						
		25						
22						Drilled to 25 feet.		
23								
24								
25	SS	5	0.9		25 to 27	Light Brown; f SAND, trace Silt; dense; saturated (25.0-25.7).	SP	
		11				Light Brown; f SAND, little Silt; dense; saturated (25.7-25.9).	SM	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** Sheet 2 of 9 **119-MW-12BR** **Location Description:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 8, 2005 - Mix of Sun and Clouds, 50°F-66°F
November 9, 2005 - Cloudy, 48°F-55°F
Date/Time Start: November 4, 2005 / 0830 (Ground Surface)
Date/Time Finish: December 14, 2005 / 1000 (154 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26						Continued from above.	SM	
27						Drilled to 30 feet.		
28								
29								
30	SS	15	1.1		**30 to 32**	Light Brown; f SAND, trace Silt; dense; saturated.	SP	
		20						
31		20						
		23						
32						Drilled to 35 feet.		
33								
34								
35	SS	7	0.1		**35 to 37**	Brown; CLAY/SILT; stiff; saturated.	CL/ML	
		8						
36		7						
		25						
37						Drilled to 40 feet.		
38								
39								
40	SS	25	1.4		**40 to 42**	Red Brown; f SAND, little Silt; dense; saturated (40.0-40.3).	SM/CL/ML	
		15				Red Brn; CLAY/SILT, f Sand laminations; hard; sat(40.3-40.6).	SM	
41		31				Red Brown; f SAND, little Silt; dense; saturated (40.6-41.2).	CL/ML	
		25				Red Brn; CLAY/SILT, f Sand laminations; hard; sat (41.2-41.4).		
42						Drilled to 45 feet.		
43								
44								
45	SS	14	1.3		**45 to 47**	Red Brown; CLAY/SILT, very stiff; saturated.	CL/ML	
		10						
46		11						
		18						
47						Drilled to 47 feet.		
48								
49								
50	SS	9	1.5		**50 to 52**	Red Brown; CLAY/SILT; minor f Sand laminations; very stiff; saturated.	CL/ML	
		13						
51		13						
		20						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 3 of 9 **WELL NO.** 119-MW-12BR **Location:** K-Mart	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 10, 2005 - Mostly Sunny, 54°F-50°F
November 11, 2005 - Sunny, 41°F-50°F
Date/Time Start: November 4, 2005 / 0830 (Ground Surface)
Date/Time Finish: December 14, 2005 / 1000 (154 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank).

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	15	1.3		55 to 57	Red Brown; CLAY, some Silt, trace m Sand to f Gravel; hard; saturated.	CL	
		21						
56		35						
		76						
57						Drilled to 60 feet.		
58								
59								
60	SS	9	2.0		60 to 62	Red Brown; CLAY, some Silt, trace- cmf Sand; hard; saturated.	CL	
		15						
61		28						
		57						
62						Drilled to 65 feet.		
63								
64								
65	SS	20	1.7		65 to 67	Red Brown; CLAY/SILT, trace- cmf Sand to f Gravel; Silt layer from 66.0-66.4 feet; hard; saturated.	CL/ML	
		53						
66		61						
		78						
67						Drilled to 70 feet.		
68								
69								
70	SS	14	2.0		70 to 72	Red Brown; SILT, little Clay, trace cmf Sand to f Gravel; f Sand laminations; Silt layer at 71.0-71.4 feet; hard; saturated.	ML	
		25						
71		36						
		65						
72						Drilled to 75 feet.		
73								
74								
75	SS	33	1.5		75 to 77	Red Brown; SILT; thin Clay layers at 76.3-76.5 feet; hard saturated.	ML	
		53						
76		65						
		80						
77						Drilled to 77 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 4 of 9
WELL NO. 119-MW-12BR
Location Description: K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 21, 2005 - Mostly Cloudy, 46°F-55°F
November 22, 2005 - Cloudy with Rain, 43°F-49°F
Date/Time Start: November 4, 2005 / 0830 (Ground Surface)
Date/Time Finish: December 14, 2005 / 1000 (154 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SS	15	1.7		**80 to 82**	Red Brown; SILT; thin Clay layers from 80.0-80.3 feet; hard; saturated (80.0-80.6).	ML	
		47						
81		45				Red Brown; SILT, trace cmf Sand, trace f Gravel (subrounded); hard; saturated (80.6-81.7).).		
		90						
82						Drilled to 85 feet.		
83								
84								
85	SS	23	2.0		**85 to 87**	Red Brown; SILT, little f Sand; thin Clay layers from 85.0-85.8 feet; hard; saturated.	ML	
		49						
86		71						
		105						
87						Drilled to 90 feet.		
88								
89								
90	SS	62	0.7		**90 to 92**	Red Brown; SILT; hard; saturated.	ML	
		100/4"						
91								
92						Drilled to 95 feet.		
93								
94								
95	SS	13	1.8		**95 to 97**	Red Brown; CLAY; laminated; hard; saturated (95.0-96.3).	CL	
		20				Red Brown; SILT, trace- f Sand; hard; saturated (96.3-96.8).		
96		39						
		100					ML	
97						Drilled to 100 feet.		
98								
99								
100	SS	75	0.8		**100 to 102**	Red Brown; SILT, trace- f Sand; hard; saturated.	ML	
		100/3"						
101								
102						Drilled to 105 feet.		
103								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. Sheet 5 of 9
119-MW-12BR

Location Description:
K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 28, 2005 - Cloudy, 49°F-59°F
November 29, 2005 - Cloudy, 58°F-67°F
Date/Time Start: November 4, 2005 / 0830 (Ground Surface)
Date/Time Finish: December 14, 2005 / 1000 (154 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	37	2.0		**105 to 107**	Red Brown; CLAY; hard; saturated.	CL	
		51						
106		53						
		37						
107						Drilled to 110 feet. Drilling became hard at 107 feet.		
108								
109								
110	SS	WOR	1.4		**110 to 112**	Red Brown; CLAY; sparse f Sand laminations; hard; saturated (110.0-110.7).	CL	
		23						
111		63				Red Brown; CLAY, little c Sand to f Gravel (angular to subangular); hard; saturated (110.7-111.4).		
		59						
112						Drilled to 115 feet.		
113								
114								
115	SS	40	1.4		**115 to 117**	Red Brown; f SAND, little+ Silt; hard; saturated.	SM	
		25						
116		19						
		36						
117						Drilled to 120 feet.		
118								
119								
120	SS	100/0"	0.0		**120 to 122**	No Recovery.		
121								
122	SS	100/4"	0.3		**122 to 124**	Red Brown; SILT, little f Sand; hard; saturated.	ML	
123								
124	SS	100/0"	0.0		**124 to 126**	No Recovery.	BEDROCK	
125								
126						Drilled to 129 feet.		
127								
128								
129	C		3.9		**129 to 134**	Light Gray; fine- to medium-grained Arkosic SANDSTONE; irregular light brown Silt (?) clasts from 130.3-131.3 and		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Blewett, Myerhoffer, Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech, Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 6 of 9 **WELL NO.** 119-MW-12BR **Location Description:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 30, 2005 - Cloudy with Rain, 57°F-60°F
December 1, 2005 - Mix of Sun and Clouds, 39°F-48°F
Date/Time Start: November 4, 2005 / 0830 (Ground Surface)
Date/Time Finish: December 14, 2005 / 1000 (154 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					132.4-132.6 feet; weathered vugs throughout.		
131							
132							
133					RQD = 78%		
134	AR				**134 to 139** Tan; fine- to medium-grained SANDSTONE (85-90%). Gray; very fine-grained SANDSTONE (5%). Red Brown; SILTSTONE (5%). Dark Gray; SILTSTONE (<5%).		
135							
136							
137							
138							
139	AR				**139 to 144** Tan; fine-grained SANDSTONE (95%). Dark Gray to Greenish Gray; SILTSTONE (5%).		
140							
141							
142							
143							
144	AR				**144 to 149** Tan; fine- to medium-grained SANDSTONE (85%). Greenish Gray; SILTSTONE (15%). Dark Gray; SILTSTONE (trace-%).		
145							
146							
147							
148							
149	AR				**149 to 154** Tan; fine- to medium-grained SANDSTONE (95%). Gray; fine- to medium-grained SANDSTONE (5%).		
150							
151							
152							
153							
154	AR				**154 to 160** Beige; fine-grained SANDSTONE (95%). Dark Gray; SILTSTONE (5%).		
155							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Blewett, Myerhoffer, Myerchin
Inspector: Mike Wilkinson
Rig Type: Gus Pech, Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 7 of 9
WELL NO. 119-MW-12BR

Location Description:
K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: December 2, 2005 - Mostly Cloudy, 38°F-44°F
December 5, 2005 - Cloudy, 32°F-38°F
Date/Time Start: June 27, 2006 / 1110 (154 feet)
Date/Time Finish: June 27, 2006 / 1445 (234 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157							
158							
159							
160	AR				**160 to 164** Beige; fine-grained SANDSTONE.		
161							
162							
163							
164	AR				**164 to 170** Gray to Dark Gray; SILTSTONE (90-95%). Gray; very fine-grained SANDSTONE (5-10%).		
165							
166							
167							
168							
169							
170	AR				**170 to 185** Gray to Greenish Gray; SILTSTONE (60%). Beige; fine-grained SANDSTONE (40%).		
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 8 of 9 **WELL NO.** 119-MW-12BR **Location Description:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: June 27, 2006 - Cloudy, 71°F-80°F

Date/Time Start: June 27, 2006 / 1110 (154 feet)

Date/Time Finish: June 27, 2006 / 1445 (234 feet)

Weight of Hammer NA

Drop of Hammer NA

Type of Hammer NA

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.		
183							
184							
185	AR				**185 to 198** Beige to Light Brown; fine-grained SANDSTONE.		
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198	AR				**198 to 210** Beige to Light Gray; ver fine- to fine-grained SANDSTONE.		
199							
200							
201							
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	B&B Drilling
Driller:	Dave Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 9 of 9
WELL NO. 119-MW-12BR
Location Description:
K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: June 27, 2006 / 1110 (154 feet)
Date/Time Finish: June 27, 2006 / 1445 (234 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Plan:

Well 119-MW-12BR is located 94.3 feet west of utility pole A71492JC and 130.2 feet north of utility pole A71491JC (both utility poles are located along Rte 440, near the North Fork Bank.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.		
209							
210	AR				**210 to 222** Light Gray; very fine-grained SANDSTONE (70%). Dark Gray; SILTSTONE (30%).		
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222	AR				**222 to 234** Beige; fine-grained SANDSTONE (75%). Light Gray; very fine-grained SANDSTONE (20%). Dark Gray; SILTSTONE (5%).		
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
					Bottom of Borehole at 234 feet.		

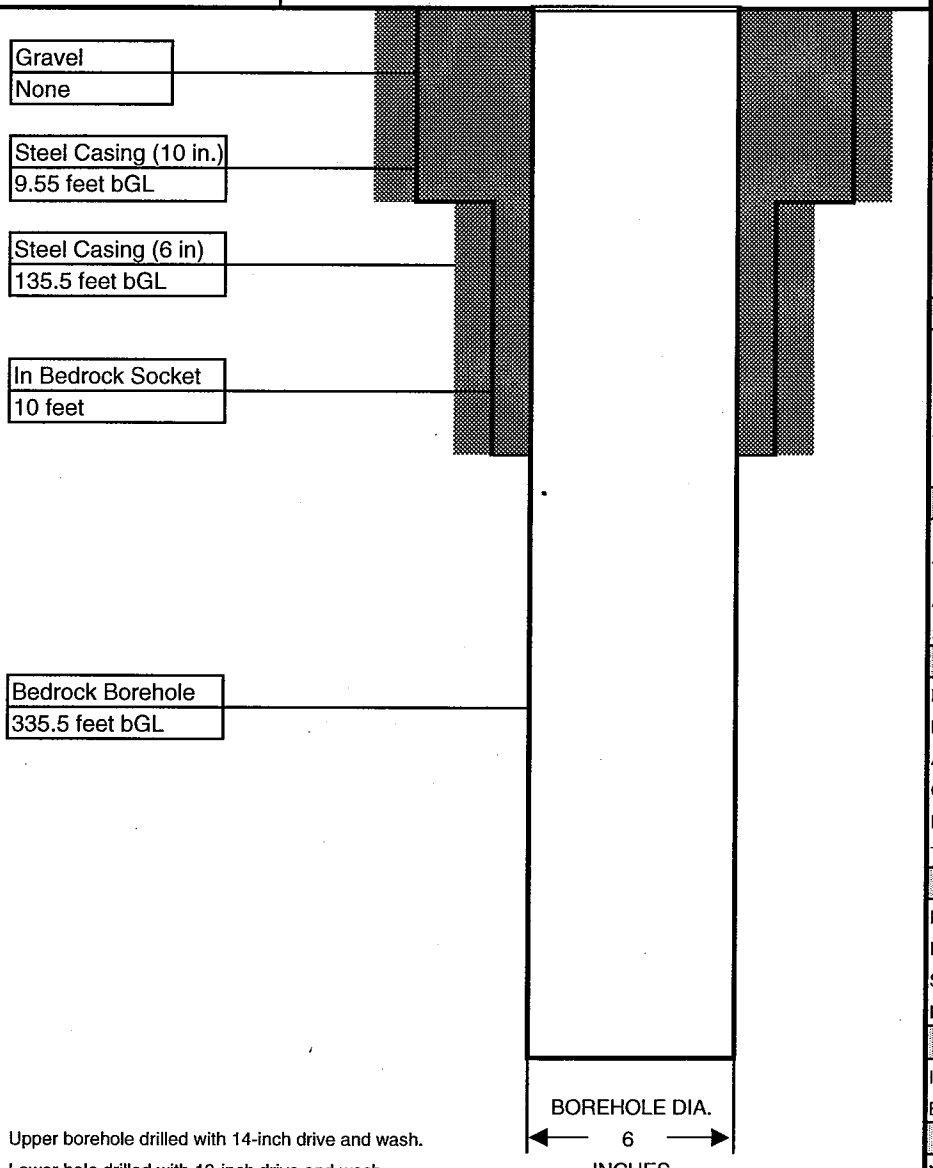
SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	119-MW-16BR	FACILITY/SITE NAME:	K-Mart
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	5-Jul-06	DATE END:	31-Jul-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary

GS Elevation:



Upper borehole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	Yes
Interval:	0 - 135.5 FEET
SEAL	
Material:	None
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. Sheet 1 of 13

Location: K-Mart

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC. near the southwest corner of the intersection between Kellogg St and Rte 440.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 5, 2006 - Cloudy, Rain, 76°F-84°F
July 6, 2006 - Mostly Cloudy, 61°F-78°F
Date/Time Start: July 5, 2006 / 0830 (Ground Level)
Date/Time Finish:
Weight of Hammer 140 lbs
Drop of Hammer 30 inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Light Brown; CLAY, some Silt, trace+ cmf Sand, trace mf Gravel; grass roots in top 2"; soft; moist (0-1.5).	CL	
1						Dark Brown; CLAY, little Silt, little+ cmf Sand, trace mf Gravel; soft; moist (1.5-1.8).		
2						Gray; CLAY; soft; moist (1.8-2.0).		
3						No Recovery (2.0-4.0).		
4						Dark Gray; cmf SAND, some mf Gravel; cinders, coal, rubber present; loose; auger hole filled with rainwater.	SW	
5						Hand auger to 5 feet for utility clearance.		
6	SS	1	0.0			Drilled to 6 feet.		
		2			6 to 8	No Recovery.		
7		1						
		WOR						
8	SS	1	1.3		8 to 10	Gray; CLAY; mild petroleum odor; very soft; saturated (8.7-9.0).		
		WOR				Dark Gray; PEAT; very soft; saturated (9.0-10.0).	CL	
9		1					PT (MEADOW MAT)	
		2						
10	SS	2	1.5		10 to 12	Light Brown; mf SAND, trace+ f Gravel; minor roots; medium dense; saturated (10.0-10.5).	SP	
		8				Red Brown; cmf SAND, little mf Gravel (rounded); medium dense; saturated (10.5-11.5).		
11		16						
		19						
12	SS	5	0.8		12 to 14	Brown; cmf SAND, little mf Gravel (rounded); increased fines at 12.6-12.8 feet; medium dense; saturated.	SW	
		11						
13		9						
		22						
14	SS	9	0.9		14 to 16	Gray Brown; mf SAND, little- mf Gravel (rounded); medium dense; saturated.		
		17						
15		10						
		14						
16	SS	9	0.9		16 to 18	Dark Brown; mf SAND, some- cmf Gravel (rounded), trace Silt; dense; saturated.	SP	
		31						
17		17						
		11						
18	SS		0.8		18 to 20	Brown; f SAND, trace+ Silt; medium dense; saturated.		
19								
20	SS	15	1.2		20 to 22	Brown; vf-f SAND, little- Silt; medium dense; saturated (20.0-20.6).	SM	
		14				Brown; f SAND, trace Silt; medium dense; saturated (20.6-21.2).		
21		13					SP	
		12						
22	SS	10	1.1		22 to 24	Red Brown; vf SAND, little+ Silt; medium dense; saturated.		
		10					SM	
23		10						
		10						
24	SS	14	0.9		24 to 26	Brown; vf SAND, trace Silt; dense; saturated.		
		18					SP	
25		17						
		17						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEO PROBE

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** Sheet 2 of 13 **119-MW-16BR** **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 7, 2006 - Sunny, 64°F-82°F
July 10, 2006 - Mix of Sun and Clouds, 69°F-86°F
Date/Time Start: July 5, 2006 / 0830 (Ground Level)
Date/Time Finish:
Weight of Hammer 140 lbs
Drop of Hammer 30 inches
Type of Hammer mechanical

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26	SS	17	1.2		**26 to 28**	Brown; vf-f SAND, trace Silt; very dense; saturated.	SP	
		25						
27		32						
		23						
28	SS	17	1.2		**28 to 30**	Brown; vf-f SAND, trace Silt; very dense; saturated.		
		25						
29		28						
		30						
30	SS	17	1.0		**30 to 32**	Brown; f SAND, trace- Silt; medium dense; saturated.		
		21						
31		17						
		10						
32	SS	9	1.0		**32 to 34**	Brown; SILT, little Clay; very stiff; saturated.	ML	
		10						
33		12						
		14						
34	SS	4	1.4		**34 to 36**	Red Brown; SILT, some Clay; very stiff; saturated (34.0-34.8). Brown; f SAND, trace Silt; medium dense; saturated (34.8-35.4).		
		7						
35		12					SP	
		14						
36	SS	8	1.2		**36 to 38**	Red Brown; SILT; abundant f Sand laminations and layers to ½" thick; very stiff; saturated.	ML	
		14						
37		10						
		14						
38	SS	12	0		**38 to 40**	No Recovery.		
		36						
39		20						
		19						
40	SS	11	1.2		**40 to 42**	Brown; SILT; abundant vf Sand laminations; very stiff; saturated.	ML	
		16						
41		13						
		18						
42	SS	10	1.2		**42 to 44**	Red Brown; SILT; abundant vf Sand laminations; very stiff; saturated.		
		13						
43		12						
		13						
44	SS	9	1.2		**44 to 46**	Red Brown; SILT; abundant vf Sand laminations; very stiff; saturated (44.0-44.4). Red Brown; SILT, little Clay; stiff; saturated (44.4-45.2).		
		8						
45		7						
		10						
46	SS	9	1.0		**46 to 48**	Red Brown; SILT, c Sand to c Gravel (rounded) at 46.3-46.5 feet; very stiff; saturated (46.0-46.5). Red Brown; SILT; abundant vf Sand laminations; very stiff; saturated (46.5-47.0).		
		10						
47		11						
		10						
48	SS	7	1.6		**48 to 50**	Red Brown; CLAY, trace c Sand to c Gravel (subrounded to rounded); laminated Silt at 49.0-49.2 feet; stiff; saturated.	CL	
		5						
49		7						
		10						
50	SS	6	0.9		**50 to 52**	Red Brown; CLAY, trace cmf Sand, trace- cmf Gravel; very stiff; saturated.		
		10						
51		13						
		9						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 3 of 13
WELL NO. 119-MW-16BR

Location: K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 11, 2006 - Partly Sunny, Humid, 73°F-86°F
July 12, 2006 - Cloudy, 78°F-86°F
Date/Time Start: July 5, 2006 / 0830 (Ground Level)
Date/Time Finish:
Weight of Hammer 140 lbs
Drop of Hammer 30 inches
Type of Hammer mechanical

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52	SS	3	1.9		**52 to 54**	Red Brown; CLAY, trace Sand, trace cmf Gravel; very stiff; saturated (52.0-52.6). Red Brown; SILT, little Clay, trace cmf Gravel; very stiff; saturated (52.6-53.9).	CL	
		10						
53		9					ML	
		12						
54	SS	13	1.2		**54 to 56**	Red Brown; SILT, trace- mf Gravel; hard; saturated.		
		19						
55		25						
		18						
56	SS	12	0		**56 to 58**	No Recovery.		
		15						
57		18						
		31						
58	SS	19	1.3		**58 to 60**	Brown; CLAY, little Silt, trace cmf Gravel (subrounded); hard; saturated.	CL	
		19						
59		33						
		36						
60	SS	17	1.4		**60 to 62**	Brown; CLAY, trace mf Gravel (subangular to subrounded); hard; saturated.		
		24						
61		31						
		41						
62	SS	22	1.5		**62 to 64**	Red Brown; vf SAND, little Silt; dense; saturated (62.0-63.1). Brown; CLAY, trace f Gravel (subrounded); hard; saturated (63.1-63.5).	SM	
		27						
63		21					CL	
		26						
64	SS	19	1.4		**64 to 66**	Red Brown; CLAY, little cmf Gravel (subrounded to rounded) hard; saturated (64.0-64.5). Red Brown; SILT; hard; saturated (64.5-65.1). Red Brown; CLAY, trace f Gravel; hard; saturated (65.1-65.4).	ML	
		26						
65		32						
		34						
66	SS	10	1.3		**66 to 68**	Red Brown; CLAY, little cmf Sand to cmf Gravel (subrounded to subangular); hard; saturated.		
		19						
67		31						
		53						
68	SS	11	1.5		**68 to 70**	Red Brown; CLAY, little mf Gravel (subrounded to subangular); hard; saturated.		
		16						
69		28						
		35						
70	SS	8	1.4		**70 to 72**	Red Brown; CLAY, trace cmf Sand to f Gravel; hard; saturated.		
		14						
71		31						
		37					CL	
72	SS	8	1.6		**72 to 74**	Brown; CLAY, trace- f Gravel (subangular); hard; saturated.		
		12						
73		24						
		34						
74	SS	10	1.4		**74 to 76**	Brown; CLAY, trace- mf Gravel (subangular to subrounded); hard; saturated.		
		18						
75		34						
		34						
76	SS	10	1.8		**76 to 78**	Brown; CLAY, trace- mf Gravel (subangular to subrounded); hard; saturated.		
		12						
77		20						
		29						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 4 of 13 **WELL NO.** 119-MW-16BR **Location:** K-Mart	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 13, 2006 - Cloudy, Scattered Showers, 74°F-86°F
July 14, 2006 - Sunny, 71°F-88°F
Date/Time Start: July 5, 2006 / 0830 (Ground Level)
Date/Time Finish:
Weight of Hammer 140 lbs
Drop of Hammer 30 inches
Type of Hammer mechanical

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78	SS	7	1.9		**78 to 80** Brown; CLAY; hard; saturated.	CL	
		14					
79		21					
		30					
80	SS	17	0.0		**80 to 82** No Recovery.		
		25					
81		39					
		47					
82	SS	10	1.7		**82 to 84** Brown; CLAY; trace- c Sand to f Gravel (angular); hard; saturated.		
		16					
83		30					
		46					
84	SS	11	1.5		**84 to 86** Red brown; CLAY, trace-cmf Gravel (angular); hard; saturated.	CL	
		20					
85		32					
		41					
86	SS	8	1.3		**86 to 88** Red Brown; CLAY, trace cmf Gravel (subrounded); hard; saturated.		
		11					
87		23					
		50/4"					
88	SS	46	1.2		**88 to 90** Red Brown; SILT, little+ vf Sand; hard; saturated.		
		77					
89		100/5"					
90	SS	49	1.2		**90 to 92** Red Brown; SILT; hard; saturated.		
		46					
91		100/5"					
92	SS	52	1.5		**92 to 94** Red Brown; SILT; hard; saturated.		
		72					
93		98					
		100/3"				ML	
94	SS	69	1.3		**94 to 96** Red Brown; SILT; hard; saturated.		
		90					
95		100/5"					
96	SS	63	1.0		**96 to 98** Red Brown; SILT; hard; saturated.		
		100					
97		100/5"					
98	SS	78	0.9		**98 to 100** Red Brown; SILT; hard; saturated.		
		100/5"					
99							
					Drilling became easier at 99.5 feet.		
100	SS	17	2.0		**100 to 102** Brown; CLAY; hard; saturated.		
		16					
101		18					
		21				CL	
102	SS	14	1.6		**102 to 104** Brown; CLAY; hard; saturated (102.0-103.4).		
		23			Brown; CLAY, little cmf Sand, little mf Gravel (angular); hard;		
103		20			saturated (103.4-103.6).		
		51					

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 5 of 13 **WELL NO.** 119-MW-16BR **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 17, 2006 - Sunny, 78°F-98°F
July 18, 2006 - Sunny, 83°F-96°F
Date/Time Start: July 5, 2006 / 0830 (Ground Level)
Date/Time Finish: July 20, 2006 / 1435 (135.5 feet)
Weight of Hammer 140 lbs
Drop of Hammer 30 inches
Type of Hammer mechanical

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104	SS	53	0.2		**104 to 106**	Brown; CLAY, some cmf Sand, little mf Gravel (angular); hard; saturated. Gravel in tip of spoon.	CL	
		93						
105		44						
		25						
106	SS	18	1.2		**106 to 108**	Red Brown; CLAY, little cmf Sand, little- mf Gravel (angular to subangular); hard; saturated.		
		22						
107		40						
		51						
108	SS	44	1.0		**108 to 110**	Brown; f SAND, little Silt, trace mf Gravel (angular); very dense; saturated.	SM	
		35						
109		35						
		51						
110	SS	37	1.6		**110 to 112**	Brown; f SAND, little Silt; very dense; saturated.		
		49						
111		81						
		80						
112	SS	53	1.2		**112 to 114**	Brown; f SAND, some Silt; very dense; saturated.		
		81						
113		100/4"						
114	SS	100/2"	0.0		**114 to 116**	No Recovery.		
115								
116	SS	200/6"	0.5		**116 to 118**	Red Brown; cmf SAND, little Silt, little+ mf Gravel (angular to subrounded); very dense; saturated.	TILL	
117								
118	SS	190/6"	0.3		**118 to 120**	Brown; cmf SAND, some- Silt, little- f Gravel (angular to subangular); very dense; saturated.		
119								
120	SS	160/6"	0.1		**120 to 122**	Red Brown; cmf SAND, little Silt, some mf Gravel (angular to subangular); very dense; saturated.	SM	
121								
122	SS	93	0.7		**122 to 124**	Red Brown; cmf SAND, little Silt, little mf Gravel (angular to subangular); very dense; saturated.		
		124/6"						
123								
124	SS	105	0.9		**124 to 126**	Red Brown; cmf SAND, little Silt, little cmf Gravel (angular) very dense; saturated.		
		84						
125		100/2"						
126	C		4.3		**126 to 131**	Gray; very fine-grained SANDSTONE; Clay-filled hairline fracture dipping 60° at 126.0-126.8 feet; hairline fracture dipping 75° at 127.0-128.3 feet; Clay-filled fracture (⅛" thick) dipping 45° at 128.3-128.6 feet intersects with an iron-stained fracture dipping 60° at 128.6-129.1 feet.	BEDROCK	
127								
128								
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** E. Blewett, D. Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech, T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 6 of 13 **WELL NO.** 119-MW-16BR **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 19, 2006 - Mostly Sunny, 73°F-85°F
July 20, 2006 - 72°F-81°F
Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Continued from above.	BEDROCK	
131	AR				**131 to 135.5** Beige; vf-grained SANDSTONE.		
135	C				**135.5 to 145.5** Tan; SANDSTONE. Red Brown; SILTSTONE.		
145	C				**145.5 to 155.5** Tan; SANDSTONE.		
155	C				**155.5 to 165.5** Tan; SANDSTONE (155.5-164).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 7 of 13 **WELL NO.** 119-MW-16BR **Location:** K-Mart	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 21, 2006 - Cloudy, 76°F-85°F
July 24, 2006 - Sunny, 67°F-87°F
Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Greenish Gray: SILTSTONE (164-165.5).	BEDROCK	
157							
158							
159							
160							
161							
162							
163							
164							
165							
	C				**165.5 to 175.5** Greenish Gray to Dark Greenish Gray: SILTSTONE.		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
	C				**175.5 to 185.5** Tan: SANDSTONE (175.5-182). Black: SILTSTONE (182-185.5).		
176							
177							
178							
179							
180							
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor:	B&B Drilling	**HYDROQUAL DRILLING RECORD**	**BORING/ WELL NO.** 119-MW-16BR Sheet 8 of 13
Driller:	Dave Myerchin		**Location:** K-Mart
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Flute Bedrock Investigation	
Rig Type:	Ingersoll Rand T4W	PROJECT NUMBER: HWEL.002.001.03	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 25, 2006 - Mix of Cluds and Sun, 73°F-87°F
July 31, 2006 - Sunny, Humid 74°F-92°F
Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.	BEDROCK	
183							
184							
185							
	C				**185.5 to 195.5** Tan; fine-grained SANDSTONE.		
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
	C				**195.5 to 205.5** Tan to Reddish Orange; fine-grained SANDSTONE (195.5-201). Dark Gray to Black; SILTSTONE (201-203.5). Tan to Reddish Orange; fine-grained SANDSTONE (203.5-205.5).		
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
	C				**205.5 to 215.5** Light Gray; fine-grained SANDSTONE. Dark Gray to Black; SILTSTONE.		
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 9 of 13 **WELL NO.** 119-MW-16BR **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.	BEDROCK	
209							
210							
211							
212							
213							
214							
215							
216	C				**215.5 to 225.5** Tan; medium- to fine-grained SANDSTONE. Light Gray; SILTSTONE.		
217							
218							
219							
220							
221							
222							
223							
224							
225							
226	C				**225.5 to 235.5** Light Gray; SILTSTONE (225.5-230.5). Dark Gray to Black; SILTSTONE (230.5-235.5).		
227							
228							
229							
230							
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor:	B&B Drilling	**HYDROQUAL DRILLING RECORD**	**BORING/ WELL NO.** Sheet 10 of 13 — 119-MW-16BR
Driller:	Dave Myerchin		**Location:** K-Mart
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Flute Bedrock Investigation	
Rig Type:	Ingersoll Rand T4W	PROJECT NUMBER: HWEL.002.001.03	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.	BEDROCK	
235							
	C				**235.5 to 245.5** Dark Gray to Black; SILTSTONE.		
236							
237							
238							
239							
240							
241							
242							
243							
244							
245							
	C				**245.5 to 255.5** Tannish Gray; SANDSTONE.		
246							
247							
248							
249							
250							
251							
252							
253							
254							
255							
	C				**255.5 to 265.5** Tannish Gray; SANDSTONE.		
256							
257							
258							
259							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor:	B&B Drilling
Driller:	Dave Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 11 of 13
WELL NO. 119-MW-16BR

Location: K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.	BEDROCK	
261							
262							
263							
264							
265							
	C				**265.5 to 275.5** Tannish Gray; SANDSTONE 265.5-272). Dark Gray to Black; SILTSTONE (272-275.5).		
266							
267							
268							
269							
270							
271							
272							
273							
274							
275							
	C				**275.5 to 285.5** Light Tannish Gray; fine-grained SANDSTONE (275.5-281). Dark Gray to Black; SILTSTONE (281-285.5).		
276							
277							
278							
279							
280							
281							
282							
283							
284							
285							
	C				**285.5 to 295.5** Light Tannish Gray; fine-grained SANDSTONE.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 12 of 13 **WELL NO.** 119-MW-16BR **Location:** K-Mart

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: July 31, 2006 / 1130 (135.5 feet)

Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)

Weight of Hammer NA

Drop of Hammer NA

Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.	BEDROCK	
287							
288							
289							
290							
291							
292							
293							
294							
295							
	C				**295.5 to 305.5** Light Tannish Gray; fine-grained SANDSTONE.		
296							
297							
298							
299							
300							
301							
302							
303							
304							
305							
	C				**305.5 to 315.5** Dark Gray to Black; SILTSTONE. Light Tannish Gray; fine-grained SANDSTONE.		
306							
307							
308							
309							
310							
311							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor: B&B Drilling
Driller: Dave Myerchin
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 13 of 13
WELL NO. 119-MW-16BR
Location: K-Mart

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: July 31, 2006 / 1130 (135.5 feet)
Date/Time Finish: July 31, 2006 / 1400 (335.5 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 119-MW-16BR is located 46.7 feet southwest of Utility Pole E69952JC and 79.0 feet west of Utility Pole A69921JC, near the southwest corner of the intersection between Kellogg St and Rte 440.

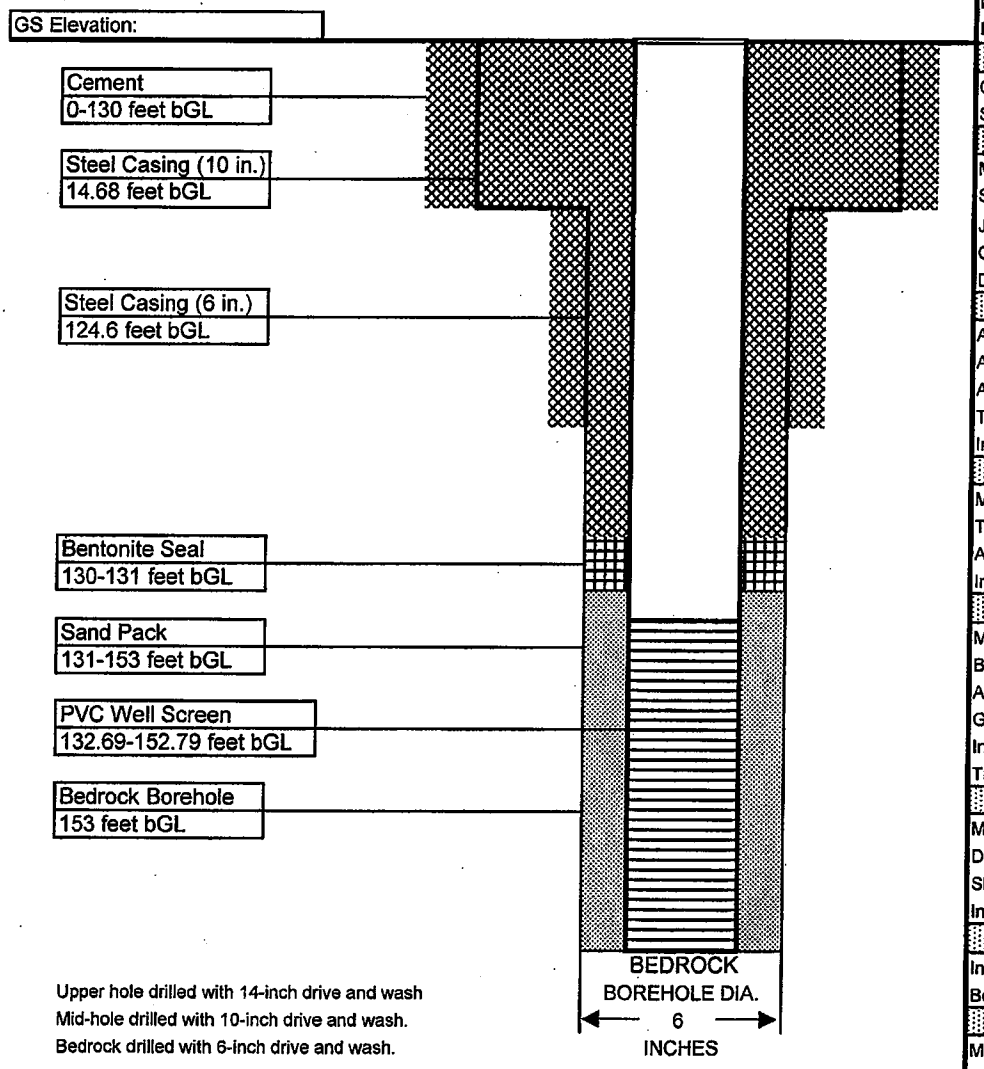
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.	BEDROCK	
313							
314							
315							
	C				**315.5 to 325.5** Tannish Gray; SANDSTONE 315.5-320). Dark Gray to Black; SILTSTONE (320-325.5).		
316							
317							
318							
319							
320							
321							
322							
323							
324							
325							
	C				**325.5 to 335.5** Dark Gray; SILTSTONE (325.5-334). Black; SILTSTONE (334-335.5).		
326							
327							
328							
329							
330							
331							
332							
333							
334							
335							
					Bottom of Borehole at 335.5 feet.		
336							
337							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	124-MW-8BR	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	29-Aug-05	DATE END:	11-Nov-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 14-inch drive and wash
Mid-hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Watertight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 130 FEET
SEAL	
Material:	BENTONITE
Type:	NA
Amount Used:	NA
Interval:	130-131 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	NA
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	131-153 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2 INCHES
Slot Size & Type:	0.010 INCH
Interval BGS:	132.69-152.79 FEET
SUMP	
Interval BGS:	152.79-153.0 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	NA

Contractor: B&B Drilling
Driller: Tim Smith, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Geoprobe 5400, Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 124-MW-8BR Sheet 1 of 6

Location:
Roosevelt Bowling Lanes

Location Description:
Well 124-MW-8BR is located 40.7 feet from the southwest corner of 38 Kellogg St. and 94.6 feet from the northwest corner of 38 Kellogg St.

Weather: August 26, 2005 - Mostly Cloudy, 69°-84°F
August 29, 2005 - Cloudy, 75°-82°F
Date/Time Start: August 26, 2005 / 0740 (Ground Surface)
Date/Time Finish: October 3, 2005 / 1430 (153 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
0	GP		4.0	NA	0 to 4	Light Brown; mf SAND, little mf Gravel (angular), little Silt; loose; dry (0-0.7).	SM	
1						Beige to Light Gray; cmf SAND, little Silt; concrete; loose; dry (0.7-2.0).		
2						Gray Brown to Lt Brown; mf SAND, little f Gravel (subrounded); fragments of red brown clay; loose; moist (2.0-4.0).		
3								
4	GP		4.0	NA	4 to 8	Brown to Light Brown; f SAND, trace f Gravel (subrounded); fragments of red brown clay; loose; wet (4.0-6.0).	SP	
5						Dark Gray to Gray; mf SAND, loose; saturated (6.0-7.5).		
6						Gray Brown; f SAND; loose; saturated (7.5-8.0).		
7								
8	GP		4.0	NA	8 to 12	Gray Brown; f SAND; loose; saturated (8.0-10.9).		
9						Dark Gray; CLAY; sparse rootlets; organic odor; very soft; saturated (10.9-11.5).	OL	
10						Gray; f SAND; loose; saturated (11.5-11.8).		
11						Gray to Dark Gray; CLAY; organic material present; very soft; saturated (11.8-12.0).	SP	
							OL	
12	GP		4.0	NA	12 to 16	Dark Gray; PEAT; soft; saturated (12.0-15.5).	PT	
13						Gray; f SAND, some Silt, trace f Gravel(subangular to subrounded); loose; saturated (15.5-16.0).		
14								
15							SM	
16						Drilled to 20 feet.		
17								
18								
19								
20	SS	11	1.3	NA	20 to 22	Light Gray; f SAND, some Silt; very dense; saturated.	SM	
		17						
21		16						
		32						
22						Drilled to 25 feet.		
23								
24								
25	SS	9	1.5	NA	25 to 27	Red Brown; f SAND, little Silt; very dense; saturated.	SM	
		30						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Permanent 10 inch steel casing installed to 14.68 feet. Six inch steel casing installed to 124.6 feet.
Additional Weather Report: October 3, 2005 - Sunny, 61°-82°F
October 4, 2005 - Mostly Sunny, 66°-80°F

Contractor:	B&B Drilling
Driller:	Tim Smith, Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 124-MW-8BR Sheet 2 of 6

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 1, 2005 - Sunny, 71°-88°F
September 2, 2005 - Sunny, 68°-90°F
Date/Time Start: August 26, 2005 / 0740 (Ground Surface)
Date/Time Finish: October 3, 2005 / 1430 (153 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well 124-MW-8BR is located 40.7 feet from the southwest corner of 38 Kellogg St. and 94.6 feet from the northwest corner of 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		39				Continued from above.	SM	
		44						
27						Drilled to 30 feet.		
28								
29								
30	SS	20	1.2	NA	30 to 32	Red Brown; f SAND, little Silt; very dense; saturated.	SM	
		25						
31		32						
		40						
32						Drilled to 35 feet.		
33								
34								
35	SS	25	1.2	NA	35 to 37	Red Brown; f SAND, little Silt; very dense; saturated (35.0-35.8).	SM	
		37						
36		45				Red Brown; SILT, little+ f Sand; hard; saturated (35.8-36.2).	ML	
		34						
37						Drilled to 40 feet.		
38								
39								
40	SS	11	1.0	NA	40 to 42	Red Brown; f SAND, little Silt; medium dense; saturated (40.0-40.5)	SM	
		12						
41		10				Red Brown; SILT; very stiff; saturated (40.5-41.0).	ML	
		9						
42						Drilled to 45 feet.		
43								
44								
45	SS	4	1.6	NA	45 to 47	Red Brown; SILT, some Clay, trace f Sand; medium stiff; saturated.	ML	
		4						
46		2						
		3						
47						Drilled to 47 feet.		
48								
49								
50	SS	5	2.0	NA	50 to 52	SILT/CLAY, trace f Sand; stiff; saturated..	ML/CL	
		6						
51		8						
		10						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling **Driller:** Tim Smith, Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Mobile B57, Gus Pech	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 124-MW-8BR	Sheet 3 of 6
		Location: Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	September 6, 2005 - Sunny, 67°-82°F September 7, 2005 - Sunny, 62°-84°F
Date					Date/Time Start:	August 26, 2005 / 0740 (Ground Surface)
Time					Date/Time Finish:	October 3, 2005 / 1430 (153 feet)
Meas. From					Weight of Hammer	140 Lbs.
					Drop of Hammer	30 Inches
					Type of Hammer	hydraulic

Location Description:

Well 124-MW-8BR is located 40.7 feet from the southwest corner of 38 Kellogg St. and 94.6 feet from the northwest corner of 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	9	1.3	NA	55 to 57	Red Brown; SILT, and f Sand; very stiff; saturated (55.0-56.0).	ML	
		12						
56		10				Red Brown; SILT, little Clay; very stiff; saturated (56.0-56.3).		
		22						
57						Drilled to 60 feet.		
58								
59								
60	SS	14	1.2	NA	60 to 62	Red Brown; f SAND, some Silt; hard; saturated.	SM	
		15						
61		18						
		13						
62						Drilled to 65 feet.		
63								
64								
65	SS	10	1.0	NA	65 to 67	Red Brown; CLAY; hard; saturated (65.0-65.7).	CL	
		31				Red Brown; CLAY, little c Sand, little f Gravel; hard; saturated (65.7-66.0).		
66		99						
		37						
67						Drilled to 70 feet.		
68								
69								
70	SS	12	1.2	NA	70 to 72	Red Brown; SILT; f Sand laminations; hard; saturated.	ML	
		23						
71		22						
		36						
72						Drilled to 75 feet.		
73								
74								
75	SS	22	1.3	NA	75 to 77	Red Brown; CLAY/SILT, little mf Gravel, trace- mf Sand; hard; saturated (75.0-75.4).	ML/CL	
		23						
76		31				Red Brown; CLAY/SILT, trace- mf Sand; hard; saturated (75.4-76.3).		
		36						
77						Drilled to 77 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Tim Smith, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Mobile B57, Gus Pech

HYDROQUAL DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. Sheet 4 of 6 — 124-MW-8BR

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: September 8, 2005 - Sunny, 65°-86°F
September 9, 2005 - Mostly Sunny, 69°-84°F
Date/Time Start: August 26, 2005 / 0740 (Ground Surface)
Date/Time Finish: October 3, 2005 / 1430 (153 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well 124-MW-8BR is located 40.7 feet from the southwest corner of 38 Kellogg St. and 94.6 feet from the northwest corner of 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80	SS	6	1.7	NA	80 to 82	Red Brown; CLAY; hard; saturated.	CL	
		16						
81		18						
		23						
82						Drilled to 85 feet.		
83								
84								
85	SS	6	2	NA	85 to 87	Red Brown; CLAY, trace mf Gravel; very stiff; saturated.	CL	
		13						
86		16						
		21						
87						Drilled to 90 feet.		
88								
89								
90	SS	8	0	NA	90 to 92	No Recovery.		
		14						
91		11						
		11						
92						Drilled to 95 feet.		
93								
94								
95	SS	12	1.8	NA	95 to 97	Red Brown; SILT, trace Clay; hard; saturated (95.0-96.6).	ML	
		15				Red Brown; CLAY/SILT; hard; saturated (96.6-96.8).		
96		21						
		19					CL/ML	
97						Drilled to 100 feet.		
98								
99								
100	SS	WOR	2.0	NA	100 to 102	Brown; CLAY/SILT; f Sand laminations; medium stiff; saturated.	CL/ML	
		WOR						
101		6						
		6						
102						Drilled to 105 feet.		
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Tim Smith, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Mobile B57, Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. 124-MW-8BR
Sheet 5 of 6

Location:
Roosevelt Bowling Lanes

Location Description:
Well 124-MW-8BR is located 40.7 feet from the southwest corner of 38 Kellogg St. and 94.6 feet from the northwest corner of 38 Kellogg St.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: September 27, 2005 - Sunny, 66°-77°F
September 28, 2005 - Sunny, 57°-75°F
Date/Time Start: August 26, 2005 / 0740 (Ground Surface)
Date/Time Finish: October 3, 2005 / 1430 (153 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	12	0	NA	105 to 107	No Recovery.		
		8						
106		11						
		17						
107						Drilled to 110 feet. Drilling became hard at 107 feet.	TILL (?)	
108								
109								
110	SS	35	1.1	NA	110 to 112	Red Brown; cmf SAND, some Silt, little+ cmf Gravel; hard; saturated.	SM (TILL)	
		43						
111		75						
		80						
112						Drilled to 115 feet.		
113								
114								
115	SS	100/0"	0.0	NA	115 to 117	No Recovery. Drilling became hard at 115 feet.		
116								
117						Drilled to 120 feet.		
118								
119								
120	SS	215/1"	0.0	NA	120 to 122	No Recovery		
121								
122						Drilled to 153 feet.		
123								
124								
125								
126								
127								
128						Red Brown; SILTSTONE. Drilling became very hard at 128.5 feet.	BEDROCK	
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Bedrock descriptions are based on rock chips circulating with drilling mud.

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 6 of 6
WELL NO. 124-MW-8BR
Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: September 29, 2005 - Cloudy with Showers, 68°-73°F
September 30, 2005 - Sunny, 51°-68°F
Date/Time Start: August 26, 2005 / 0740 (Ground Surface)
Date/Time Finish: October 3, 2005 / 1430 (153 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 124-MW-8BR is located 40.7 feet from the southwest corner of 38 Kellogg St. and 94.6 feet from the northwest corner of 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Continued from above.		
131							
132							
133					Dark Gray, SILTSTONE.		
134							
135							
136							
137							
138							
139							
140							
141						BEDROCK	
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153					Bottom of Borehole at 153 feet.		
154							
155							

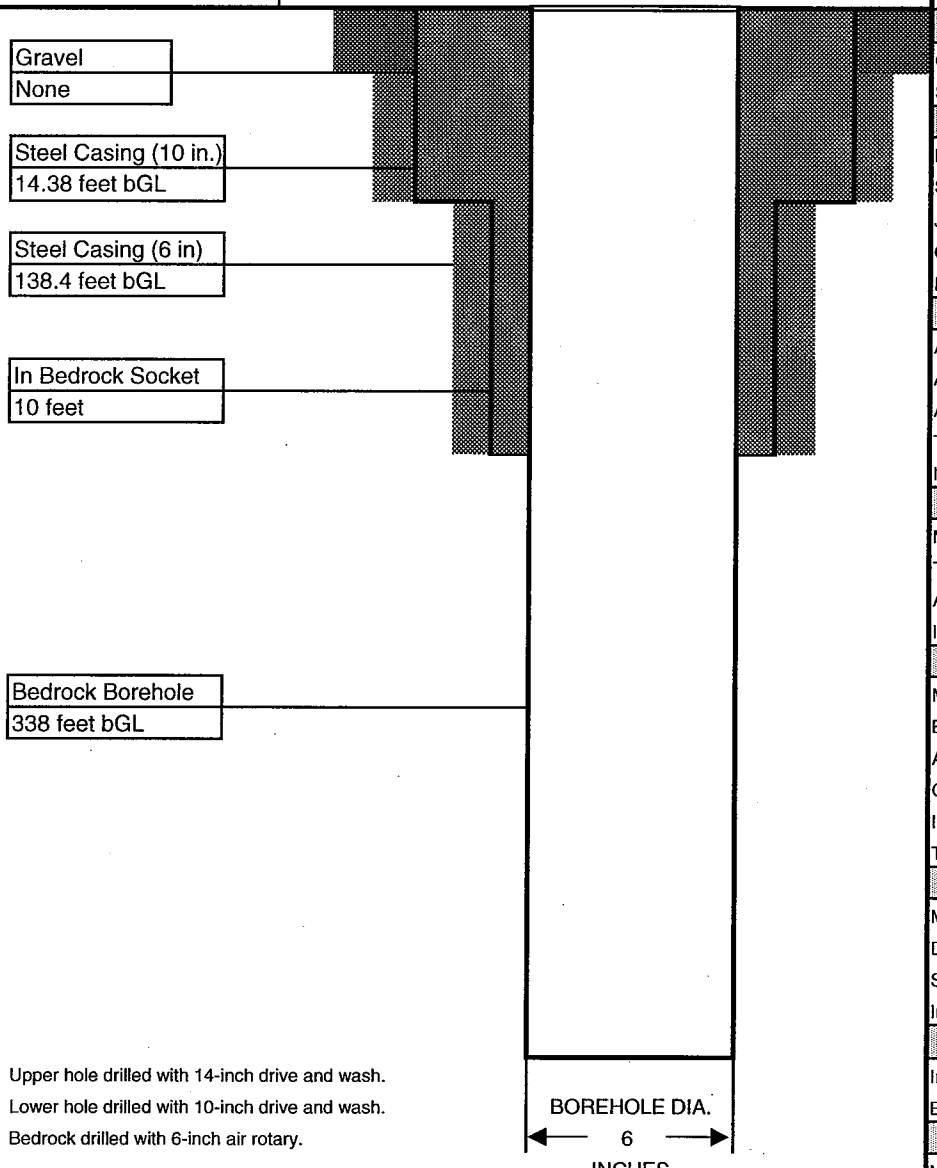
SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Bedrock descriptions are based on rock chips circulating with drilling mud.

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	124-MW-17BR	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B & B Drilling
DATE START:	20-Apr-06	DATE END:	11-May-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary

GS Elevation:



Upper hole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 138.4 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. Sheet 1 of 13
124-MW-17BR

Location:
Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 20, 2006 - Mostly Sunny, 61°F-78°F
April 21, 2006 - Mix of Sun and Clouds, 51°F-57°F
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer 140 lbs
Drop of Hammer 30 inches
Type of Hammer mechanical

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
0					See the soil boring log for adjacent well 124-MW-8BR for soil descriptions.		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12	SS	1	1.4		**12 to 14** Gray; f SAND; loose; saturated (12.0-12.2). Dark Brown; PEAT; organic odor; soft; saturated (12.2-13.4).	SP	
		1					
13		2				PT (MEADOW MAT)	
		4					
14	SS	2	1.6		**14 to 16** Dark Brown; PEAT; organic odor; soft; saturated (14.0-15.6).		
		2					
15		3					
		3					
16					Drilled to 138.5 feet.		
17							
18							
19							
20							
21							
22							
23							
24							
25							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEO PROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 2 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 24, 2006 - Cloudy, 48°F-62°F
April 25, 2006 - Mostly Sunny, 52°F-70°F
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26					Drilled to 138.5 feet.		
27					See the soil boring log for adjacent well 124-MW-8BR for soil descriptions.		
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 3 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 26, 2006 - Sunny, 41°F-62°F
April 27, 2006 - Sunny, 48°F-64°F
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
52					Drilled to 138.5 feet.		
53					See the soil boring log for adjacent well 124-MW-8BR for soil descriptions.		
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 4 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 28, 2006 - Mostly Sunny, 48°F-60°F
May 1, 2006 - Mostly Sunny, 53°F-67°F
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78					Drilled to 138.5 feet.		
79					See the soil boring log for adjacent well 124-MW-8BR for soil descriptions.		
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 5 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 20, 2006 / 0840 (Ground Level)

Date/Time Finish: May 1, 2006 / 1430 (338 feet)

Weight of Hammer

Drop of Hammer

Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
104					Drilled to 138.5 feet.		
105					See the soil boring log for adjacent well 124-MW-8BR for soil descriptions.		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							
128							
129					Bedrock at 128.5 feet. Drilled to 138.5 feet.	BEDROCK	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:

Contractor: B&B Drilling **Driller:** E. Blewett, J. Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech. T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 6 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Continued from above.	BEDROCK	
131							
132							
133							
134							
135							
136							
137							
138							
	AR				**138.5 to 148** Light Brown; fine-grained SANDSTONE (80%). Grayish Brown; fine-grained SANDSTONE (20%).		
139							
140							
141							
142							
143							
144							
145							
146							
147							
148	AR				**148 to 158** Light Brown; fine-grained SANDSTONE (80-85%). Gray; fine-grained SANDSTONE (15-20%).		
149							
150							
151							
152							
153							
154							
155							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 7 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157							
158	AR				**158 to 168** Gray; very fine-grained SANDSTONE (75-85%). Dark Gray; SILTSTONE (15-25%).		
159							
160							
161							
162							
163							
164							
165							
166							
167							
168	AR				**168 to 178** Light Brown; fine-grained SANDSTONE (50%). Light Gray; very fine-grained SANDSTONE (30-35%). Dark Gray; SILTSTONE (15-20%).	BEDROCK	
169							
170							
171							
172							
173							
174							
175							
176							
177							
178	AR				**178 to 188** Beige; fine-grained SANDSTONE (30%). Gray to Dark Gray; SILTSTONE (70%).		
179							
180							
181							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 8 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 20, 2006 / 0840 (Ground Level)

Date/Time Finish: May 1, 2006 / 1430 (338 feet)

Weight of Hammer

Drop of Hammer

Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.	BEDROCK	
183							
184							
185							
186							
187							
188	AR				**188 to 198** Gray to Dark Gray; very fine-grained SANDSTONE.		
189							
190							
191							
192							
193							
194							
195							
196							
197							
198	AR				**198 to 208** Light Brown to Cream; fine-grained SANDSTONE (70%). Gray; very fine-grained sandstone (30%).		
199							
200							
201							
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	B&B Drilling	**HYDROQUAL**	**BORING/** Sheet 9 of 13
Driller:	Justin Myerhoffer	**DRILLING RECORD**	**WELL NO.** 124-MW-17BR
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Flute Bedrock Investigation	**Location:** Roosevelt Bowling Lanes
Rig Type:	Ingersoll Rand T4W	PROJECT NUMBER: HWEL.002.001.03	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 20, 2006 / 0840 (Ground Level)

Date/Time Finish: May 1, 2006 / 1430 (338 feet)

Weight of Hammer

Drop of Hammer

Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208	AR				**208 to 218** Beige; medium to fine-grained SANDSTONE (85-90%). Light Gray; fine-grained SANDSTONE (10-15%).	BEDROCK	
209							
210							
211							
212							
213							
214							
215							
216							
217							
218	AR				**218 to 228** Beige; very fine-grained SANDSTONE (90-95%). Light Brown, variegated; fine-grained SANDSTONE (5-10%).		
219							
220							
221							
222							
223							
224							
225							
226							
227							
228	AR				**228 to 238** Dark Gray; SILTSTONE (75-80%). Grayish Brown; very fine-grained SANDSTONE (20-25%).		
229							
230							
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 10 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.	BEDROCK	
235							
236							
237							
238	AR				**238 to 248** Light Gray; fine-grained SANDSTONE.		
239							
240							
241							
242							
243							
244							
245							
246							
247							
248	AR				**248 to 258** Light Gray; fine-grained SANDSTONE (50%). Beige; medium to fine-grained SANDSTONE (50%).		
249							
250							
251							
252							
253							
254							
255							
256							
257							
258	AR				**258 to 268** Light Brown; fine-grained SANDSTONE (50%). Gray; fine-grained SANDSTONE (25%). Dark Gray; SILTSTONE (25%).		
259							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 11 of 13 **WELL NO.** 124-MW-17BR **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: April 20, 2006 / 0840 (Ground Level)

Date/Time Finish: May 1, 2006 / 1430 (338 feet)

Weight of Hammer

Drop of Hammer

Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.	BEDROCK	
261							
262							
263							
264							
265							
266							
267							
268	AR				**268 to 278** Beige; very fine-grained SANDSTONE (85-90%). Gray; fine-grained SANDSTONE (10-15%).		
269							
270							
271							
272							
273							
274							
275							
276							
277							
278	AR				**278 to 288** Beige; fine-grained SANDSTONE (60%). Gray; fine-grained SANDSTONE (40%).		
279							
280							
281							
282							
283							
284							
285							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 12 of 13
WELL NO. 124-MW-17BR
Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.	BEDROCK	
287							
288	AR				**288 to 298** Dark Gray; SILTSTONE (60%). Cream; medium to fine-grained SANDSTONE (30%). Gray; very fine-grained SANDSTONE (10%).		
289							
290							
291							
292							
293							
294							
295							
296							
297							
298	AR				**298 to 308** Light Gray; very fine-grained SANDSTONE (60%). Dark Gray; SILTSTONE; near top of interval (30%). Light Brown; fine-grained SANDSTONE (10%).		
299							
300							
301							
302							
303							
304							
305							
306							
307							
308	AR				**308 to 318** Light Brown; fine-grained SANDSTONE.		
309							
310							
311							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 13 of 13
WELL NO. 124-MW-17BR

Location:
Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather:
Date/Time Start: April 20, 2006 / 0840 (Ground Level)
Date/Time Finish: May 1, 2006 / 1430 (338 feet)
Weight of Hammer
Drop of Hammer
Type of Hammer

Location Description:
Well 124-MW-17BR is located 84.1 feet southwest of the northwest corner of the building at 38 Kellogg St.and 48.7 feet north of the southwest corner of the building at 38 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.	BEDROCK	
313							
314							
315							
316							
317							
318	AR				**318 to 328** Beige; fine-grained SANDSTONE (60%). Whitish; medium to fine-grained SANDSTONE (40%). Gray; very fine-grained SANDSTONE (trace).		
319							
320							
321							
322							
323							
324							
325							
326							
327							
328	AR				**328 to 338** Beige to Light Brown; fine-grained SANDSTONE (75%). Gray; very fine-grained SANDSTONE (25%).		
329							
330							
331							
332							
333							
334							
335							
336							
337					End of Borehole at 338 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PARSONS DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. 124-SB-101 **Sheet** 1 of 3

Location: Roosevelt Bowling Lanes

Location Description: Located 104.0 feet South of Well 115-SB-208 and 164.4 feet Southeast of Well 124-MW-102T.

Weather: March 4, 2005 - Mostly Sunny, 24°-38°F
Weather: March 7, 2005 - Mostly Cloudy, 45°-56°F
Date/Time Start: March 4, 2005 / 1040
Date/Time Finish: March 23, 2005 / 1200
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
0					0 to 5	Gray Brown; mf SAND, little cmf Gravel, trace+ Silt; loose; moist (0 1.0)	SP	
1						Brown; f SAND, little Silt, little cmf Gravel; loose; moist (1.0-1.5).	SM	
2						Dark Gray; mf SAND, trace Silt, little- cmf Gravel; loose; wet (1.5-2.0).	SM	
3						Dark Gray; mf SAND, little cmf Gravel; slag; loose; wet (2.0-3.0). Dark Gray; mf SAND, little mf Gravel; slag; loose; wet (2.0-4.0).		
4						Light Green; CLAY(?), little Sand; very low plasticity; 300 mg/kg Cr+6 (4.0-5.0). COPR present	CL? (COPR)	
5	SP	5	1.6	NA	5 to 7	Hand auger to 5 feet for utility clearance. Greenish Gray; mf SAND, some Clay/Silt, trace c Sand to f Gravel; medium dense; wet. COPR present.		pH: NA mS: NA Temp: NA ntu. NA
6		7						
		10						
		12						
7	SP	5	1.8	35	7 to 9	Greenish Gray; f SAND, some- Clay/Silt; layered; medium dense; wet. COPR present.	SC/SM (COPR)	pH: 11.55 mS: 5.53 Temp: 15.4 ntu. >1000
8		6						
		4						
9	SP	2	1.5	NA	9 to 11	Black; PEAT; soft; moist (9.5-11.0).		pH: NA mS: NA Temp: NA ntu. NA
		2					PT	
10		2						
		4						
11					11 to 12	Drilled to 12 feet.		
12	SP	6	1.3	NA	12 to 14	Dark Brown; f SAND, trace Gravel; minor roots; medium dense; saturated (12.7-13.3).	SP	pH: NA mS: NA Temp: NA ntu. NA
		7						
13		11				Light Red Brown; f SAND, little+ Silt, trace mf Gravel; medium dense; saturated (13.3-14.0).	SM	
		22						
14	SP	5	2.0	NA	14 to 16	Light Red Brown; SILT, some f Sand, trace f Gravel; very stiff; saturated (14.0-15.5).	ML	pH: NA mS: NA Temp: NA ntu. NA
		9						
15		9				Dark Brown; f SAND, trace Gravel; medium dense; saturated (15.5-16.0).		
		16						
16	SP	2	0.4	NA	16 to 18	Red Brown; f SAND; medium dense; saturated.		pH: NA mS: NA Temp: NA ntu. NA
		5						
17		9					SP	
		16						
18	SP	5	0.6	NA	18 to 20	Red Brown; f SAND; medium dense; saturated.		pH: NA mS: NA Temp: NA ntu. NA
		12						
19		15						
		18						
20	SP	10	1.0	ND	20 to 22	Red Brown; SILT, little f Sand; very stiff; saturated.		pH: 6.99 mS: 0.63 Temp: 10.4 ntu. 162
		10					ML	
21		14						
		20						
22	SP	8	1.1	ND	22 to 24	Brown; mf SAND, trace c Sand; med dense; saturated (22.0-22.1).	SP	pH: 7.35 mS: 0.93 Temp: 10 ntu. 167
		10				Red Brown; SILT, little f Sand; very stiff; saturated (22.1-22.4).		
23		13				Brown; mf SAND, trace c Sand; med dense; saturated (22.4-23.1).	ML	
		17					SP	
24	SP	3	1.1	ND	24 to 26	Brown; f SAND; medium dense; saturated (24.0-24.3).		pH: 7.42 mS: 0.80 Temp: 9.3 ntu. 275
		8				Red Brown; SILT, some f Sand; very stiff; saturated (24.3-25.1).		
25		14					ML	
		20						

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLE

COMMENTS:
Borehole tremie grouted on March 23, 2005. No monitoring well installed.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 2 of 3 124-SB-101
Driller:	Ed Blewett		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Roosevelt Bowling Lanes	
Rig Type:	Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: March 8, 2005 - Light Rain/Snow, 50°-32°F
Weather: March 10, 2005 - Mostly Sunny, 22°-35°F
Date/Time Start: March 4, 2005 / 1040
Date/Time Finish: March 23, 2005 / 1200
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 104.0 feet South of Well 115-SB-208 and 164.4 feet Southeast of Well 124-MW-102T.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
26	SP	3	1.2	ND	26 to 28	Brown; f SAND, trace Silt; medium dense; saturated.	SP	pH: 7.60	mS: 0.78	Temp: 10.5	ntu. 167
		10									
27		32									
		50									
28	SP	29	0.4	NA	28 to 30	Brown; f SAND, some Silt; very dense; saturated (28.0-28.4).	SM	pH: NA	mS: NA	Temp: NA	ntu. NA
		68									
29		100/3"									
30	SP	16	1.4	ND	30 to 32	Brown; f SAND, trace Silt; very dense; saturated (30.0-30.7).	SP	pH:	mS:	Temp:	ntu.
		39				Red Brown; SILT, little f Sand; hard; saturated (30.7-31.4).	ML	7.37	0.64	10.5	NA
31		76									
		86									
32	SP	26	1.0	ND	32 to 34	Brown; f SAND, little Silt; very dense; saturated.	SM	pH: 7.73	mS: 0.76	Temp: 10.0	ntu. NA
		65									
33		79									
		80									
34	SP	37	1.0	NA	34 to 36	Brown; f SAND, some Silt; hard; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		78									
35		100/3"									
36	SP	22	0.8	NA	36 to 38	Brown; SILT, trace f Sand; hard; saturated.	ML	pH: NA	mS: NA	Temp: NA	ntu. NA
		21									
37		17									
		20									
38	SP	22	1.0	ND	38 to 40	Red Brown; f SAND, some Silt; hard; saturated.	SM	pH: 6.91	mS: 1.05	Temp: 11.5	ntu. 129
		21									
39		17									
		15									
40	SP	12	1.2	ND	40 to 42	Brown; SILT, little+ f Sand; hard; saturated.	ML	pH: 6.83	mS: 1.05	Temp: 14.3	ntu. 157
		20									
41		21									
		23									
42	SP	14	1.3	ND	42 to 44	Brown; SILT, and f Sand; hard; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		18									
43		41									
		61									
44	SP	31	1.3	ND	44 to 46	Brown; f SAND, some Silt; very dense; saturated.	SM	pH: NA	mS: NA	Temp: NA	ntu. NA
		73									
45		100/4"									
46	SP	17	0.9	ND	46 to 48	Brown; SILT, little- f Sand; hard; saturated.	ML	pH: 6.84	mS: 1.15	Temp: 14.7	ntu. 162
		49									
47		100/5"									
48	SP	20	1.5	NA	48 to 50	Brown; f SAND, trace Silt; very dense; saturated (48.0-48.5).	SP	pH:	mS:	Temp:	ntu.
		33				Brown; f SAND, some Silt; very dense; saturated (48.5-49.5).		NA	NA	NA	NA
49		39									
		29									
50	SP	6	0.8	NA	50 to 52	Brown; f SAND little Silt; medium dense; saturated.	SM	pH: NA	mS: NA	Temp: NA	ntu. NA
		8									
51		9									
		15									

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Additional Weather:
March 15, 2005 - Sunny, 29°-44°F
March 16, 2005 - Mostly Sunny, 33°-46°F
March 17, 2005 - Mostly Sunny, 36°-46°F

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**PARSONS DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 124-SB-101	Sheet 3 of 3

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: March 11, 2005 - Snow/Rain, 30°-38°F
Weather: March 14, 2005 - Sunny, 31°-42°F
Date/Time Start: March 4, 2005 / 1040
Date/Time Finish: March 23, 2005 / 1200
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location: Roosevelt Bowling Lanes

Location Description: Located 104.0 feet South of Well 115-SB-208 and 164.4 feet Southeast of Well 124-MW-102T.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
52	SP	12	1.4	ND	52 to 54	Brown; f SAND, trace Silt; medium dense; saturated.	SP	pH: 6.92	mS: 1.87	Temp: 16.2	ntu. 147
		12									
53		18									
		17									
54	SP	9	1.5	ND	54 to 56	Red Brown; SILT; stiff; saturated (54.0-55.1).	ML	pH: 7.04	mS: 2.37	Temp: 13.8	ntu. 166
		9				Red Brown; CLAY, some Silt; stiff; saturated (55.1-55.5).					
55		5					CL				
		7									
56	SP	10	1.5	ND	56 to 58	Red Brown; CLAY/SILT; stiff; saturated.	CL/ML	pH: 7.04	mS: 2.43	Temp: 13.1	ntu. >1000
		7									
57		10									
		12									
58	SP	10	1.3	ND	58 to 60	Red Brown; SILT, little Clay, trace+ cmf Gravel; hard; saturated.	ML	pH: 7.32	mS: 2.65	Temp: 12.3	ntu. >1000
		17									
59		20									
		19									
60	SP	7	1.4	ND	60 to 62	Red Brown; CLAY/SILT; very stiff; saturated.	CL/ML	pH: 7.96	mS: 1.95	Temp: 14.9	ntu. >1000
		18									
61		12									
		12									
62	SP	5	0.8	ND	62 to 64	Brown; f SAND, little Silt; very stiff; saturated.	SM	pH: 7.72	mS: 1.59	Temp: 13.1	ntu. 150
		11									
63		15									
		12									
64	SP	4	1.7	1	64 to 66	Red Brown; CLAY; stiff; saturated.	CL	pH: 7.33	mS: 1.55	Temp: 13	ntu. 694
		4									
65		5									
		7									
66	SP	5	0.8	1	66 to 68	Brown; f SAND, trace Silt; loose; saturated (66.0-66.5).	SP	pH: 7.12	mS: 1.73	Temp: 14.8	ntu. 153
		5				Red Brown; SILT; stiff; saturated 66.5-66.8).	ML				
67		4									
		6									
68	SP	13	1.0	0.23	68 to 70	Light Brown; f SAND, trace Silt; dense; saturated.	SP	pH: 6.93	mS: 2.33	Temp: 13.5	ntu. 51
		22									
69		24									
		18									
70	SP	10	1.0	ND	70 to 72	Red Brown; SILT, little Clay; very stiff; saturated (70.0-70.5).	ML	pH: NA	mS: NA	Temp: NA	ntu. >1000
		11				Light Brown; f SAND, some Silt, trace f Gravel; medium					
71		19				dense; saturated (7.05-71.0).	SM				
		28									
72	SP	7	1.2	ND	72 to 74	Brown; cmf SAND, trace mf Gravel; dense; saturated	SW	pH: 7.33	mS: 2.12	Temp: 14.1	ntu. >1000
		11				(72.0-72.5).					
73		20				Light Brown; f SAND, little Silt; dense; saturated (72.5-73.2).	SM				
		25									
74	SP	7	1.4	NA	74 to 76	Red Brown; CLAY, trace-cmf Gravel; hard; saturated.	CL	pH: NA	mS: NA	Temp: NA	ntu. NA
		12									
75		26									
		33									
76	SP	21	1.6	NA	76 to 78	Red Brown; SILT; hard; saturated (76.0-77.0).	ML	pH: 7.60	mS: 1.07	Temp: 14	ntu. >1000
		30				Red Brown; CLAY, some Silt, trace cmf Gravel; hard;					
77		29				saturated (77.0-77.6).	CL				
		27				End of Boring at 78 feet.					

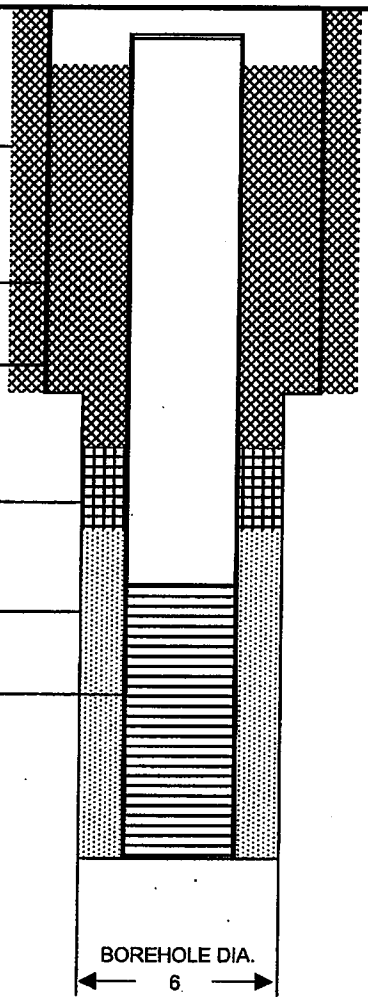
SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Additional Weather:
March 18, 2005 - Sunny, 37°-48°F
March 23, 2005 - Rain/Snow, 46°-37°F

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-102D	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	6-May-05	DATE END:	11-May-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

GS Elevation:

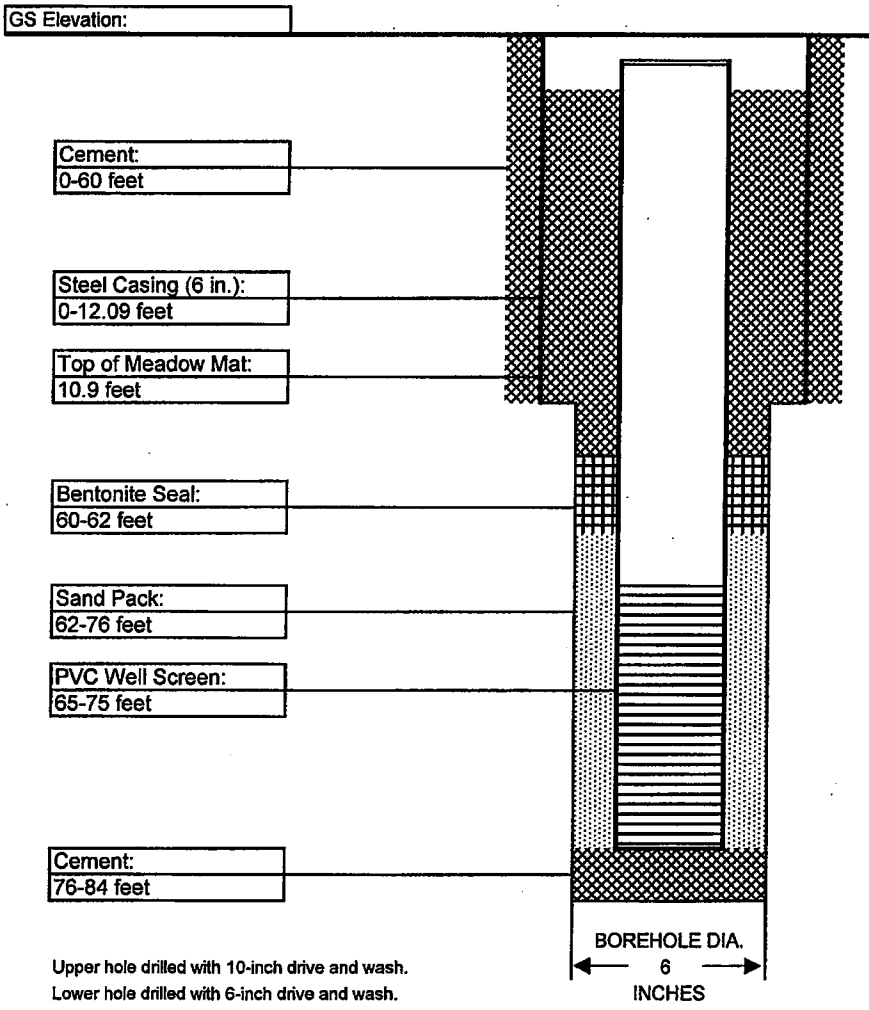


Upper hole drilled with 14-inch augers.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	GRAVEL
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-17 FEET
SEAL	
Material:	BENTONITE
Type:	NA
Amount Used:	NA
Interval:	17-18 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	18-30.4 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" / MACHINE SLOT
Interval BGS:	20.17-30.17 FEET
SUMP	
Interval BGS:	30.17-30.39 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-102T	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	25-Mar-05	DATE END:	11-May-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	GRAVEL
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-60 FEET, 76-84 FEET
SEAL	
Material:	BENTONITE
Type:	NA
Amount Used:	3 GALLONS
Interval:	60-62 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	62-76 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	65-75 FEET
SUMP	
Interval BGS:	N/A
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 124-SB-102 Sheet 1 of 4 **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: March 24, 2005 - Cloudy, 34°-42°F
Weather: March 25, 2005 - Cloudy, 40°-48°F
Date/Time Start: March 24, 2005 / 1305 (Ground Surface)
Date/Time Finish: March 25, 2005 / 1230 (12 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:
Well 124-MW-102T is located 159.7 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS15171JC. Well 124-MW-102D is located 149.0 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS15171JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5 feet	Asphalt Surface Material (0-0.3). Greenish Gray; mf SAND, little Silt; weakly cemented; loose; moist (0.3-2.0). COPR present. Greenish Gray to Yellow; mf SAND, little Silt; weakly cemented; loose; moist (2.0-4.0). COPR present. Greenish Gray to Yellow; mf SAND, little Silt; weakly cemented; loose; wet (4.0-5.0). COPR present. Hand auger to 5 feet for utility clearance.	SM (COPR)	
1								
2								
3								
4								
5					5 to 6 feet	Drilled to 6 feet.		
6	SP	5	1.4	NA	6 to 8 feet	Dark Greenish Gray; mf SAND, little+ Silt; sparse yellow grains; weakly cemented nodules; medium dense; wet. COPR present.	SM (COPR)	pH: 11.72 mS: 10.94 Temp: 10.7 ntu. NA
		9						
7		14						
		23						
8	SP	7	1.6	8	8 to 10 feet	Gark Greenish Gray; mf SAND, some Silt/Clay; pockets and streaks of yellow; white grains; weakly cemented nodules; medium dense; saturated. COPR present.		
		7						
9		9						
		9						
10	SP	2	1.9	2	10 to 12 feet	Tan; CLAY/SILT; laminated; f Sand layers; v. soft; moist (10.0-10.6). COPR.	CL/ML (COPR)	pH: 10.09 mS: 8.26 Temp: 10.5 ntu. 108
		6				Dark Brown to Dark Gray; mf SAND, little+ Silt/Clay; weakly cemented nodules; loose; wet (10.6-10.9). COPR present.	SM (COPR)	
11		2				Darkk Brown to Black; PEAT; soft; moist (10.9-11.9).	PT	
		4						
12	SP	6	0	NA	12 to 14 feet	No Recovery.		pH: NA mS: NA Temp: NA ntu. NA
		3						
13		3						
		2						
14	SP	3	0.7	NA	14 to 16 feet	Gray Brown; f SAND, trace c Sand to c Gravel, trace Silt; medium dense; saturated.	SP	pH: NA mS: NA Temp: NA ntu. NA
		5						
15		6						
		8						
16	SP	6	1.6	NA	16 to 18 feet	Gray to Lt Brn; SILT, some f Sand; very stiff; saturated (16.0-16.9).	ML	pH: NA mS: NA Temp: NA ntu. NA
		12				Lt Brown; mf SAND, trace Silt; medium dense; saturated (16.9-17.3).		
17		13				Lt Brown; SILT, some f Sand; very stiff; saturated (17.3-17.6).	SP	
		20					ML	
18	SP	4	1.4	ND	18 to 20	Gray Brown; f SAND, trace m Sand; crushed shell fragments; loose; saturated.	SP	pH: 7.74 mS: 1.89 Temp: 16 ntu. >1000
		4						
19		5						
		7						
20	SP	7	1.2	NA	20 to 22	Grayish Red; f SAND, trace f Gravel; crushed shell fragments; medium dense; saturated.		pH: NA mS: NA Temp: NA ntu. NA
		8						
21		6						
		7						
22	SP	4	0.7	ND	22 to 24	Grayish Red; f SAND; medium dense; saturated.		pH: 7.52 mS: 0.79 Temp: 13.8 ntu. >1000
		7						
23		6						
		8						
24	SP	5	1	ND	24 to 26	Reddish Brown; f SAND, trace Silt; trace shell material; medium dense; saturated.		pH: 9.58 mS: 0.85 Temp: 14.9 ntu. >1000
		6						
25		7						
		7						

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLE

COMMENTS:
Permanent 6" steel casing grouted in place at 12.09 feet below grade.
Additional Weather: April 6, 2005 - Partly Sunny, 52°-72°F

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.**	Sheet 2 of 4 124-SB-102
		Location:	Roosevelt Bowling Lanes
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From	Weather: March 29, 2005 - Cloudy, 45°-52°F Weather: March 30, 2005 - Sunny, 46°-60°F Date/Time Start: March 29, 2005 / 0900 (12 feet) Date/Time Finish: April 6, 2005 / 1430 (84 feet) Weight of Hammer 300 Lbs. Drop of Hammer 30 Inches Type of Hammer mechanical	**Location Description:**	Well 124-MW-102T is located 159.7 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS1517IJC. Well 124-MW-102D is located 149.0 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS1517IJC.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26	SP	4	0	1.5	26 to 28	No Recovery.		pH: 10.65 mS: 1.31 Temp: 15.6 ntu. >1000
		4						
27		6						
		7						
28	SP	4	0.3	ND	28 to 30	Reddish Brown; f SAND, little Silt; medium dense; saturated.	SM	pH: 8.64 mS: 0.64 Temp: 16.0 ntu. >1000
		4						
29		6						
		8						
30	SP	4	0.7	NA	30 to 32	Light Brown; SILT, and f Sand; stiff; saturated.	ML	pH: NA mS: NA Temp: NA ntu. NA
		5						
31		7						
		10						
32	SP	2	1.0	ND	32 to 34	Brown; SILT, some Clay; stiff; saturated (32.0-32.8). Brown; f SAND, trace+ Silt; medium dense; saturated (32.8-33.0).		pH: 8.69 mS: 0.74 Temp: 14.3 ntu. >1000
		4						
33		7						
		16						
34	SP	2	0.3	ND	34 to 36	Brown; mf SAND, trace Silt, trace+ cmf Gravel; Silt/Clay layers; very loose; saturated.	SP	pH: NA mS: NA Temp: NA ntu. >1000
		1						
35		2						
		5						
36	SP	5	1.0	ND	36 to 38	Red Brown; SILT; hard; saturated (36.0-36.8). Brown; f SAND, some Silt; very dense; saturated (36.8-37.0).	ML	pH: 8.52 mS: 0.83 Temp: 15.6 ntu. >1000
		23					SM	
37		34						
		50						
38	SP	12	1.8	NA	38 to 40	Red Brown; SILT, little f Sand; hard; saturated.	ML	pH: NA mS: NA Temp: NA ntu. NA
		28						
39		47						
		31						
40	SP	1	0.4	NA	40 to 42	Brown; mf SAND, trace f Gravel, trace Silt; very loose; saturated.	SP	pH: NA mS: NA Temp: NA ntu. NA
		1						
41		1						
		10						
42	SP	6	1.0	ND	42 to 44	Red Brown; SILT, little Clay, trace f Sand; very stiff; saturated.		pH: 8.92 mS: 1.06 Temp: 18.1 ntu. >1000
		7						
43		10						
		11						
44	SP	5	0.8	ND	44 to 46	Red Brown SILT, little+ f Sand, trace f Gravel; very stiff; saturated.		pH: 8.39 mS: 0.88 Temp: 15 ntu. >1000
		9						
45		8					ML	
		7						
46	SP	5	1.2	ND	46 to 48	Red Brown; SILT, little+ f Sand; very stiff; saturated.		pH: 15 mS: 7.73 Temp: 0.74 ntu. 14.5 334
		8						
47		9						
		14						
48	SP	8	1.2	ND	48 to 50	Brown; SILT, trace+ f Sand; hard; saturated.		pH: 7.42 mS: 0.84 Temp: 14.5 ntu. 34
		16						
49		20						
		25						
50	SP	3	1.2	NA	50 to 52	Brown; CLAY, some f Sand, trace c Sand; medium stiff; saturated.	CL	pH: NA mS: NA Temp: NA ntu. NA
		3						
51		5						
		12						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 3 of 4 **WELL NO.** 124-SB-102 **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: March 31, 2005 - Mix of Sun and Clouds, 41°-49°F
Weather: April 1, 2005 - Cloudy, 41°-58°F
Date/Time Start: March 24, 2005 / 1305
Date/Time Finish: April 6, 2005 / 1430
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Well 124-MW-102T is located 159.7 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS15171JC. Well 124-MW-102D is located 149.0 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS15171JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
52	SP	10	1.3	ND	52 to 54	Brown; f SAND, and Silt; f Sand laminations; dense; saturated (52.0-53.2). Brown; f SAND, trace Silt; dense; saturated (53.2-53.3).	SM	pH: 7.12, mS: 1.08, Temp: 13.6, ntu. 149
		16					SP	
53		20						
		18						
54	SP	5	0.9	ND	54 to 56	Brown; f SAND, and Silt; f Sand laminations; medium dense; saturated.	SM	pH: 7.43, mS: 1.53, Temp: 13.6, ntu. 258
		13						
55		14						
		15						
56	SP	8	0.7	ND	56 to 58	Brown; SILT; hard; saturated.	ML	pH: 7.90, mS: 2.72, Temp: 13.5, ntu. >1000
		19						
57		15						
		10						
58	SP	4	1.0	NA	58 to 60	Red Brown; CLAY;, trace+ c Sand to c Gravel; very stiff; moist.	CL	pH: NA, mS: NA, Temp: NA, ntu. NA
		6						
59		11						
		10						
60	SP	5	1.2	NA	60 to 62	Red Brown; CLAY, trace- c Sand to f Gravel; very stiff; moist.		pH: NA, mS: NA, Temp: NA, ntu. NA
		10						
61		8						
		11						
62	SP	1	1.1	ND	62 to 64	Brown; CLAY, little cmf Sand, trace cmf Gravel; soft; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		1						
63		3						
		6						
64	SP	6	1.3	ND	64 to 66	Red Brown; CLAY, trace- mf Gravel; hard; wet (64.0-64.6). Red Brown; SILT, some f Sand; dense; saturated (64.6-65.0). Red Brown; CLAY; f Sand laminations; hard; moist (65.0-65.3).		pH: 7.58, mS: 3.55, Temp: 14.3, ntu. 184
		11					ML	
65		24						
		20					CL	
66	SP	8	1.3	NA	66 to 68	Red Brown; CLAY, trace cmf Sand, little cmf Gravel; very stiff; moist (66.0-67.1). Red Brown; SILT; very stiff; saturated (67.1-67.3).		pH: NA, mS: NA, Temp: NA, ntu. NA
		8						
67		12					ML	
		19						
68	SP	6	1.6	ND	68 to 70	Brown; CLAY, some cmf Gravel; hard; moist (68.0-68.7). Brown; SILT, little+ f Sand; hard; saturated (68.7-69.6).	CL	pH: 7.45, mS: 1.39, Temp: 16.7, ntu. 169
		14						
69		20					ML	
		21						
70	SP	7	0.7	ND	70 to 72	Brown; f SAND, trace Silt; medium dense; saturated.	SP	pH: 7.60, mS: 1.12, Temp: 18.3, ntu. 104
		8						
71		11						
		19						
72	SP	12	1.4	ND	72 to 74	Red Brown; f SAND, some Silt; dense; saturated (72.0-72.7). Gray Brown; mf SAND; dense; saturated (72.7-73.2). Red Brown; SILT, some f Sand; hard; saturated (73.2-73.4).	SM	pH: 7.51, mS: 1.10, Temp: 15.4, ntu. 118
		20					SP	
73		24					ML	
		29						
74	SP	5	0.8	NA	74 to 76	Brown; CLAY, trace- c Sand to f Gravel; very stiff; moist.		pH: NA, mS: NA, Temp: NA, ntu. NA
		7						
75		9						
		20					CL	
76	SP	6	1.4	NA	76 to 78	Brown; CLAY, trace- c Sand to f Gravel; very stiff; moist.		pH: NA, mS: NA, Temp: NA, ntu. NA
		10						
77		17						
		37						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** 124-SB-102	Sheet 4 of 4
		Location: Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 4, 2005 - Mostly Sunny, 43°-55°F
Weather: April 5, 2005 - Mostly Sunny, 45°-64°F
Date/Time Start: March 24, 2005 / 1305
Date/Time Finish: April 6, 2005 / 1430
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Well 124-MW-102T is located 159.7 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS15171JC. Well 124-MW-102D is located 149.0 feet Southeast of Well 124-MW-06 and 122.5 feet Northeast of Utility Pole PS15171JC.

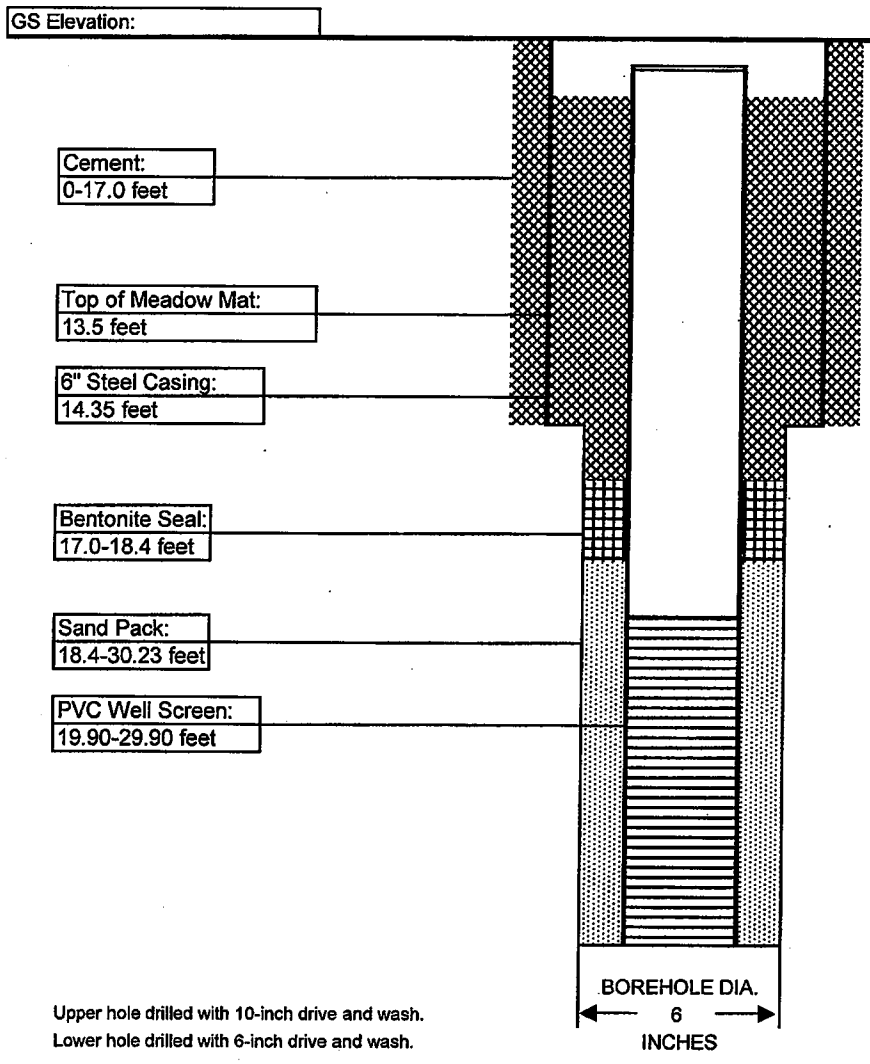
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
78	SS	6	1.2	NA	78 to 80	Brown; CLAY, trace f Gravel; very stiff; moist (78.0-79.0).	CL	pH: 6	mS:	Temp:	atu.
		8				Brown; SILT; very stiff; moist (saturated (79.0-79.2).		NA	NA	NA	NA
79		19					ML				
		21									
80	SS	15	1.3	NA	80 to 82	Brown; SILT, little Clay; hard; saturated.		pH: 6	mS:	Temp:	atu.
		18					CL	NA	NA	NA	NA
81		30									
		32									
82	SS	10	1.3	NA	82 to 84	Brown; SILT, little Clay; very stiff; saturated (82.0-82.5).	ML	pH: 6	mS:	Temp:	atu.
		11				Brown; CLAY, trace- f Gravel; very stiff; moist (82.5-83.3).		NA	NA	NA	NA
83		10					CL				
		15									
84						End of Boring at 84 feet.					
85											
86											
87											
88											
89											
90											
91											
92											
93											
94											
95											
96											
97											
98											
99											
100											
101											
102											
103											

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-103D	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Heneywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	1-Sep-05	DATE END:	6-Sep-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

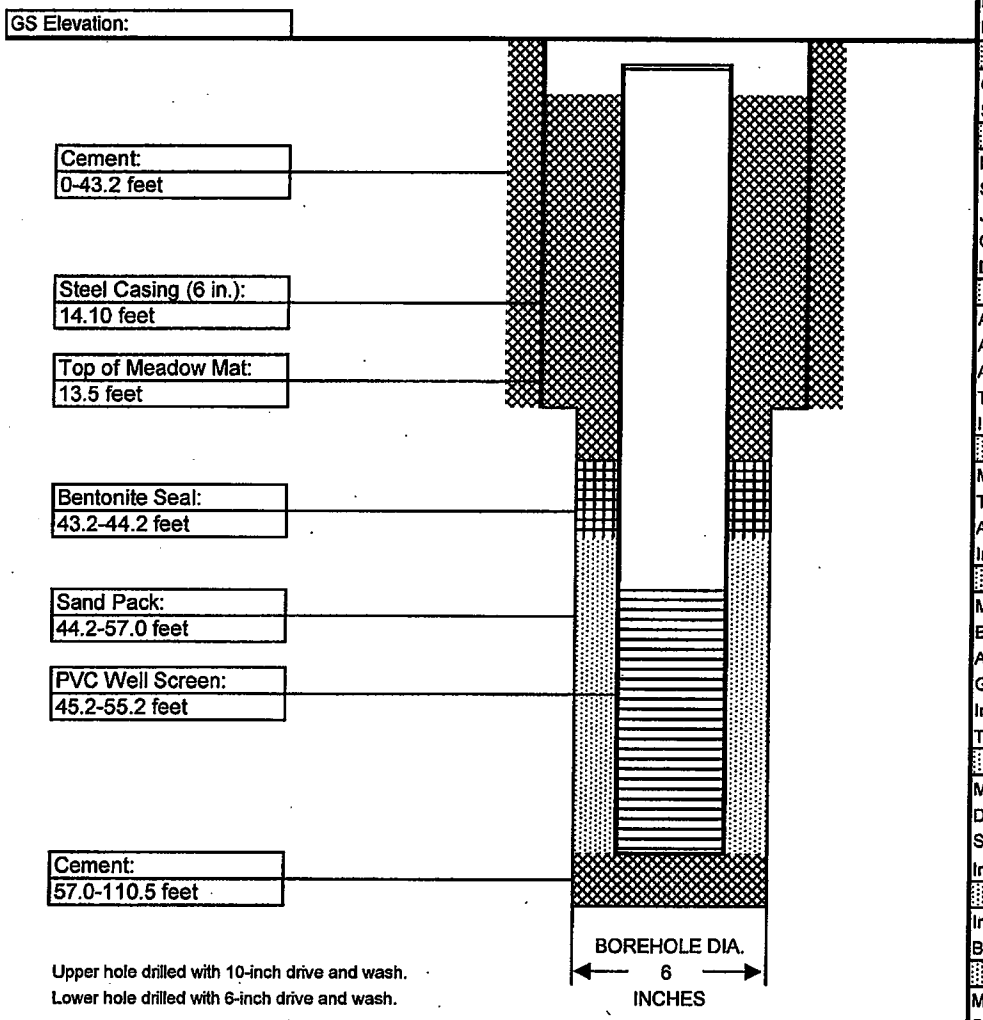


Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-17.0
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	17.0-18.4 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	18.4-30.2 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	19.90-29.90 FEET
SUMP	
Interval BGS:	29.90-30.23 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-103L	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	7-Jul-05	DATE END:	25-Aug-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-43.2 FEET, 57-110.5 FE
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	43.2-44.2 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	44.2-57.0 FEET
Tremied:	YES
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	65-75 FEET
SUMP	
Interval BGS:	N/A
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-103 **Sheet** 1 of 5

Location: Roosevelt Bowling Lanes

Location Description: Located 144.7 feet northwest of Well 124-MW-102D and 11.6 feet southeast of Well 124-MW-06.

Weather: July 5, 2005 - Mostly Cloudy, 71°-84°F
Weather: July 6, 2005 - Cloudy, Scattered Light Rain, 71°-84°F
Date/Time Start: July 5, 2005 / 1000 (Ground Surface)
Date/Time Finish: July 22, 2005 / 1150 (110.5 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Asphalt Surface Material (0-0.3). Brown; f SAND, trace cm Sand, little Silt, little cmf Gravel; loose; moist (0.3-2.0). Light Gray to Yellow Brown; f SAND, little+ Silt; weakly cemented; moist (2.0-2.8). COPR present. Greenish Gray; f SAND, little Silt; weakly cemented; clear to white precipitated material; moist, wet below 4.5 feet. COPR present. Hand auger to 5 feet for utility clearance.	SM (COPR)	
1								
2								
3								
4								
5					5 to 6	Drilled to 6 feet.		
6	SP	6	1.8	NA	6 to 8	Gray, Yellow and Green color present; SILT, little cmf Sand; clear to white precipitated material; very stiff; moist to wet. COPR present.	ML (COPR)	pH: NA; mS: NA; Temp: NA; ntu. NA
		7						
7		14						
		18						
8	SP	5	2.0	8.5	8 to 10	Greenish Gray; SILT, little mf Sand; tan clay-like pockets at 9.2-9.4 feet; laminated at 9.4-9.5 feet; gray below 9.7 feet; very stiff; moist to wet. COPR present.		pH: NA; mS: NA; Temp: NA; ntu. NA
		6						
9		13						
		20						
10	SP	3	1.9	7	10 to 12	Gray; SILT, and mf Sand, trace f Gravel (nodules); stiff; saturated (10.0-11.0). COPR present. Gray; SILT, little Sand; tan Clay-like laminations present; stiff; saturated (11.0-11.9). COPR present.		pH: 11.15; mS: 10.10; Temp: 28.1; ntu. 27
		7						
11		4						
		3						
12	SP	1	0	NA	12 to 14	No Recovery. Note: Pushed down 3" splitspoon from 12-14.4 feet along side of borehole and recovered 1.0 foot of Peat, from 13.5-14.5 feet.		pH: NA; mS: NA; Temp: NA; ntu. NA
		2						
13		2						
		2					PT	
14	SP	2	1.5	4	14 to 16	Black: PEAT; soft; saturated (14.5-15.8). Gray; f SAND, little Silt; loose; saturated (15.8-16.0).		pH: NA; mS: NA; Temp: NA; ntu. NA
		2						
15		2						
		3					SM	
16	SP	2	1.3	1.5	16 to 18	Gray; f SAND, trace Silt; loose; saturated (16.0-17.0). Gray; f SAND, little Silt; loose; saturated (17.0-17.3).	SP	pH: 9.71; mS: 0.52; Temp: 21.3; ntu. 850
		3						
17		3					SM	
		7						
18	SP	2	1.0	1.5	18 to 20	Gray Brown; f SAND, trace+ cmf Gravel; medium dense; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		5						
19		7						
		15						
20	SP	4	0.8	3	20 to 22	Red Brown; f SAND; medium dense; saturated.		pH: 9.42; mS: 0.80; Temp: 18.7; ntu. >1000
		8						
21		13						
		17					SP	
22	SP	7	0.1	2.5	22 to 24	Red Brown; f SAND; trace SILT; medium dense; saturated.		pH: 9.79; mS: 0.83; Temp: 18.9; ntu. >1000
		10						
23		12						
		17						
24	SP	4	0.7	ND	24 to 26	Red Brown; f SAND; trace c Sand; medium dense; saturated.		pH: 8.51; mS: 1.06; Temp: 24.2; ntu. >1000
		7						
25		8						
		9						

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLE!

COMMENTS:
Additional Weather: July 20, 2005 - Mostly Sunny, Humid, 79°-94°F
July 21, 2005 - Mostly Sunny, 74°-92°F
July 22, 2005 - Mix of Sun and Clouds, 77°-92°F

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/** Sheet 2 of 5 **WELL NO.** 124-SB-103 **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 7, 2005 - Cloudy, 67°-75°F
Weather: July 8, 2005 - Rain, 60°-65°F
Date/Time Start: July 5, 2005 / 1000 (Ground Surface)
Date/Time Finish: July 22, 2005 / 1150 (110.5 feet)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:
Located 144.7 feet northwest of Well 124-MW-102D and 11.6 feet southeast of Well 124-MW-06.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS			
26	SP	4	0.5	NA	26 to 28	Red Brown; f SAND; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		10						NA	NA	NA	NA
27		9									
		12									
28	SP	8	0.9	ND	28 to 30	Red Brown; f SAND; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		15						8.73	1.19	28.1	>1000
29		16									
		18									
30	SP	6	0.3	ND	30 to 32	Red Brown; f SAND, trace c Sand to f Gravel; medium dense; saturated.	SP	pH:	mS:	Temp:	ntu.
		8						9.49	1.25	28.1	>1000
31		10									
		12									
32	SP	12	0.6	ND	32 to 34	Brown to Red Brown; f SAND; thin Silty Sand lenses at 32.5 feet; medeium dense; saturated.		pH:	mS:	Temp:	ntu.
		10						8.64	1.37	27.7	>1000
33		10									
		17									
34	SP	5	0.8	ND	34 to 36	Red Brown; f SAND; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		11						8.45	1.52	29.0	>1000
35		13									
		10									
36	SP	7	0.6	ND	36 to 38	Red Brown; SILT, trace f Sand; very stiff; saturated (36.0-36.5). Red Brown; SILT, little Clay; very stiff; saturated (36.5-36.6).		pH:	mS:	Temp:	ntu.
		9						8.22	2.00	25.6	>1000
37		8									
		8									
38	SP	3	1.2	ND	38 to 40	Red Brown; SILT, little Clay; abundant f Sand laminations throughout; stiff; saturated.		pH:	mS:	Temp:	ntu.
		5						8.19	2.02	25.7	>1000
39		6									
		9									
40	SP	4	0.9	NA	40 to 42	Red Brown; SILT, some Clay; f Sand laminations present; stiff; saturated.		pH:	mS:	Temp:	ntu.
		5						8.27	2.19	25.5	>1000
41		4									
		9									
42	SP	8	1.3	NA	42 to 44	Red Brown; SILT, little+ f Sand; f Sand laminations present; very stiff; saturated.	ML	pH:	mS:	Temp:	ntu.
		14						NA	NA	NA	NA
43		15									
		16									
44	SP	11	1.2	ND	44 to 46	Red Brown; SILT, trace f Sand; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		13						8.42	1.92	25.9	>1000
45		15									
		15									
46	SP	13	1.1	NA	46 to 48	Red Brown; SILT, trace f Sand; hard; saturated.		pH: 15	mS:	Temp:	ntu.
		16						NA	NA	NA	NA
47		19									
		19									
48	SP	12	1.0	NA	48 to 50	Red Brown; SILT, trace f Sand; hard; saturated.		pH:	mS:	Temp:	ntu.
		18						8.10	1.50	22.2	>1000
49		14									
		13									
50	SP	8	0.7	ND	50 to 52	Red Brown; f SAND, and Silt; dense; saturated.		pH:	mS:	Temp:	ntu.
		21					SM	7.68	1.27	21.6	190
51		23									
		31									

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** 124-SB-103 Sheet 3 of 5 **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 11, 2005 - Sunny, Humid, 72°-94°F
Weather: July 12, 2005 - Mostly Sunny, 74°-84°F
Date/Time Start: July 5, 2005 / 1000 (Ground Surface)
Date/Time Finish: July 22, 2005 / 1150 (110.5 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Located 144.7 feet northwest of Well 124-MW-102D and 11.6 feet southeast of Well 124-MW-06.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52	SP	11	1.0	ND	52 to 54	Red Brown; SILT, trace f Sand; hard; saturated.	ML	pH: 8.11 mS: 1.29 Temp: 21.7 ntu. >1000
		22						
53		25						
		26						
54	SP	16	1.0	ND	54 to 56	Red Brown; f SAND, little Silt; dense; saturated.	SM	pH: 7.27 mS: 2.04 Temp: 21.2 ntu. 95
		23						
55		22						
		20						
56	SP	17	1.2	ND	56 to 58	Red Brown; f SAND, little Silt; dense; saturated.		pH: 7.37 mS: 3.20 Temp: 23.0 ntu. 600
		19						
57		14						
		16						
58	SP	12	0.8	NA	58 to 60	Red Brown; f SAND, some Silt; medium dense; saturated.		pH: NA mS: NA Temp: NA ntu. NA
		14						
59		9						
		7						
60	SP	5	0.9	NA	60 to 62	Red Brown; Silt, and Clay, trace- cmf Sand, trace cmf Gravel; stiff; saturated.	ML/CL	pH: NA mS: NA Temp: NA ntu. NA
		6						
61		7						
		9						
62	SP	5	1.3	ND	62 to 64	Red Brown; CLAY, and Silt, trace mf Sand, trace+ cmf Gravel; very stiff; saturated.	CL/ML	pH: 7.78 mS: 8.79 Temp: 23.6 ntu. NA
		8						
63		12						
		15						
64	SP	10	1.2	NA	64 to 66	Red Brown; CLAY, some Silt, little- cmf Sand, little- cmf Gravel; hard; saturated.	CL	pH: 8.37 mS: 8.06 Temp: 25.2 ntu. NA
		17						
65		22						
		24						
66	SP	22	0.8	ND	66 to 68	Red Brown; CLAY,some Silt, little cmf Sand, little cmf Gravel; hard; saturated.		pH: 7.76 mS: 6.60 Temp: 24.5 ntu. 500
		43						
67		55						
		57						
68	SP	19	1.6	ND	68 to 70	Brown; f SAND, trace Silt; very dense; saturated.	SP	pH: NA mS: NA Temp: NA ntu. >1000
		33						
69		36						
		40						
70	SP	29	1.5	ND	70 to 72	Red Brown; f SAND, little Silt; very dense; saturated (70.0-70.7). Brown; f SAND, trace Silt; very dense; saturated (70.7-70.8). Red Brown; CLAY; hard; saturated (70.8-71.5).	SM SP	pH: NA mS: NA Temp: NA ntu. >1000
		32						
71		30						
		17						
72	SP	7	1.4	NA	72 to 74	Red Brown; CLAY, trace- f Gravel; sparse f Sand laminations; very stiff; saturated.	CL	pH: NA mS: NA Temp: NA ntu. NA
		12						
73		14						
		24						
74	SP	14	1.5	NA	74 to 76	Red Brown; SILT, little Clay, trace cmf Gravel; hard; saturated.		pH: NA mS: NA Temp: NA ntu. NA
		39						
75		48						
		50						
76	SS	19	1.6		76 to 78	Red Brown; SILT, little Clay, little- cmf Gravel to Cobbles; hard; saturated.	ML	pH: mS: Temp: ntu.
		30						
77		24						
		38						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME:	Honeywell Deep Overburden Well Investigation
PROJECT NUMBER:	HWEL.002.001.02

BORING/ WELL NO. Sheet 4 of 5 — 124-SB-103

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:	July 13, 2005 - Cloudy, Humid, 69°-80°F
Weather:	July 14, 2005 - Mix of Sun and Clouds, Humid, 73°-82°F
Date/Time Start:	July 5, 2005 / 1000 (Ground Surface)
Date/Time Finish:	July 22, 2005 / 1150 (110.5 feet)
Weight of Hammer	300 Lbs.
Drop of Hammer	30 Inches
Type of Hammer	mechanical

Location Description:

Located 144.7 feet northwest of Well 124-MW-102D and 11.6 feet southeast of Well 124-MW-06.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78	SS	10	1.7		78 to 80	Red Brown; CLAY, little Silt, trace cmf Sand to cmf Gravel; hard; saturated.	CL	pH: mS: Temp: ntu.
		19						
79		27						
		32						
80	SS	6	1.4		80 to 82	Brown; CLAY, trace- c Sand to cmf Gravel; hard; saturated.		pH: mS: Temp: ntu.
		15						
81		17						
		32						
82	SP	39	1.1	NA	82 to 84	Red Brown; SILT, little f Sand; hard; saturated.	ML	pH: mS: Temp: ntu. NA NA NA NA
		86						
83		80/4"						
84	SP	33	1.3	NA	84 to 86	Red Brown; SILT, little f Sand; hard; saturated (84.0-84.9).		pH: mS: Temp: ntu.
		67				Red Brown; CLAY, little Silt, trace- f Gravel; hard; saturated (84.9-85.3).		8.05 0.98 29.3 >1000
85		42						
		48						
86	SP	11	1.5	ND	86 to 88	Red Brown; CLAY, little Silt, trace f Sand, trace- f Gravel; hard; saturated.		pH: mS: Temp: ntu. 8.38 0.41 26.8 >1000
		18						
87		25						
		37						
88	SP	10	1.3	ND	88 to 90	Red Brown; CLAY, little Silt, trace f Sand, trace- mf Gravel; hard; saturated.	CL	pH: mS: Temp: ntu. NA NA NA NA
		14						
89		16						
		31						
90	SP	12	1.2	NA	90 to 92	Red Brown; CLAY, little Silt, little- c Sand to c Gravel; hard; saturated.		pH: mS: Temp: ntu. NA NA NA NA
		16						
91		31						
		28						
92	SP	9	1.8	NA	92 to 94	Red Brown; CLAY, tr f Gravel; v stiff; saturated (92.0-92.8).		pH: mS: Temp: ntu.
		12				Red Brown; SILT, some Clay; v stiff; saturated (92.8-93.3).		8.46 0.24 26.3 >1000
93		16				Red Brown; CLAY, tr f Gravel; v stiff; saturated (92.8-93.3).	ML	
		21						
94	SP	7	1.7	NA	94 to 96	Red Brown; SILT, some Clay; v stiff; saturated (94.0-94.8).	CL	pH: mS: Temp: ntu.
		12				Red Brown; CLAY; very stiff; saturated (94.8-95.7).		8.57 0.20 26.5 >1000
95		12					ML	
		13						
96	SP	3	1.7	NA	96 to 98	Red Brown; CLAY; Silty f Sand laminations; stiff; saturated.		pH: mS: Temp: ntu. NA NA NA NA
		5						
97		6						
		8						
98	SP	4	1.1	NA	98 to 100	Red Brown; CLAY; Silty f Sand laminations; stiff; saturated.	CL	pH: mS: Temp: ntu. NA NA NA NA
		4						
99		5						
		6						
100	SP	4	1.1	NA	100 to 102	Red Brown; CLAY; Silty f Sand laminations; very stiff; saturated (100.0-100.7).		pH: mS: Temp: ntu. NA NA NA NA
		7						
101		10				Red Brown; SILT, some f Sand, little c Sand to mf Gravel; very stiff; saturated (100.7-101.1).	ML	
		11						
102	SP	17	0.7	NA	102 to 104	Red Brown; f SAND, some Silt, some c Sand to cmf Gravel; very stiff; saturated.	SM	pH: mS: Temp: ntu. NA NA NA NA
		14						
103		8						
		7						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** 124-SB-103 Sheet 5 of 5 **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 15, 2005 - Scattered Showers, 75°-86°F
Weather: July 19, 2005 - Hazy, Humid, 78°-94°F
Date/Time Start: July 5, 2005 / 1000 (Ground Surface)
Date/Time Finish: July 22, 2005 / 1150 (110.5 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Located 144.7 feet northwest of Well 124-MW-102D and 11.6 feet southeast of Well 124-MW-06.

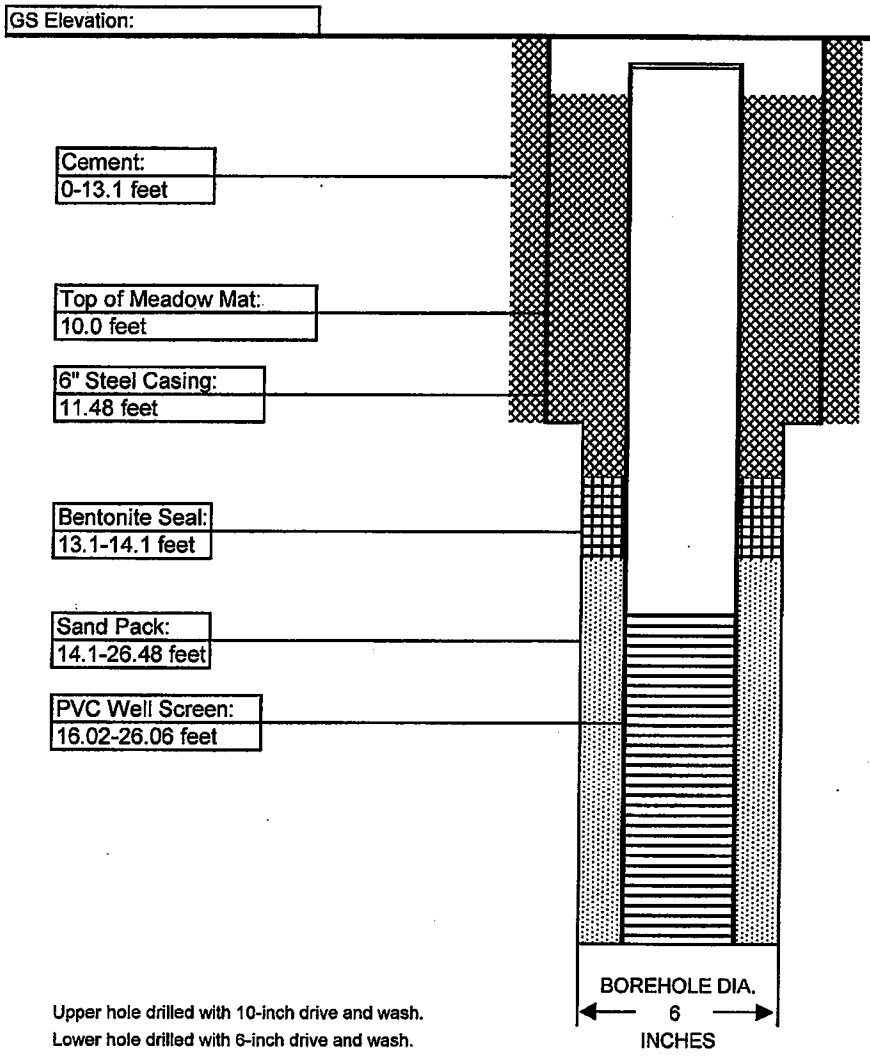
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104	SP	13	0.7	ND	**104 to 106**	Red Brown; SILT, little f Sand, little c Saned to cmf Gravel; hard; saturated.	ML	pH: 8.07 mS: 1.45 Temp: 25.6 ntu. >1000
		12						
105		30						
		24						
106	SP	29	1.0	NA	**106 to 108**	Red Brown; f SAND, some Silt, some c Sand to cmf Gravel; very dense; saturated.	SM (TILL)	pH: NA mS: NA Temp: NA ntu. NA
		36						
107		30						
		24						
108	SP	75	0	NA	**108 to 110**	No Recovery.		pH: NA mS: NA Temp: NA ntu. NA
		100						
109		100/5"						
110	SP	60	0.5	NA	**110 to 112**	Red Brown; f SAND, little- Silt; hard; saturated (110.0-110.3). Red Brown; cmf SAND, little Silt, little cmf Gravel; hard; saturated (110.3-110.5).	SM (TILL)	pH: NA mS: NA Temp: NA ntu. NA
		100/2"						
111								
112						End of Boring at 110.5 feet.		
113								
114								
115								
116								
117								
118								
119								
120								
121								
122								
123								
124								
125								
126								
127								
128								
129								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-104D	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	5-Oct-05	DATE END:	13-Oct-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

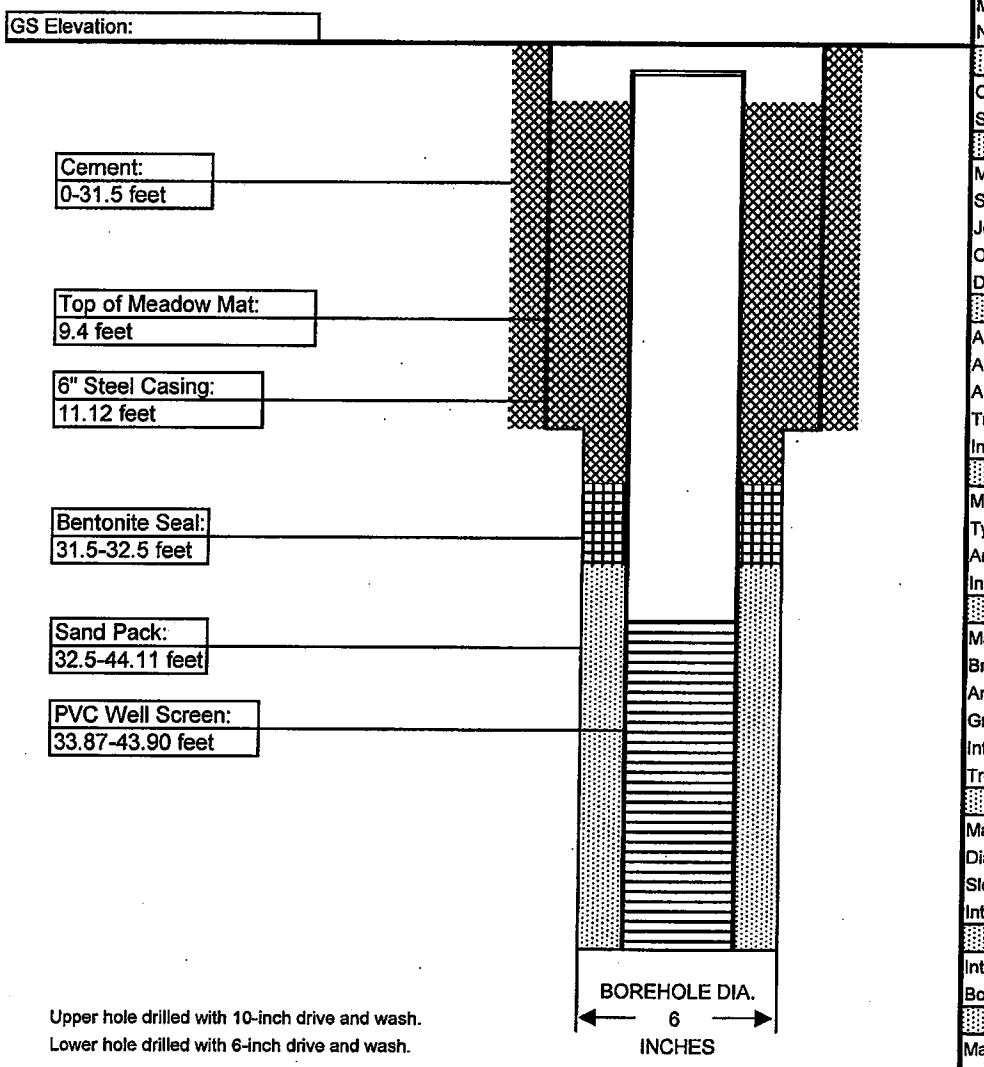


Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-13.1 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	13.1-14.1 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	14.1-26.27 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	16.02-26.06 FEET
SUMP	
Interval BGS:	26.06-26.27 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-104L	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	6-Oct-05	DATE END:	17-Oct-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

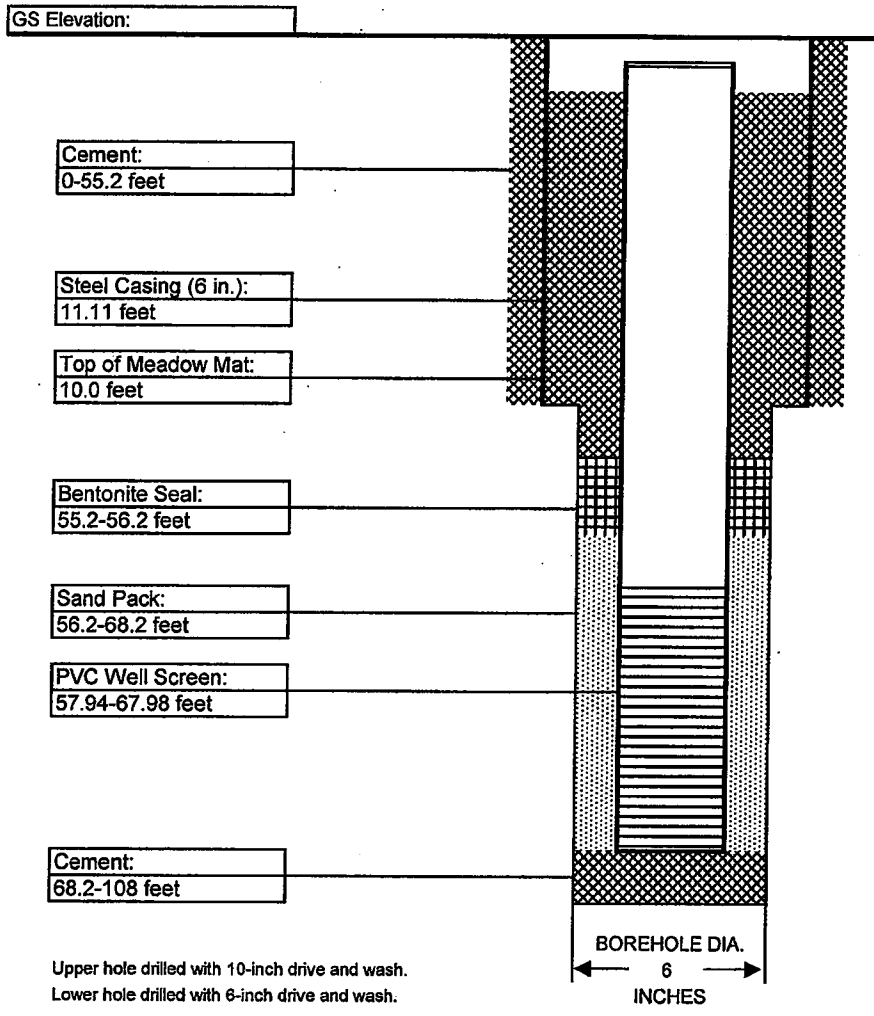


Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-31.5 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	31.5-32.5 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	32.5-44.11 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	33.87-43.90 FEET
SUMP	
Interval BGS:	43.90-44.11 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-104T	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	26-Jul-05	DATE END:	12-Oct-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-55.2 FEET, 68.2-108 FT
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	55.2-56.2 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	56.2-68.2 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	57.94-67.98 FEET
SUMP	
Interval BGS:	67.98-68.19 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** 124-SB-104 Sheet 1 of 5 **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 18, 2005 - Cloudy, Humid, 76°-89°F
Weather: July 25, 2005 - Cloudy, Humid, 73°-90°F
Date/Time Start: July 18, 2005 / 0930 (Ground Surface)
Date/Time Finish: August 12, 2005 / 0900 (108 feet bGL)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:
Located 9.3 feet northwest of property corner closest to the Colonette Diner and 134.0 feet southwest of the property corner closest to Route 440 (directly above the 24" gas main).

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
0					0 to 5	Asphalt Surface Material (0-0.1). Dark Gray; cmf SAND, little Silt, little cmf Gravel; loose; moist (0.1-1.0). Light Gray to Gray; cmf SAND, some Silt, little+ cmf Gravel; slag present; loose; very moist (1.0-2.0). Black; cmf SAND, some+ cmf Gravel, trace Silt; abundant slag; loose; wet (2.0-3.0). Dark Gray, with White grains throughout; cmf SAND, some+ cmf Gravel; loose; saturated (3.0-5.0). COPR present. Hand auger to 5 feet for utility clearance.	SM SW (COPR)				
1											
2											
3											
4											
5					5 to 6	Drilled to 6 feet.					
6	SP	3	1.5	NA	6 to 8	Light Green; CLAY-like material; very soft; wet (6.0-6.1). COPR present. Dark Gray; mf SAND, little Silt; medium dense; saturated (6.1-6.2). Greenish Gray with Light Green layers and Yellowish blebs; CLAY-like material; some f Sand; stiff; wet (6.2-7.5). COPR present.	CL (?) (COPR)	pH: NA	mS: NA	Temp: NA	ntu. NA
		5									
7		6									
		6									
8	SP	2	1.8	NA	8 to 10	Dark Greenish Gray; SILT, little mf Sand; soft; wet (8.0-8.3). Green to Brown to Dark Gray; CLAY-like material; layered (layers <3mm thick); soft; moist (8.3-9.8). COPR present.	ML CL (?) (COPR)	pH: NA	mS: NA	Temp: NA	ntu. NA
		2									
9		2									
		1									
10	SP	1	2.0	NA	10 to 12	Black; PEAT; soft; saturated (10.0-11.7). Dark Brown; f SAND, little+ Silt; very loose; saturated (11.7-12.0).	PT	pH: NA	mS: NA	Temp: NA	ntu. NA
		2									
11		2									
		2									
12	SP	2	0.7	ND	12 to 14	Brown; f SAND, some Silt, trace- cmf Gravel; medium dense; saturated.	SM	pH: 8.26	mS: 13.93	Temp: 28.6	ntu. >1000
		3									
13		9									
		17									
14	SP	4	0.9	NA	14 to 16	Brown; f SAND, little Silt trace mf Gravel; medium dense; saturated (14.0-14.5). Brown; f SAND, trace Silt; medium dense; saturated (14.5-14.9).	SP	pH: NA	mS: NA	Temp: NA	ntu. NA
		13									
15		12									
		16									
16	SP	4	1.1	ND	16 to 18	Gray Brown to Red Brown; f SAND, trace Silt; medium dense; saturated.		pH: 7.76	mS: 0.79	Temp: 28.5	ntu. >1000
		6									
17		6									
		14									
18	SP	2	0.8	ND	18 to 20	Red Brown; f SAND, trace Silt; medium dense; saturated.		pH: 8.82	mS: 0.70	Temp: 19.0	ntu. >1000
		5									
19		8									
		11									
20	SP	5	0.6	1	20 to 22	Red Brown; f SAND, trace Silt; medium dense; saturated.		pH: 9.08	mS: 0.79	Temp: 23.1	ntu. >1000
		6									
21		7									
		10									
22	SP	4	0.6	NA	22 to 24	Red Brown; f SAND; trace SILT; loose; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		4									
23		6									
		7									
24	SP	5	0.4	NA	24 to 26	Red Brown; f SAND; trace Silt; medium dense; saturated.		pH: 8.93	mS: 0.71	Temp: 26.2	ntu. >1000
		5									
25		7									
		8									

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLEI

COMMENTS:
Additional Weather: August 9, 2005 - Partly Cloudy, 69°-87°F
August 10, 2005 - Partly Cloudy, 76°-85°F
August 11, 2005 - Partly Cloudy, 75°-99°F
August 12,2005 - Partly Cloudy, 76°-95°F

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.**	Sheet 2 of 5 124-SB-104
		Location:	Roosevelt Bowling Lanes
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From	Weather: July 26, 2005 - Sunny, Humid, 75°-94°F Weather: July 27, 2005 - Sunny, Humid, 80°-94°F Date/Time Start: July 18, 2005 / 0930 (Ground Surface) Date/Time Finish: August 12, 2005 / 0900 (108 feet bGL) Weight of Hammer 300 Lbs. Drop of Hammer 30 Inches Type of Hammer mechanical	**Location Description:**	Located 9.3 feet northwest of property corner closest to the Colonette Diner and 134.0 feet southwest of the property corner closest to Route 440 (directly above the 24" gas main).

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
26	SP	5	0.7	ND	26 to 28	Red Brown; f SAND, trace Silt; medium dense; saturated.	SP	pH: 7.93	mS: 0.54	Temp: 23.7	ntu. 240
		9									
27		10									
		12									
28	SP	4	1.2	ND	28 to 30	Red Brown; SILT, some Clay; f Sand layers and laminations; stiff; saturated.	ML	pH: 7.84	mS: 0.56	Temp: 24.5	ntu. 380
		4									
29		5									
		12									
30	SP	5	1.2	ND	30 to 32	Red Brown; f SAND, trace Silt; Silty Clay laminations; medium dense; saturated.	SP	pH: 7.81	mS: 0.52	Temp: 24.2	ntu. 450
		11									
31		9									
		13									
32	SP	4	1.3	ND	32 to 34	Red Brown; f SAND; trace Silt; alternating with thin layers and laminations of Silty Clay; medium dense; saturated.	SP/CL	pH: 7.96	mS: 0.54	Temp: 20.2	ntu. 29
		6									
33		7									
		14									
34	SP	7	1.7	ND	34 to 36	Red Brown; f SAND, tr Silt; med dense; saturated (34.0-34.3).	SP	pH:	mS:	Temp:	ntu.
		7				Red Brown; SILT, little Clay; f Sand laminations; f Gravel at 34.8- 34.9 feet; very stiff; saturated (34.3-35.1).	ML/CL	8.06	0.62	22.6	>1000
35		12				Red Brown; SILT, some Clay; very stiff; saturated (35.1-35.7).					
		21									
36	SP	5	1.2	NA	36 to 38	Red Brown; SILT; some f Sand laminations; stiff; saturated.	ML	pH: NA	mS: NA	Temp: NA	ntu. NA
		10									
37		5									
		9									
38	SP	5	0.9	NA	38 to 40	Red Brown; SILT, some f Sand; very stiff; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		9									
39		8									
		12									
40	SP	6	0.8	ND	40 to 42	Red Brown; f SAND, trace Silt; medium dense; saturated (40.0-40.5).	SP	pH:	mS:	Temp:	ntu.
		9						7.57	0.98	26	170
41		10				Red Brown; f SAND, little Silt; medium dense; saturated (40.5-40.8).	SM				
		10									
42	SP	9	1.0	ND	42 to 44	Red Brown; SILT, little- f Sand, trace cmf Gravel; trace Clay; very stiff; saturated.	ML	pH: 7.65	mS: 0.88	Temp: 25.4	ntu. >1000
		9									
43		7									
		6									
44	SP	6	0.7	NA	44 to 46	Red Brown; SILT; medium stiff; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		4									
45		4									
		5									
46	SP	8	0.6	NA	46 to 48	Red Brown; f SAND, some Silt, trace mf Gravel; medium dense; saturated.	SM	pH: 7.93	mS: 1.61	Temp: 26.3	ntu. NA
		10									
47		11									
		12									
48	SP	9	0.5	ND	48 to 50	Red Brown; SILT, little f Sand; very stiff; saturated.	ML	pH: 7.85	mS: 1.48	Temp: 24.9	ntu. >1000
		11									
49		14									
		20									
50	SP	7	1.0	NA	50 to 52	Red Brown; f SAND, trace Silt, medium dense; saturated.	SM	pH: NA	mS: NA	Temp: NA	ntu. NA
		12									
51		11									
		14									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/** Sheet 3 of 5 **WELL NO.** 124-SB-104 **Location:** Roosevelt Bowling Lanes	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: July 28, 2005 - Partly Cloudy, 69°-81°F
Weather: July 29, 2005 - Mostly Sunny, Humid, 69°-84°F
Date/Time Start: July 18, 2005 / 0930 (Ground Surface)
Date/Time Finish: August 12, 2005 / 0900 (108 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 9.3 feet northwest of property corner closest to the Colonette Diner and 134.0 feet southwest of the property corner closest to Route 440 (directly above the 24" gas main).

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
52	SP	15	1.3	NA	52 to 54	Red Brown; f SAND, little Silt; medium dense;saturated (52.0-53.0).	SM	pH:	mS:	Temp:	ntu.
		16						7.74	1.57	27.8	NA
53		14				Red Brown; SILT, little Clay, trace cmf Gravel; very stiff; saturated (53.0-53.3).	ML				
		15									
54	SP	9	1.2	NA	54 to 56	Red Brown; SILT, trace f Sand; very stiff; saturated (54.0-54.4).		pH:	mS:	Temp:	ntu.
		8						NA	NA	NA	NA
55		10				Red Brown; CLAY, little- c Sand to cmf Gravel; very stiff; saturated (54.4-55.2).	CL				
		16									
56	SP	4	1.1	ND	56 to 58	Red Brown; CLAY, trace c Sand to cmf Gravel; very stiff; saturated (56.0-57.0).		pH:	mS:	Temp:	ntu.
		7						7.94	0.67	29.8	>1000
57		12				Red Brown; mf SAND, little- Silt; medium dense; saturated 57.0-57.1).	SM				
		24									
58	SP	14	1.3	ND	58 to 60	Red Brown; CLAY, trace c Sand to f Gravel; Silty f Sand layer at 58.9-59.2 feet; hard; saturated.	CL	pH:	mS:	Temp:	ntu.
		16						8.03	0.47	24.5	250
59		22					SM				
		23									
60	SP	10	1.6	ND	60 to 62	Red Brown; SILT, little f Sand; f Sand laminations at 60.0-60.4 feet; Clay content increases from 61.3-61.6 feet; very stiff; saturated.	ML	pH:	mS:	Temp:	ntu.
		15						8.04	0.58	25.9	>1000
61		14									
		13									
62	SP	8	1.1	NA	62 to 64	Red Brown; SILT; very stiff; saturated (62.0-62.5).		pH:	mS:	Temp:	ntu.
		11						8.10	1.47	27.9	NA
63		14				Red Brown; f SAND, little Silt; medium dense; saturated (62.5-63.1).	SM				
		14									
64	SP	11	1.3	NA	64 to 66	Red Brown; f SAND, trace+ Silt; medium dense; saturated (64.0-64.7).	SP	pH:	mS:	Temp:	ntu.
		15						NA	NA	NA	NA
65		11				Red Brown; SILT; Clayey Silt with little c Gravel from 65.0-65.1 feet; very stiff; saturated (64.7-65.0).					
		11									
66	SP	12	1.1	NA	66 to 68	Red Brown; SILT, little Clay; f Sand laminations; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		16						8.14	0.54	22.8	NA
67		11					ML				
		14									
68	SP	17	1.5	ND	68 to 70	Red Brown; SILT, trace f Gravel; hard; saturated (68.0-68.5).		pH:	mS:	Temp:	ntu.
		24						8.17	0.59	25.1	>1000
69		22				Red Brown; SILT; f Sand laminations; hard; saturated (68.5-69.5).					
		27									
70	SP	14	0.8	NA	70 to 72	Red Brown; SILT, little f Sand; hard; saturated.		pH:	mS:	Temp:	ntu.
		12						8.37	0.74	28.1	NA
71		21									
		24									
72	SP	8	1.5	NA	72 to 74	Red Brown; CLAY, trace- c Sand to cmf Gravel (subangular to subrounded); very stiff; saturated.		pH:	mS:	Temp:	ntu.
		10						NA	NA	NA	NA
73		16					CL				
		22									
74	SP	11	1.6	NA	74 to 76	Red Brown; CLAY, trace c Sand to f Gravel; hard; saturated.		pH:	mS:	Temp:	ntu.
		16						NA	NA	NA	NA
75		21									
		27									
76	SP	12	1.35	ND	76 to 78	Red Brown; SILT/CLAY, trace- f Gravel from 76.0-76.8 feet; f Sand laminations from 77.0-77.35 feet; hard; saturated.		pH:	mS:	Temp:	ntu.
		24						8.49	0.23	21.8	>1000
77		26					ML/CL				
		28									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Nick Santella
Rig Type:	Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-104 Sheet 4 of 5

Location: Roosevelt Bowling Lanes

Location Description: Located 9.3 feet northwest of property corner closest to the Colonette Diner and 134.0 feet southwest of the property corner closest to Route 440 (directly above the 24" gas main).

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 2, 2005 - Sunny, Humid, 75°-92°F
Weather: August 3, 2005 - Sunny, Humid, 77°-94°F
Date/Time Start: July 18, 2005 / 0930 (Ground Surface)
Date/Time Finish: August 12, 2005 / 0900 (108 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78	SP	8	0.6	NA	78 to 80	Red Brown; SILT, trace- cmf Sand; hard; saturated.	ML	pH: NA; mS: NA; Temp: NA; ntu. NA
		46						
79		100/5"						
80	SP	44	0.8	NA	80 to 82	Red Brown; SILT, trace- f Sand; hard; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		100						
81		100/3"						
82	SP	60	0.4	NA	82 to 84	Red Brown; SILT, trace f Sand; hard; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		150/5"						
83								
84	SP	39	0.9	NA	84 to 86	Red Brown; SILT, trace+ f Sand; hard; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		100						
85		97						
86	SP	56	0.85	NA	86 to 88	Red Brown; f SAND, little Silt; hard; saturated.	SM	pH: NA; mS: NA; Temp: NA; ntu. NA
		120						
87		100/3"						
88	SP	30	1.0	NA	88 to 90	Red Brown; f SAND, some Silt; hard; saturated (88.0-88.8). Red Brown; CLAY/SILT; hard; saturated (88.8-89.0).		pH: NA; mS: NA; Temp: NA; ntu. NA
		48					ML/CL	
89		39						
90	SP	26	1.2	NA	90 to 92	Red Brown; f SAND; little Clay/Silt from 90.0-90.5 feet; very dense; saturated.	SM	pH: NA; mS: NA; Temp: NA; ntu. NA
		96					SP	
91		110						
92	SP	55	1.55	NA	92 to 94	Red Brown; f SAND; very stiff; saturated (92.0-93.4) Red Brown; CLAY, trace f Gravel; hard; saturated (93.4-93.55).		pH: NA; mS: NA; Temp: NA; ntu. NA
		76						
93		49						
94	SP	6	1.4	ND	94 to 96	Red Brown; CLAY; thin f Sand layers (1/2"-3/4" thick) at 94.15, 94.3, 94.6, and 94.7 feet; very stiff; saturated.	CL	pH: 8.54; mS: 0.35; Temp: 23.9; ntu. >1000
		8						
95		12						
96	SP	9	1.3	NA	96 to 98	Red Brown; CLAY; hard; saturated (96.0-96.2). Red Brown; SILT, little Clay; laminated; hard; saturated (96.2-97.3).		pH: NA; mS: NA; Temp: NA; ntu. NA
		22					ML	
97		24						
98	SP	7	0.8	NA	98 to 100	Red Brown; SILT, little Clay; very stiff; saturated (98.0-98.2). Red Brown; CLAY; laminated; very stiff; saturated (98.2-98.8).		pH: NA; mS: NA; Temp: NA; ntu. NA
		9						
99		7						
100	SP	3	2.0	ND	100 to 102	Red Brown; CLAY, trace c Gravel; f Sand laminations; stiff; saturated.	CL	pH: 5.24; mS: 0.23; Temp: 30.1; ntu. >1000
		5						
101		8						
102	SP	6	1.2	NA	102 to 104	Red Brown; CLAY; f Sand laminations; stiff; saturated 102.0-102.8). Red Brown; CLAY, little cmf Sand, trace f Gravel; some gray coloring; stiff; saturated (102.8-103.2).		pH: NA; mS: NA; Temp: NA; ntu. NA
		6						
103		8						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Nick Santella
Rig Type:	Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-104 Sheet 5 of 5

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 5, 2005 - Sunny, Humid, 80°-96°F
Weather: August 8, 2005 - Mix of Sun and Clouds, 69°-87°F
Date/Time Start: July 18, 2005 / 0930 (Ground Surface)
Date/Time Finish: August 12, 2005 / 0900 (108 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 9.3 feet northwest of property corner closest to the Colonette Diner and 134.0 feet southwest of the property corner closest to Route 440 (directly above the 24" gas main).

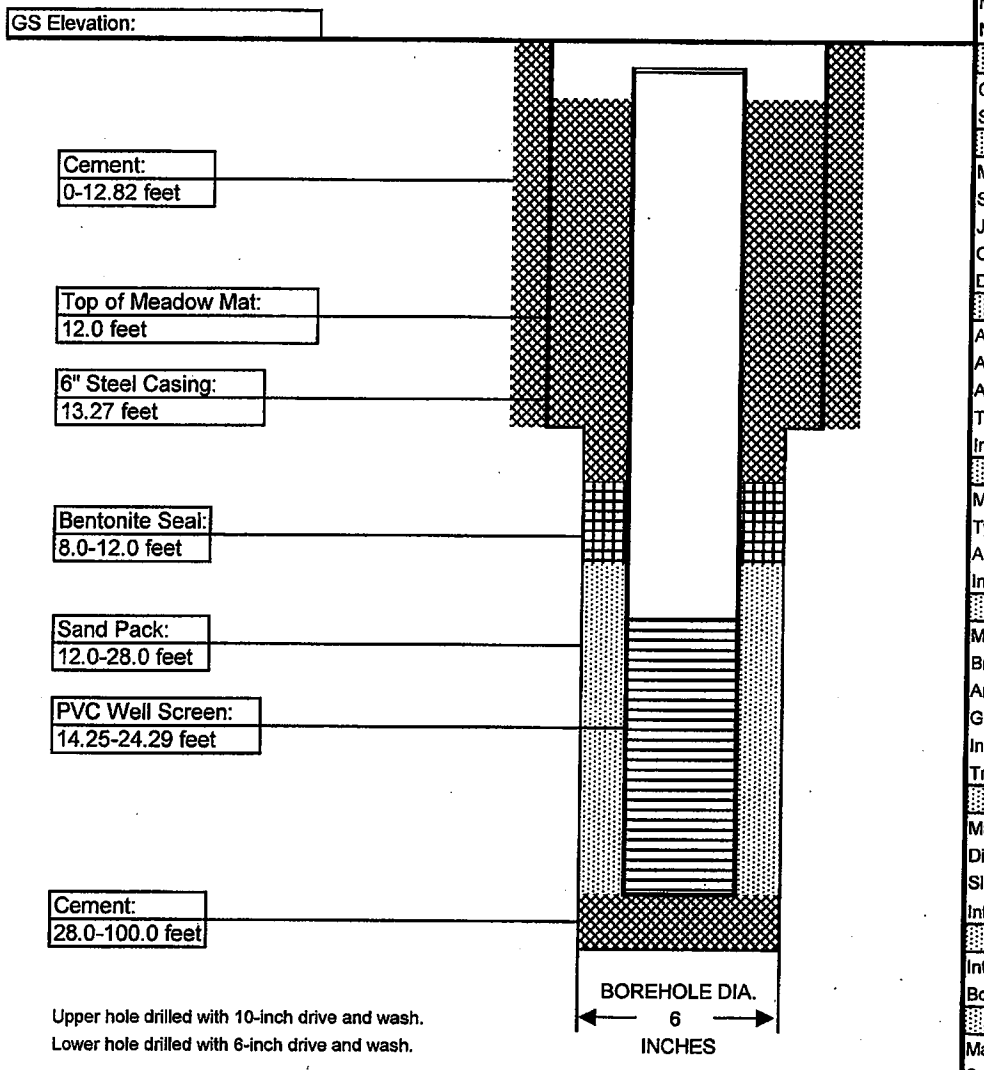
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104	SP	11	0.7	NA	104 to 106	Red Brown; mf SAND, and Silt, little cmf Gravel; very stiff, saturated.	TILL SM	pH: 7.90 mS: 0.48 Temp: 34.1 ntu. NA
		12						
105		12						
		13						
106	SS	12			106 to 108	Red Brown; mf SAND, and Silt, little cmf Gravel; very stiff, saturated.		pH: mS: Temp: ntu.
		17						
107		12						
		21						
108						Bottom of Borehole at 108 feet.		
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
121								
122								
123								
124								
125								
126								
127								
128								
129								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-105D	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	15-Aug-05	DATE END:	23-Nov-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary

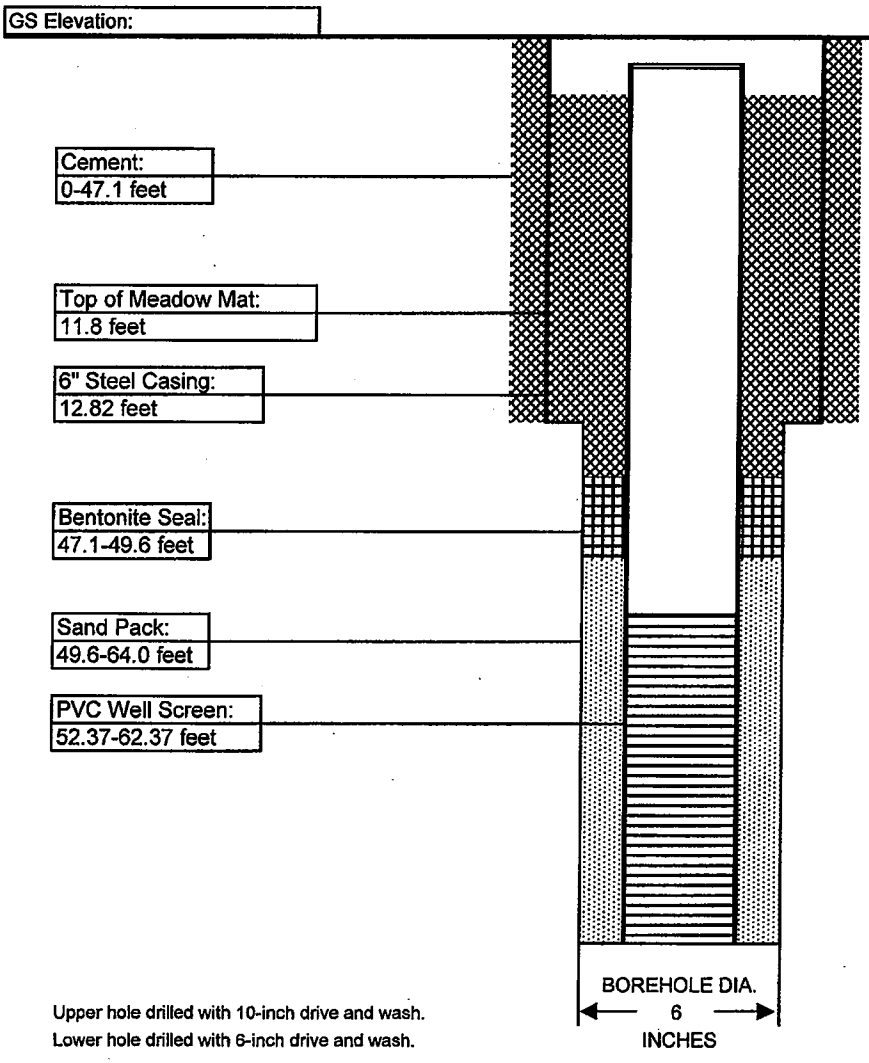


Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-12.82 and 28-100 FT
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	8.0-12.0 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	12.0-28.0 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	14.25-24.29 FEET
SUMP	
Interval BGS:	24.29-24.62 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-105T	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	4-Nov-05	DATE END:	23-Nov-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled with 6-inch drive and wash.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-47.1 FEET
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	47.1-49.6 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	49.6-64.0 FEET
Tremied:	YES
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	52.37-62.37 FEET
SUMP	
Interval BGS:	62.37-62.7 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	N/A

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

BORING/ WELL NO. 124-SB-105 **Sheet** 1 of 4

PROJECT NAME: Honeywell Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Roosevelt Bowling Lanes

Location Description: Located 178.3 feet south of Well 124-MW-06 and 146.0 feet west of Well 124-MW-102T.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: August 15, 2005 - Mix of Sun and Clouds, 73°-86°F
Weather: August 16, 2005 - Mostly Cloudy, 70°-80°F
Date/Time Start: August 15, 2005 / 1045 (Ground Surface)
Date/Time Finish: August 30, 2005 / 1110 (100 feet bGL)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Asphalt Surface Material and Trap Rock (0-0.4).	ASPHALT	
						Dark Gray Brown; cmf SAND, trace Silt, little- cmf Gravel; loose; moist (0.4-0.8).	SW	
1								
						Brown to Dark Brown; cmf SAND, little Silt, little+ cmf Gravel; small pieces of wood at 1.0 foot; loose; moist to wet (0.8-2.5).	SM	
2								
						Cobbles and Wood (2.5-4.3).		
3								
						Dark Brown; mf SAND, trace- Silt, trace- c Sand to f Gravel; loose; saturated (4.3-4.6).	COBBLES & WOOD	
4								
						Light Brown; f SAND, trace- Silt; loose; saturated (4.6-5.0).		
						Hand auger to 5 feet for utility clearance.	SP	
5					5 to 6	Drilled to 6 feet.		
6	SP	3	1.8	NA	6 to 8	Greenish Gray; mf SAND, little f Gravel; beige grains and nodules; beige clay-like layers and pockets; clusters of yellowish grains; medium dense; wet. COPR present.	SP (COPR)	pH: NA, mS: NA, Temp: NA, ntu. NA
		4						
7		11						
		15						
8	SP	3	1.7	5.5	8 to 10	Greenish Gray; mf SAND, little f Gravel; beige grains and nodules; beige clay-like layers and pockets; clusters of yellowish grains; medium dense; wet (8.0-9.4). COPR present.		pH: 12.12, mS: 8.89, Temp: 24.4, ntu. 100
		5						
9		12						
		17				Dk Gray; Clay-like layers; some f Sand; stiff; sat (9.4-9.7). COPR	SC (COPR)	
10	SP	4	1.5	5	10 to 12	Greenish Gray; mf SAND, little f Gravel; beige grains and nodules; beige clay-like layers and pockets; clusters of yellowish grains; medium dense; wet 10.0-11.4). COPR present.	SP (COPR)	pH: 11.98, mS: 6.21, Temp: 24.1, ntu. 33
		5						
11		4						
		4				Black; CLAY; organic odor; stiff; saturated (11.4-11.5).	OL	
12	SP	2	2.0	NA	12 to 14	Black; PEAT; organic odor; medium stiff; saturated.	PT	pH: NA, mS: NA, Temp: NA, ntu. NA
		2						
13		3						
		3						
14	SP	2	0.0	2	14 to 16	No Recovery.		pH: 9.82, mS: 0.68, Temp: 24.6, ntu. >1000
		3						
15		2						
		4						
16	SP	2	1.2	ND	16 to 18	Gray; mf SAND, little cmf Gravel, trace Silt; wood; stiff; saturated (16.0-16.5).		pH: 6.83, mS: 2.72, Temp: 24.3, ntu. 400
		7						
17		8				Gray; mf SAND, trace Silt; light gray Silt layer (1/2") at 17.0 feet; stiff; saturated (16.5-17.2).		
		15						
18	SP	6	1.1	ND	18 to 20	Red Brown; mf SAND; medium dense; saturated.		pH: 6.94, mS: 2.23, Temp: 24.2, ntu. 380
		9						
19		8						
		12						
20	SP	2	0.8	1	20 to 22	Red Brown; mf SAND, trace- c Sand; medium dense; saturated.	SP	pH: 7.42, mS: 2.03, Temp: 26.7, ntu. 200
		7						
21		8						
		13						
22	SP	5	0.8	NA	22 to 24	Red Brown; f SAND; trace Silt; medium dense; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		6						
23		5						
		8						
24	SP	4	0.7	NA	24 to 26	Red Brown; f SAND; trace Silt; medium dense; saturated.		pH: 7.33, mS: 1.89, Temp: 27.1, ntu. >1000
		7						
25		8						
		16						

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLEI

COMMENTS:
Additional Weather: August 25, 2005 - Mostly Sunny, 68°-82°F
August 26, 2005 - Mostly Cloudy, 69°-84°F
August 29, 2005 - Cloudy, 75°-82°F
August 30, 2005 - Cloudy, Humid, 75°-82°F

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	BORING/ WELL NO. 124-SB-105 Sheet 2 of 4 Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 17, 2005 - Sunny, 61°-88°F
Weather: August 18, 2005 - Mostly Cloudy, 68°-82°F
Date/Time Start: August 15, 2005 / 1045 (Ground Surface)
Date/Time Finish: August 30, 2005 / 1110 (100 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Located 178.3 feet south of Well 124-MW-06 and 146.0 feet west of Well 124-MW-102T.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
26	SP	2	1.3	NA	26 to 28	Red Brown; f SAND, trace Silt; medium dense; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		8						
27		12						
		28						
28	SP	7	0.8	ND	28 to 30	Red Brown; f SAND, trace Silt, trace f Gravel; medium dense; saturated.	SP	pH: 7.31, mS: 1.90, Temp: 23.7, ntu. >1000
		14						
29		10						
		17						
30	SP	6	0.6	ND	30 to 32	Red Brown; f SAND, trace Silt; medium dense; saturated (30.0-30.4).		pH: 7.97, mS: 1.78, Temp: 24.3, ntu. >1000
		8						
31		8				Red Brown; SILT, little f Sand; very stiff; saturated (30.4-30.6).	ML	
		15						
32	SP	8	0.9	NA	32 to 34	Red Brown; f SAND; some- Silt; medium dense; saturated.		pH: 8.67, mS: 2.29, Temp: 23.8, ntu. NA
		11						
33		10					SM	
		12						
34	SP	7	1.4	NA	34 to 36	Red Brown; f SAND; little Silt; medium dense; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		11						
35		12						
		19						
36	SP	9	1.0	NA	36 to 38	Red Brown; SILT; abundant f Sand laminations; very stiff; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		12						
37		11					ML	
		15						
38	SP	7	1.0	ND	38 to 40	Red Brown; SILT; f Sand laminations; Clay layer (1/2") at 38.1 feet; very stiff; saturated (38.0-38.8).		pH: 7.76, mS: 7.18, Temp: 23.6, ntu. >1000
		11						
39		11				Red Brown; CLAY/SILT; very stiff; saturated (38.8-39.0).	CL/ML	
		15						
40	SP	7	1.0	ND	40 to 42	Red Brown; f SAND, trace Silt; medium dense; saturated (40.0-40.6).	SP	pH: 7.10, mS: 10.79, Temp: 23.5, ntu. 240
		6						
41		5				Red Brown; SILT, little f Sand; stiff; saturated (40.6-41.0).	ML	
		3						
42	SP	3	1.1	NA	42 to 44	Red Brown; SILT, little Clay, trace f Sand, medium stiff; saturated (42.0-42.7).		pH: 7.41, mS: 8.34, Temp: 24.1, ntu. >1000
		3						
43		3				Red Brown; CLAY; f Sand laminations; medium stiff; saturated (42.7-43.1).	CL	
		7						
44	SP	4	1.3	ND	44 to 46	Red Brown; f SAND, trace Silt; loose; saturated (44.0-44.2).	SP	pH: 7.27, mS: 7.19, Temp: 27, ntu. 210
		5				Red Brn; SILT; f Sand laminations; stiff; saturated (44.2-45.0).	ML	
45		5				Red Brn; CLAY; f Sand laminations; stiff; saturated(45.0-45.3)	CL	
		8						
46	SP	3	0.8	NA	46 to 48	Red Brown; SILT/CLAY; f Sand laminations; stiff; saturated.		pH: 7.59, mS: 5.79, Temp: 25.1, ntu. >1000
		3					ML/CL	
47		7						
		7						
48	SP	3	1.0	ND	48 to 50	Red Brown; SILT, little Clay; abundant f Sand laminations; stiff; saturated.		pH: 7.56, mS: 4.19, Temp: 25.2, ntu. 330
		5					ML	
49		5						
		7						
50	SP	4	1.1	NA	50 to 52	Red Brown; f SAND, and Silt, medium dense; saturated (50.0-50.5).	SM	pH: NA, mS: NA, Temp: NA, ntu. NA
		11						
51		12				Red Brown; SILT, f Sand laminations; very stiff; saturated (50.5-51.1).	ML	
		21						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling
Driller:	Ed Blewett, Tim Smith
Inspector:	M. Wilkinson/N. Santella
Rig Type:	Gus Pech, Mobile B57

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-105 Sheet 3 of 4

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 19, 2005 - Mix of Sun and Clouds, 71°-80°F
Weather: August 22, 2005 - Sunny, 74°-86°F
Date/Time Start: August 15, 2005 / 1045 (Ground Surface)
Date/Time Finish: August 30, 2005 / 1110 (100 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical, hydraulic

Location Description:
Located 178.3 feet south of Well 124-MW-06 and 146.0 feet west of Well 124-MW-102T.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
52	SP	10	1.1	ND	52 to 54	Red Brown; SILT, little f Sand; hard; saturated (52.0-52.9). Red Brown; CLAY, little cmf Gravel (subangular), trace mf Sand; hard; saturated (52.9-53.1).	ML	pH:	mS:	Temp:	ntu.
		19						7.80	2.81	20.7	>1000
53		15					CL				
		23									
54	SP	10	0.8	ND	54 to 56	Red Brown; SILT, trace f Sand; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		16					ML	7.91	2.69	21.7	190
55		14									
		14									
56	SP	6	0.9	NA	56 to 58	Red Brown; CLAY, trace c Sand to f Gravel; stiff; saturated saturated (56.0-56.8).	CL	pH:	mS:	Temp:	ntu.
		5						NA	NA	NA	NA
57		8				Red Brown; SILT, trac e c Sand to f Gravel; stiff; saturated 56.8-56.9).	ML				
		28									
58	SP	10	0.8	NA	58 to 60	Red Brown; f SAND, and Silt; medium dense; saturated (58.0-58.3).	SM	pH:	mS:	Temp:	ntu.
		11						7.72	2.92	23.3	NA
59		10				Red Brown; CLAY, little- cmf Gravel, trace mf Sand; very stiff; saturated (58.3-58.8).	CL				
		15									
60	SP	6	1.3	ND	60 to 62	Red Brown; CLAY, little cmf Gravel (rounded), hard; saturated (60.0-60.3).		pH:	mS:	Temp:	ntu.
		20						7.52	3.07	24	40
61		22				Brown; f SAND, little Silt; med dense; saturated (60.3-61.0).	SM				
		29				Red Brown; SILT; f Sand laminations; hard; sat (61.0-61.3).					
62	SP	7	0.6	ND	62 to 64	Red Brown; f SAND, trace Silt; med dense; sat (62.0-62.1).	SP	pH:	mS:	Temp:	ntu.
		11				Red Brown; CLAY; f Sand/Silt laminations; very stiff; saturated (62.1-62.5).	CL	7.58	2.79	19.1	140
63		10					SP				
		21				Red Brown; f SAND; medium dense; saturated (62.5-62.6).					
64	SP	13	0.8	NA	64 to 66	Red Brown; CLAY, trace cmf Sand, trace cmf Gravel (subangular to subrounded); hard; saturated.		pH:	mS:	Temp:	ntu.
		24						NA	NA	NA	NA
65		100/5"									
66	SP	14	1.3	ND	66 to 68	Red Brown; CLAY, trace- c Sand to f Gravel; minor f Sand laminations; hard; saturated.		pH:	mS:	Temp:	ntu.
		17						7.85	1.83	23.1	320
67		22									
		40									
68	SP	19	1.4	ND	68 to 70	Red rown; CLAY, trace cmf Gravel (subangular to subroundeed); Sandy Silt layers from 68.4-68.8 and 69.1-69.2 feet; hard; saturated.	CL	pH:	mS:	Temp:	ntu.
		32						7.89	1.24	22.9	600
69		29									
		44									
70	SP	13	1.4	NA	70 to 72	Red Brown; CLAY, trace- c Sand to f Gravel; f Sand/Silt laminations; hard; saturated.		pH:	mS:	Temp:	ntu.
		14						NA	NA	NA	NA
71		16									
		23									
72	SP	7	0.2	NA	72 to 74	Red Brown; CLAY, trace mf Sand; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		10						7.26	1.07	23.2	>1000
73		11									
		17									
74	SP	2	1.5	NA	74 to 76	Red Brown; SILT, trace Clay, trace c Sand to f Gravel; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		8						NA	NA	NA	NA
75		10					ML				
		22									
76	SP	6	1.0	NA	76 to 78	Red Brown; SILT, trace Clay, trace cmf Sand, trace f Gravel; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		12						NA	NA	NA	NA
77		14									
		21									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Tim Smith **Inspector:** Mike Wilkinson **Rig Type:** Mobile B57	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** 124-SB-105 Sheet 4 of 4 **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: August 23, 2005 - Mostly Sunny, 68°-80°F
Weather: August 24, 2005 - Mostly Sunny, 67°-80°F
Date/Time Start: August 15, 2005 / 1045 (Ground Surface)
Date/Time Finish: August 30, 2005 / 1110 (100 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Located 178.3 feet south of Well 124-MW-06 and 146.0 feet west of Well 124-MW-102T.

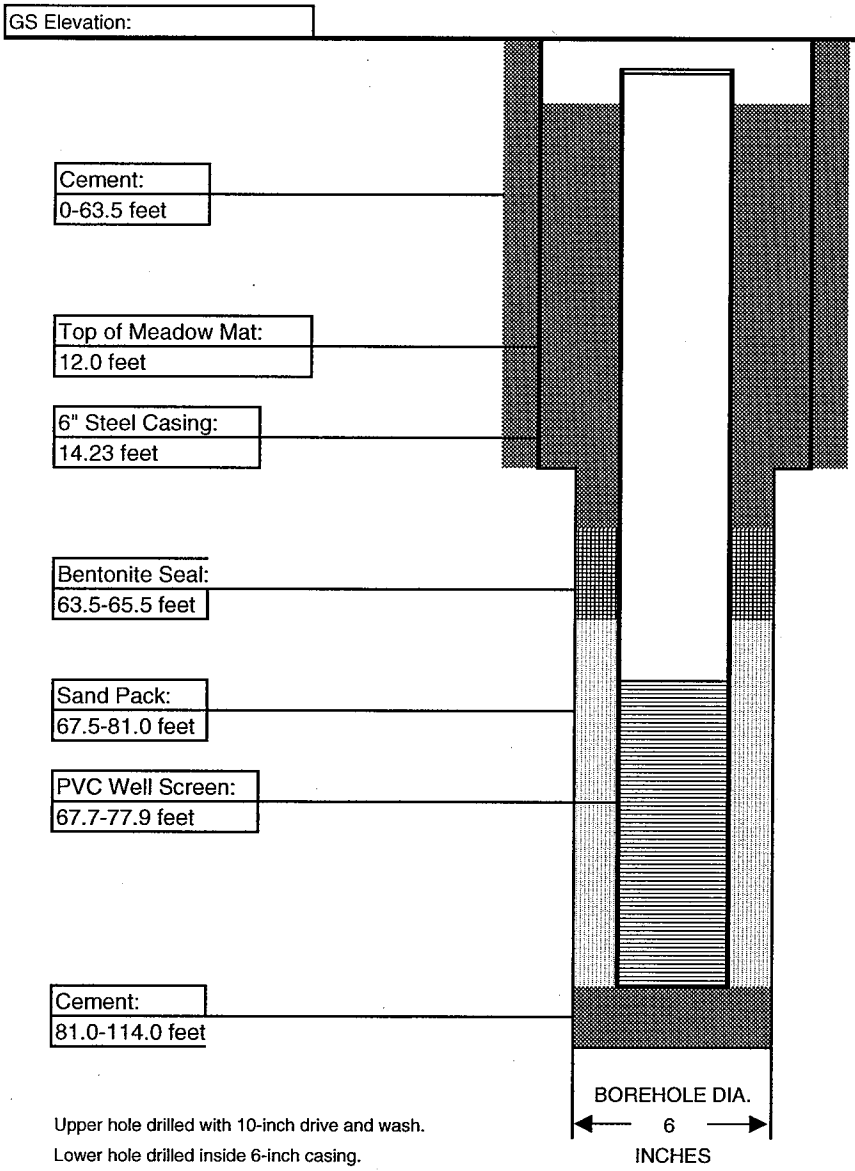
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78	SP	7	0.95	NA	78 to 80	Red Brown; SILT, trace Clay, trace c Sand to f Gravel; Silty f Sand layers from 78.6-78.95 feet; very stiff; saturated.	ML	pH: NA; mS: NA; Temp: NA; ntu. NA
		9						
79		14						
		48						
80	SP	4	1	ND	80 to 82	Red Brown; CLAY, trace- c Sand to f Gravel; very stiff; saturated.	CL	pH: 9.08; mS: 0.72; Temp: 19.3; ntu. >1000
		7						
81		10						
		15						
82	SP	5	0.7	NA	82 to 84	Red Brown; CLAY, trace f Gravel; very stiff; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		12						
83		10						
		17						
84	SP	3	0.8	NA	84 to 86	Red Brown; CLAY, trace cmf Gravel; stiff; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		5						
85		10						
		15						
86	SP	4	1.5	NA	86 to 88	Red Brown; CLAY, trace cmf Gravel; stiff; saturated.		pH: NA; mS: NA; Temp: NA; ntu. NA
		7						
87		7						
		12						
88	SP	3	1.5	NA	88 to 90	Red Brown; CLAY/SILT; f Sand laminations; stiff; saturated.	CL/ML	pH: 8.23; mS: 0.21; Temp: 22.5; ntu. >1000
		4						
89		9						
		19						
90	SP	6	1.5	NA	90 to 92	Red Brown; SILT/CLAY; f Sand laminations; hard; saturated.	ML/CL	pH: 8.32; mS: 0.17; Temp: 23.1; ntu. >1000
		15						
91		16						
		15						
92	SP	4	1.4	NA	92 to 94	Red Brown; CLAY; f Sand/Silt laminations; stiff; sasturated.	CL	pH: 8.62; mS: 0.20; Temp: 26.7; ntu. >1000
		5						
93		6						
		9						
94	SP	4	1.1	NA	94 to 96	Red Brown; SILT/CLAY, trace cmf Gravel; f Sand laminations; hard; saturated (94.0-94.5).	ML/CL	pH: NA; mS: NA; Temp: NA; ntu. NA
		15				Red Brown; SILT, little mf Sand, some cmf Gravel (subrounded); hard; saturated (94.5-95.1).	ML	
95		25						
		29						
96	SP	25	0.8	NA	96 to 98	Red Brown; cmf SAND, some cmf Gravel (subrounded), little Silt; dense; saturated.	TILL SM	pH: NA; mS: NA; Temp: NA; ntu. NA
		22						
97		18						
		14						
98	SS	25	0.7		98 to 100	Red Brown; cmf SAND, little cmf+ Gravel (subrounded), little Silt; medium dense; saturated.		
		16						
99		13						
		15						
100						End of Boring at 100 feet.		
101								
102								
103								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-106T	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	4-May-06	DATE END:	23-Jun-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-63.5 and 81.0-114.0 F
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	63.5-65.5 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	67.5-81.0 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	67.7-77.9 FEET
SUMP	
Interval BGS:	77.9-78.3 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

HYDROQUAL
DRILLING RECORD

Contractor:	B&B Drilling
Driller:	Ed Blewett
Inspector:	Mike Wilkinson
Rig Type:	Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-106 Sheet 1 of 5

Location: Roosevelt Bowling Lanes

Location Description: Located 273.2 feet south of the northeast corner of the building at 60 Kellogg St. and 111.1 feet east of the southeast corner of building at 60 Kellogg St.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: May 4, 2006 - Mix of Sun and Clouds, 54°-68°F
Weather: May 5, 2006 - Mix of Sun and Clouds, 66°-80°F
Date/Time Start: May 4, 2006 / 0800 (Ground Surface)
Date/Time Finish: May 23, 2006 / 1420 (114 feet bGL)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
0					0 to 5	Asphalt and Trap Rock (0-0.7). Dark Gray; cmf SAND, little cmf Gravel, little+ Silt; loose; moist (0.7-1.5). Dark Brown; cmf SAND, little mf Gravel, little+ Silt; loose; moist (1.5-2.0). Brown; mf SAND, little- cmf Gravel, little+ Silt; creosote odor below 2.5 feet; loose; moist (2.0-5.0). Hand auger to 5 feet for utility clearance.						
1											
2											
3											
4											
5					5 to 6	Drilled to 6 feet.					
6	SP	4	0.9	ND	6 to 8	Grayish Brown; mf SAND; roots; medium dense; wet.		pH: 7.33	mS: 1.87	Temp: 20.8	ntu. >1000
		5									
7		7									
		5									
8	SP	4	0.3	NA	8 to 10	Grayish Brown; f SAND; loose; wet.	SP	pH: 8.43	mS: 1.04	Temp: 24.3	ntu. >1000
		2									
9		2									
		3									
10	SP	4	0.5	ND	10 to 12	Grayish Brown; f SAND; loose; saturated (10.0-10.4). Grayish Brown; f SAND, some Silt; loose; saturated (10.4-10.5).		pH:	mS:	Temp:	ntu.
		3						6.58	4.79	23.3	200
11		2					SM				
		2									
12	SP	2	1.3	NA	12 to 14	Dark Gray; CLAY; roots, organic odor; soft; saturated (12.0-12.2). Grayish Brown; PEAT; organic odor; soft; saturated (12.2-13.3).	CL	pH:	mS:	Temp:	ntu.
		1						NA	NA	NA	NA
13		1									
		3									
14	SS	2	0.7		14 to 16	Dark Brown; PEAT; stiff; saturated.		pH:	mS:	Temp:	ntu.
		4									
15		5					PT				
		6									
16	SP	2	1.1	ND	16 to 18	Dark Brown; PEAT; soft; saturated.		pH: 6.91	mS: 5.97	Temp: 15.1	ntu. >1000
		1									
17		2									
		10									
18	SP	2	1.2	NA	18 to 20	Gray; f SAND, trace+ Silt; medium dense; saturated (18.0-18.8). Light Gray; SILT, some f Sand; medium dense; saturated (18.8-19.2).	SM	pH:	mS:	Temp:	ntu.
		8						NA	NA	NA	NA
19		17					ML				
		24									
20	SP	16	0.0	NA	20 to 22	No Recovery.		pH:	mS:	Temp:	ntu.
		11						NA	NA	NA	NA
21		21									
		29									
22	SP	9	1.1	ND	22 to 24	Grayish Brown to Brown; f SAND, trace Silt; dense; saturated.		pH: 8.82	mS: 2.49	Temp: 17.3	ntu. 350
		16									
23		17					SP				
		21									
24	SP	6	1.2	ND	24 to 26	Brown; f SAND, trace Silt; very dense; saturated.		pH: 8.80	mS: 2.53	Temp: 18.2	ntu. >1000
		19									
25		32									
		41									

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Additional Weather: May 18, 2006 - Mostly Sunny, 57°-76°F
May 19, 2006 - Cloudy, Morning Rain, 54°-66°F
May 22, 2006 - Mostly Sunny, Windy, 49°-64°F
May 23, 2006 - Sunny, 45°-68°F

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. Sheet 2 of 5
124-SB-106
Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: May 8, 2006 - Mostly Cloudy, 54°-65°F
Weather: May 9, 2006 - Mostly Cloudy, 56°-66°F
Date/Time Start: May 4, 2006 / 0800 (Ground Surface)
Date/Time Finish: May 23, 2006 / 1420 (114 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Located 273.2 feet south of the northeast corner of the building at 60 Kellogg St. and 111.1 feet east of the southeast corner of building at 60 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26	SP	11	1.2	ND	**26 to 28**	Brown; f SAND, some Silt; dense; saturated.	SM	pH: 7.21, mS: 2.81, Temp: 14.9, ntu. >1000
		18						
27		17						
		21						
28	SP	9	1.4	ND	**28 to 30**	Red Brown; SILT, some Clay; hard; saturated (28.0-28.4).	ML	pH: 7.50, mS: 2.31, Temp: 15.3, ntu. >1000
		15				Red Brown; vf SAND, trace Silt; dense; saturated (28.4-28.7).	SP	
29		17				Red Brown; SILT, and vf Sand; hard; saturated (28.7-29.4).	ML	
		26						
30	SP	14	1.4	ND	**30 to 32**	Red Brown; vf-f SAND, little Silt; very dense; saturated.	SM	pH: 7.72, mS: 2.11, Temp: 16.7, ntu. >1000
		31						
31		40						
		53						
32	SP	18	1.1	NA	**32 to 34**	Red Brown; vf-f SAND, trace Silt; very dense; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		46						
33		77/6"						
34	SP	14	1.6	NA	**34 to 36**	Red Brown; vf SAND; trace+ Silt; very dense; saturated.	SP	pH: 7.99, mS: 2.44, Temp: 20.1, ntu. >1000
		29						
35		38						
		42						
36	SP	6	0.8	ND	**36 to 38**	Brown; f SAND, trace Silt; medium dense; saturated (36.0-36.7).		pH: 7.49, mS: 3.34, Temp: 18.6, ntu. 100
		10						
37		14				Red Brown; SILT, some vf Sand; very stiff; saturated (36.7-36.8).		
		13						
38	SP	8	0.9	ND	**38 to 40**	Red Brown; SILT, trace Clay; hard; saturated.		pH: 7.71, mS: 4.28, Temp: 15.7, ntu. >1000
		15						
39		17						
		20						
40	SP	9	1.2	ND	**40 to 42**	Red Brown; SILT, and vf Sand; very stiff; saturated.		pH: 7.36, mS: 6.91, Temp: 15.8, ntu. 140
		13					ML	
41		12						
		14						
42	SP	5	0.9	NA	**42 to 44**	Red Brown; SILT; vf Sand laminations; very stiff; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		9						
43		11						
		11						
44	SP	9	0.3	ND	**44 to 46**	Red Brown; SILT, trace vf Sand; very stiff; saturated.		pH: 7.04, mS: 15.49, Temp: 17.8, ntu. 170
		12						
45		7						
		5						
46	SP	7	1.3	ND	**46 to 48**	Red Brown; CLAY, very stiff, saturated (46.0-46.1).	CL	pH: 7.17, mS: 16.76, Temp: 17.3, ntu. 220
		11				Red Brown; SILT, very stiff, saturated (46.1-47.3).		
47		13						
		10						
48	SP	6	0.5	NA	**48 to 50**	Brown; SILT; vf Sand laminations; stiff; saturated.	ML	pH: 7.27, mS: 15.67, Temp: 18.0, ntu. >1000
		6						
49		9						
		7						
50	SP	2	1.1	NA	**50 to 52**	Red Brown; CLAY; laminated; medium stiff; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		4					CL	
51		3						
		5						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

HYDROQUAL
DRILLING RECORD

BORING/ Sheet 3 of 5
WELL NO. 124-SB-106

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: May 10, 2006 - Cloudy, 55°-63°F
Weather: May 11, 2006 - Cloudy, 56°-60°F
Date/Time Start: May 4, 2006 / 0800 (Ground Surface)
Date/Time Finish: May 23, 2006 / 1420 (114 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 273.2 feet south of the northeast corner of the building at 60 Kellogg St. and 111.1 feet east of the southeast corner of building at 60 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
52	SP	2	1.3	NA	**52 to 54**	Red Brown; CLAY, trace- mf Gravel; laminated; medium stiff; saturated (52.0-52.6)..	CL	pH:	mS:	Temp:	ntu.
		5					ML	7.06	8.72	26.6	>1000
53		9				Red Brown; SILT, little Clay; laminated; stiff; sat. (52.6-53.1).					
		11				Red Brown; CLAY; stiff; saturated (53.1-53.3).					
54	SP	2	0.8	ND	**54 to 56**	Brown; CLAY; laminated; stiff; saturated.		pH:	mS:	Temp:	ntu.
		4						7.21	14.85	20.7	950
55		6					CL				
		8									
56	SP	2	1.0	ND	**56 to 58**	Red Brown; CLAY, some Silt; vf Sand laminations; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		5						7.38	12.76	21.2	>1000
57		4									
		4									
58	SP	4	1.1	NA	**58 to 60**	Red Brown; CLAY/SILT; vf Sand laminations; very stiff; saturated.	CL/ML	pH:	mS:	Temp:	ntu.
		6						NA	NA	NA	NA
59		10									
		13									
60	SP		1.1	ND	**60 to 62**	Red Brown; SILT, little Clay; very stiff; saturated.		pH:	mS:	Temp:	ntu.
								7.53	9.22	13.9	370
61											
62	SP	33	0.9	NA	**62 to 64**	Red Brown; SILT, hard; saturated		pH:	mS:	Temp:	ntu.
		110						7.96	8.45	15.9	>1000
63		80/6"									
64	SP	82	1.4	NA	**64 to 66**	Red Brown; SILT, trace- c Sand to c Gravel (rounded); hard; saturated.		pH:	mS:	Temp:	ntu.
		157						NA	MNA	NA	NA
65		90/6"									
66	SP	15	1.3	ND	**66 to 68**	Red Brown; SILT, trace- m Gravel (subangular); hard; saturated (66.0-66.5).		pH:	mS:	Temp:	ntu.
		17						7.75	5.95	17.0	190
67		16				Red Brown; SILT, little+ Clay; laminated; hard; saturated (66.5-67.3).					
		32									
68	SP	18	1.3	ND	**68 to 70**	Red Brown; SILT; c Gravel at 68.0-68.3 feet; laminated at 68.0-68.5 feet; hard; saturated.	ML	pH:	mS:	Temp:	ntu.
		39						8.18	4.40	16.6	>1000
69		50									
		55									
70	SP	31	1.2	ND	**70 to 72**	Red Brown; SILT; hard;saturated.		pH:	mS:	Temp:	ntu.
		27						8.29	4.42	16.0	130
71		28									
		23									
72	SP	23	1.3	ND	**72 to 74**	Red Brown; SILT, trace c Gravel (subrounded); hard; saturated.		pH:	mS:	Temp:	ntu.
		34						7.55	4.48	14.7	190
73		30									
		43									
74	SP	11	1.4	ND	**74 to 76**	Red Brown; SILT; hard;saturated (74.0-75.1). Red Brown; SILT, little Clay; hard; saturated (75.1-75.4).		pH:	mS:	Temp:	ntu.
		25						7.89	3.87	14.9	150
75		31									
		59									
76	SP	31	1.0	ND	**76 to 78**	Red Brown; SILT; minor laminations at 76.6-76.7 feet; hard; saturated (76.0-76.7).		pH:	mS:	Temp:	ntu.
		36						8.09	3.39	15.7	270
77		30				Red Brown; CLAY, some Silt, tracec Sand to f Gravel; hard; saturated (76.7-77.0).	CL				
		29									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-106 Sheet 4 of 5

Location: Roosevelt Bowling Lanes

Location Description:
Located 273.2 feet south of the northeast corner of the building at 60 Kellogg St. and 111.1 feet east of the southeast corner of building at 60 Kellogg St.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: May 12, 2006 - Mostly Cloudy, Morning Rain, 58°-66°F
Weather: May 15, 2006 - Cloudy, 51°-60°F
Date/Time Start: May 4, 2006 / 0800 (Ground Surface)
Date/Time Finish: May 23, 2006 / 1420 (114 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78	SP	9	1.7	NA	**78 to 80**	Red Brown; CLAY, trace- c Sand to f Gravel (angular to subangular); hard; saturated.	ML	pH: NA, mS: NA, Temp: NA, ntu. NA
		19						
79		23						
		41						
80	SP	11	1.7	ND	**80 to 82**	Red Brown; CLAY, trace- c Sand to c Gravel (angular to subrounded); hard; saturated.		pH: 7.56, mS: 1.76, Temp: 15.3, ntu. 40
		23						
81		34						
		59						
82	SP	12	0.0	NA	**82 to 84**	No Recovery.		pH: NA, mS: NA, Temp: NA, ntu. NA
		21						
83		36						
		47						
84	SP	6	1.1	NA	**84 to 86**	Red Brown; CLAY, trace+ mf Gravel (subangular); minor laminations; hard; saturated.		pH: 8.25, mS: 1.04, Temp: 19.1, ntu. >1000
		11						
85		25						
		22						
86	SP	13	1.6	NA	**86 to 88**	Red Brown; CLAY, trace c Sand to c Gravel (angular to subangular); hard; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		24						
87		27					CL	
		33						
88	SP	11	1.0	NA	**88 to 90**	Red Brown; CLAY, trace- c Sand to m Gravel (subangular to subrounded); hard; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		26						
89		32						
		41						
90	SP	9	1.5	NA	**90 to 92**	Red Brown; CLAY, trace- c Sand to m Gravel (subangular to subrounded); laminated; very stiff; saturated.		pH: 8.31, mS: 0.68, Temp: 16.1, ntu. NA
		13						
91		15						
		24						
92	SP	4	1.4	NA	**92 to 94**	Red Brown; CLAY, trace c Sand to c Gravel (subangular to subrounded); Silty Clay from 93.0-93.3 feet; laminated; hard; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		11						
93		20						
		22						
94	SP	12	1.7	NA	**94 to 96**	Red Brown; SILT, some Clay; Clay layer from 94.7-94.8 feet; laminated; hard; saturated (94.0-95.3).		pH: 8.45, mS: 0.22, Temp: 22.9, ntu. >1000
		19					ML	
95		22				Red Brown; CLAY; hard; saturated (95.3-95.7).		
		26					CL	
96	SP	14	1.5	NA	**96 to 98**	Red Brown; CLAY; hard; saturated (96.0-96.5).		pH: 8.49, mS: 0.25, Temp: 22.6, ntu. >1000
		17				Red Brown; SILT, little Clay; laminated; hard; saturated (96.5-97.5).		
97		29					ML	
		38						
98	SP	7	1.6	NA	**98 to 100**	Red Brown; CLAY; Silty from 98.0-98.3 feet; laminated; very stiff; saturated.		pH: NA, mS: NA, Temp: NA, ntu. NA
		8						
99		10						
		17						
100	SP	3	1.5	NA	**100 to 102**	Red Brown; CLAY; laminated; stiff; saturated.		pH: 8.43, mS: 0.34, Temp: 15.0, ntu. >1000
		5					CL	
101		6						
		8						
102	SP	5	0.9	NA	**102 to 104**	Red Brown; CLAY; laminated; very stiff; saturated (102.0-102.7).		pH: 8.56, mS: 0.50, Temp: 16.5, ntu. >1000
		5						
103		16				Red Brown; CLAY, some cmf Sand, some cmf Gravel; very stiff; saturated (102.7-102.9).		
		39						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Deep Overburden Well Investigation PROJECT NUMBER: HWEL.002.001.02	**BORING/ WELL NO.** Sheet 5 of 5 **124-SB-106** **Location:** Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: May 16, 2006 - Rain, 53°-68°F
Weather: May 17, 2006 - Mostly Sunny, 54°-72°F
Date/Time Start: May 4, 2006 / 0800 (Ground Surface)
Date/Time Finish: May 23, 2006 / 1420 (114 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 273.2 feet south of the northeast corner of the building at 60 Kellogg St. and 111.1 feet east of the southeast corner of building at 60 Kellogg St.

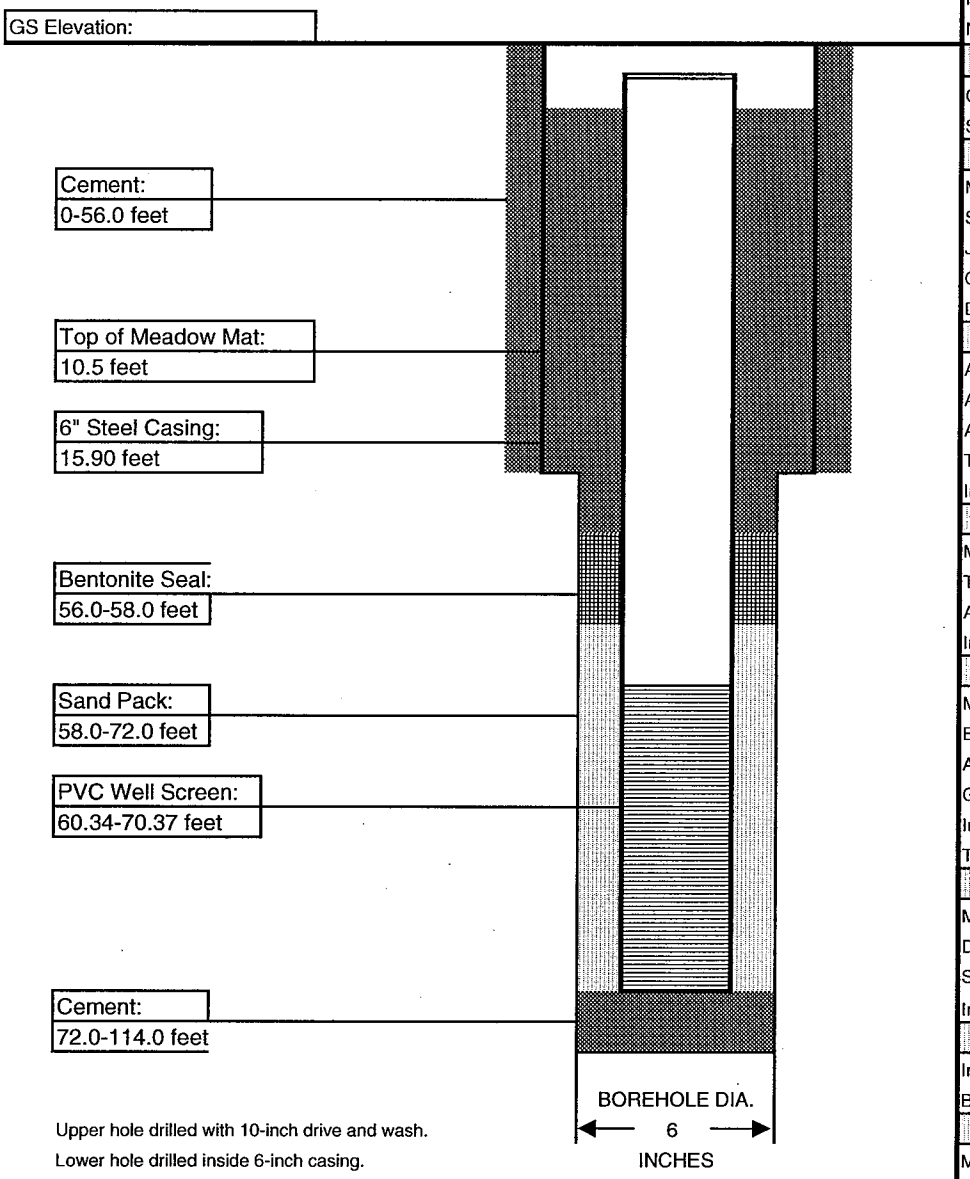
Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
104	SP	17	0.1	NA	**104 to 106** Red Brown; CLAY, some cmf Sand, some cmf Gravel; hard; saturated.	CL	pH: 8.08 mS: 2.09 Temp: 18 ntu. NA
		46					
105		41					
		30					
106	SS	41	1.6		**106 to 108** Red Brown; vf SAND, trace Silt, little c Sand to c Gravel (subangular); dense; saturated.	SP	pH: mS: Temp: ntu.
		20					
107		21					
		30					
108	SS	40	1.6		**108 to 110** Red Brown; f SAND, trace Silt, little cmf Gravel (subangular to subrounded); layers of cmf Sand at 108.1-108.2 and 109.5-109.6 feet; very dense; saturated.		pH: mS: Temp: ntu.
		40					
109		53					
		75					
110	SP	180	0.7	NA	**110 to 112** Red Brown; f SAND, little- Silt, little- c Sand to c Gravel (subrounded); very dense; saturated.	TILL	pH: NA mS: NA Temp: NA ntu. NA
		265/4"					
111						SM	
112	SP	180/5"	0.3	NA	**112 to 114** Red Brown; cmf SAND, some Silt, some- cmf Gravel (subangular); very dense; saturated.		pH: NA mS: NA Temp: NA ntu. NA
113							
114					End of Borehole at 114 feet.		
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							
128							
129							

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED FLUSHMOUNT WELL CONSTRUCTION LOG

WELL NO.:	124-MW-107T	FACILITY/SITE NAME:	Roosevelt Bowling Lanes
PROJ. NO.:	HWEL.002.001.02	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTC	B&B Drilling
DATE START:	24-May-06	DATE END:	15-Aug-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary



Upper hole drilled with 10-inch drive and wash.
Lower hole drilled inside 6-inch casing.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap	YES
GUARD POSTS	
Material:	N/A
No. & Size:	N/A
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" DIAMETER
RISER PIPE	
Material:	PVC
Schedule:	SCH 40
Joint Type:	THREADED
O-ring:	RUBBER
Diameter:	2.0 INCHES
GROUT	
Amt cement:	N/A
Amt bentonite:	N/A
Amt water:	N/A
Tremied:	YES
Interval:	0-56.0 and 72.0-114.0 F
SEAL	
Material:	BENTONITE
Type:	N/A
Amount Used:	N/A
Interval:	56.0-58.0 FEET
FILTER PACK	
Material:	SILICA SAND
Brand Name:	FILPRO
Amount Used:	N/A
Grain Size Dist.:	#1 WELL GRAVEL
Interval:	58.0-72.0 FEET
Tremied:	NO
SCREEN	
Material:	PVC
Diameter:	2.0 INCHES
Slot Size & Type:	0.010" MACHINE SLOT
Interval BGS:	60.34-70.37 FEET
SUMP	
Interval BGS:	70.37-70.58 FEET
Bottom Cap:	YES
BACKFILL PLUG	
Material:	CEMENT
Setup/Hydration Time:	24 HOURS

Contractor: B&B Drilling	**HYDROQUAL**	**BORING/**	Sheet 1 of 5
Driller: Ed Blewett	**DRILLING RECORD**	**WELL NO.**	124-SB-107
Inspector: N. Santella, M. Wilkinson	PROJECT NAME: Deep Overburden Well Investigation	**Location:**	Roosevelt Bowling Lanes
Rig Type: Gus Pech	PROJECT NUMBER: HWEL.002.001.02		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: May 24, 2006 - Sunny, 53°-74°F
Weather: May 25, 2006 - Sunny, 57°-76°F
Date/Time Start: May 24, 2006 / 1030 (Ground Surface)
Date/Time Finish: June 9, 2005 / 0930 (106 feet bGL)
Weight of Hammer: 300 Lbs.
Drop of Hammer: 30 Inches
Type of Hammer: mechanical

Location Description:

Located 323.3 feet northeast of the southeast corner of the building at 60 Kellogg St. and 84.6 feet southeast of the northeast corner of building at 60 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
0					**0 to 5**	Hand auger to 5 feet for utility clearance.					
1											
2											
3											
4											
5					**5 to 6**	Drilled to 6 feet.					
6	SP	1	1.3	1.5	**6 to 8**	Light Gray; CLAY-like material; layered; medium stiff; COPR present (6.0-6.7).	COPR	pH:	mS:	Temp:	ntu.
		1					ML	12.12	5.40	20	300
7		4				Dark Brown; SILT, some f Sand; loose; saturated (6.7-7.0).	SP				
		8				Dark Brown to Red Brown; f SAND; loose; saturated (7.0-7.3).					
8	SP	3	1.3	17.5	**8 to 10**	Dark Brown; f SAND, some Silt; thin black laminations; organic odor; very loose; saturated (8.0-8.8).	SM	pH:	mS:	Temp:	ntu.
		3					ML	12.21	10.73	17.5	45
9		1				Dark Brown; SILT; soft; saturated (8.8-9.0).					
		3				Yellowish Tan; COPR; soft; saturated (9.0-9.3).	COPR				
10	SP	1	0.7	4.0	**10 to 12**	Yellowish Tan; SILT; soft; saturated; COPR present (10.0-10.5).		pH:	mS:	Temp:	ntu.
		1				Brown to Black; SILT, trace f Sand; organic odor; soft saturated (10.5-10.7).		12.16	11.27	21.8	29
11		1					ML				
		1									
12	SP	1	1.9	NA	**12 to 14**	Dark Gray; CLAY/SILT; roots; soft; saturated.		pH:	mS:	Temp:	ntu.
		1					CL/ML	NA	NA	NA	NA
13		1									
		1									
14	SP	1	0.3	NA	**14 to 16**	Dark Brown to Black; SILT; shell fragments; soft; saturated.		pH:	mS:	Temp:	ntu.
		1						NA	NA	NA	NA
15		1					ML				
		3									
16	SS	2	0.4		**16 to 18**	Dark Brown; SILT; organic material present; soft; saturated.		pH:	mS:	Temp:	ntu.
		2									
17		2									
		3									
18	SS	3	1.1		**18 to 20**	Gray; CLAY; laminated; medium stiff; saturated (18.0-18.2).	CL	pH:	mS:	Temp:	ntu.
		3				Gray; f SAND; thin (1/2") Clay layer at 18.9 feet; thin (1/4") brown Sand layer at 18.7 feet; medium stiff; saturated (18.2-19.1).					
19		2					SP				
		2									
20	SP	7	0.8	ND	**20 to 22**	Brown; f SAND, trace Silt; medium dense; saturated (20.0-20.3).		pH:	mS:	Temp:	ntu.
		9				Brown; cmf SAND, trace+ f Gravel (rounded); trace- Silt; medium dense; saturated (20.3-20.5).		6.90	4.68	23.8	80
21		16					SM				
		15				Brown; f SAND, little Silt; medium dense; saturated (20.5-20.8).					
22	SP	3	0.8	ND	**22 to 24**	Brown; f SAND, trace- Silt; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		7						7.15	3.43	25.9	>1000
23		12									
		16					SP				
24	SP	4	0.1	ND	**24 to 26**	Brown; f SAND, trace- Silt; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		8						6.93	3.37	32.2	55
25		14									
		16									

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Additional Weather: June 8, 2006 - Scattered Rain, 57°-69°F
June 9, 2006 - Mix of Sun and Clouds, Afternoon Thunderstorm, 62°-73°F

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-107 Sheet 2 of 5
Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: May 26, 2006 - Sunny, 60°-80°F
Weather: May 30, 2006 - Mix of Sun and Clouds, 68°-85°F
Date/Time Start: May 24, 2006 / 1030 (Ground Surface)
Date/Time Finish: June 9, 2005 / 0930 (106 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Located 323.3 feet northeast of the southeast corner of the building at 60 Kellogg St. and 84.6 feet southeast of the northeast corner of building at 60 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
26	SP	9	0.0	ND	**26 to 28**	Red Brown; SILT, some vf Sand; very stiff; saturated.		pH:	mS:	Temp:	ntu.
		6					ML	7.04	2.87	31.1	>1000
27		10									
		9									
28	SP	6	0.2	ND	**28 to 30**	No Recovery.		pH:	mS:	Temp:	ntu.
		8						7.29	3.65	19.7	19
29		10									
		13									
30	SP	4	0.3	ND	**30 to 32**	Red Brown; f SAND, trace Silt; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		6					SP	7.35	3.49	21.1	>1000
31		12									
		16									
32	SP	9	0.1	ND	**32 to 34**	Red Brown; vf SAND; trace+ Silt; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		10						7.22	4.30	22.3	75
33		12				Note: Collapsing borehole indicates zone of c Sand to					
		13				f Gravel in this interval.	SP				
34	SP	12	0.1	ND	**34 to 36**	Red Brown; f SAND; trace Silt; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		16						7.69	3.83	24.5	>1000
35		14									
		19									
36	SP	18	0.1	ND	**36 to 38**	Red Brown; vf-f SAND, little Silt; very dense; saturated.		pH:	mS:	Temp:	ntu.
		28					SM	7.16	7.62	25.6	220
37		23									
		24									
38	SP	9	0.7	ND	**38 to 40**	Red Brown; SILT; some vf Sand; very stiff; saturated	ML	pH:	mS:	Temp:	ntu.
		11				(38.0-38.5).		6.98	11.09	29.3	100
39		14				Brown; vf SAND, trace Silt; medium dense; saturated	SP				
		13				(38.5-38.7).					
40	SP	12	0.7	ND	**40 to 42**	Brown; vf SAND, some Silt; medium dense; saturated.		pH:	mS:	Temp:	ntu.
		11					SM	7.05	12.19	21.0	380
41		12									
		10									
42	SP	3	1.5	NA	**42 to 44**	Red Brown; CLAY; possible laminations; Silt layer at		pH:	mS:	Temp:	ntu.
		4				42.5-42.7 feet; stiff; saturated.	CL	NA	NA	NA	NA
43		4									
		5									
44	SP	2	0.8	ND	**44 to 46**	Red Brown; SILT, little Clay; stiff; saturated.		pH:	mS:	Temp:	ntu.
		4						6.83	19.93	24.4	>1000
45		4									
		6									
46	SP	4	0.8	ND	**46 to 48**	Brown; SILT, trace Clay; stiff; saturated.	ML	pH:	mS:	Temp:	ntu.
		6						7.01	15.36	26.7	650
47		7									
		5									
48	SP	6	1.0	ND	**48 to 50**	Brown; SILT, little Clay; laminated; stiff; saturated (48.0-48.4).		pH:	mS:	Temp:	ntu.
		7				Brown; vf SAND, some Silt; medium dense; saturated		6.83	19.90	29.5	150
49		4				(48.4-49.0).	SM				
		6									
50	SP	2	1.0	ND	**50 to 52**	Brown; SILT; laminated; stiff; saturated (50.0-50.3).	ML	pH:	mS:	Temp:	ntu.
		3				Brown; CLAY; f Sand laminations; stiff; saturated (50.3-51.0).		6.93	16.33	27.4	45
51		5					CL				
		7									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

HYDROQUAL
DRILLING RECORD

BORING/ Sheet 3 of 5
WELL NO. 124-SB-107

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

Location: Roosevelt Bowling Lanes

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: May 31, 2006 - Mix of Sun and Clouds, 65°-78°F
Weather: June 1, 2006 - Cloudy, Thunderstorms, 66°-85°F
Date/Time Start: May 24, 2006 / 1030 (Ground Surface)
Date/Time Finish: June 9, 2005 / 0930 (106 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 323.3 feet northeast of the southeast corner of the building at 60 Kellogg St. and 84.6 feet southeast of the northeast corner of building at 60 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
52	SP		0.9	ND	**52 to 54**	Brown; CLAY; abundant vf Sand laminations; medium stiff; saturated.	CL	pH: 7.08	mS: 15.56	Temp: 19.2	ntu. 29
53											
54	SP	3	1.4	ND	**54 to 56**	Brown; CLAY; abundant vf Sand laminations; stiff; saturated.		pH: 7.24	mS: 13.01	Temp: 20.6	ntu. 210
		3									
55		6									
		7									
56	SP	5	1.0	ND	**56 to 58**	Brown; SILT/CLAY; abundant vf-f Sand laminations; very stiff; saturated (56.0-56.8).	ML/CL	pH: 7.24	mS: 12.43	Temp: 25.0	ntu. 450
		8									
57		17				Brown; vf SAND, some Silt; medium dense; saturated (56.8-57.0).	SM				
		11									
58	SP	5	1.2	ND	**58 to 60**	Brown; SILT/CLAY; vf Sand laminations; very stiff; saturated (58.0-58.3).	ML/CL	pH: 7.51	mS: 11.24	Temp: 23.1	ntu. 140
		9									
59		9				Brown; SILT, little vf Sand; medium dense; saturated (58.3-59.2).					
		7									
60	SP	5	1.1	ND	**60 to 62**	Brown; SILT, trace mf Gravel (angular); very stiff; saturated.		pH: 7.51	mS: 10.19	Temp: 25.4	ntu. 70
		7									
61		6					ML				
		10									
62	SP	11	0.9	ND	**62 to 64**	Brown; SILT, trace mf Gravel (angular); very stiff; saturated (62.0-62.7).		pH: 7.44	mS: 11.10	Temp: 24.8	ntu. 170
		13									
63		11				Brown; SILT, little Clay, very stiff; saturated (62.7-62.9).					
		12									
64	SP	10	1.1	ND	**64 to 66**	Brown; SILT; hard; saturated (64.0-64.7).		pH: 7.25	mS: 11.87	Temp: 17.1	ntu. 90
		18				Brown; CLAY, and Silt; hard; saturated (64.7-65.1).					
65		14					CL				
		11									
66	SP	12	1.3	ND	**66 to 68**	Brown; vf SAND, little Silt; dense; saturated (66.0-66.2).	SM	pH: 7.20	mS: 12.83	Temp: 17.7	ntu. 100
		25				Red Brown; SILT, c Sand to c Gravel (subangular) at 66.2-66.4 feet; hard; saturated (66.2-67.3).					
67		20					ML				
		14									
68	SP	12	1.0	ND	**68 to 70**	Brown; vf SAND, some Silt; dense; saturated.		pH: 7.22	mS: 12.84	Temp: 19.2	ntu. 120
		19					SM				
69		28									
		34									
70	SP	16	1.0	ND	**70 to 72**	Red Brown; SILT, thin (1/2") layer with mf Gravel (angular to subangular) at 70.6 feet; hard; saturated.		pH: 7.27	mS: 11.57	Temp: 20.4	ntu. 170
		18					ML				
71		32									
		33									
72	SP	7	0.1	NA	**72 to 74**	Red Brown; CLAY, very stiff; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		7									
73		14					CL				
		17									
74	SP	3	1.0	ND	**74 to 76**	Red Brown; CLAY, little c Sand to c Gravel (rounded); very stiff; saturated (74.0-74.4).		pH: 7.38	mS: 10.38	Temp: 16.4	ntu. 29
		5									
75		15				Red Brown; SILT; very stiff; saturated (74.4-75.0).	ML				
		23									
76	SP	9	1.1	NA	**76 to 78**	Brown to Red Brown; CLAY, little cmf Gravel (rounded); thin layers of vf Sand; very stiff; saturated.		pH: NA	mS: NA	Temp: NA	ntu. NA
		23					CL				
77		17									
		19									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor:	B&B Drilling	**HYDROQUAL**	**BORING/** Sheet 4 of 5
Driller:	Ed Blewett	**DRILLING RECORD**	**WELL NO.** 124-SB-107
Inspector:	Mike Wilkinson	PROJECT NAME: Deep Overburden Well Investigation	**Location:** Roosevelt Bowling Lanes
Rig Type:	Gus Pech	PROJECT NUMBER: HWEL.002.001.02	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: June 2, 2006 - Cloudy. Rain. 72°-78°F
Weather: June 5, 2006 - Cloudy. 58°-75°F
Date/Time Start: May 24, 2006 / 1030 (Ground Surface)
Date/Time Finish: June 9, 2005 / 0930 (106 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Located 323.3 feet northeast of the southeast corner of the building at 60 Kellogg St. and 84.6 feet southeast of the northeast corner of the building at 60 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS			
78	SP	6	1.1	ND	**78 to 80**	Brown; SILT, little Clay; hard; saturated (78.0-78.4).		pH:	mS:	Temp:	ntu.
		11				Brown; CLAY; laminated; hard; saturated (78.4-78.7).	ML	7.22	4.85	19.1	320
79		29				Brown; CLAY, little- cmf Gravel (rounded); hard; saturated					
		34				(78.7-79.1).					
80	SP	5	1.2	NA	**80 to 82**	Brown; CLAY, trace cmf Gravel (subrounded to rounded);		pH:	mS:	Temp:	ntu.
		10				vf Sand/Silt laminations; very stiff; saturated.		NA	NA	NA	NA
81		12									
		24									
82	SP	13	1.4	ND	**82 to 84**	Brown; CLAY, trace f Gravel (subrounded); laminated; thin		pH:	mS:	Temp:	ntu.
		16				(1/2") layer of f Sand at 82.5 feet; hard; saturated.		7.52	2.60	20.0	500
83		18									
		24									
84	SP	9	1.5	NA	**84 to 86**	Brown; CLAY, trace+ cmf Gravel (subrounded); vf Sand	CL	pH:	mS:	Temp:	ntu.
		19				laminations; hard; saturated.		NA	NA	NA	NA
85		35									
		34									
86	SP	8	1.5	NA	**86 to 88**	Brown; CLAY, trace cmf Gravel (subrounded to rounded);		pH:	mS:	Temp:	ntu.
		13				abundant vf Sand laminations; hard; saturated.		NA	NA	NA	NA
87		32									
		34									
88	SP	17	0.9	NA	**88 to 90**	Brown; CLAY; hard; saturated (88.0-88.2).		pH:	mS:	Temp:	ntu.
		100/6"				Brown; SILT, trace mf Gravel (subangular to subrounded);	ML	8.17	1.15	16.5	>1000
89						f Sand laminations; hard; saturated (88.2-88.9).					
90	SP	61	1.3	NA	**90 to 92**	Red Brown; SILT; hard; saturated (90.0-90.7).	ML	pH:	mS:	Temp:	ntu.
		59				Red Brown; CLAY, little cmf Gravel; hard; sat. (90.7-90.9).	CL	8.34	0.64	17.1	>1000
91		49				Red Brown; SILT; hard; saturated (90.9-91.1).	ML				
		53				Red Brown; CLAY, little cmf Gravel; hard; sat. (91.1-91.3).	CL				
92	SP	14	1.3	NA	**92 to 94**	Red Brown; CLAY, trace cmf Gravel (angular to subangular);		pH:	mS:	Temp:	ntu.
		23				laminations; hard; saturated.		NA	NA	NA	NA
93		33									
		35									
94	SP	7	1.7	NA	**94 to 96**	Brown; CLAY, trace- mf Gravel (subangular); laminated;		pH:	mS:	Temp:	ntu.
		9				very stiff; saturated.		NA	NA	NA	NA
95		15									
		22									
96	SP	9	1.8	NA	**96 to 98**	Brown; CLAY, trace- c Sand to mf Gravel (subangular to		pH:	mS:	Temp:	ntu.
		14				subrounded); abundant vf Sand/Silt laminations; hard;	CL	NA	NA	NA	NA
97		24				saturated.					
		33									
98	SS	5	1.8	NA	**98 to 100**	Brown; CLAY; abundant vf Sand laminations; stiff; saturated.		pH:	mS:	Temp:	ntu.
		4						NA	NA	NA	NA
99		8									
		10									
100		4	1.3	NA	**100 to 102**	Brown; CLAY; abundant vf Sand laminations; stiff; saturated		pH:	mS:	Temp:	ntu.
		4				(100.0-101.0).		NA	NA	NA	NA
101		6				Brown; CLAY; little cmf Sand, little cmf Gravel (angular to					
		9				subrounded); stiff; saturated (101.0-101.3).					
102		22	1.0	NA	**102 to 104**	Brown; vf SAND, some Clay, little+ c Sand to cmf Gravel		pH:	mS:	Temp:	ntu.
		21				(subangular to subrounded); very dense; saturated	SC	8.17	1.84	18	>1000
103		53				(101.0-101.3).					
		57									

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

Contractor: B&B Drilling
Driller: Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Deep Overburden Well Investigation
PROJECT NUMBER: HWEL.002.001.02

BORING/ WELL NO. 124-SB-107 Sheet 5 of 5

Location: Roosevelt Bowling Lanes

Location Description:
Located 323.3 feet northeast of the southeast corner of the building at 60 Kellogg St. and 84.6 feet southeast of the northeast corner of the building at 60 Kellogg St.

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: June 6, 2006 - Mostly Sunny, 60°-77°F
Weather: June 7, 2006 - Rain, 61°-68°F
Date/Time Start: May 24, 2006 / 1030 (Ground Surface)
Date/Time Finish: June 9, 2005 / 0930 (106 feet bGL)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Sample Depth	Sample Type	Blows per 6"	Rec. (ft)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
104	SP	74	1	ND	**104 to 106** Red Brown; vf SAND, little Silt, trace cmf Gravel (angular	TILL	pH: 7.84 mS: 1.25 Temp: 17.3 ntu. 85
		97			to subrounded); very dense; saturated.	SM	
105		94					
		114/4"					
106					End of Boring at 106 feet.		
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							
128							
129							

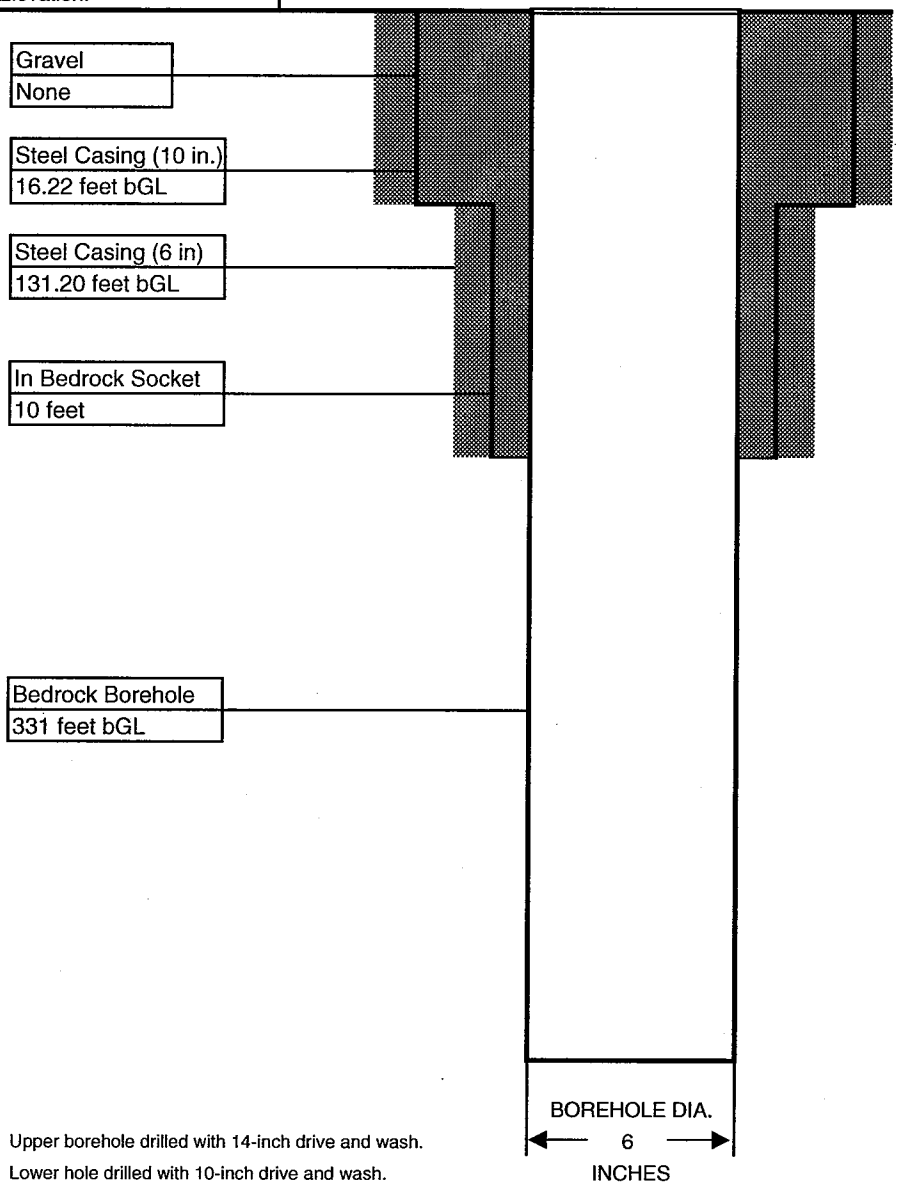
COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	140-MW-9BR	FACILITY/SITE NAME:	80 Kellog St.
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	30-Aug-05	DATE END:	12-Apr-06
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary

GS Elevation:



Upper borehole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	15 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	30" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 131.2 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: B&B Drilling
Driller: Tim Smith, Ed Blewett
Inspector: Mike Wilkinson
Rig Type: Geoprobe 5400, Mobile B-57
Gus Pech

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 1 of 13
WELL NO. 140-MW-9BR

Location:
80 Kellogg Street

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: August 30, 2005 - Cloudy, Humid, 75°-82°F
August 31, 2005 - Cloudy, Humid, 77°-86°F
Date/Time Start: August 30, 2005 / 1220 (Ground Surface)
Date/Time Finish: September 23, 2005 / 1230 (151 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0	GP		2.0		**0 to 2**	Asphalt Surface Material (0-0.6). Dark Brown to Black; cmf SAND, little Silt, little f Gravel; petroleum odor; slag with wood below 1.0 foot, concrete from 1.8-2.0 feet; very loose; moist (0.6-2.0).		
1								
2	GP		4.0		**2 to 6**	Dark Gray; f SAND, some Silt; wood; loose; moist, wet at 2.7 feet, saturated at 3.4 feet (2.0-6.0).	SM	
3								
4								
5								
6	GP		2.0		**6 to 8**	Dark Gray; CLAY; organic odor; very soft; saturated (6.0-6.7). Gray; mf SAND; trace shell fragments; very loose; saturated (6.7-8.0).	OL	
7								
8	GP		4.0		**8 to 12**	Gray; mf SAND; trace shell fragments; very loose; saturated (6.7-8.0).		
9								
10								
11							SP	
12	GP		4.0		**12 to 16**	Gray; mf SAND; trace shell fragments; very loose; saturated (12.0-15.9). Dark Brown; PEAT; very soft; wet (15.9-16.0).		
13								
14								
15								
16	GP		2.5		**16 to 18.5**	Dark Gray to Dark Brown; PEAT; organic odor; very soft; saturated (16.0-16.3).	PT	
17						Dark Brown; PEAT, and f Sand; organic odor; very soft; wet (16.3-16.6).	SP	
18						Light Gray; f SAND; loose; saturated (16.6-18.5).		
19						Drilled to 20 feet.		
20	SS	9	1.2		**20 to 22**	Gray; mf SAND; medium dense; saturated (20.0-20.8).	SP	
		10						
21		13				Grey; SILT, trace mf Sand; very stiff; saturated (20.8-21.2).	ML	
		10						
22						Drilled to 25 feet.		
23								
24								
25	SS	13	1.2		**25 to 27**	Red Brown; mf SAND, some Silt; medium dense; saturated (25.0-25.9).	SM	
		21				Red Brown; mf SAND, trace Silt; medium dense; saturated (25.9-26.2).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor:	B&B Drilling	HYDROQUAL DRILLING RECORD	BORING/ WELL NO.	Sheet 2 of 13 140-MW-9BR
Driller:	Tim Smith, Ed Blewett		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Flute Bedrock Investigation	80 Kellogg Street	
Rig Type:	Mobile B-57, Gus Pech	PROJECT NUMBER: HWEL.002.001.03		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 7, 2005 - Sunny, 62°-84°F
September 8, 2005 - Sunny, 65°-86°F
Date/Time Start: August 30, 2005 / 1220 (Ground Surface)
Date/Time Finish: September 23, 2005 / 1230 (151 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		23				Continued from above.	SP	
		15						
27						Drilled to 30 feet.		
28								
29								
30	SS	6	1.4		**30 to 32**	Red Brown; SILT, little+ f Sand; stiff; saturated.	ML	
		6						
31		8						
		13						
32						Drilled to 35 feet.		
33								
34								
35	SS	4	1.4		**35 to 37**	Red Brown; SILT, little+ f Sand; stiff; saturated (35.0-36.1).	ML	
		8				Red Brown; CLAY, stiff; saturated (36.1-36.4).		
36		6					CL	
		10						
37						Drilled to 40 feet.		
38								
39								
40	SS	13	1.2		**40 to 42**	Red Brown; SILT, little+ f Sand; hard; saturated (40.0-40.5).	ML	
		20				Red Brown; f SAND, and Silt; medium dense; saturated	SM	
41		16				(40.5-40.8).	ML	
		18				Red Brown; SILT, some f Sand; hard; saturated (40.8-41.2).		
42						Drilled to 45 feet.		
43								
44								
45	SS	3	1.7		**45 to 47**	Red Brown; CLAY, trace- f Gravel; stiff; saturated.	CL	
		4						
46		5						
		6						
47						Drilled to 47 feet.		
48								
49								
50	SS	2	1.8		**50 to 52**	Red Brown; CLAY, trace- c Sand to f Gravel; stiff; saturated.	CL	
		3						
51		6						
		19						

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Tim Smith, Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Gus Pech	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 3 of 13 **WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 9, 2005 - Mostly Sunny, 69°-84°F
September 13, 2005 - Mix of Sun and Clouds, 72°-90°F
Date/Time Start: August 30, 2005 / 1220 (Ground Surface)
Date/Time Finish: September 23, 2005 / 1230 (151 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
52					Drilled to 55 feet.		
53							
54							
55	SS	3	1.2		**55 to 57** Red Brown; CLAY, trace- c Sand to f Gravel (angular); stiff; saturated.	CL	
		5					
56		6					
		10					
57					Drilled to 60 feet.		
58							
59							
60	SS	11	1.3		**60 to 62** Red Brown; SILT; hard; saturated.	ML	
		16					
61		20					
		29					
62					Drilled to 65 feet.		
63							
64							
65	SS	3	2.0		**65 to 67** Red Brown; CLAY, trace- c Sand to mf Gravel (angular); stiff; saturated.	CL	
		5					
66		5					
		8					
67					Drilled to 70 feet.		
68							
69							
70	SS	1	2.0		**70 to 72** Red Brown; CLAY; stiff; saturated (70.0-71.5).	CL	
		5			Red Brown; SILT/CLAY; stiff; saturated (71.5-72.0).		
71		8					
		8				CL/ML	
72					Drilled to 75 feet.		
73							
74							
75	SS	10	1.1		**75 to 77** Red Brown; SILT; hard; saturated.	ML	
		15					
76		16					
		13					
77					Drilled to 77 feet.		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling Driller: Tim Smith, Ed Blewett Inspector: Mike Wilkinson Rig Type: Mobile B-57, Gus Pech	HYDROQUAL DRILLING RECORD PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	BORING/ WELL NO. 140-MW-9BR Sheet 4 of 13 Location: 80 Kellogg Street

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 14, 2005 - Mostly Cloudy, 72°-92°F
September 15, 2005 - Light Rain, 75°-82°F
Date/Time Start: August 30, 2005 / 1220 (Ground Surface)
Date/Time Finish: September 23, 2005 / 1230 (151 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78					Continued from above.		
79							
80	SS	6	0.4		**80 to 82** Red Brown; CLAY, little Silt, little c Sand to mf Gravel (subrounded to rounded); stiff; saturated.	CL	
		10					
81		14					
		15					
82					Drilled to 85 feet.		
83							
84							
85	SS	5	1.6		**85 to 87** Red Brown; CLAY/SILT, little cmf Sand, little- mf Gravel (subrounded); stiff; saturated.	CL/ML	
		9					
86		13					
		26					
87					Drilled to 90 feet.		
88							
89							
90	SS	9	1.9		**90 to 92** Red Brown; CLAY, trace cmf Sand, trace cmf Gravel; hard; saturated.	CL	
		22					
91		28					
		70					
92					Drilled to 95 feet.		
93							
94							
95	SS	18	0.0		**95 to 97** No Recovery.		
		29					
96		38					
		38					
97					Drilled to 100 feet.		
98							
99							
100	SS	4	1.6		**100 to 102** Red Brown; CLAY, trace cmf Sand, trace mf Gravel (subangular); very stiff; saturated.	CL	
		8					
101		8					
		9					
102					Drilled to 105 feet.		
103							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Tim Smith, Ed Blewett **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Gus Pech	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street	Sheet 5 of 13

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 19, 2005 - Mostly Sunny, 67°-84°F
September 21, 2005 - Sunny, 66°-85°F
Date/Time Start: August 30, 2005 / 1220 (Ground Surface)
Date/Time Finish: September 23, 2005 / 1230 (151 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:
Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	4	1.9		**105 to 107**	Red Brown; CLAY, trace cmf Sand, trace- mf Gravel; stiff; saturated.	CL	
		6						
106		8						
		10						
107						Drilled to 110 feet. Drilling became hard at 107 feet.		
108								
109								
110	SS	32	1.0		**110 to 112**	Red Brown; mf SAND, some Silt, little+ cmf Gravel; dense; saturated.	SM (TILL)	
		25						
111		23						
		20						
112						Drilled to 115 feet.		
113								
114								
115	SS	100/2"	0.1		**115 to 117**	Red Brown; mf SAND, some Silt, little+ cmf Gravel; very dense; saturated.	SM (TILL)	
116								
117						Drilled to 120 feet.		
118								
119								
120	SS	87	0.5		**120 to 122**	Red Brown; cmf SAND, some Silt, little+ cmf Gravel; very dense; saturated.	SM (TILL)	
		145/4"						
121						Very hard drilling at 121 feet.	BEDROCK	
122						Drilled to 125 feet.		
123								
124								
125	SS	100/0"	0.0		**125 to 127**	No Recovery.		
126								
127						Drilled to 131 feet.		
128								
129								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Ed Blewett, Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Gus Pech, Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 6 of 13 **WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 22, 2005 - Mostly Sunny, 67°-84°F
September 23, 2005 - Mix of Sun and Clouds, 71°-86°F
Date/Time Start: August 30, 2005 / 1220 (Ground Surface)
Date/Time Finish: September 23, 2005 / 1230 (151 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
130						Continued from above.	BEDROCK	
131	AR				**131 to 136**	Dark Gray; very fine-grained SANDSTONE.		
136	AR				**136 to 141**	Dark Gray; very fine-grained SANDSTONE (85-90%). Light Greenish Gray; fine- to medium-grained SANDSTONE (10-15%).		
141	AR				**141 to 146**	Light Greenish Gray; fine- to medium-grained SANDSTONE (70-80%). Dark Gray; very fine-grained SANDSTONE (20-30%).		
146	AR				**146 to 151**	Light Greenish Gray; fine- to medium-grained SANDSTONE (95%). Dark Gray; fine- to medium-grained SANDSTONE (5%).		
151	AR				**151 to 161**	Red Brown; SILTSTONE (75-80%). Light Gray; fine-grained SANDSTONE (20-25%).		
155								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling
Driller: Justin Myerhoffer
Inspector: Mike Wilkinson
Rig Type: Ingersoll Rand T4W

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 7 of 13
WELL NO. 140-MW-9BR

Location:
80 Kellogg Street

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 12, 2006 - Sunny, 52°-68°F
Date/Time Start: April 12, 2006 / 0900 (151 feet)
Date/Time Finish: April 12, 2006 / 1345 (331 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.	BEDROCK	
157							
158							
159							
160							
161	AR				**161 to 171** Red Brown; SILTSTONE.		
162							
163							
164							
165							
166							
167							
168							
169							
170							
171	AR				**171 to 181** Greenish Gray to Beige; fine-grained SANDSTONE.		
172							
173							
174							
175							
176							
177							
178							
179							
180							
181	AR				**181 to 191** Beige; fine-grained SANDSTONE.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** 140-MW-9BR Sheet 8 of 13 **Location:** 80 Kellogg Street

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 12, 2006 - Sunny, 52°-68°F

Date/Time Start: April 12, 2006 / 0900 (151 feet)

Date/Time Finish: April 12, 2006 / 1345 (331 feet)

Weight of Hammer NA

Drop of Hammer NA

Type of Hammer NA

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.	BEDROCK	
183							
184							
185							
186							
187							
188							
189							
190							
191	AR				**191 to 201** Beige; fine-grained SANDSTONE.		
192							
193							
194							
195							
196							
197							
198							
199							
200							
201	AR				**201 to 211** Beige; fine-grained SANDSTONE (80-85%). Dark Gray; SILTSTONE (15-20%).		
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor:	B&B Drilling	HYDROQUAL DRILLING RECORD	BORING/ WELL NO.	Sheet 9 of 13 140-MW-9BR
Driller:	Justin Myerhoffer		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Flute Bedrock Investigation	80 Kellogg Street	
Rig Type:	Ingersoll Rand T4W	PROJECT NUMBER: HWEL.002.001.03		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 12, 2006 - Sunny, 52°-68°F

Date/Time Start: April 12, 2006 / 0900 (151 feet)
Date/Time Finish: April 12, 2006 / 1345 (331 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.	BEDROCK	
209							
210							
211	AR				**211 to 221** Red Brown; SILTSTONE.		
212							
213							
214							
215							
216							
217							
218							
219							
220							
221	AR				**221 to 231** Gray; fine-grained SANDSTONE (70%). Beige; fine-grained SANDSTONE (30%).		
222							
223							
224							
225							
226							
227							
228							
229							
230							
231	AR				**231 to 241** Beige; fine-grained SANDSTONE (80-85%). Dark Gray; SILTSTONE (15-20%). Red Brown; SILTSTONE (trace).		
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 10 of 13 **WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 12, 2006 - Sunny, 52°-68°F

Date/Time Start: April 12, 2006 / 0900 (151 feet)

Date/Time Finish: April 12, 2006 / 1345 (331 feet)

Weight of Hammer NA

Drop of Hammer NA

Type of Hammer NA

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.		
235							
236							
237							
238							
239							
240							
241	AR				**241 to 251** Beige; fine-grained SANDSTONE (65-75%). Red Brown; SILTSTONE (25-35%).	BEDROCK	
242							
243							
244							
245							
246							
247							
248							
249							
250							
251	AR				**251 to 261** Red Brown; SILTSTONE (90-95%). Beige; fine-grained SANDSTONE (5-10%).		
252							
253							
254							
255							
256							
257							
258							
259							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 11 of 13 **WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 12, 2006 - Sunny, 52°-68°F
Date/Time Start: April 12, 2006 / 0900 (151 feet)
Date/Time Finish: April 12, 2006 / 1345 (331 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.	BEDROCK	
261	AR				**261 to 271** Beige; fine-grained SANDSTONE (65-75%). Red Brown; SILTSTONE (25-35%).		
271	AR				**271 to 281** Gray to Dark Gray; SILTSTONE.		
281	AR				**281 to 291** Dark Brown to Red Brown; SILTSTONE.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 12 of 13 **WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: April 12, 2006 - Sunny, 52°-68°F

Date/Time Start: April 12, 2006 / 0900 (151 feet)

Date/Time Finish: April 12, 2006 / 1345 (331 feet)

Weight of Hammer NA

Drop of Hammer NA

Type of Hammer NA

Location Description:

Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.	BEDROCK	
287							
288							
289							
290							
291	AR				**291 to 301** Beige to Gray; fine-grained SANDSTONE.		
292							
293							
294							
295							
296							
297							
298							
299							
300							
301	AR				**301 to 311** Red Brown; SILTSTONE.		
302							
303							
304							
305							
306							
307							
308							
309							
310							
311	AR				**311 to 321** Beige; fine-grained SANDSTONE (80%). Red Brown; SILTSTONE (20%).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

Contractor: B&B Drilling **Driller:** Justin Myerhoffer **Inspector:** Mike Wilkinson **Rig Type:** Ingersoll Rand T4W	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 13 of 13 **WELL NO.** 140-MW-9BR **Location:** 80 Kellogg Street	
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From	Weather: April 12, 2006 - Sunny, 52°-68°F Date/Time Start: April 12, 2006 / 0900 (151 feet) Date/Time Finish: April 12, 2006 / 1345 (331 feet) Weight of Hammer NA Drop of Hammer NA Type of Hammer NA	**Location Description:** Well 140-MW-9BR is located 23.9 feet south of the southwest corner of 80 Kellogg St. and 56.3 feet west of the southeast corner of 80 Kellogg St.	

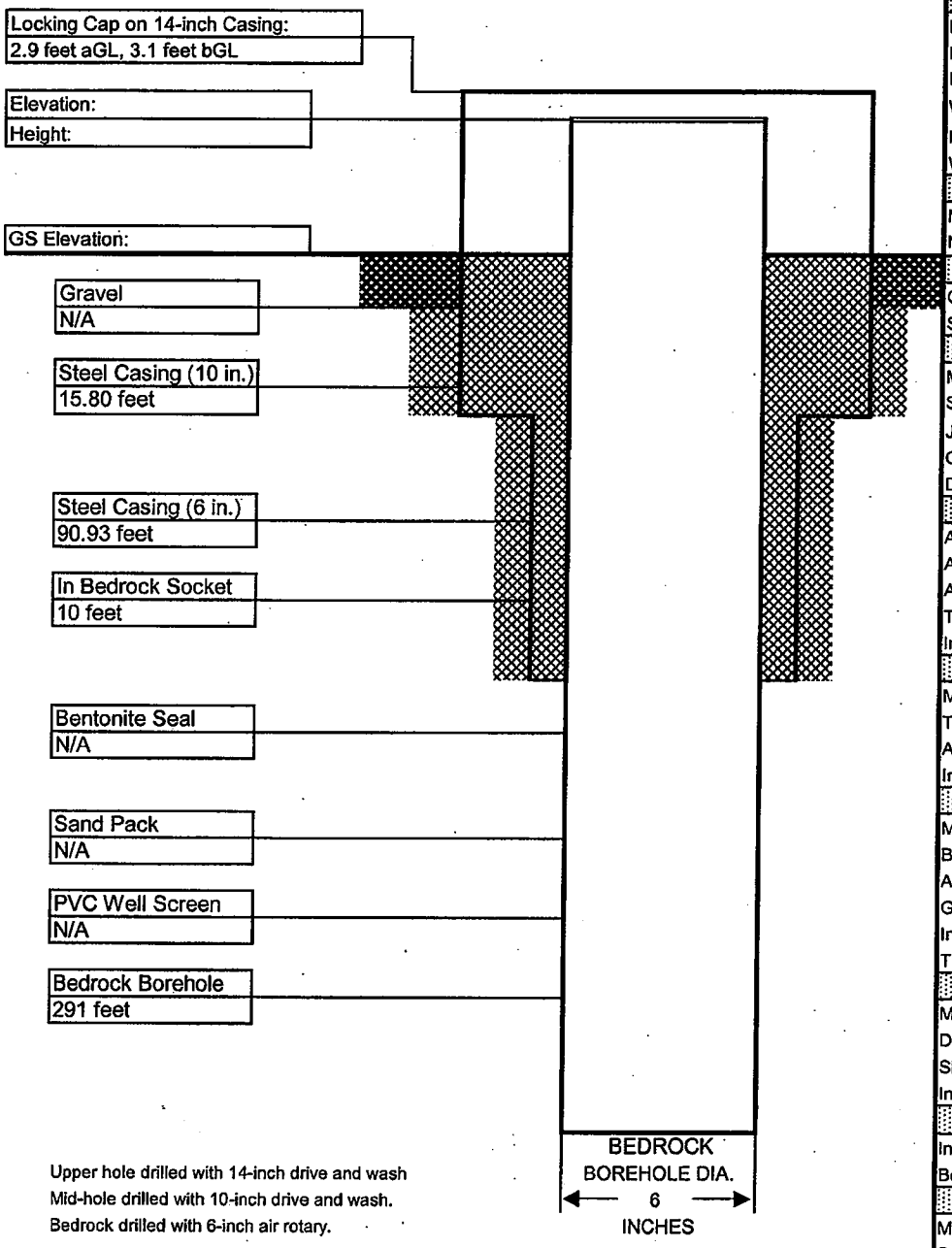
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
312					Continued from above.		
313							
314							
315							
316							
317							
318							
319							
320							
321	AR				**321 to 331** Light Gray: fine-grained SANDSTONE.	BEDROCK	
322							
323							
324							
325							
326							
327							
328							
329							
330							
331					Bottom of borehole at 331 feet.		
332							
333							
334							
335							
336							
337							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval (estimated percentage of each rock type in parenthesis).

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	SA6-MW-5BR	FACILITY/SITE NAME:	Hudson Mall
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	4-Jun-04	DATE END:	26-Jul-04
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 14-inch drive and wash
Mid-hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

PROTECTIVE CASING	
Material:	STEEL
Diameter:	14 INCHES
Depth BGS:	2.1 FEET
Water Tight Seal:	NA
Flushmount:	NONE
Weep hole:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	NA
Size:	NA
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 90.93 FEET
SEAL	
Material:	NONE
Type:	N/A
Amount Used:	N/A
Interval:	N/A
FILTER PACK	
Material:	NONE
Brand Name:	NA
Amount Used:	NA
Grain Size Dist.:	NA
Interval:	NA
Tremied:	NA
SCREEN	
Material:	NONE
Diameter:	NA
Slot Size & Type:	NA
Interval BGS:	NA
SUMP	
Interval BGS:	NONE
Bottom Cap:	NONE
BACKFILL PLUG	
Material:	NONE
Setup/Hydration Time:	NA

Figure C1 5.2

Contractor: B&B Drilling Driller: Ed Blewett Inspector: Mike Wilkinson Rig Type: Gus Pech	PARSONS DRILLING RECORD PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	BORING/ WELL NO. SA6-MW-5BR Sheet 1 of 12 Location: Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: June 4, 2004 / 1005 (Ground Level)
Date/Time Finish: June 17, 2004 / 1200 (90.9 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0					0 to 5	Dark Brown; SILT, little mf Sand, little cmf Gravel; moist (0-1.0).	ML	
						Brown; f SAND, little+ mf Gravel; moist (1.0-2.0).		
1						Gray; f SAND; weak hydrocarbon odor; glass; moist to wet (2.0-3.0).		
						Dark Brown to Dark Gray; f SAND, some Silt; glass, tile, red brick,	SP	
2						rubber, scrap metal, plastic, roots; moist (3-5).		
3								
4								
						Hand dig to 5 feet.	SM	
5	SS	3	0.4		5 to 7	Dark Gray; f SAND, little Silt, trace mf Gravel; glass; loose;		
		4				saturated. Wood in tip of spoon.		
6		2						
		5						
7	SS	4	0.9		7 to 9	Dark Brown; f SAND, trace f Gravel; medium dense; saturated.		
		8					SP	
8		5						
		4						
9	SS	7	0.2		9 to 11	Dark Gray; CLAY; very soft; saturated.		
		3					CL	
10		1						
		2						
11	SS	1	0		11 to 13	No Recovery.		
		1						
12		1						
		1						
13	SS	1	0.3		13 to 15	Olive Gray; CLAY; very soft; saturated.		
		WOR					CL	
14		1						
		1						
15	SS	1	1.8		15 to 17	Olive Gray; CLAY; very soft; saturated (15.2-15.8).	CL	
		1				Dark Gray; PEAT; soft; organic odor; wet (15.8-16.0).	PT	
16		2				Light Gray; f SAND, trace- f Gravel; very loose; saturated	SP	
		3				(16.0-17.0).		
17						Drilled to 20 feet.		
18								
19								
20	SP	11	1.5	NA	20 to 22	Gray; f SAND; Silt laminations below 21.4 feet; medium dense;		pH 6.93 | mS: 11.49 | Temp: 24.8 | ntu. NA
		13				saturated.	SP	
21		9						Diss. Hex Cr, Diss. Total Cr, Total Cr/TDS/Resistivity only
		7				Collected Sample OSBR-MW-05-020022 @ 1015		
22						Drilled to 25 feet.		
23								
24								
25	SP	5	0.6	NA	25 to 27	Gray; SILT, little- f Sand; micaceous grains; Silty Clay from	ML	pH 11.40 | mS: 4.72 | Temp: 25 | ntu. NA
		2				25.2-25.4 feet; medium stiff; saturated.		

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Permanent 10 inch steel casing installed to 15.8 feet. Six inch steel casing installed to 91 feet.

Contractor: B&B Drilling **Driller:** Ed Blewett **Inspector:** Mike Witkinson **Rig Type:** Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** SA6-MW-5BR **Location:** Hudson Mall	Sheet 2 of 12

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: June 4, 2004 / 1005 (Ground Level)
Date/Time Finish: June 17, 2004 / 1200 (90.9 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		6				Continued from above.		
		7				Collected Sample OSBR-MW-05-025027 @ 1115		
27						Drilled to 30 feet.		
28								
29								
30	SP	2	1.2	0	30 to 32	Gray Brown; SILT, little Clay; medium stiff; saturated (30.0-30.5).	ML	pH 6.88 mS: 8.14 Temp: 24.8 ntu. 500
		5						
31		3				Gray; f SAND; loose; saturated (30.5-31.2).	SP	
		4				Collected Sample OSBR-MW-05-030032 @ 1210		
32						Drilled to 35 feet.		
33								
34								
35	SP	3	1.4	0	35 to 37	Brown; CLAY/SILT; with f sand laminations; medium stiff; saturated (35.0-35.8).	CL/ML	pH 6.94 mS: 5.51 Temp: 26.8 ntu. 380
		2						
36		4				Gray; f SAND; loose; saturated (35.8-36.4).	SP	
		4				Collected Sample OSBR-MW-05-035037 @1310		
37						Drilled to 40 feet.		
38								
39								
40	SP	2	0.1	NA	40 to 42	Brown; f SAND, little Silt; possible slough; loose; saturated.		pH 8.52 mS: 4.75 Temp: 29.8 ntu. NA
		5					SM	
41		4						
		5				Collected Sample OSBR-MW-05-040042 @ 1410		Dissolved Hex Cr only
42						Drilled to 42 feet.		
43								
44								
45	SP	3	1.0	NA	45 to 47	Brown; mf SAND; loose; saturated (45.0-45.5).		pH 6.88 mS: 4.12 Temp: 31.1 ntu. NA
		4				Brown; f SAND, trace f Gravel; loose; saturated (45.5-46.0).	SP	
46		5						
		7				Collected Sample OSBR-MW-05-045047 @ 1500		Dissolved Hex Cr only
47						Drilled to 50 feet.		
48								
49								
50	SP	5	1.5	0	50 to 52	Brown; mf SAND; silt lenses at 50.7 feet and 50.9-51.0 feet; medium dense; saturated.		pH 6.58 mS: 4.50 Temp: 23.8 ntu. 140
		5					SP	
51		6						
		9				Collected Sample OSBR-MW-05-050052 @ 0940		

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 3 of 12 SA6-MW-5BR
Driller:	Ed Blewett		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hudson Mall	
Rig Type:	Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: June 4, 2004 / 1005 (Ground Level)
Date/Time Finish: June 17, 2004 / 1200 (90.9 feet)
Weight of Hammer 300 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SP	13	1.3	NA	55 to 57	Brown; mf SAND, little Silt; zones with cmf Gravel at 55.0-55.5 and 55.8-56.0 feet; dense; saturated	SP	pH mS: Temp: ntu. NA NA NA NA
		22						
56		16						
		12				Collect Sample OSBR-MW-05-055057 @ 1045		Dissolved Hex Cr only
57						Drilled to 60 feet.		
58								
59								
60	SP	17	1.4	NA	60 to 62	Red Brown; cmf GRAVEL, some cmf Sand, little- Silt; very dense; saturated.	GW	pH mS: Temp: ntu. 11.38 3.61 25 NA
		23						
61		45						
		37				Collect Sample OSBR-MW-05-060062 @ 1150		Dissolved Hex Cr only
62						Drilled to 65 feet.		
63								
64								
65	SP	23	1.6	NA	65 to 67	Red Brown; SILT some cmf Gravel; hard; saturated (65.0-65.5).	ML	pH mS: Temp: ntu. 10.26 6.39 24.3 NA
		27				Red Brown; SILT, trace mf Gravel, trace Sand; hard; sat. (65.5-66.2).		
66		26				Red Brown; SILT, some Clay, trace mf Gravel; hard; sat. (66.2-66.6).		
		19				Collect Sample OSBR-MW-05-065067 @ 1330		
67						Drilled to 70 feet.		
68								
69								
70	SP	17	2.0	NA	70 to 72	Red Brown; CLAY/SILT, little- cmf Gravel; hard; moist.	CL/ML (TILL)	pH mS: Temp: ntu. NA NA NA NA
		19						
71		21						
		47				No Sample Collected		
72						Drilled to 75 feet.		
73								
74								
75	SP	9	1.4	NA	75 to 77	Red Brown; CLAY/SILT, trace mf Gravel; very stiff; saturated.	CL/ML (TILL)	pH mS: Temp: ntu. NA NA NA NA
		14						
76		13						
		24				No Sample Collected		
77						Drilled to 80 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Permanent 6 inch casing installed to 28 feet. Two inch PVC monitoring well installed to 40 feet and screened from 30 to 40 feet.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 4 of 12 SA6-MW-5BR
Driller:	E. Blewett, D. Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hudson Mall	
Rig Type:	Gus Pech, Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS					Weather: See Daily Report	Location Description:
Water Level					Date/Time Start: July 26, 2004 / 1025 (90.9 feet)	
Date					Date/Time Finish: July 26, 2004 / 1315 (291 feet)	
Time						
Meas. From					Weight of Hammer 300 Lbs.	
					Drop of Hammer 30 Inches	
					Type of Hammer mechanical	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78					Drilled to 80 feet.		
79							
80	SP	20	0.8	NA	80 to 82 Red Brown; CLAY/SILT, little- cmf Gravel (subrounded);	CL/ML	pH mS: Temp: ntu.
		50/2"			hard; saturated.	(TILL)	NA NA NA NA
81					No Sample Collected	BEDROCK	
82					Drilled to 85 feet.		
83							
84							
85	SS	50/0"	0		85 to 87 No Recovery. Used split-spoon to confirm the presence of bedrock, angular to subangular Siltstone fragments inside split-spoon.		
86							
87					Drilled to 291 feet.		
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 5 of 12 SA6-MW-SBR
Driller:	Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hudson Mall	
Rig Type:	Ingersol Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
104					Continued from above.		
105							
106							
107							
108							
109					Possible fracture at 109 feet.		
110							
111							
112							
113							
114					Possible fracture zone at 114-117 feet.		
115							
116							
117						BEDROCK	
118							
119							
120					Possible fracture at 119.5 feet.		
121							
122					Possible fracture at 122 feet.		
123							
124							
125							
126					Softer drilling at 126 feet.		
127							
128							
129					Possible fracture at 129 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 6 of 12 SA6-MW-5BR
Driller:	Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hudson Mall	
Rig Type:	Ingersol Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
130					Continued from above.		
131							
132							
133					Possible fractures at 133.5-134.5 feet.		
134							
135					Hard drilling at 135 feet.		
136							
137							
138							
139							
140							
141							
142					Soft drilling at 142-146 feet.	BEDROCK	
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor: B&B Drilling Driller: Dave Myerchin Inspector: Mike Wilkinson Rig Type: Ingersol Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 7 of 12 **WELL NO.** SA6-MW-SBR **Location:** Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
156					Continued from above.		
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
						BEDROCK	
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 8 of 12 SA6-MW-5BR
Driller:	Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hudson Mall	
Rig Type:	Ingersol Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
182					Continued from above.		
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195						BEDROCK	
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor:	B&B Drilling
Driller:	Dave Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Ingersol Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. SA6-MW-5BR (Sheet 9 of 12)
Location: Hudson Mall

Location Description:

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
208					Continued from above.		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220						BEDROCK	
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersol Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 10 of 12 **WELL NO.** SA6-MW-5BR **Location:** Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)

Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
234					Continued from above.		
235							
236							
237							
238							
239							
240							
241							
242							
243					Possible fracture at 243 feet.		
244							
245							
246						BEDROCK	
247							
248							
249							
250							
251							
252							
253							
254							
255							
256							
257							
258							
259							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 11 of 12 SA6-MW-5BR
Driller:	Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	Hudson Mall	
Rig Type:	Ingersol Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.		
261							
262							
263							
264							
265							
266							
267							
268							
269							
270							
271							
272							
						BEDROCK	
273							
274							
275							
276							
277							
278							
279							
280							
281							
282							
283							
284							
285							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

Contractor: B&B Drilling **Driller:** Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Ingersol Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 12 of 12 **WELL NO.** SA6-MW-5BR **Location:** Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: See Daily Report
Date/Time Start: July 26, 2004 / 1025 (90.9 feet)
Date/Time Finish: July 26, 2004 / 1315 (291 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

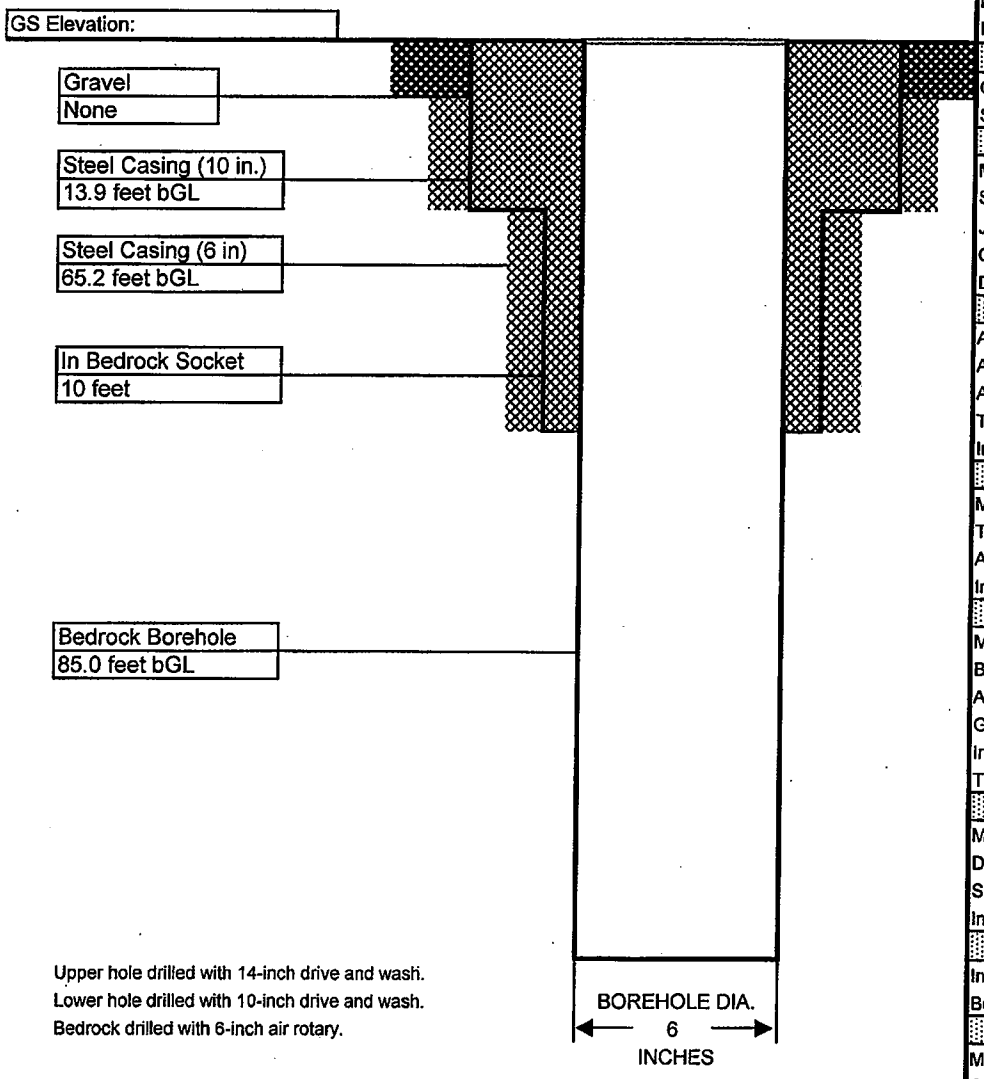
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 Mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
286					Continued from above.		
287							
288							
289							
290							
291					End of Borehole at 291 feet.	BEDROCK	
292							
293							
294							
295							
296							
297							
298							
299							
300							
301							
302							
303							
304							
305							
306							
307							
308							
309							
310							
311							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
SP = SIMULPROBE SAMPLER

COMMENTS:
Rock chips were blown directly into a covered rolloff during air rotary drilling, in order to keep dust levels down, and were not observed. Notes describing fractures in bedrock are based on the response of the drilling rig.

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	SA6-MW-14BR	FACILITY/SITE NAME:	Hudson Mall (behind Hyundai Dealership)
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Nick Santella	DRILLING CONTACTO	SGS
DATE START:	10-Oct-05	DATE END:	21-Oct-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" X 24"
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 65.2 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: SGS
Driller: Larry Lynch
Inspector: Nick Santella
Rig Type: Mobile B80

HYDROQUAL DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. SA6-MW-14BR

Location: Hudson Mall

Location Description:
Well SA6-MW-14BR is located 86.3 feet west of the southwest cornerd of the Hyundai Dealership and 19.6 feet north of utility pole A70132JC.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: October 10, 2005 - Cloudy, 58°-62°F
October 11, 2005 - Cloudy, Rain, 58°-62°F
Date/Time Start: October 10, 2005 / 1100 (Ground Surface)
Date/Time Finish: October 21, 2005 / 1040 (85 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0			NA		1 to 5	Topsoil; moist (0-0.5).		
						Red Brown; mf SAND; moist (0.5-2.0).		
1						Red Brown; mf SAND; layers of Black Silt; cement; metal; moist.	SP	
						(2.0-2.5).		
2						Black; SILT,and Clay; moist; organic smell (2.5-3.2).		
						Black; SILT, some cmf Sand; glass, metal, plastic; moist (3.2-6).	ML/CL	
3								
4								
5							ML	
						Hand auger to 6 feet for utility clearance.		
6	SS	9	0.3		6 to 8	Black; SILT; organic; glass; very stiff; saturated.		
		11						
7		6						
		3						
8	SS	2	0.0		8 to 10	No Recovery.		
		1						
9		1						
		2						
10	SS	3	0.0		10 to 12	No Recovery.		
		2						
11		1						
		2						
12	SS	2	0.8		12 to 14	Grey; CLAY; organic; soft; saturated (12.0-12.3).	OL	
		1				Black; PEAT; saturated (12.3-12.8).		
13		1					PT	
		3						
14	SS	1	2.0		14 to 16	Black; PEAT; saturated (14.0-14.5).		
		1				Brown; CLAY, trace Sand; organic odor; soft; saturated (14.5-14.9).	OL	
15		3				Grey; f SAND, little Clay; loose; saturated (14.9-16.0).	SC	
		5						
16						Drilled to 20 feet.		
17								
18								
19								
20	SS	10	1.3		20 to 22	Red Brown; f SAND, trace Silt, trace m Sand to f Gravel;	SP	
		12				grey Clay laminations from 20.0-20.3 feet; medium dense; saturated.		
21		13						
		3						
22						Drilled to 25 feet.		
23								
24								
25	SS	8	1.3		25 to 27	Red Brown; f SAND; Silt laminations; medium dense; saturated	SP	
		9				(25.0-25.3).		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Additional Weather Reports: October 20, 2005 - Partly Cloudy, 49°-62°F
October 21, 2005 - Mostly Cloudy, 44°-58°F

Contractor: SGS	HYDROQUAL DRILLING RECORD	BORING/ WELL NO. SA6-MW-14BR	Sheet 2 of 4
Driller: Larry Lynch		Location:	
Inspector: Nick Santella	PROJECT NAME: Honeywell Flute Bedrock Investigation	Hudson Mall	
Rig Type: Mobile B80	PROJECT NUMBER: HWEL.002.001.03		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 12, 2005 - Cloudy, Rain, 50°-58°F
October 13, 2005 - Cloudy, Rain, Windy, 56°-62°F
Date/Time Start: October 10, 2005 / 1100 (Ground Surface)
Date/Time Finish: October 21, 2005 / 1040 (85 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:

Well SA6-MW-14BR is located 86.3 feet west of the southwest comerd of the Hyundai Dealership and 19.6 feet north of utility pole A70132JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		7				Red Brown; f SAND; Silt laminations; medium dense; saturated (25.3-26.3).	SM	
		9						
27						Drilled to 30 feet.		
28								
29								
30	SS	13	0.5		30 to 32	Red Brown; mf SAND, trace f Gravel; dense; saturated.	SP	
		16						
31		17						
		11						
32						Drilled to 35 feet.		
33								
34								
35	SS	40	1.5		35 to 37	Red Brown; f SAND, and Silt; very dense; saturated (35.0-35.5).	SM	
		60				Grey; COBBLE (35.5-36.0).		
36		38				Red Brown; f SAND, and Silt; very dense; saturated (36-36.5).		
		38				Grey; CLAY (in tip of spoon).		
37						Drilled to 40 feet.		
38								
39								
40	SS	25	0.0		40 to 42	No Recovery.		
		25						
41		21						
		23						
42						Drilled to 45 feet.		
43								
44								
45	SS	21	1.4		45 to 47	Red Brown; SILT, trace cmf Sand, trace mf Gravel; hard; saturated.	ML (TILL)	
		26						
46		28						
		32						
47						Drilled to 47 feet.		
48								
49								
50	SS	33	1.5		50 to 52	Red Brown; SILT, trace cmf Sand, trace f Gravel (subrounded to rounded); hard; saturated.	ML (TILL)	
		66						
51		83						
		100/3"						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: SGS
Driller: Larry Lynch
Inspector: Nick Santella
Rig Type: Mobile B80

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ WELL NO. SA6-MW-14BR

Location: Hudson Mall

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: October 14, 2005 - Cloudy, Rain 58°-64°F
October 17, 2005 - Mix of Sun and Clouds, 54°-66°F
Date/Time Start: October 10, 2005 / 1100 (Ground Surface)
Date/Time Finish: October 21, 2005 / 1040 (85 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well SA6-MW-14BR is located 86.3 feet west of the southwest cornerd of the Hyundai Dealership and 19.6 feet north of utility pole A70132JC.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	100/2"	0.0		55 to 57	No Recovery.	BEDROCK	
56								
57						Drilled to 60 feet.		
58								
59								
60	C				60 to 65	Dark Brown; SILTSTONE (60.0-62.2).		
61						Tan; SANDSTONE; grey and orange layering (62.2-63.9).		
62						Tan; SANDSTONE (63.9-64.9).		
63								
64						RQD = 98%		
65	AR				65 to 67	Tan; coarse-grained SANDSTONE.		
66								
67	AR				67 to 79	Reddish Tan; coarse-grained SANDSTONE.		
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

Contractor: SGS Driller: Larry Lynch Inspector: Nick Santella Rig Type: Mobile B80	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** SA6-MW-14BR (Sheet 4 of 4) **Location:** Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 18, 2005 - Mostly Sunny, 54°-70°F
October 19, 2005 - Sunny, 48°-72°F
Date/Time Start: October 10, 2005 / 1100 (Ground Surface)
Date/Time Finish: October 21, 2005 / 1040 (85 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer mechanical

Location Description:

Well SA6-MW-14BR is located 86.3 feet west of the southwest cornerd of the Hyundai Dealership and 19.6 feet north of utility pole A70132JC.

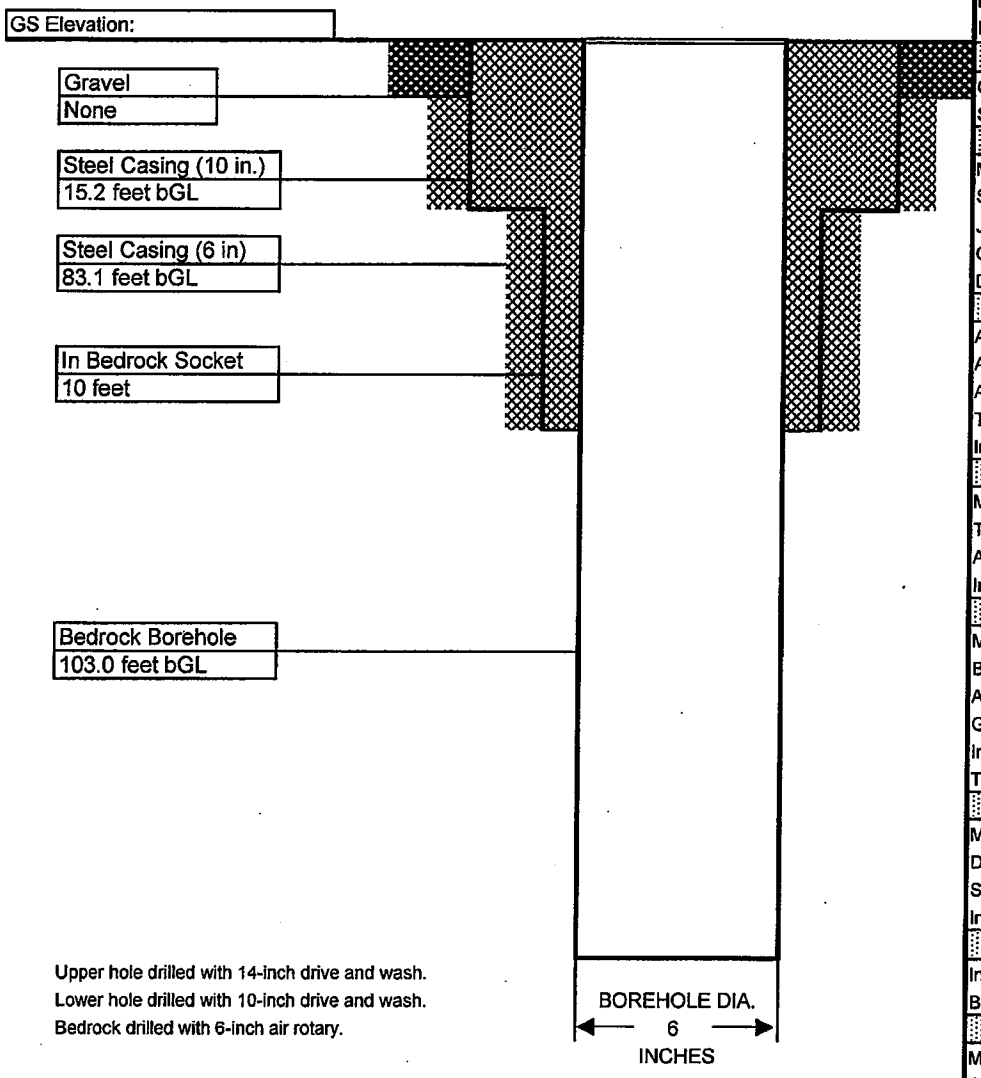
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
78					Continued from above.		
79	AR				79 to 85 Dark Brown; SILTSTONE.	BEDROCK	
80							
81							
82							
83							
84							
85					Bottom of Borehole at 85 feet.		
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from air rotary cuttings over indicated interval.

DOUBLE CASED WELL CONSTRUCTION LOG

WELL NO.:	SA6-MW-15BR	FACILITY/SITE NAME:	Hudson Mall
PROJ. NO.:	HWEL.002.001.03	CLIENT:	Honeywell
INSPECTOR:	Nick Santella	DRILLING CONTACTO	SGS
DATE START:	27-Sep-05	DATE END:	7-Oct-05
LOCATION:	Jersey City, NJ	DRILLING METHOD:	Mud Rotary / Air Rotary



Upper hole drilled with 14-inch drive and wash.
Lower hole drilled with 10-inch drive and wash.
Bedrock drilled with 6-inch air rotary.

MANHOLE	
Material:	STEEL
Diameter:	8 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	24" X 24"
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 83.1 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Contractor: SGS
Driller: Larry Lynch
Inspector: Nick Santella
Rig Type: Mobile B80

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Flute Bedrock Investigation
PROJECT NUMBER: HWEL.002.001.03

BORING/ Sheet 1 of 4
WELL NO. SA6-MW-15BR
Location: Hudson Mall

Weather: September 27, 2005 - Sunny 66°F-77°F
September 28, 2005 - Sunny, 57°F-75°F
Date/Time Start: September 27, 2005 / 0900 (Ground Surface)
Date/Time Finish: October 7, 2005 / 0953 (103 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well SA6-MW-15BR is located 99.1 feet northwest of the north side of the bay door at Marshall's Receiving (at the back of the store) and 113.0 feet southwest of the southwest corner of the cinema.

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L		FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
0					1 to 5	Asphalt Surface Material (0-0.2).	SM	
						Light Grey; cmf SAND, little Silt (0.2-1.0).		
1						Dark Gray; mf SAND, little Gravel; moist (1.0-1.5).		
						Red Brown; f SAND; moist (1.5-2.0).		
2						Dark Gray; mf SAND, some- c Gravel; coal, glass, slag; moist (2.0-3.5).	SP	
						Dark Grey; mf SAND, little Silt, little cm Gravel; wood, coal present;		
3						moist (3.5-5).		
4							SM	
						Hand auger to 5 feet for utility clearance.		
5	SS	3	0.5		5 to 7	Dark Gray; SILT/CLAY, some f Sand; brick; stiff; moist.		
		4					ML/CL	
6		6						
		12						
7	SS	2	0.5		7 to 9	Dark Gray; f SAND, some Clay; stiff; saturated (7.0-7.3).	SC	
		4				Black; CLAY, little f Sand; saturated (7.3-7.5).	OL	
8		5						
		8						
9	SS	1	1.2		9 to 11	Black; SILT, little f Gravel, trace f Sand; hydrocarbon odor; very stiff;		
		5				saturated.	ML	
10		14						
		16						
11	SS	7			11 to 13	Olive Grey; CLAY; soft; saturated.		
		1						
12		1						
		2						
13	SS	WOR	1.9		13 to 15	Olive Grey; CLAY; very soft; saturated (13.0-14.7).		
		WOR				Brown; PEAT very soft (14.7-14.9).	OL	
14		1						
		1						
15		2	1.7		15 to 17	Black; PEAT; root from 16.1-16.3 feet (15.0-16.3).	PT	
		4				Light Grey; f SAND; very loose, saturated (16.3-17.0).		
16		5						
		3					SP	
17						Drilled to 20 feet.		
18								
19								
20	SS	12	1.6		20 to 22	Yellow Orange; f SAND; medium dense; saturated (20-20.9).		
		11				Light brown; f SAND; Silty from 20.9-21.1 feet; medium dense;	SP	
21		17				saturated (20.9-21.6).		
		22						
22						Drilled to 25 feet.		
23								
24								
25	SS	14	1.4		25 to 27	Light Brown; f SAND; dense; saturated (25.0-25.2).	SP	
		22				Redish Brown; f SAND, c Sand to f Gravel at 25.2-25.3 feet (subrounded		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
HD =Hand Dug

COMMENTS:
Additional Weather Reports: October 7, 2005 - Cloudy, Rain, 71°F-76°F

Contractor: SGS	HYDROQUAL DRILLING RECORD	BORING/ WELL NO. SA6-MW-15BR	Sheet 2 of 4
Driller: Larry Lynch		Location:	
Inspector: Nick Santella	PROJECT NAME: Honeywell Flute Bedrock Investigation	Hudson Mall	
Rig Type: Mobile B80	PROJECT NUMBER: HWEL.002.001.03		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: September 29, 2005 - Cloudy, Showers, 68°F-73°F
September 30, 2005 - Sunny, 51°F-68°F
Date/Time Start: September, 27 2005 / 0900 (Ground Surface)
Date/Time Finish: October 7, 2005 / 0953 (103 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well SA6-MW-15BR is located 99.1 feet northwest of the north side of the bay door at Marshall's Receiving (at the back of the store) and 113.0 feet southwest of the southwest corner of the cinema.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26		25				to rounded); grey Clay layers; very dense; saturated (25.2-26.4).	SP	
		27						
27						Drilled to 30 feet.		
28								
29								
30	SS	14	1.1		30 to 32	Red Brown; f SAND, trace Silt, trace m Gravel (rounded); very dense; saturated.	SP	
		26						
31		29						
		29						
32						Drilled to 35 feet.		
33								
34								
35	SS	12	1.2		35 to 37	Red Brown; f SAND, little- Silt; dense; saturated.	SM	
		17						
36		24						
		24						
37						Drilled to 40 feet.		
38								
39								
40	SS	12	1.9		40 to 42	Red Brown; CLAY/SILT; hard; saturated (40.0-40.4).	CL/ML	
		18				Red Brown; f SAND; little Silt; dense; saturated (40.4-41.0).	SM	
41		31				Red Brown; SILT; some Clay; hard; saturated (41.0-41.9).	ML	
		22						
42						Drilled to 45 feet.		
43								
44						Possible Gravel at 44 feet.		
45	SS	9	1.4		45 to 47	Red Brown; SILT; Clay layers; hard; saturated;	ML	
		18						
46		31						
		40						
47						Drilled to 47 feet.		
48								
49								
50	SS	6	1.3		50 to 52	Red Brown; SILT, trace- f Sand; layers with c Sand to f Gravel; very stiff; saturated.	ML	
		11						
51		18						
		28						

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: SGS Driller: Larry Lynch Inspector: Nick Santella Rig Type: Mobile B80	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/ WELL NO.** SA6-MW-15BR Sheet 3 of 4 **Location:** Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 3, 2005 - Sunny, 61°F-82°F
October 4, 2005 - MostlySunny, 66°F-80°F
Date/Time Start: September, 27 2005 / 0900 (Ground Surface)
Date/Time Finish: October 7, 2005 / 0953 (103 feet)
Weight of Hammer 140 Lbs.
Drop of Hammer 30 Inches
Type of Hammer hydraulic

Location Description:
Well SA6-MW-15BR is located 99.1 feet northwest of the north side of the bay door at Marshall's Receiving (at the back of the store) and 113.0 feet southwest of the southwest corner of the cinema.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52						Drilled to 55 feet.		
53								
54								
55	SS	11	0.8		55 to 57	Red Brown; SILT, some f Sand; very stiff; saturated (55.0-55.6).	ML	
		10				Red Brown; CLAY, some f Gravel (angular); very stiff; saturated		
56		18				(55.6-55.8).	CL	
		24						
57						Drilled to 60 feet.		
58								
59								
60	SS	15	1.4		60 to 62	Red Brown; SILT/CLAY, trace c Sand to f Gravel (subangular);		
		59				hard; saturated.	ML/CL	
61		48					(TILL)	
		100/4"						
62						Drilled to 65 feet.		
63								
64								
65	SS	21	0.3		65 to 67	Red Brown; SILT, little cmf Sand, some f Gravel (subrounded);		
		100/3"				stiff; saturated.	ML	
66							(TILL)	
67						Drilled to 70 feet.		
68								
69								
70	SS	100/1"	0.05		70 to 72	No Recovery. Sandstone in tip of spoon.		
71								
72						Drilled to 75 feet.		
73						Bedrock at 73 feet.	BEDROCK	
74								
75	SS	100/1"	0		75 to 77	No recovery.		
76								
77					77 to 83	Brown to Grey; SANDSTONE.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
Rock chips collected from mud rotary and air rotary cuttings over indicated interval.

Contractor: SGS Driller: Larry Lynch Inspector: Nick Santella Rig Type: Mobile B80	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Flute Bedrock Investigation PROJECT NUMBER: HWEL.002.001.03	**BORING/** Sheet 4 of 4 **WELL NO.** SA6-MW-15BR **Location:** Hudson Mall

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: October 5, 2005 - Sunny, 63°F-78°F
October 6, 2005 - Mostly Cloudy, 64°F-78°F
Date/Time Start: September, 27 2005 / 0900 (Ground Surface)
Date/Time Finish: October 7, 2005 / 0953 (103 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:
Well SA6-MW-15BR is located 99.1 feet northwest of the north side of the bay door at Marshall's Receiving (at the back of the store) and 113.0 feet southwest of the southwest corner of the cinema.

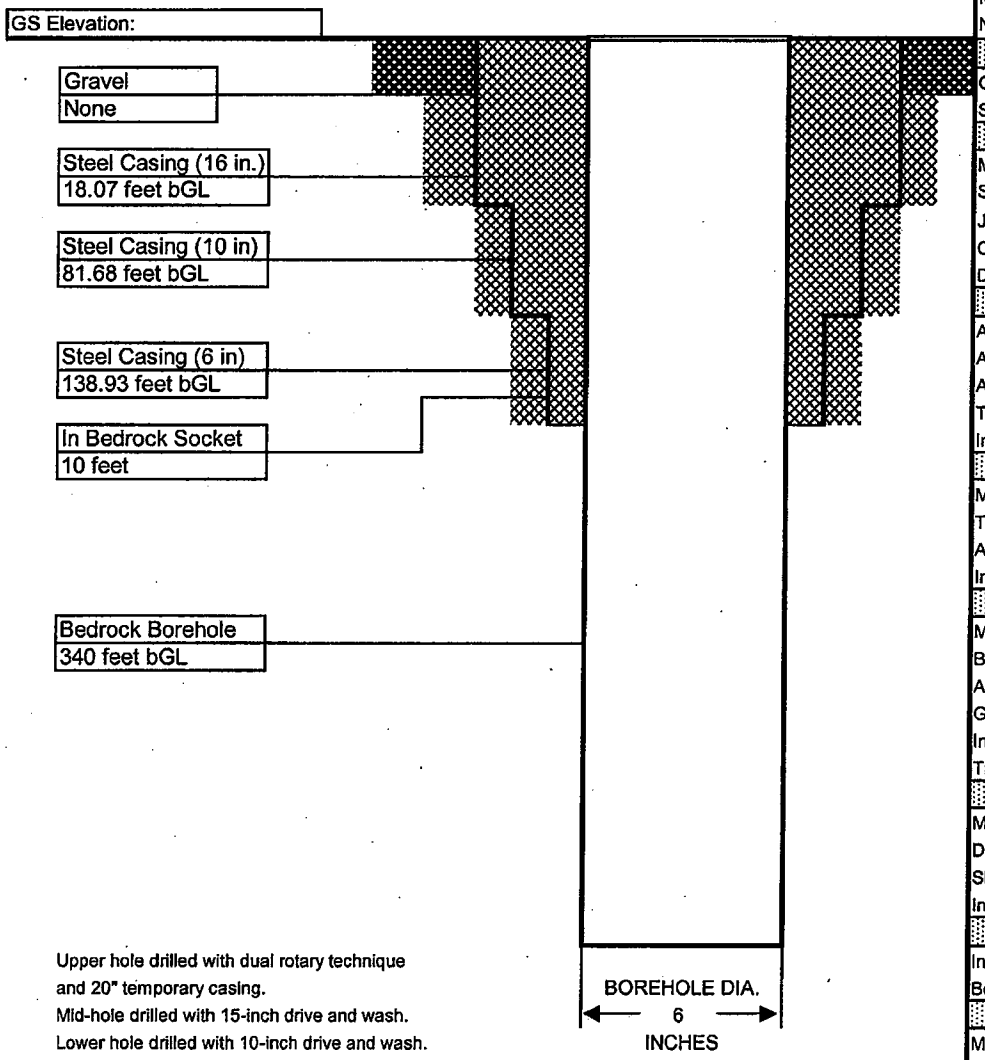
Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79								
80								
81								
82								
83	AR				83 to 88	Red Brown; SANDSTONE; with dark grey Sandstone and reddish brown Siltstone.		
84								
85								
86								
87								
88	AR				88 to 93	Red Brown; SANDSTONE; with reddish tan Sandstone and black Siltstone.		
89								
90							BEDROCK	
91								
92								
93	AR				93 to 98	Red Brown; SANDSTONE; with reddish tan Sandstone and grey Sandstone.		
94								
95								
96								
97								
98	AR				98 to 99	Reddish Tan; coarse-grained SANDSTONE.		
99	AR				99 to 100.5	Dark Grey; SILTSTONE, with red brown siltstone.		
100								
	AR				100.5 to 103	Dark Brown; SILTSTONE.		
101								
102								
103						Bottom of borehole at 103 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
AR = AIR ROTARY

COMMENTS:
Rock chips collected from mud rotary and air rotary cuttings over indicated interval.

TRIPLE CASED WELL CONSTRUCTION LOG

WELL NO.:	KP-MW-6BR	FACILITY/SITE NAME:	A.N.E. Trucking
PROJ. NO.:	441286-23236	CLIENT:	Honeywell
INSPECTOR:	Mike Wilkinson	DRILLING CONTACTO	B&B Drilling
DATE START:	1-Feb-05	DATE END:	2-Mar-05
LOCATION:	South Kearny, NJ	DRILLING METHOD:	Geoprobe / Dual Rotary / Mud Rotary / Air Rotary



MANHOLE	
Material:	STEEL
Diameter:	18 INCHES
Depth BGS:	12 INCHES
Water Tight Seal:	YES
Flushmount:	YES
Expanding Cap:	NA
GUARD POSTS	
Material:	NONE
No. & Size:	NA
SURFACE PAD	
Composition:	QUIKRETE
Size:	32" DIAMETER
RISER PIPE	
Material:	NONE
Schedule:	NA
Joint Type:	NA
O-ring:	NA
Diameter:	NA
GROUT	
Amt cement:	NA
Amt bentonite:	NA
Amt water:	NA
Tremied:	YES
Interval:	0 - 138.9 FEET
SEAL	
Material:	NONE
Type:	NA
Amount Used:	NA
Interval:	NA
FILTER PACK	
Material:	NONE
Brand Name:	N/A
Amount Used:	N/A
Grain Size Dist.:	N/A
Interval:	N/A
Tremied:	N/A
SCREEN	
Material:	NONE
Diameter:	N/A
Slot Size & Type:	N/A
Interval BGS:	N/A
SUMP	
Interval BGS:	N/A
Bottom Cap:	N/A
BACKFILL PLUG	
Material:	NA
Setup/Hydration Time:	N/A

Figure C1 5.2

Contractor: B&B Drilling Driller: G. Blewett, Doug Myerchin Inspector: Mike Wilkinson Rig Type: Geoprobe 6610DT, Dual Rotary DR-24	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** Sheet 1 of 14 **KP-MW-6BR** **Location:** South Kearny	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: February 1, 2005 - Sunny, 27°-38°F
February 2, 2005 - Sunny, 28°-35°F
Date/Time Start: February 1, 2005 / 0945 (Ground Surface)
Date/Time Finish: February 2, 2005 / 1045 (80 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
0	GP		4.0	NA	0 to 4	Light Brown; cmf GRAVEL, and mf Sand, trace Silt; loose; moist (0-0.5).	GW	
1						Dark Gray; SILT, some f Sand; frozen soil; stiff (0.5-2.0).	ML	
2						Gray to Light Gray; f SAND; moderate hydrocarbon odor; loose; wet (2.0-4.0).		
3								
4	GP		4.0	NA	4 to 8	Gray to Light Gray; f SAND; moderate hydrocarbon odor; loose; wet (4.0-4.5).	SP	
5						Gray; f SAND, little- Silt; very loose; saturated (4.5-5.3).		
6						Gray; f SAND; weak hydrocarbon odor; very loose; saturated (5.3-6.8).		
7						Gray; mf SAND; moderate hydrocarbon odor; loose; saturated (6.8-8.0).		
8	GP		4.0	NA	8 to 12	Gray; CLAY/SILT; sparse vegetation and shell material; soft; wet (8.0-10.5).	ML/CL	
9						Gray; SILT/CLAY, little f Sand; sparse shell material; soft; wet (10.5-12.0).		
10								
11								
12	GP		4.0	NA	12 to 16	Gray; SILT/CLAY, little f Sand; sparse shell material; soft; wet.		
13								
14								
15								
16	GP		4.0	NA	16 to 20	Gray; SILT/CLAY, little f Sand; sparse shell material; soft; wet.		
17								
18								
19								
20	GP		4.0	NA	20 to 24	Gray; SILT/CLAY, trace- f Sand; sparse shell material; soft wet.		
21.								
22								
23								
24	GP		4.0	NA	24 to 28	Gray; SILT/CLAY, trace- f Sand; very soft; wet, moist below 27.2 feet.		
25								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling
Driller: Gordon Blewett
Inspector: Mike Wilkinson
Rig Type: Geoprobe 6610DT

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. KP-MW-6BR Sheet 2 of 14
Location: South Kearny

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: February 3, 2005 - Partly Cloudy, 30°-40°F
February 4, 2005 - Mostly Cloudy with Rain in Morning - 34°-40°F
Date/Time Start: February 1, 2005 / 0945 (Ground Surface)
Date/Time Finish: February 2, 2005 / 1045 (80 feet)
Weight of Hammer: NA
Drop of Hammer: NA
Type of Hammer: NA

Location Description:
Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
26						Continued from above.		
27								
28	GP		4.0	NA	28 to 32	Gray; SILT/CLAY, minor root material from28-30.5 feet; minor f Sand laminations from 31-32 feet; very soft; moist to wet.		
29								
30								
31								
32	GP		4.0	NA	32 to 36	Gray; SILT/CLAY, f Sand laminations; very soft; moist to wet.		
33							ML/CL	
34								
35								
36	GP		4.0	NA	36 to 40	Gray; SILT/CLAY; f Sand laminations more abundant; very soft; moist to wet.		
37								
38								
39								
40	GP		4.0	NA	40 to 44	Gray; SILT/CLAY; f Sand laminations; very soft; moist to wet (40.0-41.8).		
41						Light Gray; mf SAND, little Silt, trace f Gravel; abundant shell fragments; loose; saturated (41.8-42.3).		
42						Light Gray; SILT, some+ f Sand; very soft; saturated (42.3-44.0).	SM	
43							ML	
44	GP		4.0	NA	44 to 48	Gray to Brown; CLAY/SILT; very soft; saturated .		
45								
46								
47							CL/ML	
48	GP		4.0	NA	48 to 52	Brown; CLAY/SILT; very soft; saturated.		
49								
50								
51								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor:	B&B Drilling
Driller:	Gordon Blewett
Inspector:	M. Wilkinson, M. DaSilva
Rig Type:	Geoprobe 6610DT

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. KP-MW-6BR — Sheet 3 of 14

Location: South Kearny

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: February 7, 2005 - Partlys Sunny, 39°-52°F
February 8, 2005 - Mostly Cloudy, 42°-53°F
Date/Time Start: February 1, 2005 / 0945 (Ground Surface)
Date/Time Finish: February 2,2005 / 1045 (80 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
52	GP		2.8	NA	52 to 56	Brown; CLAY/SILT; very soft; saturated (52.0-53.3).		
						Brown; SILT, trace Clay; very soft; saturated (53.3-53.8).	CL/ML	
53						Brown; f SAND; loose; saturated (53.8-54.8).		
							ML	
54								
55								
56	GP -		4.0	NA	56 to 60	Brown; f SAND; loose; saturated.	SP	
57								
58								
59								
60	GP		4.0	NA	60 to 64	Red Brown; SILT, little Clay; very soft; saturated.		
61								
							ML	
62								
63								
64	GP		4.0	NA	64 to 68	Brown; CLAY, trace Silt; saturated.		
65								
66								
67							CL	
68	GP		4.0	NA	68 to 72	Brown; CLAY, trace Silt; saturated (68.0-71.0).		
						Brown; f SAND, trace Silt; saturated (71.0-72.0).		
69								
70								
71								
72	GP		4.0	NA	72 to 76	Brown; f SAND, trace Silt; saturated.		
73							SP	
74								
75								
76	GP		4.0		76 to 80	Brown; CLAY, trace Silt; saturated (76.0-77.5).		
						Brown; f SAND, trace Silt; saturated (77.5-77.9).	CL	
77						Brown; CLAY, trace Silt; with brownish gray Clay layers; saturated (77.9-80.0).		
							SP	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 4 of 14 KP-MW-6BR
Driller:	Ed Blewett		Location:	
Inspector:	Mike DaSilva	PROJECT NAME: Honeywell Expanded Bedrock Investigation	South Kearny	
Rig Type:	Gus Pech	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS					Weather: February 9, 2005 - Cloudy, 47°-50°F February 10, 2005 - Light Rain, 43°-37°F Date/Time Start: February 4, 2005 / 0900 (80 feet) Date/Time Finish: February 7, 2005 / 1510 (137 feet) Weight of Hammer 140 Lbs. Drop of Hammer 30 Inches Type of Hammer mechanical	Location Description:
Water Level						Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.
Date						
Time						
Meas. From						

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
78						Continued from above.		
79							CL	
80	SS	WOR	2.0	NA	80 to 82	Brown; CLAY/SILT; with gray brown layering; saturated.	CL/ML	
		3						
81		7						
		7						
82						Drilled to 85 feet.		
83								
84								
85	SS	10	0	NA	85 to 87	No Recovery.		
		16						
86		16						
		15						
87						Drilled to 90 feet.		
88								
89								
90	SS	WOR	2.0	NA	90 to 92	Brown; CLAY, trace Silt, trace- f Gravel (subangular); saturated.	CL	
		10						
91		14						
		16						
92						Drilled to 95 feet.		
93								
94								
95	SS	WOR	2.0	NA	95 to 97	Brown; CLAY, trace Silt, trace- f Gravel; saturated.	CL	
		11						
96		13						
		15						
97						Drilled to 100 feet.		
98								
99								
100	SS	WOR	2.0	NA	100 to 102	Brown; CLAY, trace- cmf Gravel; saturated.	CL	
		14						
101		18						
		18						
102						Drilled to 105 feet.		
103								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling Driller: Ed Blewett, Inspector: Mike DaSilva Rig Type: Gus Pech	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** Sheet 5 of 14 **KP-MW-6BR** **Location:** South Kearny	

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	February 11, 2005 - Mix of Sun and Clouds, 30°-37°F February 14, 2005 - Mostly Cloudy, 33°-40°F
Date					Date/Time Start:	February 4, 2005 / 0900 (80 feet)
Time					Date/Time Finish:	February 7, 2005 / 1510 (137 feet)
Meas. From					Weight of Hammer	140 Lbs.
					Drop of Hammer	30 Inches
					Type of Hammer	mechanical

Location Description:
Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
104						Continued from above.		
105	SS	7	0	NA	105 to 107	No Recovery.		
		12						
106		21						
		32						
107						Drilled to 110 feet.		
108								
109								
110	SS	13	1.2	NA	110 to 112	Brown; CLAY, c Gravel; hard; saturated (110.0-110.5). Brown; CLAY; hard; moist (110.5-111.2).	CL	
		15						
111		19						
		26						
112						Drilled to 115 feet.		
113								
114								
115	SS	7	2.0	NA	115 to 117	Brown; f SAND, Gravel (subangular to rounded); medium dense; saturated.	SP	
		6						
116		19						
		50						
117						Drilled to 120 feet.		
118								
119								
120	SS	7	2.0	NA	120 to 122	Brown; f SAND; medium dense; saturated (120.0-120.5). CLAY, some f Sand, trace Silt; very stiff (120.5-121.6). SAND, with Silt/Clay, Gravel (subangular); very stiff; saturated (121.6-122.0).	SP CL SP	
		10						
121		18						
		48						
122						Drilled to 125 feet.		
123								
124								
125	SS	51	0.3	NA	125 to 127	Brown; f SAND, trace Silt, f Gravel (angular to rounded).	SP	
		79						
126		65						
		38						
127						Drilled to 130 feet.		
128								
129						Very hard drilling at 129 feet.	BEDROCK	

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling Driller: Blewett, Smith, Myerchin Inspector: DaSilva/Wilkinson Rig Type: Gus Pech, Mobile B-57, Ingersoll Rand T4W	PARSONS DRILLING RECORD PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	BORING/ WELL NO. KP-MW-6BR	Sheet 6 of 14
		Location: South Kearny	

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	February 15, 2005 - Mix of Sun and Clouds, 47°-58°F February 16, 2005 - Partly Sunny, 45°-53°F
Date					Date/Time Start:	February 23, 2005 / 1110 (139 feet)
Time					Date/Time Finish:	March 2, 2005 / 1105 (340 feet)
Meas. From					Weight of Hammer	140 Lbs.
					Drop of Hammer	30 Inches
					Type of Hammer	mechanical

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
130	SS	73/1"	0.1	NA	130 to 132	Brown; fine-grained SANDSTONE; with gray Caliche (possibly due to weathered bedrock surface).		
131								
132						Drilled to 135 feet.		
133								
134								
135	SS	80/1"	0.1	NA	135 to 137	Brown; fine-grained subagular SANDSTONE.		
136								
137						Drilled to 139 feet.		
138								
139	C		6.0	NA	139 to 145	Light Brown; SILTSTONE, Sandy; irregular light gray layering; weak calcareous cement; calcareous white patches at 139.5-141.2 feet; possible burrows at 142.0-142.4 feet; calcite veinlet at 142.9 feet (139.0-143.0). Light Brown; fine-grained SANDSTONE; micaceous grains; weathered from 143.0-144.0 feet; light gray layer from 144.7-144.9 feet (143.0-145.0).		
140								
141								
142							BEDROCK	
143								
144						RQD = 57%		
145	C		9.7	NA	145 to 155	Light Brown; SILTSTONE; calcite veinlets dipping 20°-30° from 145.0-145.7 feet; irregular layering from 145.9-147.0 feet; small (1-3 mm) cream-colored patches at 147.8-150.6 feet; near-vertical anastomosing calcite veinlets at 150.0-150.5 feet; light gray Sandy Siltstone layer with burrows at 150.9-151.2 feet; calcite veinlet at 152.2 feet.		
146								
147								
148								
149								
150								
151								
152								
153								
154						RQD = 84%		
155	C		10.0	NA	155 to 165	Light Brown; SILTSTONE; anastomosing calcite veinlets at 155.0-155.6 feet; small (1-10mm) light gray to beige patches at		

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor:	B&B Drilling
Driller:	Tim Smith, Dave Myerchin
Inspector:	Mike Wilkinson
Rig Type:	Mobile B-57, Ingersoll Rand T4W

PARSONS
DRILLING RECORD

PROJECT NAME: Honeywell Expanded Bedrock Investigation
PROJECT NUMBER: 441286-23236

BORING/ WELL NO. KP-MW-6BR Sheet 7 of 14

Location: South Kearny

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: February 17, 2005 - Mostly Cloudy, 31°-41°F
February 18, 2005 - Partly Sunny, 27°-33°F
Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
156						156.2-158.1 feet; abundant irregular patches (bioturbation) at 159.1-159.3 and 159.9-160.1 feet; burrows at 164.1-164.2 feet; irregular layering at 164.4-165.0 feet.		
157								
158								
159								
160								
161								
162								
163								
164								
						RQD = 98%		
165	C		10.0	NA	165 to 175	Light Brown; SILTSTONE; calcite-filled fractures dipping 80° at 165.1-166.6 feet; cross-bedded at 166.2-167.3 feet; abundant rip up clasts (?) at 167.6-168.2 feet; cross-bedded at 168.2-168.4 feet; small (<10 mm) calcareous beige patches at 168.4-169.0 feet; discontinuous beige layering (possibly cross-bedded) at 172.1-172.7 feet; abundant small calcareous beige patches at 172.8-173.1 feet.		BEDROCK	
166								
167								
168								
169								
170								
171								
172								
173								
174								
						RQD = 97%		
175	C		10.0	NA	175 to 185	Light Brown; SILTSTONE; weak calcareous cement; small (<2 mm) calcareous beige patches throughout; irregular beige layering at 182.0-182.5 and 183.1-183.3 feet; thin clay seam at 181.7 feet (possibly due to weathering along horizontal fracture).			
176								
177								
178								
179								
180								
181								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 8 of 14 KP-MW-6BR
Driller:	Tim Smith, Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	South Kearny	
Rig Type:	Mobile B-57, Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: February 22, 2005 - Mostly Cloudy, 32°-40°F
February 23, 2005 - Sunny, 36°-40°F
Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
182						Continued from above.		
183								
184						RQD = 99%		
185	C		10.0	NA	185 to 195	Light Brown; SILTSTONE; weak calcareous cement; small (<3 mm) beige calcareous patches throughout; clay seam (¾") at 186.8 feet (possibly due to weathering); irregular beige Sandy Siltstone layer at 190.7-191.2 feet.		
186								
187								
188								
189								
190								
191								
192								
193								
194						RQD = 98%	BEDROCK	
195	C		10.0	NA	195 to 205	Light Brown; SILTSTONE; small (<2 mm) calcareous beige patches throughout; crescent-shaped stuctures (possibly due to bioturbation) at 195.4 feet; irregular beige layer at 197.9-198.1 feet; light gray layers (1"-2" thick) at 199.3, 199.5, and 199.9 feet; light brown fine-grained weathered Sandstone layers at 202.8-203.2 and 203.7-203.9 feet; irregular calcareous beige patches (<10 mm) at 203.2- 204.4 feet.		
196								
197								
198								
199								
200								
201								
202								
203								
204						RQD = 94%		
205	C		10.0	NA	205 to 215	Light Brown; SILTSTONE; small calcareous beige patches throughout; irregular calcareous beige layer at 205.7-205.9 feet; near-horizontal weathered calcite veinlets (~1 mm thick) at 206.8, 207.0, and 208.0 feet; burrows at 207.2 feet; light gray to beige layer with rip-up clasts at 208.2-208.3 feet; thin calcite-filled fractures dipping ~80° at 209.5-210.4 feet;		
206								
207								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling Driller: Tim Smith, Dave Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-57, Ingersoll Rand T4W	PARSONS DRILLING RECORD PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	BORING/ WELL NO. KP-MW-6BR	Sheet 9 of 14
		Location: South Kearny	

GROUNDWATER OBSERVATIONS						
Water Level					Weather:	February 24, 2005 - Cloudy - 26°-30°F February 25, 2005 - Mostly Cloudy, 23°-32°F
Date					Date/Time Start:	February 23, 2005 / 1110 (139 feet)
Time					Date/Time Finish:	March 2, 2005 / 1105 (340 feet)
Meas. From					Weight of Hammer	NA
					Drop of Hammer	NA
					Type of Hammer	NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
208						thin calcite-filled fractures dipping ~15° at 211.4 feet; cross-bedded at 212.5-213.2 and 214.1-214.6 feet.		
209								
210								
211								
212								
213								
214						RQD = 92%		
215	C		10.3	NA	215 to 225	Light Brown; SILTSTONE; small (<2 mm) calcareous beige structures throughout; cross-bedded at 215.0-216.0 feet; thin (½") layers with light gray angular clasts at 216.1 and 216.4 feet; discontinuous beige layering at 217.1-217.3 feet; thin calcite-filled veinlets at 218-221 feet overlaps clay-filled fractures and a zone of broken rock from 218.5-220.5 feet; calcite veinlets at 221.3-222.0 and 222.9-223.6 feet; rock appears more weathered at 223.1-224.1 and 224.3-225.0 feet; irregular and discontinuous gray layering at 224.4-225.0 feet.		
216								
217								
218								
219								
220							BEDROCK	
221								
222								
223								
224						RQD = 85%		
225	C		10.2	NA	225 to 235	Light Brown; SILTSTONE; weak calcareous cement; anastomosing calcite veinlets at 225.0-225.7 feet; gray clay-filled parallel (bedding?) planes dipping ~30° at 225.7-227.0 feet; thin dark gray parallel layers dipping ~30° at 225.5-227.4 feet; discontinuous beige layering from 227.4-227.9 feet; small (1-2 mm) beige patches from 227.9-230.8 feet; calcite veinlets dipping 15° at 229.5 and 229.7 feet; discontinuous beige layering at 231.7-231.9 and 232.5-232.7 feet; irregular layers (½"-1" thick) with gray angular to rounded fragments and brecciated appearance at 233.3 and 233.6 feet.		
226								
227								
228								
229								
230								
231								
232								
233								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 10 of 14 KP-MW-6BR
Driller:	Tim Smith, Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	South Kearny	
Rig Type:	Mobile B-57, Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: February 28, 2005 - Cloudy, Nor'easter by afternoon - 27°-38°F
March 1, 2005 - Mostly Cloudy, 30°-32°F
Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
234						Continued from above.		
						RQD = 84%		
235	C		10.0	NA	235 to 245	Light Brown; SILTSTONE; thin (5-10 mm) very light brown irregular layering at 235.0-237.9 feet; rregular light gray layering at 237.9-238.0 feet; calcareous beige layer with irregular boundaries and brecciated appearance at 238.1-238.4 feet; sparse small (1-2 mm) calcareous mottles at 238.4-240.0 feet are more abundant and larger (to 15 mm) at 238.9-239.2 feet; irregular and discontinuous dark brown layer (3-4 mm) at 240.9-242.2 feet; sparse small (1-3 mm) calcareous mottles at 242.2-243.0 feet; mottled layer at 244.2-244.4 feet.		
236								
237								
238								
239								
240								
241								
242								
243								
244								
						RQD = 100%		
245	C		8.8	NA	245 to 254	Light Brown; SILTSTONE; fine-grained Sandy Siltstone layer at 245.0-245.1 feet; sparse small (1 mm) calcareous mottles at 245.1-247.6 feet; irregular calcareous beige layer at 247.6-247.8 feet; calcite veinlet at 247.6-248.2 feet; irregular beige layer (½") at 248.4 feet; friable weathered fine-grained Snadstone layers at 249.0-249.3 and 249.4-249.5 feet; irregular and discontinuous calcareous beige layering at 249.5-251.1 feet; thin brown to light brown layering at 250.8-251.3 feet is more broken up at 252.0-252.2 feet with grayish fracture filling material; abundant calcareous beige mottles at 252.6-253.1 feet.	BEDROCK	
246								
247								
248								
249								
250								
251								
252								
253								
						RQD = 80%		
254	C		10.2	NA	254 to 264	Light Brown; SILTSTONE; small (~1 mm) mottles at 254.0-256.9 feet; possible mud crack fillings at 256.3 feet; light brown to dark brown laering at 256.9-257.6 feet; calcite filled veinlet at 257.5-258.3 feet; irregular Sandstone layers (½"-1") at 259.3, 259.5, 260.1, and 260.3 feet; irregular and discontinuous layers (<5 mm) at 260.4-262.4 feet; large (2") indistinct gray mottle at 262.7 feet; Sandy Siltstone at 257.8-259.1 feet; weathered zone (½") at 263.0 feet is broken up.		
255								
256								
257								
258								
259								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor:	B&B Drilling	PARSONS DRILLING RECORD	BORING/ WELL NO.	Sheet 11 of 14 KP-MW-6BR
Driller:	Tim Smith, Dave Myerchin		Location:	
Inspector:	Mike Wilkinson	PROJECT NAME: Honeywell Expanded Bedrock Investigation	South Kearny	
Rig Type:	Mobile B-57, Ingersoll Rand T4W	PROJECT NUMBER: 441286-23236		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: March 2, 2005 - Partly Sunny, 31°-38°F

Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
260					Continued from above.		
261							
262							
263					RQD = 99%		
264	C		10.0	NA	**264 to 274** Light Brown; SILTSTONE; small (1-2 mm) sparse beige mottles from 264.7-268.6 feet; irregular calcareous beige Sandy Siltstone layer at 265.9-266.2 feet; mottles (<5 mm) at 270.0-270.8 feet; anastomosing calcite veinlets at 270.9-271.6 feet; thin discontinuous layering at 270.1-272.0 feet; burrow at 271.9 feet; sparse beige mottles (<3 mm) at 272.0-273.4 feet		
265							
266							
267							
268							
269							
270							
271							
272							
273					RQD = 97%	BEDROCK	
274	C		10.2	NA	**274 to 284** Light Brown; SILTSTONE; sparse calcareous beige mottles (1-2 mm) throughout are most abundant at 274.8-276.0 feet; calcite filled veinlets at 276.3, 276.8, and 277.3 feet; irregular beige layering at 274.5-274.6 feet; irregular layering with burrows at 280.2-282.0 feet; Sandy Siltstone below 283.3 feet with mottled beige fine-grained Sandstone at 283.7-284.0 feet.		
275							
276							
277							
278							
279							
280							
281							
282							
283					RQD = 100%		
284	C		9.7	NA	**284 to 294** Light Brown; SILTSTONE; calcareous mottled beige Sandy Siltstone at 284.0-284.3 feet; calcareous mottled beige to very light brown fine-grained Sandstone layers with irregular contacts at 285.2-285.3, 286.7-286.9, and 287.9-288.8 feet;		
285							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Tim Smith, Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** KP-MW-6BR Sheet 12 of 14 **Location:** South Kearny	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
286						calcareous beige mottles (<3 mm) at 286.4-287.9 and 290.8-291.8 feet; discontinuous layering at 289.3-290.0 feet; thin 292.1-292.8 feet.		
287								
288								
289								
290								
291								
292								
293						RQD = 97%		
294	C		10.2	NA	**294 to 304**	Light Brown; SILTSTONE; irregular calcareous beige Sandy Siltstone layer at 294.0-294.5 feet; calcareous beige mottles (<10 mm) at 294.5-295.5 feet; layer (1½') with brecciated appearance at 297.1-297.2 feet; mottled layer at 297.7-298.1 feet; irregular and discontinuous layering with possible burrows at 298.5-299.6 feet; calcite veinlet dipping 10° at 300.5 feet; discontinuous layering with burrows at 300.7-301.8 and 302.2-303.3 feet; calcite veinlets dipping 80° at 303.0-303.7 feet.	BEDROCK	
295								
296								
297								
298								
299								
300								
301								
302								
303						RQD = 99%		
304	C		9.3	NA	**304 to 313**	Light Brown; SILTSTONE; discontinuous layering with burrows at 304.0-306.2 feet; cross-bedded at 306.6-306.8 feet; burrows at 307.4-307.8 feet; discontinuous layering at 307.6-307.8 feet; discontinuous layering with burrows at 309.9-310.2 feet; gray fracture filling material at 310.2 and 312.0 feet; irregular and discontinuous Sandy Siltstone at 310.2-311.5 feet; cross-bedded at 311.5-313.3 feet.		
305								
306								
307								
308								
309								
310								
311								

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

Contractor: B&B Drilling **Driller:** Tim Smith, Dave Myerchin **Inspector:** Mike Wilkinson **Rig Type:** Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/** Sheet 13 of 14 **WELL NO.** KP-MW-6BR **Location:** South Kearny

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer: NA
Drop of Hammer: NA
Type of Hammer: NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
312						Continued from above.		
						RQD = 99%		
313	C		10.0	NA	**313 to 323**	Light Brown; SILTSTONE; cross-bedded at 313.0-315.0 feet; thin Sandy Siltstone layering at 315.0-316.0 feet; calcite veinlets dipping 70°-80° at 314.3-315.2 feet; irregular and discontinuous fine-grained Sandstone layering at 316.6-317.0 feet; discontinuous dark gray layering at 317.0-317.3 feet; Sandy Siltstone layer with light brown mottling at 318.7-319.1 feet; irregular light brown fine-grained Sandstone layer at 320.5-320.7 feet; discontinuous dark gray and beige layering at 320.7-321.3 feet; gray Sandy Siltstone with rust to beige mottling at 321.3-322.8 feet.		
314								
315								
316								
317								
318								
319								
320								
321								
322								
						RQD = 99%		
323	C		10.2	NA	**323 to 333**	Gray Brown to Gray; fine-grained SANDSTONE; dark gray layering at 323.0-324.5 feet; brown mottling at 324.5-325.2 feet (323.0-325.2). Gray Brown; SILTSTONE; irregular contacts; dark gray brown layer at 325.3-325.4 feet (325.2-325.6). Gray; fine-grained SANDSTONE; beige mottling (325.6-326.4). Gray Brown; SILTSTONE; cross-bedded; fracture dipping 60° at 326.9 feet (326.4-328.1). Brown; CLAY, possibly weathered mudstone (328.1-328.3). Gray Brown to Brown; SILTSTONE; cross-bedded Sandy Siltstone at 328.3-329.6 feet; Sandy Siltstone with irregular beige layering at 330.2-331.2 feet; rock is broken up at 329.3-331.5 feet; calcite veinlet dipping 10° 332.9 feet (328.3-333.0).	BEDROCK	
324								
325								
326								
327								
328								
329								
330								
331								
332								
						RQD = 83%		
333	C		6.5	NA	**333 to 339.5**	Gray Brown; SILTSTONE; dark gray non-parallel laminations at 333.0-333.8 feet; light gray mottled irregular Sandy Siltstone at 334.8-335.1 feet; calcite veinlets at 336.2, 336.5, and 337.8 feet; discontinuous dark gray layering at 336.5-337.6 feet; Sandy Siltstone with burrows at 337.6-338.3 feet.		
334								
335								
336								
337								

COMMENTS:

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

Contractor: B&B Drilling Driller: Tim Smith, Dave Myerchin Inspector: Mike Wilkinson Rig Type: Mobile B-57, Ingersoll Rand T4W	**PARSONS** **DRILLING RECORD** PROJECT NAME: Honeywell Expanded Bedrock Investigation PROJECT NUMBER: 441286-23236	**BORING/ WELL NO.** KP-MW-6BR Sheet 14 of 14 **Location:** South Kearny

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather:

Date/Time Start: February 23, 2005 / 1110 (139 feet)
Date/Time Finish: March 2, 2005 / 1105 (340 feet)
Weight of Hammer NA
Drop of Hammer NA
Type of Hammer NA

Location Description:

Well KP-MW-6BR is located at A.N.E. Trucking in South Kearny. The well is located 20 feet South of the northern boundary fenceline and 39.5 feet West of the eastern boundary fenceline.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
338					Continued from above.	BEDROCK	
339					RQD = 95%		
					End of Boring at 339.5 feet.		
340							
341							
342							
343							
344							
345							
346							
347							
348							
349							
350							
351							
352							
353							
354							
355							
356							
357							
358							
359							
360							
361							
362							
363							

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:

DEEP RIVER BEDROCK BORINGS

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 1 of 5 **Boring No.** DRB-001 **Location:** Hackensack River

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 8, 2005 - Sunny
Date/Time Start: November 8, 2005 / 1100 hrs.
Date/Time Finish: November 12, 2005 / 1000 hrs. (123 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-001 is located offshore and to the south of SA-7 (offshore of Degan Oil) on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
					0 to 5	Drilled to 5 feet, soft mud/sediment.		
5'-7'	SP				5 to 7	Black, organic silt and clay, sulfide odor.		
						Drilled to 10 feet.		
10'-12'	SP				10 to 12	Washed gravel.		
						Drilled to 15 feet.		
15'-17'	SP				15 to 17	Well-sorted, gray, fine-medium sand; red silt with trace clay in tip.		
						Drilled to 20 feet.		
20'-22'	SP				20 to 22	Red silt, uniform with laminations.		
						Drilled to 25 feet.		
25'-27'	SP				25 to 27	Red silt.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: B&B Drilling Driller: Greg, Nick Inspector: Rob Laufenberg Rig Type: CME	HYDROQUAL DRILLING RECORD PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	BORING/ WELL NO. DRB-001 Sheet 2 of 5 Location: Hackensack River

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 9, 2005 - Overcast, 50°F
Date/Time Start: November 8, 2005 / 1100 hrs.
Date/Time Finish: November 12, 2005 / 1000 hrs. (123 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-001 is located offshore and to the south of SA-7 (offshore of Degan Oil) on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					Continued from previous page.		
					Drilled to 30 feet.		
30'-32'	SP				30 to 32 Red silt.		
					Drilled to 35 feet.		
35'-37'	SP				35 to 37 Red silt.		
					Drilled to 40 feet.		
40'-42'	SP				40 to 42 Red silt.		
					Drilled to 45 feet.		
45'-47'	SP				45 to 47 Red silt.		
					Drilled to 50 feet.		
50'-52'	SP				50 to 52 Red silt.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 3 of 5 **WELL NO.** DRB-001 **Location:** Hackensack River	
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From	Weather: November 10, 2005 - Sunny, ~45°F November 11, 2005 - Partly sunny, ~40°F Date/Time Start: November 8, 2005 / 1100 hrs. Date/Time Finish: November 12, 2005 / 1000 hrs. (123 feet) Weight of Hammer 300 lb. Drop of Hammer Type of Hammer mechanical	**Location Description:** DRB-001 is located offshore and to the south of SA-7 (offshore of Degan Oil) on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
						Drilled to 55 feet.		
55'-57'	SP				55 to 57	Red silt.		
						Drilled to 60 feet.		
60'-62'	SP				60 to 62	Red-brown, clayey silt		
						Drilled to 65 feet.		
65'-67'	SP				65 to 67	Brownish, clayey silt.		
						Drilled to 70 feet.		
70'-72'	SP				70 to 72	Brown, clayey silt.		
						Drilled to 75 feet.		
75'-77'	SP				75 to 77	Reddish silt.		
						Drilled to 80 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/ WELL NO.** DRB-001 Sheet 4 of 5 **Location:** Hackensack River

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 11, 2005 - Partly sunny, ~40°F
November 12, 2005 - Sunny, ~40°F
Date/Time Start: November 8, 2005 / 1100 hrs.
Date/Time Finish: November 12, 2005 / 1000 hrs. (123 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-001 is located offshore and to the south of SA-7 (offshore of Degan Oil) on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					Drilled to 80 feet.		
80'-82'	SP				80 to 82 Reddish silt, trace gray sand in tip.		
					Drilled to 85 feet.		
85'-87'	SP				85 to 87 Brownish silt.		
					Drilled to 90 feet.		
90'-92'	SP				90 to 92		
					Drilled to 95 feet.		
95'-97'	SP				95 to 97 Red-brown compacted silt.		
					Drilled to 101 feet.		
					101 to 103 Drilling becoming difficult.		
					103 Bedrock - Drilled bedrock 20 feet.	BR	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 5 of 5 **WELL NO.** DRB-001 **Location:** Hackensack River

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 12, 2005 - Sunny, ~40°F

Date/Time Start: November 8, 2005 / 1100 hrs.
Date/Time Finish: November 12, 2005 / 1000 hrs. (123 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-001 is located offshore and to the south of SA-7 (offshore of Degan Oil) on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					105	BR	
					110	BR	
					120	BR	
					123 Drilled bedrock to 123 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 1 of 5 **Boring No.** DRB-002 **Location:** Hackensack River	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 14, 2005 - Sunny, 50°F-60°F
November 15, 2005 - Overcast, occassional drizzle, 50°F-60°F
Date/Time Start: November 14, 2005 / 0900 hrs.
Date/Time Finish: November 18, 2005 / 1050 hrs. (118 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-002 is located offshore and to the south of SA-7 on the western edge of the main river channel at a depth of approximately 15 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
					0 to 5	Drilled to 5 feet.		
5'-7'	SP				5 to 7	Gray-brown silt.		
						Drilled to 15 feet.		
15'-17'	SP				15 to 17	Gray-brown silt with some transition to reddish brown color evident.		
						Drilled to 25 feet.		
25'-27'	SP				25 to 27	Reddish brown silt and sand layer, and gray-brown clayey silt layer.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: B&B Drilling Driller: Greg, Nick Inspector: Rob Laufenberg Rig Type: CME	HYDROQUAL DRILLING RECORD PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	BORING/ WELL NO. DRB-002 Sheet 2 of 5 Location: Hackensack River

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 16, 2005 - Mostly overcast, 65°F
Date/Time Start: November 14, 2005 / 0900 hrs.
Date/Time Finish: November 18, 2005 / 1050 hrs. (118 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:
DRB-002 is located offshore and to the south of SA-7 on the western edge of the main river channel at a depth of approximately 15 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
						Continued from previous page.		
						Drilled to 35 feet.		
35'-37'	SP				35 to 37	Reddish brown, clayey silt.		
						Drilled to 45 feet.		
45'-47'	SP				45 to 47	Reddish brown, clayey silt.		
						Drilled to 55 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 3 of 5 **WELL NO.** DRB-002 **Location:** Hackensack River	
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From	Weather: November 16, 2005 - Mostly overcast, 65°F November 17, 2005 - Sunny, 45°F Date/Time Start: November 14, 2005 / 0900 hrs. Date/Time Finish: November 18, 2005 / 1050 hrs. (118 feet) Weight of Hammer 300 lb. Drop of Hammer Type of Hammer mechanical	**Location Description:** DRB-002 is located offshore and to the south of SA-7 on the western edge of the main river channel at a depth of approximately 15 feet at MLW.	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					Continued from previous page.		
55'-57'	SP				55 to 57 Reddish brown, clayey silt.		
					Drilled to 65 feet.		
65'-67'	SP				65 to 67 Reddish brown, clayey silt.		
					Drilled to 75 feet.		
75'-77'	SP				75 to 77 Reddish brown, clayey silt.		
					Drilled to 85 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/ WELL NO.** DRB-002	Sheet 4 of 5
	Weather: November 17, 2005 - Sunny, 45°F November 18, 2005 - Sunny, 40°F Date/Time Start: November 14, 2005 / 0900 hrs. Date/Time Finish: November 18, 2005 / 1050 hrs. (118 feet) Weight of Hammer 300 lb. Drop of Hammer Type of Hammer mechanical	**Location:** Hackensack River **Location Description:** DRB-002 is located offshore and to the south of SA-7 on the western edge of the main river channel at a depth of approximately 15 feet at MLW.	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					Continued from previous page.		
85'-87'	SP				85 to 87 Red-brown compacted silt, dry, less clay content.		
					Drilled to 95 feet.		
					95 to 97 Drilling difficult, continued drilling to confirm bedrock.		
					98 Bedrock - Drilled bedrock 20 feet.	BR	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 5 of 5 **WELL NO.** DRB-002 **Location:** Hackensack River	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 18, 2005 - Sunny, 40°F
Date/Time Start: November 14, 2005 / 0900 hrs.
Date/Time Finish: November 18, 2005 / 1050 hrs. (118 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-002 is located offshore and to the south of SA-7 on the western edge of the main river channel at a depth of approximately 15 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					105	BR	
					110	BR	
					118	BR	
					123 Drilled bedrock to 123 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc.
Driller: Greg, Nick
Inspector: Rob Laufenberg
Rig Type: CME

HYDROQUAL
DRILLING RECORD

PROJECT NAME: Honeywell Fall 2005 River Investigation
PROJECT NUMBER: HWEL.002.001.10

BORING/ Sheet 1 of 5
Boring No. DRB-007
Location: Hackensack River

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: November 19, 2005 - Sunny, 40°F
November 21, 2005 - Overcast, 50°F
Date/Time Start: November 19, 2005 / 0900 hrs.
Date/Time Finish: November 28, 2005 / 1500 hrs. (121 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:
DRB-007 is located offshore of the approximate mid-point of SA-7, on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					0 to 10 Drilled to 10 feet.		
10'-12'	SP				10 to 12 Gray-brown silt.		
					Drilled to 20 feet.		
20'-22'	SP				20 to 22 Reddish-brown, dry silt.		
					Drilled to 30 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: B&B Drilling	HYDROQUAL DRILLING RECORD	BORING/ WELL NO. DRB-007	Sheet 2 of 5
Driller: Greg, Nick		Location:	
Inspector: Rob Laufenberg	PROJECT NAME: Honeywell Fall 2005 River Investigation	Hackensack River	
Rig Type: CME	PROJECT NUMBER: HWEL.002.001.10		

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 21, 2005 - Overcast, 50°F

Date/Time Start: November 19, 2005 / 0900 hrs.

Date/Time Finish: November 28, 2005 / 1500 hrs. (121 feet)

Weight of Hammer 300 lb.

Drop of Hammer

Type of Hammer mechanical

Location Description:

DRB-007 is located offshore of the approximate mid-point of SA-7, on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					Continued from previous page.		
30'-32'	SP				30 to 32 Reddish, gray-brown, clayey silt.		
					Drilled to 40 feet.		
40'-42'	SP				40 to 42 Reddish-brown silt with trace clay.		
					Drilled to 50 feet.		
50'-52'	SP				50 to 52 Red-brown, clayey silt.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL** **DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/** Sheet 3 of 5 **WELL NO.** DRB-007 **Location:** Hackensack River	
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From	Weather: November 21, 2005 - Overcast, 50°F November 22, 2005 - Cloudy with heavy rain, 45°F Date/Time Start: November 19, 2005 / 0900 hrs. Date/Time Finish: November 28, 2005 / 1500 hrs. (121 feet) Weight of Hammer 300 lb. Drop of Hammer Type of Hammer mechanical	**Location Description:** DRB-007 is located offshore of the approximate mid-point of SA-7, on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.	

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					Drilled to 60 feet.		
60'-62'	SP				60 to 62 Red-brown, clayey silt.		
					Drilled to 70 feet.		
70'-72'	SP				70 to 72 Red-brown, clayey silt.		
					Drilled to 80 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/ WELL NO.** DRB-007 Sheet 4 of 5 **Location:** Hackensack River

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 28, 2005 - Partly sunny, 55°F
Date/Time Start: November 19, 2005 / 0900 hrs.
Date/Time Finish: November 28, 2005 / 1500 hrs. (121 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-007 is located offshore of the approximate mid-point of SA-7, on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL		Soil Classification	COMMENTS
					Continued from previous page.			
80'-82'	SP				80 to 82	Red-brown, clayey silt with some small stones (till).		
						Drilled to 90 feet.		
90'-92'	SP				90 to 92	Red-brown, clayey silt with gravel (till).		
						Drilled to 100 feet.		
					98 to 99	Drilling difficult, continued drilling to confirm bedrock.		
					101	Bedrock, drilled 20 feet.	BR	

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Contractor: CMI Subsurface Investigations, Inc. **Driller:** Greg, Nick **Inspector:** Rob Laufenberg **Rig Type:** CME	**HYDROQUAL DRILLING RECORD** PROJECT NAME: Honeywell Fall 2005 River Investigation PROJECT NUMBER: HWEL.002.001.10	**BORING/ WELL NO.** DRB-007 Sheet 5 of 5 **Location:** Hackensack River	

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

Weather: November 28, 2005 - Partly sunny, 55°F

Date/Time Start: November 19, 2005 / 0900 hrs.
Date/Time Finish: November 28, 2005 / 1500 hrs. (121 feet)
Weight of Hammer 300 lb.
Drop of Hammer
Type of Hammer mechanical

Location Description:

DRB-007 is located offshore of the approximate mid-point of SA-7, on the eastern edge of the main river channel at a depth of approximately 20 feet at MLW.

Sample Depth	Sample Type	Blows per 6"	Rec. (feet)	Cr+6 mg/L	FIELD IDENTIFICATION OF MATERIAL	Soil Classification	COMMENTS
					105	BR	
					110	BR	
					120	BR	
					121 Drilled bedrock to 121 feet.		

SAMPLING METHOD
SS = SPLIT SPOON
C = ROCK CORING
GP = GEOPROBE

COMMENTS:
SP = Simulprobe sampling.

Table B-2
Monitoring Well Construction Details

WELL ID	Ref. Pt. Elev. (ft, msl)	Zone	X Coord.	Y Coord.	Ground Elev. (ft, msl)	Inner Casing Diam. (in)	Screen Length (ft.)	Screen Bottom Depth (ft)	Date Installed
073-MW-10BR	6.67	Rock	601550.1	685241.3	7.07	6			
073-MW-10BR-1	6.67	Rock	601550.1	685241.3	7.07	*	10	155	7/28/06
073-MW-10BR-2	6.67	Rock	601550.1	685241.3	7.07	*	10	170	7/28/06
073-MW-10BR-3	6.67	Rock	601550.1	685241.3	7.07	*	15	195	7/28/06
073-MW-10BR-4	6.67	Rock	601550.1	685241.3	7.07	*	15	227	7/28/06
073-MW-10BR-5	6.67	Rock	601550.1	685241.3	7.07	*	15	327	7/28/06
073-MW-1BR-1	7.575	Rock	601551.2	685607.4	8.215	6	15	144	8/30/04
073-MW-1BR-2	7.575	Rock	601551.2	685607.4	8.215	6	15	209	8/30/04
073-MW-1BR-3	7.575	Rock	601551.2	685607.4	8.215	6	15	264	8/30/04
073-MW-1BR-4	7.575	Rock	601551.2	685607.4	8.215	6	15	295	8/30/04
073-MW-1BR-5	7.575	Rock	601551.2	685607.4	8.215	6	15	326	8/30/04
073-MW-BB11	7.87	Shallow	601475	685543.2	8.3	2	10	13	8/5/97
073-MW-Y10	6.42	Shallow	601665.4	685387.6	7.1	2	10	13	8/5/97
079-MW-13BR	13.08	Rock	604496.6	685435.9	12.49	6	112	132	1/18/06
079-MW-13BR-1	13.08	Rock	604496.6	685435.9	12.098	*	10	121	11/10/06
079-MW-13BR-2	13.08	Rock	604496.6	685435.9	12.098	*	15	214	11/10/06
079-MW-13BR-3	13.08	Rock	604496.6	685435.9	12.098	*	15	284	11/10/06
079-MW-A2	8.09	Shallow	604088.5	685552	8.5	2	10	13	5/16/97
079-MW-C6	10.93	Shallow	604427.6	685438.3	11.1	2	10	13	5/16/97
087-MW-001	12.67	Shallow	602974.1	685536.7	12.78	2	13	15	5/16/05
087-MW-01	10.87	Deep	603662.1	685956.8	10.87	2	10	60	4/3/03
087-MW-02	12.57	Deep	603025.6	685848.1	12.57	2	10	82	4/29/03
087-MW-03	12.57	Deep	602722.1	685824.6	12.57	2	10	95	4/1/03
087-MW-08	12.91	Deep Till	602868.8	686739	13.24	2	10	99	3/13/03
087-MW-13	12.94	Intermediate	602870.1	686728.5	13.24	2	10	40	4/23/03
087-MW-14	10.68	Rock-Intermediate	603608.7	686287.2	9.6	2	10	97	4/24/03
087-MW-34	12.69	Deep	603285	686726.7	12.91	2	5	70	
087-MW-35	18.59	Intermediate	602354.4	686404.6	16.53	2	10	40	
087-MW-A26	10.14	Shallow	604017.5	685816.9	10.7	2	10	13	6/12/97
087-MW-A26D	10.43	Intermediate	604012.3	685824	10.63		10	28	2/27/01
087-MW-A26T	9.99	Deep	604020.6	685824.8	10.72		15	56	2/27/01
087-MW-I30	10.78	Shallow	603596.9	686306.7	0	2	10	14	6/13/97
087-MW-I30T	10.59	Rock-Till Interface	603613.1	686301.2	0	2	15	80	8/4/99
087-MW-O19	13.5	Shallow	602739.3	685689.2	14	2	10	13	5/21/97
087-MW-O19D	13.75	Intermediate	602742.9	685697.7	13.8	2	10	37	10/14/97
087-MW-O23	11.8	Shallow	602830.2	686000.2	12	2	10	13	6/10/97
087-MW-O29	10.15	Shallow	603064	686423.5	10.5	2	10	14	6/13/97
087-MW-O29D	10.31	Intermediate	603084.1	686417.3	10.49			56	
087-MW-O29T	10.02	Rock-Till Interface	603025.7	686439.3	10.5	2	15	102	8/6/99
087-MW-S19	14.47	Shallow	602463.7	685859.7	14.9	2	10	14	5/21/97
087-MW-U28	14.16	Shallow	602536.1	686534.6	14.7	2	10	16	6/16/97
087-MW-W25	18.27	Shallow	602357.2	686412.8	16.04	2	10	18	6/10/97
087-MW-W25D	18.42	Intermediate	602349.6	686416.9	16.01	0	10	66	2/21/01
087-MW-W25T	18.49	Deep	602349.3	686408.5	16.42	0	15	91	2/21/01
087-MW-Y20	19.12	Shallow	602092.1	686118.9	17.1	2	10	20	5/21/97
088-MW-001	9.28	Shallow	603792.5	685389.1	9.52	2	13	15	5/16/05
088-MW-002	12.82	Shallow	603598.2	685046	13.19	2	13	15	5/16/05
088-MW-101		Shallow	603441.7	685313.8					
088-MW-102		Shallow	603471.2	685299.1					
088-MW-103		Shallow	603415	685483					
088-MW-15	10.9	Intermediate	603414.9	685483	10.9	2	10	35	4/4/03
088-MW-G19	12.38	Shallow	603330.3	685373.6	12.8	2	10	13	6/10/97
088-MW-G19T	12.48	Deep Till	603406.5	685497.3	12.82	2	15	93	5/11/99
090-MW-07	11.82	Intermediate	603880.8	684685.9	11.82	2	10	40	3/18/03
090-MW-09	14.53	Deep	603902.1	685024.2		2	5	75	3/31/04
090-MW-10	14.99	Shallow	603797	684825	15.25	2	10	12	4/14/05
090-MW-11	15.05	Shallow	603978	684945	15.51	2	10	12	4/14/05
090-MW-18BR	16.36	Rock	604665	684115	16.76	2	15	154	9/21/06
090-MW-7BR-1	12.66	Rock	603871.6	684694.4	13.35	*	15	134	9/20/04
090-MW-7BR-2	12.66	Rock	603871.6	684694.4	13.35	*	15	177	9/21/04
090-MW-7BR-3	12.66	Rock	603871.6	684694.4	13.35	*	15	233	9/22/04

Table B-2
Monitoring Well Construction Details

WELL ID	Ref. Pt. Elev. (ft, msl)	Zone	X Coord.	Y Coord.	Ground Elev. (ft, msl)	Inner Casing Diam. (in)	Screen Length (ft.)	Screen Bottom Depth (ft)	Date Installed
090-MW-8A		Shallow	604095.1	684528.6					
090-MW-E1	13.79	Shallow	603838.5	685006.6	13.96	2	10	13.86	5/19/97
090-MW-F14	20.56	Shallow	604756.8	684434.8	21	2	10	15	5/19/07
115-MW-04R	13.08	Deep	602494.6	685310.9	13.08	2	10	87	2/11/03
115-MW-05	10.88	Deep	602479.4	684995.6	10.88	2	10	84	3/3/03
115-MW-101	9.5	Shallow	602065	685938	7.7	2	10	13	11/17/03
115-MW-103	10.1	Shallow	601760	685638	8.5	2	10	19	11/14/03
115-MW-104	11.9	Shallow	602357	685743	10.3	2	10	17	11/12/03
115-MW-107	11.55	Shallow	602219	685301	10.1	2	10	17	11/13/03
115-MW-108	17.6	Shallow	602826	685326	15.9	2	10	22	11/18/03
115-MW-109	16.1	Shallow	602596	685054	14.7	2	10	21	11/17/03
115-MW-115	14.3	Shallow	602193	685534	12.6	2	10	21	11/12/03
115-MW-118	16	Shallow	603163.9	685172.2	14.39	2	10	20	11/14/03
115-MW-119A	16.4	Shallow	603192	684805	16.7	2	10	19	11/19/03
115-MW-16	10.22	VAS	601839.5	685808.6	8.88	10			
115-MW-17	15.91	Intermediate	602153.4	685576	13.37	2	5	62	2/11/04
115-MW-18	12.1	VAS	602534.3	685308	11.36	12			
115-MW-19	17.87	Deep	603320	684847.8	15.8	2	5	84	3/2/04
115-MW-20	14.17	Intermediate	602555.9	685343.2	11.49	2	5	40	3/2/04
115-MW-201BR	8.52	Rock-Upper	601743.7	685828.9	7.48	4	20	140	2/27/04
115-MW-202BR	8.76	Rock-Upper	601574.3	685661.3	6.94	4	20	148	12/18/03
115-MW-203BR	8.7	Rock-Upper	601761.4	685524.2	7.34	4	20	162	2/26/04
115-MW-204BR(ABAN)		Rock-Upper	602085.3	685282.6	8.8	4	20	158	12/11/03
115-MW-205BR	11.84	Rock-Upper	602412.4	685049.3	10.44	4	20	151	2/13/04
115-MW-206	14.2	Shallow	602731	684792	12.7	2	10	15	11/13/03
115-MW-206BR	14.31	Rock-Upper	602719.1	684794.2	12.42	4	20	150	12/16/03
115-MW-207BR	16.07	Rock-Upper	603043.8	684515.7	14.76	4	20	143	2/11/04
115-MW-208BR	11.65	Rock-Upper	603290.8	684299.5	10.05	4	20	138	12/4/03
115-MW-209BR	14.51	Rock-Upper	603437.9	684593	13.24	4	20	132	3/3/04
115-MW-211BR	15.91	Rock-Upper	603283.8	685210.1	14.55	4	20	124	12/13/03
115-MW-212BR	12.85	Rock-Upper	602955.3	685394.3	11.43	4	20	130	2/27/04
115-MW-213BR	11.13	Rock-Upper	602628.9	685615.9	9.9	4	20	139	12/15/03
115-MW-214BR	11.11	Rock-Upper	602264.1	685807.7	9.8	4	20	148	3/2/04
115-MW-215BR	8.82	Rock-Upper	601917.2	686002.2	7.4	4	20	143	12/18/03
115-MW-216BR	17.97	Rock-Upper	603325	684930.1	16.64	4	20	131	3/1/04
115-MW-A12T	14.8	Intermediate	603527.6	684724.1	13.06	2	10	50	12/14/98
115-MW-AA15	8.66	Shallow	601739.1	685793.6	7	2	10	14	4/22/97
115-MW-E14	18.32	Shallow	603325.4	684992.2	16.2	2	10	14	4/22/97
115-MW-E14D	18.05	Intermediate	603314.8	684997.7	16.2	2	10	35	10/8/97
115-MW-E14T	17.36	Deep	603315.6	684989.7	16.27	2	15	71	12/8/98
115-MW-E8	17.14	Shallow	603121.8	684555.2	15	2	10	14	4/22/97
115-MW-E8D	17.14	Intermediate	603116.3	684560.9	15	2	10	35	10/8/97
115-MW-E8T	16.87	Deep	603123.1	684564.1	14.9	2	10	85	4/29/99
115-MW-K14T	17.36	Deep	602854	685169.9	15.47	2	10	90	5/4/99
115-MW-O13	13.79	Shallow	602562.6	685253.4	11.7	2	10	14	4/22/97
115-MW-O13D	13.14	Intermediate	602555	685259.5	11.6	2	10	35	10/10/97
115-MW-U14	14.93	Shallow	602137.2	685597.2	13.07	2	10	15	12/4/98
115-MW-U14D	14.85	Intermediate	602144.5	685589	13.03	2	10	40	12/9/98
115-MW-U14T	14.86	Deep	602150.2	685594.7	13.07	2	10	104	8/3/99
115-PW-21	18.39	Deep	603332.2	684962.7	16.65	4	10	71	3/9/04
115-PZ-01	6.7	Shallow	601619.7	685733.1	6.97	4	10	16.1	4/18/04
115-PZ-02	6.98	Shallow	601737.8	685846.1	7.32	4	10	16.2	4/17/04
115-PZ-03	6.79	Shallow	601856.2	685961.7	7.22	4	10	16.2	4/17/04
115-PZ-04	6.37	Shallow	601613.8	685739.5	6.74	2	10	16.2	4/18/04
115-PZ-05	7.47	Shallow	601732.7	685854.5	7.84	2	10	16.6	4/17/04
115-PZ-06	6.59	Shallow	601851.6	685969.8	6.91	2	10	16	4/12/04
115-PZ-07		Shallow							
115-PZ-08		Shallow							
115-PZ-A12	13.72	Shallow	603527.6	684724.1					
115-PZ-E11	16.57	Shallow	603216.2	684763.1	15.76	1	10	14	11/23/98
115-PZ-I14	15.51	Shallow	603017.5	685102.6	15.53	1	10	14	11/23/98
115-PZ-K09	12.83	Shallow	602730.1	684805.3	12.21	1	10	14	11/23/98

Table B-2
Monitoring Well Construction Details

WELL ID	Ref. Pt. Elev. (ft, msl)	Zone	X Coord.	Y Coord.	Ground Elev. (ft, msl)	Inner Casing Diam. (in)	Screen Length (ft.)	Screen Bottom Depth (ft)	Date Installed
115-RW-01	4.1	Shallow	601559.5	685676.8	6.9	4	10	15.6	4/6/04
115-RW-02	4.37	Shallow	601600.6	685716.2	7.2	4	10	16.4	4/6/04
115-RW-03	4.08	Shallow	601638.6	685751	7.11	4	10	16.2	4/7/04
115-RW-04	4.15	Shallow	601677.4	685786.7	7.21	4	10	16.5	4/7/04
115-RW-05	4.09	Shallow	601717.6	685826.7	7.22	4	10	15.6	4/18/04
115-RW-06	4.29	Shallow	601757.8	685866	7.28	4	10	16.1	4/15/04
115-RW-07	4.32	Shallow	601797.7	685904.2	7.34	4	10	16.2	4/6/04
115-RW-08	4.11	Shallow	601835.9	685942.8	7.15	4	10	16.1	4/6/04
115-RW-09	4.08	Shallow	601876.6	685980.9	7.08	4	10	16.6	4/6/04
115-RW-10	3.96	Shallow	601912.1	686017.6	7.06	4	10	16	4/6/04
117-MW-10	15.02	Deep Till	604502.2	684125.4	15.02	2	10	50	4/1/03
117-MW-11	15.33	Intermediate	604504.2	684136.6	15.33	2	10	35	4/2/03
117-MW-3BR-1	12.34	Rock	603693.8	683526.4	12.87	*	15	155	12/17/04
117-MW-3BR-2	12.34	Rock	603693.8	683526.4	12.87	*	15	263	12/17/04
117-MW-8BR	12.94	Rock	603717.3	683557.9	13.12	2	10	125	12/29/04
117-MW-A14	17.33	Shallow	603669.4	683739.2	17	4		17	
117-MW-A5	18.5	Shallow	604134.5	684046.2	18	4		16	
117-MW-A62	18.29	Shallow	603947.5	684425.3	18	4		15	
117-MW-A85	17.38	Shallow	603576.8	684242	17	4		15	
117-MW-A89	13.15	Shallow	603346.6	683961.1	13	4		16	
117-MW-A99	15.92	Shallow	603761.9	684664.2	16	4		14	
117-MW-D1	11.08	Intermediate	603330.9	683954.8	11.34	2	10	41.89	12/13/06
117-MW-D2	17.62	Intermediate	603541.5	684351.2	17.88	2	10	48.5	11/27/06
117-MW-D3	18.85	Deep	604105.3	684456.8	19.11	2	10	80	11/21/06
117-MW-I1	11.08	Intermediate	603336.2	683965.2	11.34	2	10	22	12/13/06
117-MW-I2	17.59	Intermediate	603545.7	684360.1	17.86	2	10	28.1	11/29/06
117-MW-I3	15.59	Intermediate	603708.3	684703.7	15.87	2	10	28.1	12/14/06
117-MW-I4	15.49	Deep	603895.7	684672.1	15.79	2	10	75	12/28/06
117-MW-I5	18.76	Intermediate	604098.1	684463.1	19.11	2	15	37	11/27/06
119-MW-01T	10.78	Deep	602809.6	683982.2	11.13	2	10	62	8/31/06
119-MW-02T	8.8	Deep	603011.1	683786.4	9.08	2	10	70	8/21/06
119-MW-11BR	10.75	Rock	602219.2	683593.4	11.27	6	20	159	12/19/05
119-MW-12BR	11.26	Rock	602940.1	683334.5	11.45	2	20	154	8/23/06
119-MW-16BR-1	8.61	Rock	603060	683750	9.07	*	15	151	8/8/06
119-MW-16BR-2	8.61	Rock	603060	683750	9.07	*	15	187	8/8/06
119-MW-16BR-3	8.61	Rock	603060	683750	9.07	*	15	247	8/8/06
119-MW-2BR-1	8.426	Rock	600960.5	684484.9	9.057	*	15	163	2/2/05
119-MW-2BR-2	8.426	Rock	600960.5	684484.9	9.057	*	15	245	2/2/05
119-MW-2BR-3	8.426	Rock	600960.5	684484.9	9.057	*	15	315	2/2/05
119-MW-4BR-1	8.77	Rock	602120.3	681281.9	9.352	*	15	179	12/16/05
119-MW-4BR-2	8.77	Rock	602120.3	681281.9	9.352	*	15	229	12/16/05
119-MW-4BR-3	8.77	Rock	602120.3	681281.9	9.352	*	15	314	12/16/05
120-MW-210	12.66	Shallow	603610.1	684918.4		2	5	11	11/18/03
120-MW-210BR	12.5	Rock-Upper	603597.4	684889.9	12.88	4	20	129	12/18/03
124-MW-001	9.51	Shallow	602977.7	684435	9.86				
124-MW-002	9	Shallow	603140.8	684149.8	9.3				
124-MW-06	9.39	Deep	603066	684445.7	9.75	2	10	70	3/11/03
124-MW-102D	9.375	Intermediate	603130.8	684311	9.71	2	10	30.17	5/11/05
124-MW-102T	9.33	Deep	603140.1	684303.9	9.61	2	10	75	5/11/05
124-MW-103D	9.165	Intermediate	603051.9	684444.2	9.58	2	10	29.9	9/6/05
124-MW-103L	9.765	Deep Lacustrine	603059.1	684436.6	9.885	2	10	55.2	8/25/05
124-MW-104D	9.075	Intermediate	603183.3	684119.4	9.435	2	10	26.06	10/13/05
124-MW-104L	9.215	Deep Lacustrine	603193.9	684119.6	9.495	2	10	43.9	10/17/05
124-MW-104T	9.305	Deep	603172.8	684122.2	9.545	2	10	67.98	10/12/05
124-MW-105D	9.625	Intermediate	602986.9	684286.2	9.83	2	10	24.29	11/23/05
124-MW-105T	9.33	Deep	602994.9	684281.5	9.59	2	10	62.37	11/23/05
124-MW-106T	9.24	Deep	602659.2	684430.6	9.69	2	10	78	7/23/06
124-MW-107T	9.08	Deep	602820.9	684581	9.29	2	10	70	8/15/06
124-MW-17BR-1	9.56	Rock	602727.9	684251.2	10.13	*	15	153	7/29/06
124-MW-17BR-2	9.56	Rock	602727.9	684251.2	10.13	*	15	337	7/29/06
124-MW-8BR	9.7	Rock	602723.3	684240.1	10.02	2	20	133	11/11/05

Table B-2
Monitoring Well Construction Details

WELL ID	Ref. Pt. Elev. (ft, msl)	Zone	X Coord.	Y Coord.	Ground Elev. (ft, msl)	Inner Casing Diam. (in)	Screen Length (ft.)	Screen Bottom Depth (ft)	Date Installed
124-MW-G02D	9.56	Intermediate	602710.6	684219.8	9.92	2	10	28	5/4/99
124-MW-G02T	9.5	Deep	602695.9	684225.5	9.84	2	10	69	5/5/99
125-MW-01		Shallow	602679.8	684704.3					
125-MW-L03	8.3	Shallow	602481.7	684482.5	8.9	2	10	13	8/6/97
134-MW-Q08	8.37	Shallow	602199	684965.1	8.8	2	10	13	6/9/97
134-MW-V09	7.98	Shallow	601868	685185.4	8.3	2	10	13	6/9/97
140-MW-01		Shallow	602281.5	685043.1					
140-MW-04	7.18	Shallow	602308.6	684543.7	7.18	4		6	
140-MW-06	8.33	Shallow	602540	684833.9	8.33	4		6	
140-MW-07	7.7	Shallow	602441.8	684702	7.7	4		6	
140-MW-9BR	7.32	Rock	602215.6	684650.5	7.92	6	20	151	11/3/05
140-MW-9BR-1	7.32	Rock	602215.6	684650.5	7.92	*	15	153	7/31/06
140-MW-9BR-2	7.32	Rock	602215.6	684650.5	7.92	*	15	222	7/31/06
140-MW-9BR-3	7.32	Rock	602215.6	684650.5	7.92	*	15	272	7/31/06
140-MW-P05D	7.44	Intermediate	602208.7	684685.9	7.72	2	10	30	12/10/98
153-MW-A13	9.62	Shallow	603229.7	683711.9	9.93	2	6	10	12/4/98
153-MW-A13T	9.34	Deep	603206.7	683678	9.96	2	15	58	5/6/99
153-MW-A15	11	Shallow	603193.8	683322.5	11.32	2	10	13	4/30/99
154-MW-A01	18.06	Shallow	605169	684350					
154-MW-A05A	19.16	Shallow	605441	684178					
154-MW-A06	19.87	Shallow	605456	684039					
154-MW-B6A		Shallow	605560	684090					
154-MW-C6A	20.37	Shallow	605552	684227					
154-MW-D01	18.78	Shallow	605305	684480					
154-MW-E08	22	Shallow	605804	684213					
154-MW-F7E		Shallow	605827	684359					
163-MW-CC8	10.93	Shallow	601285.1	685401.5	9.2	2	10	15	6/11/97
163-MW-R05	7.22	Shallow	601978.6	684776.4	7.8	2	10	13	6/11/97
163-MW-Y06	9.65	Shallow	601556.1	685077.7	7.7	2	10	13	6/11/97
184-MW-001	13.03	Shallow	604141	684853	13.2	2	10	12	4/15/05
184-MW-002	9.19	Shallow	604044.4	685404.6	9.61	2	10	12	4/14/05
184-MW-A10		Shallow							
184-MW-C02	8.32	Shallow	603935	685218	8.5	2	5	8	6/16/98
184-MW-C10	15.18	Shallow	604488	684844	15.49	2	10	16	6/16/98
184-MW-E10	13.88	Shallow	604353	685160	14.39	2	10	16	6/9/97
KP-MW-6BR-1	8.941	Rock	599602.1	687569.6	9.369	*	14	153	3/2/05
KP-MW-6BR-2	8.941	Rock	599602.1	687569.6	9.369	*	15	231	3/2/05
KP-MW-6BR-3	8.941	Rock	599602.1	687569.6	9.369	*	15	339	3/2/05
SA6-MW-14BR	9.99	Rock	604217.5	686740.4	10.41	2	10	85	10/2/06
SA6-MW-15BR	8.076	Rock	603777.3	687578.4	8.431	6	20	103	10/7/05
SA6-MW-5BR-1	17.06	Rock	603554.5	686958.6	17.46	*	15	106	7/26/04
SA6-MW-5BR-2	17.06	Rock	603554.5	686958.6	17.46	*	15	154	7/26/04
SA6-MW-5BR-3	17.06	Rock	603554.5	686958.6	17.46	*	13	204	7/26/04
SA6-MW-5BR-4	17.06	Rock	603554.5	686958.6	17.46	*	15	236	7/26/04
SA6-MW-5BR-5	17.06	Rock	603554.5	686958.6	17.46	*	15	281	7/26/04
SA6-MW-AA1	17.8	Shallow	603517	686975.5	18.05	2	10	15	11/30/00
SA6-MW-AA1D	19.36	Intermediate	603509.2	686973.3	19.59	2	10	32	12/1/00
SA6-MW-AA1T	15.31	Deep	603513.6	686981.5	15.88	2	10	70	12/5/00

* - Flute Sampling Tube

APPENDIX C-1

SANBORN MAPS

(PROVIDED ON CD)

"Linking Technology with Tradition"®

Sanborn® Map Transmittal

Ship To: Nicholas Santella
Hydroqual, Inc.
1200 MacArthur
Mahwah, NJ 07430

Order Date: 8/21/2006 **Completion Date:** 8/21/2006
Inquiry #: 1740131.1s
P.O. #: na
Site Name: 80 Kellogg St
Address: 80 Kellogg St
City/State: Jersey City, NJ 07035
Cross Streets:

Customer Project: HWEL.002.001.11
6010250TWC 201-529-5151

Based on client-supplied information, fire insurance maps for the following years were identified

1896 - 12 Maps
1898 - 43 Maps
1950 - 53 Maps
1951 - 15 Maps

Limited Permission to Photocopy Total Maps: 123

Hydroqual, Inc. (the client) is permitted to make up to THREE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2006 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission. EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

USER'S GUIDE

This User's Guide provides guidelines for accessing Sanborn Map® images and for transferring them to your Word Processor.

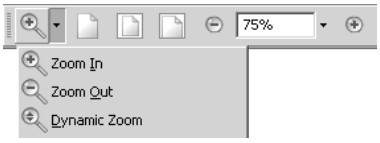
Reading Sanborn Maps

- Sanborn Maps document historical property use by displaying property information through words, abbreviations, and map symbols. The Sanborn Map Key provides information to help interpret the symbols and abbreviations used on Sanborn Maps. The Key is available from EDR's Web Site at: http://www.edrnet.com/reports/samples/key.pdf

Organization of Electronic Sanborn Image File

- Sanborn Map Report, listing years of coverage
- User's Guide
- Oldest Sanborn Map Image
- Most recent Sanborn Map Image

Navigating the Electronic Sanborn Image File

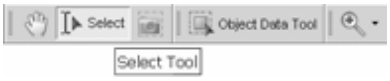


1. Open file on screen.
2. Identify TP (Target Property) on the most recent map.
3. Find TP on older printed images.
4. Using Acrobat® Reader®, zoom to 250% in order to view more clearly. (200-250% is the approximate equivalent scale of hardcopy Sanborn Maps.)
   A. On the menu bar, click "View" and then "Zoom to..."
   B. Or, use the magnifying tool and drag a box around the TP

Printing a Sanborn Map From the Electonic File

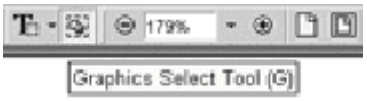
- EDR recommends printing images at 300 dpi (300 dpi prints faster than 600 dpi)
- To print only the TP area, cut and paste from Acrobat to your word processor application.

Acrobat Versions 6 and 7



1. Go to the menu bar
2. Click the "Select Tool"
3. Draw a box around the area selected
4. "Right click" on your mouse
5. Select "Copy Image to Clipboard"
6. Go to Word Processor such as Microsoft Word, paste and print.

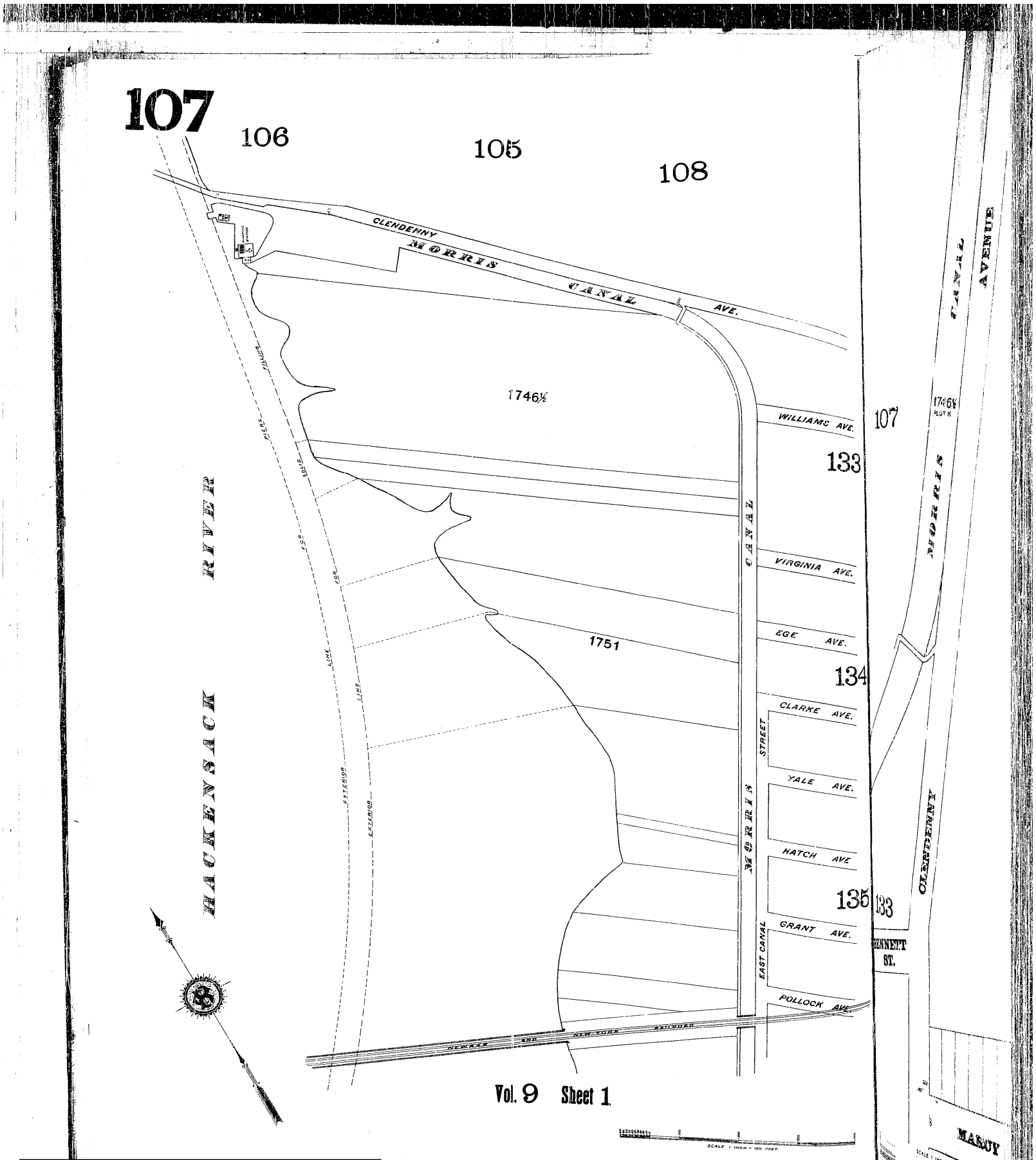
Acrobat Version 5



1. Go to the menu bar
2. Click the "Graphics Select Tool"
3. Draw a box around the area selected
4. Go to "Menu"
5. Highlight "Edit"
6. Highlight "Copy"
7. Go to Word Processor such as Microsoft Word, paste and print.

Important Information about Email Delivery of Electronic Sanborn Map Images

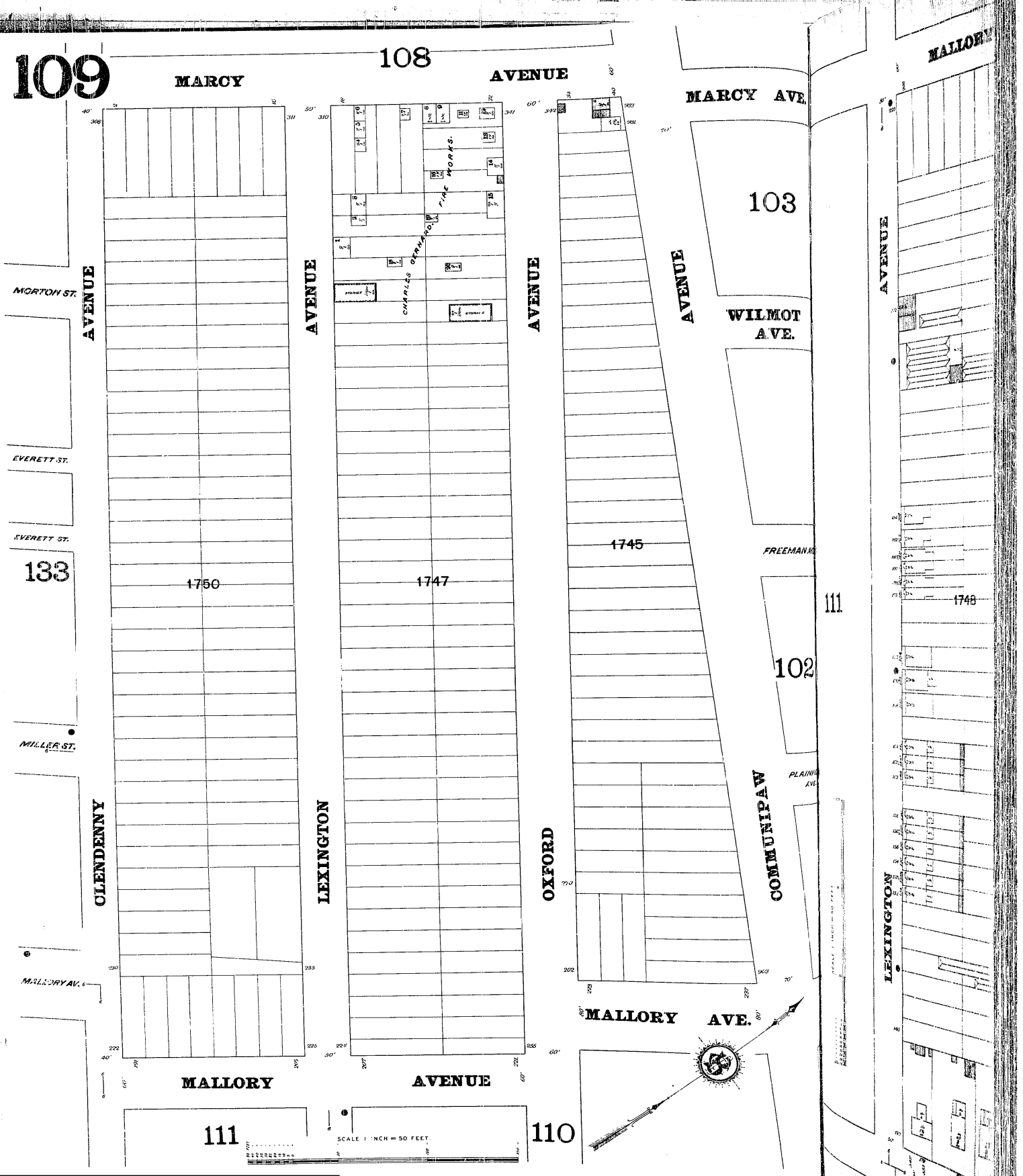
- Images are grouped intro one file, up to 2MB.
- In cases where in excess of 6-7 map years are available, the file size typically exceeds 2MB. In these cases, you will receive multiple files, labeled as "1 of 3", "2 of 3", etc. including all available map years.
- Due to file size limitations, certain ISPs, including AOL, may occasionally delay or decline to deliver files. Please contact your ISP to identify their specific file size limitations.



The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

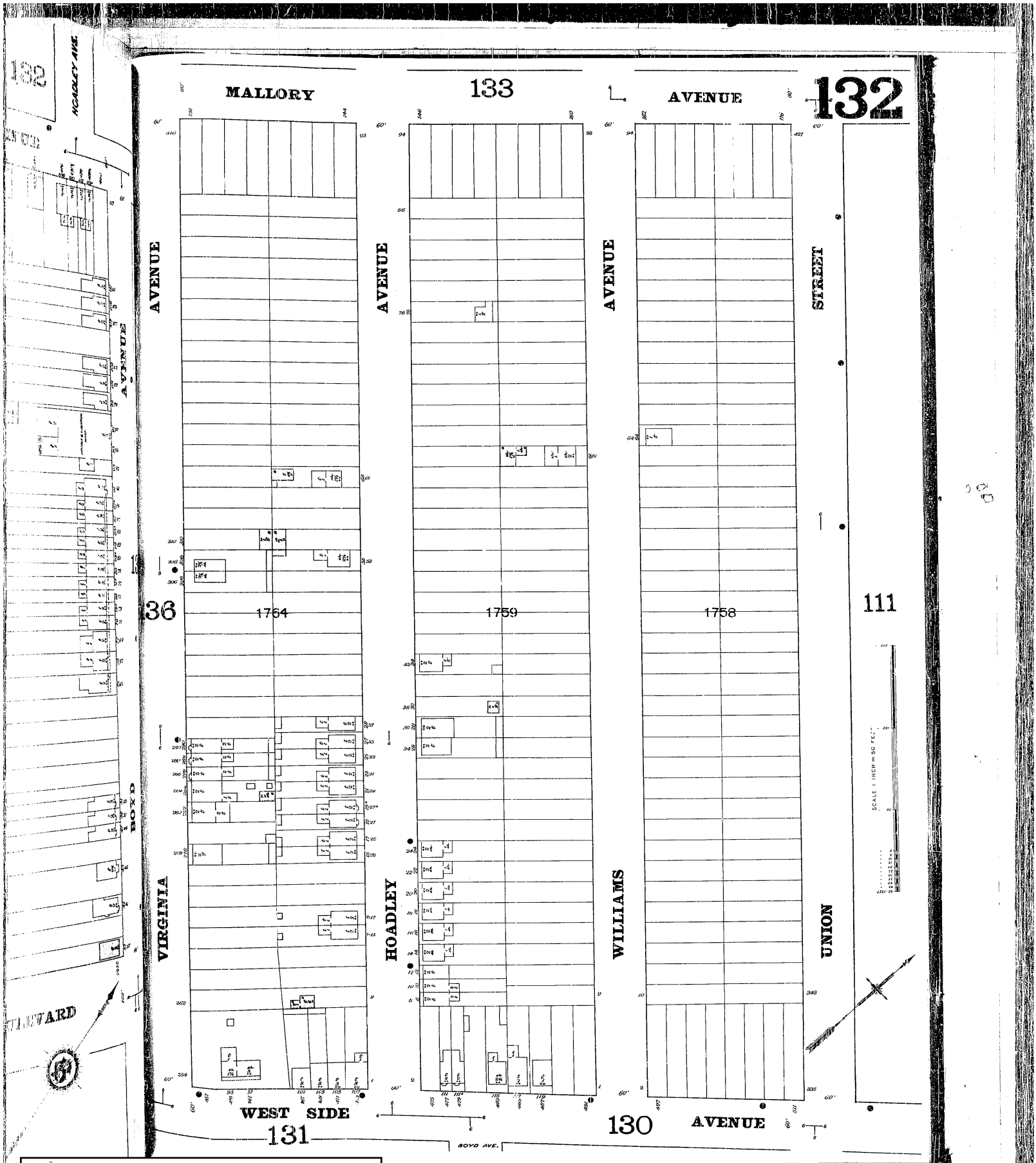
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

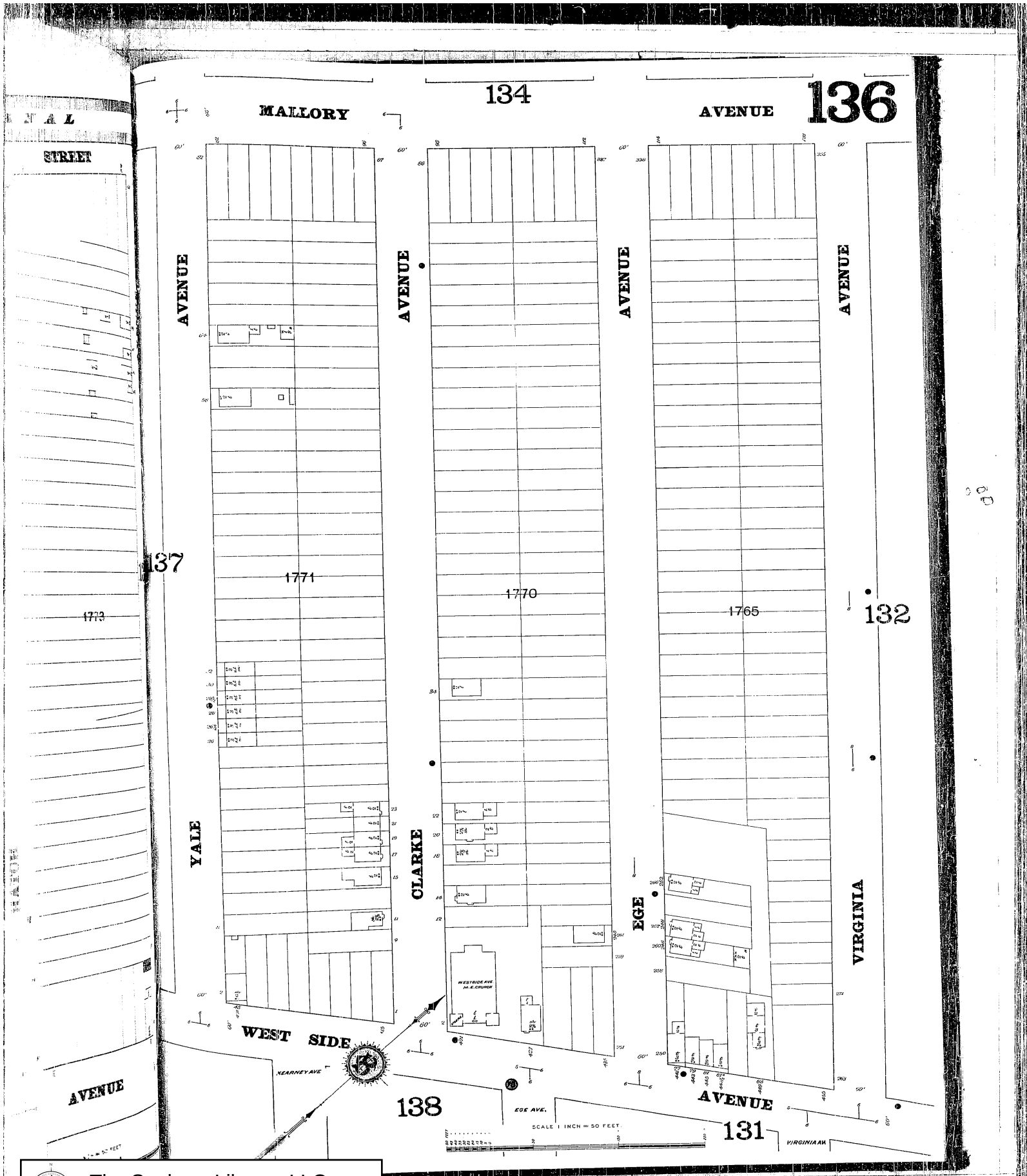
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

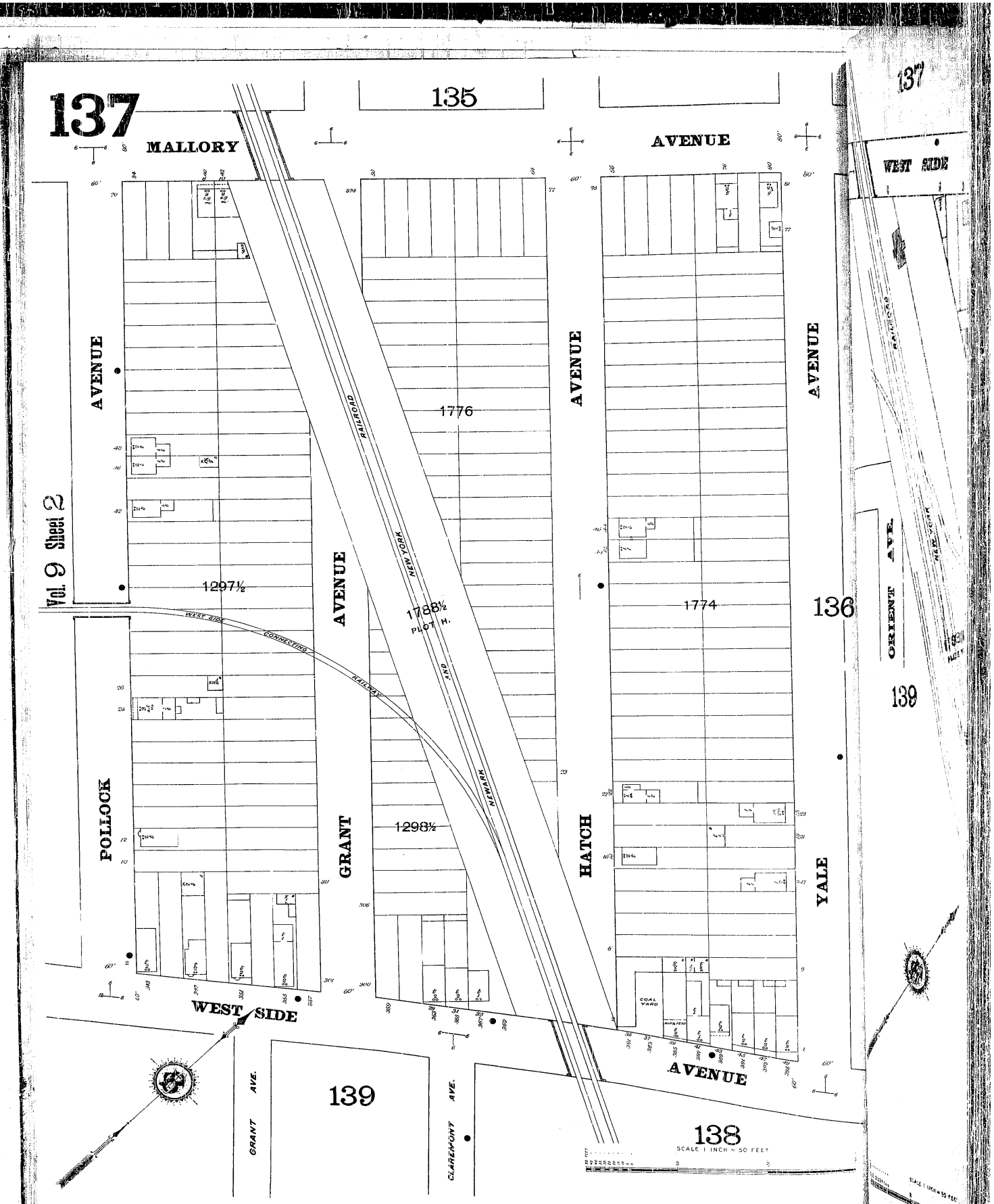
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

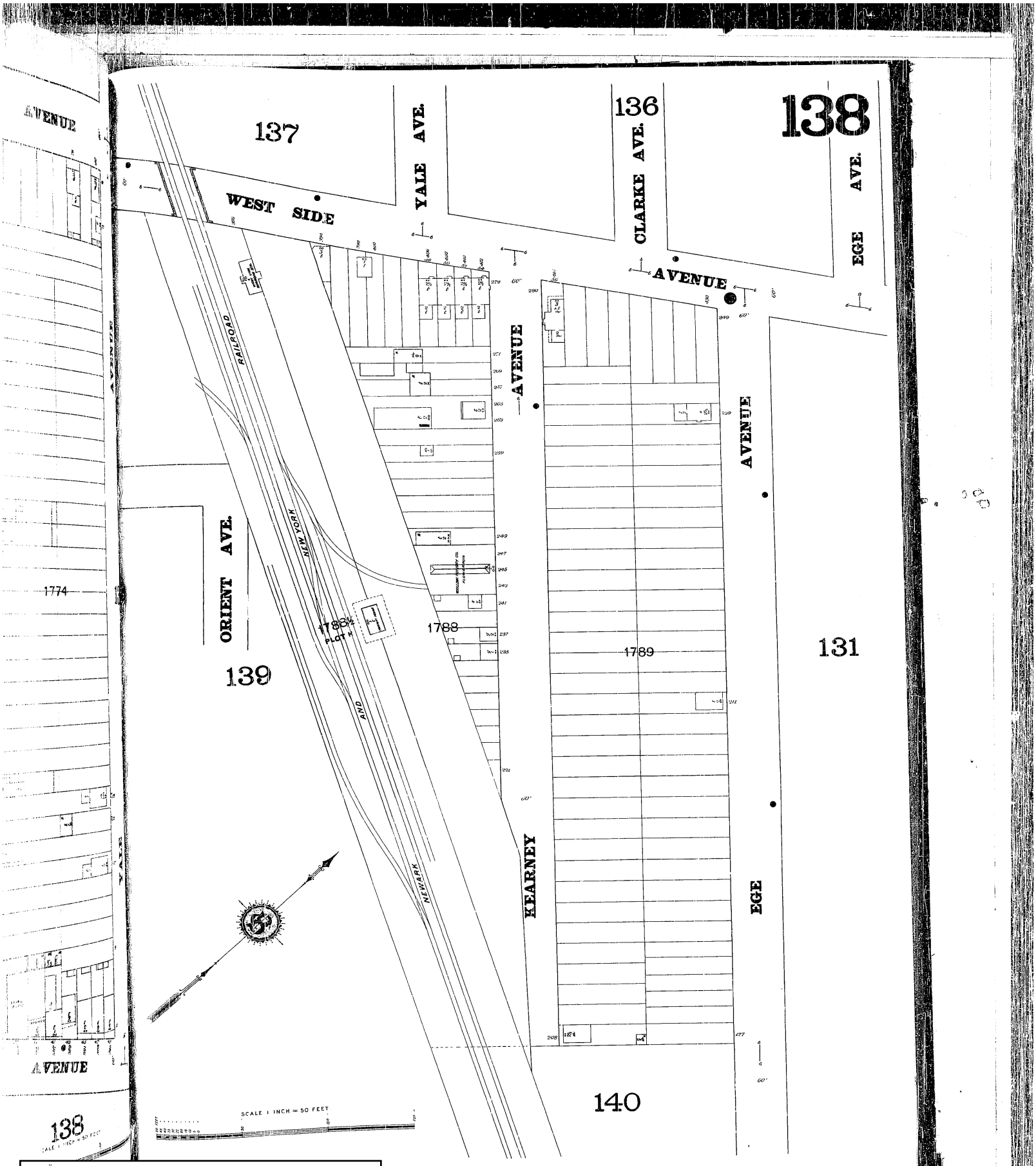
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

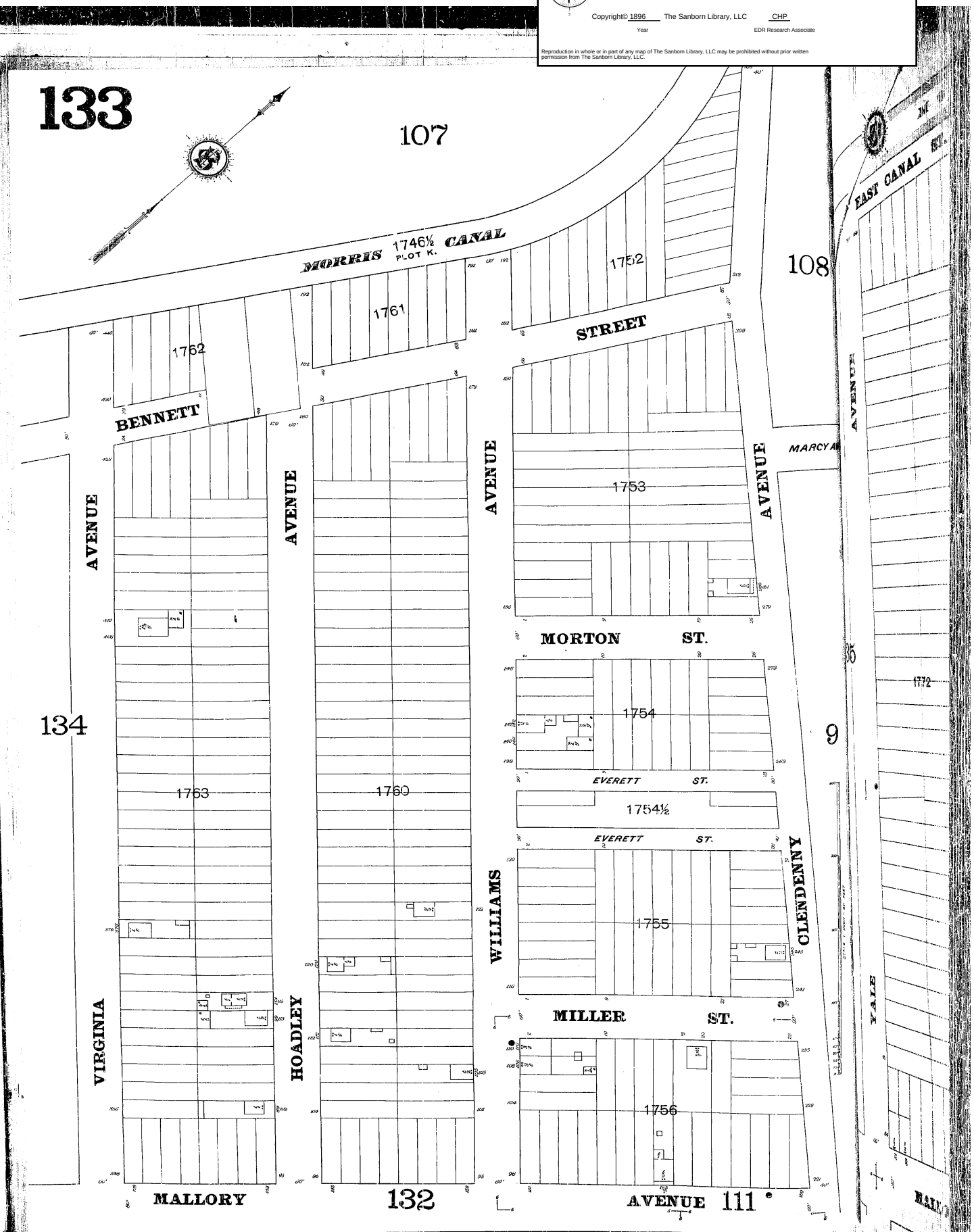
Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

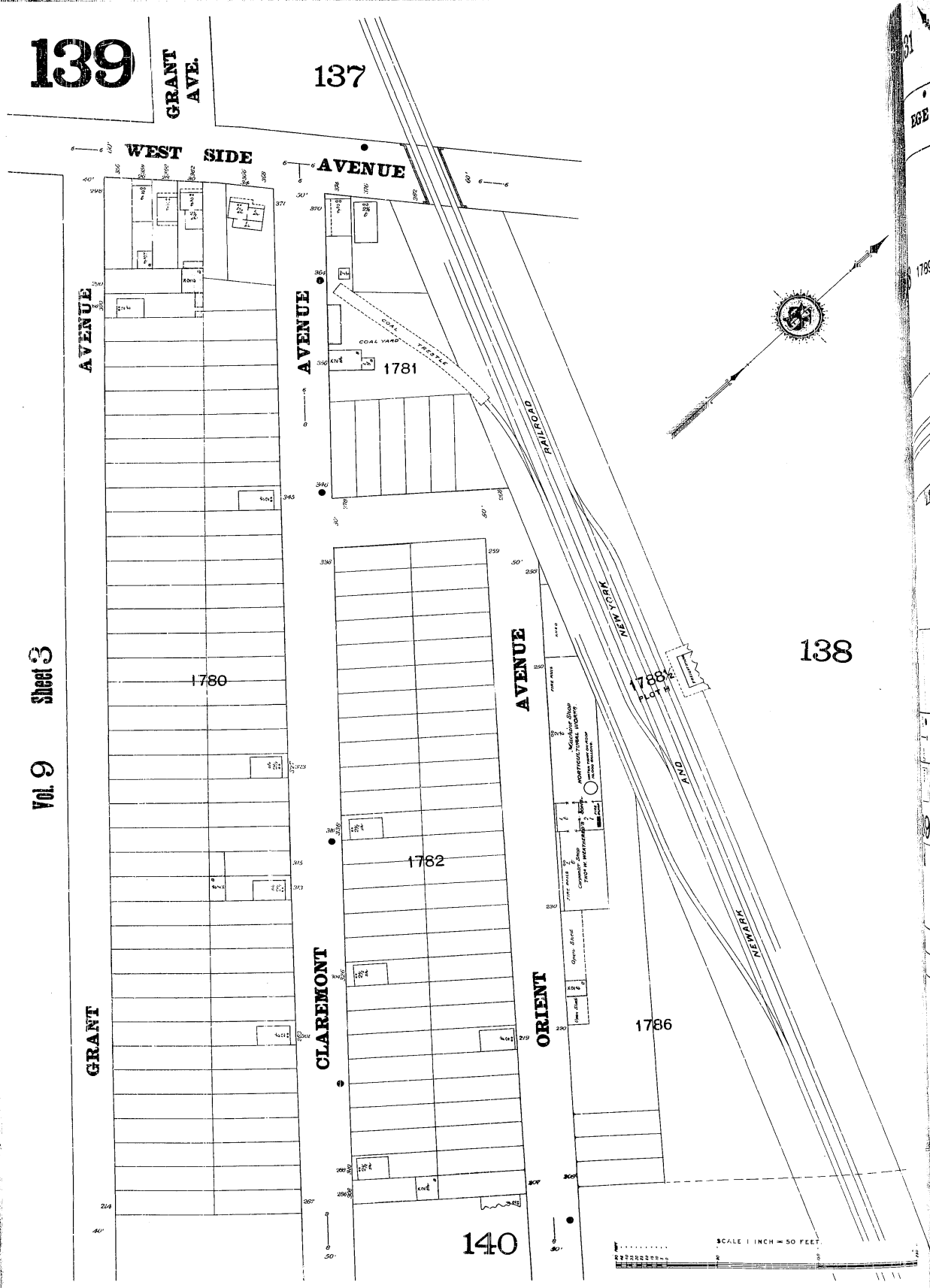
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

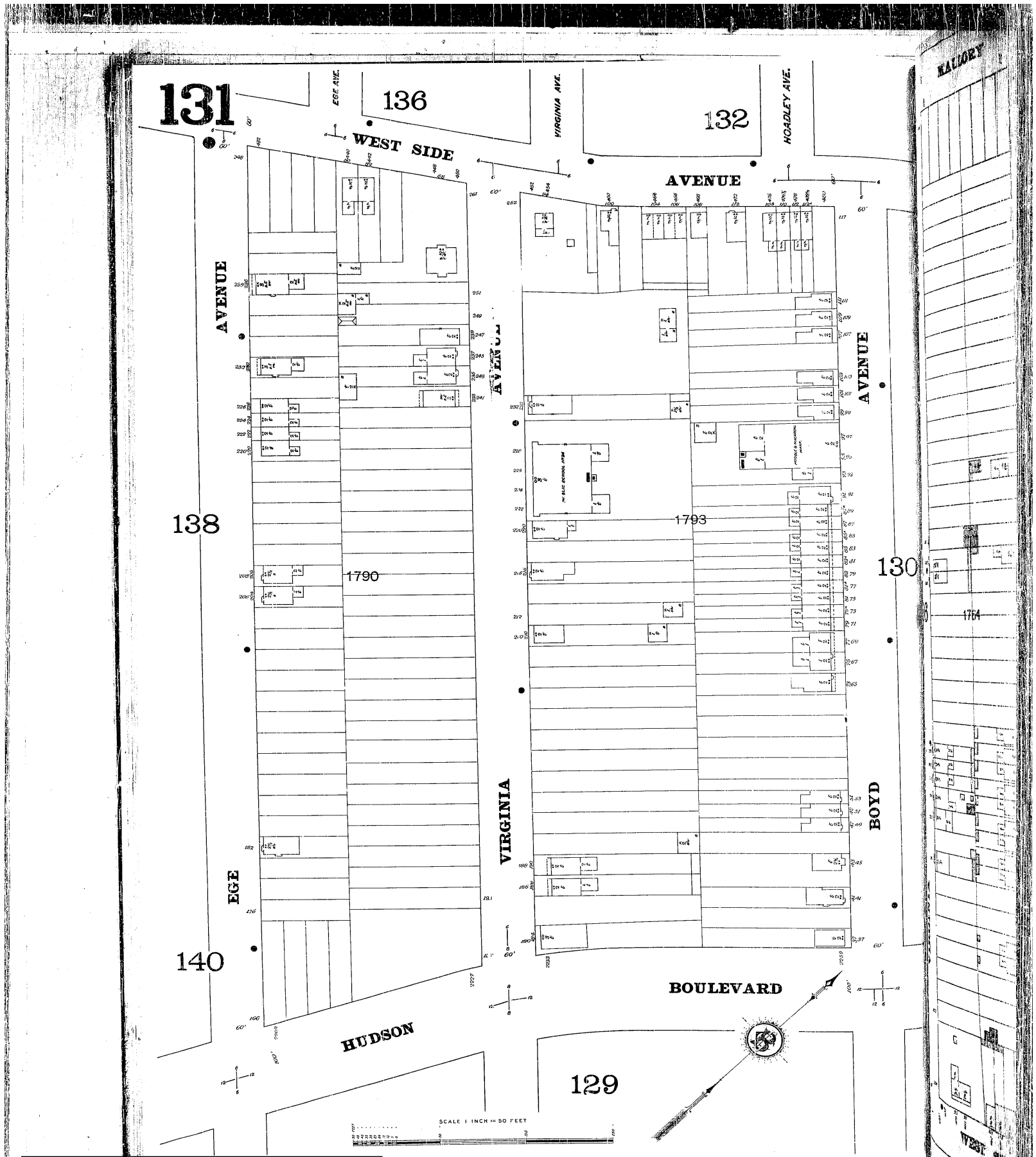




The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

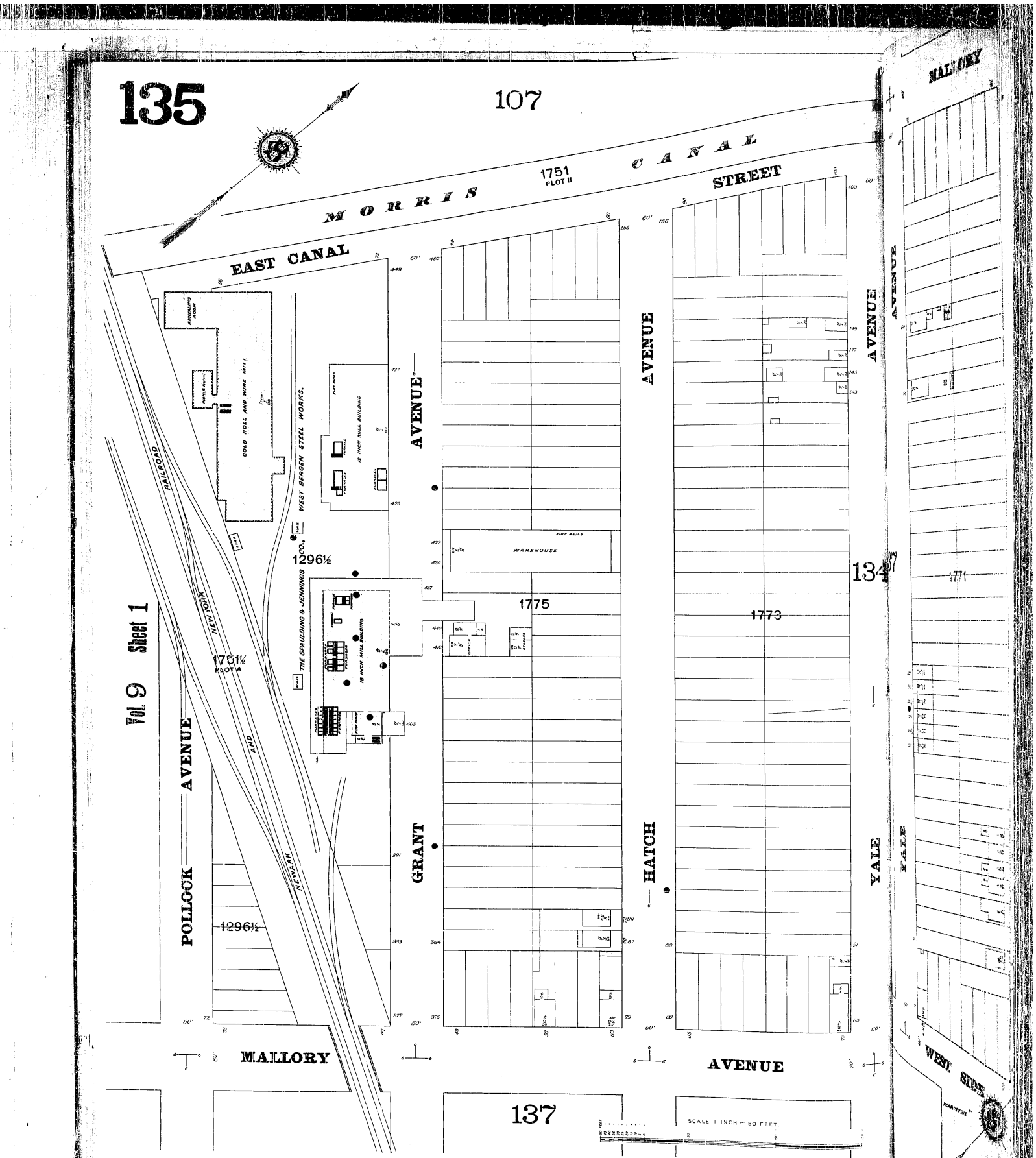
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

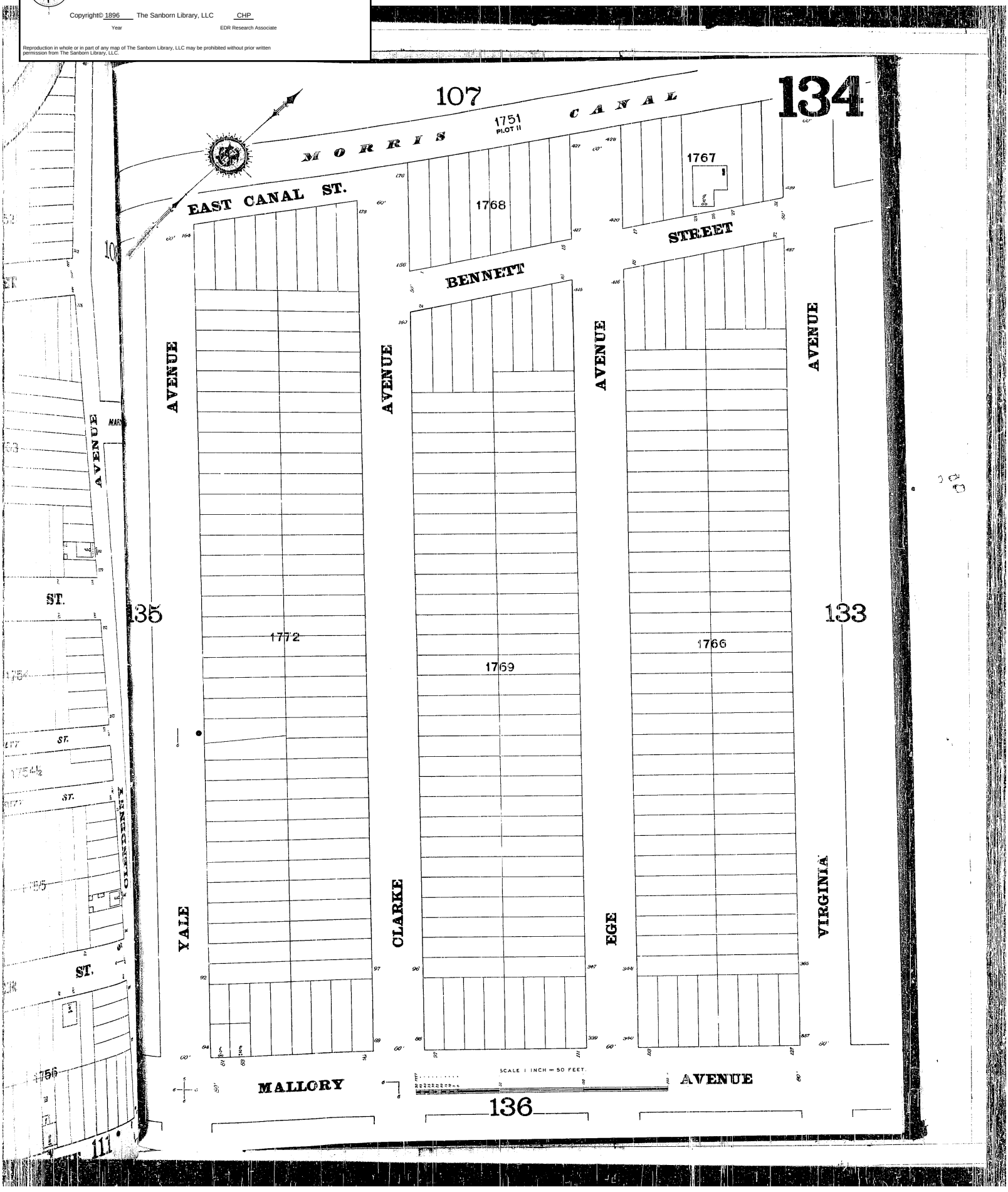
Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

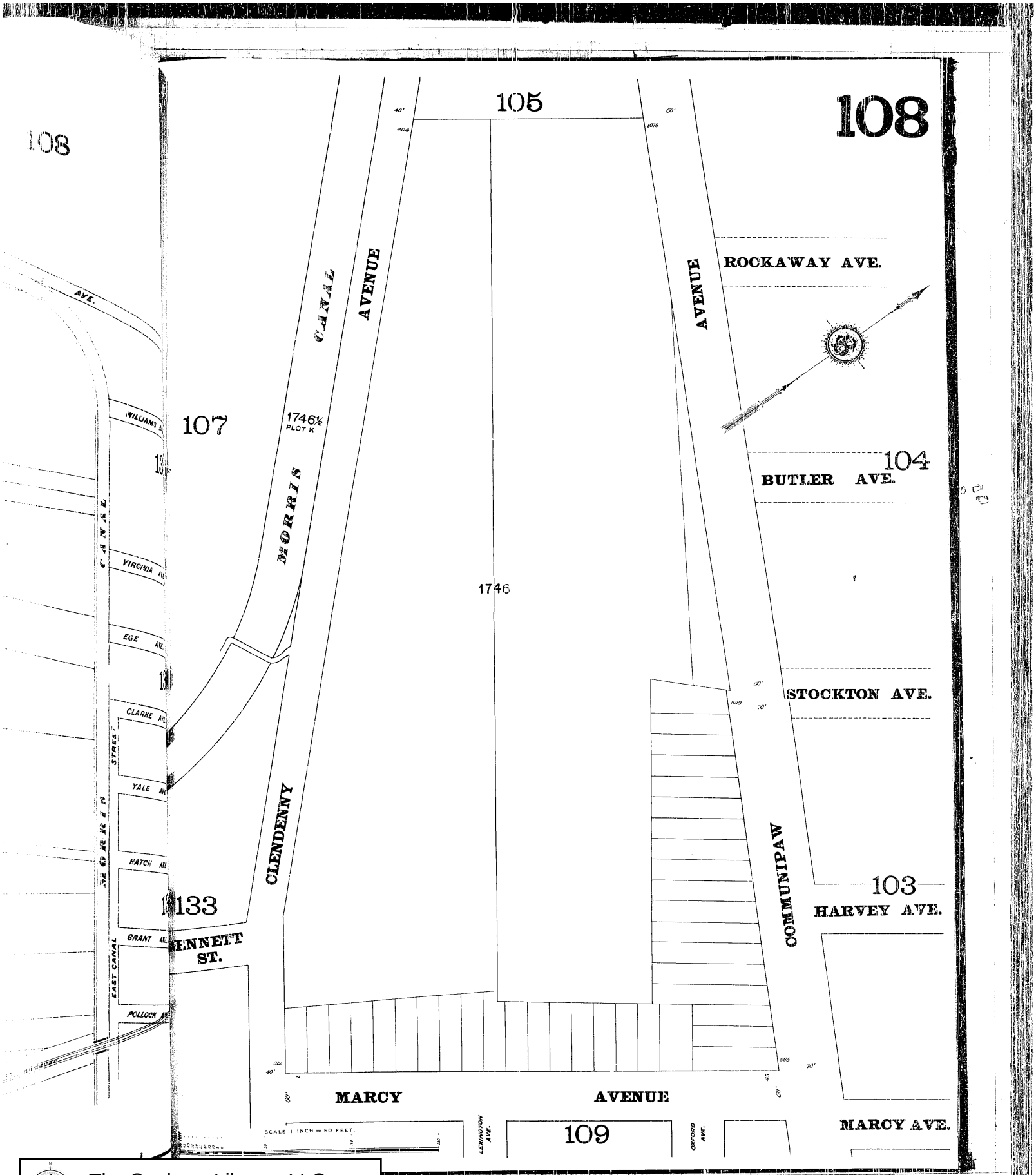
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

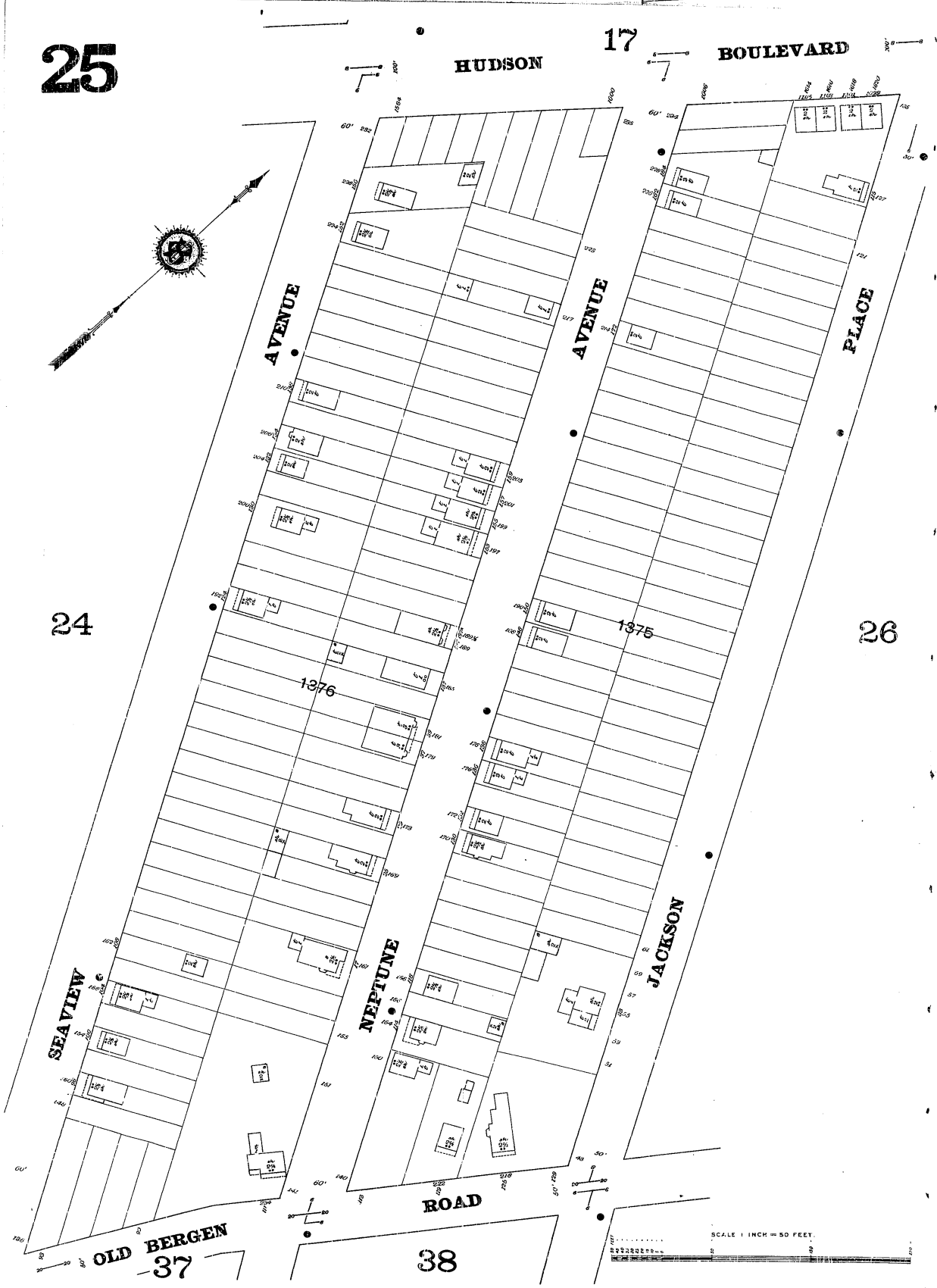




The Sanborn Library, LLC

Copyright© 1896 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP

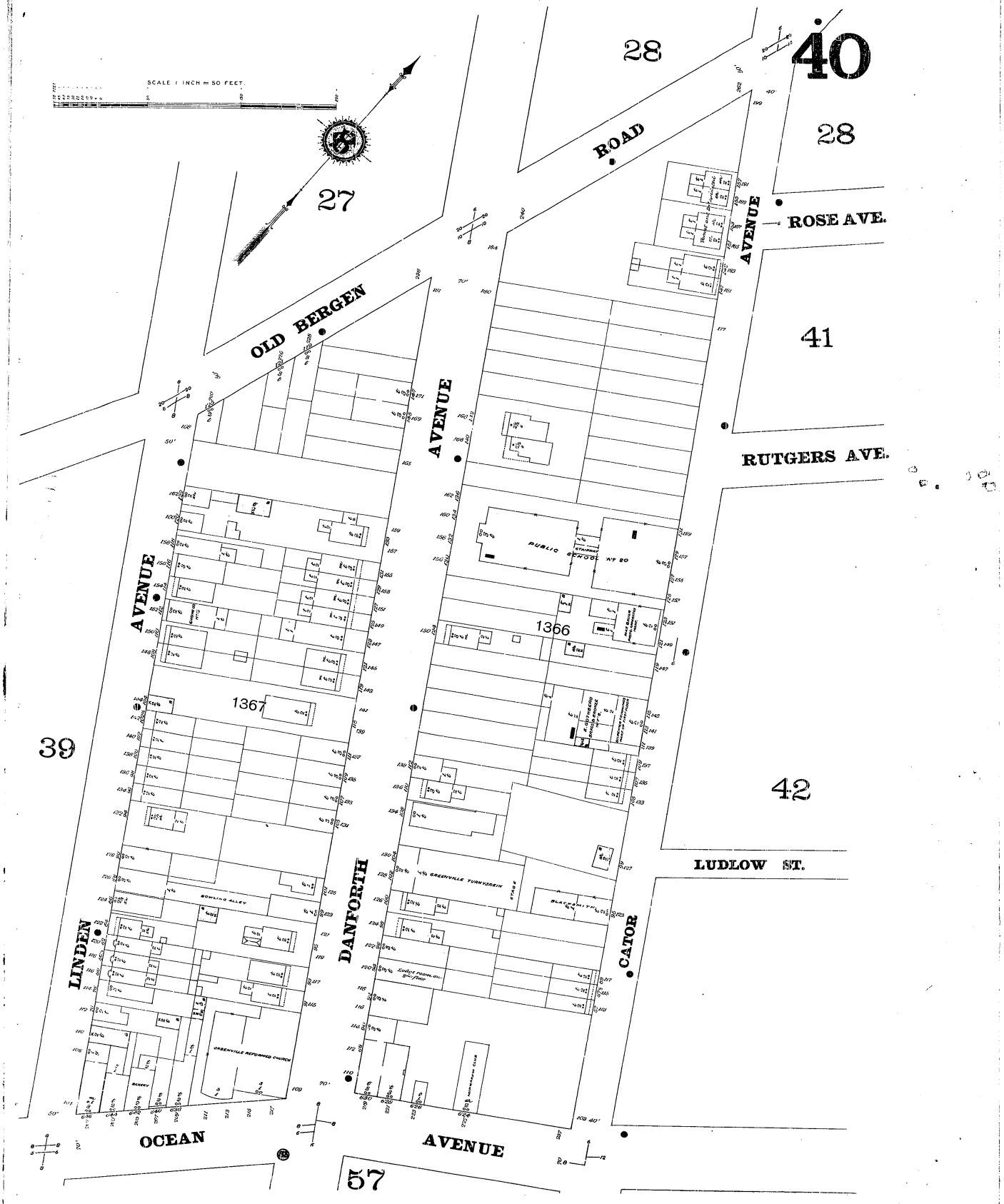
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

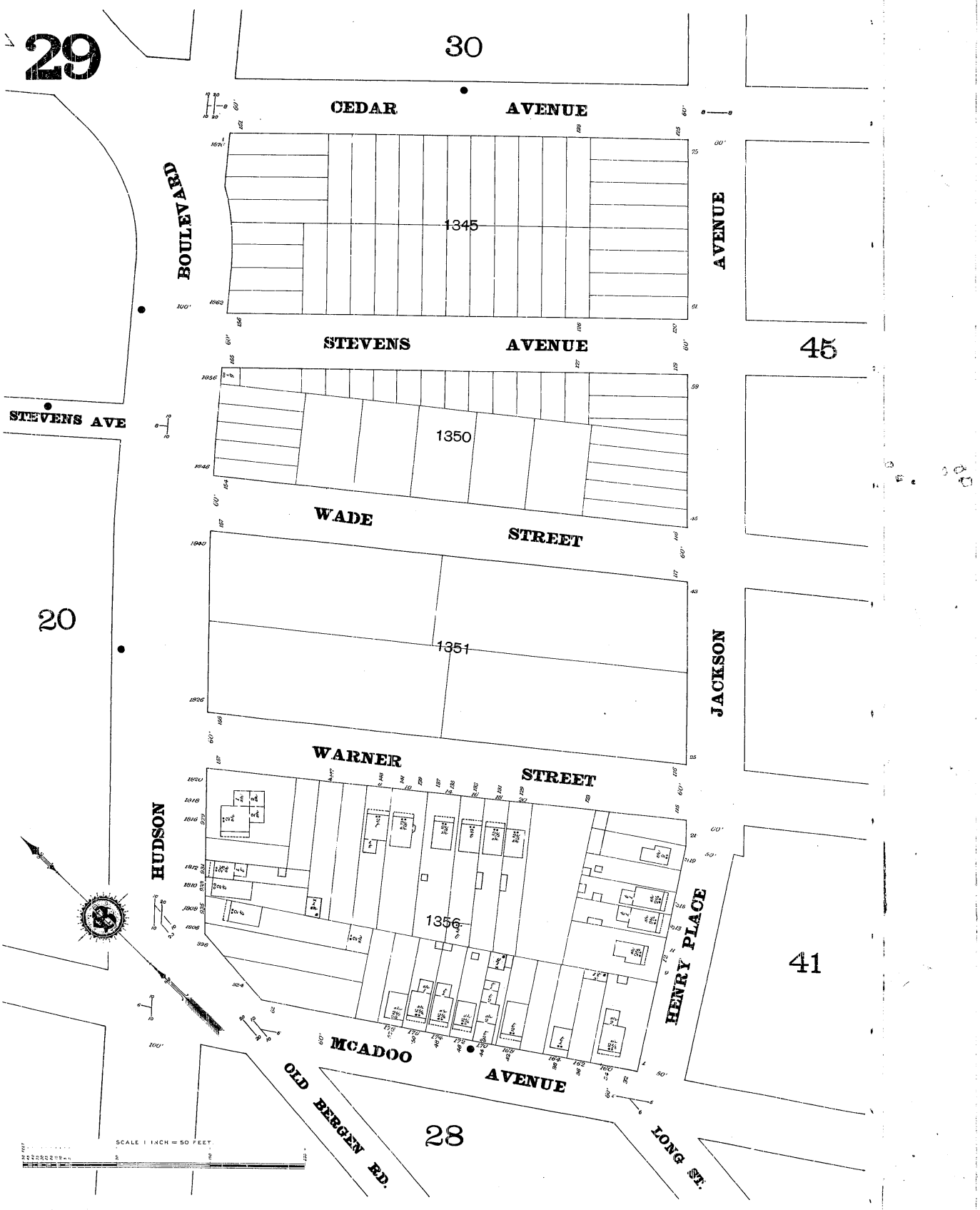
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

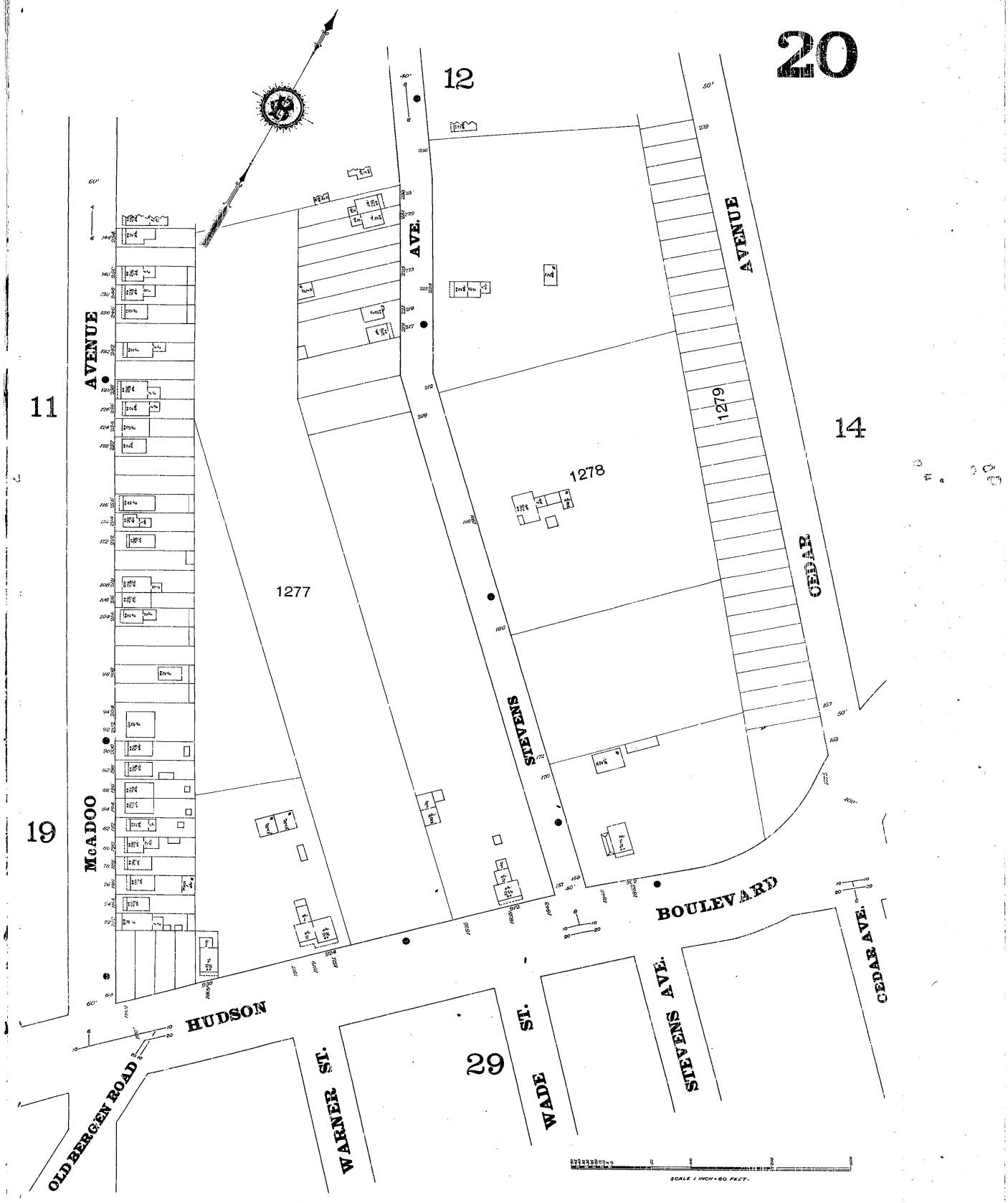


The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

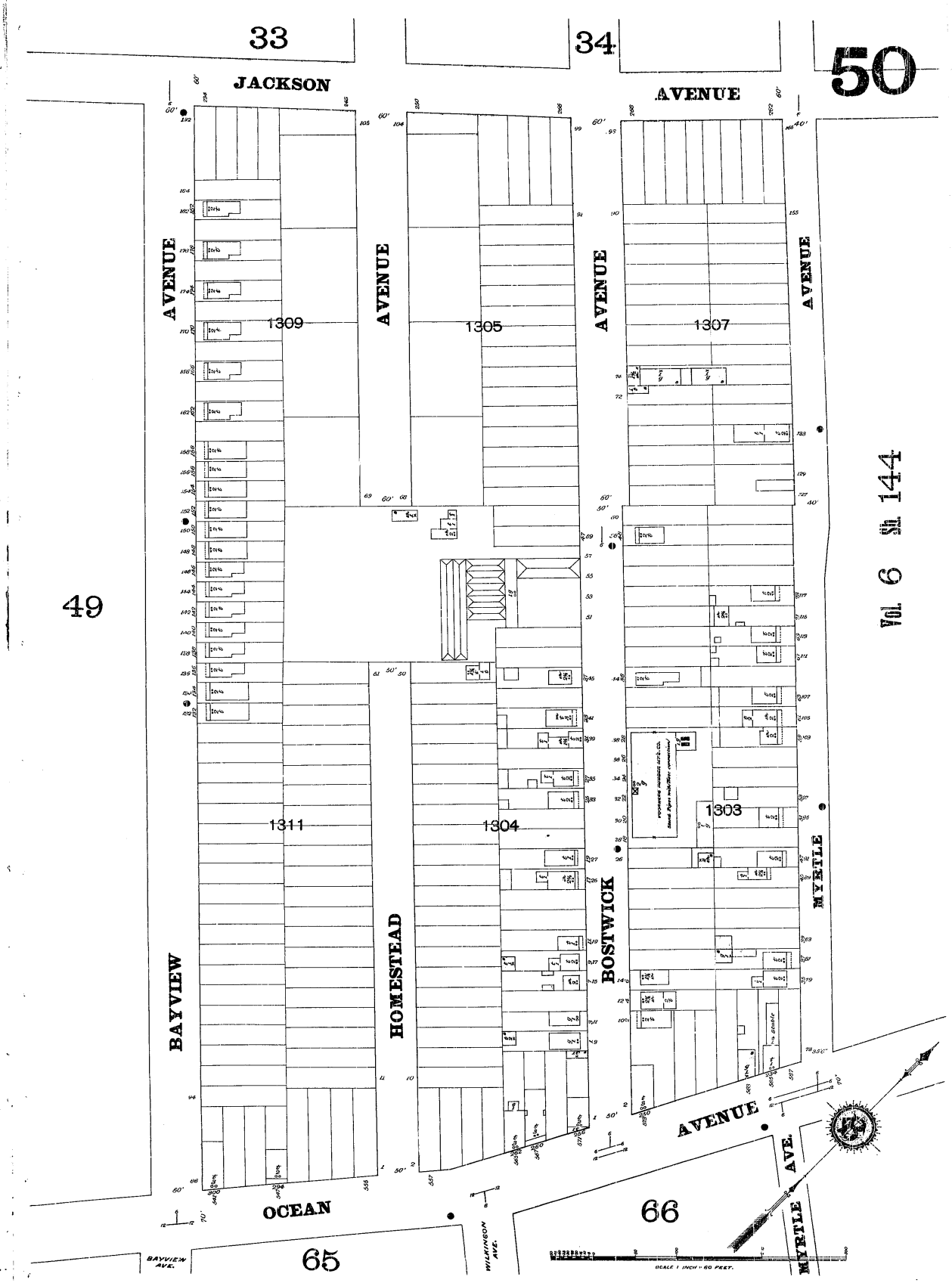




The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

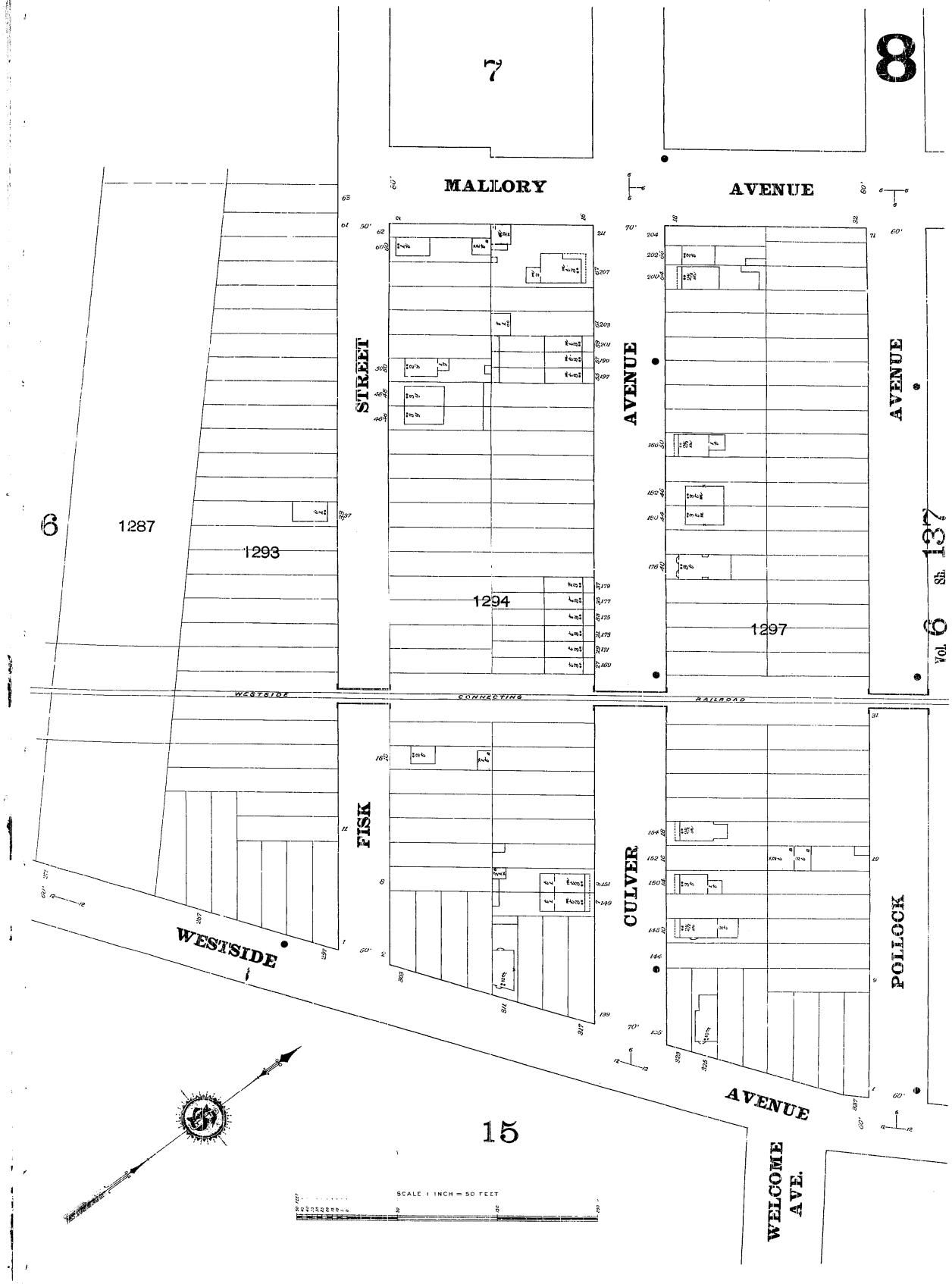
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

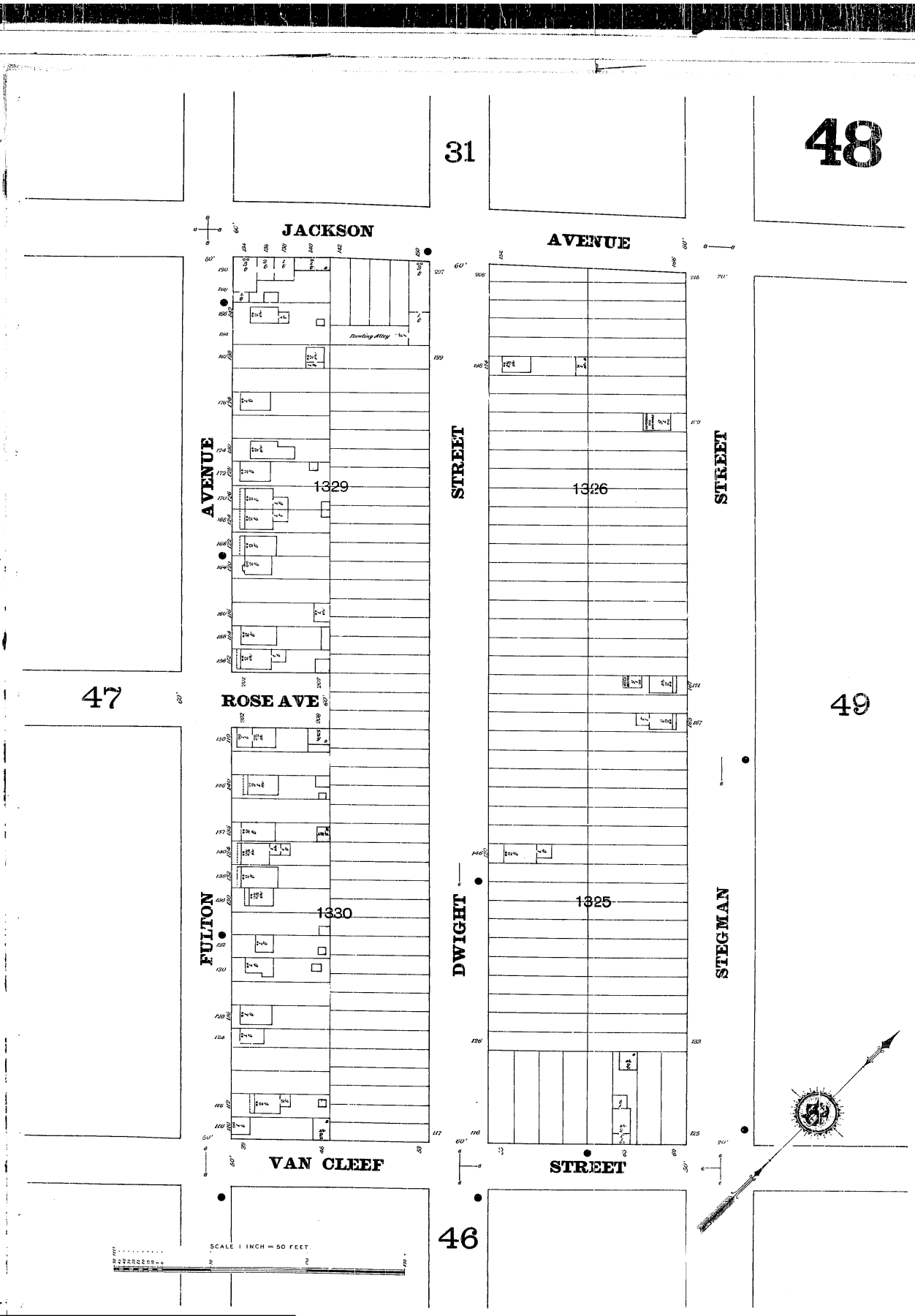
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

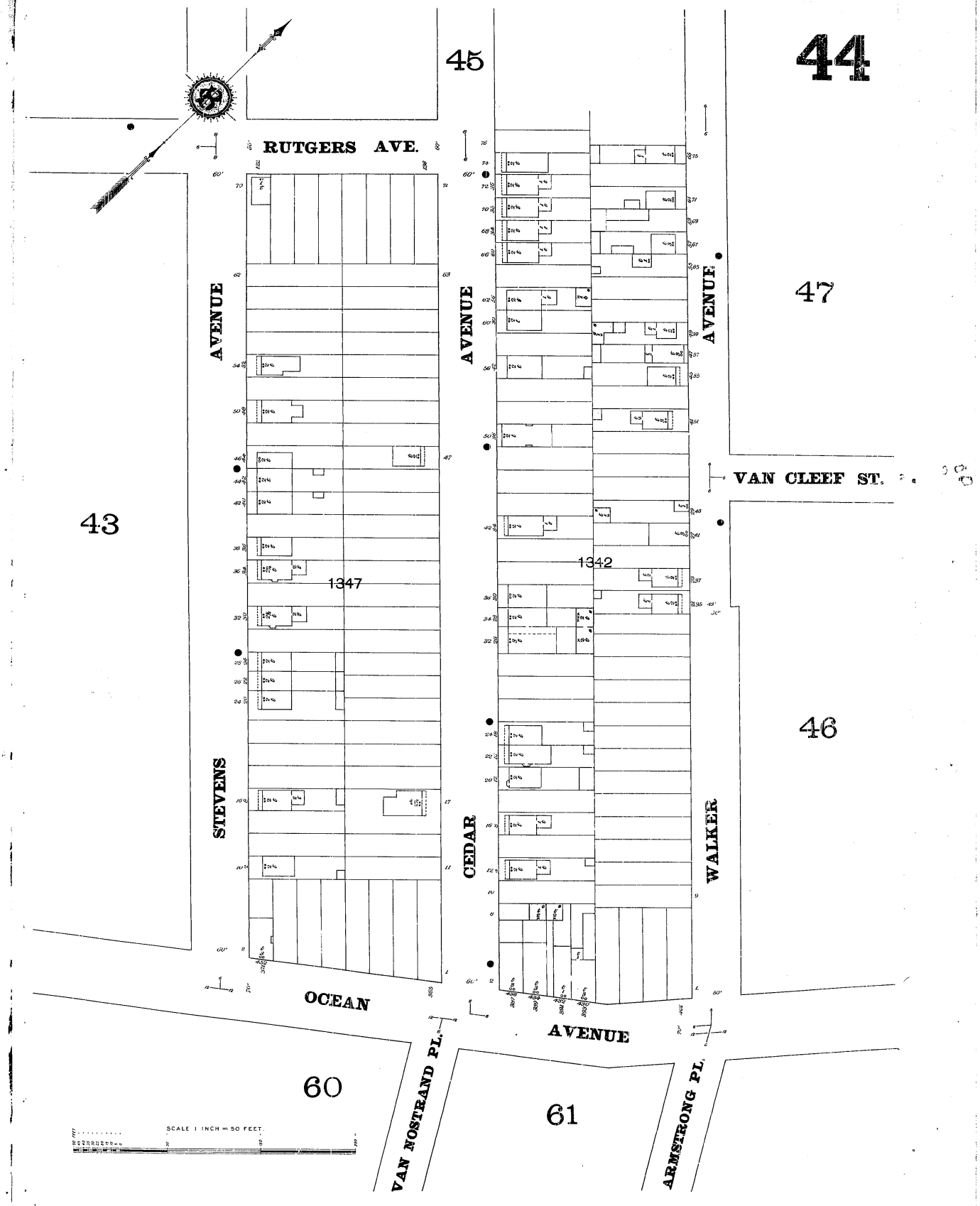
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

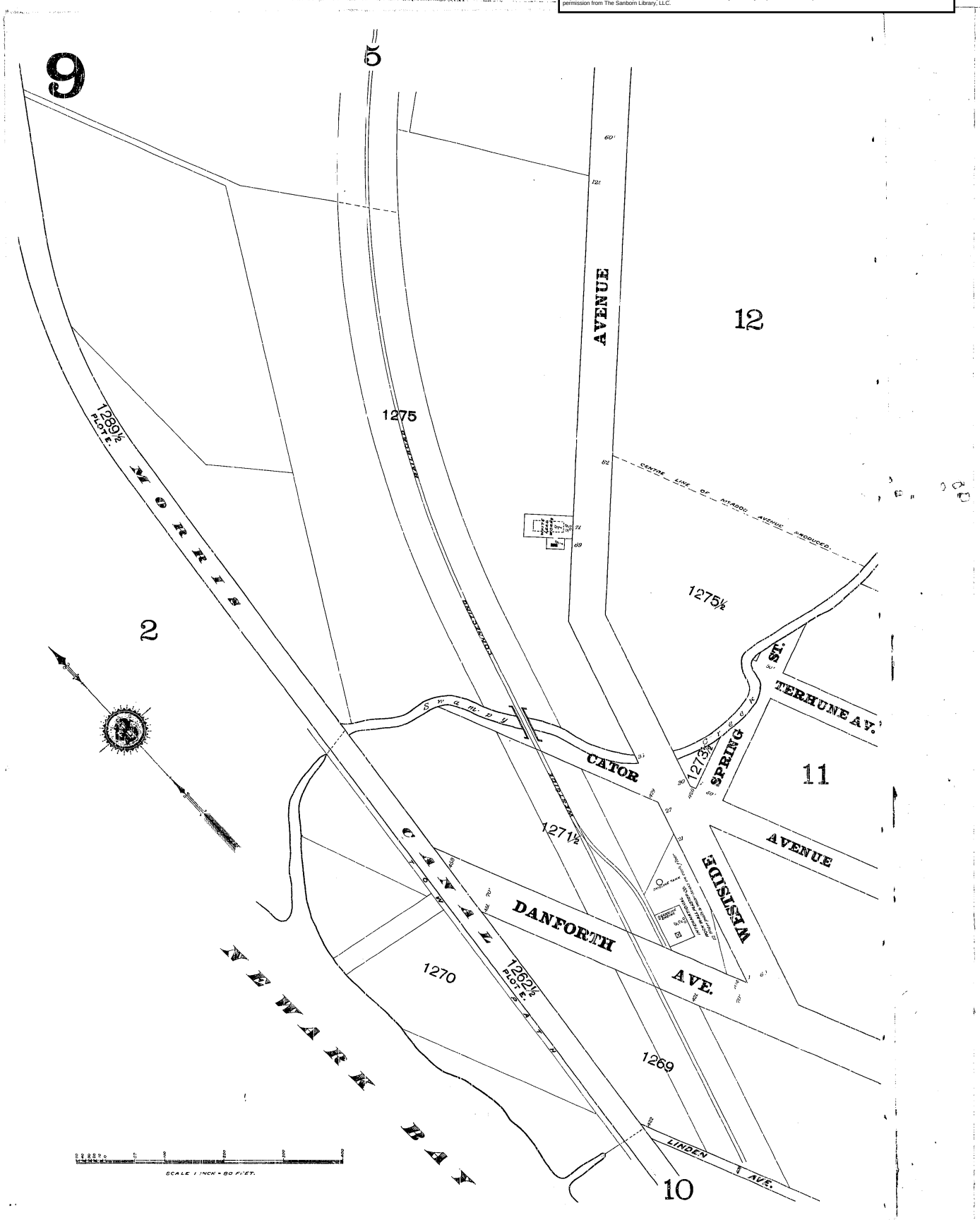
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

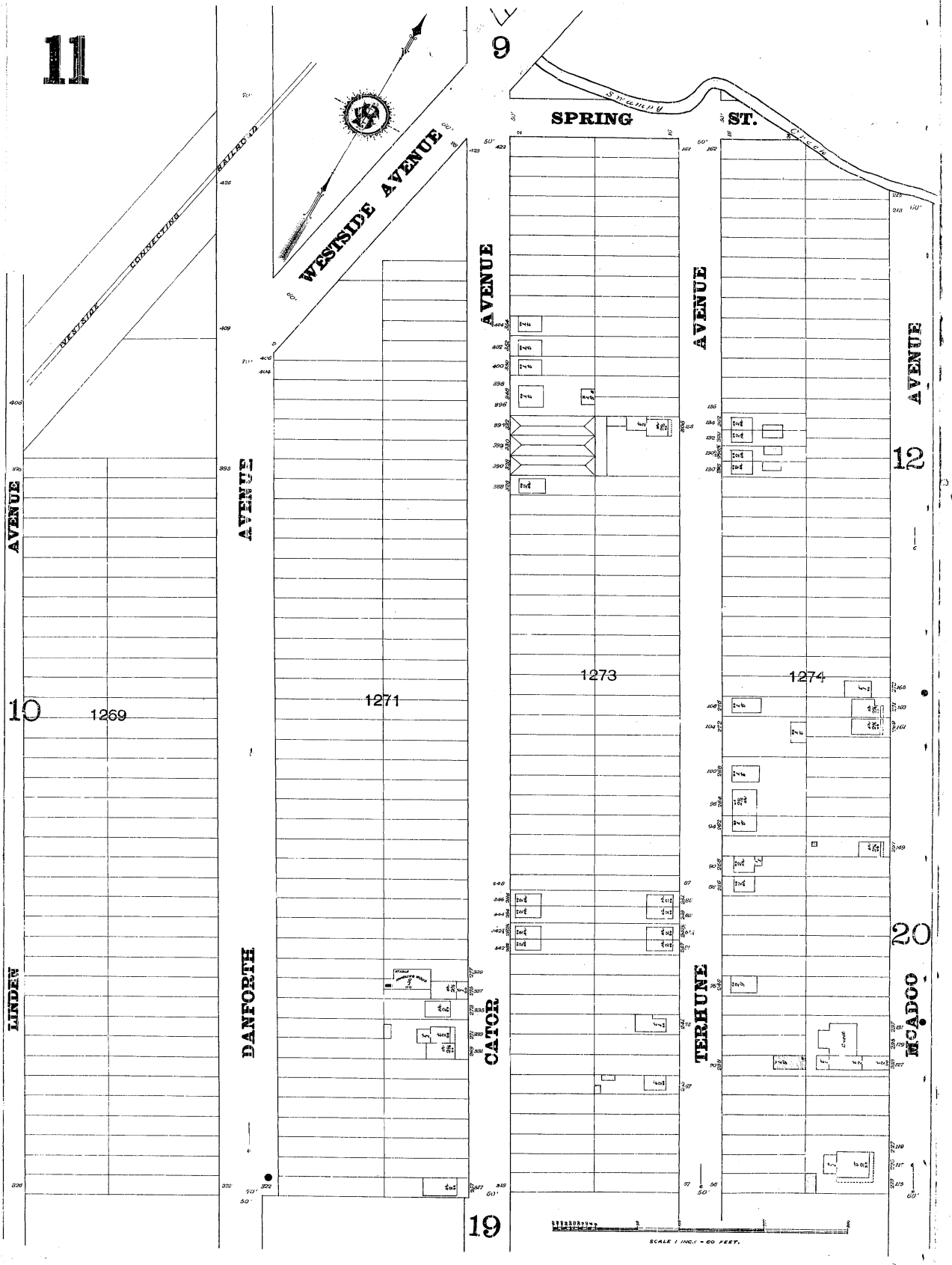
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

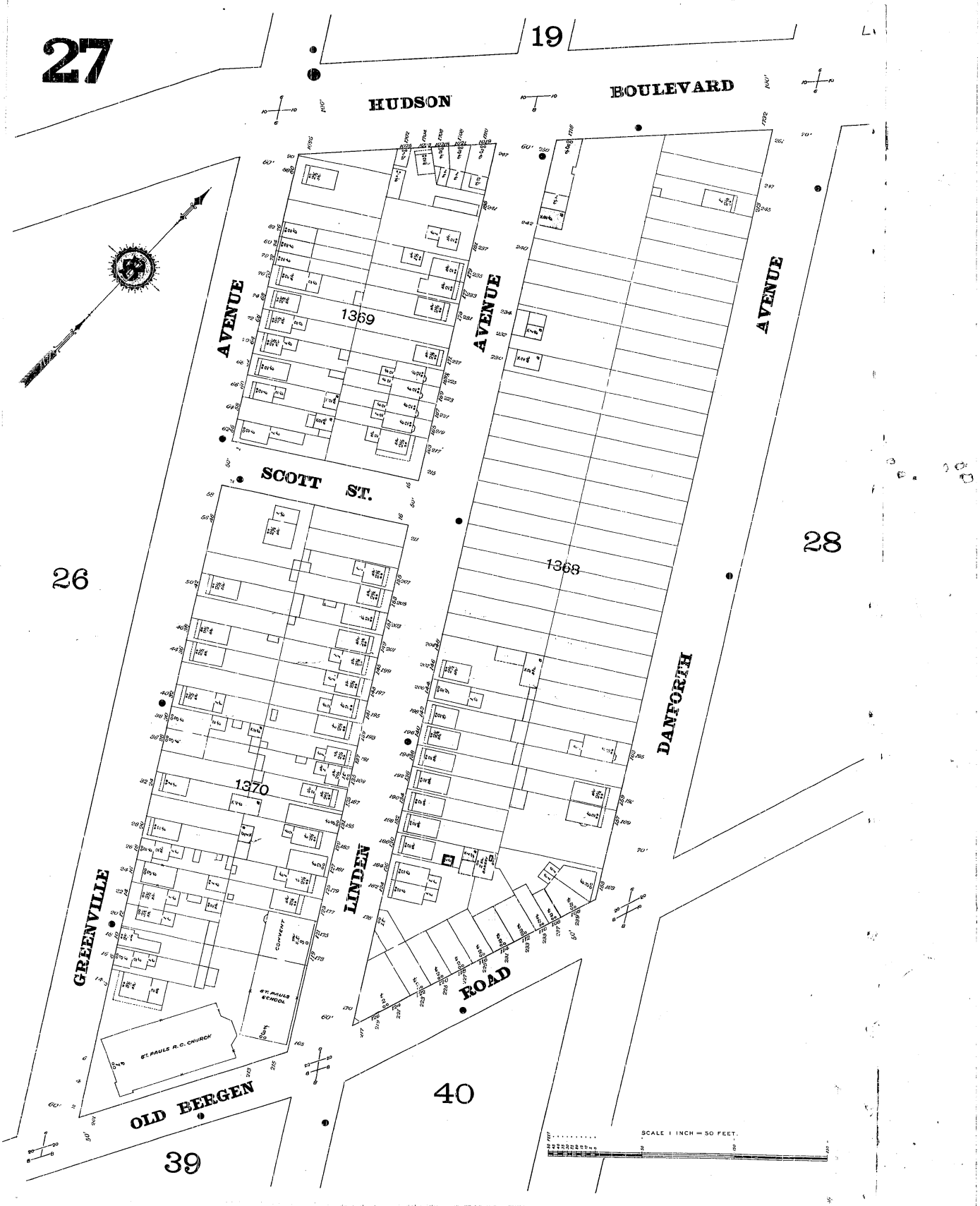
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

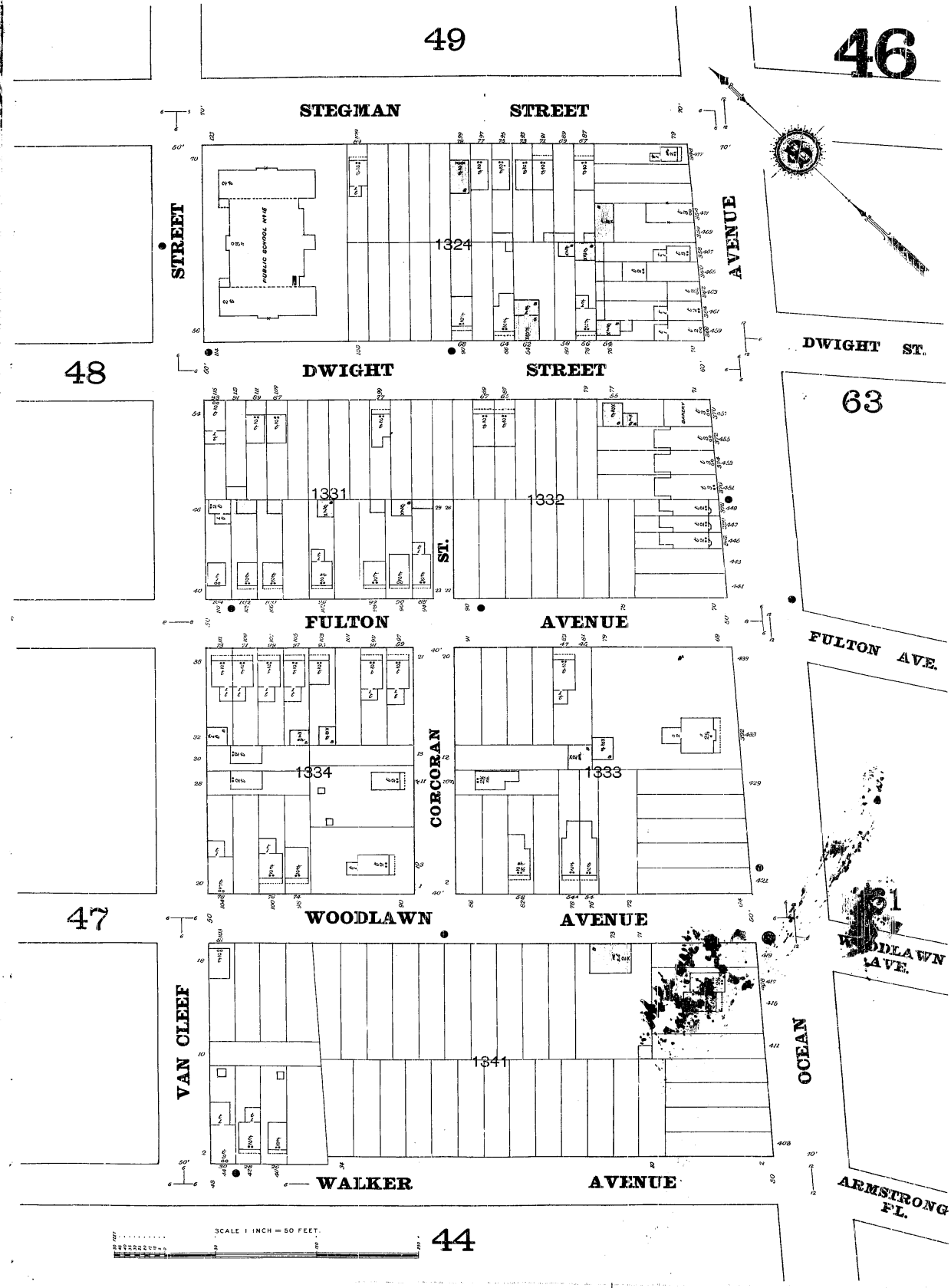
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

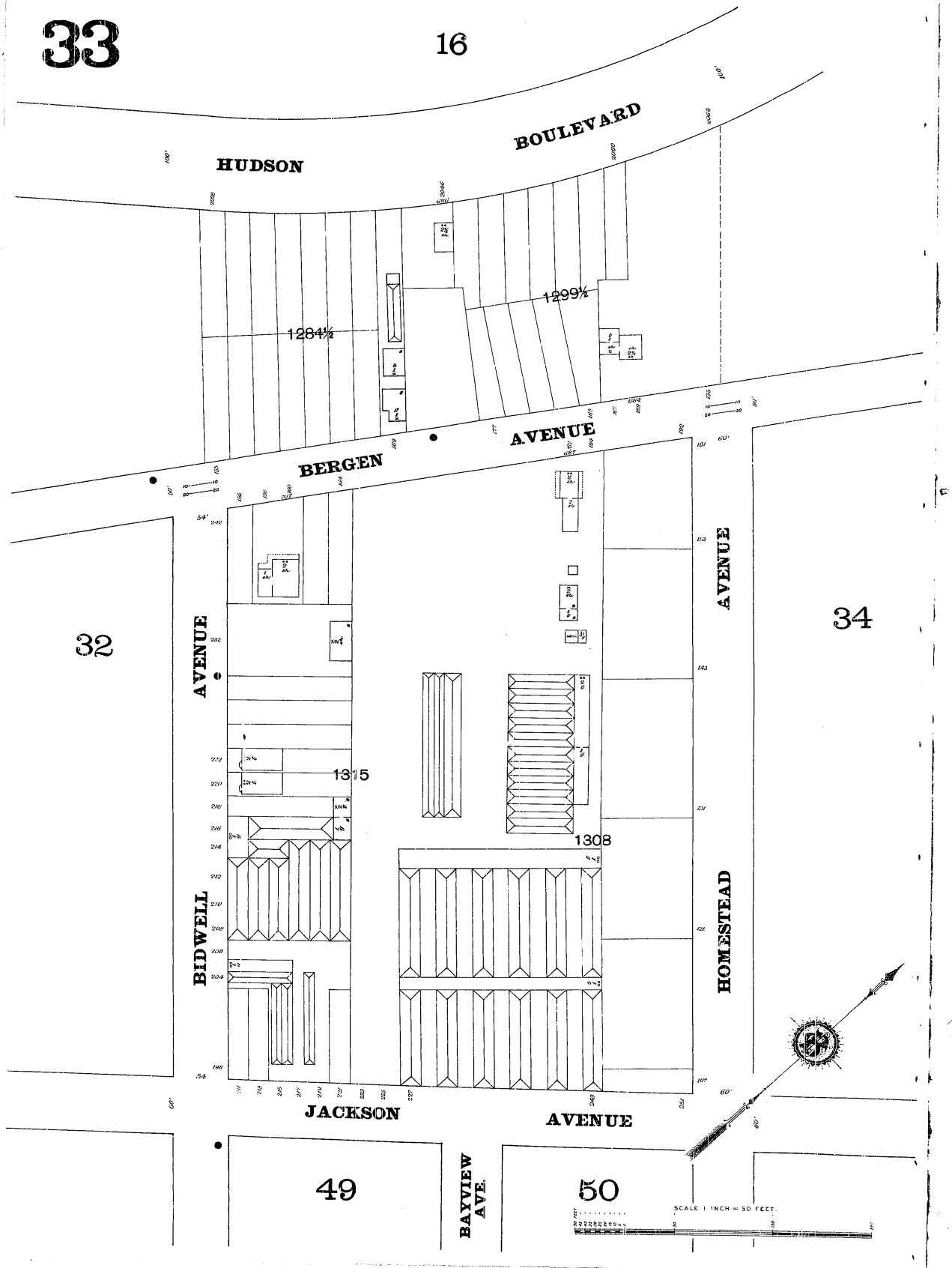


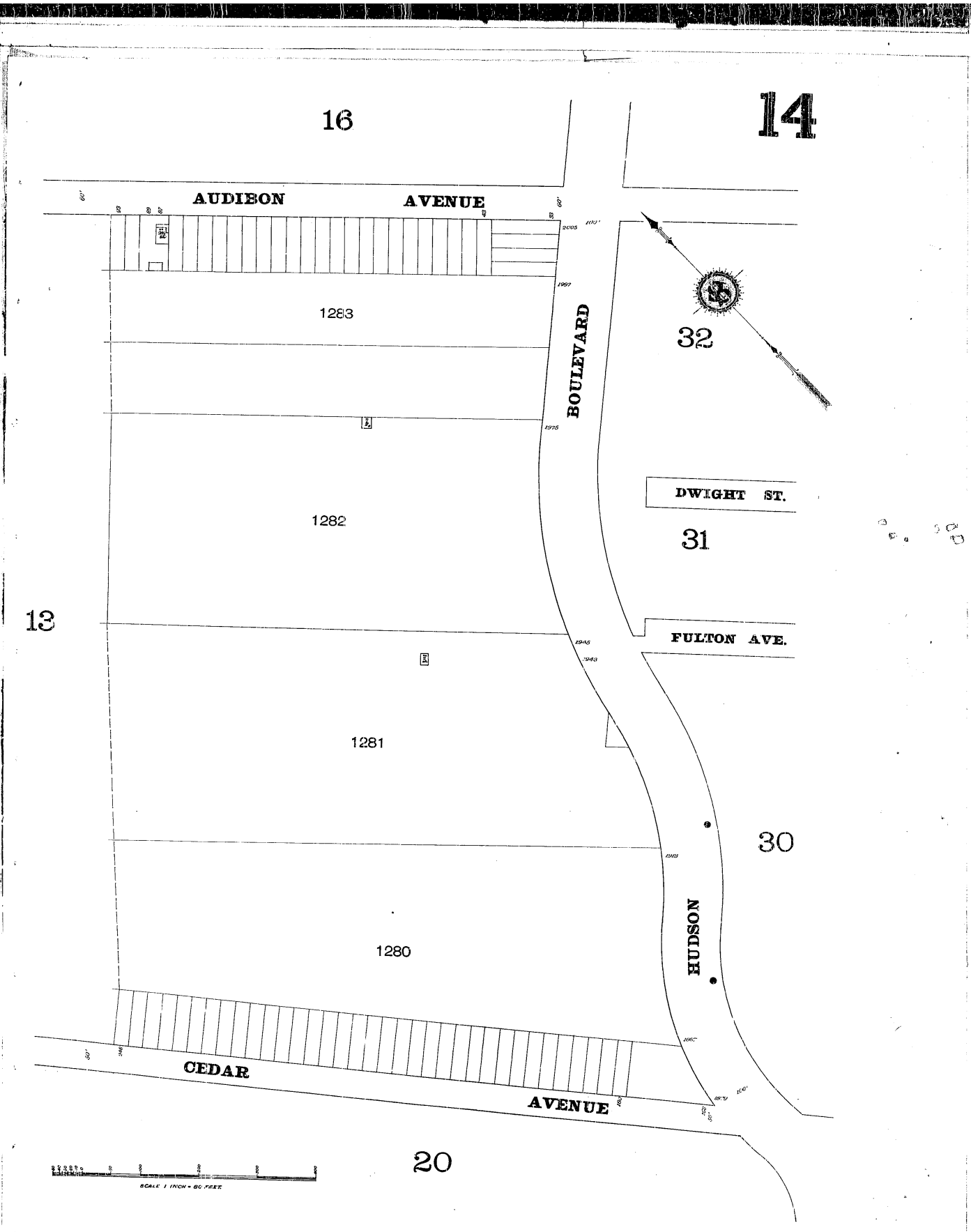
The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

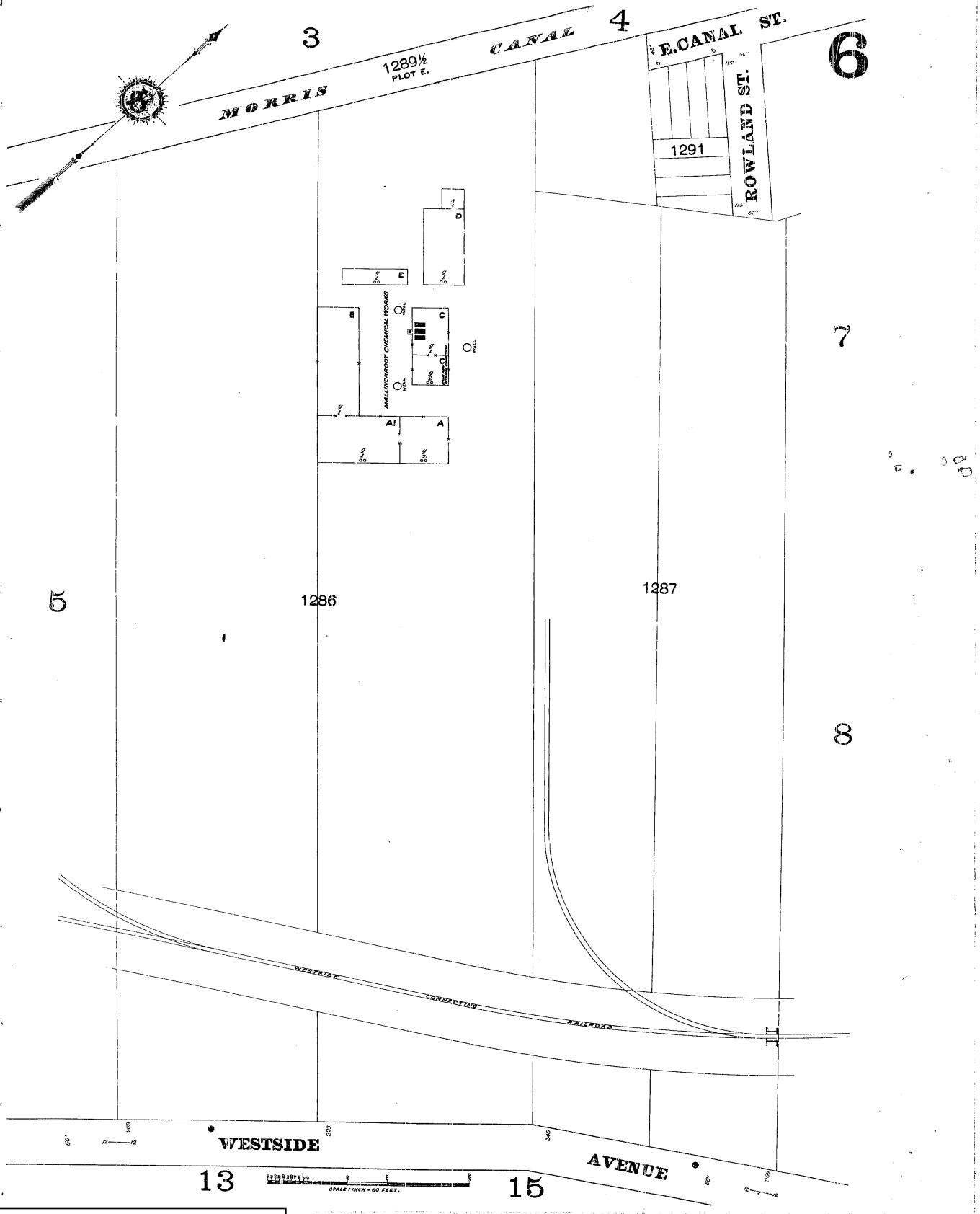




The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

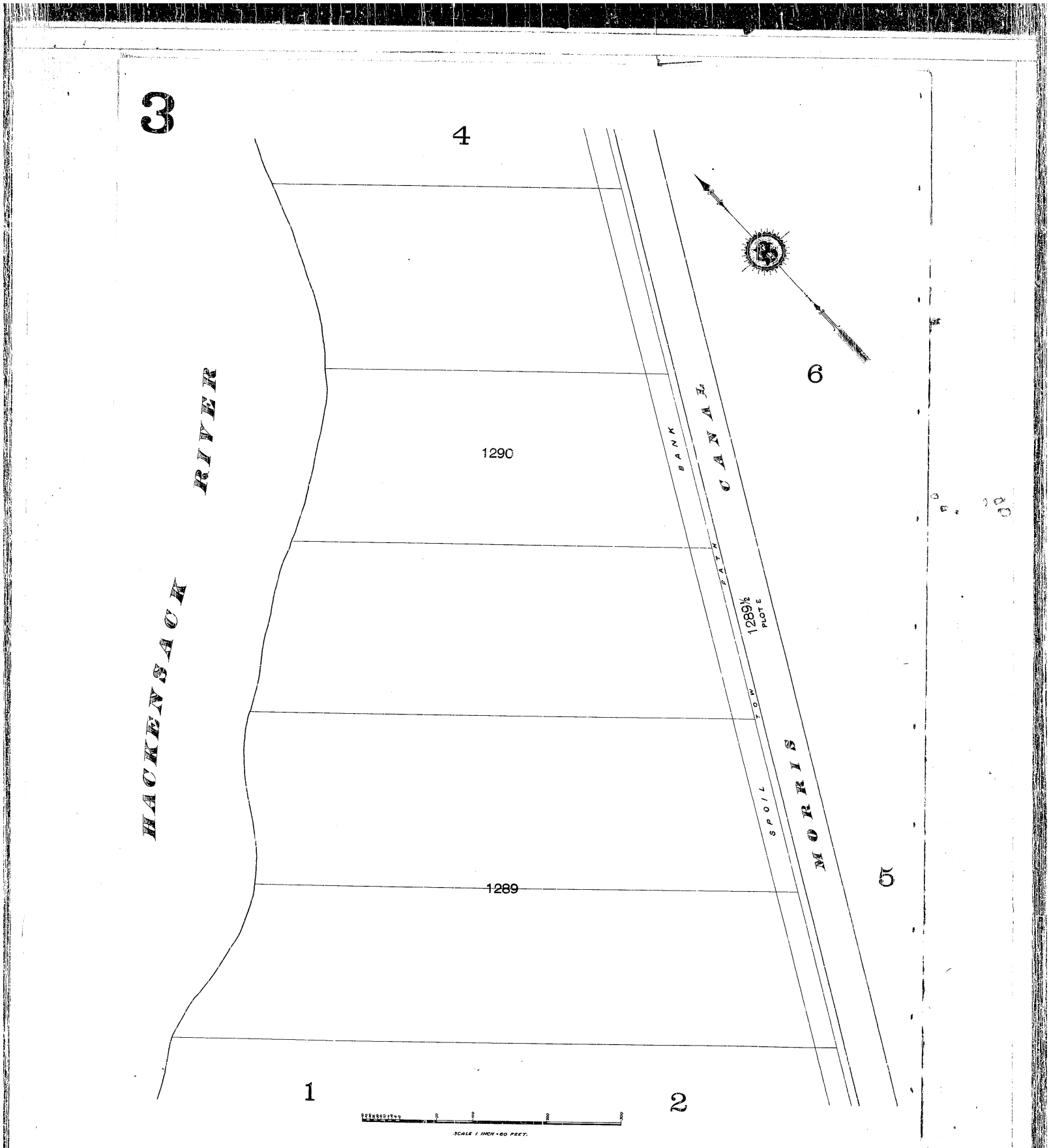
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

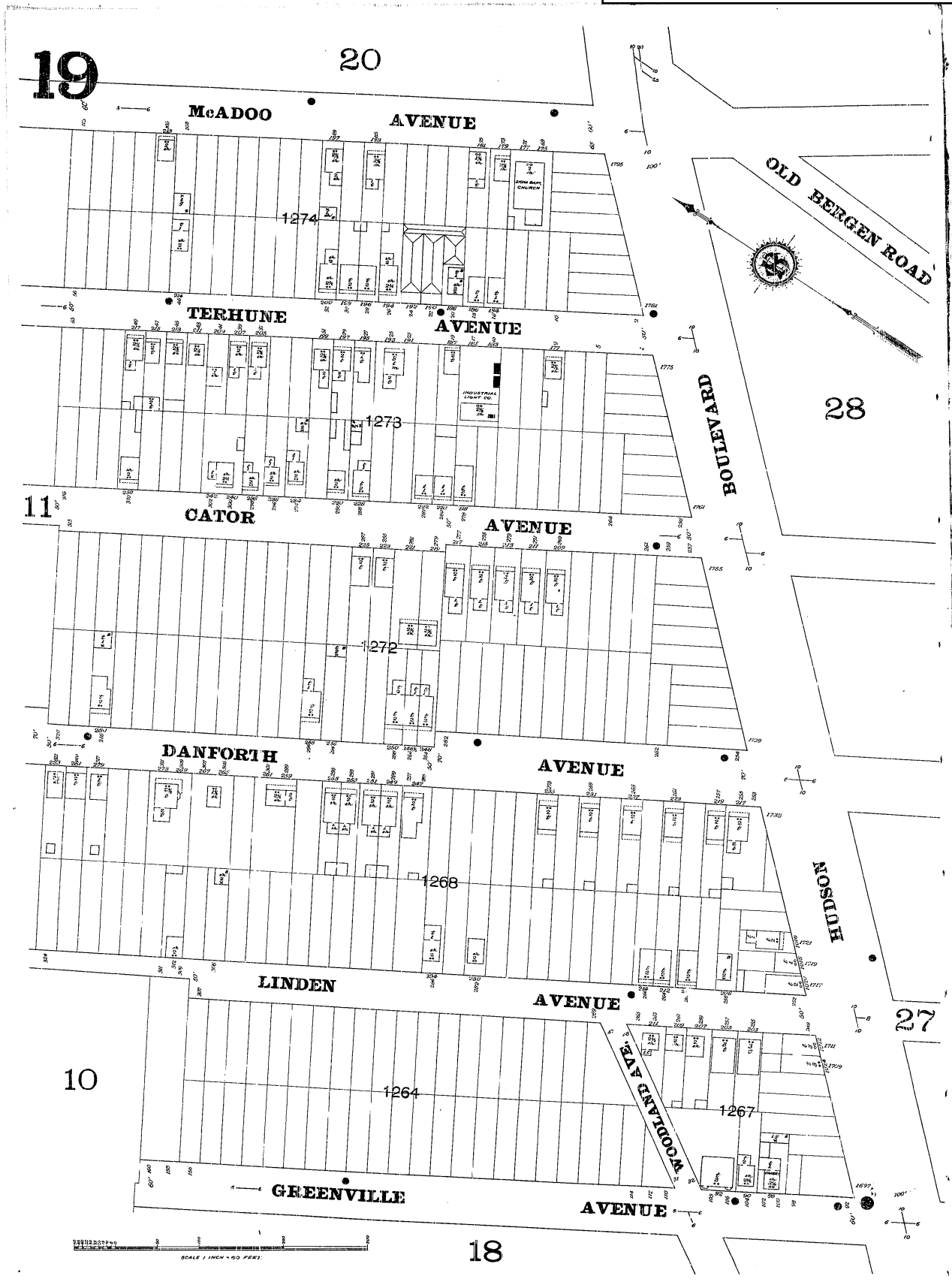
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

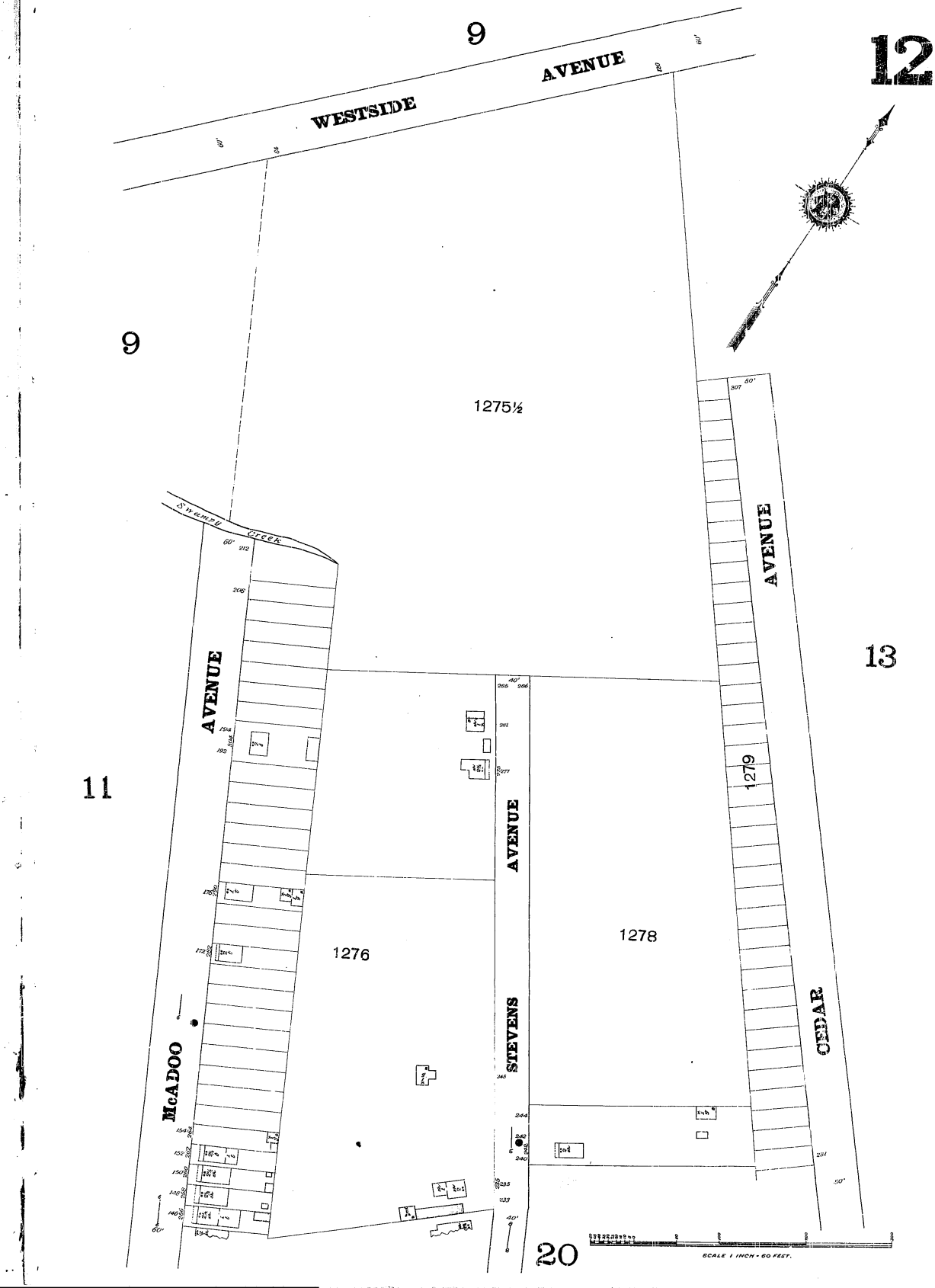
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

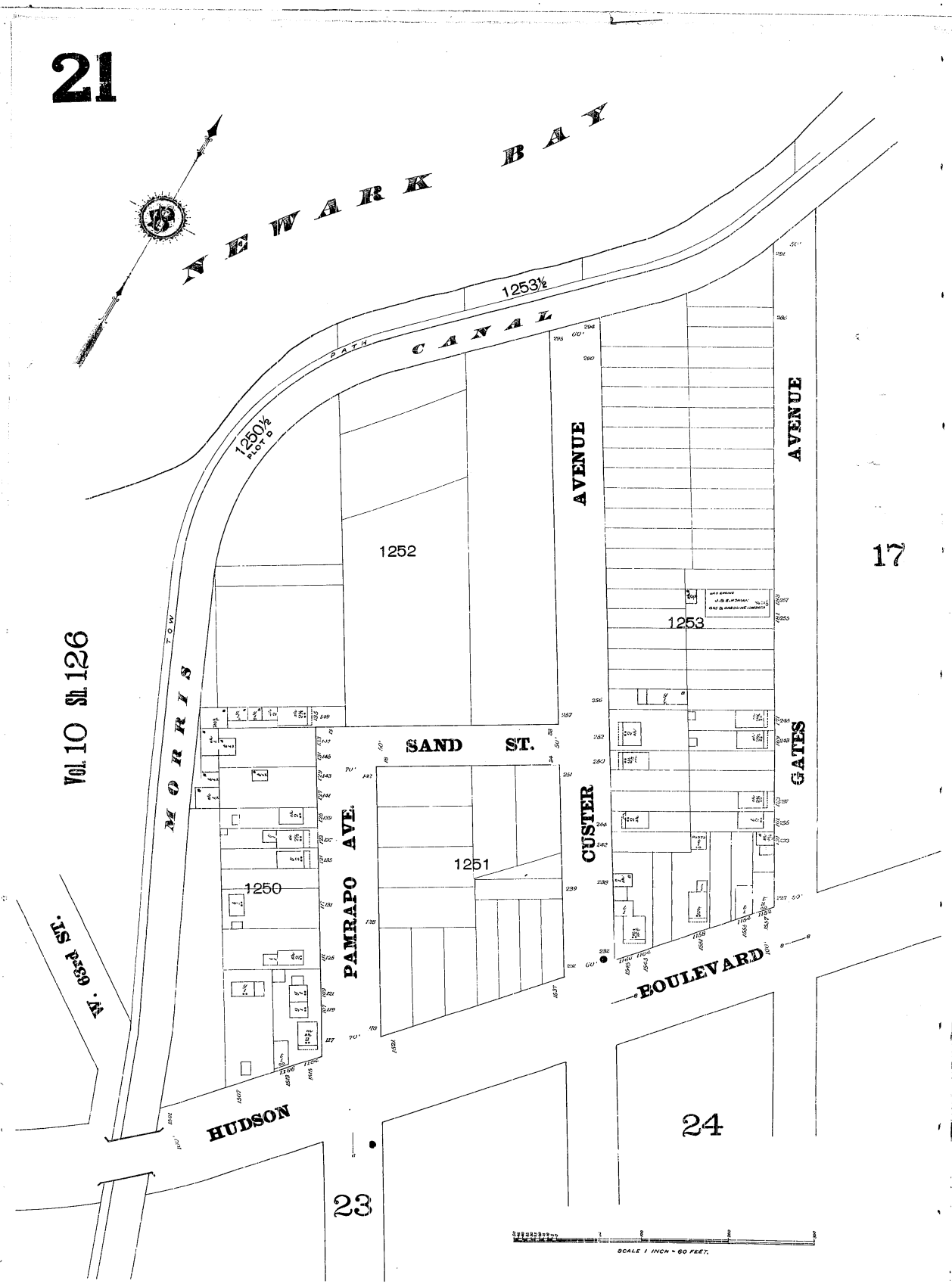




The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

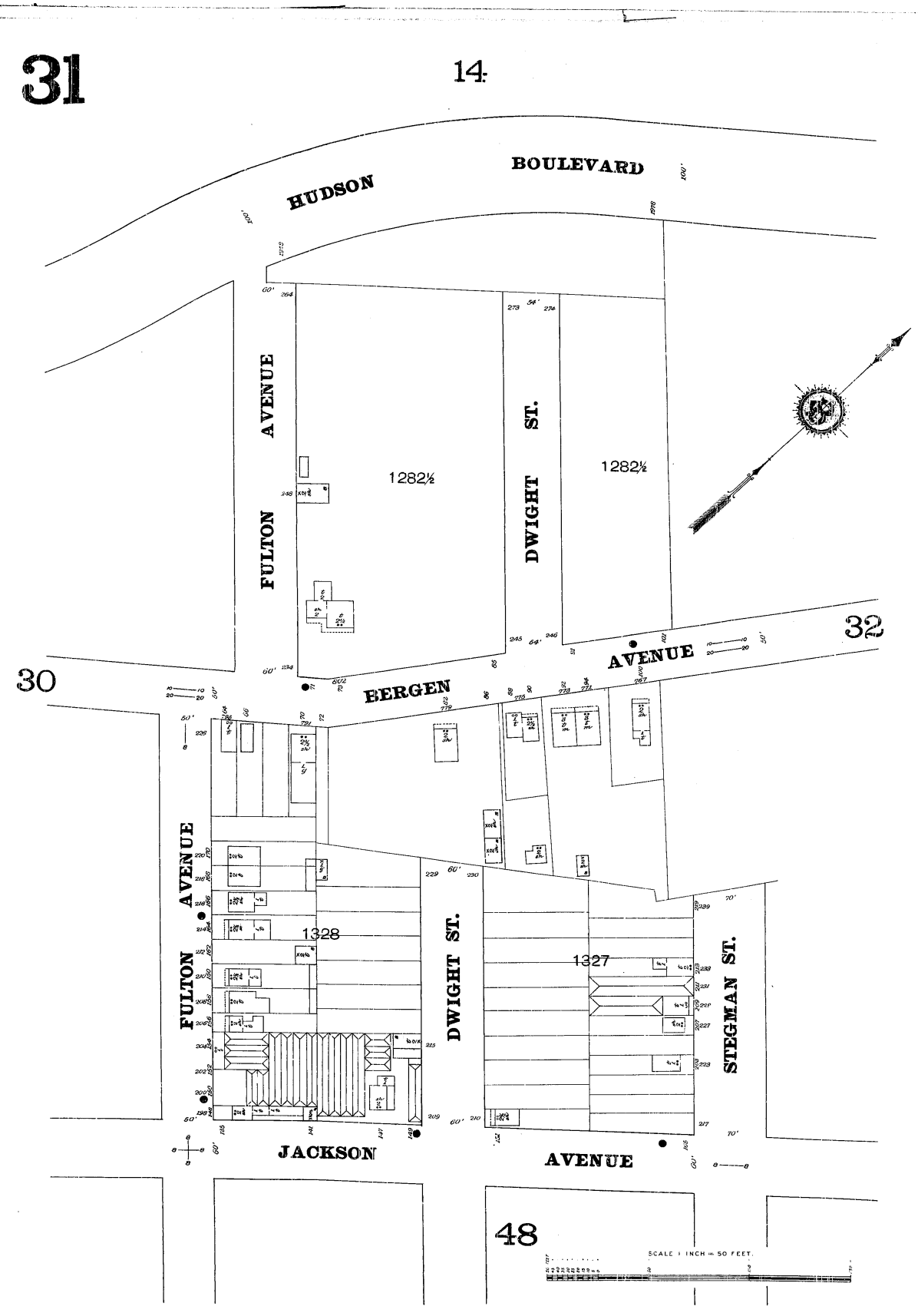
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

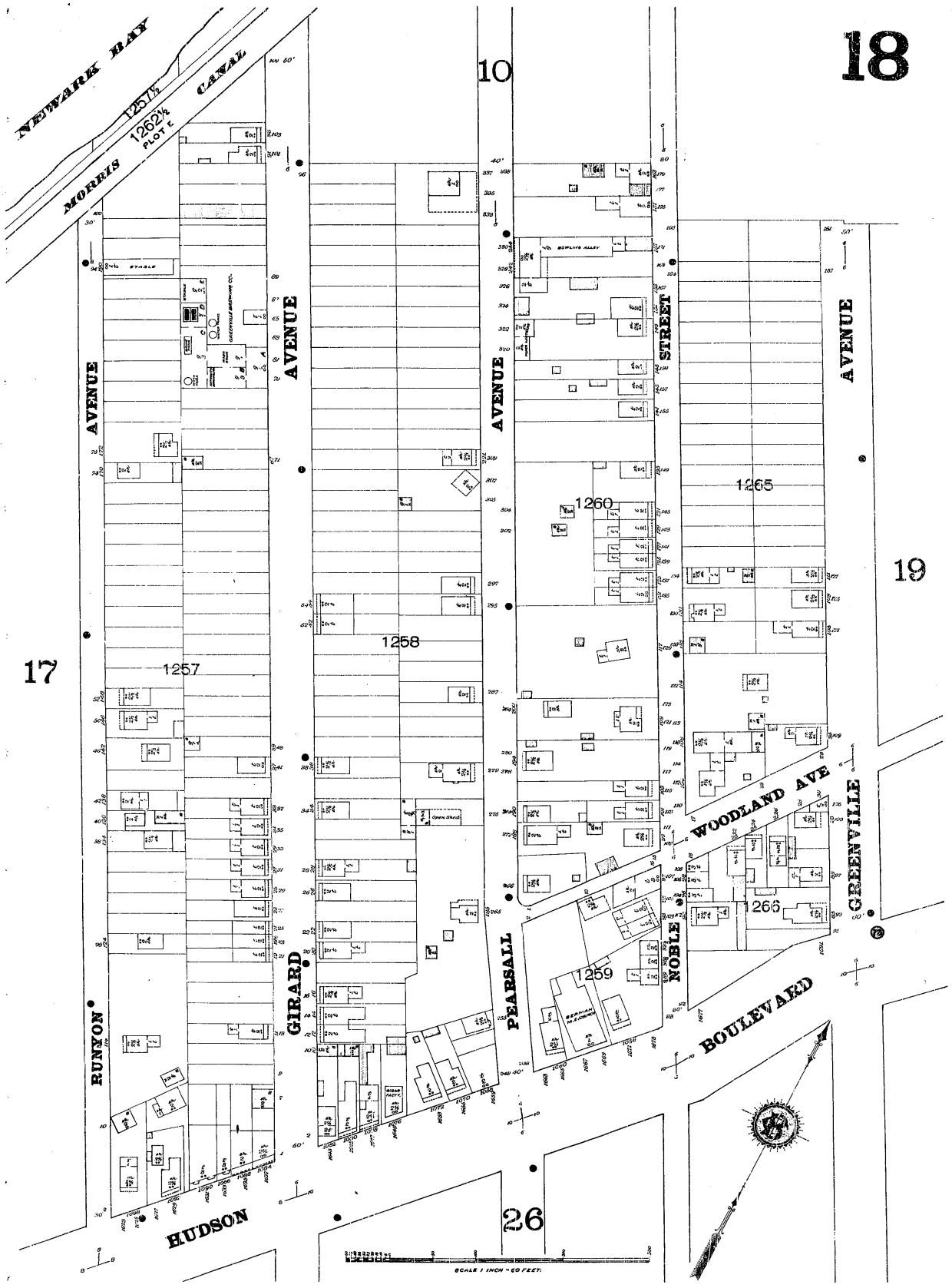
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

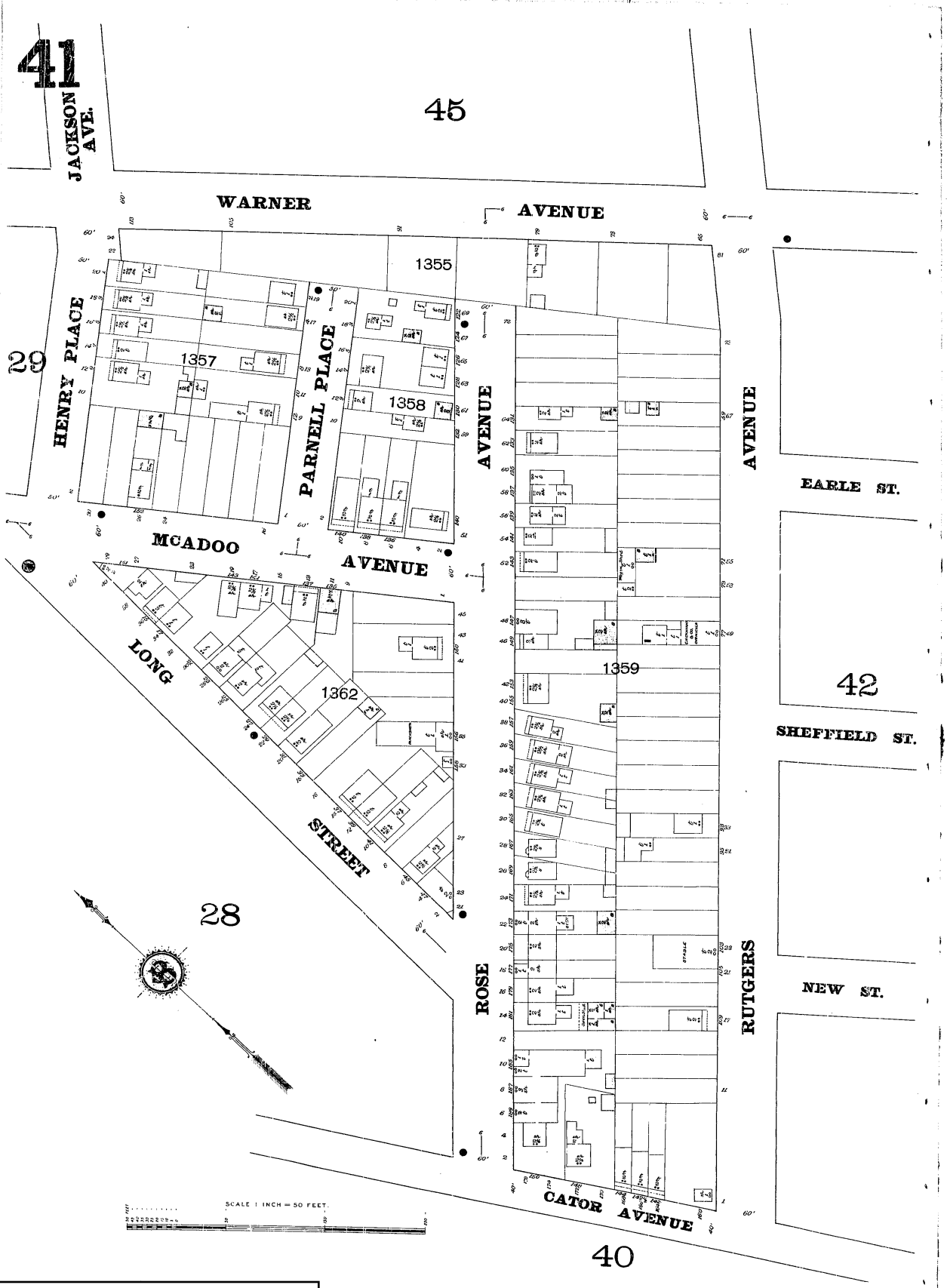
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

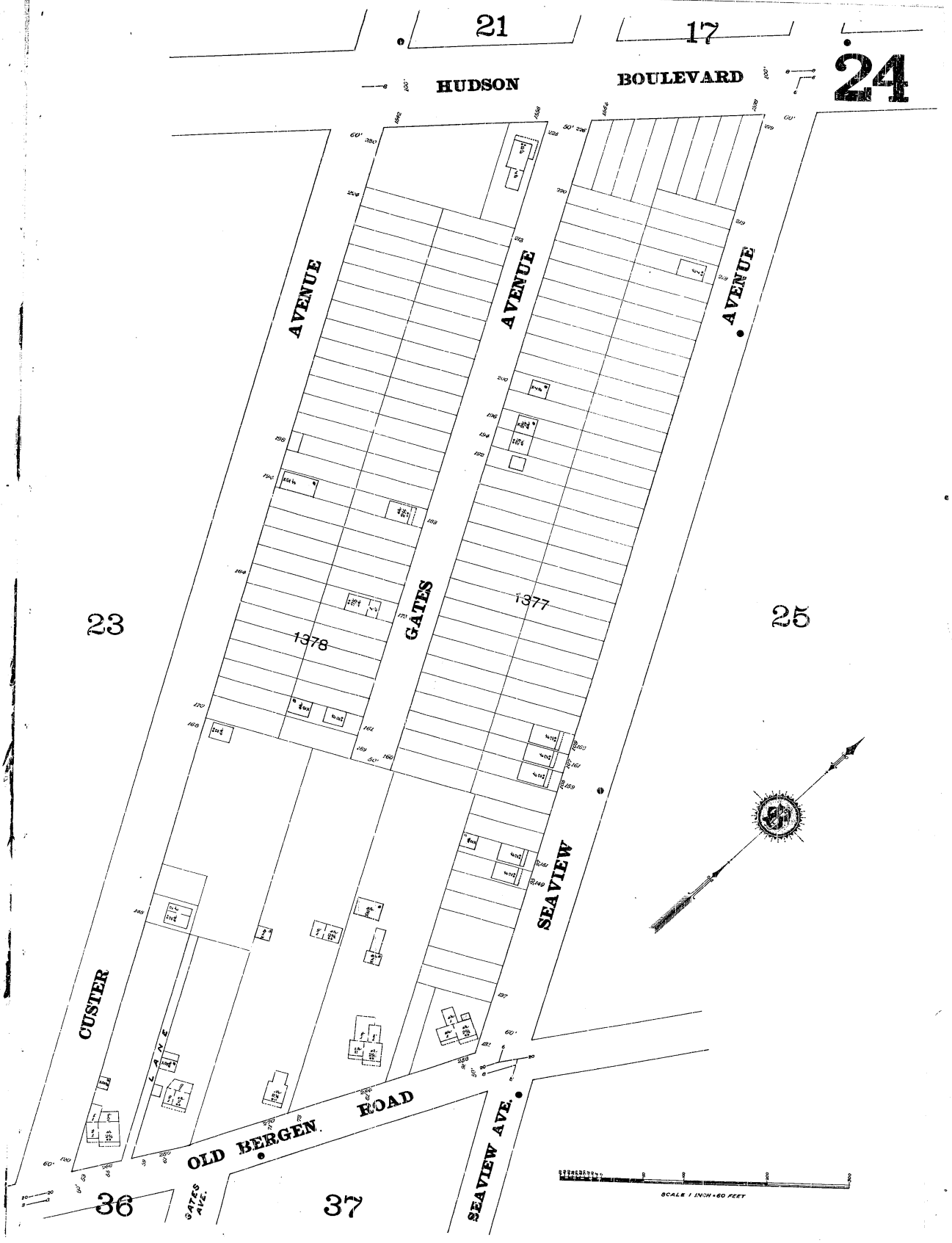
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

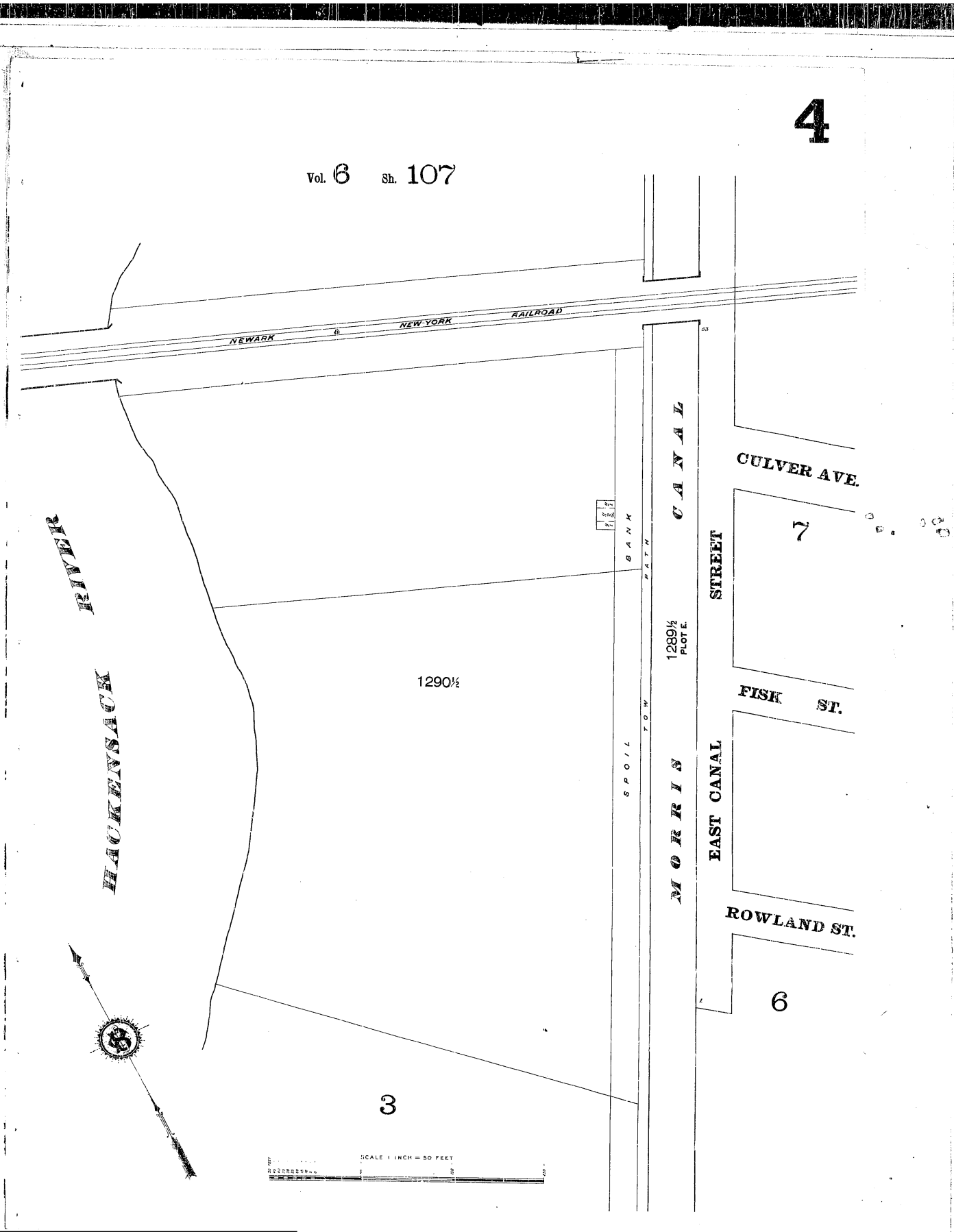
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

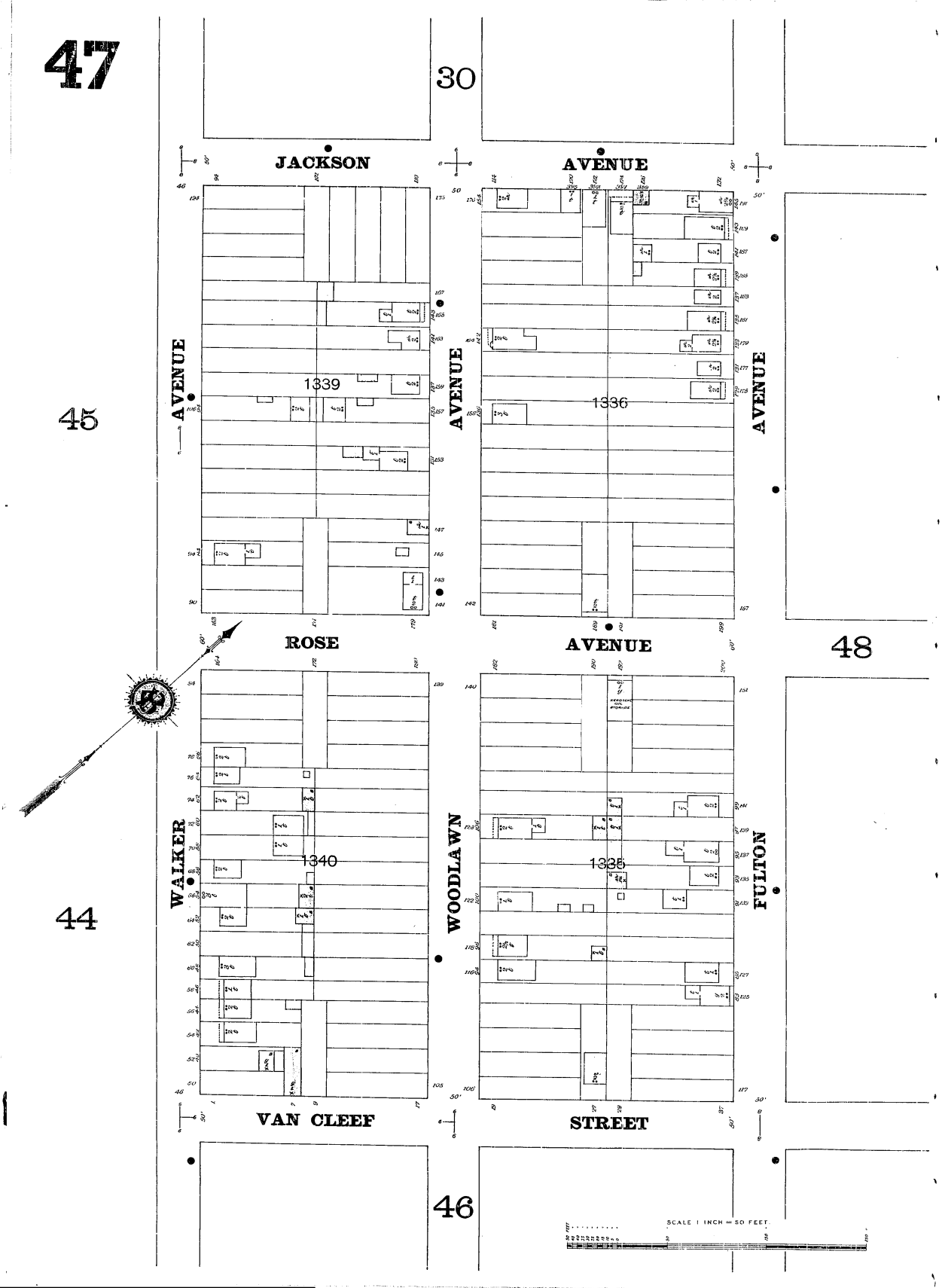




The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

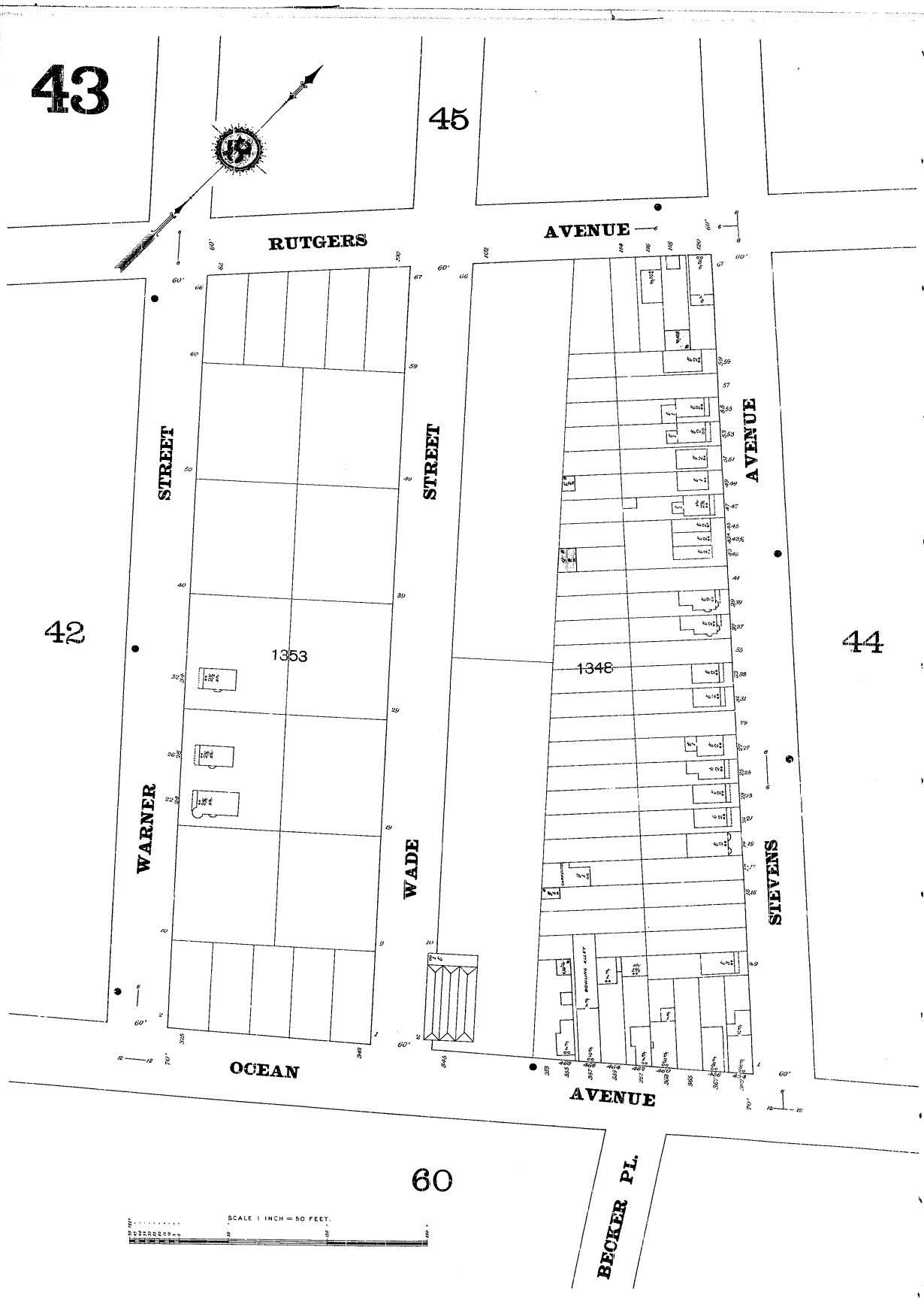
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

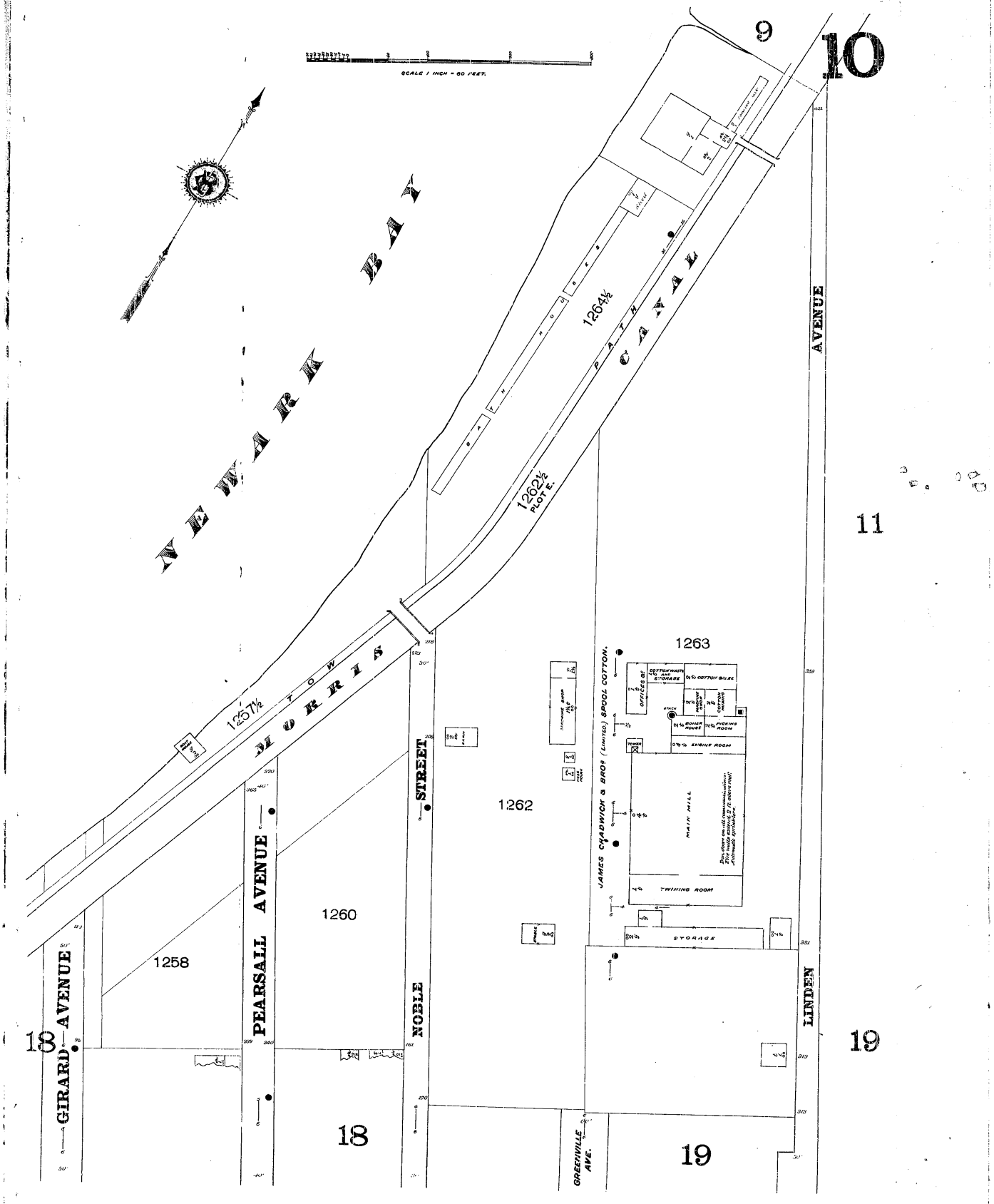
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

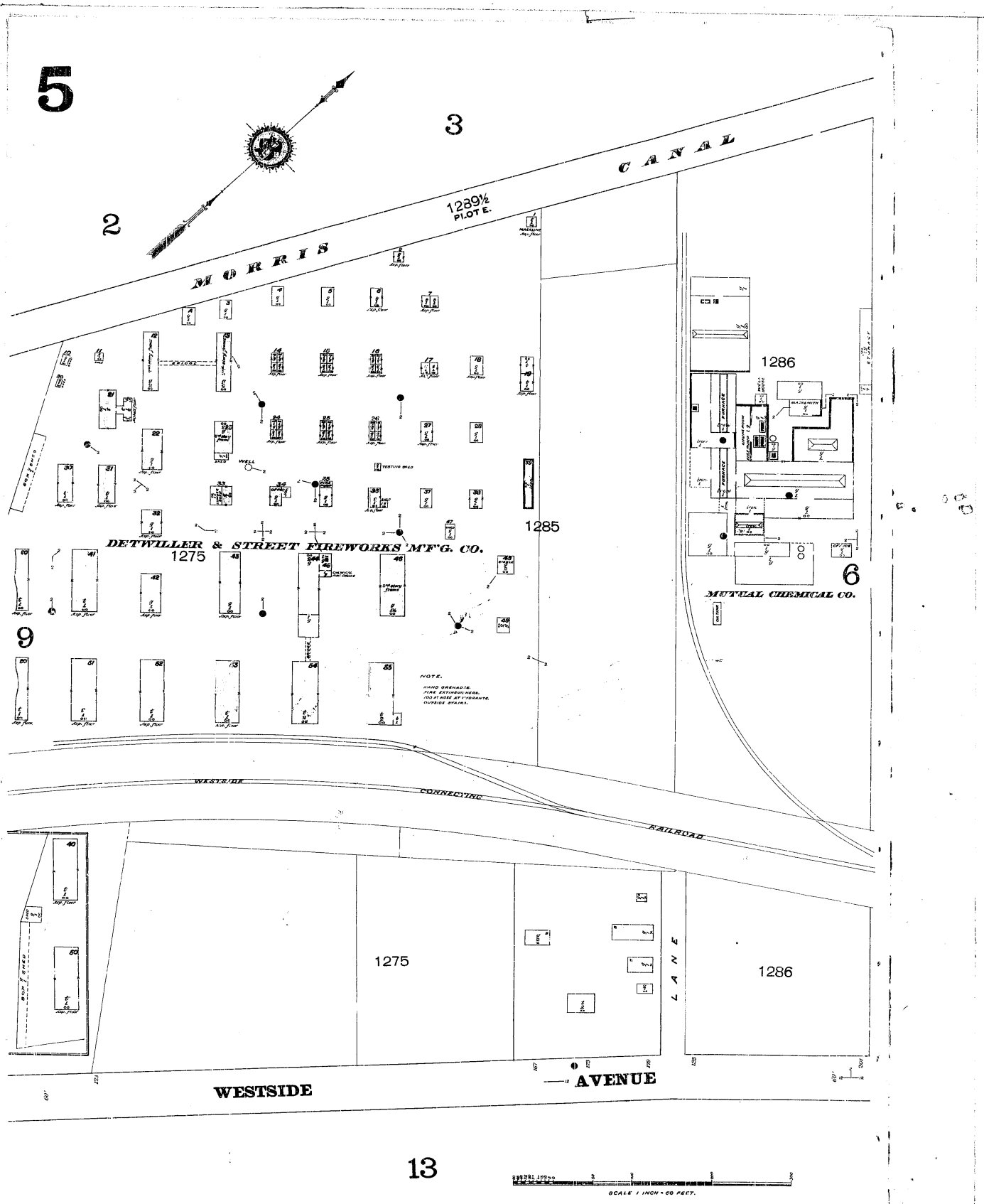
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

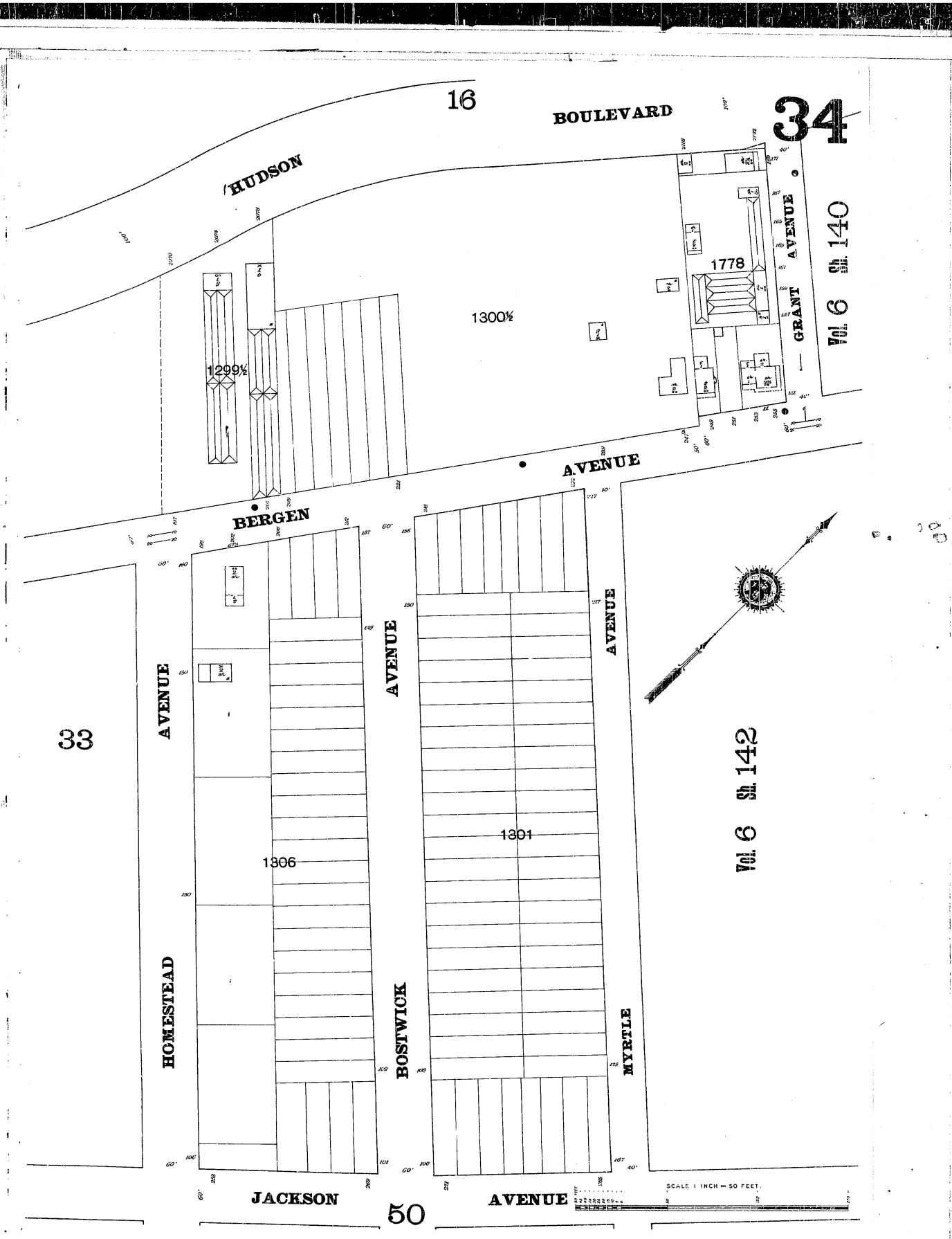




The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

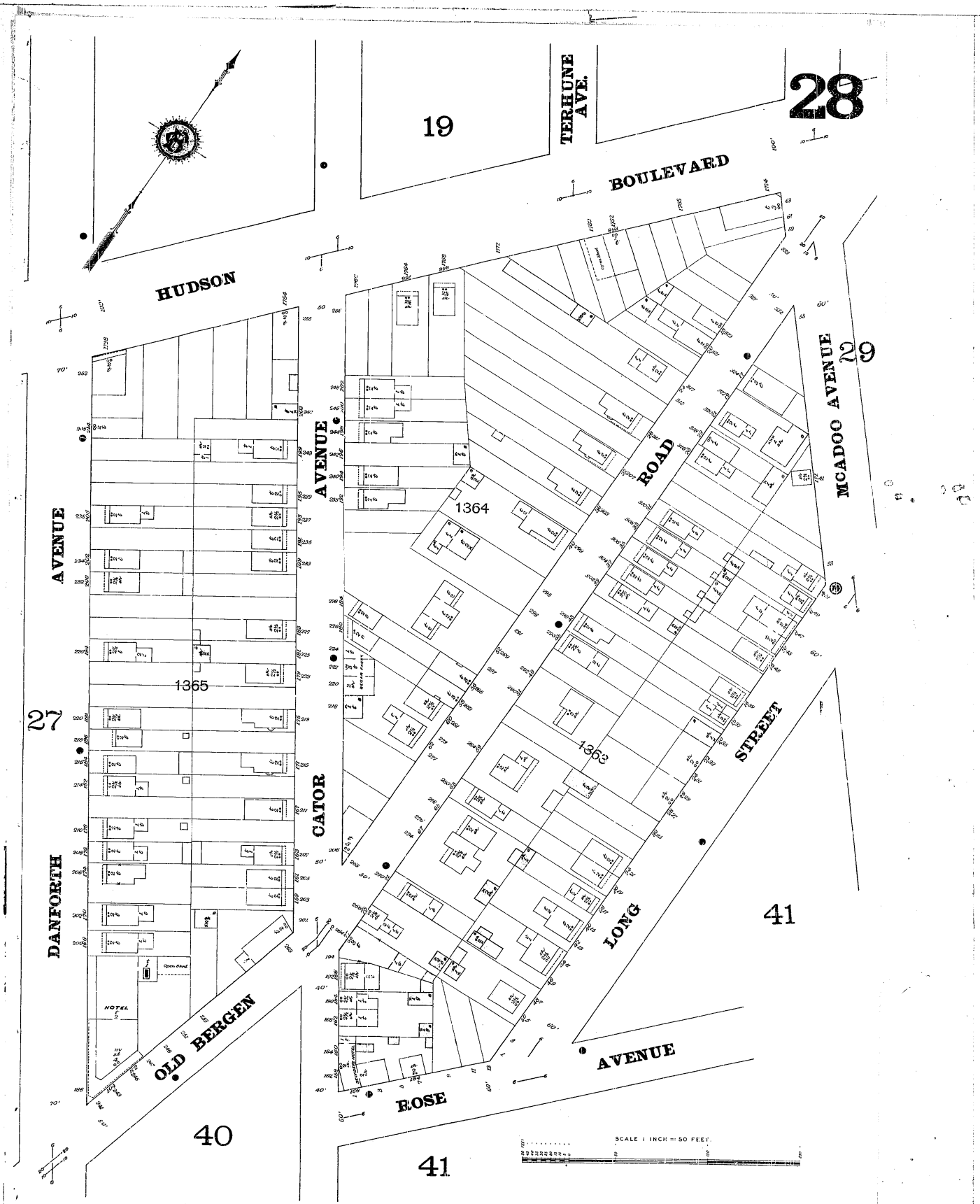
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

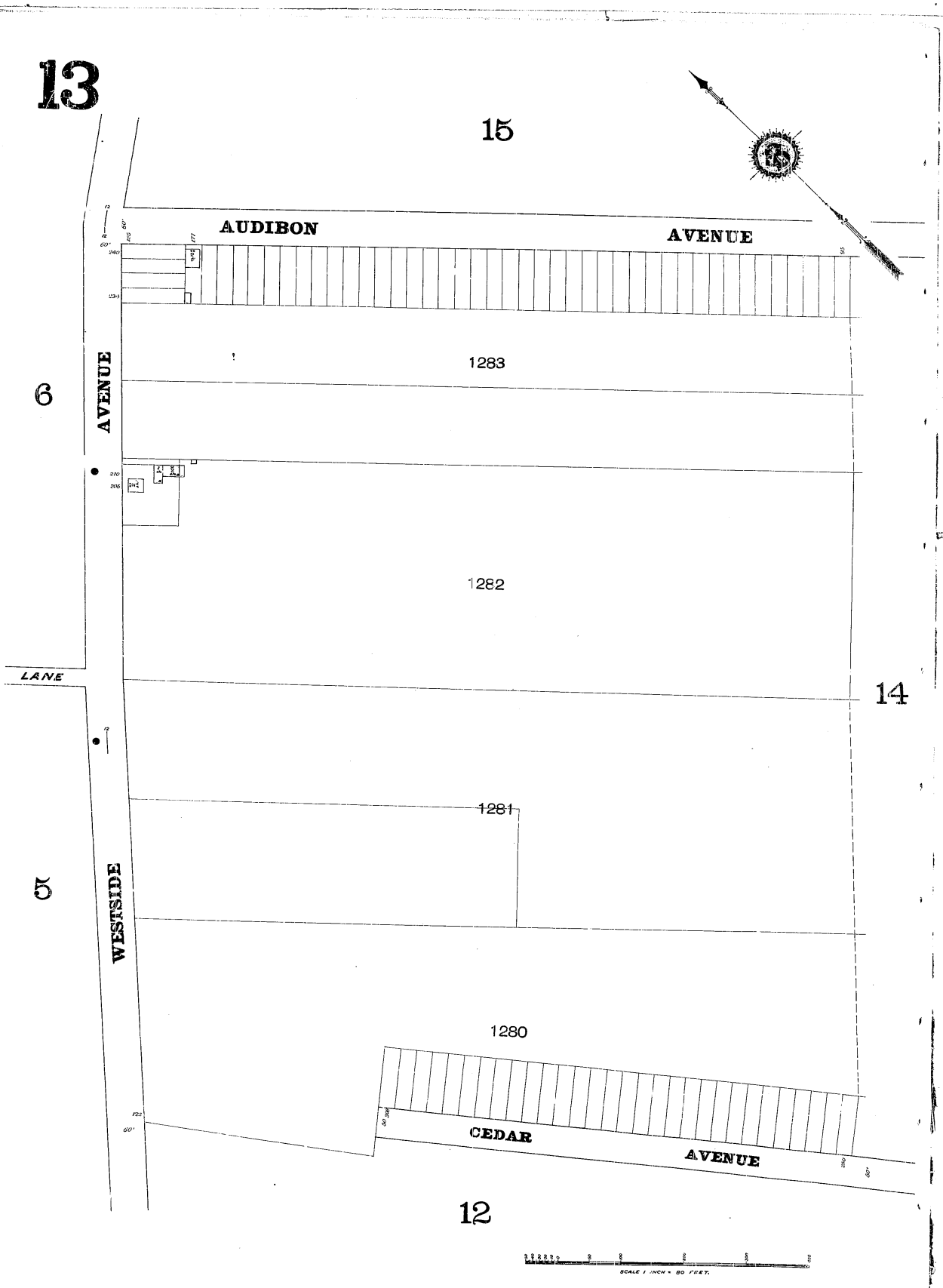
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

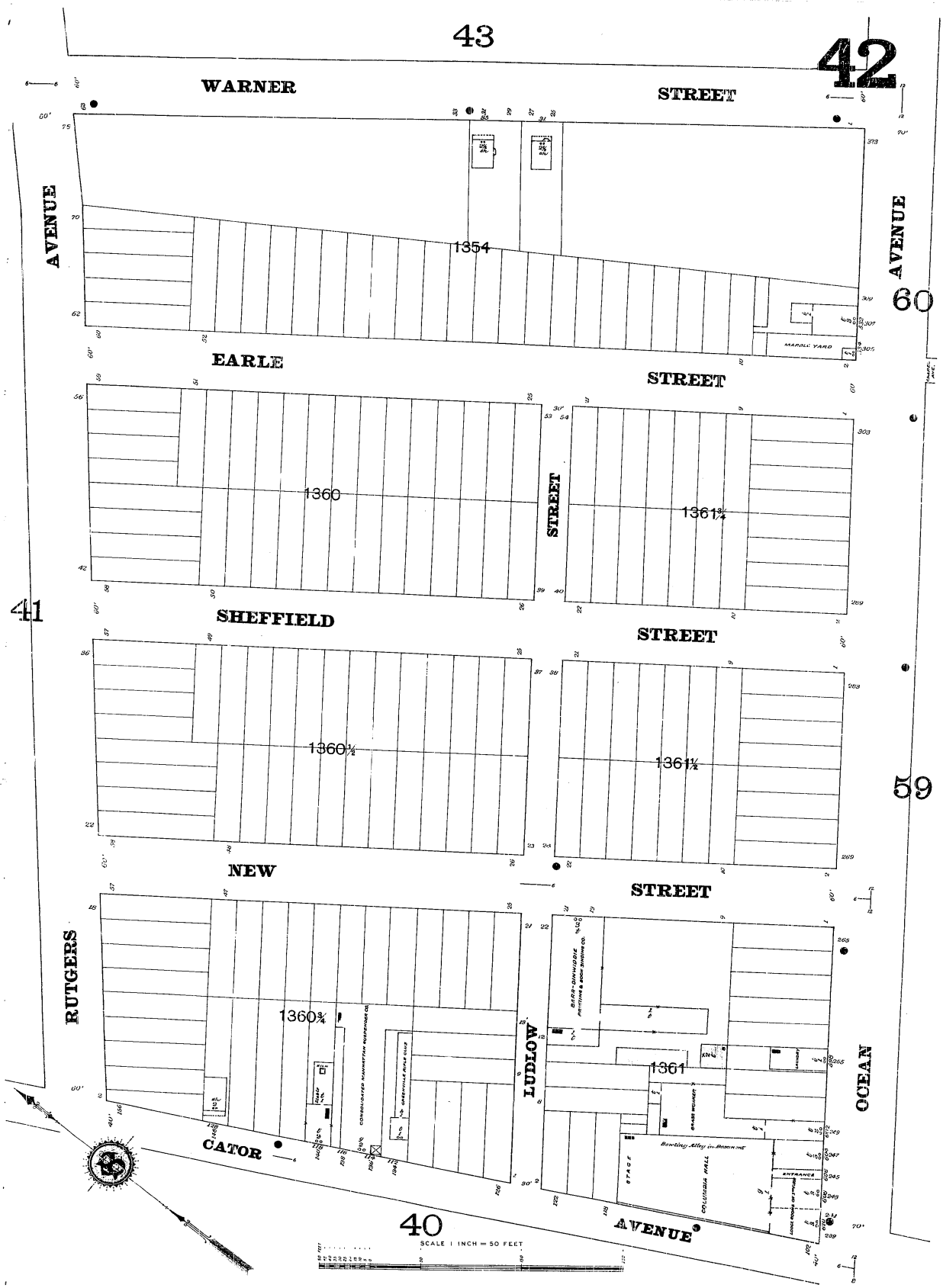
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

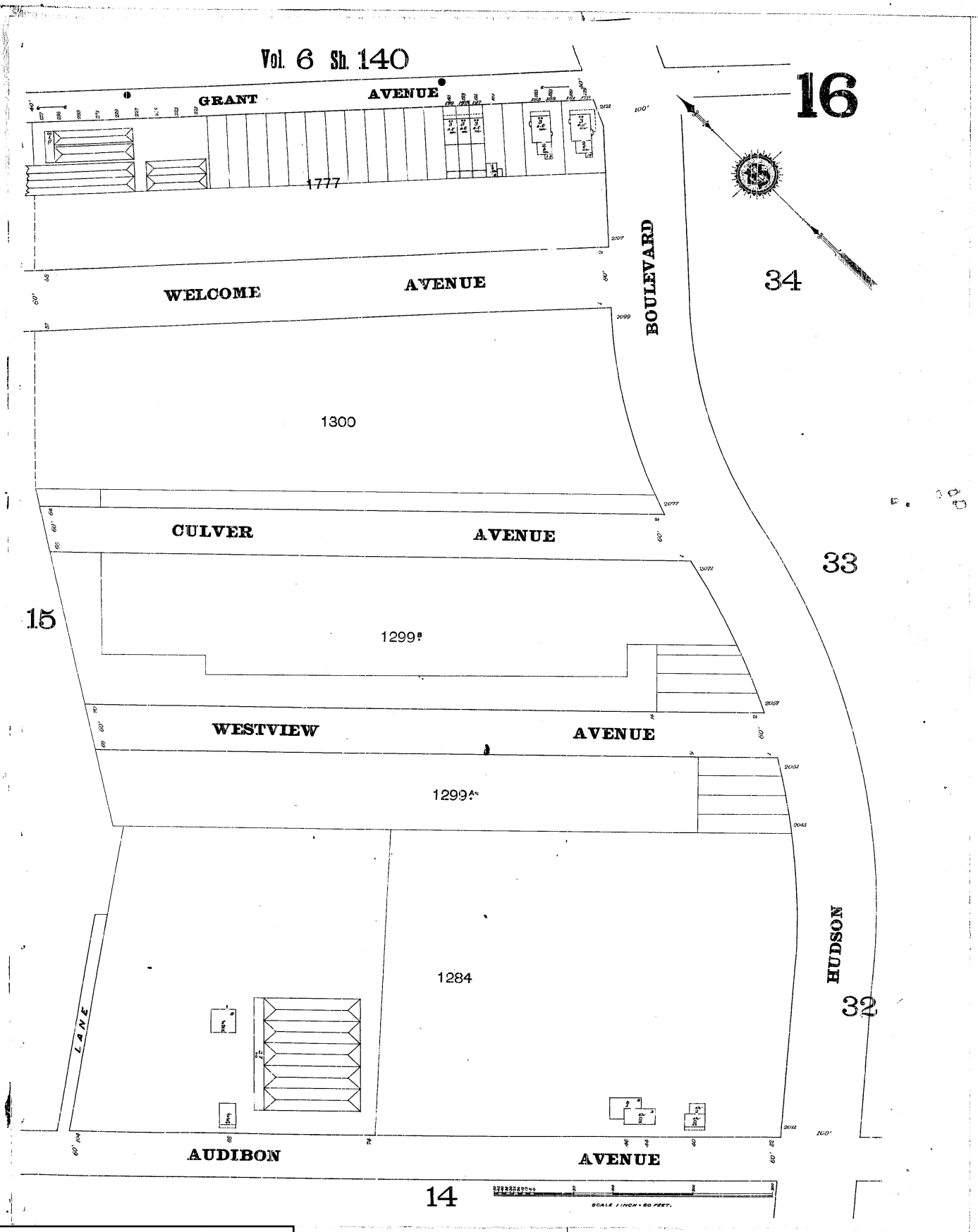
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

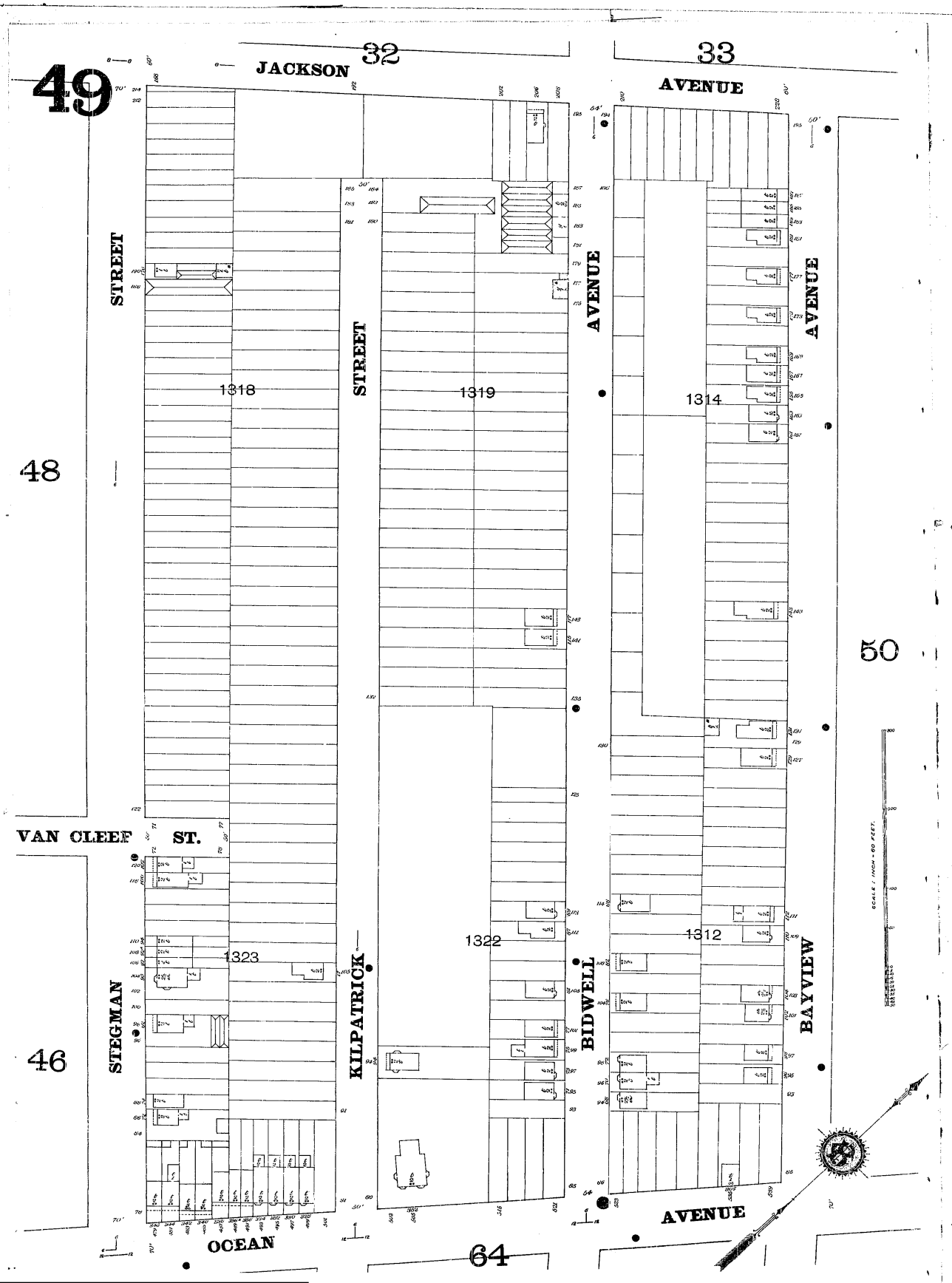
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

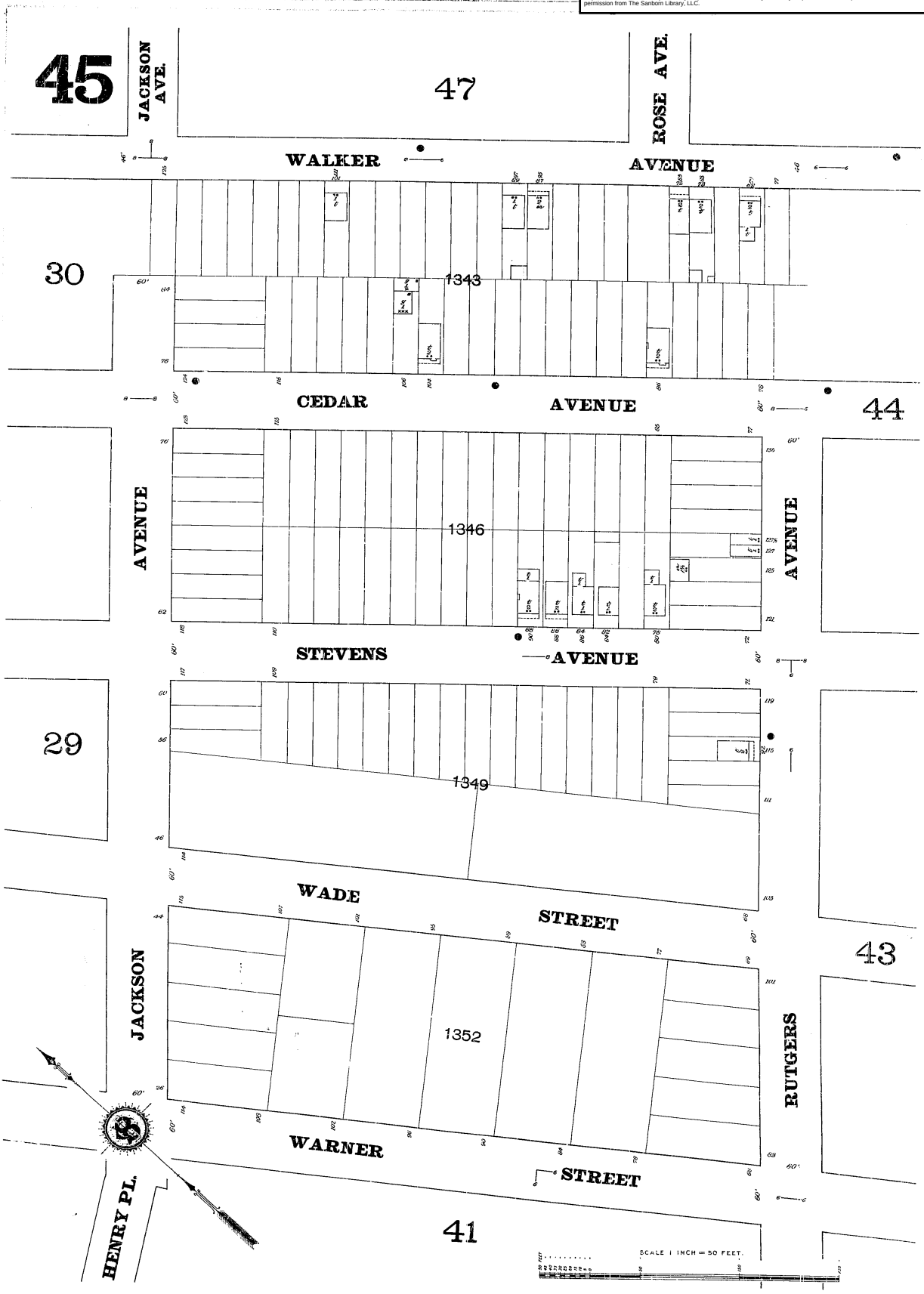
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

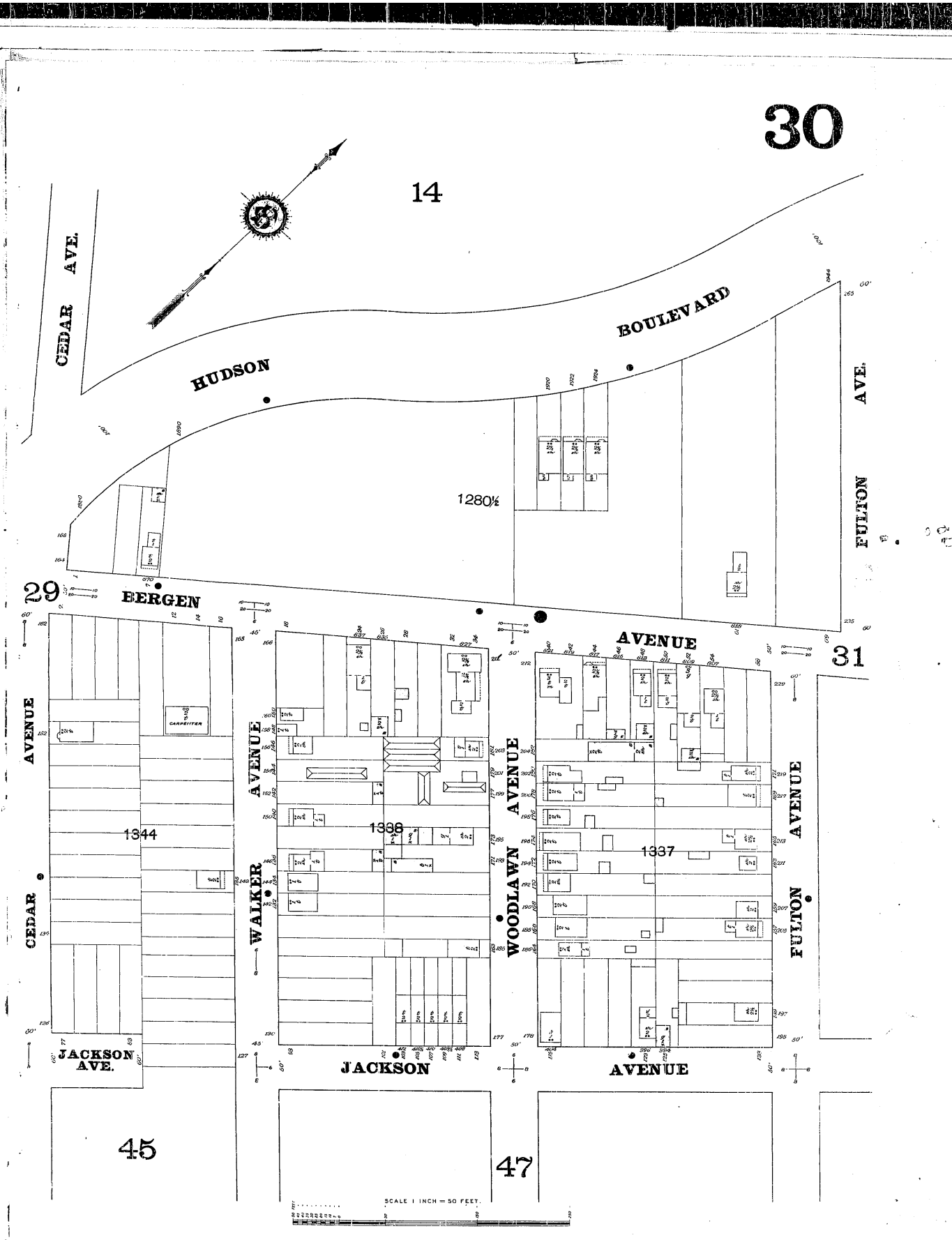
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

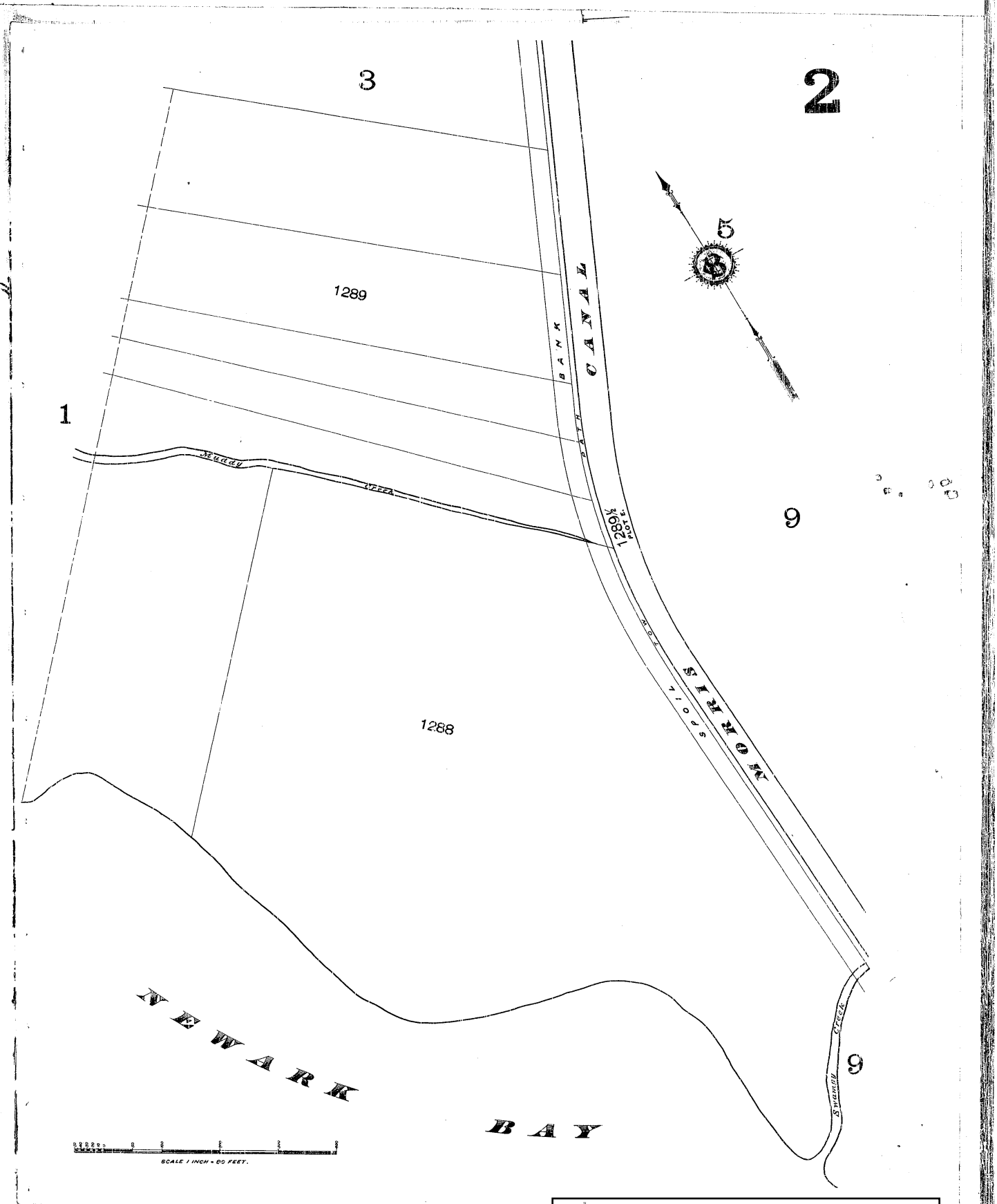




The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

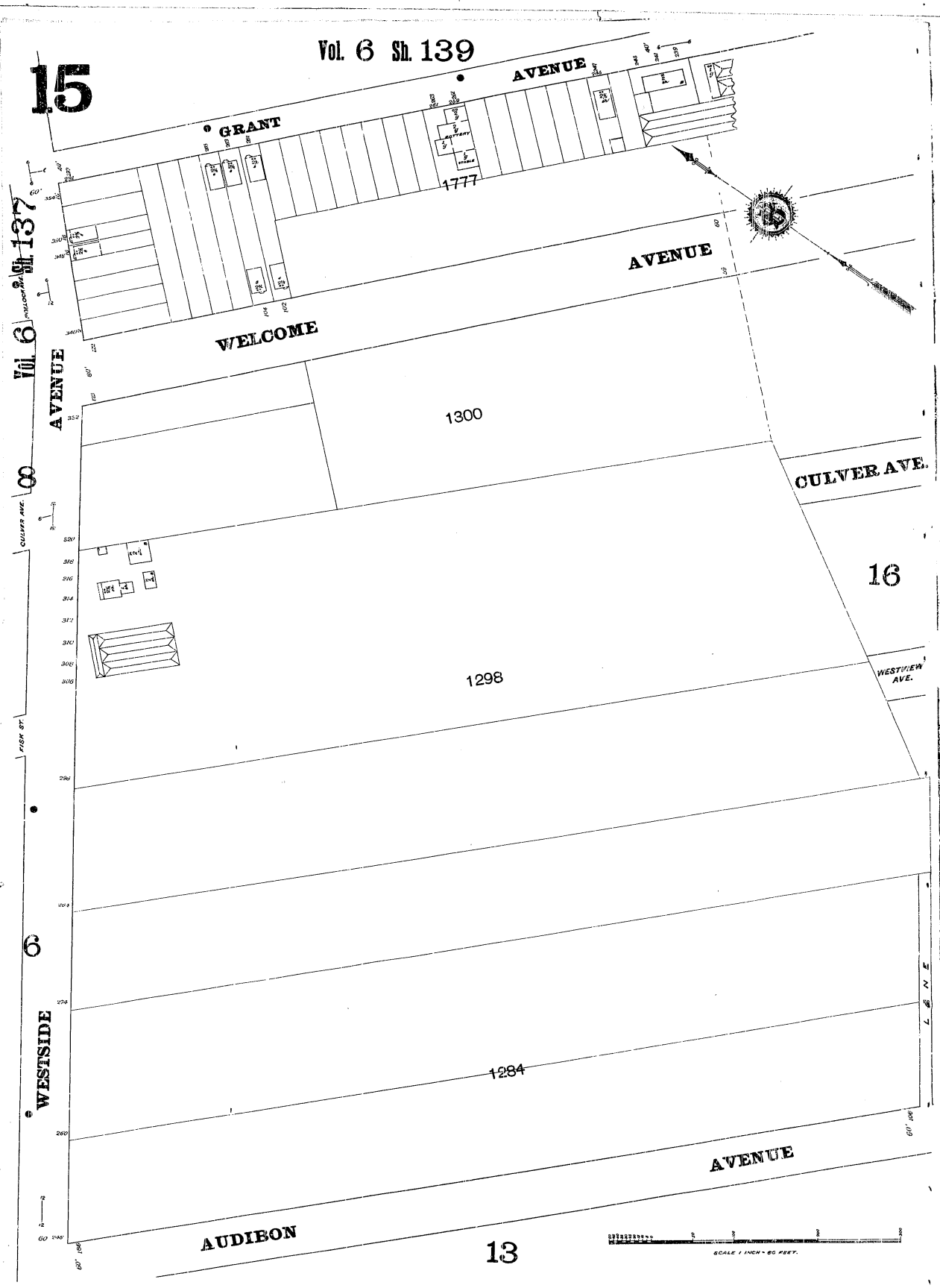


The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP

Year EDR Research Associate

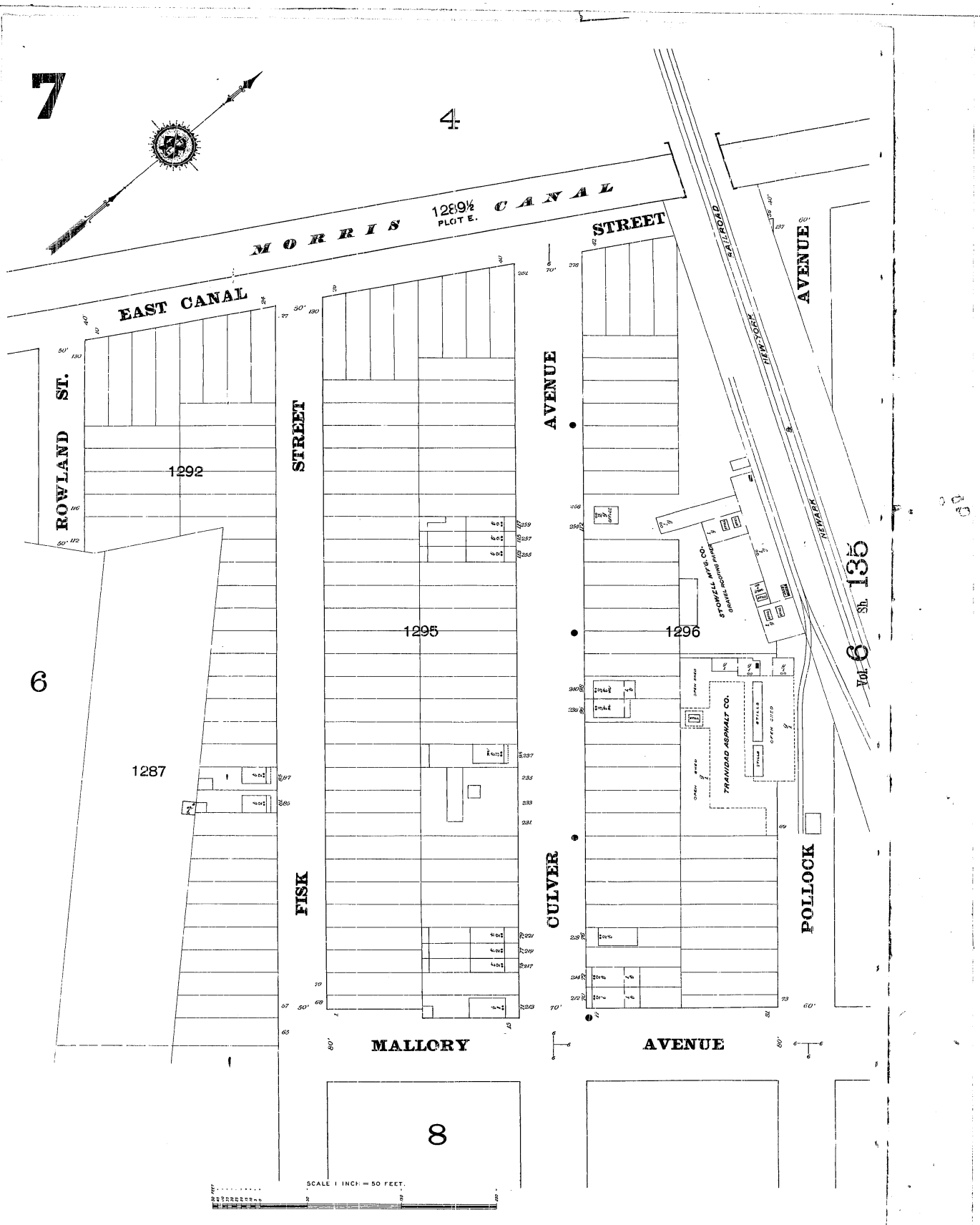
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

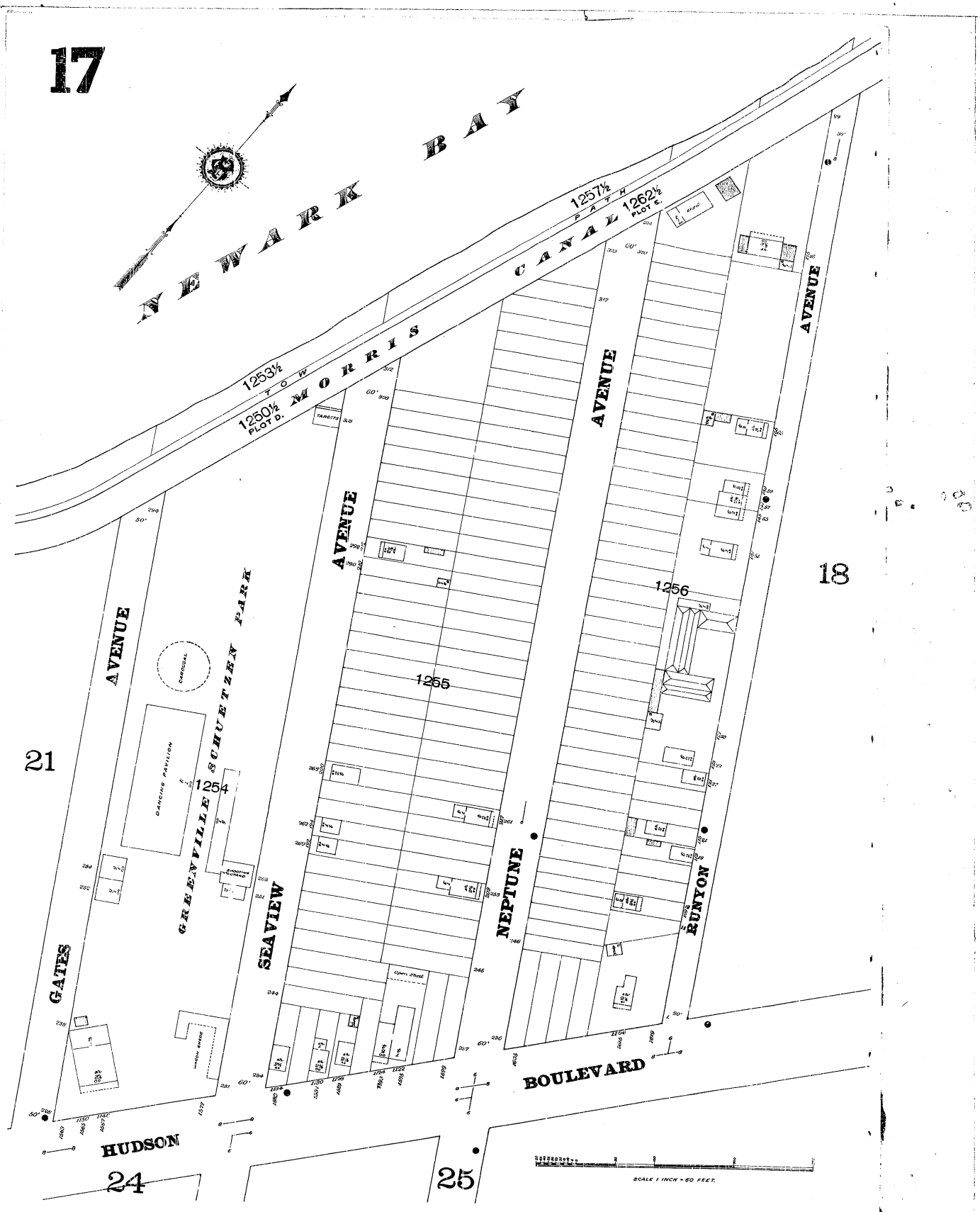
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

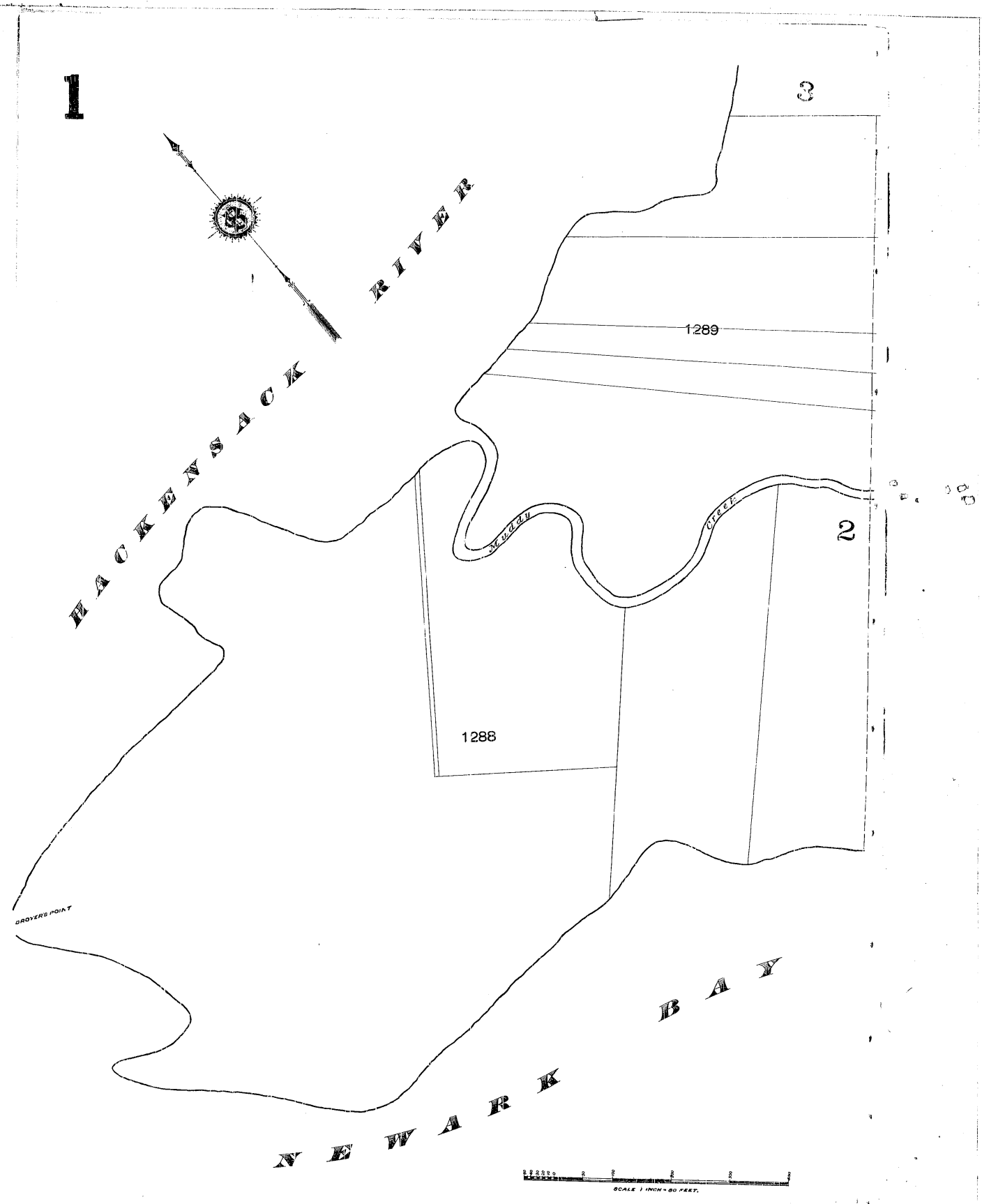


The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

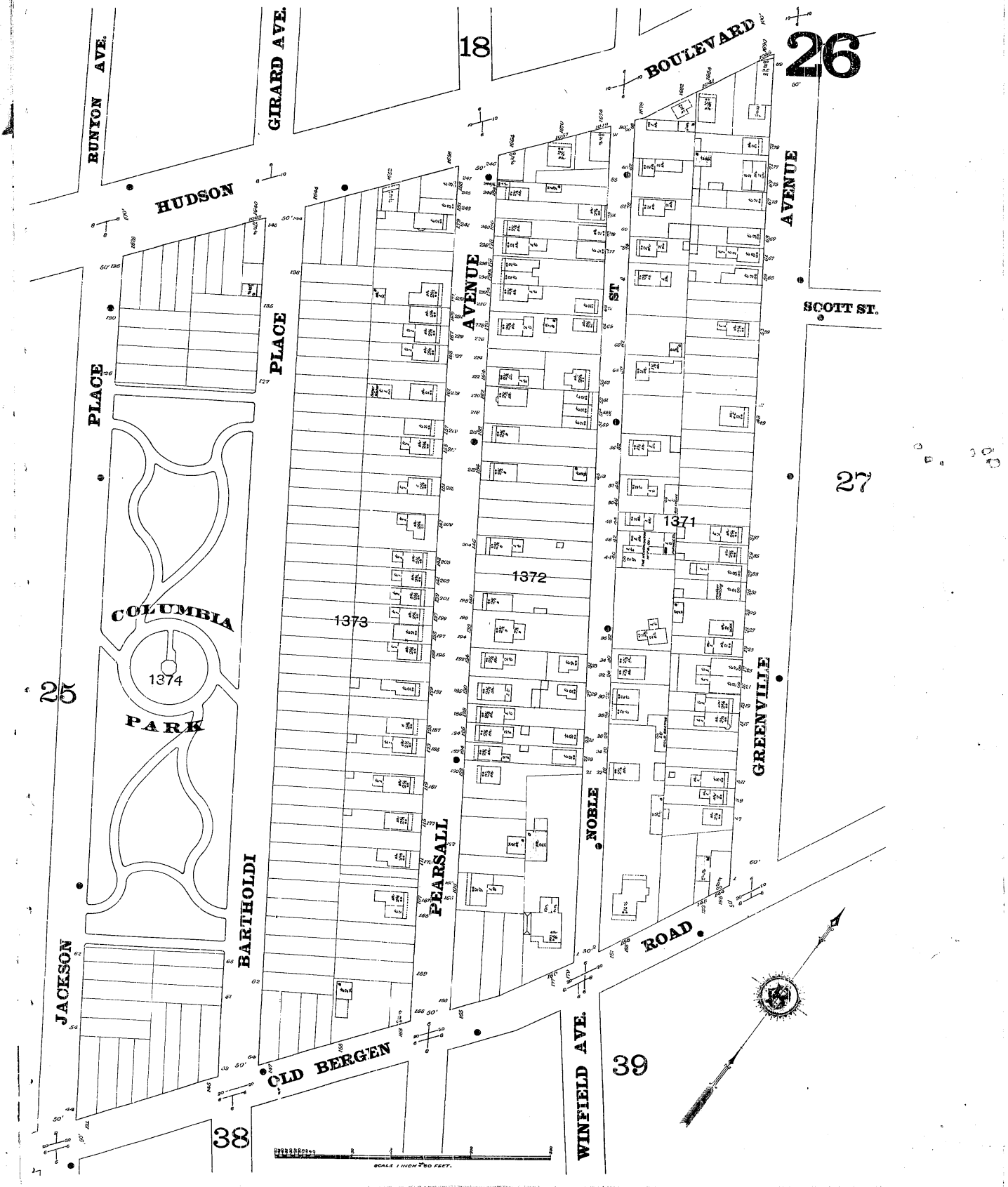
Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

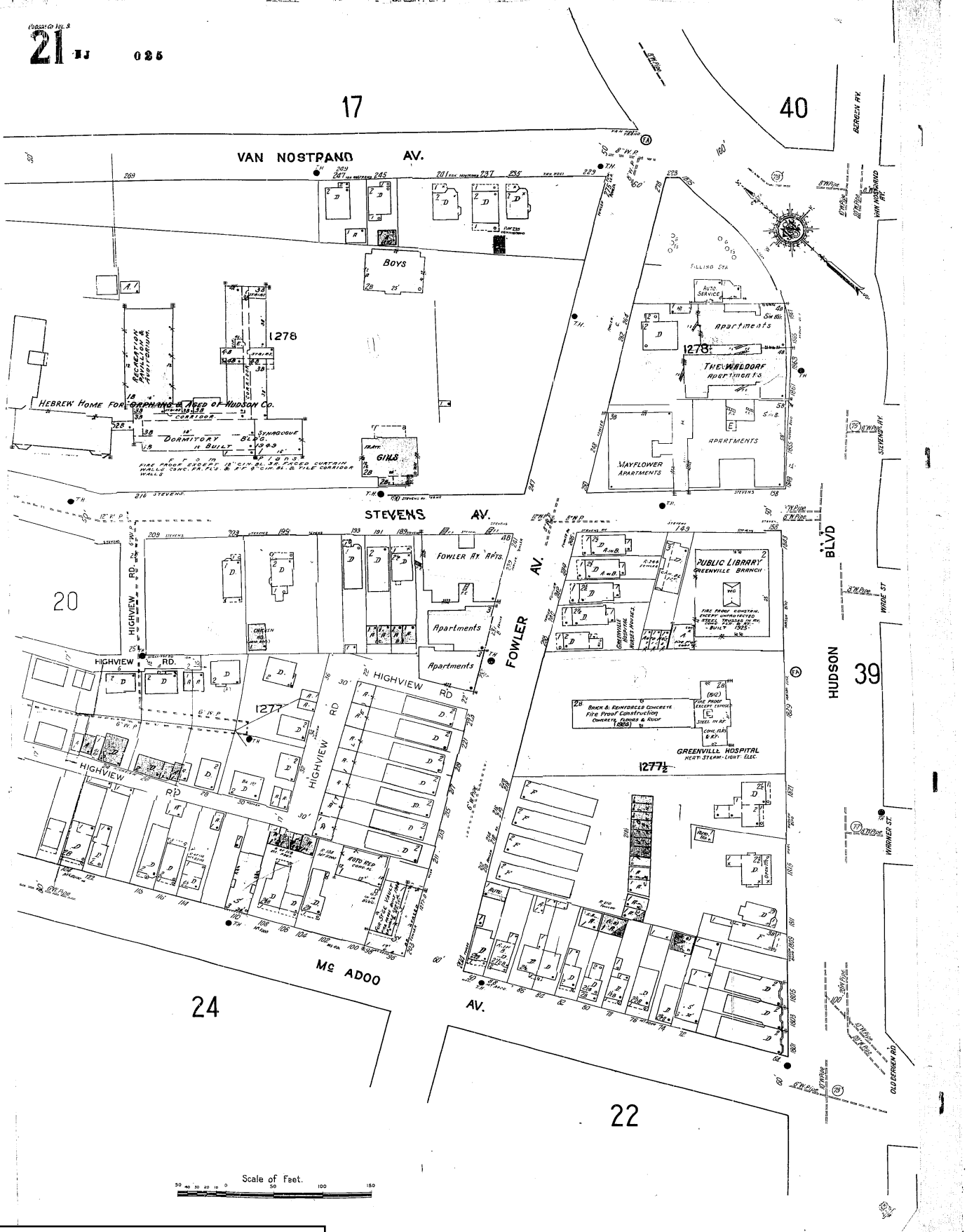


The Sanborn Library, LLC

Copyright© 1898 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

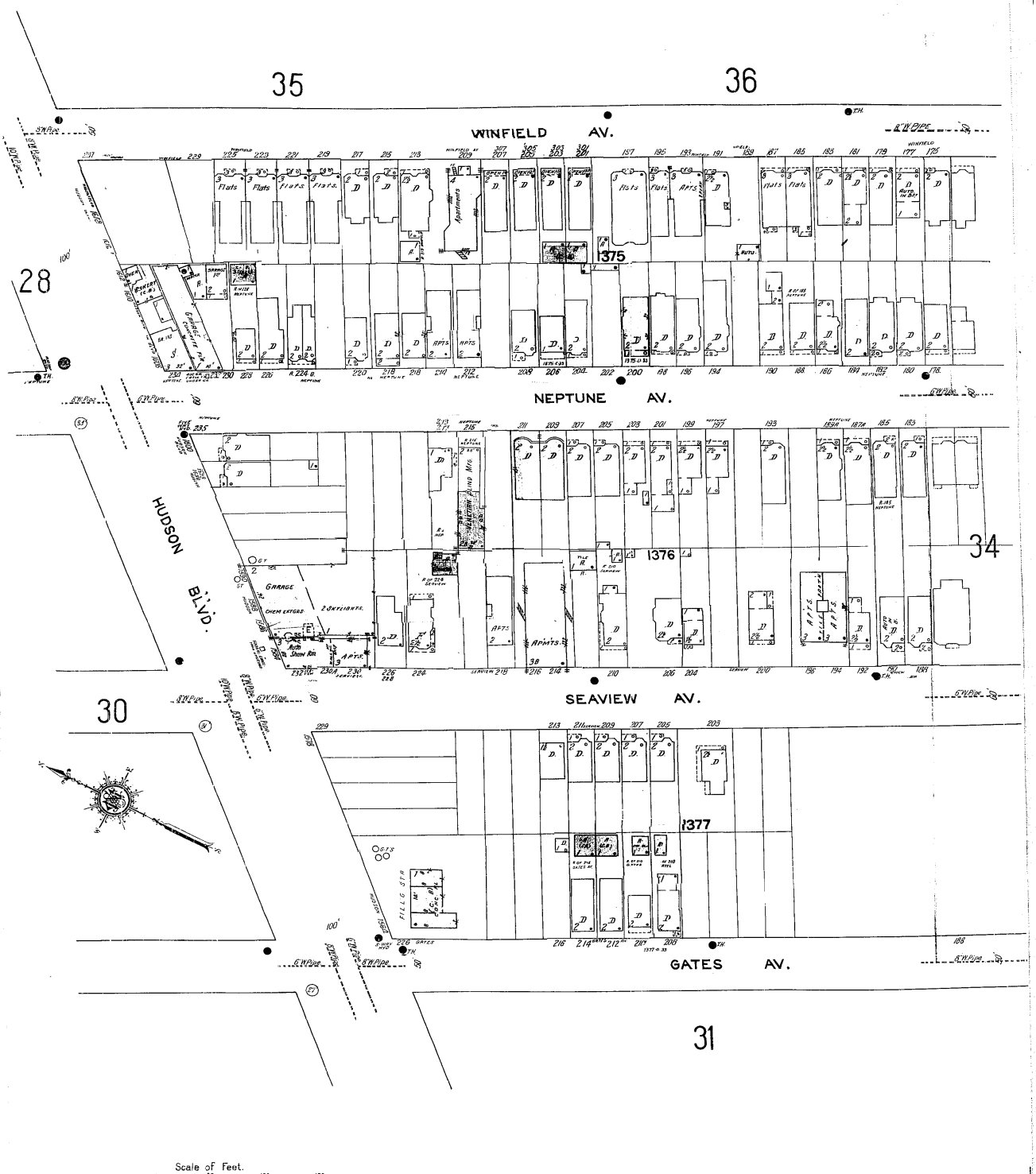
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

Hudson Co. Vol. 3

33

NJ 035

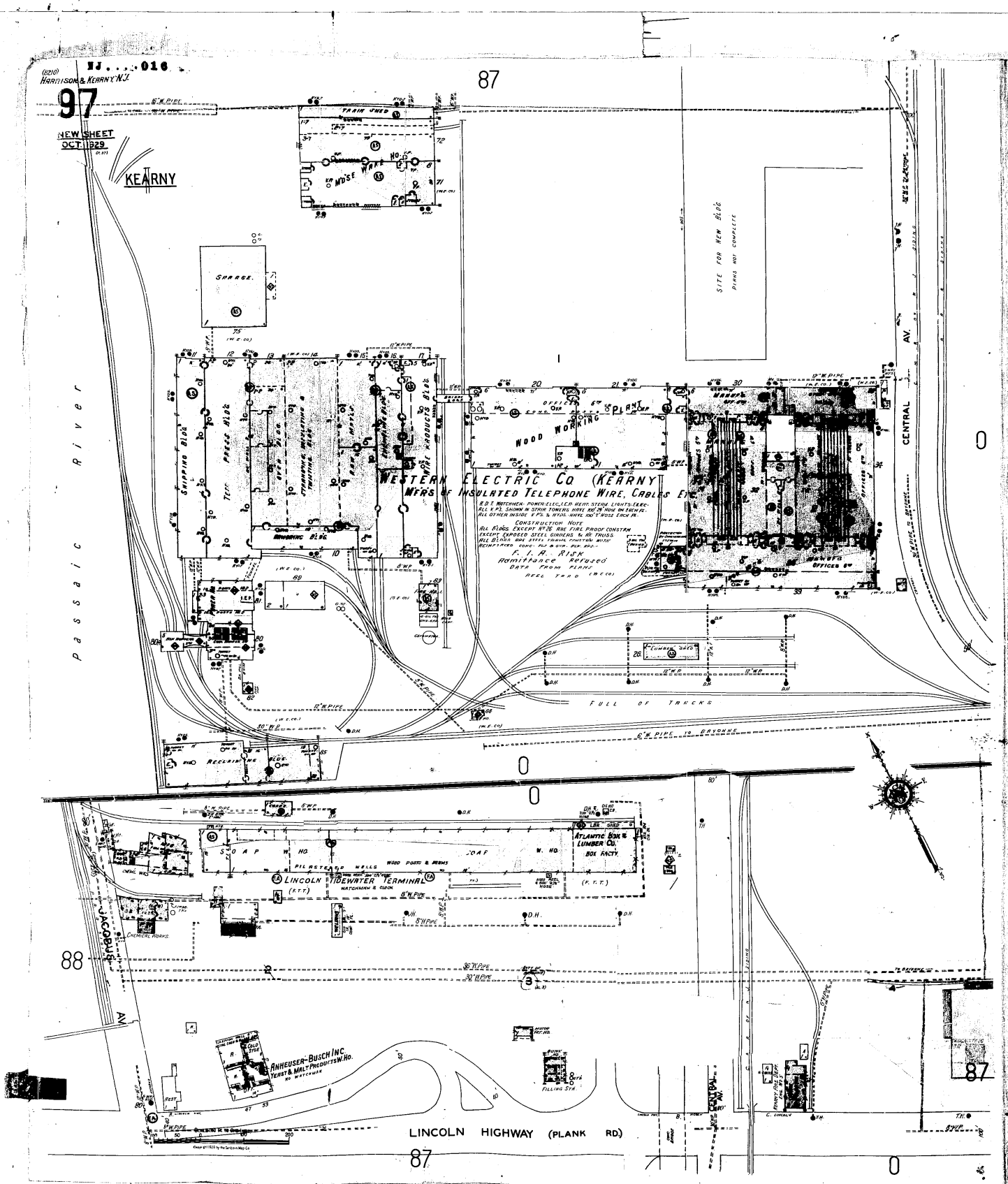


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

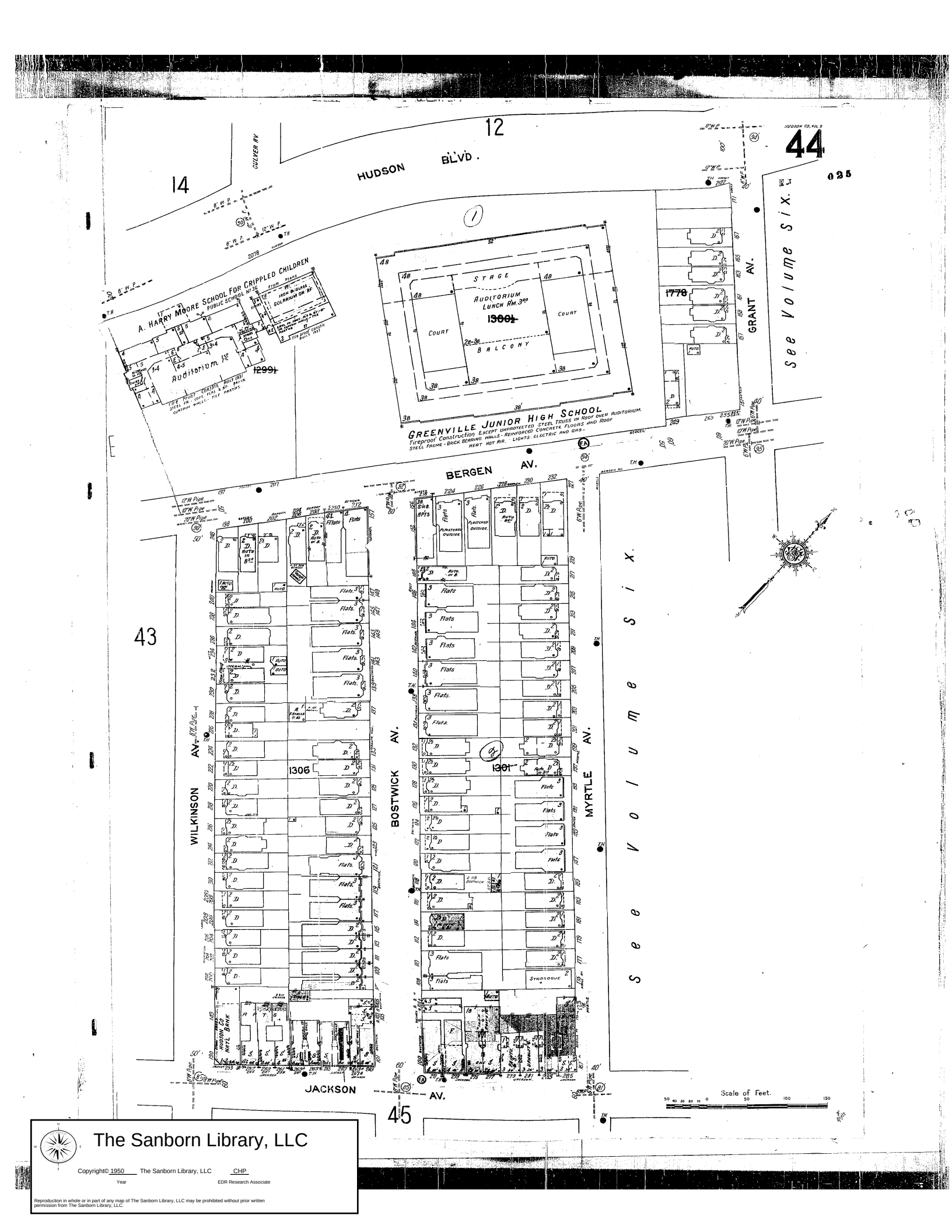
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

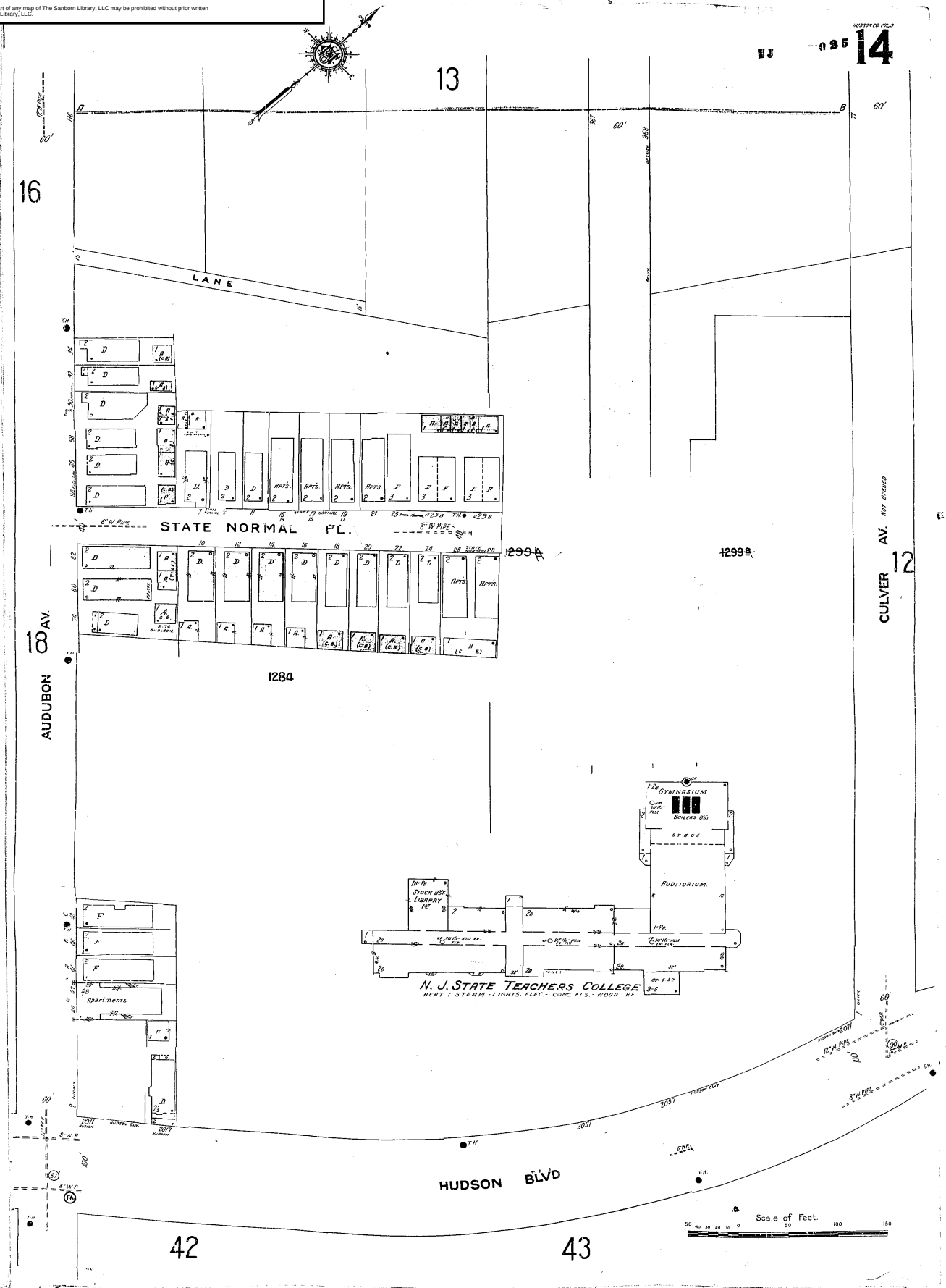
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

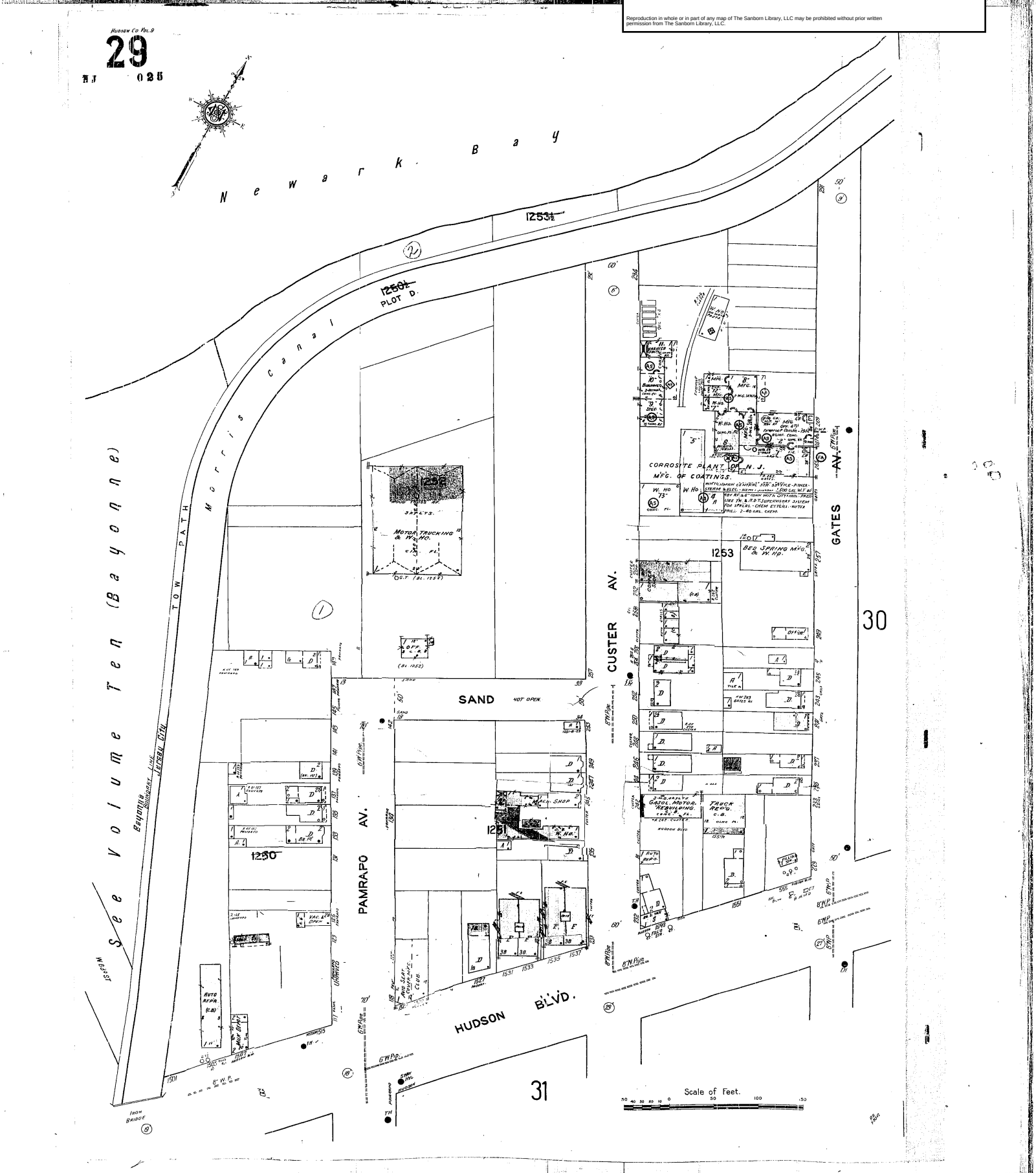
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

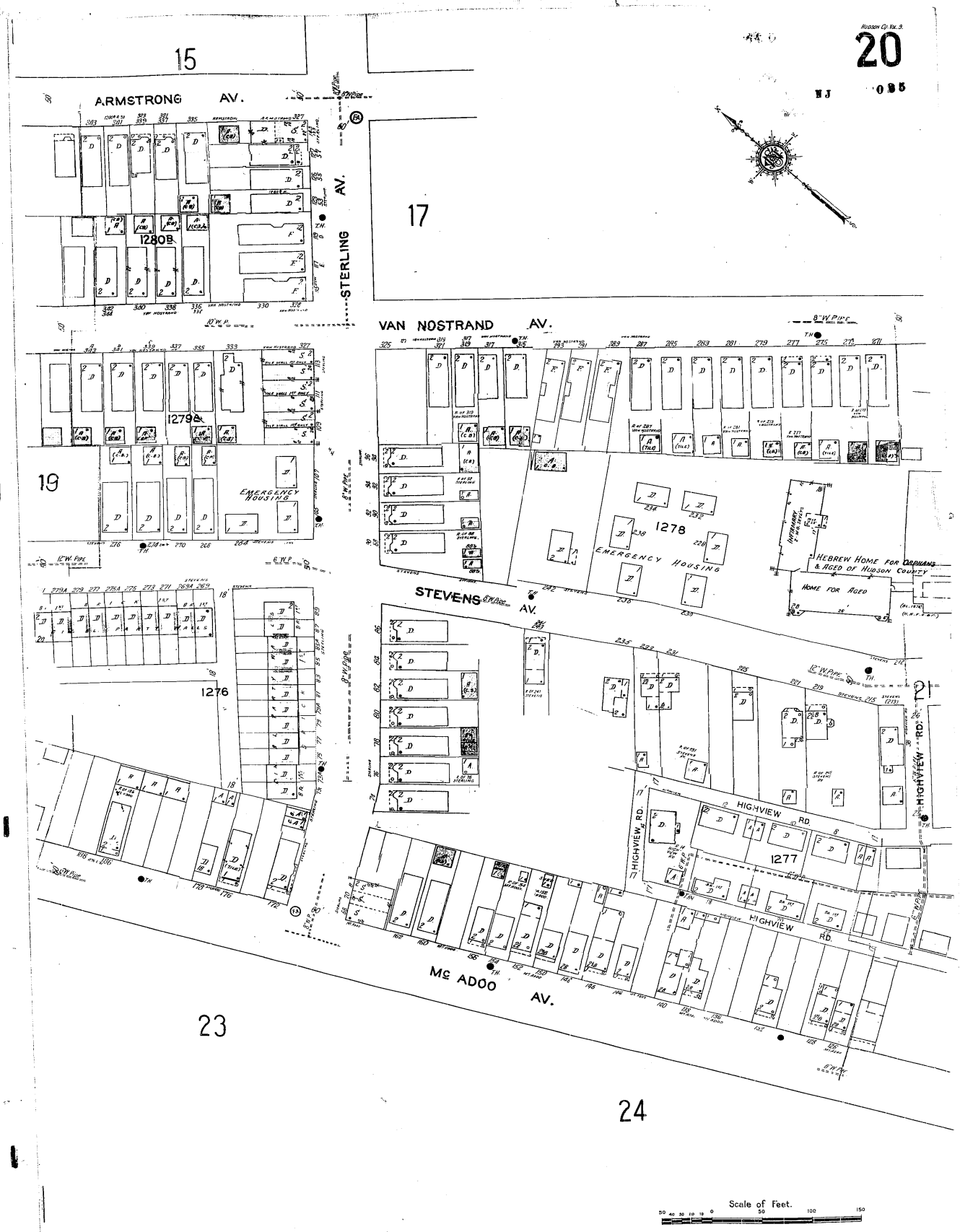


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

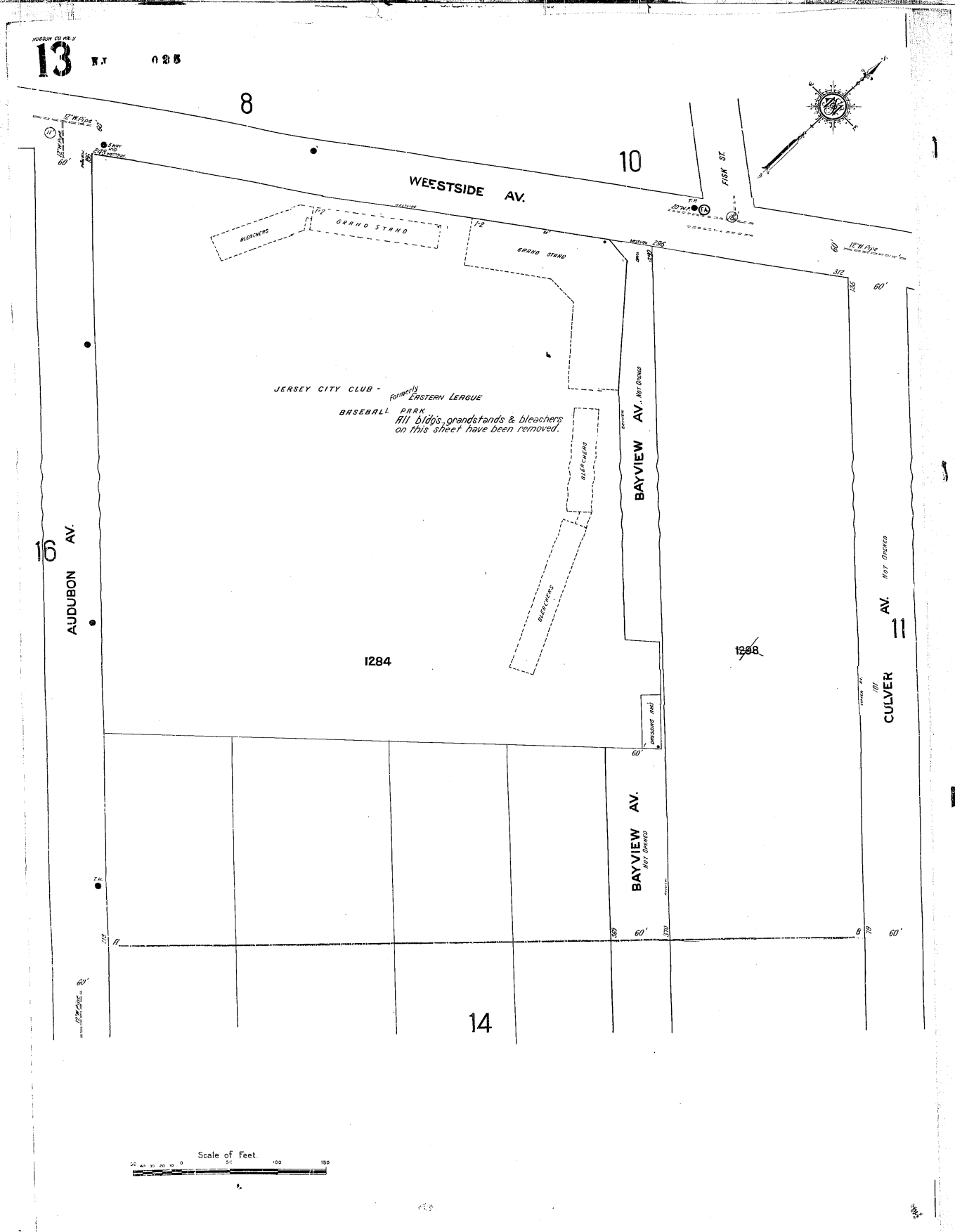




The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

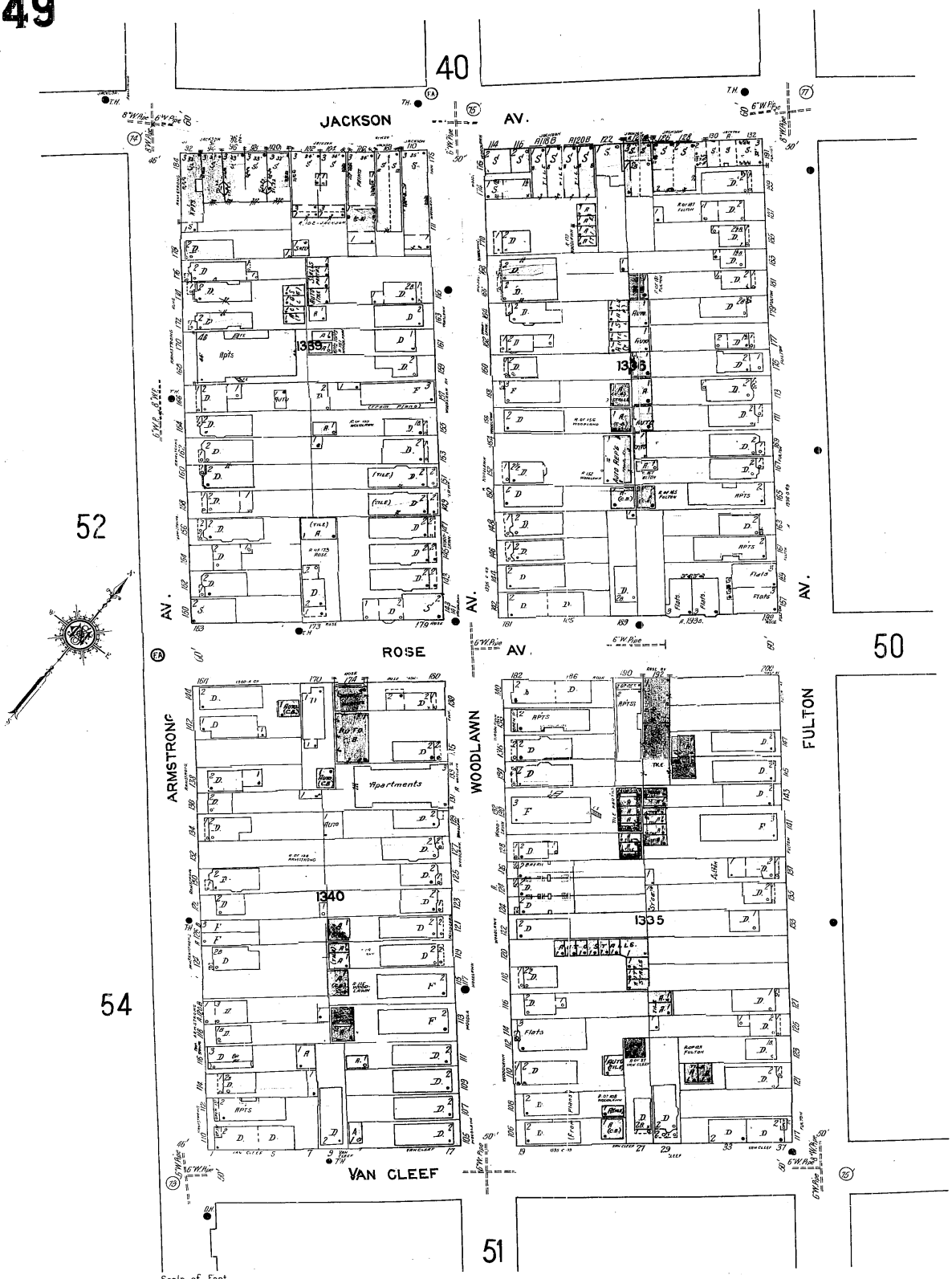
Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

HUDSON CO. VOL. 5

49

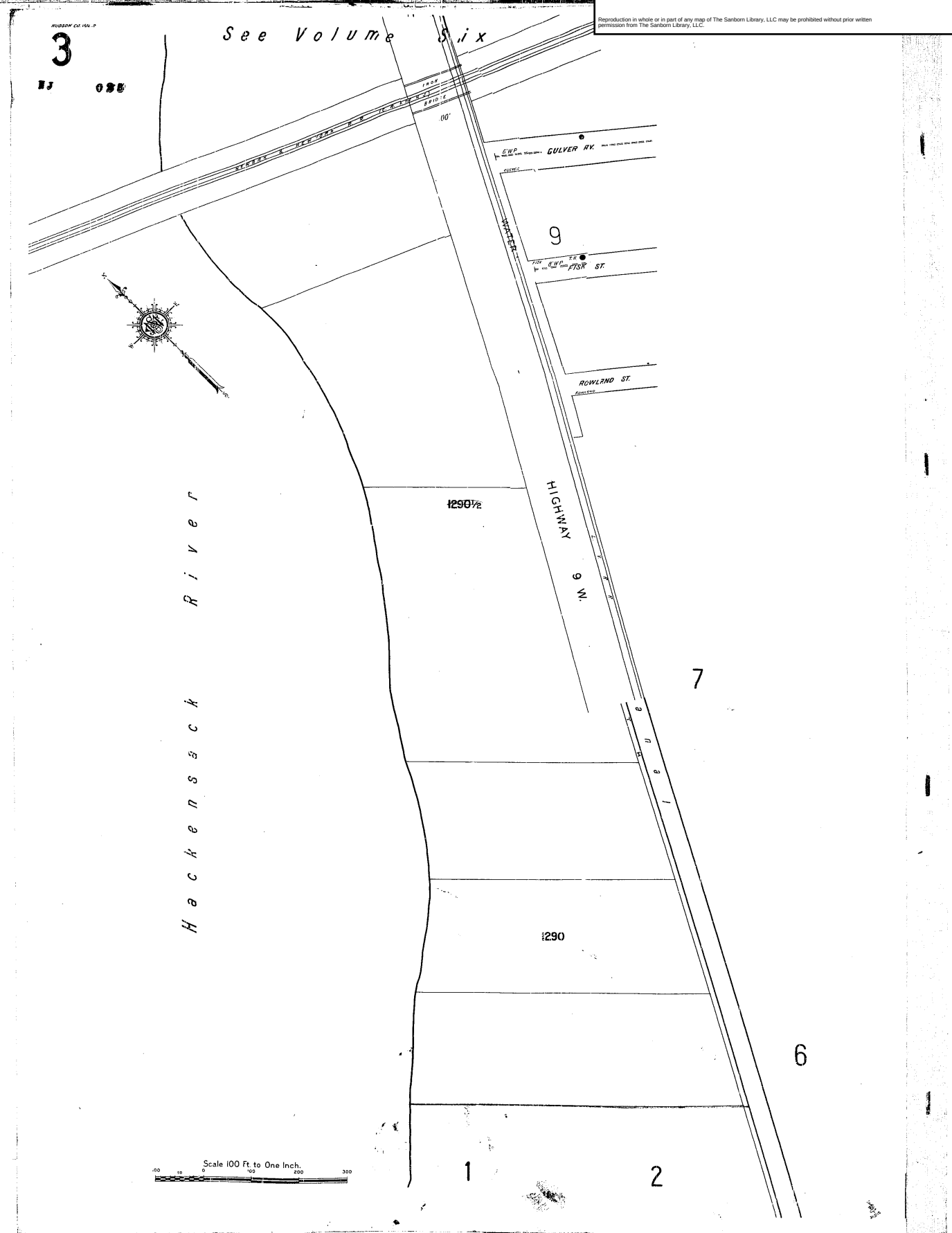


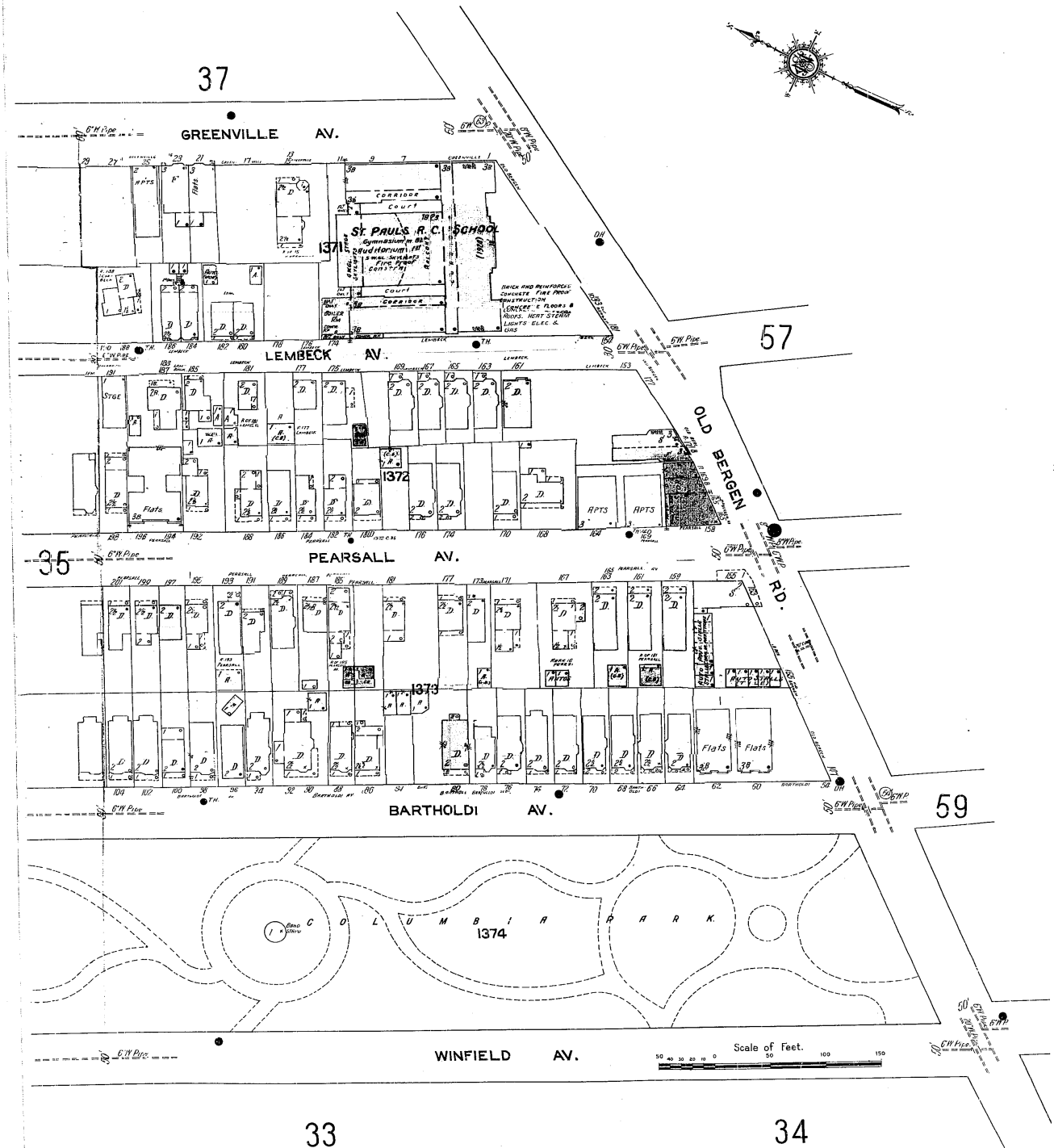
The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





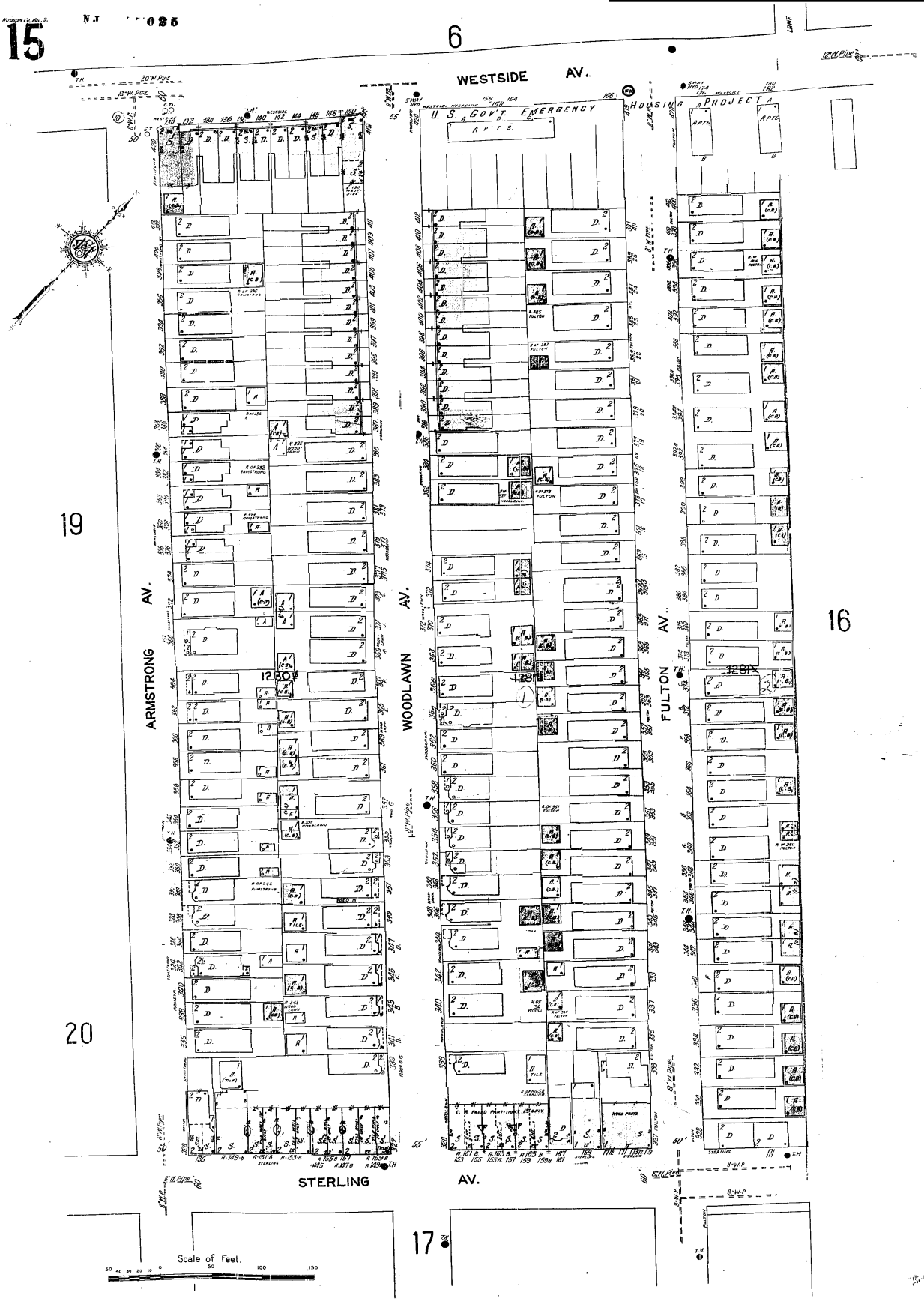
The Sanborn Library, LLC
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

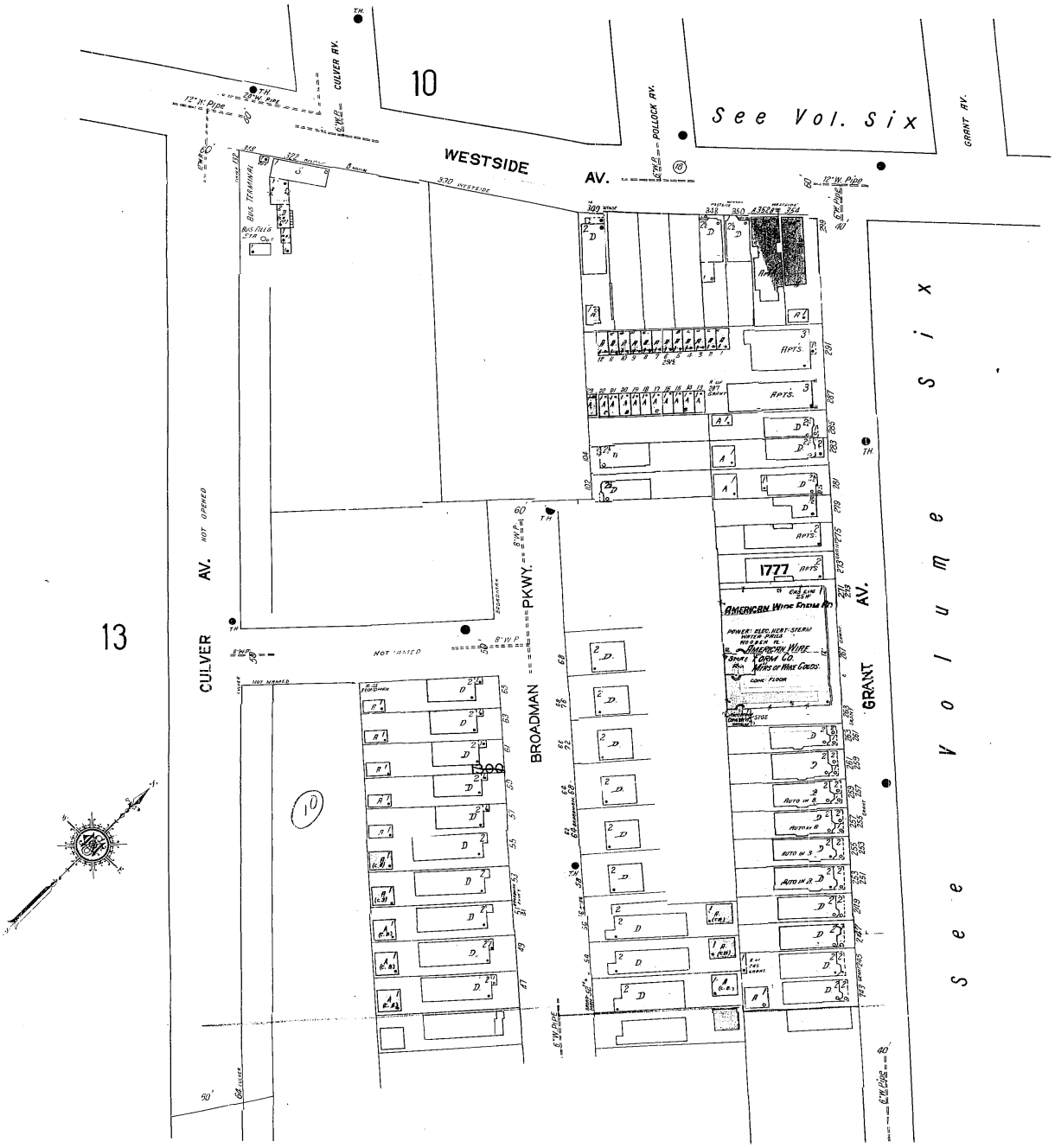
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



HUDSON CO. VOL. 5.

11

NJ 025



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

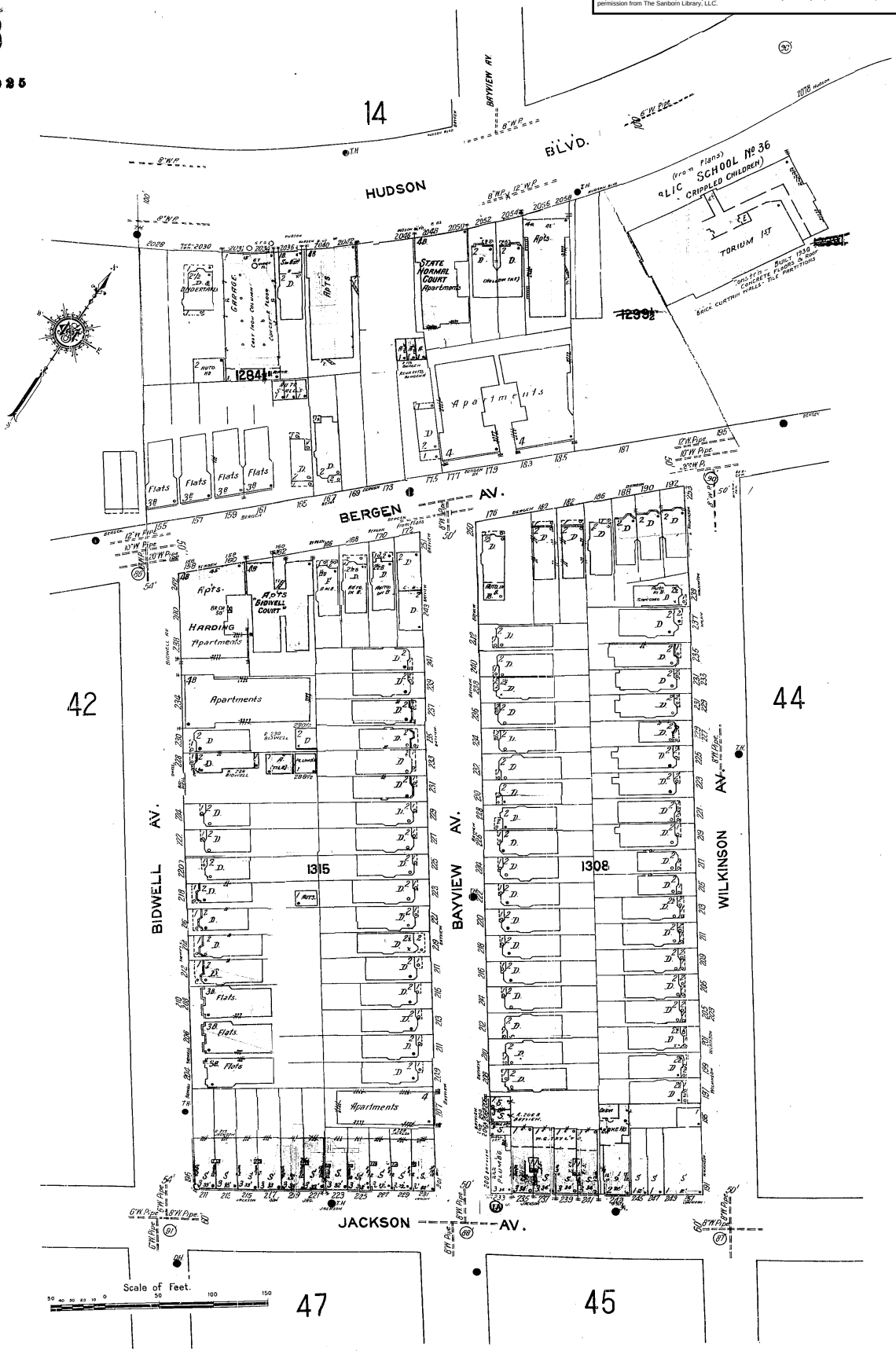
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

HUDSON CO. VOL. 5

43

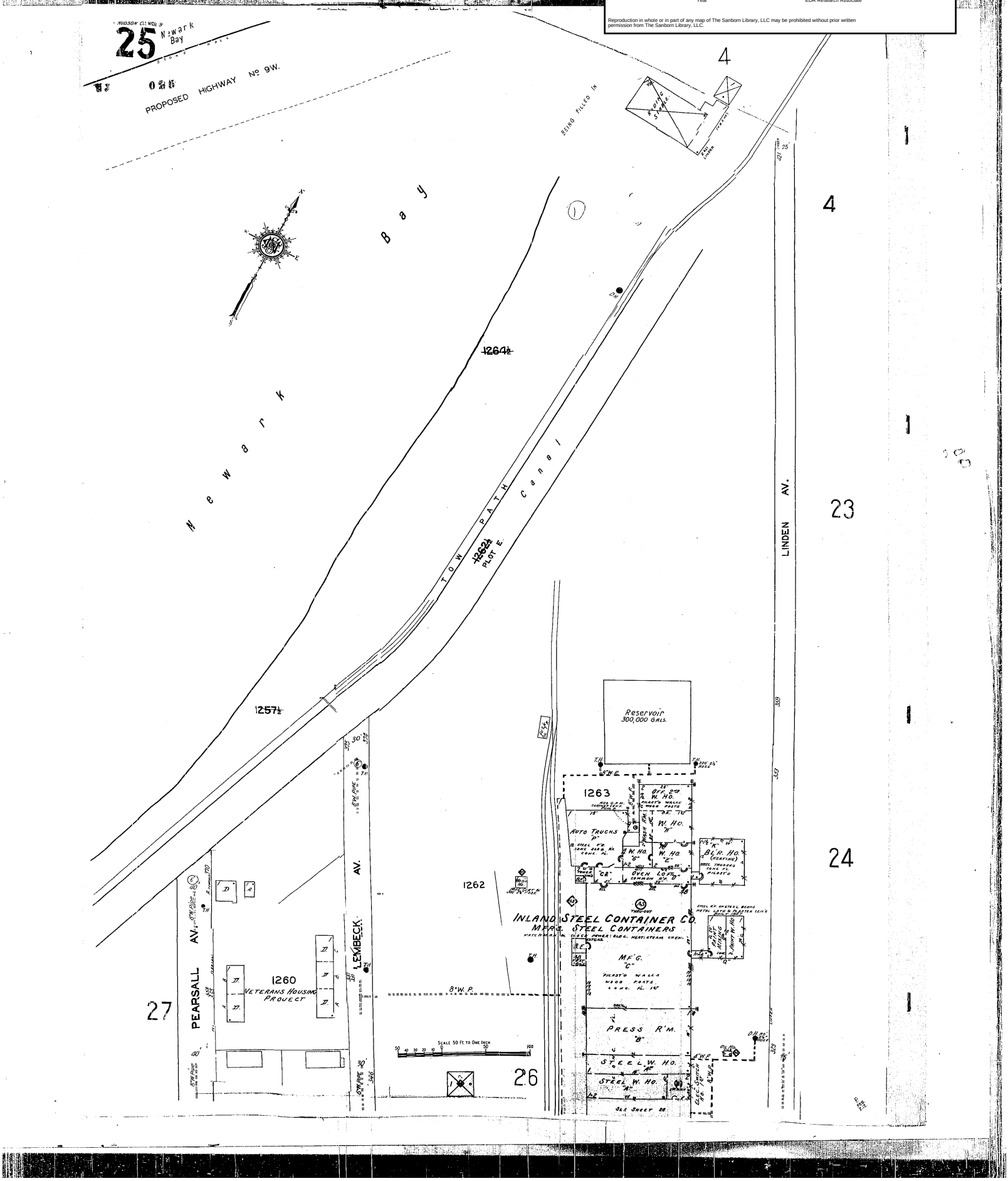
NJ 025

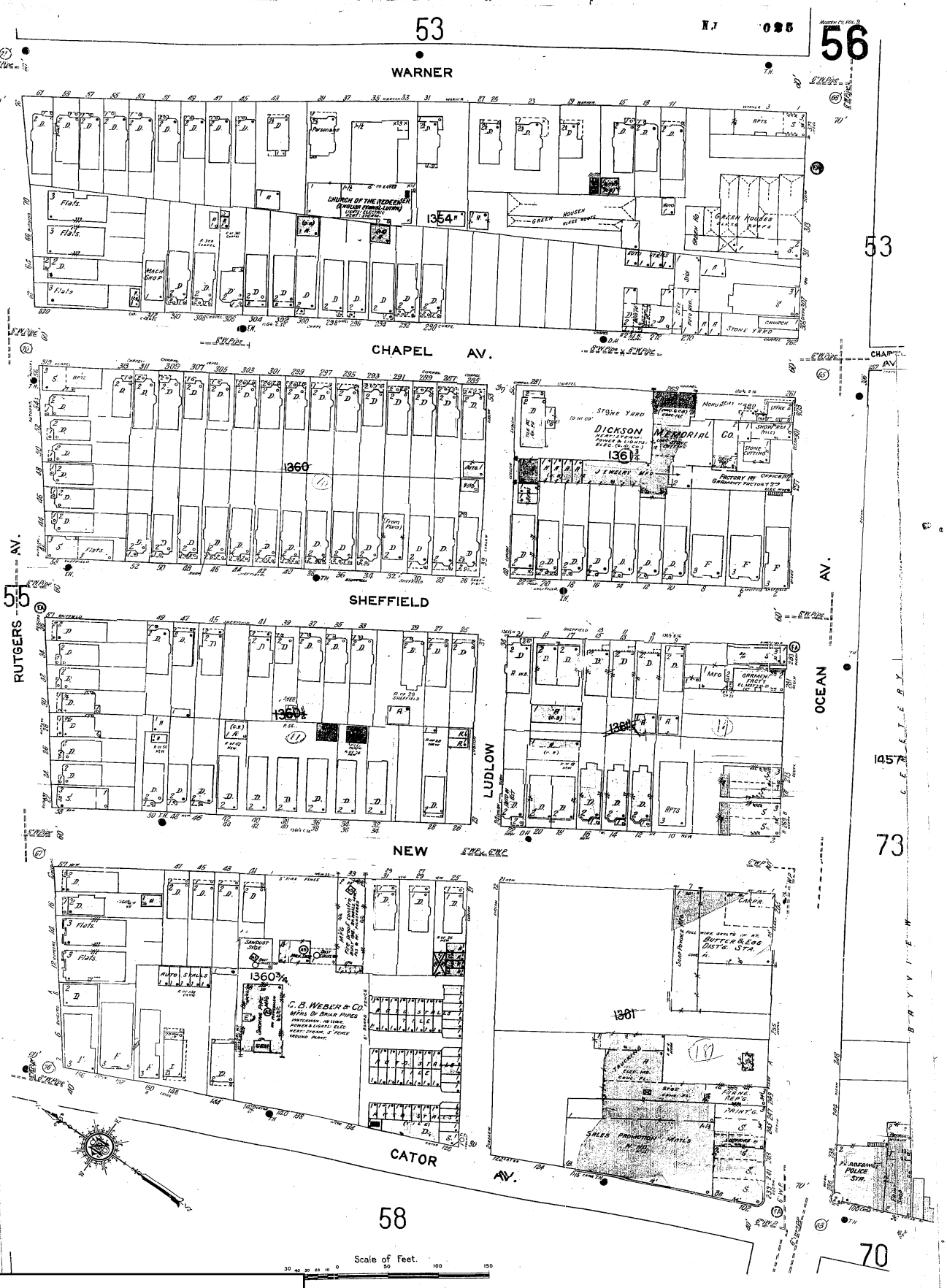


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

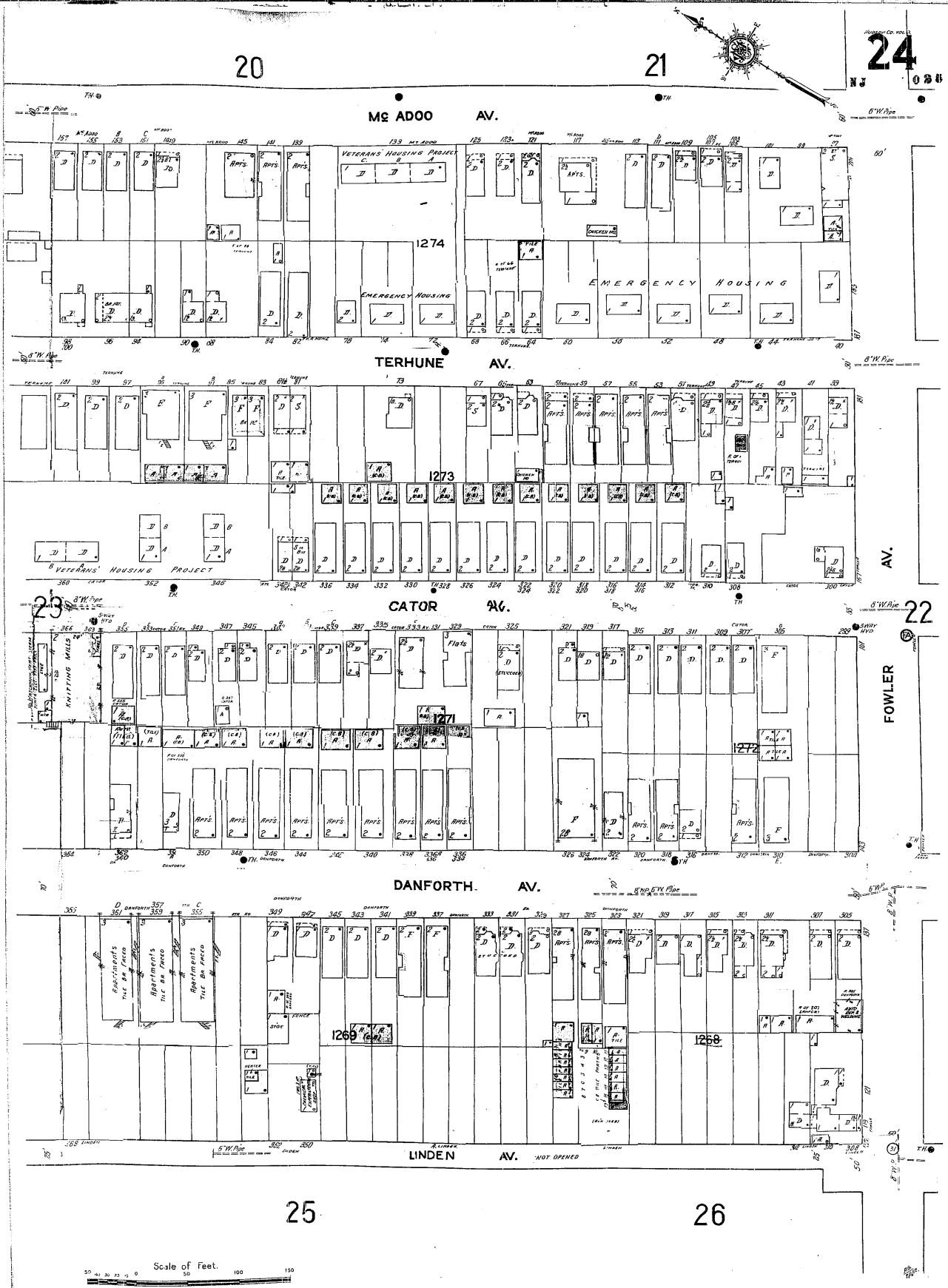




The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

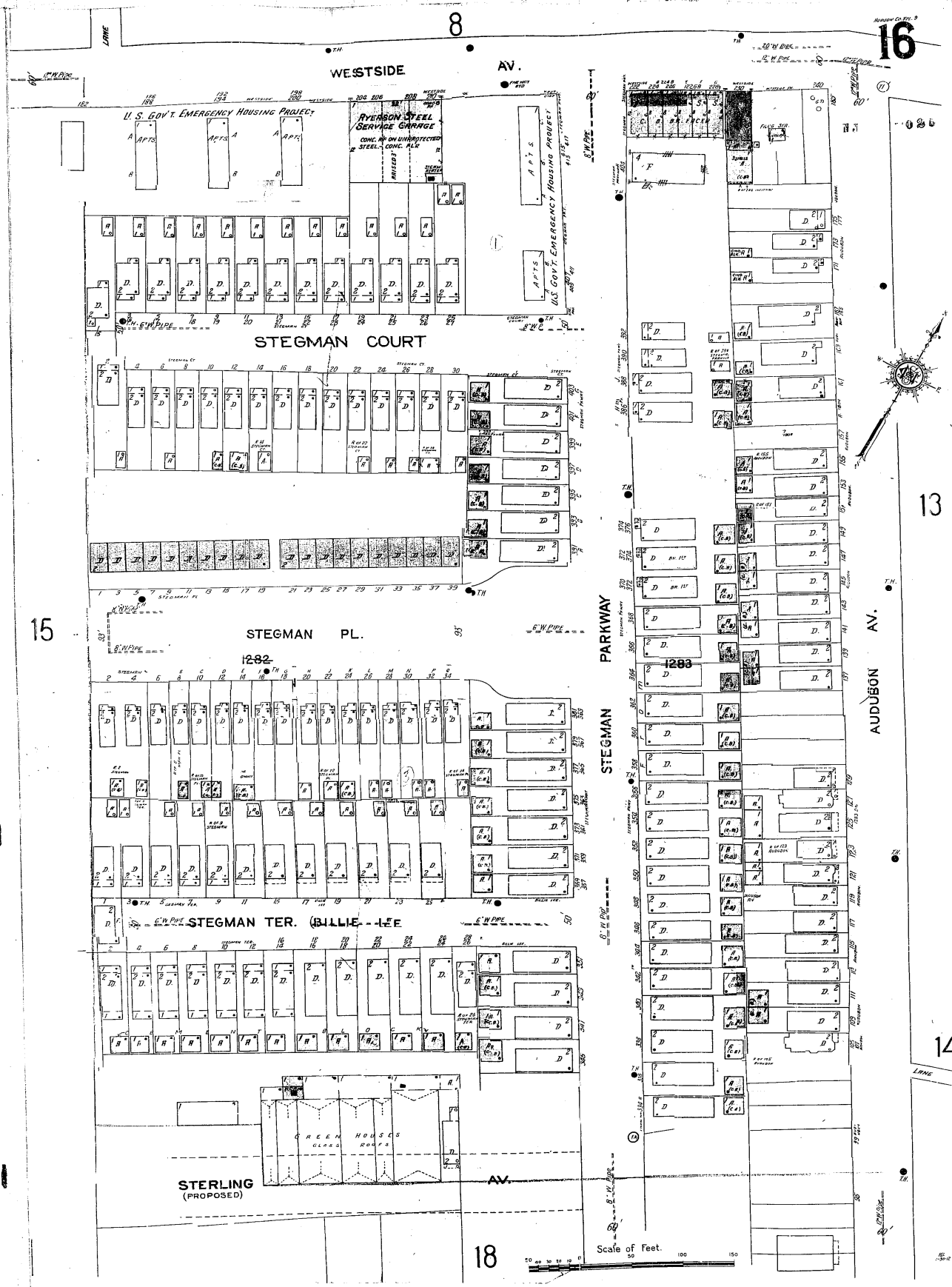


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

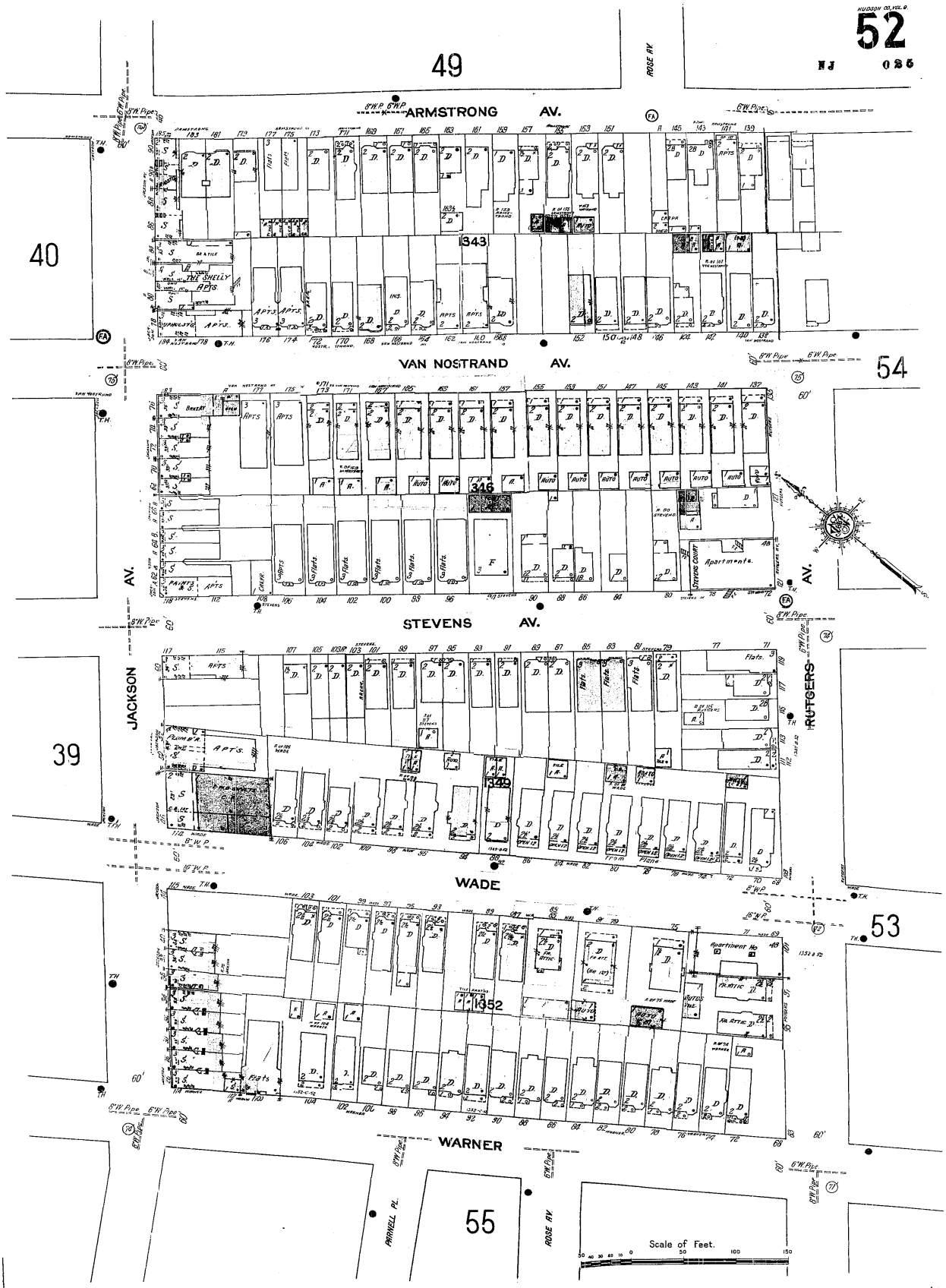


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

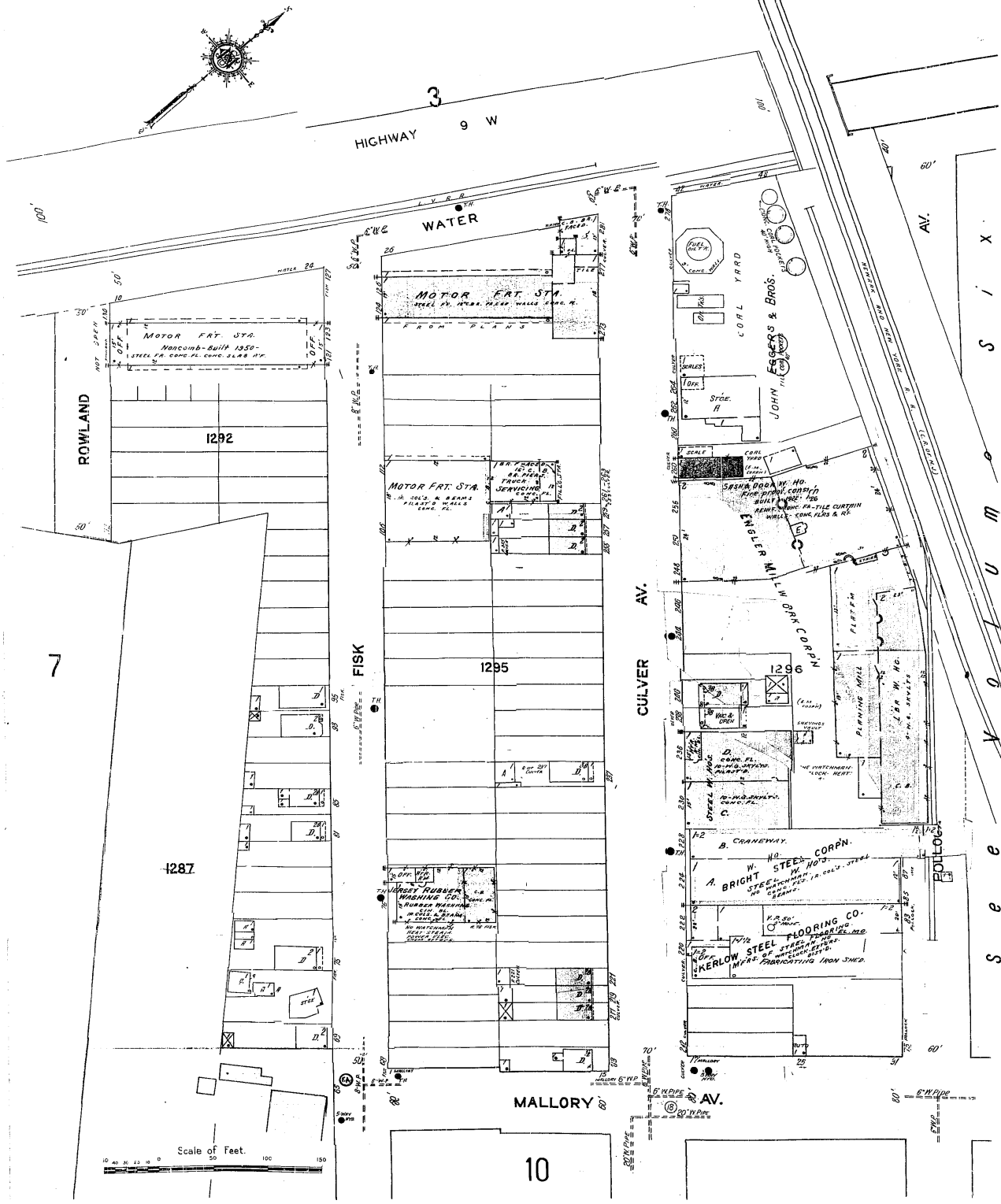
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

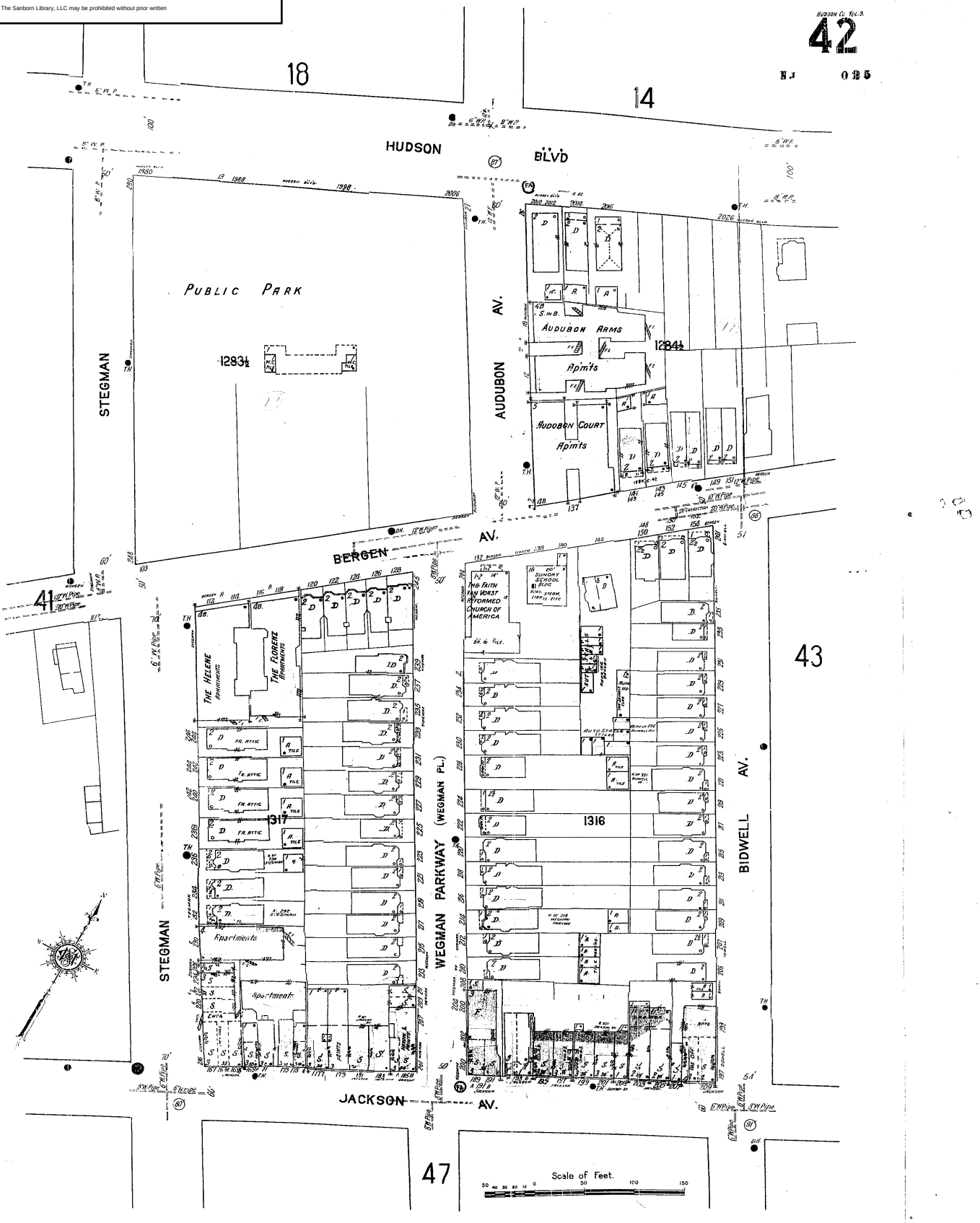
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

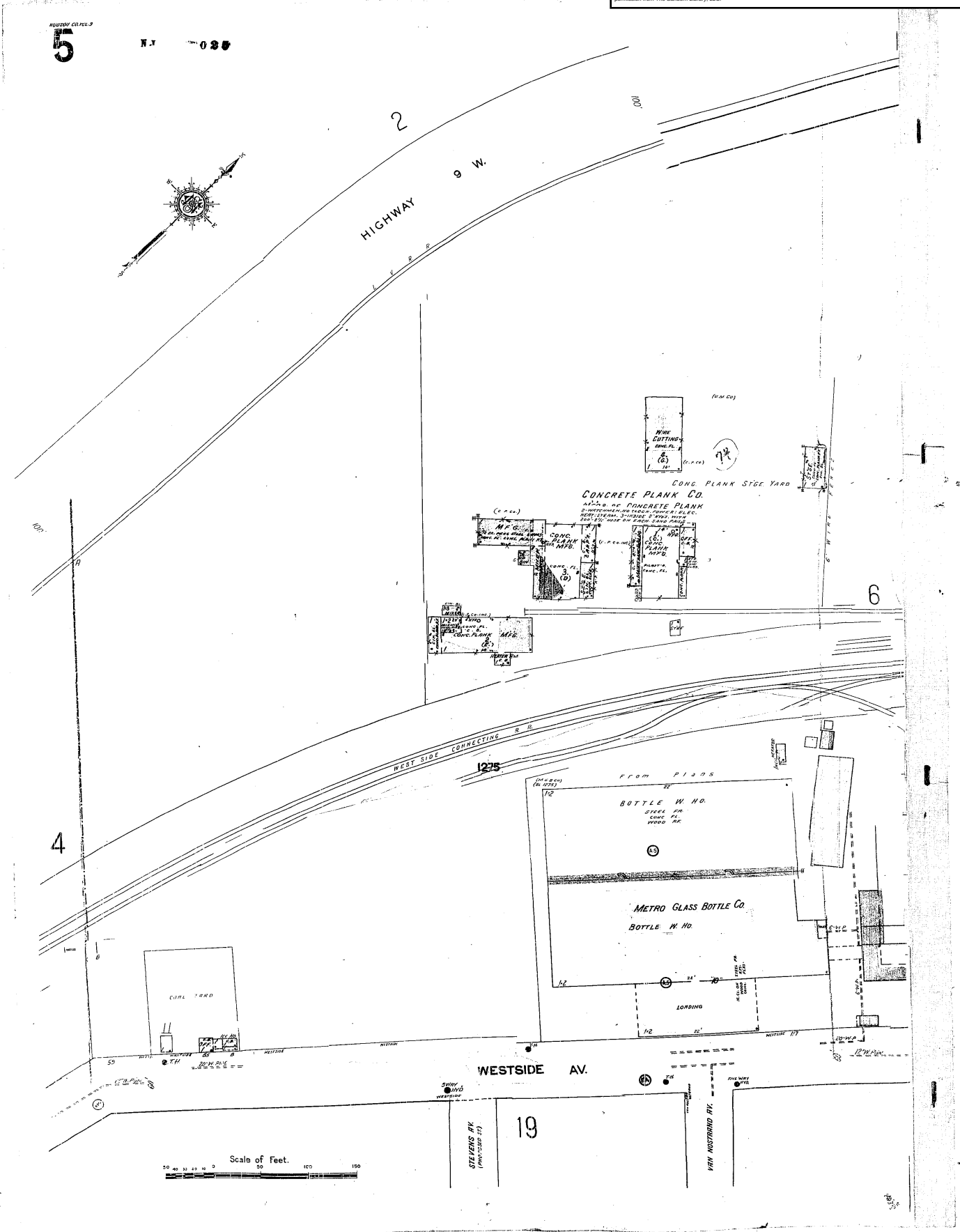
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

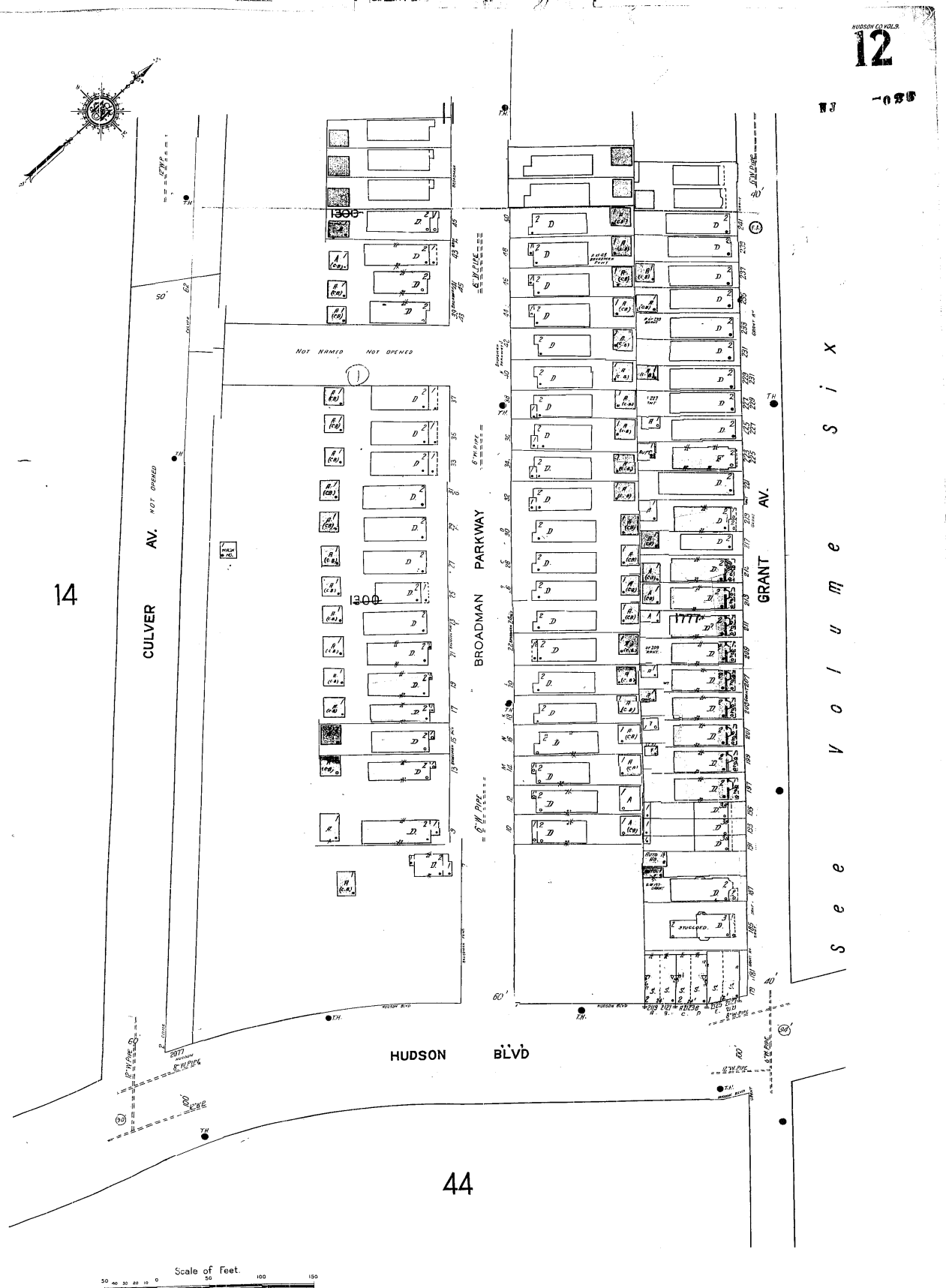


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

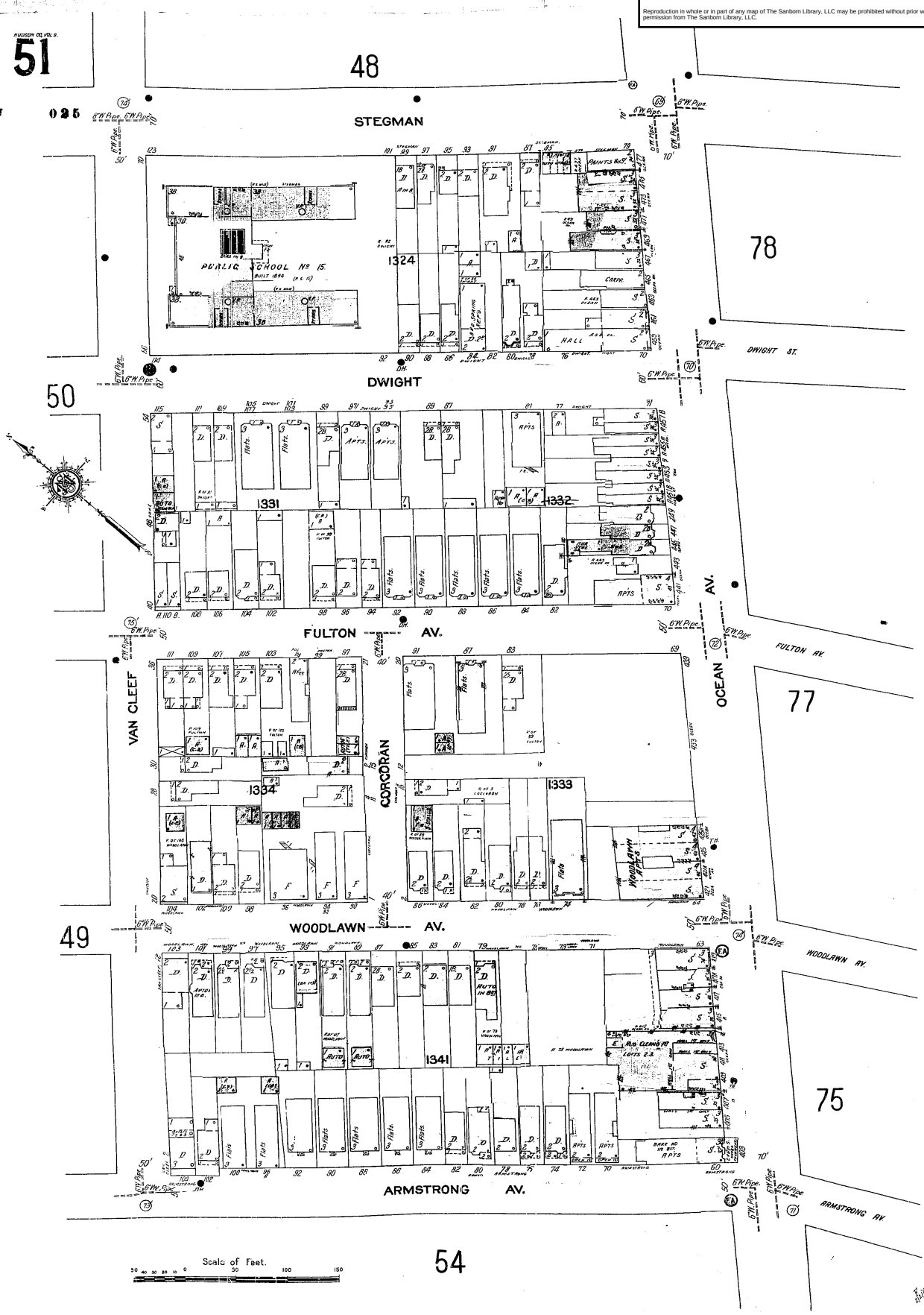
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

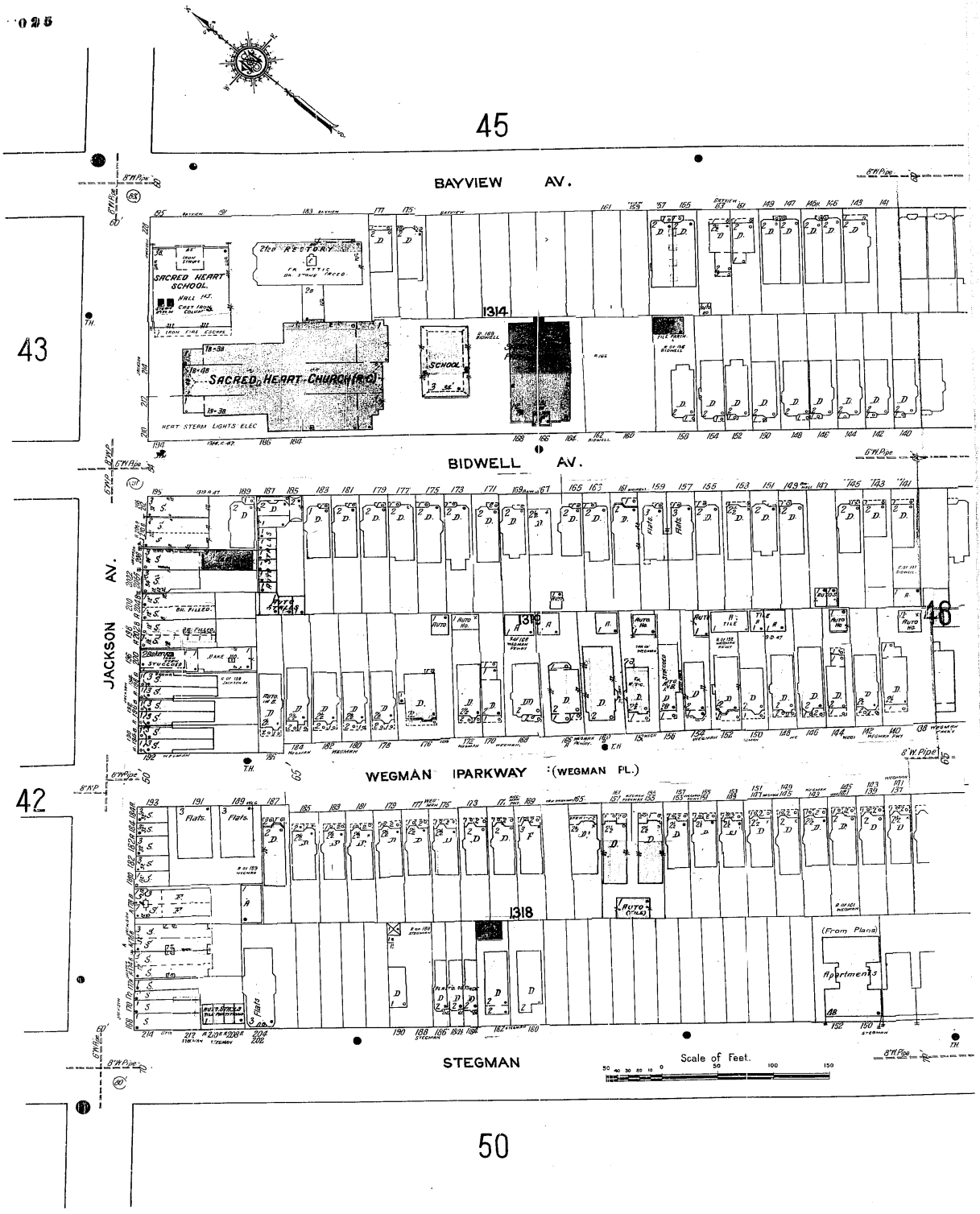
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



HUDSON CO VOL 9

47

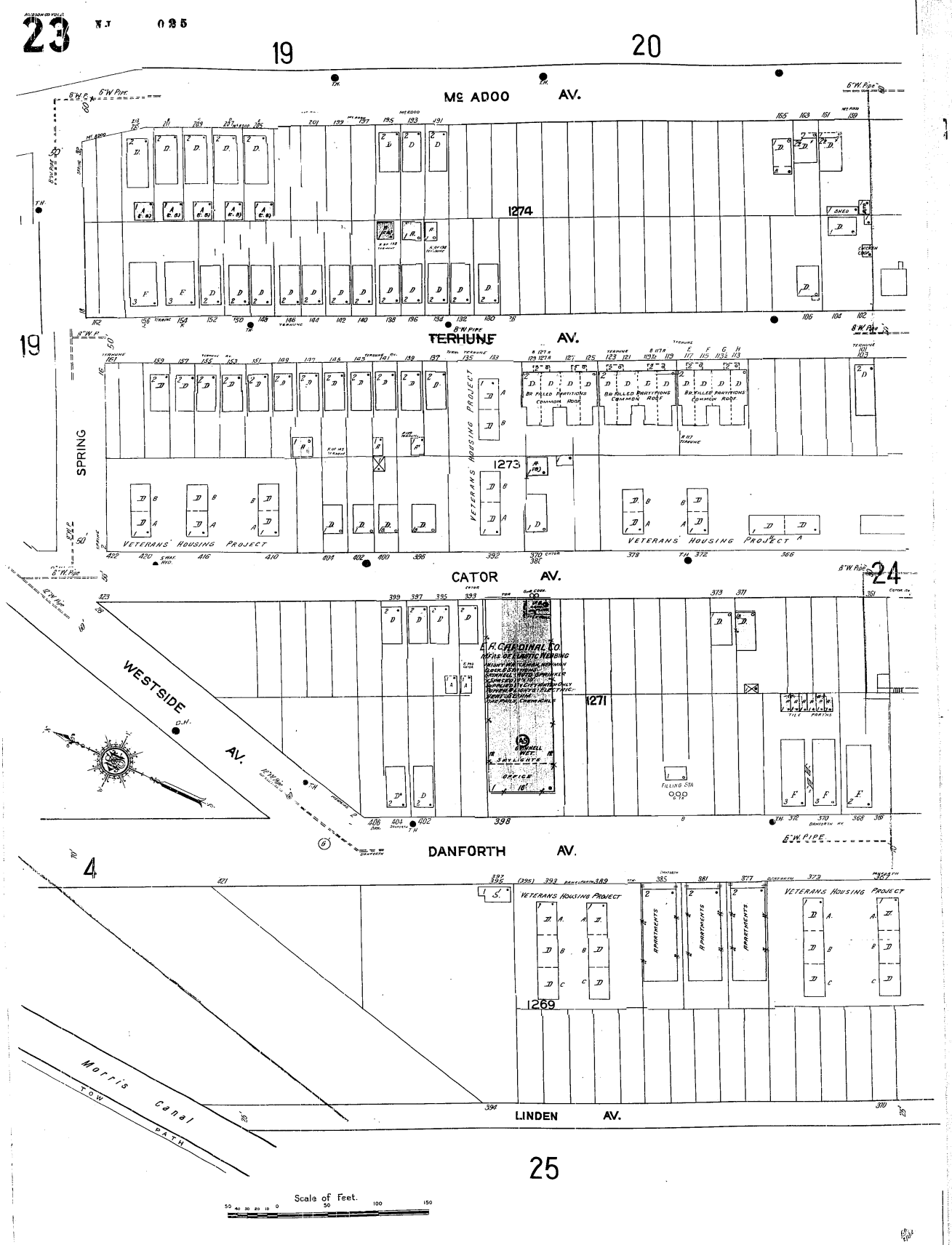


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

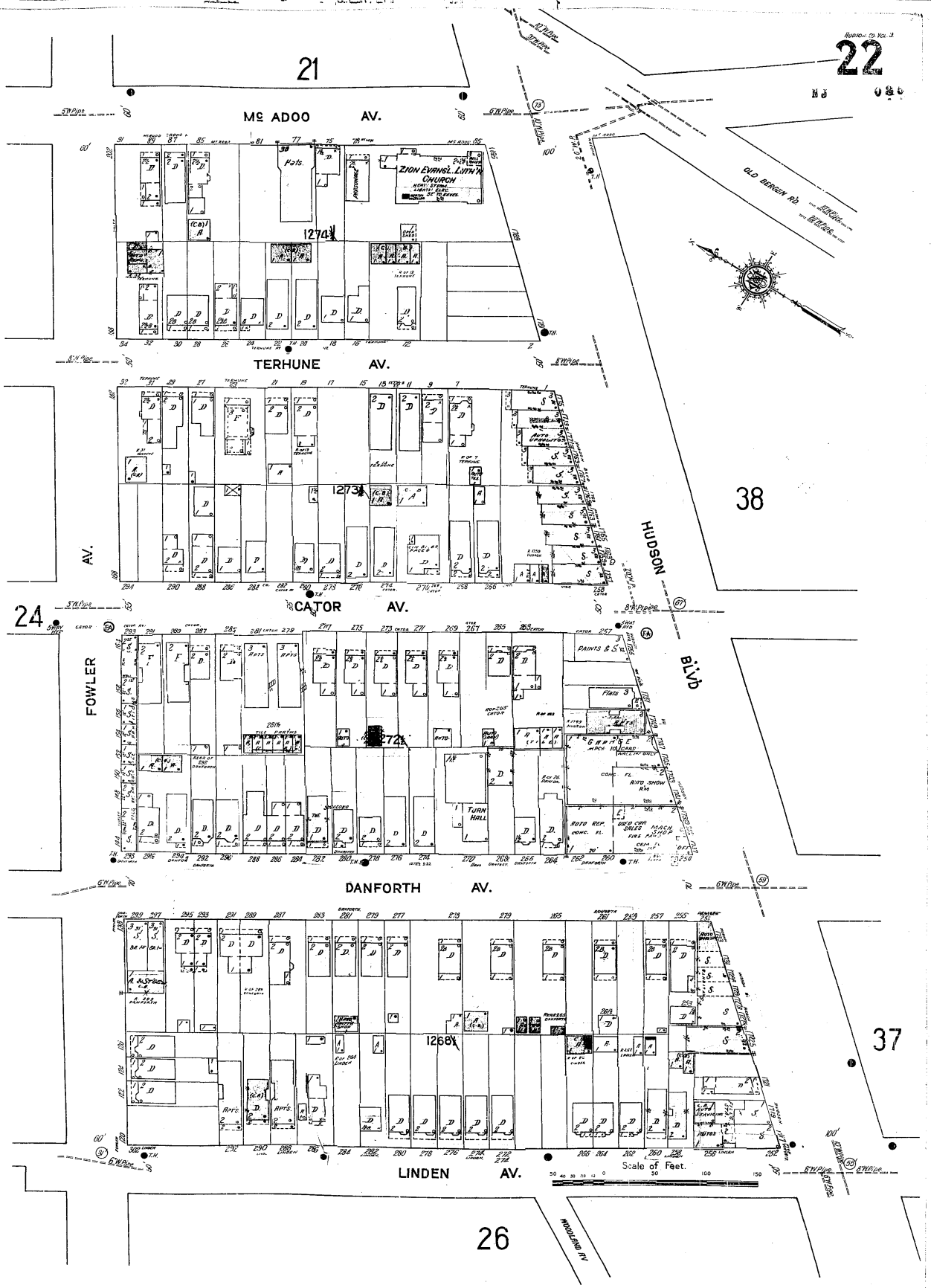
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

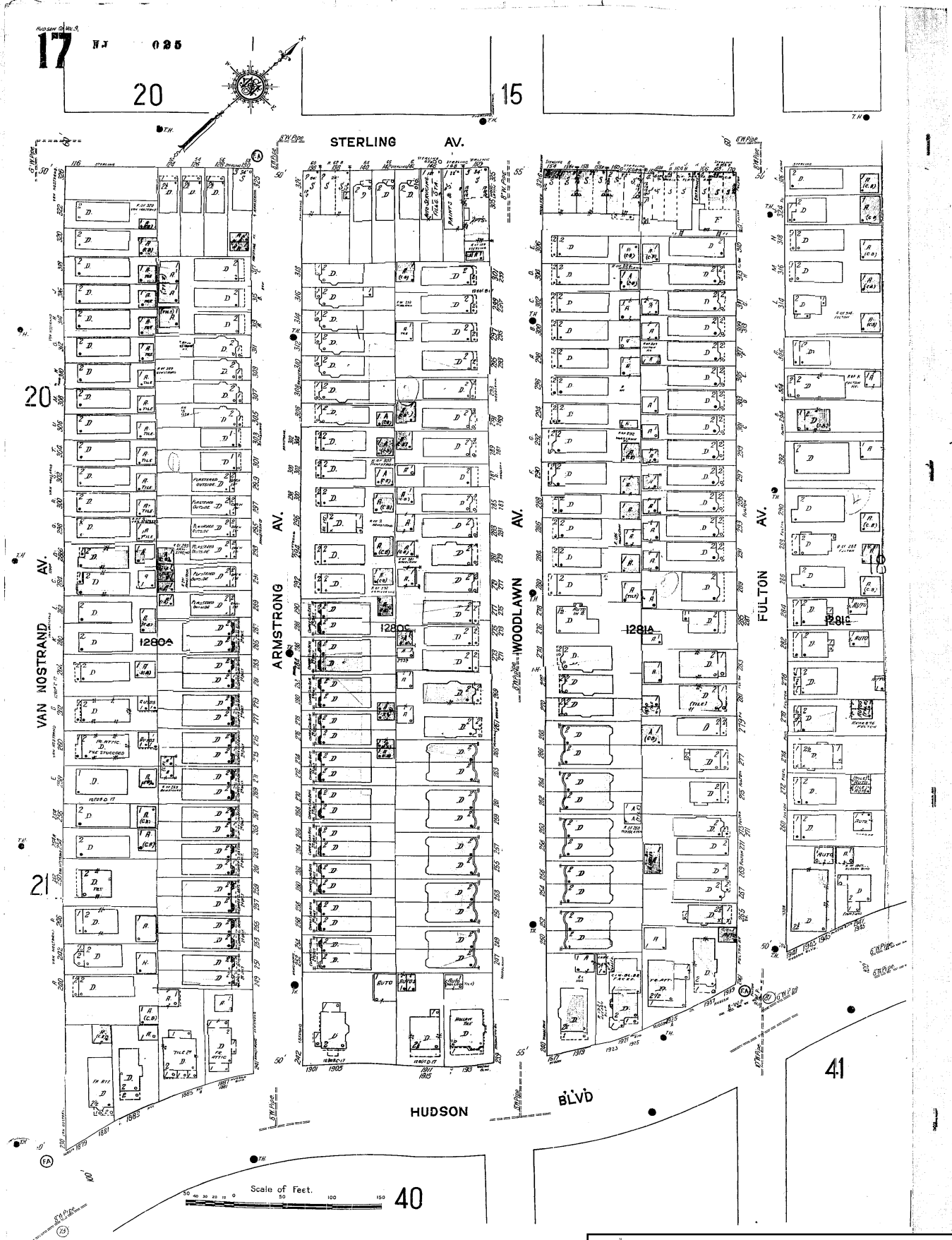
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

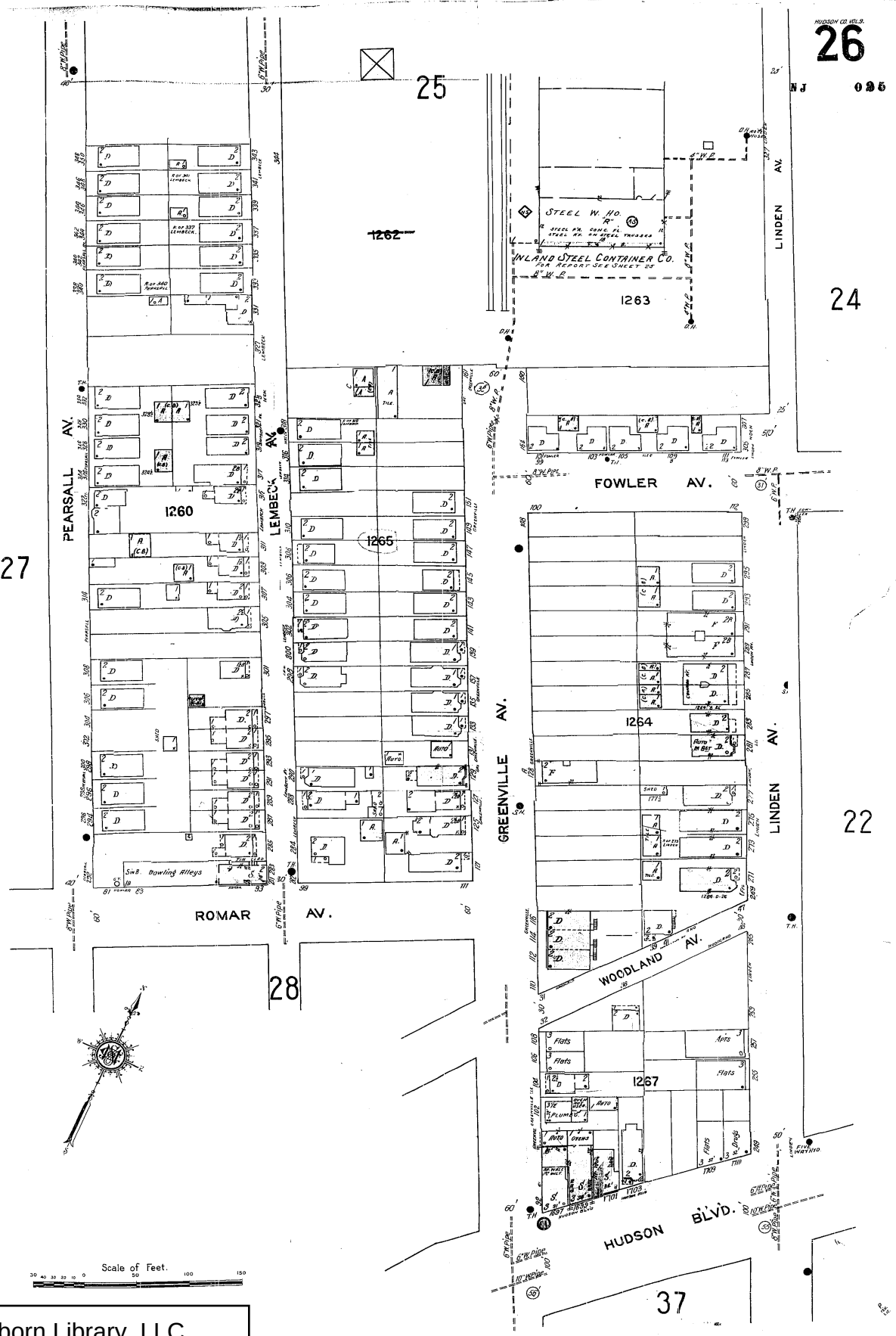
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

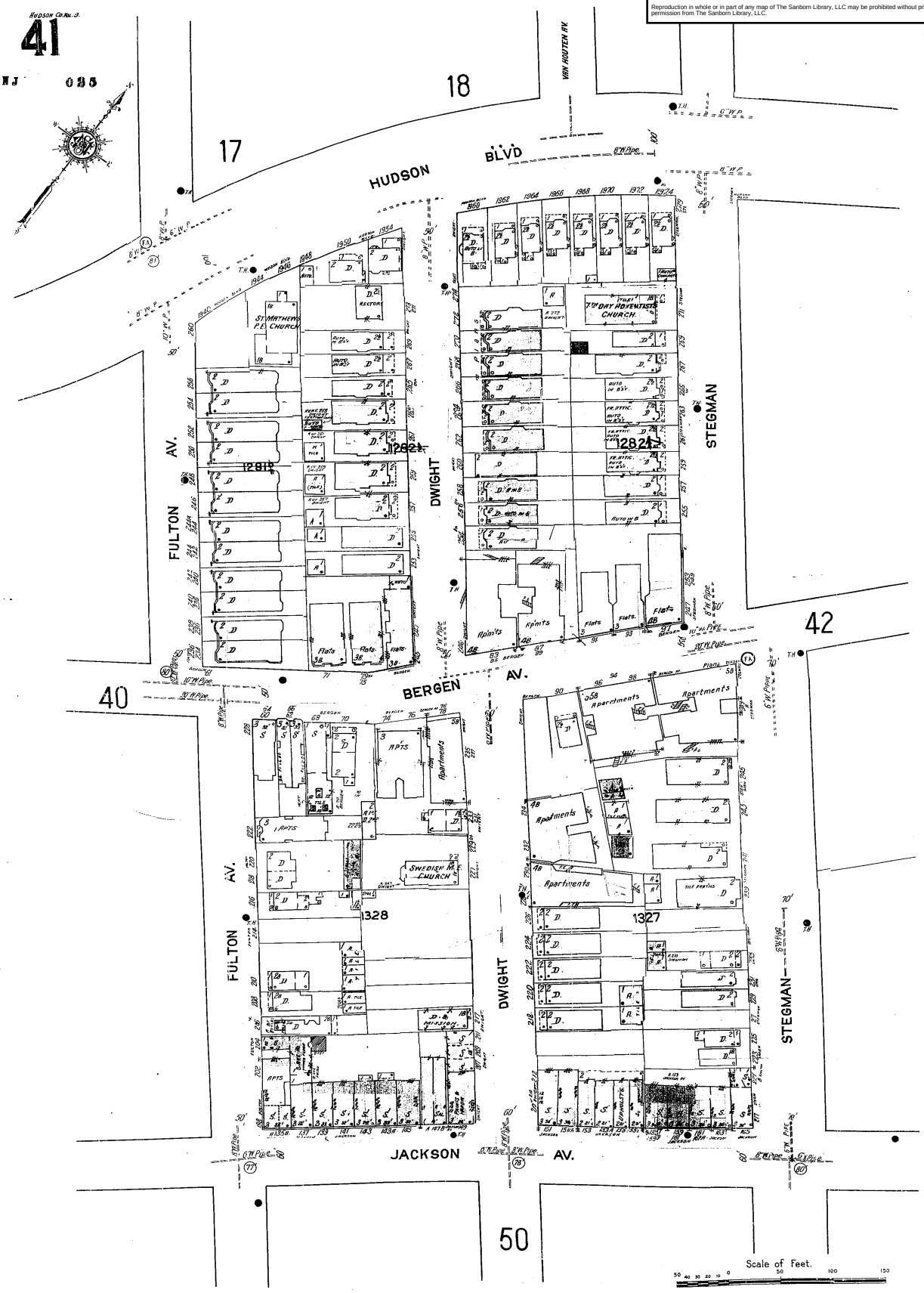
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

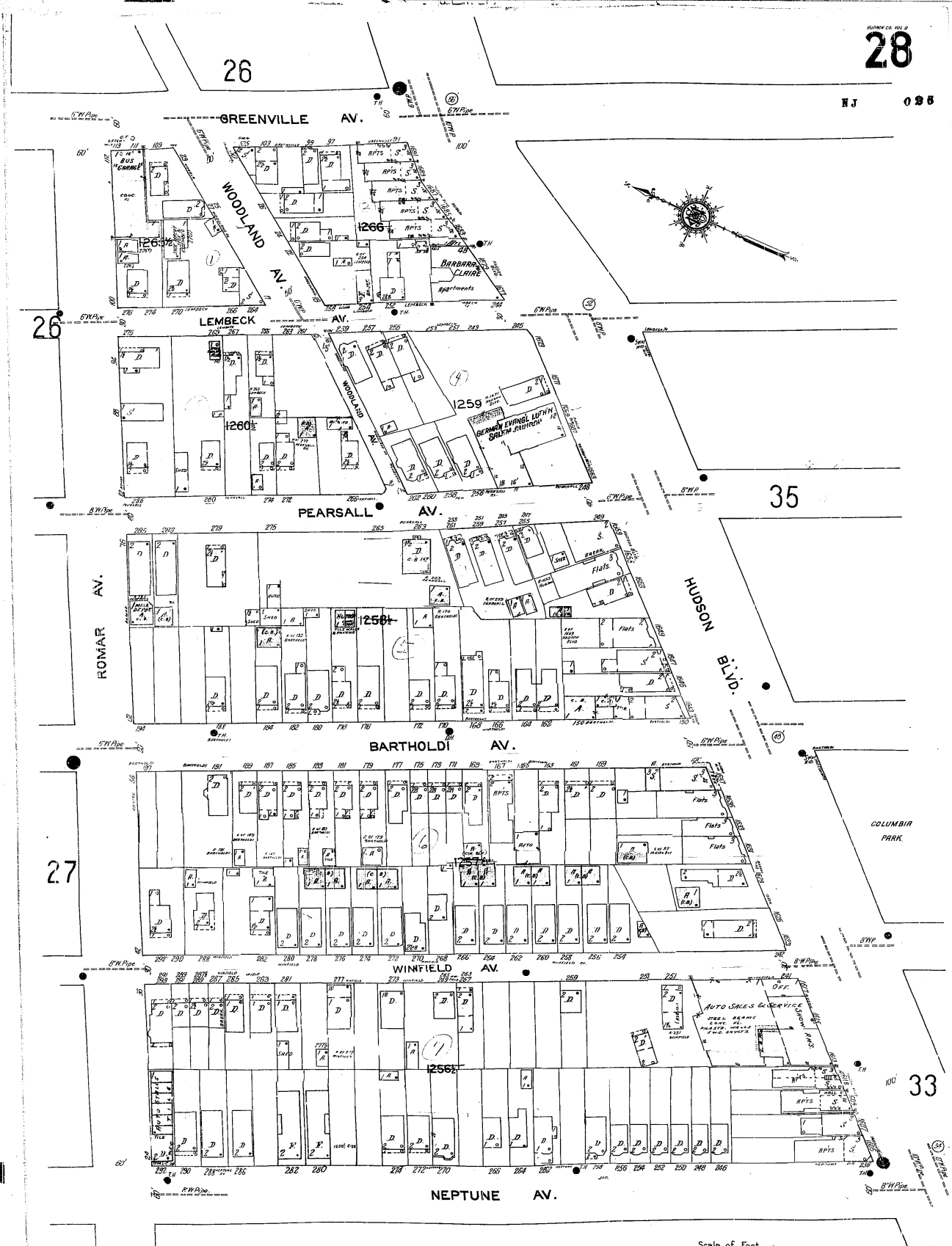
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

Hudson Co. No. 3.

41

NJ 035





The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

NJ -095

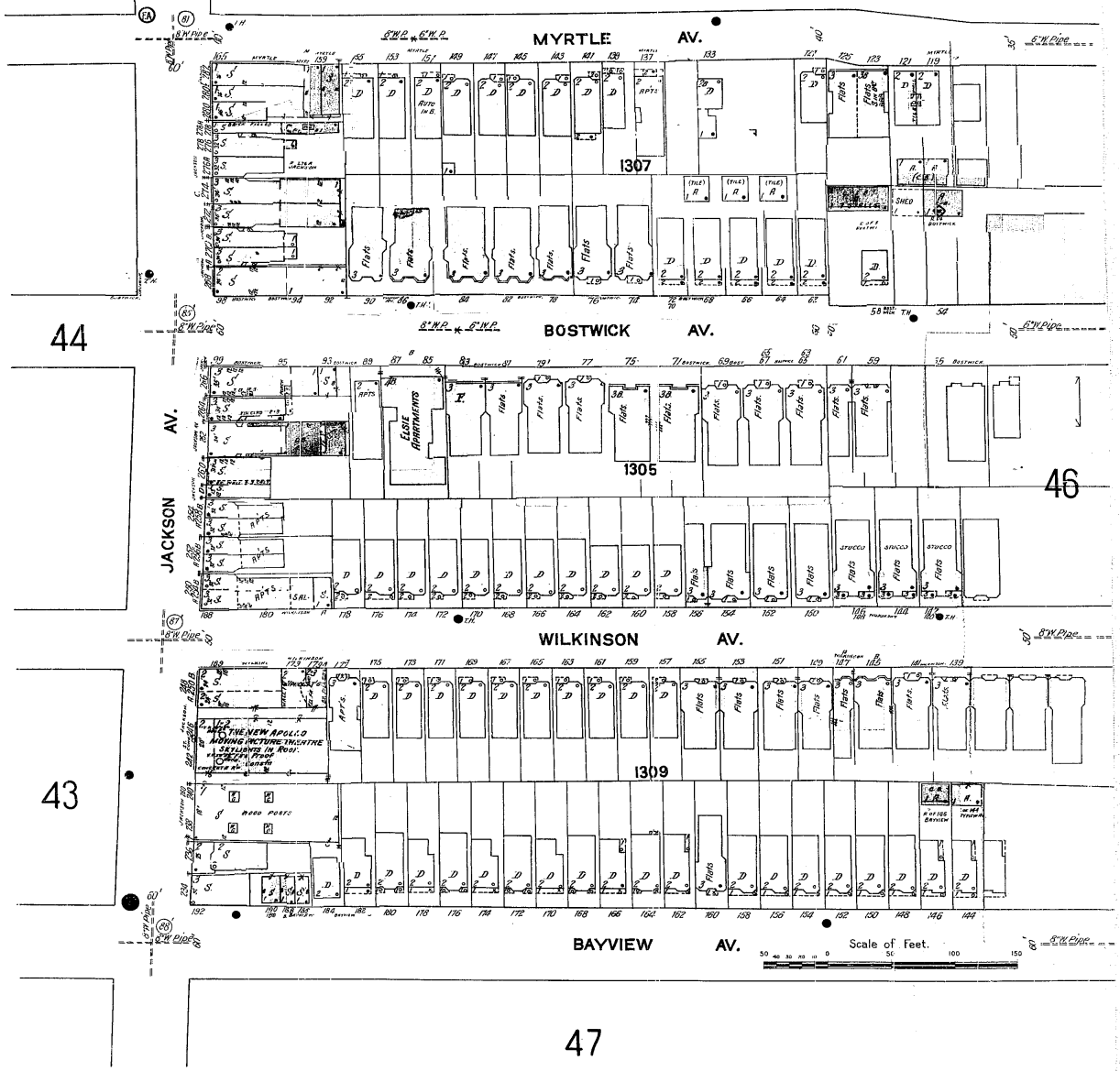
HUDSON CO. VOL. 8

45

NJ -029



See Volume Six

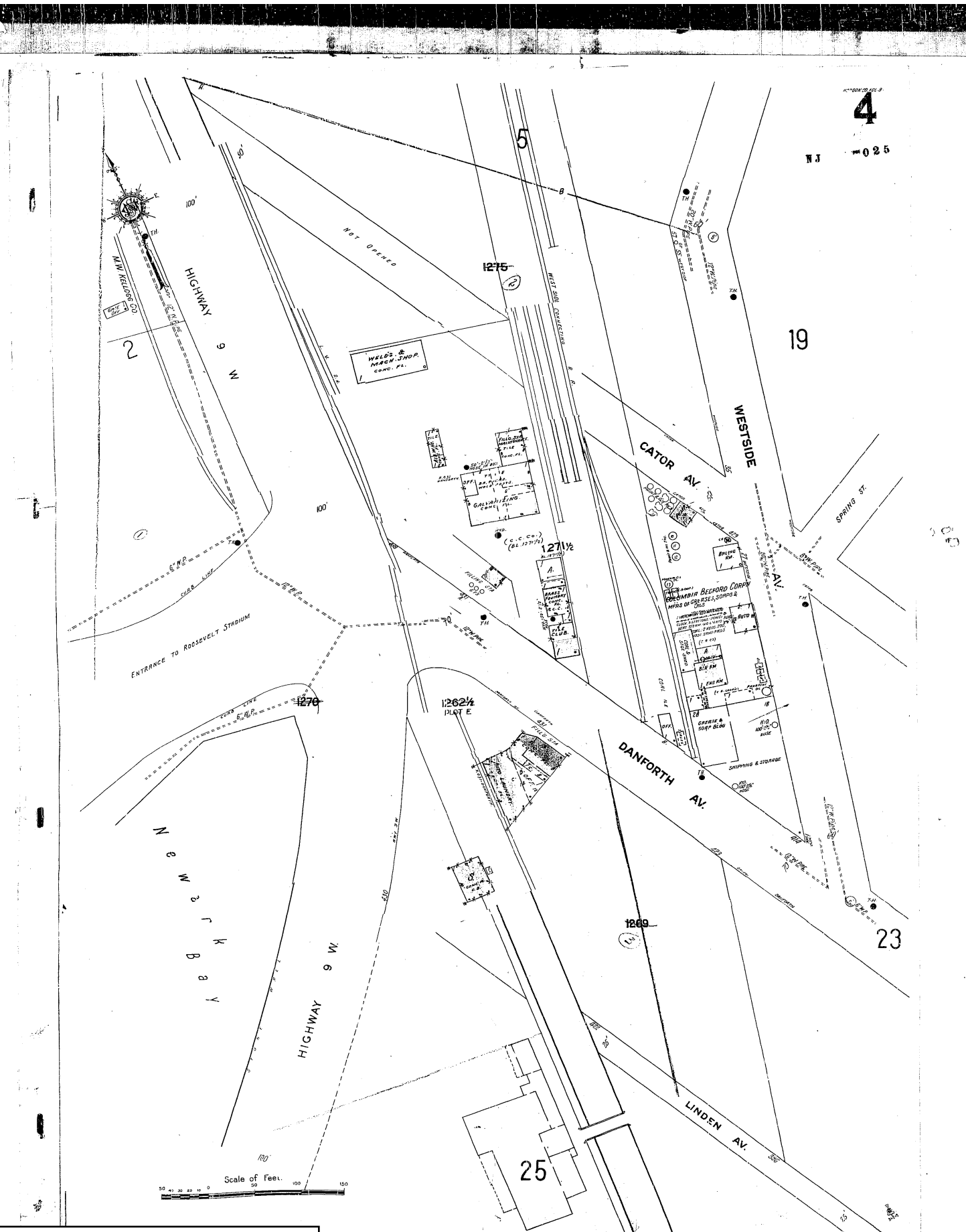


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

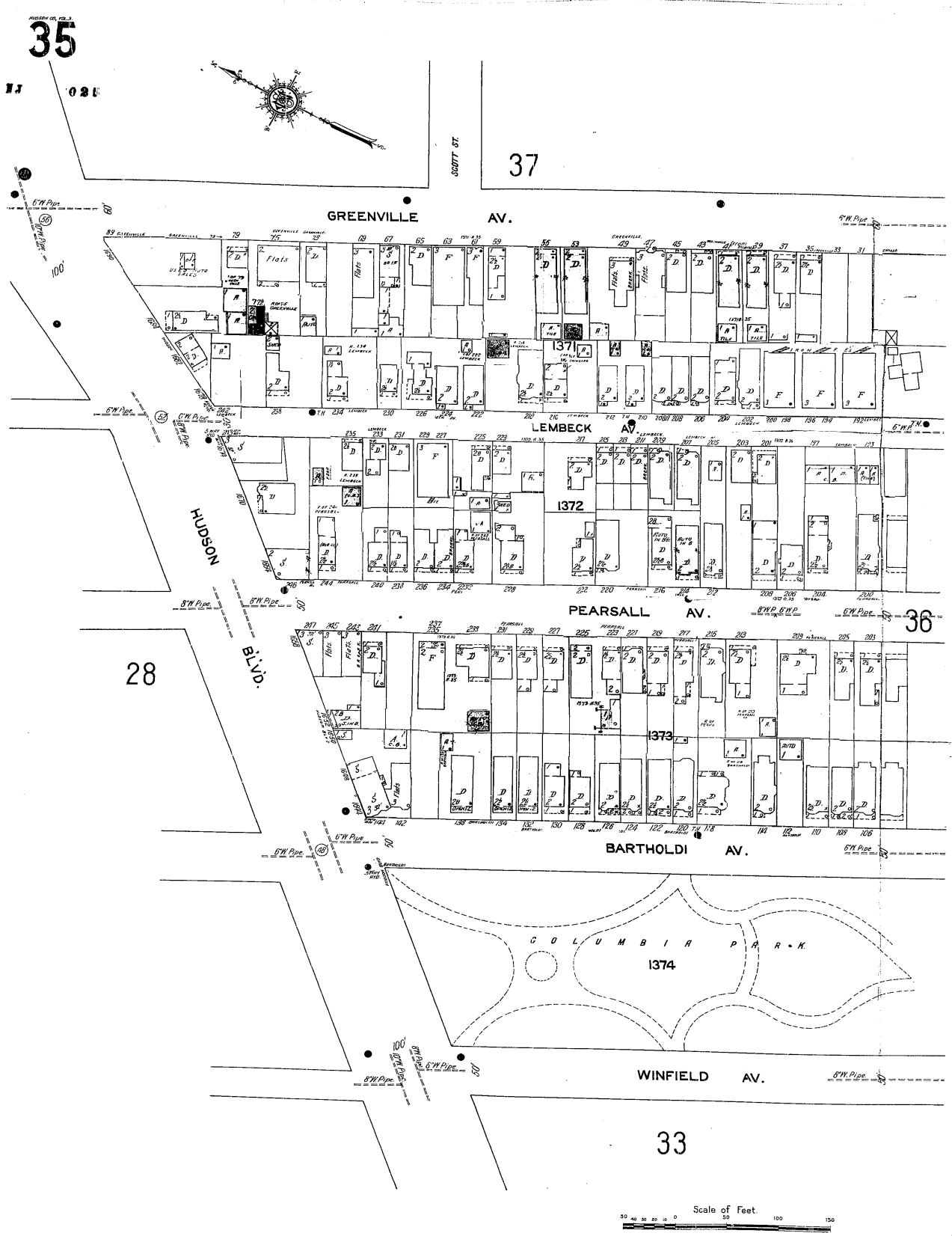
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

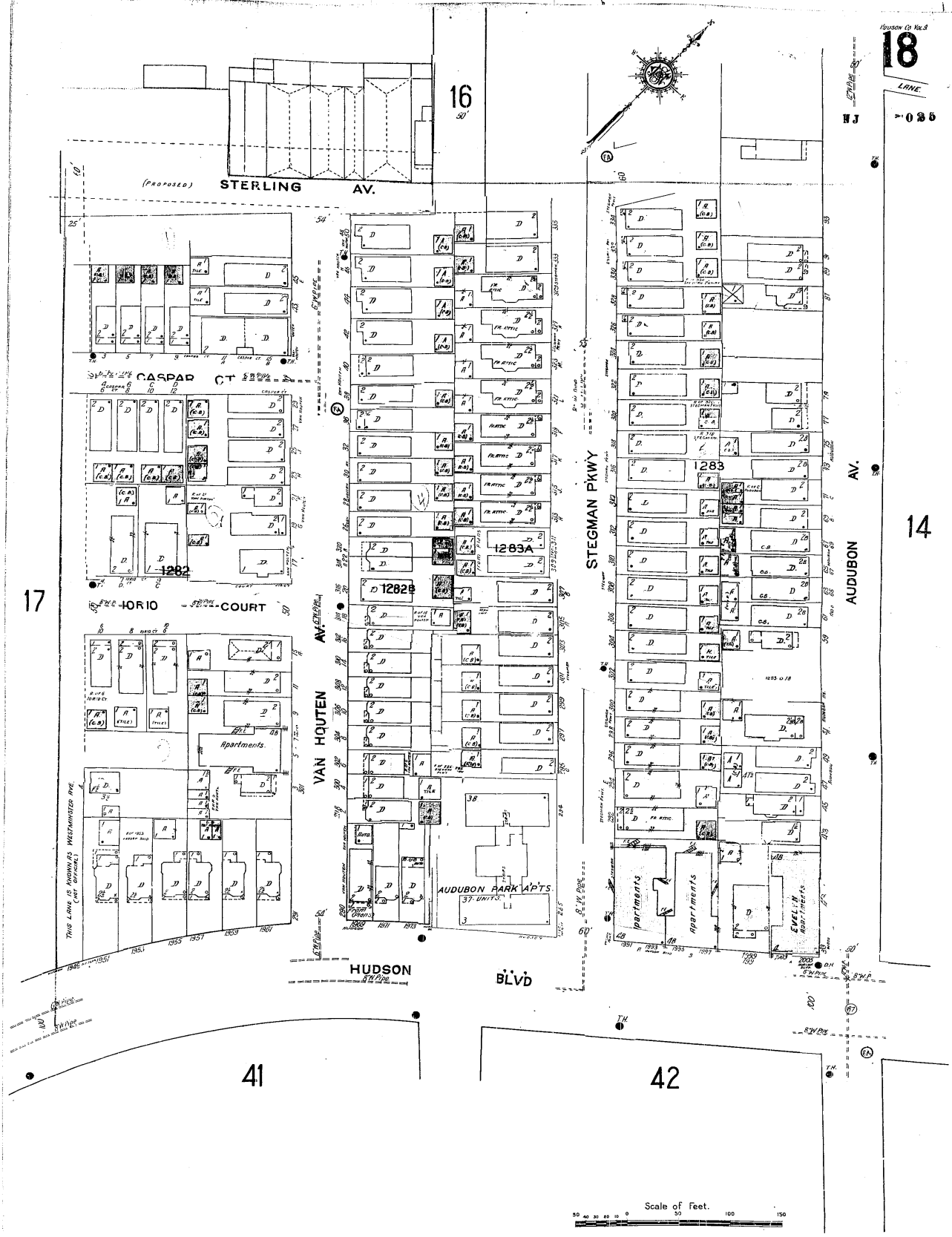
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

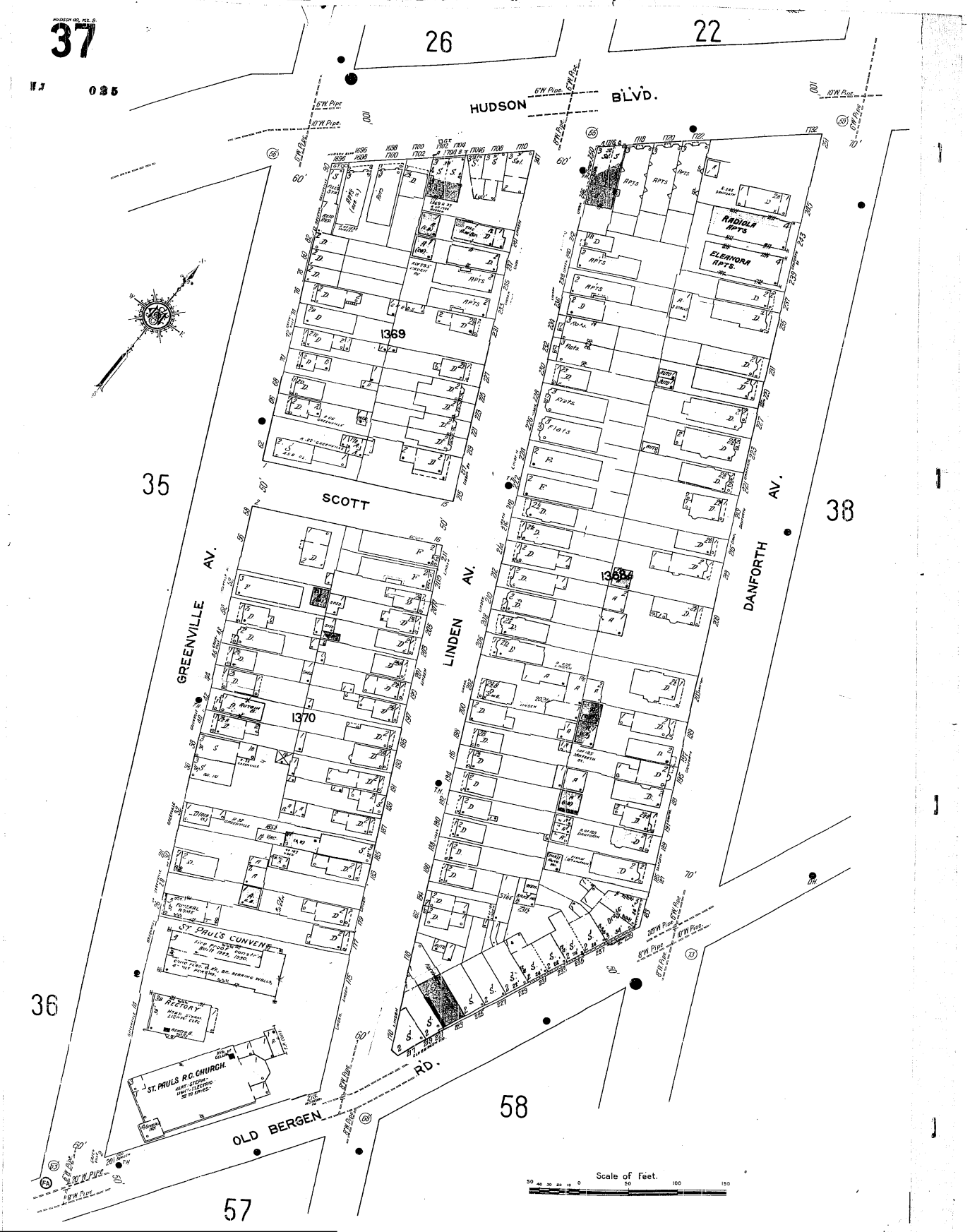
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

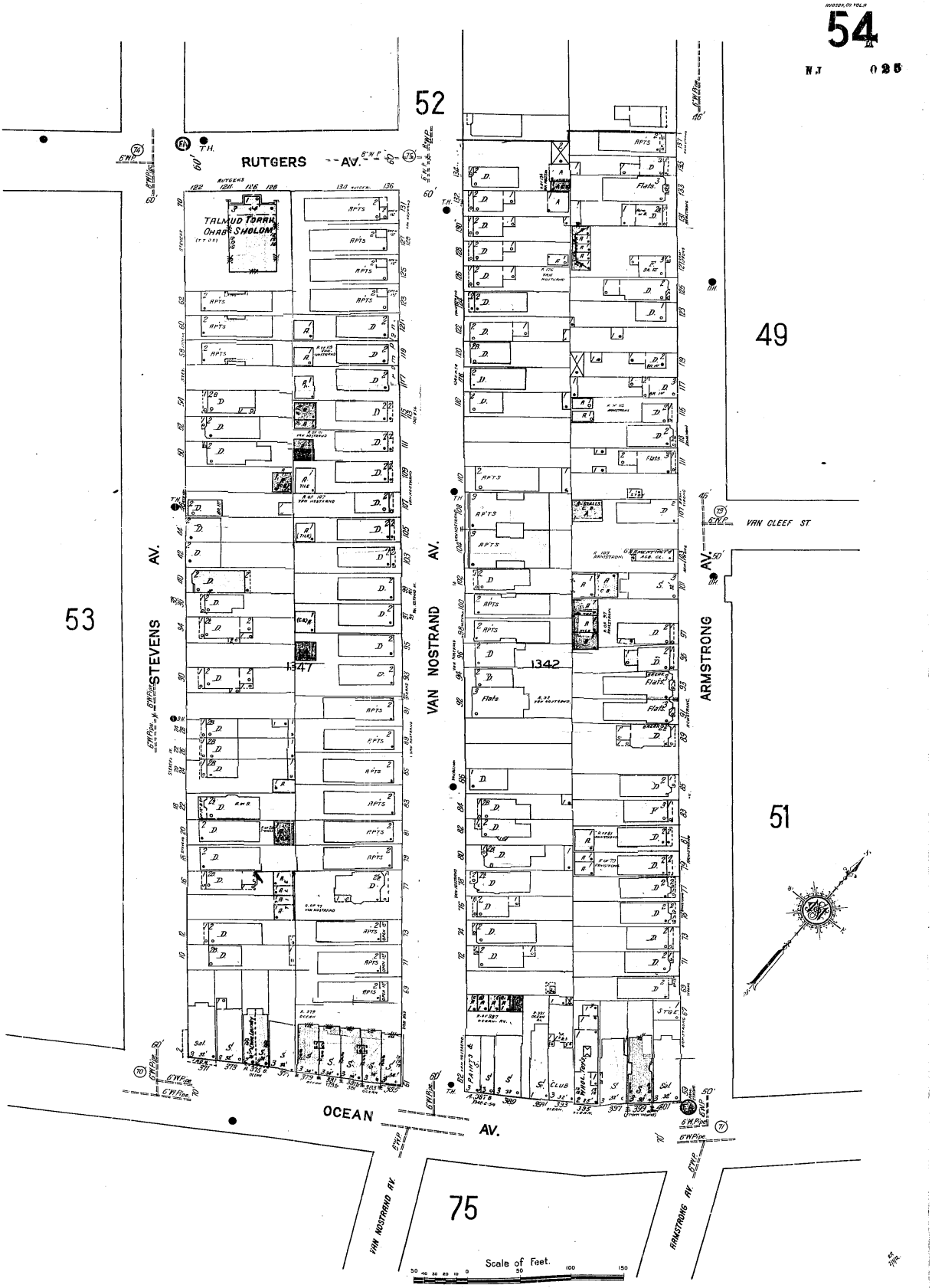
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

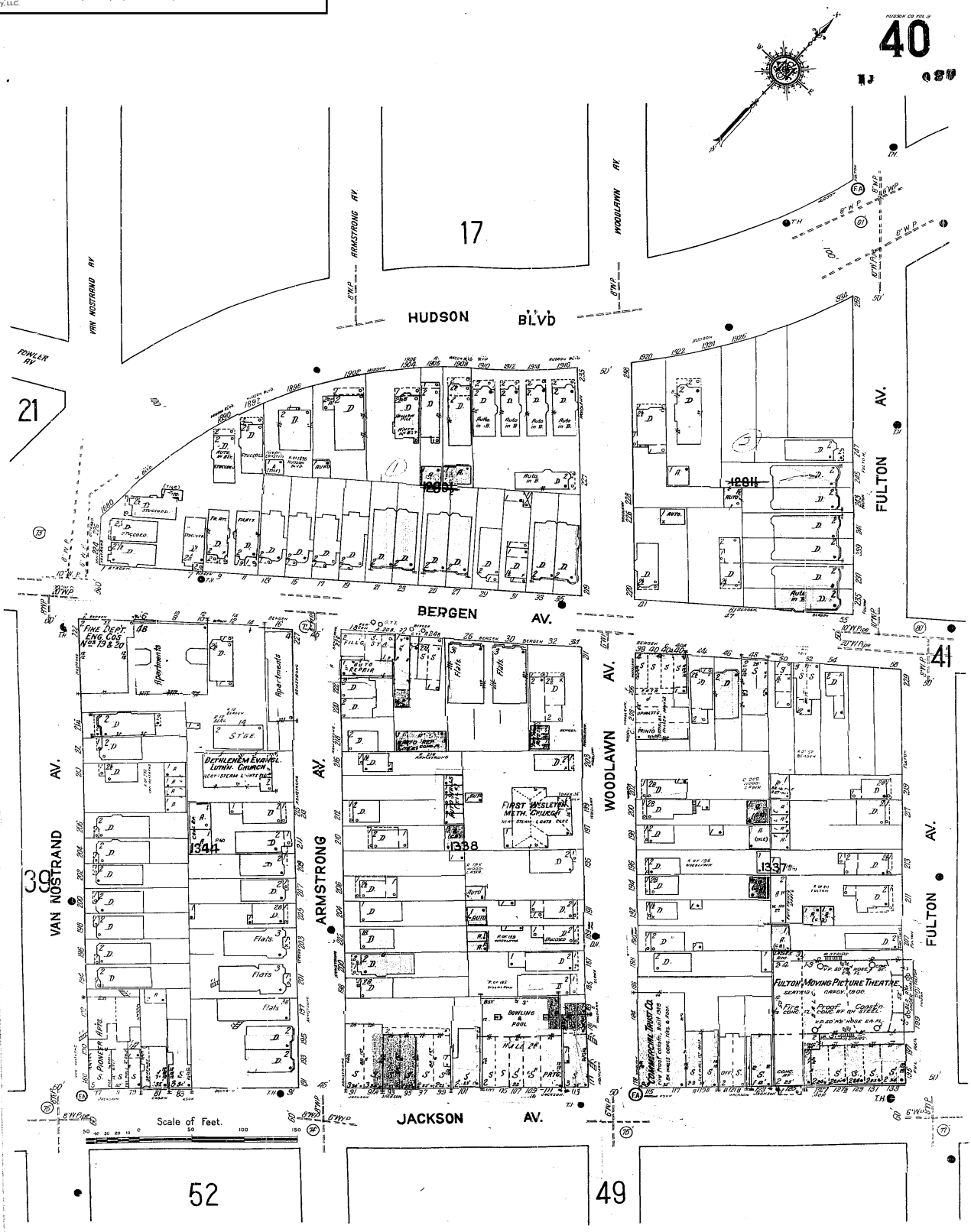
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

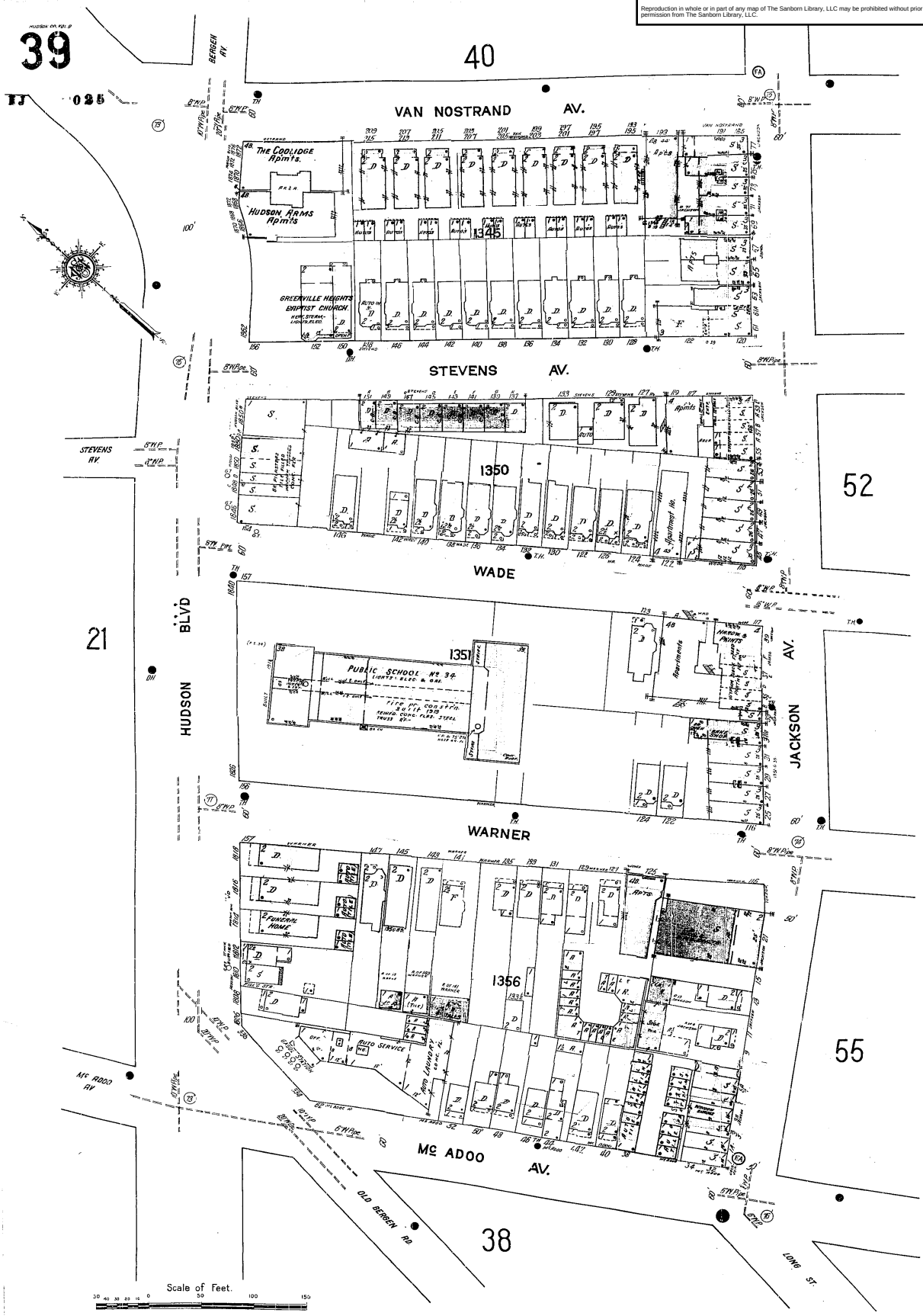


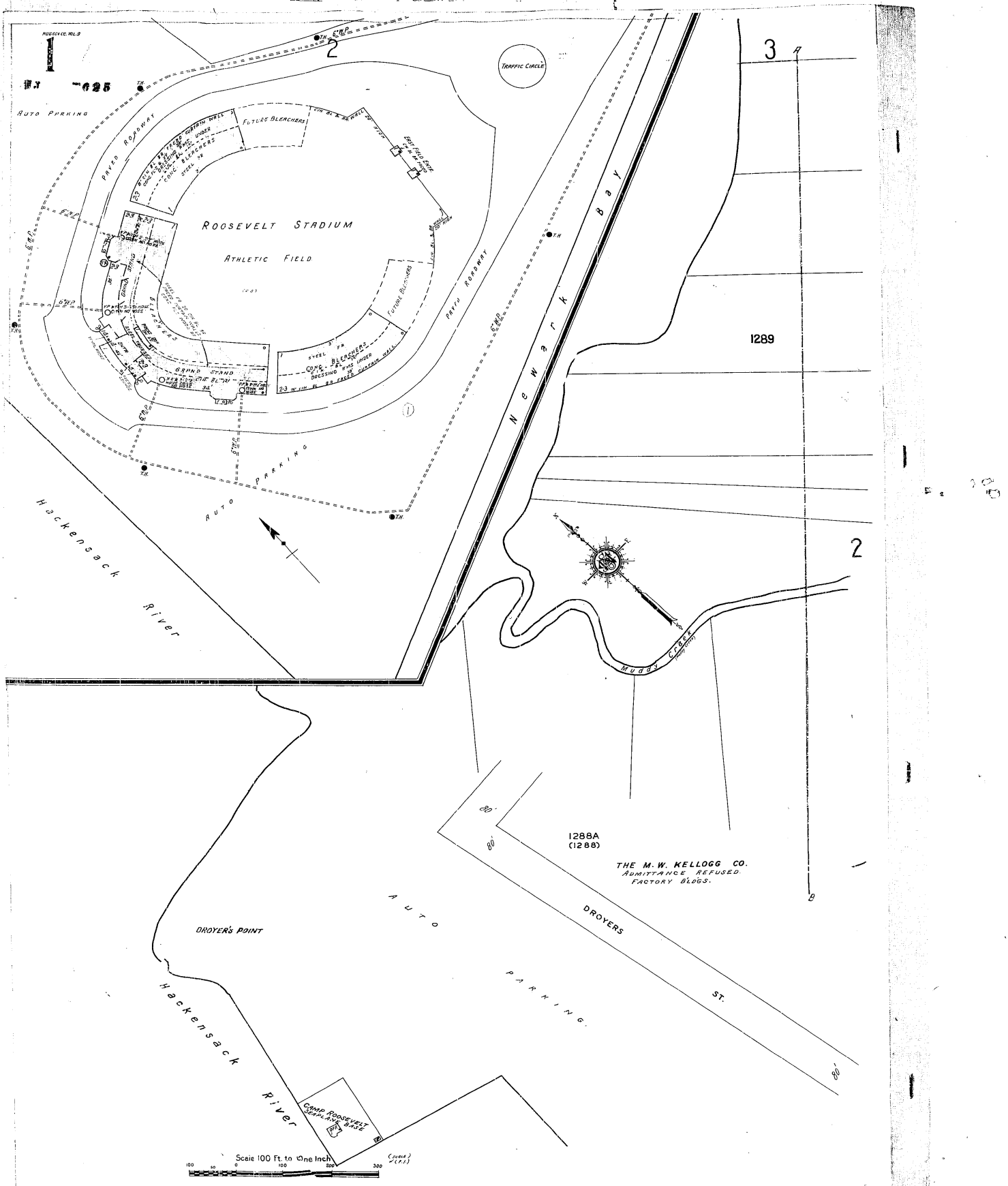
The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

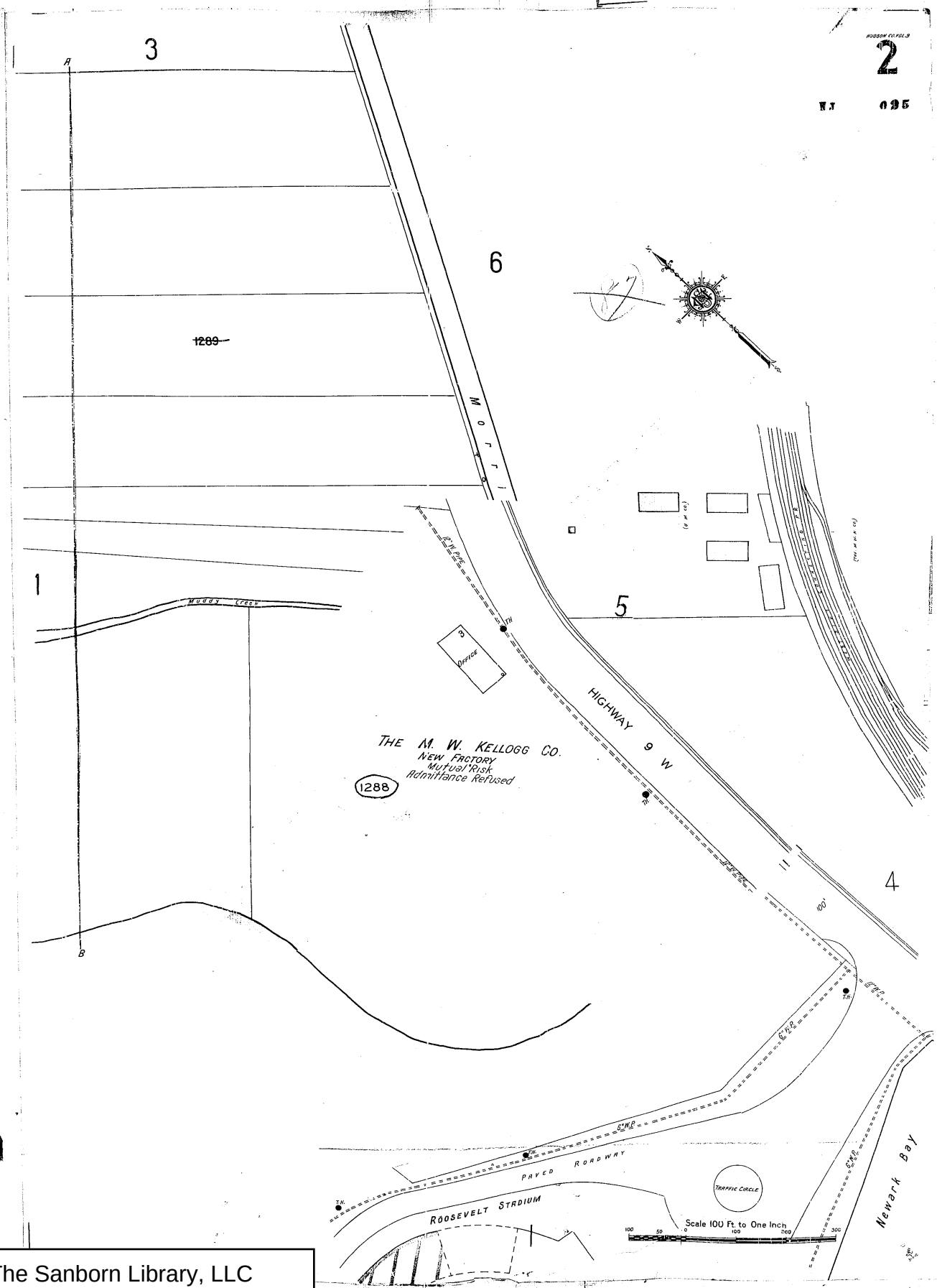




The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

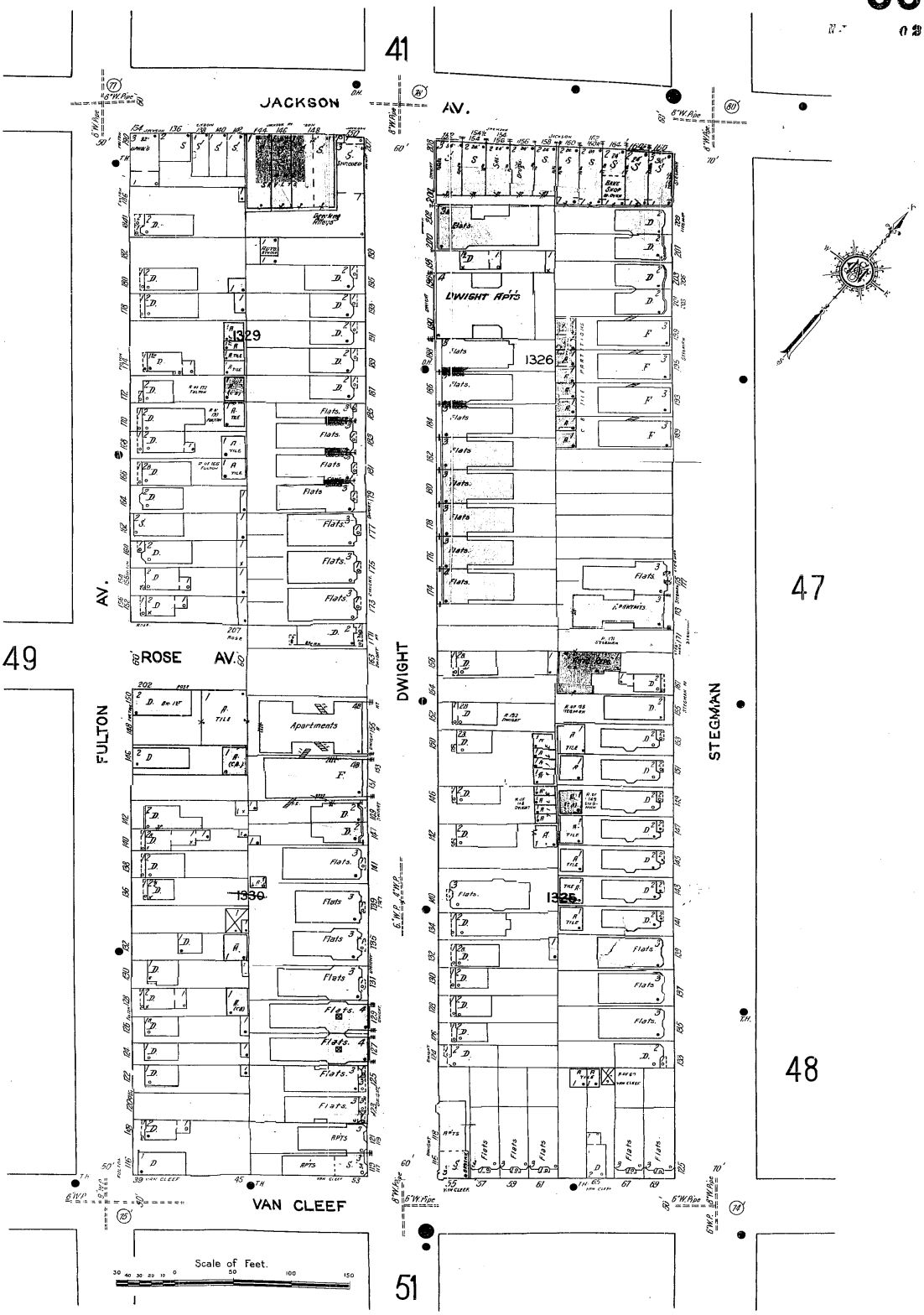
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

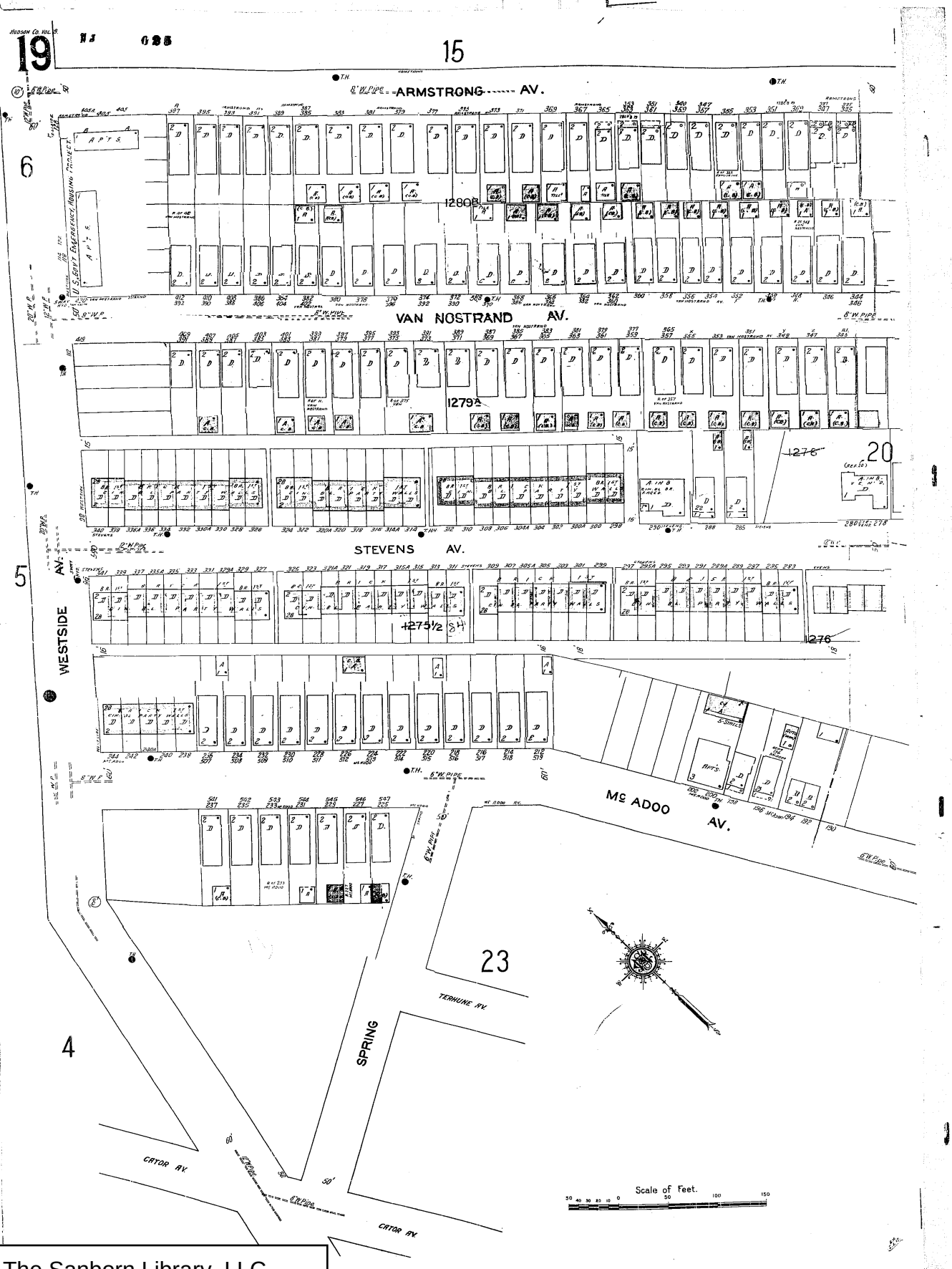
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

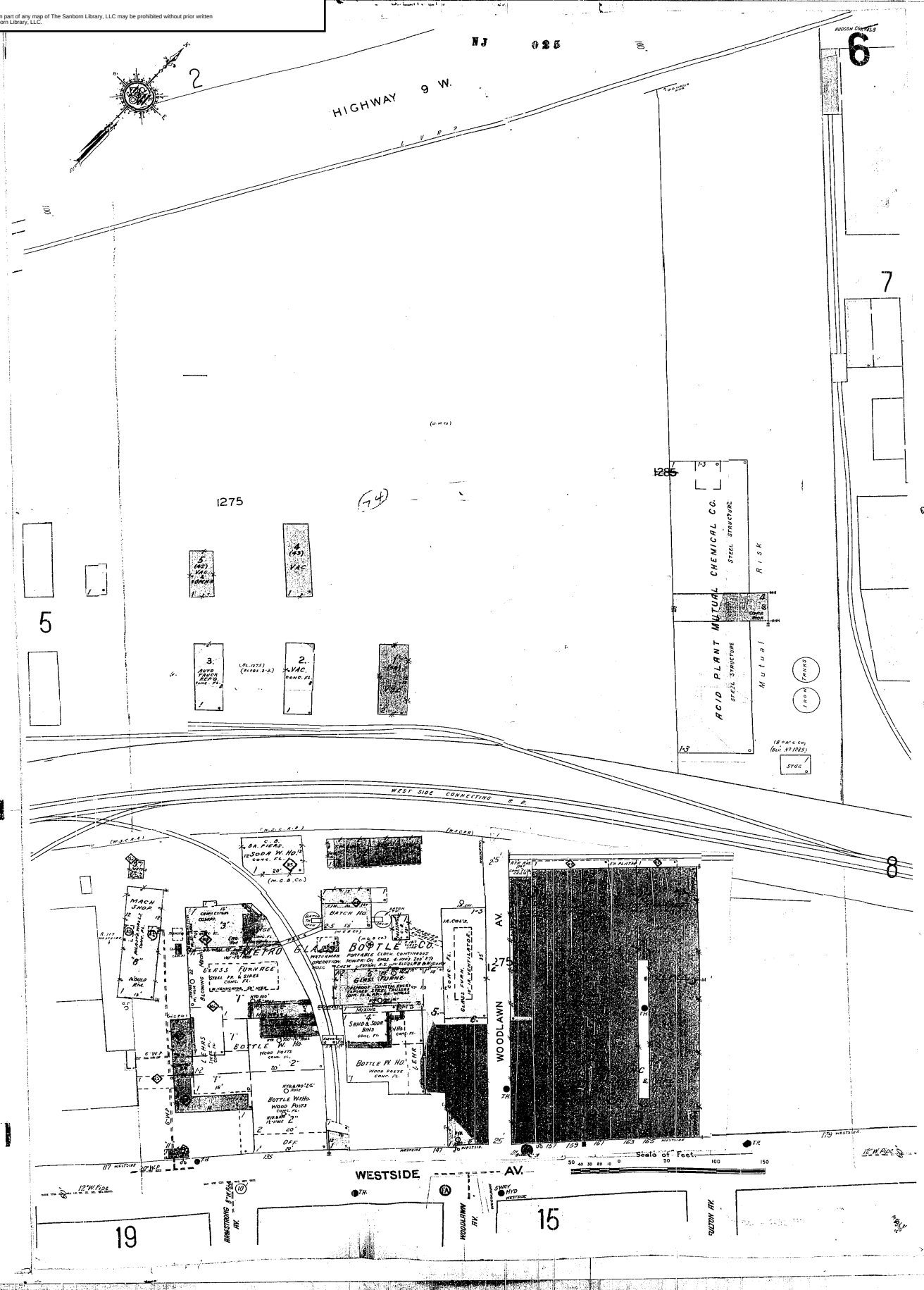
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

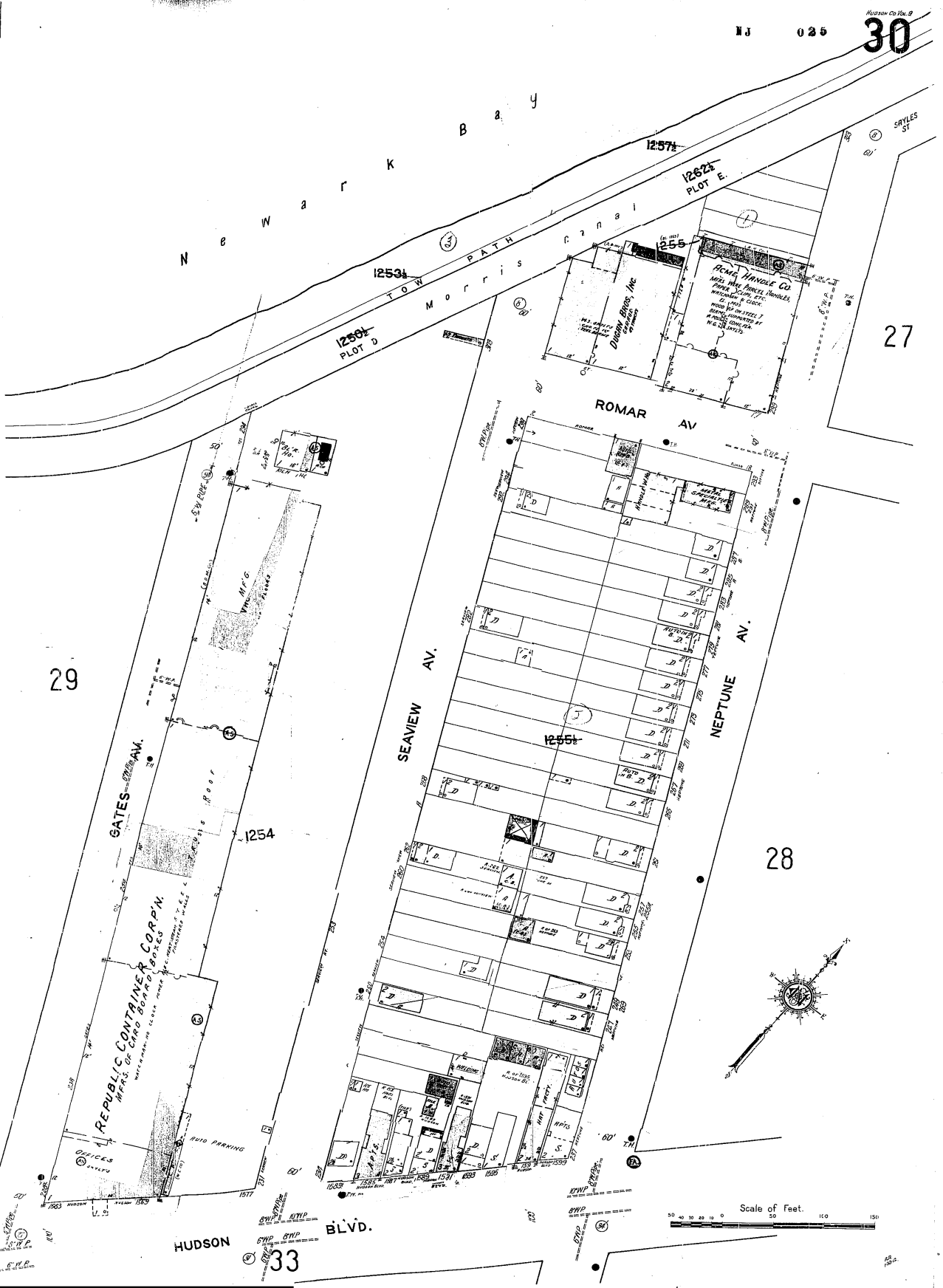
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

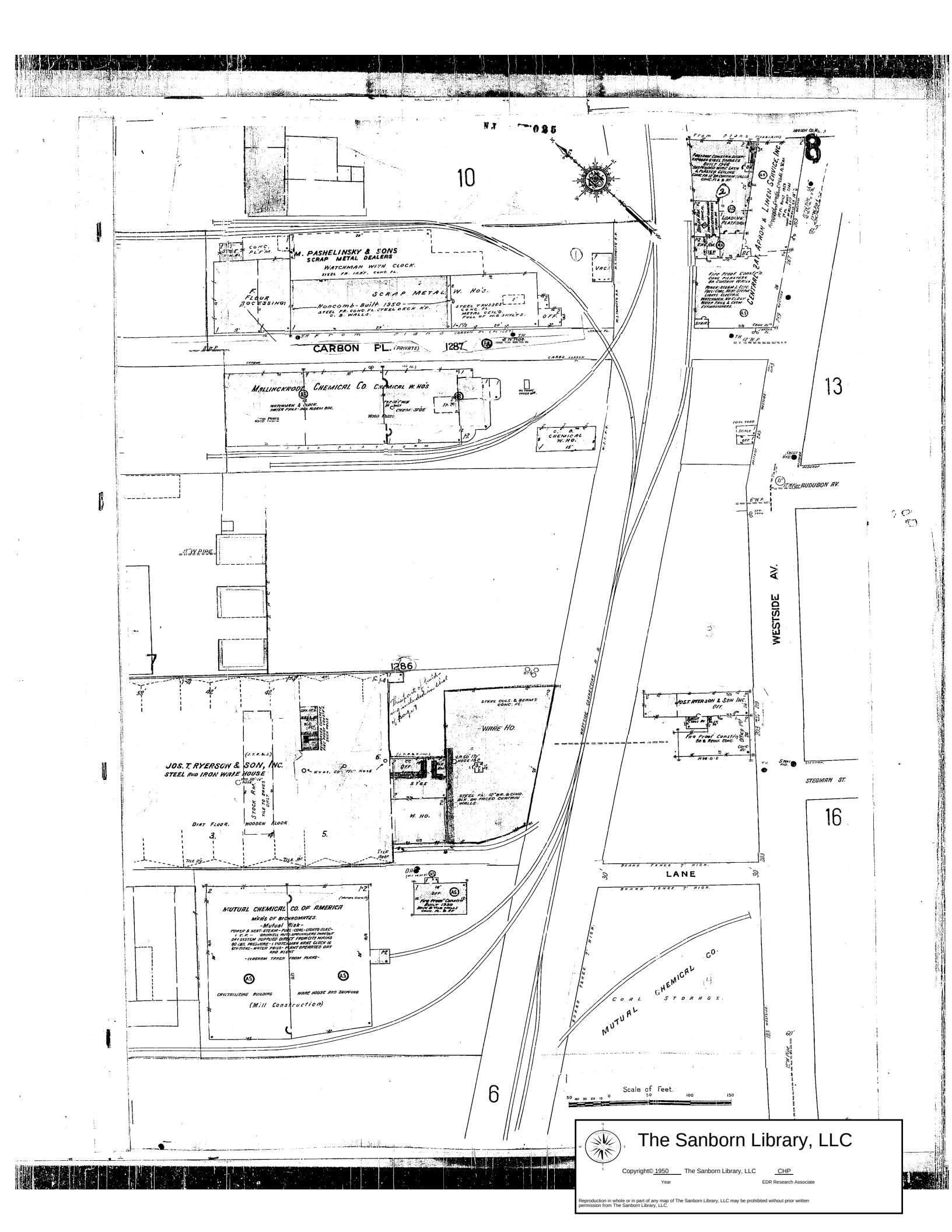




The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

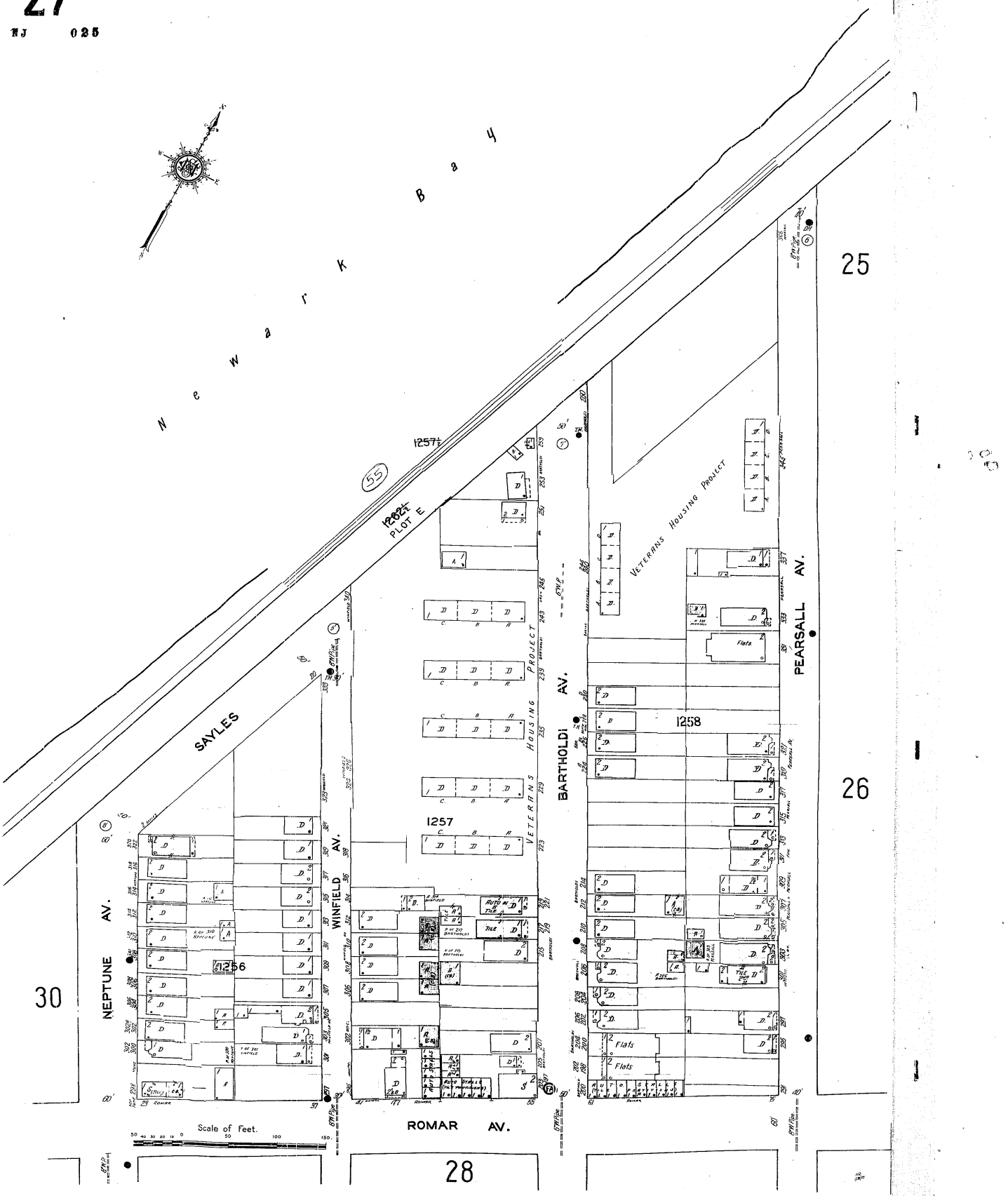
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

Hudson Co. Vol. 9

27

NJ 025

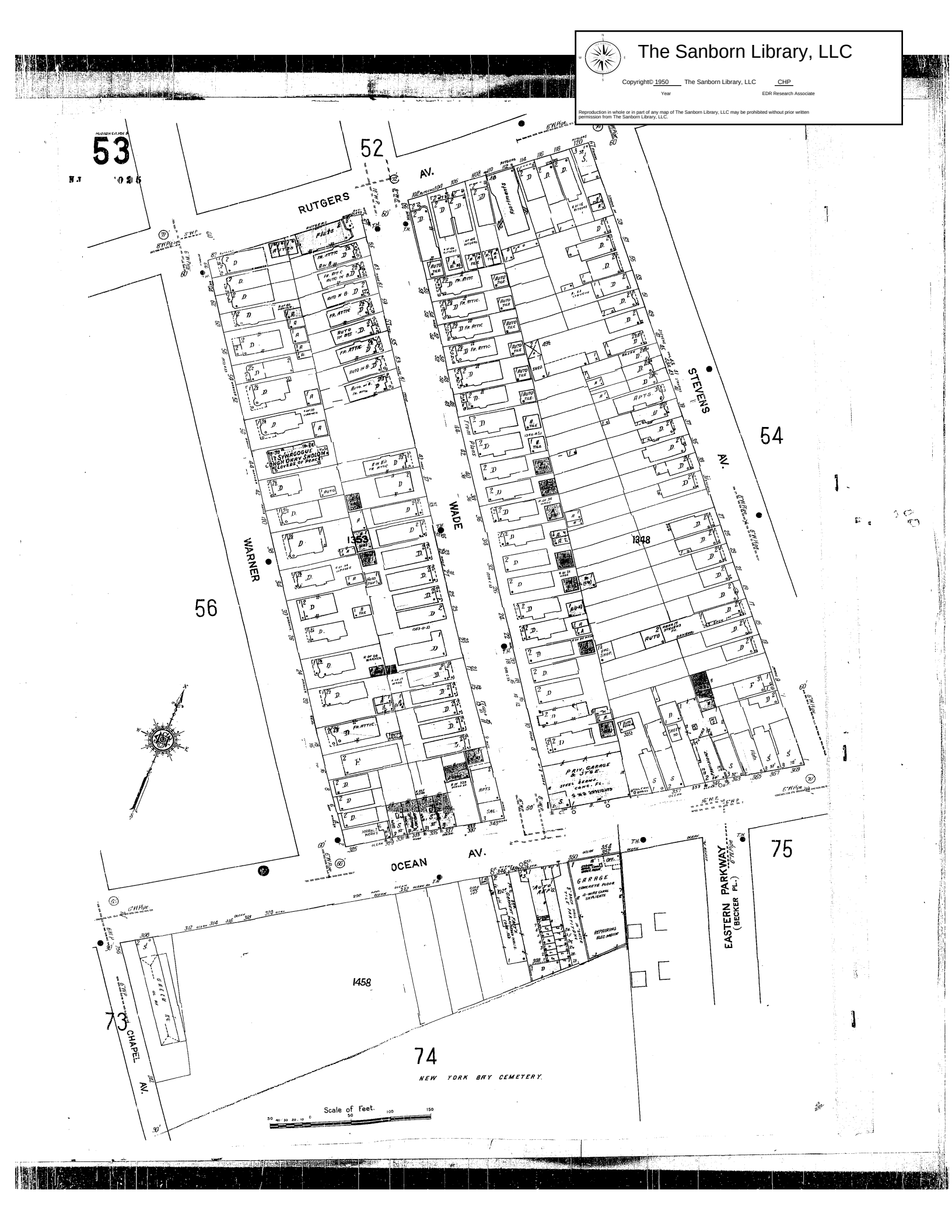


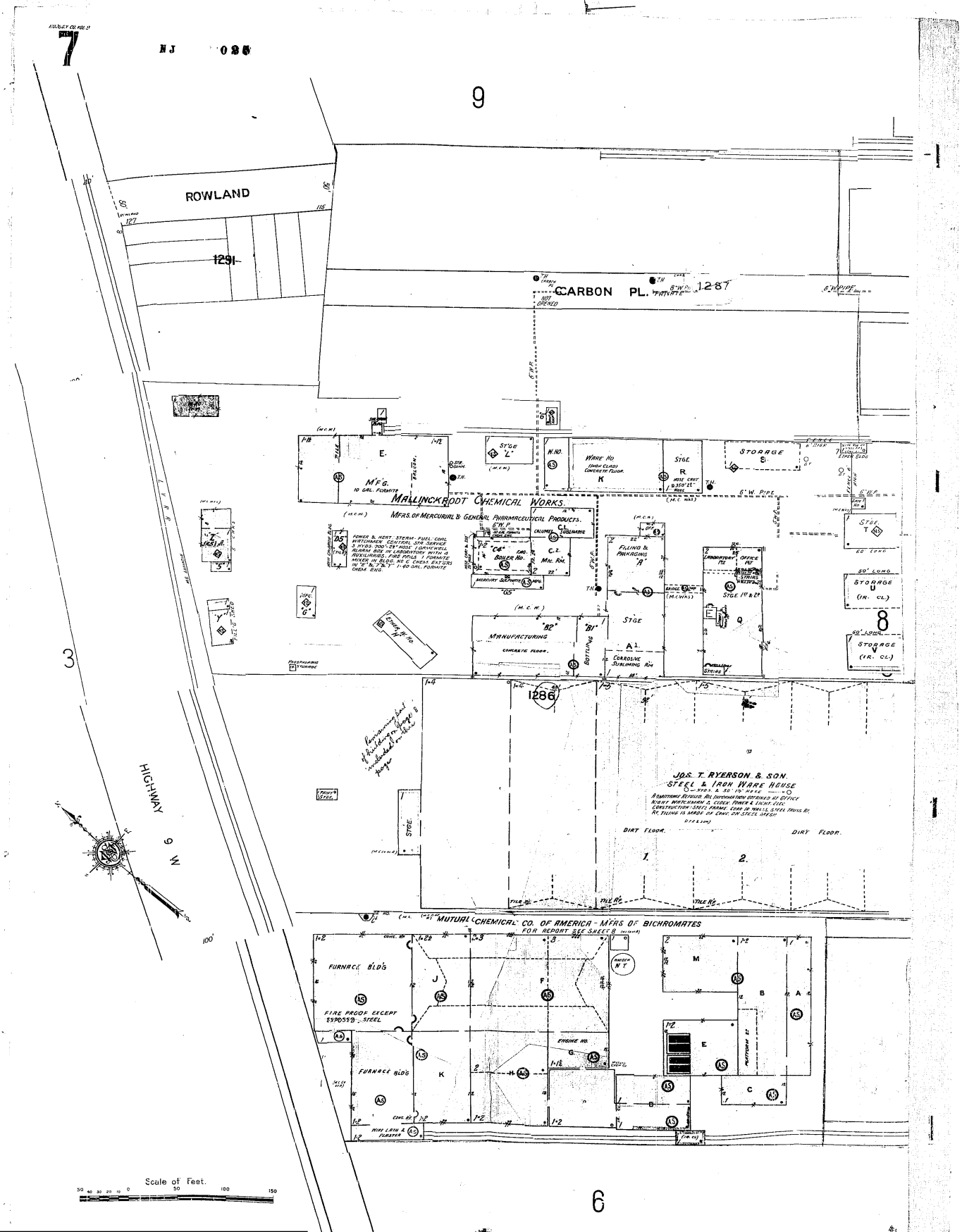
The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

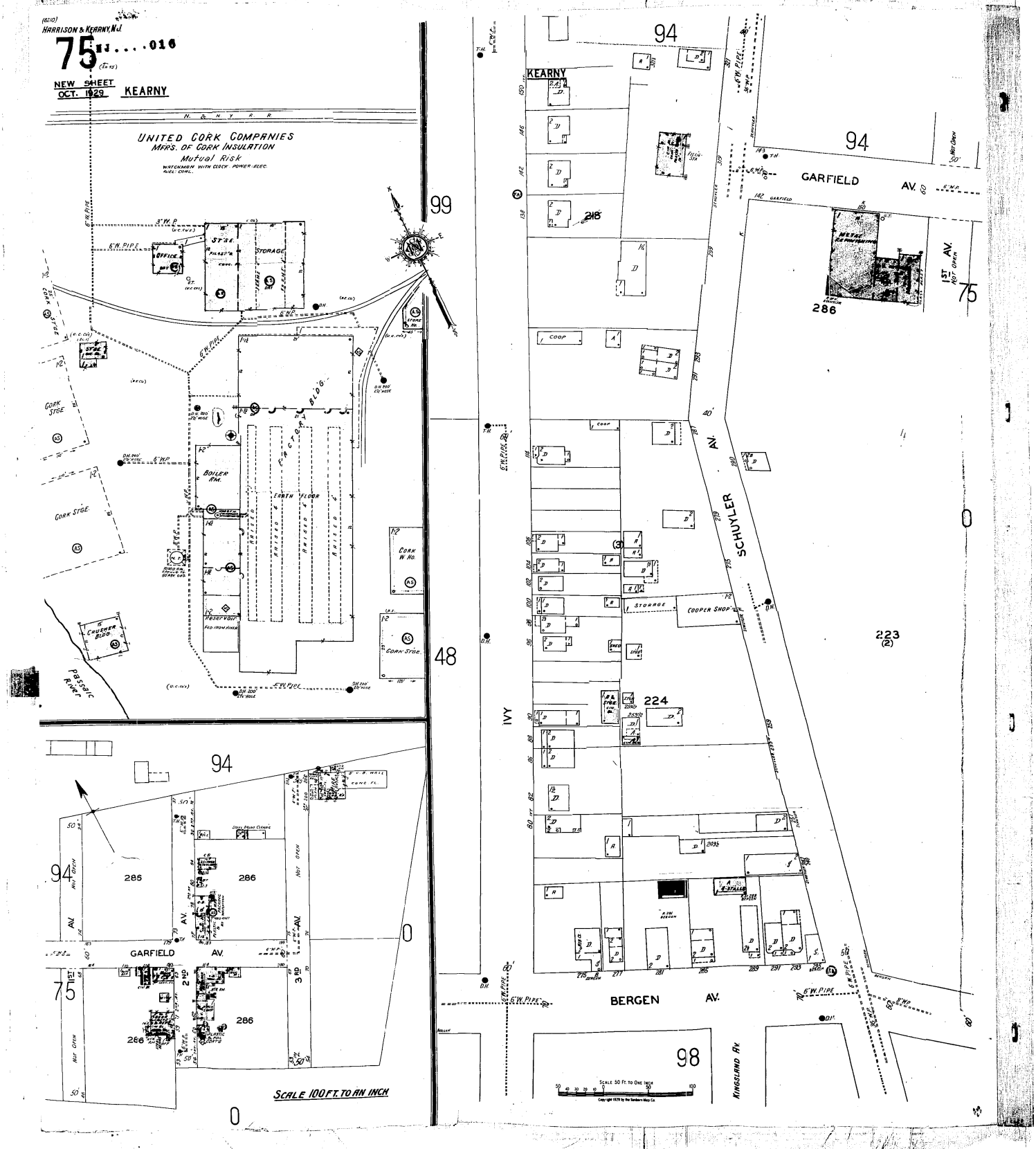
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

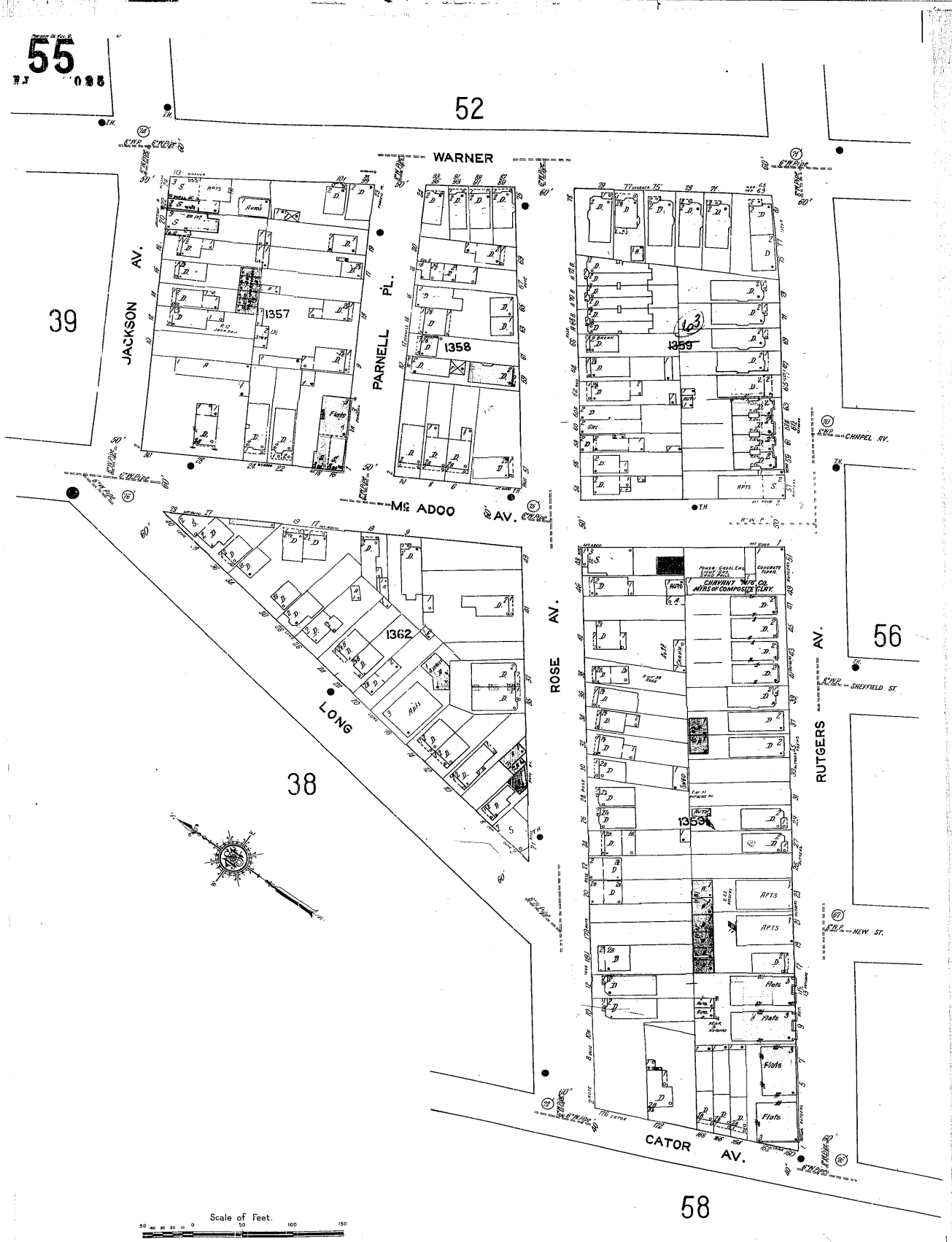


The Sanborn Library, LLC

Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

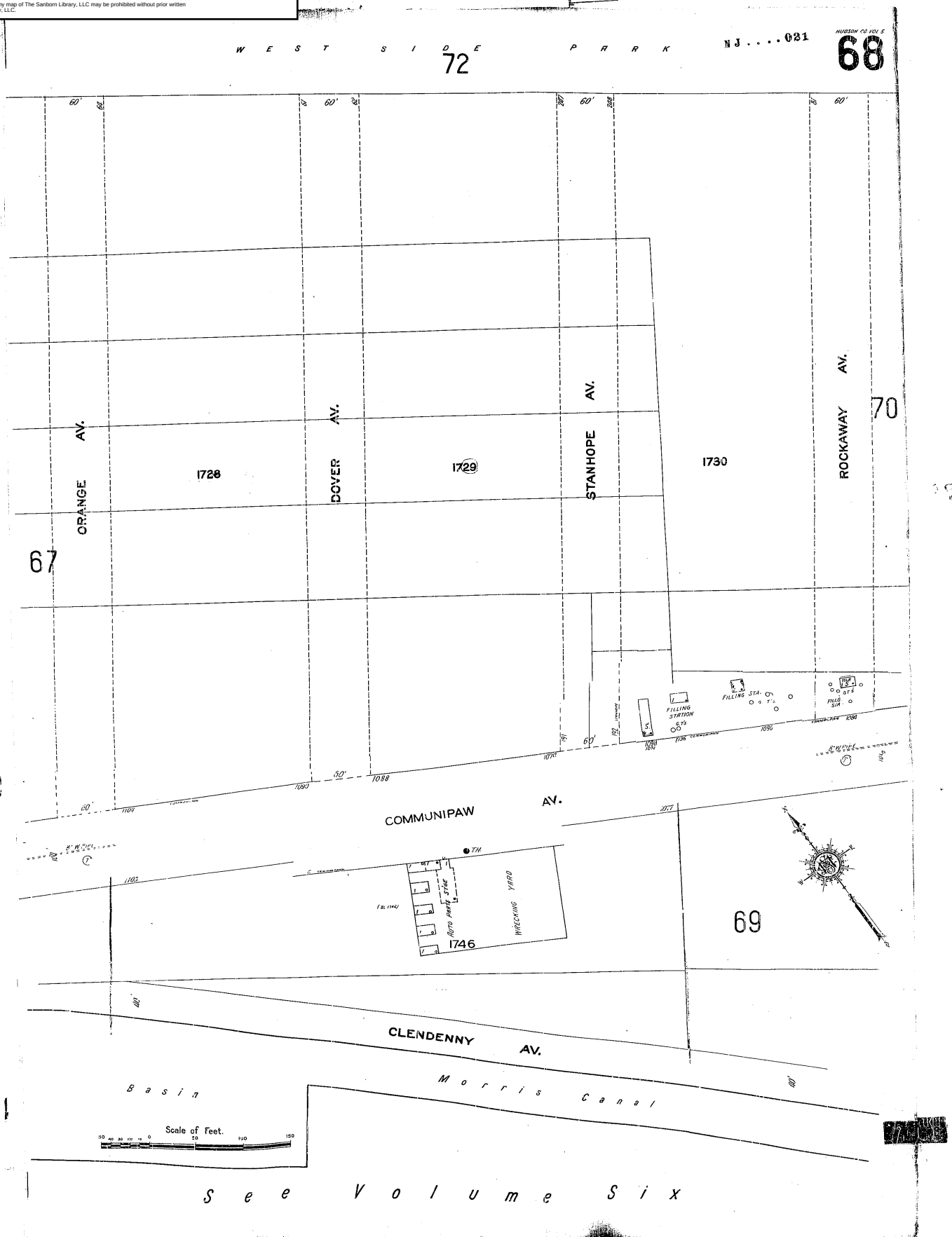
Copyright© 1950 The Sanborn Library, LLC CHP
Year EDR Research Associate

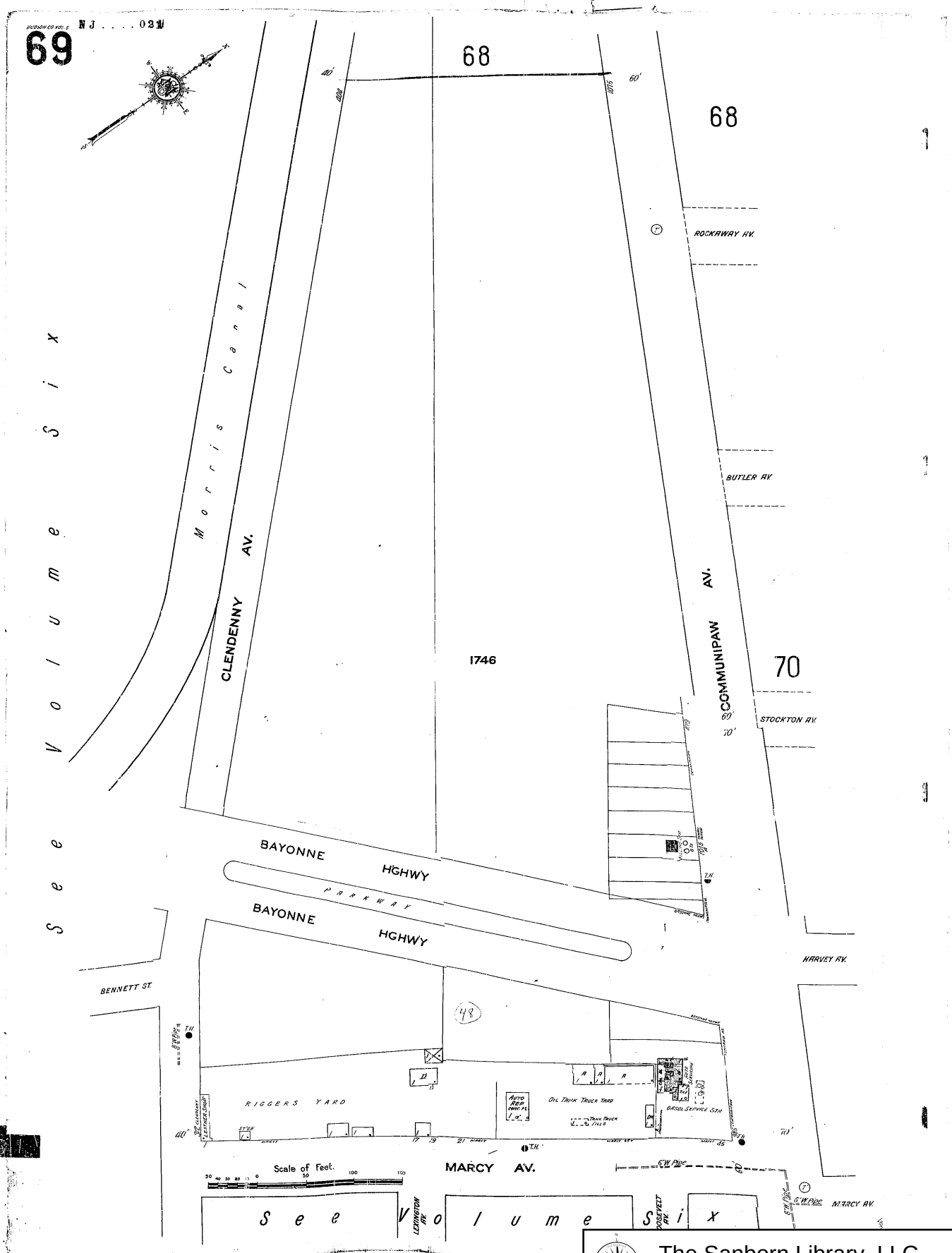
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

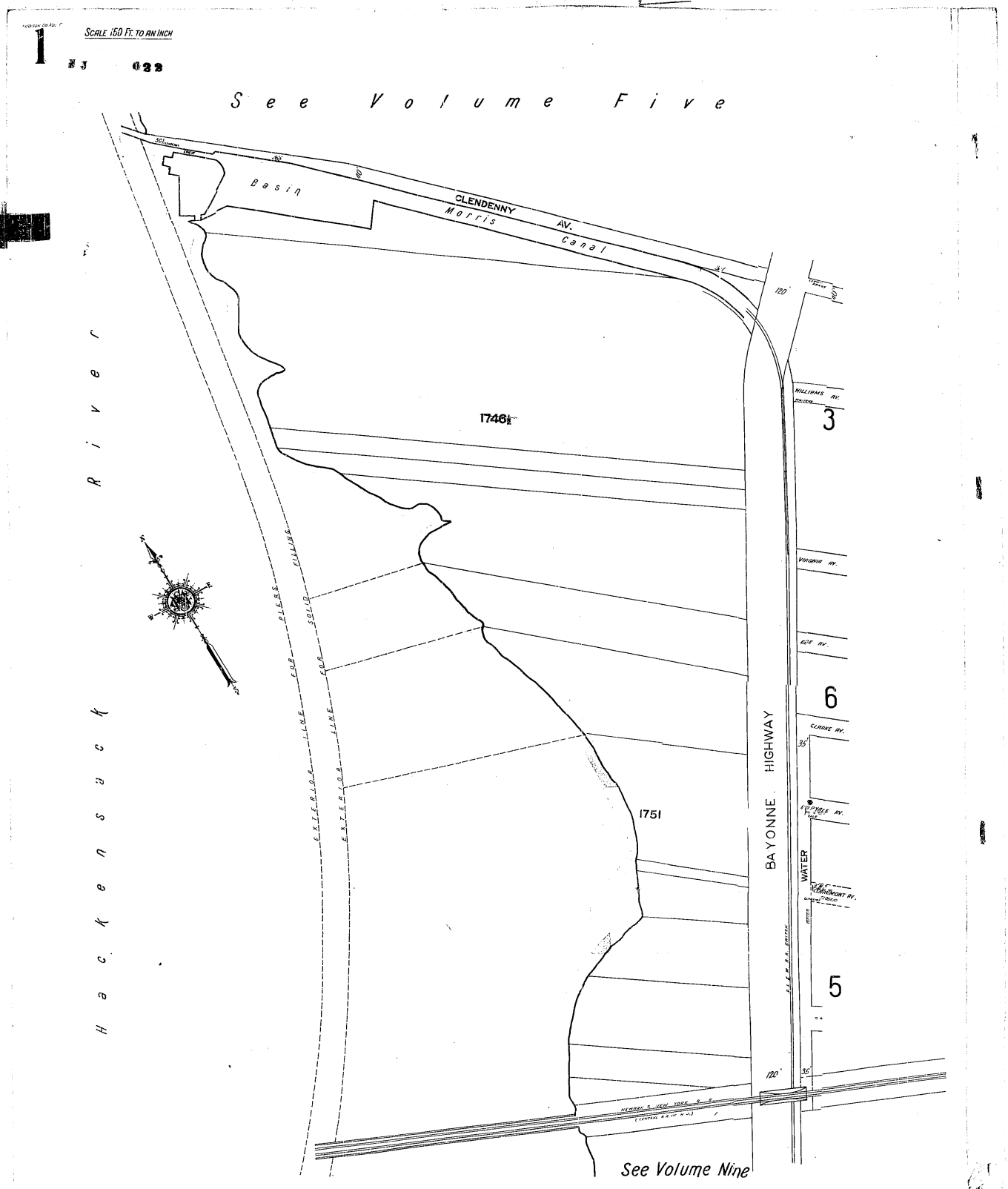




The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

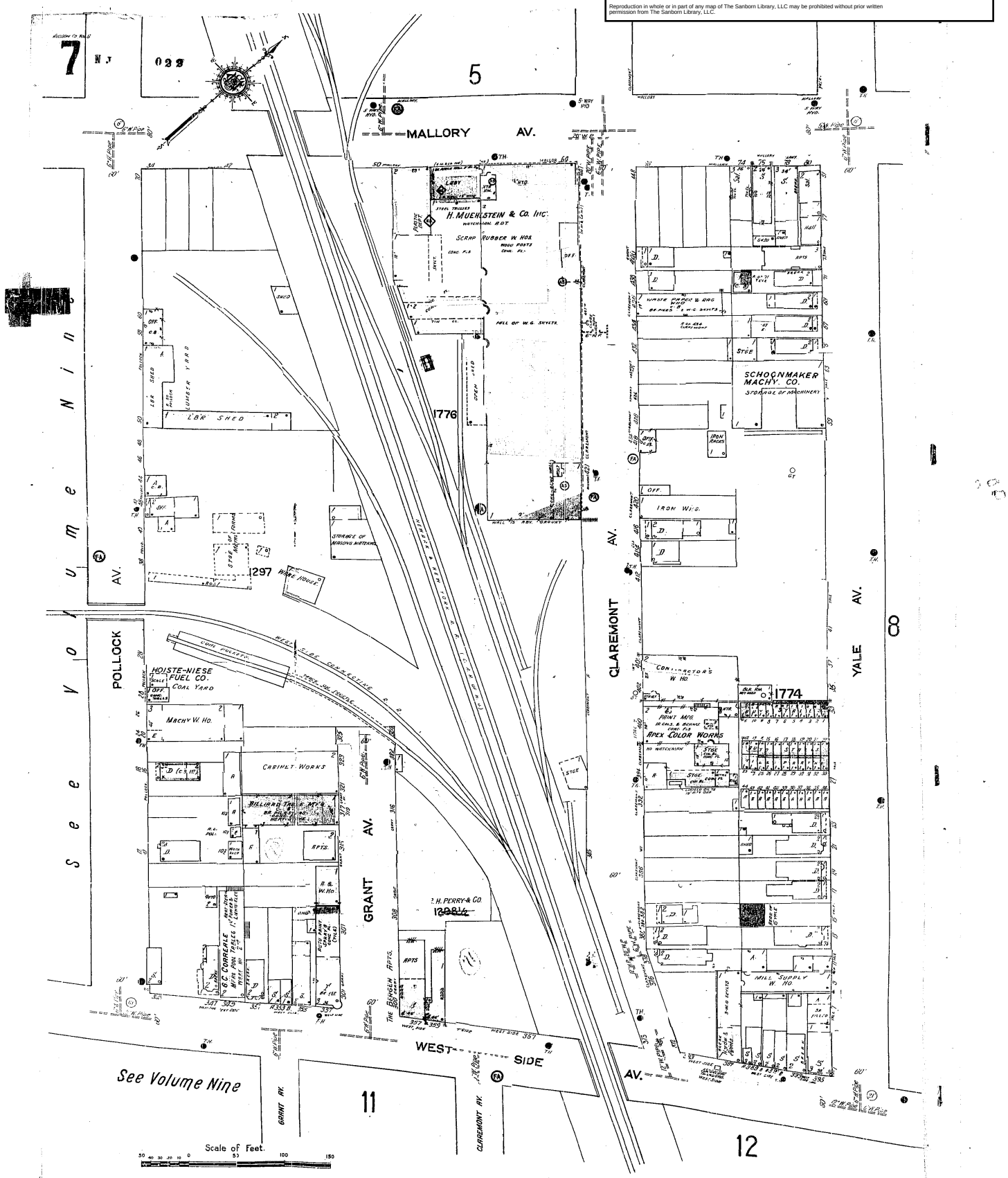
Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

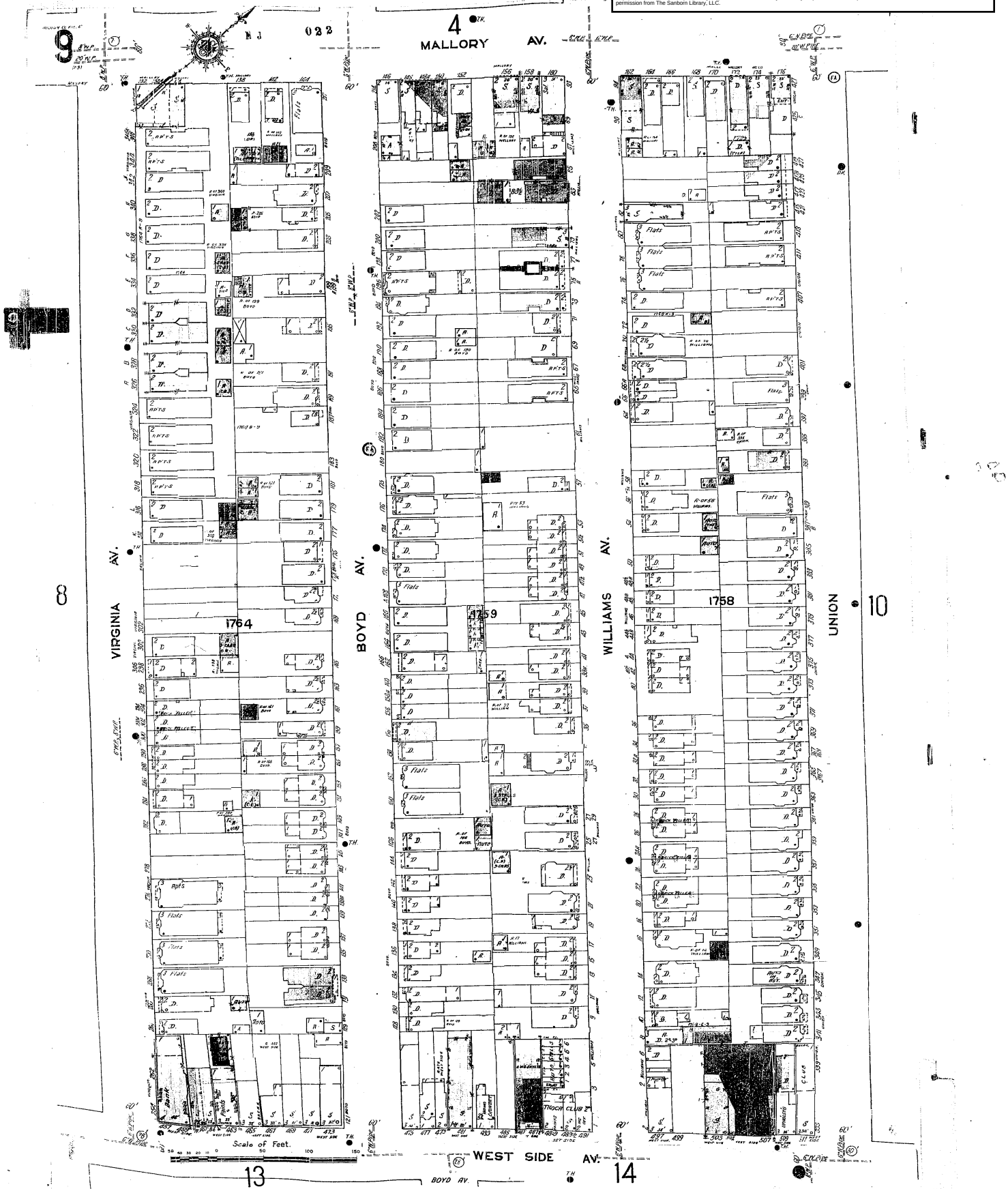
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

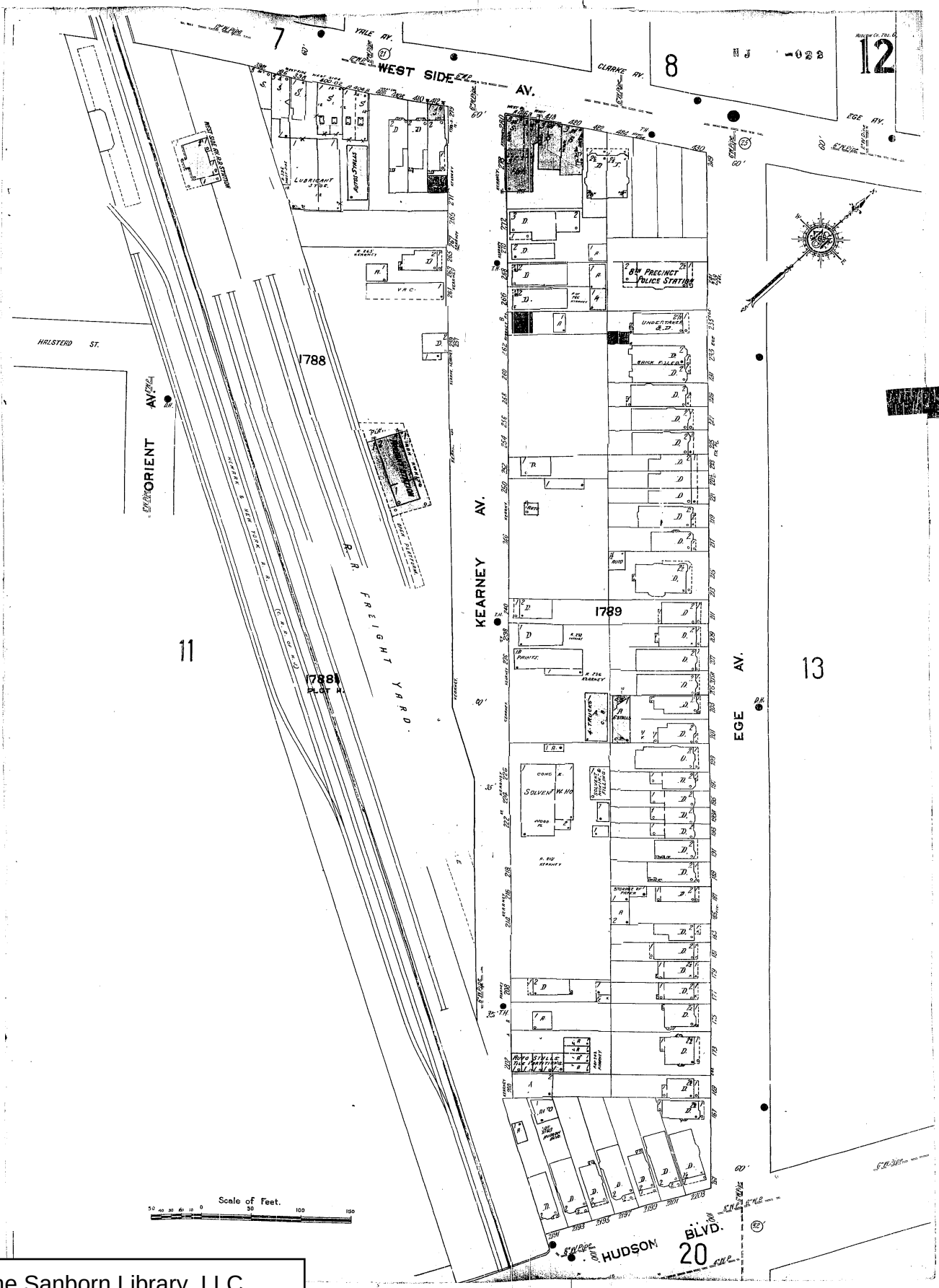


The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

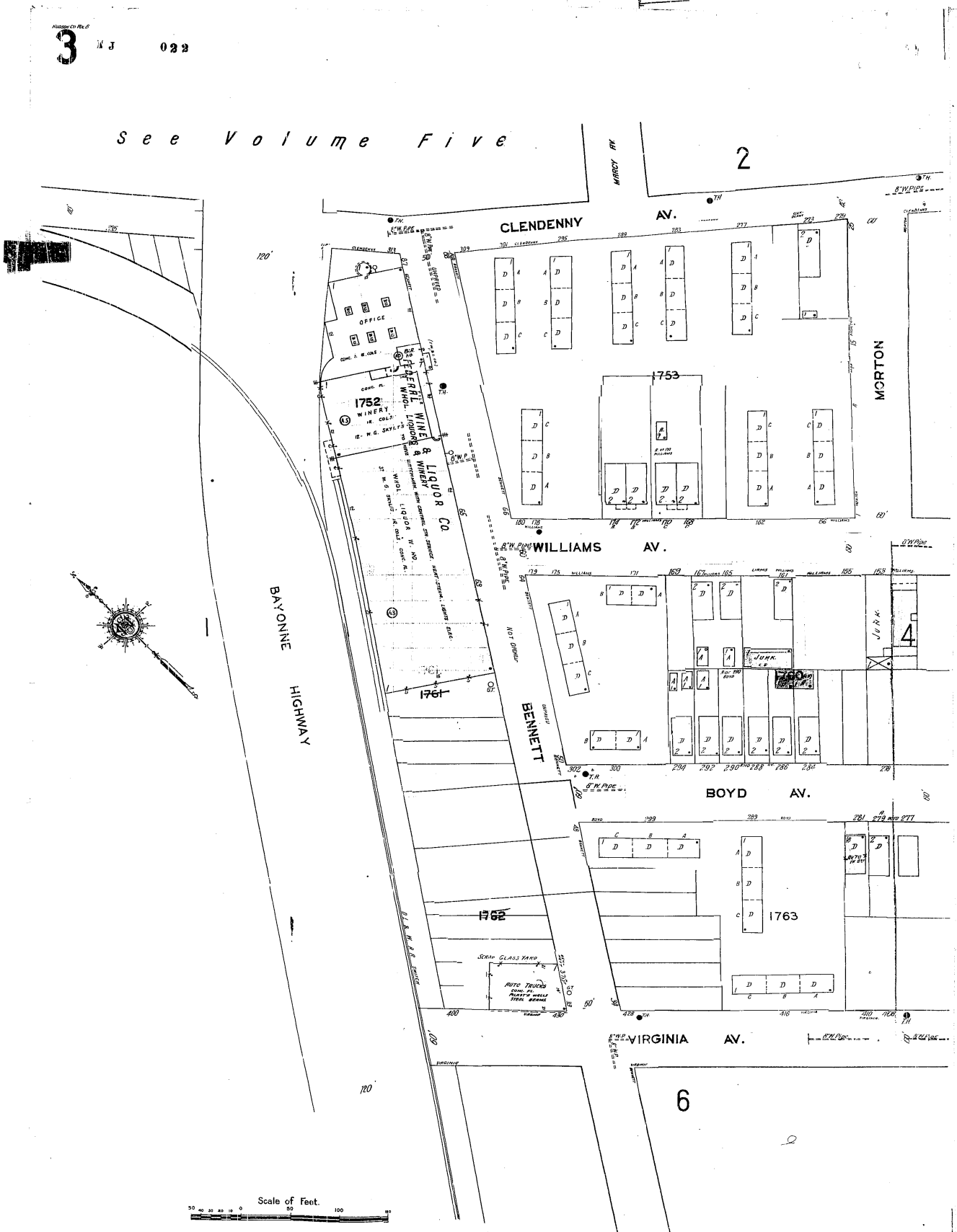




The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

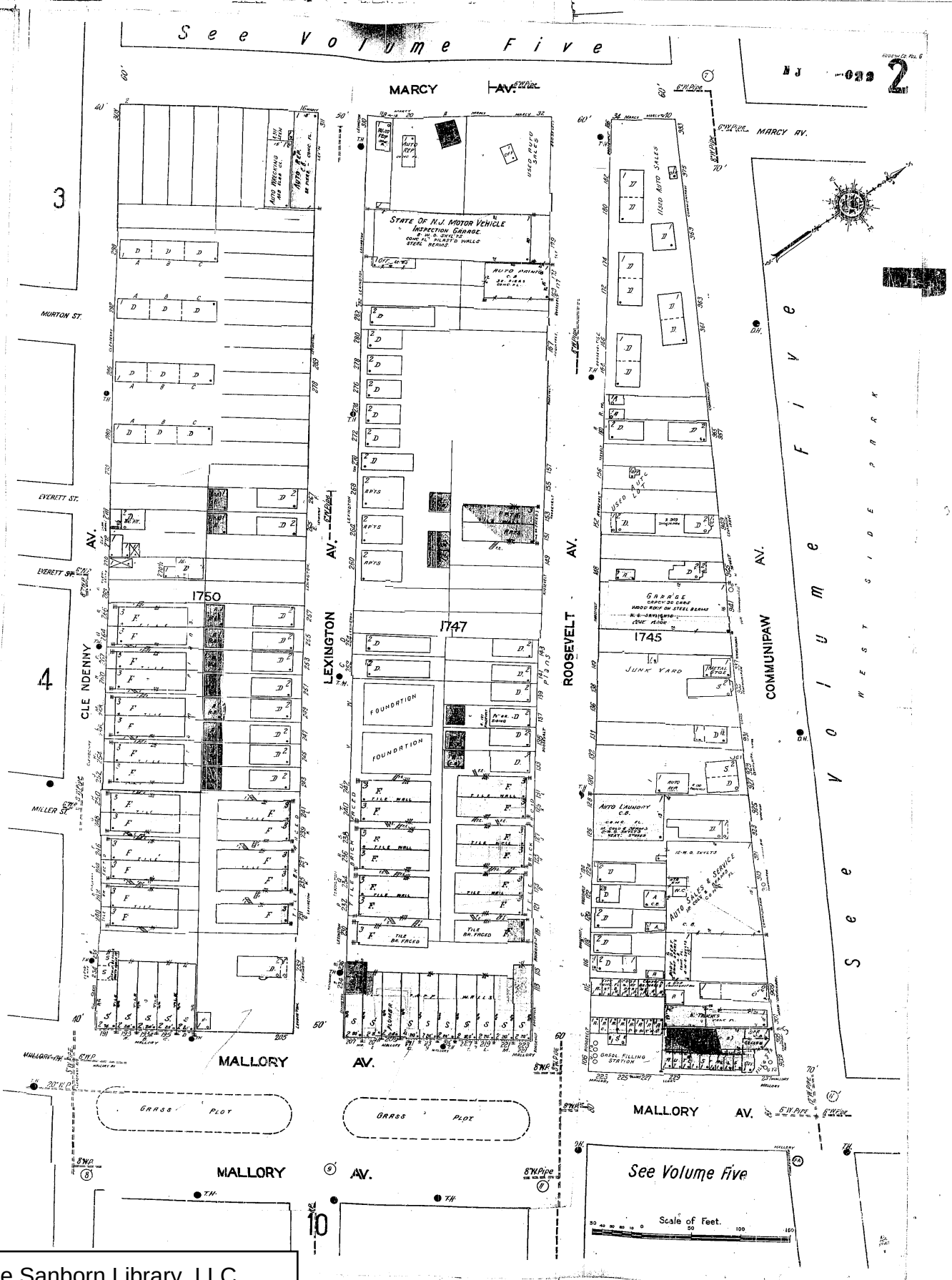
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



The Sanborn Library, LLC

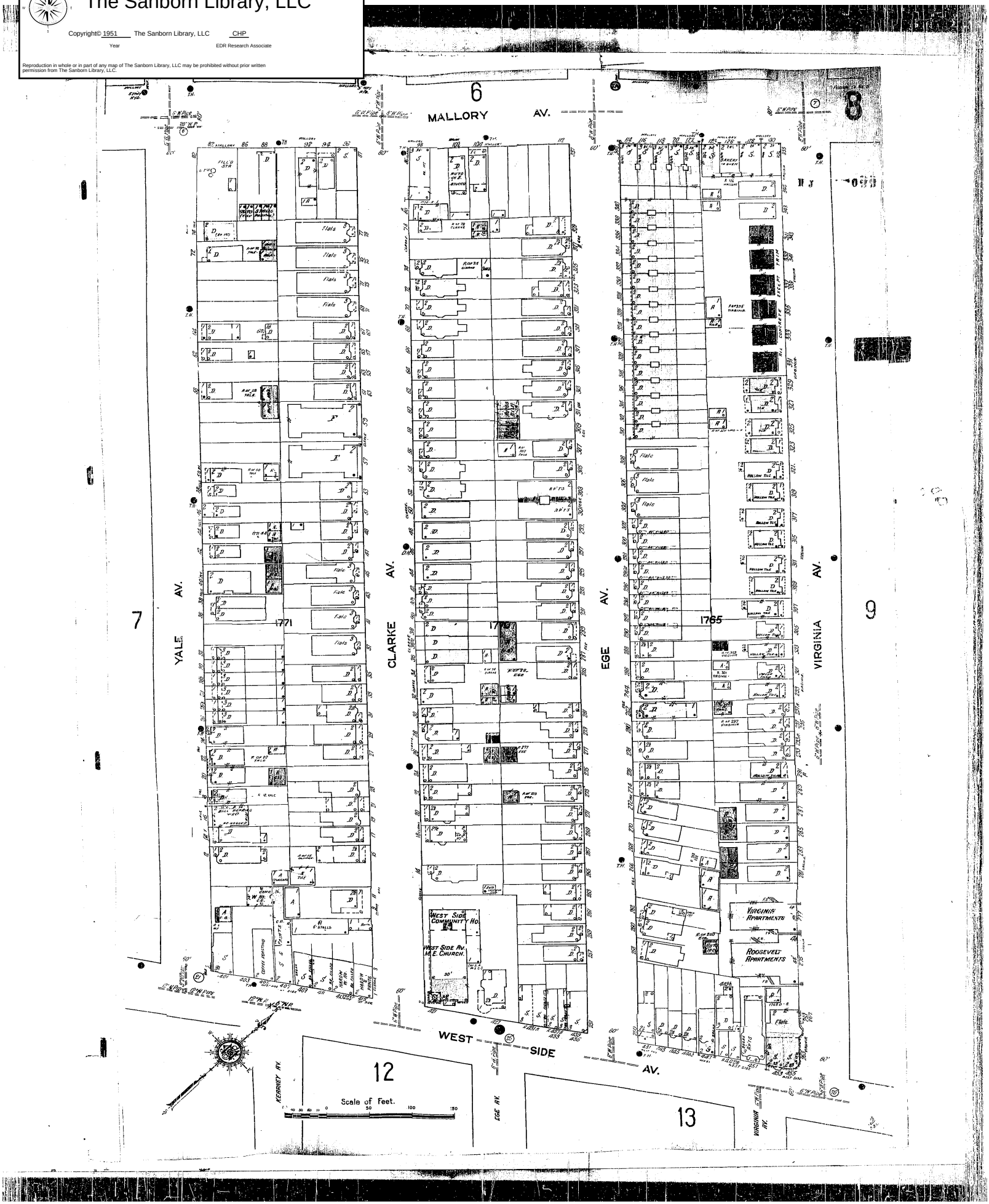
Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

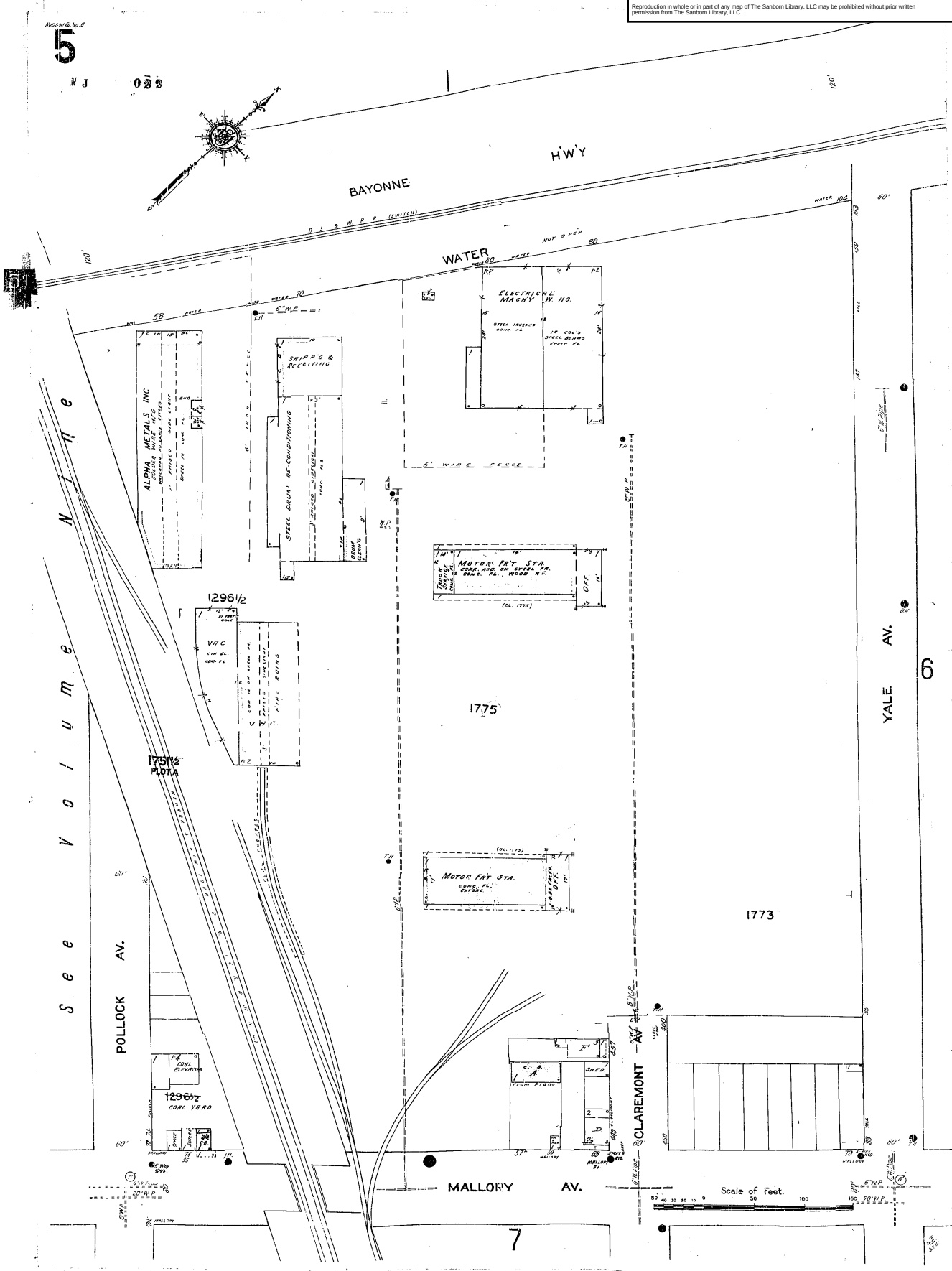
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

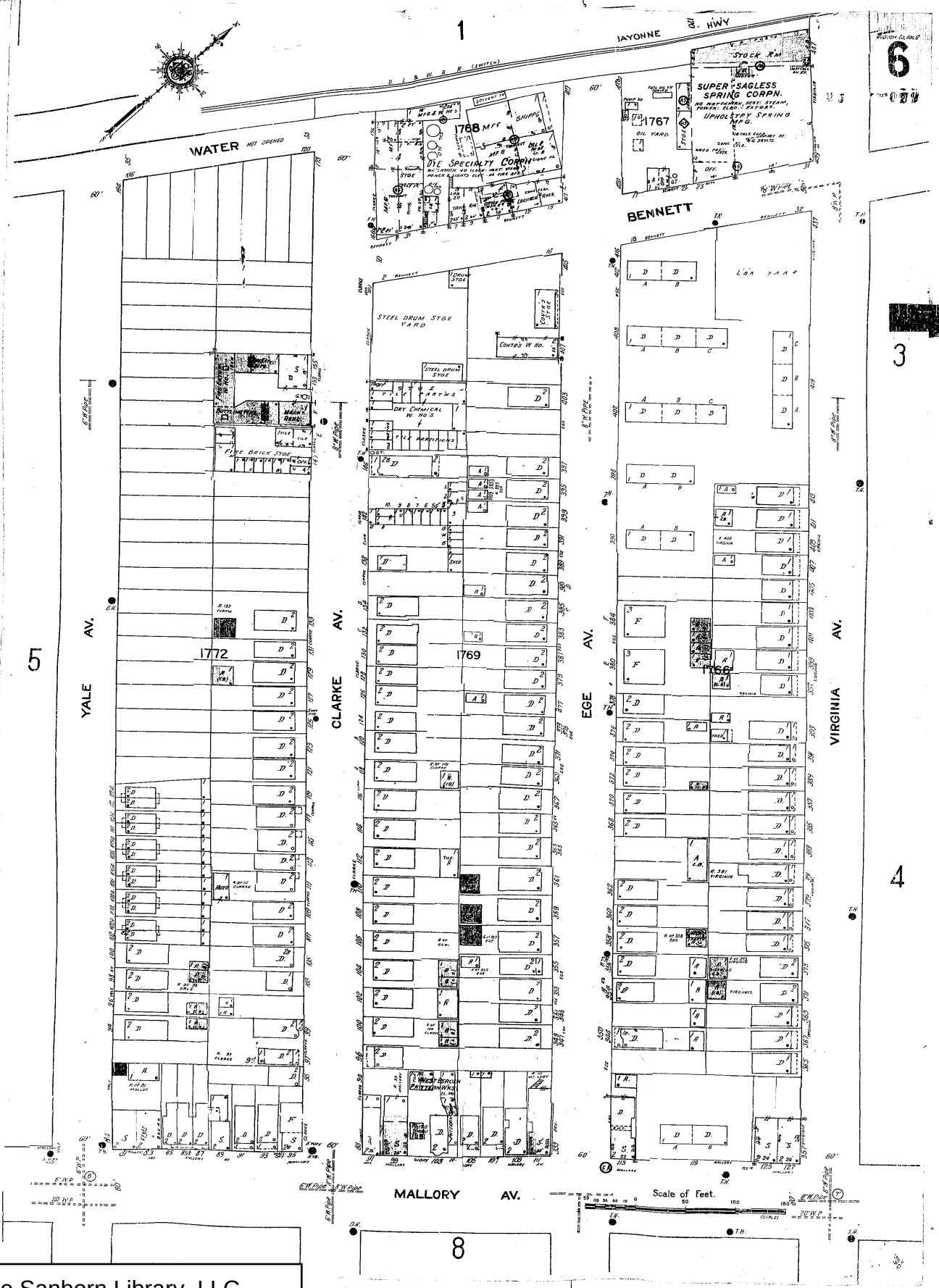


The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

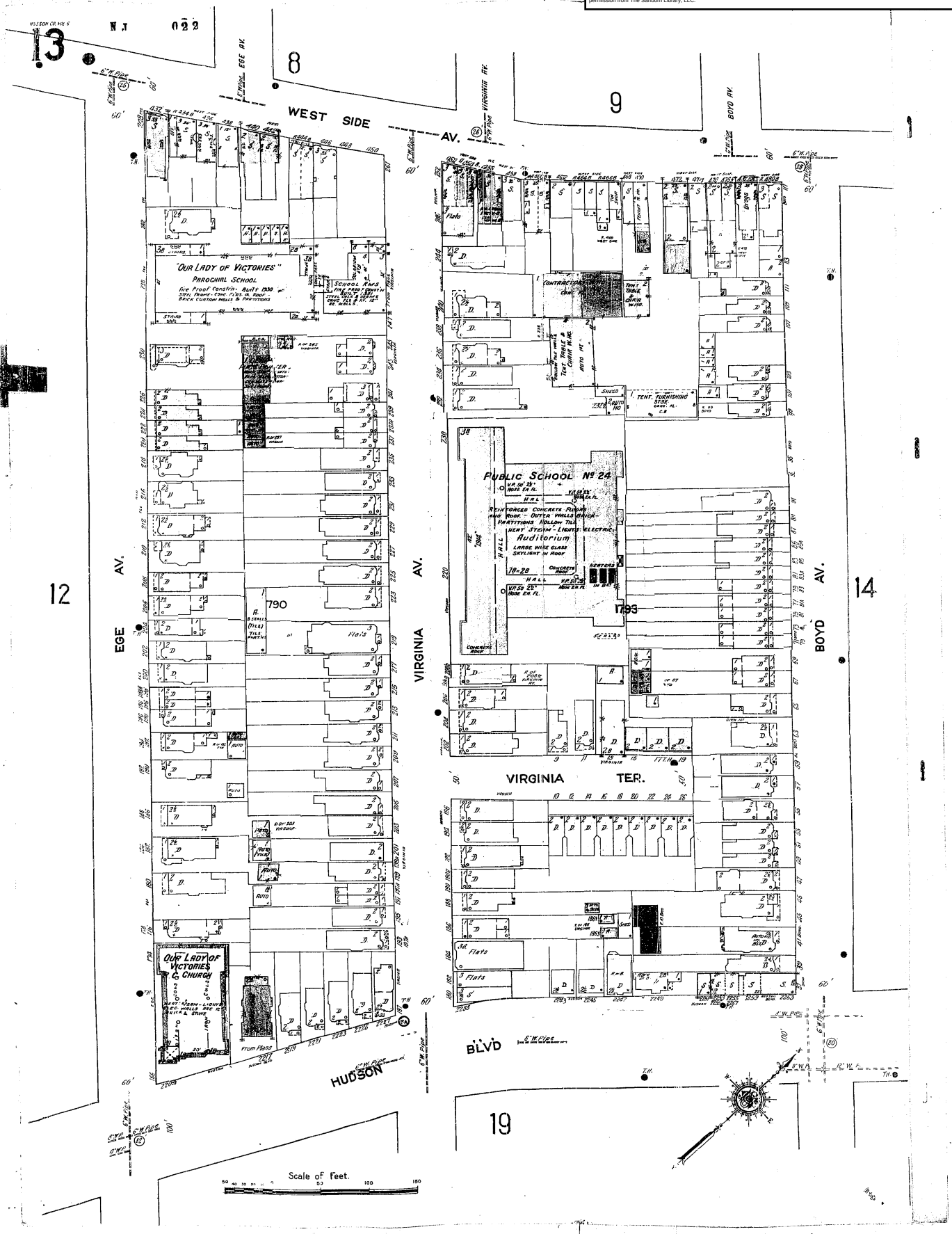
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

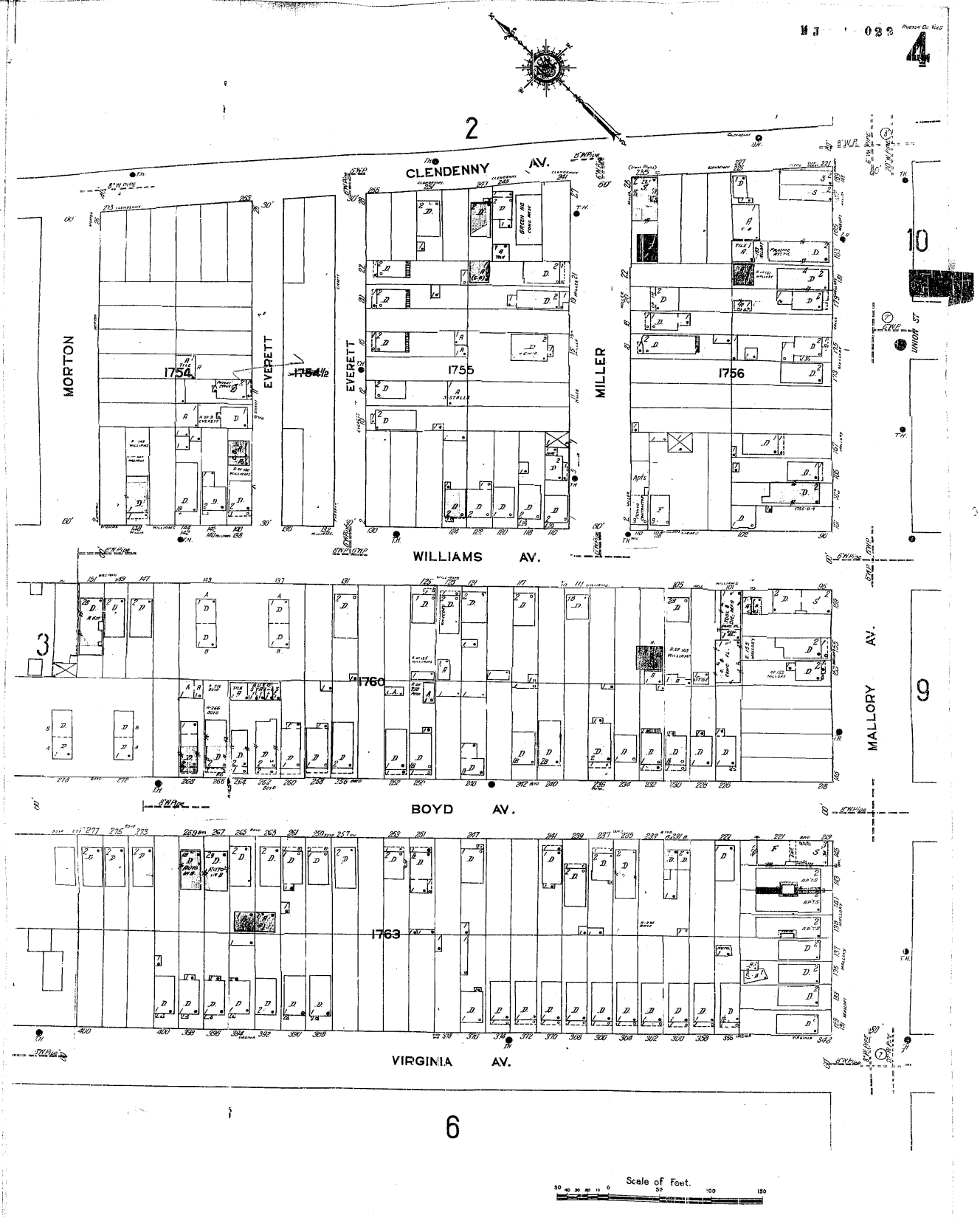


The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.





The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP
Year EDR Research Associate

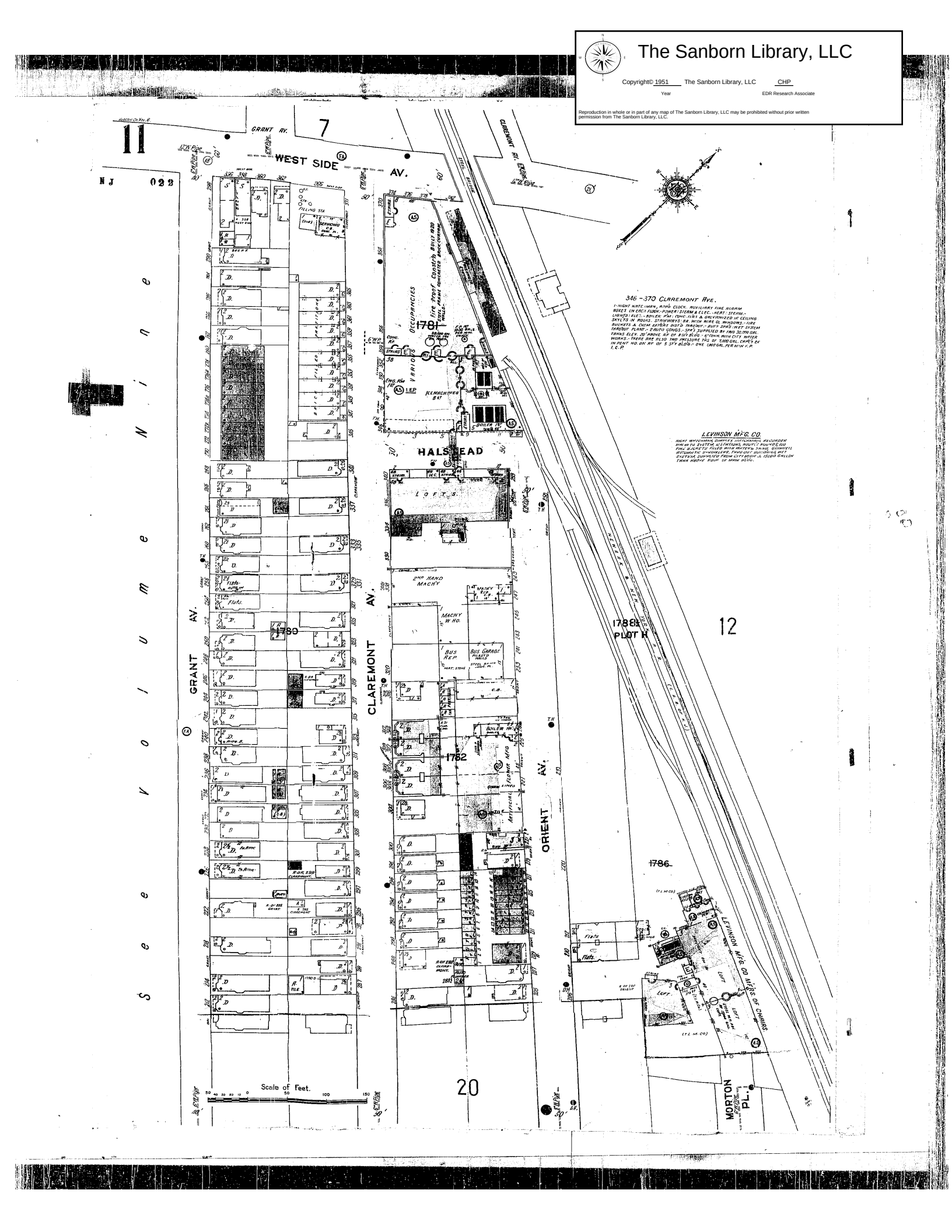
Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.

The Sanborn Library, LLC

Copyright© 1951 The Sanborn Library, LLC CHP

Year EDR Research Associate

Reproduction in whole or in part of any map of The Sanborn Library, LLC may be prohibited without prior written permission from The Sanborn Library, LLC.



APPENDIX D-1

MAJOR ION ANALYSIS

APPENDIX D-1

MAJOR ION ANALYSIS

The purpose of the following analysis of major ions in groundwater from the study area is to determine if water from any two hydro-stratigraphic zones has similar water quality characteristics. Two zones having similar water quality suggests that they may share a common source of chromium contamination. Data used in the following section is from samples collected in 2006 from wells installed within the various chromium plumes. Data are classified as being from Deep, Intermediate, Shallow or Bedrock Zones based upon the screening depth of monitoring wells.

Piper Diagrams

Piper diagrams are useful for determining the dominant cations and anions present in natural waters. In Figure 1, data from within the Deep, Intermediate, Shallow and Bedrock Zones plumes are plotted on a Piper diagram. In general, water from all four zones tends to be deficient in magnesium relative to the other cations. The shallow Zone tended to be dominated by calcium, while the other three zones dominated by mono-valent cations (sodium or potassium-type waters) relative to magnesium and calcium. Dominance in the anion profile is less clear, however chloride appears to dominate over sulfate and bicarbonate, particularly for the shallow wells. Overall, there is considerable variability in the data and no clear overlap between different zones. Therefore, it is difficult to conclude whether groundwater from any two zones has similar water quality characteristics.

A review of Figure 1 irrespective to hydro-stratigraphic zones indicates two general data groups. Group A is dominated by sodium and chloride and wells in this group are generally located in the north and west portions of the study area, beyond the historic shoreline of the Hackensack River. Group B is calcium dominated and wells in this group are generally located to the south and east, on the landward side of the former shoreline.

Total Versus Hexavalent Chromium

Hexavalent and total chromium measurements were performed on all samples. In Figure 2, hexavalent chromium concentrations from all wells are plotted versus the total chromium from filtered (panel a) and unfiltered (panel b) samples. Samples are color-coded according to zone. The 10 μg/L reporting limit for hexavalent chromium is apparent from the censored data present at this concentration. For all data points with total chromium

concentrations greater than 5,000 μg/L, there is very good agreement between hexavalent chromium and total chromium as indicated by the data points falling on the solid 1:1 line. However, in many of the samples with total chromium less than 5,000 μg/L, hexavalent chromium does not account for all of the total chromium in both filtered and unfiltered samples.

Total chromium is equal to the sum of trivalent and hexavalent chromium. However, since trivalent chromium is fairly insoluble under most environmental conditions, trivalent chromium concentrations in the water phase are usually below analytical detection limits. Thus, total chromium concentrations are usually equal in magnitude to hexavalent chromium concentrations. The discrepancy between total and hexavalent chromium observed at SA-7 indicates the presence of trivalent chromium in the water phase.

Reduction of hexavalent chromium by ferrous iron and reduced sulfur produces trivalent chromium precipitates which are retained on filter media (Eary and Rai, 1988; Fendorf and Li, 1996; Kim et al., 2001). However, the initial material formed upon hexavalent chromium reduction may consist of oligomeric and colloidal material which would be small enough to pass through a filter. As these colloids age, they become larger and are more likely to be retained on filter media. Reduction of hexavalent chromium by organic matter yields soluble trivalent chromium complexes with dissolved organic matter which may also persist in solution (Abdullah et al., 1985; James and Bartlett, 1983). The discrepancy between total and hexavalent chromium is not present in the bedrock wells. In the bedrock where organic content and concentration of reduced sulfur species are likely low, there is likely less availability of a suitable reductant for hexavalent chromium.

pH as an Indicator

Although pH is not a conservative quantity, it may be useful to identify water with similar chemical characteristics if large spatial pH gradients are present and data is available for a large number of sampling locations. In Figure 3, the pH of filtered samples is plotted versus the hexavalent chromium concentration. A similar result is obtained when pH is plotted versus the total chromium concentration. In general, the Shallow Zone wells have some of the highest pH values of all samples with values ranging as high as 12.6. This is to be expected since groundwater in contact with COPR material have characteristically high pH values between 11 - 12 (Farmer et al., 1999). The Intermediate, Deep and Bedrock Zones have neutral to slightly alkaline pH, with the exception of one data point form the Bedrock Zone (well 087-MW-14), and two data points in the Intermediate zone (one sample and one duplicate from well 117-MW-I2). The considerably higher pH in 7 of 10 Shallow Zone samples suggests that its water chemistry is different than the other three zones.

However, these results are not definitive because dilution and pH buffering effects will naturally lower the pH as water travels away from areas of very high or very low pH. In general, the Bedrock Zone has a slightly higher pH than the Deep and Intermediate Zones. This is likely due to the contribution of alkalinity from dissolution of carbonates within the bedrock.

Concentration Ratios as a Diagnostic Tool

Hexavalent chromium concentrations as high as 3,320 mg/L (well 090-MW-09) were measured in samples obtained from the Deep Zone. These high concentrations of chromium must also be accompanied by high concentrations of cations to preserve solution electroneutrality. A likely candidate for a counter-ion to hexavalent chromium ($HCrO_4^-/CrO_4^{2-}$) is sodium since the chromium contamination present at SA-7 resulted from activities related to sodium dichromate ($Na_2Cr_2O_7$) manufacturing processing, storage and waste material disposal. The stoichiometry of sodium dichromate ($Na_2Cr_2O_7(s)$) indicates that pure aqueous solutions will contain a 1:1 molar ratio of sodium to hexavalent chromium. On a mass basis, 0.442 g of sodium is expected per gram of chromium. Hexavalent chromium contamination originating from other source material such as COPR would not have the same sodium to chromium ratio.

In Figure 4, the sodium concentration is plotted versus the chromium concentration for filtered and unfiltered samples for all four zones. The dashed line is the theoretical line that results from solutions of pure sodium dichromate. It has an intercept of zero and a slope of 0.442 g Na / g Cr. All of the data points fall well above this line indicating background sodium concentrations is well in excess of that which would be present from dissolution of solid sodium dichromate.

The solid line shown in Figure 4 is a model fit for the sodium concentration considering that it is equal to the sum of (i) background Na (set at 5.0×10^5 μg/L) and (ii) Cr resulting from $Na_2Cr_2O_7$ dissolution. Determination of the background sodium concentration is difficult because of the high variability in sodium concentrations. However, at the highest measured concentrations in the Deep plume, the data appears to be approaching the theoretical 0.442 g Na / g Cr ratio. This indicates that the chromium contamination from the Deep Zone may possibly be due to dissolution of sodium dichromate. There appears to be some separation in the data amongst the Deep, and Shallow Zones at hexavalent concentrations greater than 2×10^4 μg/L, but this is largely due to fact that Deep Zone samples tend to have the highest concentrations of hexavalent chromium.

Major ion ratios were also examined to determine if trends in water quality across the different zones could be established. In Figure 5, the calcium to magnesium ratio (in g/g) for filtered and unfiltered samples is plotted as a function of the hexavalent chromium concentration. The dashed line represents an arbitrary cut-off at 6.5 g/g. There is good separation of the Shallow Zone from the other three zones. Nearly all of the data points for the Shallow Zone have calcium to magnesium ratios greater than 6.5 g/g. In the Deep Zone all data points reside below 6.5 g/g. In the Intermediate and Bedrock Zones, a large majority of the data points reside at calcium to magnesium ratios less than 6.5 g/g.

COPR is produced as a byproduct of the manufacture of chromate and dichromate salts. XRF analysis has shown that the chemistry of COPR specimens is dominated by their high calcium content (Deakin et al., 2001). Many calcium-containing mineral phases are formed during the elevated temperature high-lime chromate extraction process. These include brown millerite, $Ca_2(Al,Fe,Cr)_2O_5(s)$ and larnite, $Ca_2SiO_4(s)$ (Hiller et al., 2003). Over time these phases are weathered in the environment, forming other calcium-containing phases such as hydrogarnet, $Ca_3(Al,Fe)_2(O_4H_4)_3$; hydrocalumite, $Ca_4(Al,Fe)_2(OH)_{14}\cdot 6H_2O$; and ettringite, $Ca_6Al_2(OH)_{12}(SO_4)_3\cdot 26H_2O$ (Hiller et al., 2003). Leaching of these minerals present in the Shallow Zone appears to enrich the surrounding groundwater with calcium relative to magnesium, giving the groundwater a characteristically high Ca/Mg ratio. Calcium to magnesium ratios may therefore be a useful tool in identifying if chromium contamination is influenced by COPR.

The four data points representing the Intermediate Zone with Ca/Mg ratios greater than 6.5 g/g (wells 117-MW-I2 and its duplicate sample, 117-MW-I3, and 117-MW-I5) are located east of Route 440 along the Mutual Chemical/Baldwin Steel border. Based on the high Ca/Mg ratios observed in samples from these wells, the chromium contamination in the groundwater in this area may be related to COPR in the overlying soils. One of the three wells (117-MW-I2) also showed high pH characteristic of COPR-contacted groundwater. All of the other samples taken from Intermediate Zone wells located west of Route 440, had Ca/Mg ratios less than 6.5 g/g.

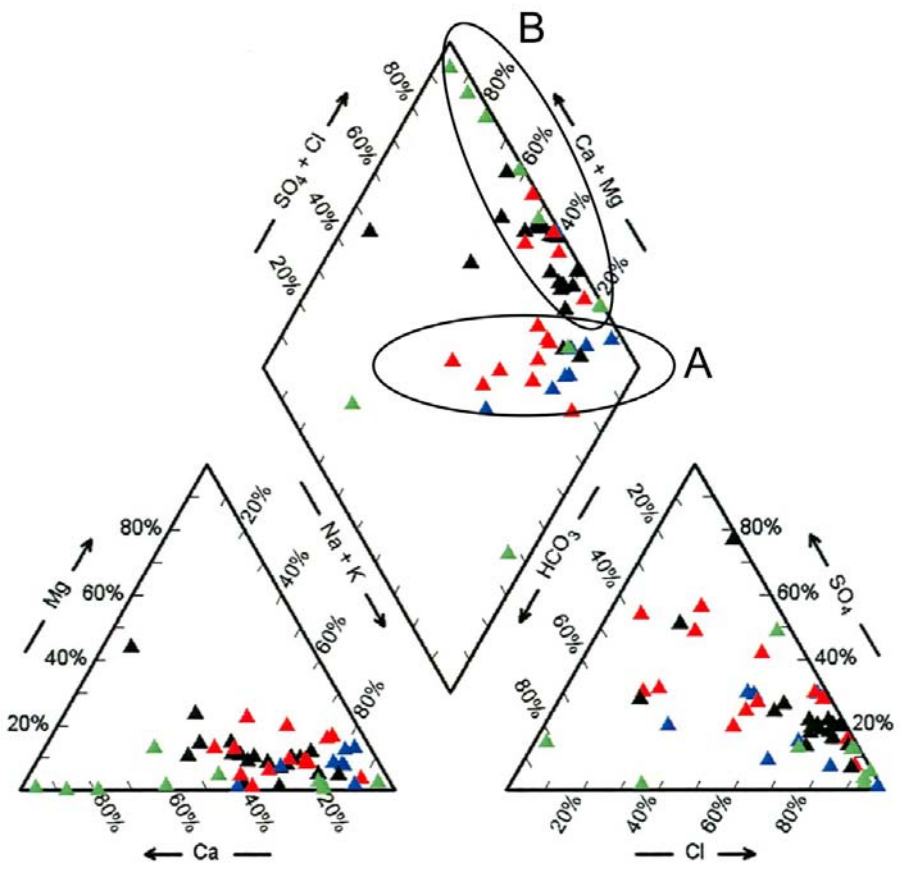


Figure 1. Piper diagram for Deep (red), Intermediate (blue), Shallow (green) and Bedrock (black) Zones for samples taken from within chromium plumes.

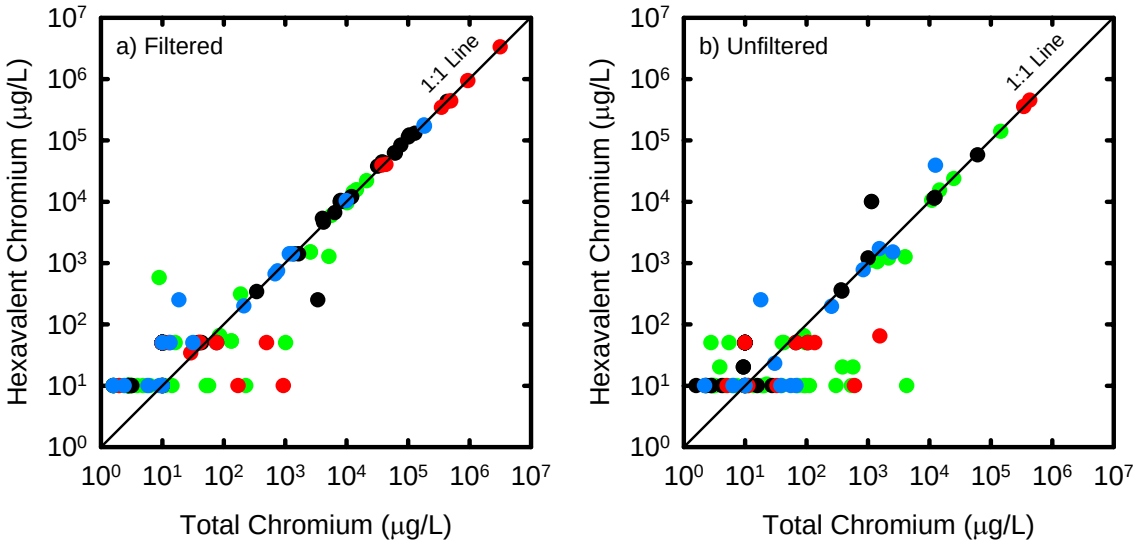


Figure 2. Hexavalent chromium versus total chromium for a) filtered and b) unfiltered samples taken from monitoring wells. Screening depths are color coded according to Zone: Deep (red), Intermediate (blue), Shallow (green) and Bedrock (black).

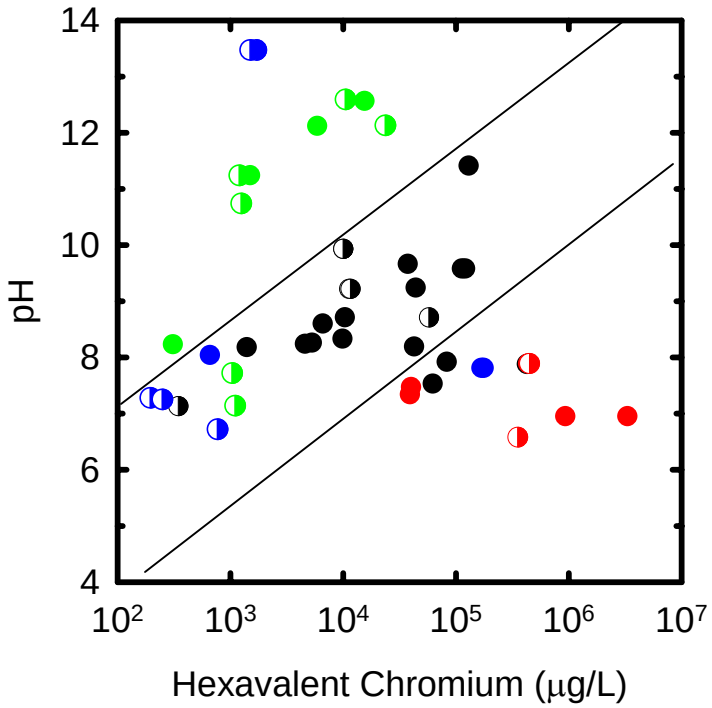


Figure 3. Sample pH versus hexavalent chromium concentration for filtered samples taken from monitoring wells. Screening depths are color coded according to zone: Deep (red), Intermediate (blue), Shallow (green) and Bedrock (black).

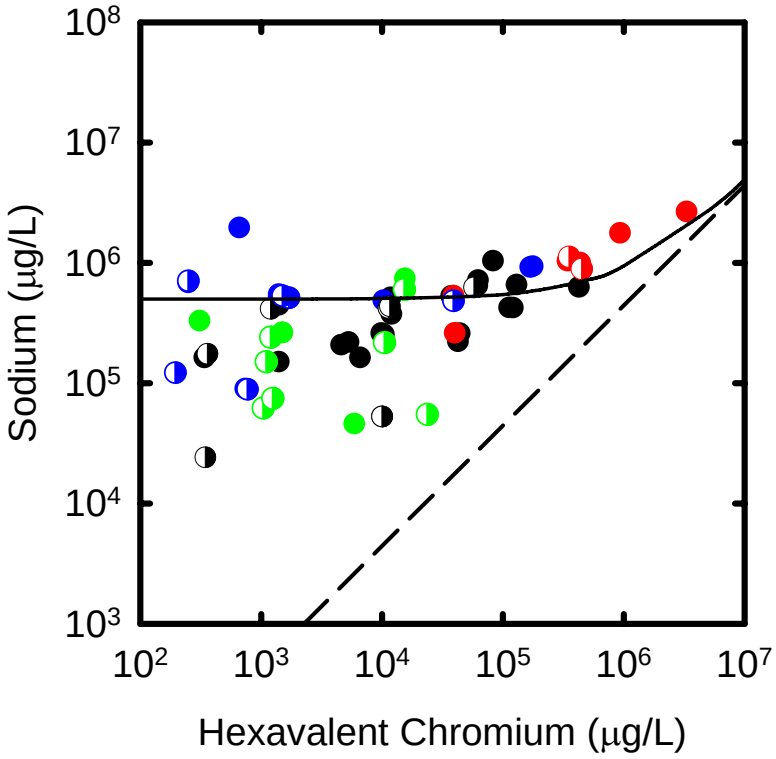


Figure 4. Hexavalent chromium versus total chromium for filtered (filled symbols) and unfiltered (half-filled symbols) samples taken from monitoring wells. Screening depths are color coded according to zone: Deep (red), Intermediate (blue), Shallow (green) and Bedrock (black).

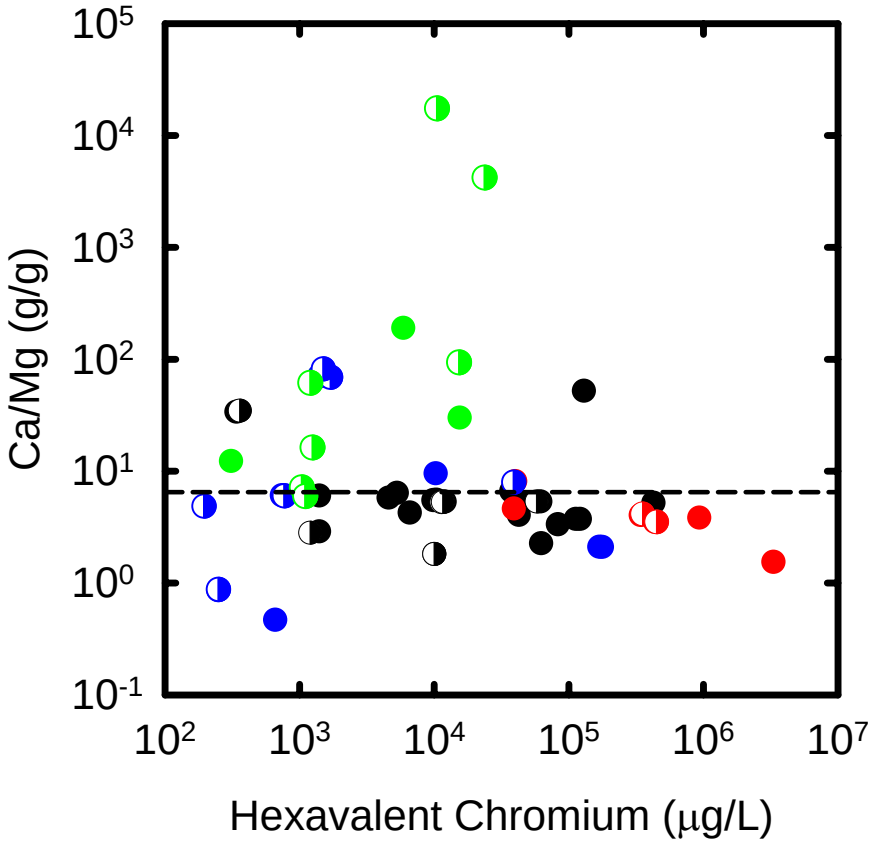


Figure 5. Calcium to magnesium mass ratio versus hexavalent chromium for filtered (filled symbols) and unfiltered (half-filled symbols) samples taken from monitoring wells. Screening depths are color coded: Deep (red), Intermediate (blue), Shallow (green) and Bedrock (black). The dashed line represents an arbitrary cut-off at a calcium to magnesium ratio of 6.5 g/g. Samples reported at the hexavalent chromium detection limit have been screened out.