ANNUAL PERFORMANCE REPORT #3
LONG-TERM MONITORING PLAN
For 2011

STUDY AREA 7
DEEP OVERBURDEN AND BEDROCK
GROUNDWATER REMEDY

HONEYWELL
Jersey City, New Jersey

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1 INTRODUCTION

This third Annual Performance Report has been prepared in accordance with Section 4 of the Long-term Monitoring Plan (LTMP) for the Deep Overburden and Bedrock Ground Water Extraction and Treatment (GWET) remedy for the Study Area 7 (SA-7) site. The purpose of this report is to present and assess the various data collected during the second year of GWET system operation and to recommend any changes to the monitoring network and/or frequency of collection. The GWET system, which began operation on December 14, 2008, consists of deep overburden and bedrock groundwater extraction from three recovery wells, with treatment of the extracted water at a treatment plant located on Kellogg Street. The extraction wells are PW-1 (Deep Overburden zone), PW-2 (Intermediate Overburden zone), and 115-MW-203BR (Upper Bedrock zone). The two overburden wells are located near the downgradient end of the deep overburden plume and contain the plume from further off-site migration. The wells also cause a reversal of the hydraulic gradient in the deep overburden beneath the Hackensack River and pull back the river-ward portion of the plume. The bedrock extraction well is located in the southwest corner of Site 115 and serves to contain the bedrock plume.

Comments were received from the Plaintiffs on Annual Performance Report #2 and have been addressed as follows.

- The low water level in well 115-MW-A12T has been further investigated. The reference point elevation was confirmed by survey to be correct; however, the well casing was found to be collapsed at a depth of approximately 17 feet. The well has not been included in any of the data tables or maps contained in this report since water level data from it are not considered reliable. This well will be sealed and abandoned in accordance with NJDEP protocol.

- The areas of elevated groundwater levels observed along the north and south SA-7 boundary are defined by multiple wells (i.e. not a survey issue), and are consistent with groundwater flow model simulations. The calibrated model includes reduced permeability zones within the Fill that mirror areas of elevated Cr concentrations within SA-6 North and SA-6 South. However, this material may not be COPR.

- Considering the various remedial measures currently underway in the area, it is agreed that the frequency of water level measurements will remain quarterly through 2012.

- An integrated groundwater monitoring plan is being prepared and will be presented to the Plaintiffs in the near future.

2 HYDRAULIC MONITORING

In accordance with the LTMP, hydraulic monitoring was conducted quarterly during this third year of monitoring to:

1) Track long-term changes in the direction of groundwater flow within the regional study area.
2) Monitor tidal fluctuations in the Hackensack River during water level measurement rounds for use in normalizing groundwater elevation measurements.
3) Document the rate of groundwater that is extracted and treated from the three recovery wells.

2.1 Groundwater Level Monitoring

2.1.1 Hydraulic Monitoring Results

Hydraulic monitoring consisted of quarterly rounds of groundwater elevation measurement in all available wells in March, June, September, and December, 2011. These data have been adjusted for tidal fluctuations using a time-series method developed by the U.S. Geological Survey (Halford, 2006) and are provided in **Table 2-1**. Groundwater elevations from the December 2011 round, three years after startup, are shown on the cross-section on **Figure 2-1**. This cross-section is drawn in the vicinity of the overburden portion of the GWET system and illustrates the impact of pumping on groundwater levels near the river. Groundwater elevations and well locations in the Shallow, Intermediate, Deep, and Bedrock zones are shown in plan-view on **Figures 2-2 through 2-5**, respectively. All groundwater elevation data are reported in units of feet above mean sea level (amsl) in the NGVD-29 vertical datum.

<u>Cross-Section.</u> **Figure 2-1** illustrates that pumping from PW-1 and PW-2 creates a combined zone of influence causing groundwater to flow both laterally and vertically into the capture zone of the wells. The capture zone spans the various semi-confining layers but considering that the vertical anisotropy of the soil is on the order of 10:1, it is likely that the primary component of flow to the wells is horizontal rather than vertical. It should be noted that the cross-section is drawn with a vertical exaggeration of 5X which tends to over-emphasize the vertical component of flow (i.e., the same cross-section drawn at true scale would more effectively illustrate that the majority of flow is horizontal).

Shallow Zone. Groundwater elevations in the Shallow zone range from over 14 feet amsl on Site 154 to less than 3 feet amsl near the Hackensack River. As a point of reference, the river has a mean tide elevation of approximately +1.2 feet relative to the NGVD-29 datum. As shown on **Figure 2-2**, shallow groundwater flow is generally from east to west across the region, but is locally impacted by subsurface features such as the SA-7 and SA-5 barrier walls, deep sewer lines that run beneath Route 440 and shallower storm sewers that run along most of the side streets. The construction dewatering on the New Jersey City University (NJCU) property noted in last year's report has ceased and groundwater levels have returned to static conditions.

Groundwater flow that is diverted around the SA-7 barrier wall moves onto SA-6 North and SA-6 South, ultimately discharging to the River or into subsurface sewers that serve as local groundwater sinks. Areas of locally elevated groundwater are observed in both SA-6 North and SA-6 South along the SA-7 perimeter wall. These elevated zones are likely caused in part by soils with locally reduced hydraulic conductivity and in part due to their location midway between groundwater discharge areas associated with the River to the west and storm sewers near Route 440 to the east.

At the NJCU site in Study Area 5, groundwater flow is generally from east to west. The north-south oriented "cross-wall" causes groundwater elevations to build up slightly east of the wall relative to heads on the Home Depot property. This is evidenced by the difference in elevations reported in wells 090-PZ-06 and 117-MW-A62 on **Figure 2-2**. In the vicinity of Route 440, this relationship becomes reversed with heads south and west of the wall being slightly higher than groundwater elevations on NJCU. The lowest groundwater levels are observed along Culver Street. Although well 184-MW-04 was not available for measurement during the December 2012 round, subsequent readings indicate that the head in this area is on the order of 4 feet msl, likely reflecting the influence of the local storm sewer on groundwater flow.

Intermediate Zone. Groundwater elevations in the Intermediate zone are shown on **Figure 2-3** and range from over 7 feet above msl in SA-5 to less than a foot below msl in the vicinity of the GWET pumping wells. Groundwater is diverted around the SA-7 barrier wall but is not impacted by near-surface features on SA-6 North to the same degree as in the Shallow zone. Groundwater elevations within the SA-7 barrier wall are relatively uniform in the range of two to three feet amsl. Vertically, heads within the Intermediate zone are generally one to four feet lower than in the Shallow zone, which indicates a significant downward vertical gradient across the Meadow Mat. This is especially the case west of Route 440 where the Meadow Mat is nearly continuous across the site. **Figure 2-3** also illustrates that the combined groundwater depression in the vicinity of the GWET pumping wells fully encompasses the deep overburden plume and provides an effective capture zone in these upper lacustrine soils.

Deep Zone. Groundwater elevations in the Deep zone (**Figure 2-4**) are similar to those in the overlying Intermediate zone, although the influence of the SA-7 barrier wall is not as prominent. As noted in prior reports, groundwater flow in the Deep zone is, to a degree, able to move beneath the SA-7 barrier wall through gravel lenses in the underlying glacial till/ice contact deposits. At SA-5, the barrier wall does not extend down to the Deep zone and thus does not influence flow. The area of influence of the GWET pumping wells on groundwater flow in the Deep zone is also illustrated on **Figure 2-4**. This zone is wider than that in the Intermediate zone due to the larger pumping rate and the more permeable S-3 formation. The resulting combined groundwater depression in the vicinity of the GWET pumping wells fully encompasses the deep overburden plume and provides effective capture in this deeper flow zone.

Upper Bedrock Zone. Groundwater elevation contours in the Upper Bedrock zone are shown on **Figure 2-5** and are relatively uniform compared to those in the overlying lacustrine units. The steeper contour intervals east of Route 440 reflect the generally lower hydraulic conductivity in that direction, whereas the more widely spaced contours to the west reflect increased fracture spacing in the bedrock in this area. The impact of the GWET pumping well 115-MW-203BR on groundwater flow is also evident from the closed contours along the western border of SA-7. This area is characterized by the southwest-northeast trending high-permeability fracture zone which aids in the propagation of the capture zone parallel to the bulkhead as shown on **Figure 2-5**.

2.1.2 Monitoring of Hydraulic Gradients across the Subsurface Containment Barrier

The LTMP program includes monitoring of the hydraulic gradients across the subsurface containment barrier (SCB) around the perimeter of SA-7. This is accomplished through monitoring of the head in each of the ten "perimeter pools" and comparing these data to groundwater elevations in various shallow piezometers located just outside of the SCB. The location of the perimeter pools and the design pool elevations are shown on **Figure 2-6**. Water level trends are plotted on the hydrographs in Appendix C which indicate the average ground surface elevation, the design pool elevation, the measured pool elevation, and the groundwater elevation in the closest piezometer outside of the wall.

Overall, the data indicate that, with a few exceptions, water levels within the SA-7 pools are greater than those outside of the SCB and thus outward gradients are occurring. The exceptions include pools N-3 and N-4 at which water levels in the wells/piezometers were occasionally at or above the measured pool elevation. However, as shown on **Table 2-1**, the annual average head in these monitoring points was either equal to the pool elevation (in the case of W1-SO at Pool N3) or below the pool elevation. Thus, the net groundwater flow direction during the year was either stagnant (in the case W1-SO) or outward. Furthermore, a review of the trends in Appendix C reveals that the majority of the exceedances occurred following moderate to heavy rainfall events. This direct (and rapid) correlation between rainfall and water level rise suggests that the permeability of the soil adjacent to the SA-7 barrier wall is relatively low and thus the potential for groundwater to actually migrate through the wall is quite low. For example, using a nominal wall thickness of three feet, an inward head difference of six inches, a wall permeability of 1.0 x 10 -7 cm/s (0.00028 ft/d), and a porosity of 0.3, the velocity of water moving through wall is calculated at 0.00015 feet per day. The time required for water to pass through the wall under this scenario, therefore is calculated at 20,000 days or over 54 years.

The final exception, and only location in which an inward gradient was observed based on annual average heads, is at Pool S-3. Here, well W5-SO reported an annual average head of 7.73 feet (**Table 2-1**) or approximately 6 inches greater than the pool elevation of 7.2 feet. However, 2011 was an extremely wet year with an annual rainfall total of 69.91 inches (at Newark Airport) which is nearly 24 inches greater than the 30 year annual average of 46 inches. The combination of excessive rainfall and low permeabitliy soils resulted in above normal groundwater elevations along this portion of the wall.

Going forward, the likelihood of significant or sustained inward gradients across the barrier wall is small. Groundwater levels outside of the SA-7 SCB wall are expected to decline when precipitation rates return to normal and a low permeability cover is proposed along the wall in SA-6 North and SA-6 South as part of the soil remedy/redevelopment plans. Groundwater modeling of this future scenario indicates that groundwater levels will be lowered to an elevation at or below +4.0 feet above mean sea level. If this is not the case, contingent groundwater pumping is proposed to achieve this objective.

2.2 Tidal Monitoring

Tidal monitoring was conducted using a pressure transducer and automatic data recorder located on the SA-7 bulkhead. River stage data were automatically recorded every six minutes in NGVD-29 datum and used to correct groundwater elevations for tidal influences.

2.3 Flow Rate Monitoring

Flow rate monitoring was conducted on each of the three force mains using flow meters located within the treatment plant, prior to flow equalization. The flow rates were controlled by a manually-operated valve by the treatment plant operator and adjusted as necessary to maintain design rates of 40 gpm and 7.5 gpm for overburden GWET wells PW-1 and PW-2, and 7.5 gpm for bedrock GWET well 115-MW-203BR. **Figure 2-7** illustrates the pumping history during 2011 and identifies the various events which resulted in the system being shut down for more than 8 hours. **Table 2-3** provides an explanation of the reasons for the shutdowns. In general, the GWET system performed as designed and was generally reliable throughout the year.

3 GROUNDWATER QUALITY MONITORING

In accordance with the LTMP, the objectives of groundwater quality monitoring are to:

1) Confirm that the horizontal and vertical extent of the plume is within the capture zone of the Groundwater Remedy by monitoring wells around the perimeter of the plume.
2) Monitor the effluent quality of the discharged water from each of the three extraction wells.
3) Assess the effectiveness of the GWET system at pulling back the river-ward portion of the deep overburden plume.
4) Monitor the water quality in the vicinity of the “plume diversion area” south of the SA-7 barrier wall. This has been accomplished through monitoring of selected perimeter wells around this portion of the plume.

3.1 Monitoring Well Sampling

A total of 27 monitoring wells and three pumping wells were sampled in December 2011, three years after startup of the GWET system. The monitoring wells are screened in the Intermediate, Deep, and Upper Bedrock zones. Monitoring of the Shallow zone is not within the scope of the LTMP.

The wells are generally located on the perimeter of the chromium plume in each layer to assess if the plumes have expanded in a horizontal direction since the last sampling event. Since the GWET system is designed to provide downgradient containment, there is no expectation of significant changes in the extent of the plume, nor in the distribution of chromium concentrations within the plumes. Thus, groundwater monitoring within the plumes is not incorporated into the LTMP. Groundwater quality data from this third annual round are provided in **Table 3-1** and are shown on **Figures 3-1 through 3-6**. Data from the pre-startup round (November 2008), the first annual round (December 2009), and the last round (December 2010) are also shown on the Figures for reference, as are the original plume contours taken from the Final Groundwater Investigation Report (FGIR) [HydroQual, 2007]. Note that these contours do not reflect current conditions, but rather, are shown for reference as noted below.

3.1.1 Bedrock Zone

Groundwater quality within the bedrock was monitored using ten perimeter wells. Hexavalent chromium and total chromium concentrations in unfiltered samples are shown on **Figures 3-1 and 3-2**, respectively. The data on **Figure 3-1** indicate that hexavalent chromium was not detected in any of the wells on this, or any of the three previous sampling dates. This includes well 090-MW-18BR which reported hexavalent chromium at 0.23 ppm in 2006 which has since been found to be non-detect. The data on **Figure 3-2** indicates that total chromium was also non-detect in each of the bedrock wells with the exception of 090-MW-18BR. Reported concentration in the unfiltered samples declined from 0.367 ppm in 2006 (which is what the contours are based upon) to below the NJ Ground Water Quality Standard of 0.07 ppm in each of the subsequent rounds.

3.1.2 Intermediate Overburden Zone

Groundwater quality data from the Intermediate overburden water-bearing zone was monitored in 5 wells as shown on **Figures 3-3 and 3-4**. Other than the sample from 117-MW-I5, total chromium concentrations were reported to be non-detected during this monitoring event. Both hexavalent and total chromium concentrations in well 117-MW-15 indicate lower, but generally stable concentrations in the 0.2 to 0.6 ppm range. The minor detections (below NJGWQC) in wells SA6-MW-AA1D and 117-MW-I1 during the previous events was not repeated in 2011.

3.1.3 Deep Overburden Zone/Plume Diversion Area

Groundwater quality data from the Deep overburden water-bearing zone is provided on **Figures 3-5 and 3-6**. Hexavalent chromium (**Figure 3-5**) was detected in three of the eleven wells monitored during the past three years. Well 124-MW-104T had a reported concentration of 0.060 ppm which is slightly higher, but generally on par with previous results. Well 124-MW-102T had a reported concentration of 0.012 ppm during this event, the first detection recorded at this well since 2008 but on par with the initial reported concentration of 0.011 ppm during the 2006 sampling event (upon which the contours are based). Concentrations at both these wells are below the NJGWQC of 0.07 ppm. These wells are in the plume diversion area and thus these data confirm that hexavalent chromium has not expanded due to the construction of the SA-7 perimeter cutoff wall. Total chromium concentrations (**Figure 3-6**) were similar to those measured in 2006 (refer to Figure 4.5-6 of the FGIR) and previous rounds are shown to vary slightly from event to event. This is likely due to the presence of trivalent chromium sorbed onto soil particles that become dislodged from the well during sampling and end up in the non-filtered sample.

Deep zone monitoring well 115-MW-E08T was destroyed during the SA-7 soil remedy and replaced in July 2010 with well 115-MW-EO8TR. Although this well is in the center of the deep plume, it was voluntarily included in this sampling event to provide baseline data for future comparisons if needed. Total and hexavalent chromium were reported at concentrations of 11.9 ppm and 13.0 ppm, respectively, which match well with the overall configuration of the plume as originally mapped in 2006 as shown on **Figures 3-5 and 3-6**.

3.2 Pumping well sampling

Groundwater discharged from the three GWET pumping wells was sampled on a monthly frequency on a voluntary basis by Honeywell. (The LTMP only requires quarterly sampling.) Samples were analyzed for total and hexavalent chromium and volatile organic chemicals (VOC). The results for hexavalent chromium are plotted on a time-series chart on **Figure 3-7** and are tabulated in **Table 3-2**. Concentrations in the Deep zone (PW-1) have declined in an asymptotic fashion from pre-startup levels of 150 ppm to approximately 40 ppm. Data from the Intermediate zone (PW-2) initially increased from 5 ppm to 40 ppm, but have since also declined to approximately 15 ppm. The observed slow decline in concentration is likely due to cleaner water being pulled into the pumping wells as the capture zone establishes itself. The cleaner water originates at the margins of the capture zone including beneath the river as the plume is pulled back. Hexavalent chromium concentrations in the bedrock have been generally stable, ranging from 10 to 20 ppm.

VOC data from the pumping wells is provided in **Table 3-2**. With the exception of carbon tetrachloride and occasionally chloroform (laboratory estimated values), VOCs have not been detected in the bedrock pumping well. Deep overburden pumping well PW-1 contains the highest VOC concentrations with the most prevalent compounds being chlorinated volatile organics such as trichloroethene (TCE) and its daughter products cis- and trans-dichloroethene and vinyl chloride. These same constituents were detected in the Intermediate zone pumping well PW-2 albeit at lower concentrations. Benzene was also detected in relatively low concentrations in PW-1 and PW-2 samples.

Figure 3-8 illustrates a time-series plot of TCE in each of the GWET pumping wells. The data indicate that concentrations increased during the first 5 months of pumping and then began to recede. Currently TCE concentrations in both PW-1 and PW-2 are in the 80 to 180 ppb range and are continuing to slowly decline. As previsouly reported, the source of the VOCs in the groundwater is not related to Honeywell.

4 RECOMMENDATIONS

Based on the results of the LTMP for the third year of GWET system operation, the following modifications to the sampling plan are proposed.

- Maintain a quarterly groundwater level monitoring frequency in 2012. Evaluate changes in groundwater elevations and flow direction throughout the year and make recommendations for changing this frequcency as appropriate in the next annual performance report.
- Annual groundwater quality sampling has now been conducted in 2008, 2009, 2010, and 2011. Collectively, these data confirm that there has been no horizontal expansion of the plumes. It is recommended therefore, that the groundwater quality sampling frequency be reduced to once every two years with the next event conducted in December 2013.
- Reduce the sampling frequency of the GWET wells (for chromium and VOCs) from monthly to quarterly. This recommendation is based on a substantial data set that shows a uniform and gradually declining trend in concentrations for these constituents. Due to the capture zone established by the GWET wells, groundwater quality variations have stabilized such that quarterly data are sufficient to provide the necessary level of monitoring and data analysis. The inclusion of VOCs in the laboratory analysis on a quarterly frequency is recommended to continue on a voluntary basis. Additional sampling of the two overburden GWET wells for total and hexavalent chromium will be conducted as part of the S-3 injection monitoring plan. Monthly sampling is not required under the approved Long Term Monitoring Plan (which calls for quarterly sampling), nor under the Consent Decree, and is currently being conducted by Honeywell on a voluntary basis.
- Integrate the various groundwater monitoring plans that have been developed for the different remedial programs associated with SA-5, SA-6, and SA-7. This integration would reduce the duplicity of effort in the field and allow a single periodic assessment of subsurface conditions.

APPENDIX A

TABLES

Table 2-1

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	21-Mar-11 GW Elevation ft, msl	21-Jun-11 GW Elevation ft, msl	12-Sep-11 GW Elevation ft, msl	12-Dec-11 GW Elevation ft, msl
073-MW-10BR-1	Rock	-0.57	-1.19	0.46	0.13
073-MW-10BR-2	Rock	-0.46	-1.11	0.46	NA
073-MW-10BR-3	Rock	0.22	-0.35	0.89	NA
073-MW-10BR-4	Rock	1.11	0.60	1.77	1.25
073-MW-10BR-5	Rock	NA	NA	NA	NA
073-MW-1BR-1	Rock	-1.05	-1.69	-0.04	-0.70
073-MW-1BR-2	Rock	-0.74	-1.28	0.31	-0.35
073-MW-1BR-3	Rock	0.59	0.04	1.50	0.85
073-MW-1BR-4	Rock	0.76	0.18	1.38	0.69
073-MW-1BR-5	Rock	1.09	0.60	1.73	0.98
073-MW-5	Shallow	NA	3.46	2.16	3.71
073-MW-BB11	Shallow	4.51	3.51	4.03	3.42
073-MW-Y10	Shallow	4.47	4.33	4.77	4.10
073-PZ-001	Shallow	NA	3.89	4.63	4.00
073-PZ-002	Intermediate	NA	1.84	2.65	1.51
079-MW-13BR-1	Rock	8.21	7.70	8.89	7.64
079-MW-13BR-2	Rock	8.10	7.80	8.88	8.13
079-MW-13BR-3	Rock	8.20	7.53	8.88	7.90
079-MW-A2	Shallow	4.35	4.01	5.17	4.55
079-MW-C6	Shallow	3.69	5.80	6.96	6.17
087-MW-001	Shallow	7.43	6.69	8.06	7.61
087-MW-01	Deep	4.01	3.59	4.98	3.94
087-MW-03	Deep	3.15	2.70	3.91	2.88
087-MW-08	Deep	2.59	1.30	3.08	2.26
087-MW-101	Shallow	3.55	3.37	4.80	3.53
087-MW-102	Shallow	3.64	3.44	5.24	3.50
087-MW-119	Shallow	4.94	4.59	5.22	2.73
087-MW-120	Shallow	NA	4.52	4.73	4.46
087-MW-121	Shallow	NA	3.28	4.68	2.93
087-MW-13	Intermediate	-0.35	0.24	0.10	-0.32
087-MW-14	Rock	3.29	2.79	2.99	3.70
087-MW-34	Deep	0.40	-0.38	1.12	0.26
087-MW-35	Intermediate	2.57	1.52	2.80	2.18
087-MW-A26	Shallow	3.85	3.50	4.98	3.95
087-MW-A26D	Intermediate	3.78	3.38	4.75	3.70
087-MW-A26T	Deep	3.69	3.32	4.64	3.62
087-MW-I30	Shallow	4.56	4.23	5.14	4.28
087-MW-I30T	Rock	2.87	2.67	3.70	3.04

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	21-Mar-11 GW Elevation ft, msl	21-Jun-11 GW Elevation ft, msl	12-Sep-11 GW Elevation ft, msl	12-Dec-11 GW Elevation ft, msl
087-MW-O19	Shallow	7.98	7.27	NA	7.95
087-MW-O23	Shallow	6.47	5.90	6.43	6.01
087-MW-O29	Shallow	4.56	4.27	4.60	4.40
087-MW-O29D	Intermediate	2.01	1.59	2.81	1.86
087-MW-O29T	Rock	2.64	1.96	3.17	2.62
087-MW-S19	Shallow	NA	NA	NA	NA
087-MW-U28	Shallow	6.75	5.25	5.79	5.37
087-MW-W25	Shallow	5.24	4.61	5.06	4.83
087-MW-W25D	Intermediate	2.79	1.82	2.74	2.31
087-MW-W25T	Deep	2.48	1.57	2.78	2.15
087-MW-Y20	Shallow	3.52	3.47	3.99	3.24
087-OBS-1D	Intermediate	3.39	2.48	3.34	2.97
087-OBS-1L	Deep	2.44	2.38	2.75	2.45
087-OBS-1T	Deep	3.34	1.52	3.76	2.75
087-OBS-2D	Intermediate	-0.63	-1.53	0.02	-0.80
087-OBS-3L	Deep	0.64	0.32	0.85	0.03
087-OBS-4T	Deep	1.68	1.38	2.29	0.74
087-OBS-5D	Intermediate	2.23	1.03	2.60	1.93
087-OBS-5T	Deep	1.07	0.05	1.77	0.91
087-OBS-6D	Intermediate	3.09	2.92	4.33	3.26
087-PW-1	Deep	-21.27	-21.96	-20.59	-20.21
087-PW-2	Intermediate	-11.23	-14.41	-15.33	-17.28
087-PZ-001	Shallow	4.72	3.95	5.45	4.28
087-PZ-002	Intermediate	3.02	2.13	3.03	2.52
087-PZ-003	Shallow	6.28	5.54	7.33	6.30
087-PZ-004	Intermediate	2.76	2.80	3.90	2.78
087-PZ-005	Shallow	NA	NA	8.61	2.17
087-PZ-006	Intermediate	NA	NA	3.01	NA
088-MW-001	Shallow	5.66	4.78	5.99	5.95
088-MW-002	Shallow	8.78	7.10	8.43	8.60
088-MW-101	Shallow	4.07	3.52	5.48	3.91
088-MW-102	Shallow	5.21	4.29	6.22	5.50
088-MW-103	Shallow	3.78	3.79	6.05	3.55
088-MW-15	Intermediate	NA	NA	NA	3.16
088-MW-G19T	Deep	3.24	3.26	4.18	3.39
088-PZ-001	Shallow	6.49	4.19	7.29	6.55
088-PZ-002	Intermediate	4.52	5.21	5.45	4.57
088-PZ-003	Shallow	6.37	5.96	7.21	6.36
088-PZ-004	Intermediate	3.34	2.96	3.94	3.13

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	21-Mar-11 GW Elevation ft, msl	21-Jun-11 GW Elevation ft, msl	12-Sep-11 GW Elevation ft, msl	12-Dec-11 GW Elevation ft, msl
090-MW-09	Deep	NA	6.82	NA	4.93
090-MW-18BR	Rock	6.21	6.82	7.88	-9.46
090-MW-7BR-1	Rock	NA	5.05	5.98	5.58
090-MW-7BR-2	Rock	NA	4.99	5.99	5.28
090-MW-7BR-3	Rock	NA	5.06	5.88	5.27
090-MW-F14	Shallow	12.36	12.37	12.71	12.61
090-PZ-05	Shallow	NA	NA	NA	8.00
090-PZ-06	Shallow	NA	NA	NA	10.34
115-E1-DI	Intermediate	3.14	2.99	4.17	2.97
115-E1-DO	Intermediate	3.44	3.14	3.96	3.10
115-E1-SO	Shallow	NA	4.74	5.38	6.43
115-E2-DO	Intermediate	4.96	4.77	5.49	5.09
115-E2-SO	Shallow	6.54	6.09	6.42	6.47
115-E3-DO	Intermediate	5.25	5.36	7.34	5.84
115-E3-SO	Shallow	7.02	6.53	6.89	7.05
115-E4-DO	Intermediate	4.15	3.82	5.03	4.14
115-E5-DO	Intermediate	3.16	2.85	4.01	2.99
115-E6-DI	Intermediate	3.16	2.91	4.11	3.23
115-E6-DO	Intermediate	2.72	2.82	3.68	2.39
115-MW-20	Deep	2.58	2.81	3.56	2.59
115-MW-203BR	Rock	-0.77	-1.51	0.22	-0.35
115-MW-211BR	Rock	4.07	3.92	4.86	4.01
115-MW-215BR	Rock	-3.15	-3.93	-2.08	-2.65
115-MW-216BR	Rock	4.13	4.01	4.94	4.12
115-MW-E14D	Intermediate	2.80	2.56	3.77	2.62
115-MW-E14T	Deep	3.23	2.96	4.22	3.07
115-OMW-E08TR	Deep	3.40	3.29	4.43	3.32
115-PW-21	Deep	3.50	-3.50	4.15	3.02
115-W1-DO	Intermediate	2.22	1.87	2.84	2.06
115-W1-SO	Shallow	6.50	7.39	8.53	7.65
115-W4-DO	Intermediate	2.45	2.61	3.06	2.16
117-MW-3BR-1	Rock	5.87	5.67	8.14	8.68
117-MW-3BR-2	Rock	6.70	6.43	7.36	7.29
117-MW-8BR	Rock	6.00	4.89	6.68	6.05
117-MW-A05	Shallow	NA	7.35	8.52	7.90
117-MW-A14	Shallow	5.85	5.64	6.31	5.89
117-MW-A62	Shallow	5.97	6.53	6.76	6.83
117-MW-A85	Shallow	9.20	5.77	6.18	5.93
117-MW-A89	Shallow	5.13	4.87	5.71	5.16
117-MW-A99	Shallow	6.20	6.17	9.47	6.39
117-MW-D1	Deep	3.95	3.70	4.53	3.98

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	21-Mar-11 GW Elevation ft, msl	21-Jun-11 GW Elevation ft, msl	12-Sep-11 GW Elevation ft, msl	12-Dec-11 GW Elevation ft, msl
117-MW-D2	Deep	5.10	4.77	5.57	5.47
117-MW-D3	Deep	5.28	6.48	7.38	6.82
117-MW-I1	Intermediate	4.01	4.16	4.97	4.52
117-MW-I2	Intermediate	6.50	5.70	6.75	6.03
117-MW-I3	Intermediate	5.34	5.53	9.47	5.64
117-MW-I4	Intermediate	NA	6.24	7.07	6.55
117-MW-I4S	Shallow	NA	6.35	6.92	6.65
117-MW-I5	Intermediate	5.93	7.02	7.65	7.48
119-MW-01T	Deep	3.00	2.76	3.92	2.74
119-MW-02T	Deep	3.72	3.55	4.43	3.69
119-MW-11BR	Rock	4.48	3.90	5.11	4.12
119-MW-12BR	Rock	5.57	5.41	6.26	5.57
119-MW-16BR-1	Rock	NA	NA	7.90	5.23
119-MW-16BR-2	Rock	4.63	4.53	5.28	4.64
119-MW-16BR-3	Rock	4.54	4.45	5.18	4.58
119-MW-2BR-1	Rock	NA	NA	NA	-0.02
119-MW-2BR-2	Rock	NA	NA	NA	0.26
119-MW-2BR-3	Rock	NA	NA	NA	0.64
119-MW-4BR-1	Rock	4.42	4.52	4.25	4.44
119-MW-4BR-2	Rock	4.97	4.62	4.13	4.26
119-MW-4BR-3	Rock	4.95	4.55	4.46	4.62
124-MW-02	Shallow	7.28	6.73	3.60	6.68
124-MW-06	Deep	3.66	3.54	4.40	3.55
124-MW-102D	Intermediate	3.37	3.04	3.87	3.01
124-MW-102T	Deep	3.72	3.69	4.63	3.94
124-MW-103D	Intermediate	3.48	3.20	4.00	3.19
124-MW-103L	Deep	3.52	3.40	4.29	3.41
124-MW-104D	Intermediate	3.49	3.16	3.94	3.21
124-MW-104L	Deep	3.90	3.63	4.47	3.71
124-MW-104T	Deep	3.66	3.73	4.42	3.56
124-MW-105D	Intermediate	3.78	3.45	4.28	3.44
124-MW-105T	Deep	3.29	3.30	4.19	3.61
124-MW-106T	Deep	3.25	3.35	4.24	3.24
124-MW-107T	Deep	3.03	3.18	4.20	3.10
124-MW-10	Shallow	NA	NA	5.18	4.93
124-MW-11	Shallow	NA	NA	5.96	NA
124-MW-17BR-1	Rock	3.92	3.92	4.67	3.97
124-MW-17BR-2	Rock	3.98	3.88	4.58	4.03
124-MW-8BR	Rock	4.01	3.98	4.73	3.99
124-MW-G02D	Intermediate	3.32	3.14	3.81	3.11
124-MW-G02T	Deep	2.92	2.93	3.49	3.49

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	21-Mar-11 GW Elevation ft, msl	21-Jun-11 GW Elevation ft, msl	12-Sep-11 GW Elevation ft, msl	12-Dec-11 GW Elevation ft, msl
125-MW-01	Shallow	7.10	6.62	6.77	6.46
125-PZ-001	Shallow	NA	7.10	7.96	7.65
125-PZ-002	Intermediate	NA	3.02	3.79	2.83
125-PZ-003	Shallow	NA	4.98	5.87	5.78
125-PZ-004	Intermediate	NA	3.07	3.93	2.92
134-MW-2	Shallow	NA	NA	6.55	6.78
134-MW-Q08	Shallow	7.23	6.80	6.97	6.81
134-MW-V09	Shallow	5.47	5.88	6.41	5.43
134-PZ-001	Shallow	NA	4.41	5.51	4.89
134-PZ-002	Intermediate	NA	2.30	2.69	1.78
134-PZ-003	Shallow	NA	6.47	7.19	7.01
134-PZ-004	Intermediate	NA	2.46	3.13	2.14
140-MW-04	Shallow	5.89	5.37	5.82	5.43
140-MW-06	Shallow	7.32	7.23	7.31	7.05
140-MW-07	Shallow	6.08	5.49	5.75	4.93
140-MW-08	Shallow	NA	NA	6.22	5.38
140-MW-1R	Shallow	6.13	5.56	6.04	5.48
140-MW-9BR-1	Rock	1.82	1.72	2.05	1.75
140-MW-9BR-2	Rock	3.52	3.21	3.60	3.24
140-MW-9BR-3	Rock	3.47	3.29	3.72	3.35
140-MW-P05D	Intermediate	3.44	3.23	3.50	2.46
140-PZ-001	Shallow	NA	5.84	6.74	6.41
140-PZ-002	Intermediate	NA	2.81	3.45	2.45
153-MW-02	Shallow	NA	NA	NA	NA
153-MW-05	Shallow	NA	NA	NA	NA
153-MW-A13	Shallow	4.13	3.40	4.51	4.11
153-MW-A13T	Deep	3.93	3.63	3.89	4.32
153-MW-A15	Shallow	3.22	2.87	3.68	3.14
154-MW-A01	Shallow	11.99	11.09	11.95	11.77
154-MW-A06	Shallow	11.56	11.85	13.86	13.88
154-MW-A5A	Shallow	12.11	11.12	11.97	11.93
154-MW-B6A	Shallow	13.25	12.12	13.63	13.37
154-MW-C6A	Shallow	12.88	11.85	12.77	12.75
154-MW-D01	Shallow	13.53	12.21	12.87	12.73
154-MW-E08	Shallow	14.07	15.66	14.08	14.01
163-MW-CC08	Shallow	8.51	3.32	NA	NA
163-MW-R05	Shallow	4.93	5.11	6.19	5.35

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	21-Mar-11 GW Elevation ft, msl	21-Jun-11 GW Elevation ft, msl	12-Sep-11 GW Elevation ft, msl	12-Dec-11 GW Elevation ft, msl
184-MW-001	Shallow	NA	7.74	5.33	NA
184-MW-002	Shallow	NA	NA	NA	NA
184-MW-005	Shallow	NA	NA	NA	5.84
184-MW-006	Shallow	NA	NA	NA	8.35
184-MW-C10	Shallow	NA	10.28	10.94	10.92
KP-MW-6BR-1	Rock	2.87	4.22	1.73	5.56
KP-MW-6BR-2	Rock	0.29	0.19	3.15	4.97
KP-MW-6BR-3	Rock	-4.05	-12.96	-1.04	4.91
SA6-MW-14BR	Rock	3.68	2.66	4.45	3.58
SA6-MW-15BR	Rock	1.77	1.09	2.41	1.42
SA6-MW-5BR-1	Rock	2.45	2.57	2.92	1.99
SA6-MW-5BR-2	Rock	2.96	2.97	3.53	2.93
SA6-MW-5BR-3	Rock	3.69	NA	4.52	3.82
SA6-MW-5BR-4	Rock	3.50	3.54	4.20	3.56
SA6-MW-5BR-5	Rock	3.57	3.58	4.38	3.64
SA6-MW-AA1	Shallow	4.60	4.12	4.77	4.54
SA6-MW-AA1D	Intermediate	2.66	1.92	3.17	2.38
SA6-MW-AA1T	Deep	2.23	1.72	2.84	2.07

Table 2-2
Annual Average Groundwater Elevations Near Perimeter Pools

Pool ID	Pool Elevation (ft., msl)	Monitoring Well ID	Annual Average Groundwater Elevation (ft., msl)
N-1	10.0	115-E4-SO	7.04
		115-E5-SO	7.30
N-2	8.0	087-MW-001	7.21
N-3	7.5	115-W1-SO	7.50
		087-MW-O19	7.41
N-4	6.5	087-MW-Y20	4.73
		115-W6-SO	6.55
E-1	9.0	115-E3-SO	7.03
E-2	8.0	115-E2-SO	6.56
S-1	8.0	115-E1A-SO	6.85
S-2	7.5	115-E1A-SO	6.85
		124-MW-06	6.99
		124-MW-07	5.55
S-3	7.0	115-W5-SO	**7.73**
		134-MW-V09	5.65
		134-MW-Q08	6.64
S-4	6.0	115-W3-SO	5.71
		073-MW-B11	3.69
		073-MW-Y10	4.20

Bold: Outside Head Exceeds Pool Elevation

Table 2-3

GWET Pumping Outages in 2011

Well ID	Start Date	End Date	Duration Days and	Hours	Comment
All 3 pumping wells	7-Feb-11	7-Feb-11	--	1	WWTP control PLC shut down for microfilter maintenance.
087-PW-1 and PW-2	2-May-11	3-May-11	1	2.8	Shut down for PW-2 acid line cleaning pump and soak.
115-MW-203BR	2-May-11	3-May-11	1	0.8	Shut down for PW-2 acid line cleaning pump and soak.
All 3 pumping wells	3-May-11	3-May-11	--	0.9	Shut down for the "cross-over" hose removal (after PW-2 pump inlet strainer mechanical cleaning).
All 3 pumping wells	11-May-11	11-May-11	--	0.1	Shut down due to utility power failure.
087-PW-1 and PW-2	15-May-11	15-May-11	--	1	Shut down due to utility power failure.
All 3 pumping wells	27-Jun-11	27-Jun-11	--	1.5	Shut down due to utility power failure.
087-PW-1 and PW-2	13-Jul-11	13-Jul-11	--	3	Shut down due to utility power failure.
087-PW-1 and PW-2	16-Aug-11	16-Aug-11	--	2.2	Shut down and locked for excavation safety during asphalt repairs and access box replacement oi the DiFeo parking lot.
087-PW-1 and PW-2	17-Aug-11	17-Aug-11	--	7.2	Shut down and locked for excavation safety during asphalt repairs and access box replacement oi the DiFeo parking lot.
All 3 pumping wells	27-Aug-11	29-Aug-11	1	11.5	Shut down during the hurricane.
087-PW-2	13-Sep-11	13-Sep-11	--	2.5	Shut down due to overload (pump replaced).
087-PW-1	21-Sep-11	22-Sep-11	1	1.5	Shut down for DiFeo lot shunt installation and for PW-2 acid line cleaning pump and soak.
087-PW-2	21-Sep-11	22-Sep-11	1	2.6	Shut down for WWTP header dissasembly and city water flushing and for the acid line cleaning pump and soak.
115-MW-203BR	21-Sep-11	22-Sep-11	--	23.5	Shut down for PW-2 acid line cleaning pump and soak.
All 3 pumping wells	29-Sep-11	29-Sep-11	--	0.2	Shut down due to a sudden rain event - turned back on after the sump level was restored.
All 3 pumping wells	11-Dec-11	12-Dec-11	--	1.3	Multiple shut downs due to WWTP influent ModuTank selection operated valve switch-overs.
All 3 pumping wells	22-Dec-11	23-Dec-11	--	7.8	Shut down due to power failure and failed PLC power supply.

Table 3-1

Summary of Ground Water Quality Data from Monitoring Wells
December 2011

	Unfiltered		Filtered	
Well	Total Cr (mg/L)	Hex Cr. (mg/L)	Total Cr. (mg/L)	Hex Cr. (mg/L)
079-MW-13BR-2	ND	ND	ND	ND
087-MW-A26D	ND	ND	ND	ND
087-MW-A26T	ND	ND	ND	ND
087-MW-W25D	ND	ND	ND	ND
087-MW-W25T	ND	ND	ND	ND
090-MW-18BR	0.017	ND	ND	ND
117-MW-8BR	ND	ND	ND	ND
117-MW-D3	0.014	ND	ND	ND
117-MW-I1	ND	ND	ND	ND
117-MW-I5	0.232	0.24	0.259	0.24
119-MW-01T	ND	ND	ND	ND
119-MW-02T	ND	ND	ND	ND
119-MW-16BR-2	ND	ND	ND	ND
119-MW-2BR-2	ND	ND	ND	ND
124-MW-102T	0.019	0.012	0.021	0.012
124-MW-104T	0.066	0.060	0.057	0.056
124-MW-106T	0.024	ND	ND	ND
124-MW-107T	ND	ND	ND	ND
124-MW-8BR	ND	ND	ND	ND
124-MW-G02T	ND	ND	ND	ND
140-MW-9BR-1	ND	ND	ND	ND
KP-MW-6BR-1	ND	ND	ND	ND
SA6-MW-14BR	ND	ND	ND	ND
SA6-MW-15BR-1	ND	ND	ND	ND
SA6-MW-AA1D	ND	ND	ND	ND
SA6-MW-AA1T	0.014	ND	ND	ND
115-MW-E08TR	11.9	13.0	12.2	12.0

Table 3-2
Summary of Groundwater Quality Data from GWET Wells

Parameter	14-Jan-11			15-Feb-11			16-Mar-11		
	PW-1 (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	4.3	7.5	ND	4.6	7.3	ND	4.5	7.0	ND
Carbon Tetrachloride	9.2	4.0	1.9	8.9	3.9	1.9	9.6	4.6	2.1
Chloroform	33.3	132	ND	34.4	119	0.20J	36.5	117	0.23J
1,1-Dichloroethene	1.2J	ND	ND	1.2J	ND	ND	1.1J	ND	ND
cis-1,2-Dichloroethene	222	21.3	ND	229	20.8	ND	218	20.2	ND
trans-1,2-Dichloroethene	8.5	0.74J	ND	9.4	0.88J	ND	9.1	1.0J	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	177	101	ND	186	95.6	ND	168	90.1	ND
1,1-Dichloroethane	ND	ND	ND	0.68J	ND	ND	0.72J	ND	ND
Methylene chloride	1.0J	3.7	ND	1.1J	3.5	ND	1.1J	3.2	ND
Vinyl chloride	11.1	3.6	ND	12.2	4.4	ND	12.1	ND	ND
1,2-Dichlorobenzene	0.96J	ND	ND	0.95	ND	ND	0.84J	ND	ND
Chlorobenzene	0.59J	ND	ND	0.60J	ND	ND	0.55J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	50,900	18,500	15,400	47,400	18,300	15,400	50,200	19,700	16,900
Total Chromium	50,600	19,400	15,900	47,900	19,200	15,400	50,400	19,400	16,400

NA = Not Available for Testing due to COPR excavation activities.
ND = Not detected above reporting limit.
J = estimated value.

Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

Parameter	13-Apr-11			16-May-11			13-Jun-11		
	PW-1 (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	5.5	8.2	ND	5.8	7.1	ND	5.1	7.7	ND
Carbon Tetrachloride	9.9	4.1	2.4	13.0	5.2	2.7	11.4	5.9	2.5
Chloroform	42.1	123	ND	47.6	119	ND	43.0	115	ND
1,1-Dichloroethene	1.6	ND	ND	1.7	ND	ND	1.5	ND	ND
cis-1,2-Dichloroethene	283	24.3	ND	277	21.6	ND	255	23.2	ND
trans-1,2-Dichloroethene	10.4	0.99J	ND	11.6	0.94J	ND	10.2	0.81J	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	200	95.9	ND	206	94.9	ND	199	105	ND
1,1-Dichloroethane	0.87J	ND	ND	1.0	ND	ND	0.77J	ND	ND
Methylene chloride	1.3	4.0	ND	1.3	3.6	ND	1.5	2.7	ND
Vinyl chloride	14.4	5.6	ND	14.4	5.3	ND	11.0	5.9	ND
1,2-Dichlorobenzene	1.0	ND	ND	1.1	ND	ND	1.1	ND	ND
Chlorobenzene	0.62J	ND	ND	0.75J	ND	ND	0.72J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	36,000	18,000	16,300	48,100[1]	17,700	17,500	48,100	17,200	15,600
Total Chromium	47,900	17,900	16,100	41,400	17,700	15,700	52,300	18,300	15,600

NA = Not Available for Testing due to COPR excavation activities.
ND = Not detected above reporting limit.
J = estimated value.

Note:
1. Result from sample out of holding time due to the lab error.

Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

Parameter	14-Jul-11 PW-1 (ug/L)	14-Jul-11 PW-2 (ug/L)	14-Jul-11 115-MW-203BR (ug/L)	15-Aug-11 PW-1 (ug/L)	15-Aug-11 PW-2 (ug/L)	15-Aug-11 115-MW-203BR (ug/L)	20-Sep-11 PW-1 (ug/L)	20-Sep-11 PW-2 (ug/L)	20-Sep-11 115-MW-203BR (ug/L)
Benzene	5.3	7.8	ND	4.6	7.4	ND	4.2	6.4	ND
Carbon Tetrachloride	10.3	5.0	2.1	6.7	4.4	2.4	7.1	4.0	1.6
Chloroform	45.7	114	ND	38.9	95.6	0.17J	41.2	92.1	0.18J
1,1-Dichloroethene	1.4	ND	ND	0.92J	ND	ND	1.0	ND	ND
cis-1,2-Dichloroethene	252	23.6	ND	222	21.9	ND	208	20.7	ND
trans-1,2-Dichloroethene	9.9	0.61J	ND	7.6	0.69J	ND	8.4	0.54J	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	188	99.6	ND	162	95.7	ND	152	77.8	ND
1,1-Dichloroethane	0.85J	ND	ND	0.61J	ND	ND	0.67J	ND	ND
Methylene chloride	ND	2.7	ND	1.1	2.2	ND	ND	2.5	ND
Vinyl chloride	14.6	7.5	ND	9.1	6.9	ND	10.7	5.8	ND
1,2-Dichlorobenzene	0.99J	ND	ND	0.93J	ND	ND	0.93J	ND	ND
Chlorobenzene	0.64J	ND	ND	0.60J	ND	ND	0.55J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	47,600	15,900	15,800	43,200	15,200	13,600	47,000	18,400	18,200
Total Chromium	43,700	20,100	15,400	48,500	15,800	15,500	48,400	18,600	17,600

NA = Not Available for Testing due to COPR excavation activities.
ND = Not detected above reporting limit.
J = estimated value.

Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

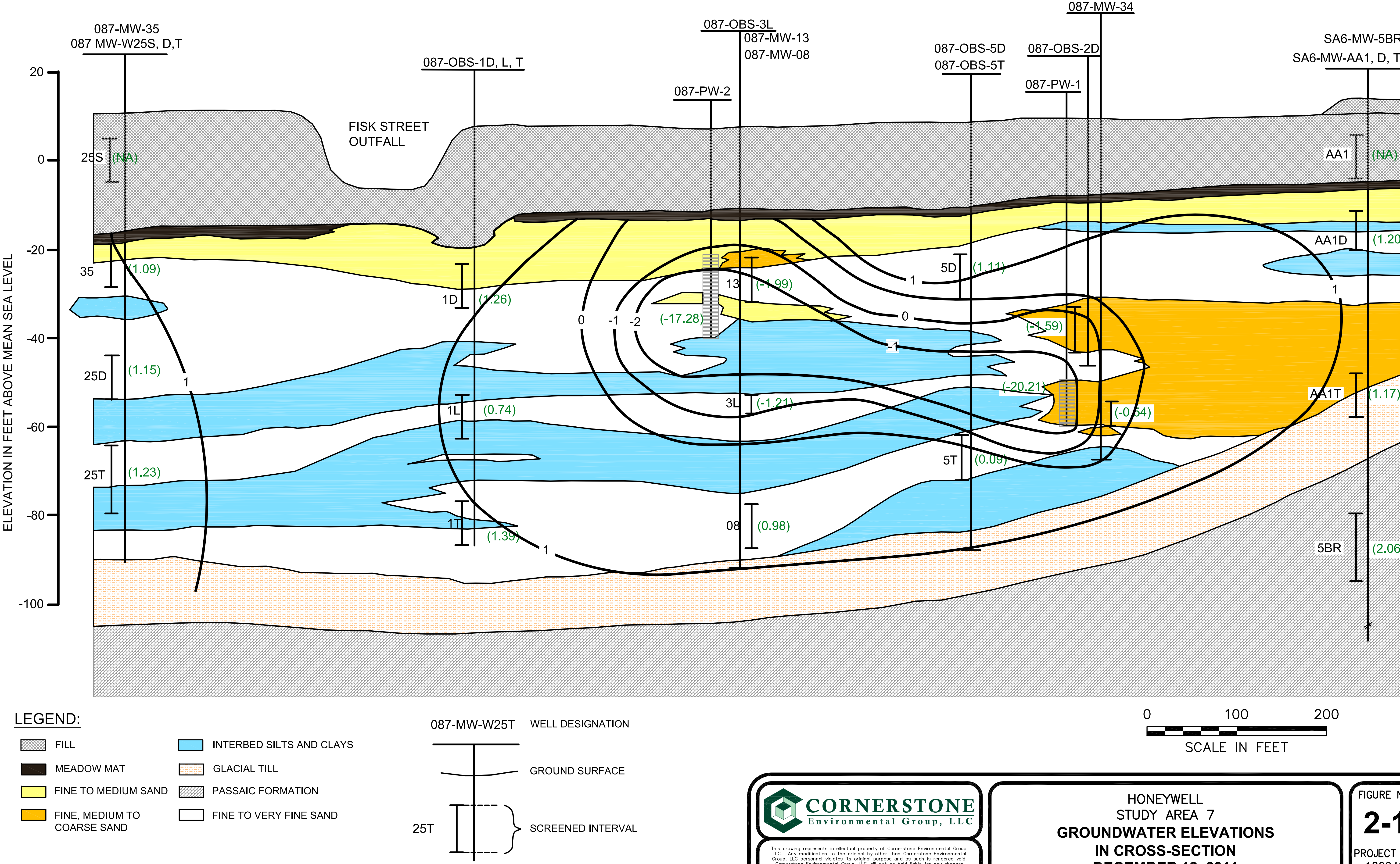
Parameter	19-Oct-11			17-Nov-11			14-Dec-11		
	PW-1 (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	4.9	8.1	ND	4.3	6.7	ND	4.4	6.6	ND
Carbon Tetrachloride	9.4	5.9	2.7	8.1	4.9	1.9	8.8	4.8	2.4
Chloroform	48.5	113.0	0.27J	35.6	72.7	ND	40.2	77.6	ND
1,1-Dichloroethene	1.5J	ND	ND	1.5J	ND	ND	1.3	ND	ND
cis-1,2-Dichloroethene	290	27.9	ND	213	21.0	ND	231	23.3	ND
trans-1,2-Dichloroethene	11.4	0.63J	ND	7.5	0.47J	ND	8.7	0.51J	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	183	103	ND	154	83.7	ND	166	83.0	ND
1,1-Dichloroethane	0.75J	ND	ND	0.59J	ND	ND	0.67J	ND	ND
Methylene chloride	ND	2.9	ND	1.1	1.9	ND	1.1	1.9	ND
Vinyl chloride	12.7	7.9	ND	10.8	6.2	ND	12.1	6.1	ND
1,2-Dichlorobenzene	1.1J	ND	ND	0.87J	ND	ND	0.96J	ND	ND
Chlorobenzene	0.62J	ND	ND	0.54J	ND	ND	0.56J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	0.21J	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	42,200	15,600	16,600	46,000	16,200	16,300	39,900	14,800	18,100
Total Chromium	45,000	49,500[2]	17,000	47,800	18,100	17,000	42,800	17,000	16,700

NA = Not Available for Testing due to COPR excavation activities.
ND = Not detected above reporting limit.
J = estimated value.

Note:
2. Result from sample with suspected elevated turbidity.

APPENDIX B

FIGURES



File: X:\PROJECTS\HONEYWELL\090354 – SA7_PROJECT DRAWINGS\2011– 4Q – Annual Figures\MIHONSF-05.dwg Layout: FIGURE 2-1 BEDROCK ZONE User: magda.mendola Mar 15, 2012 – 1:20pm

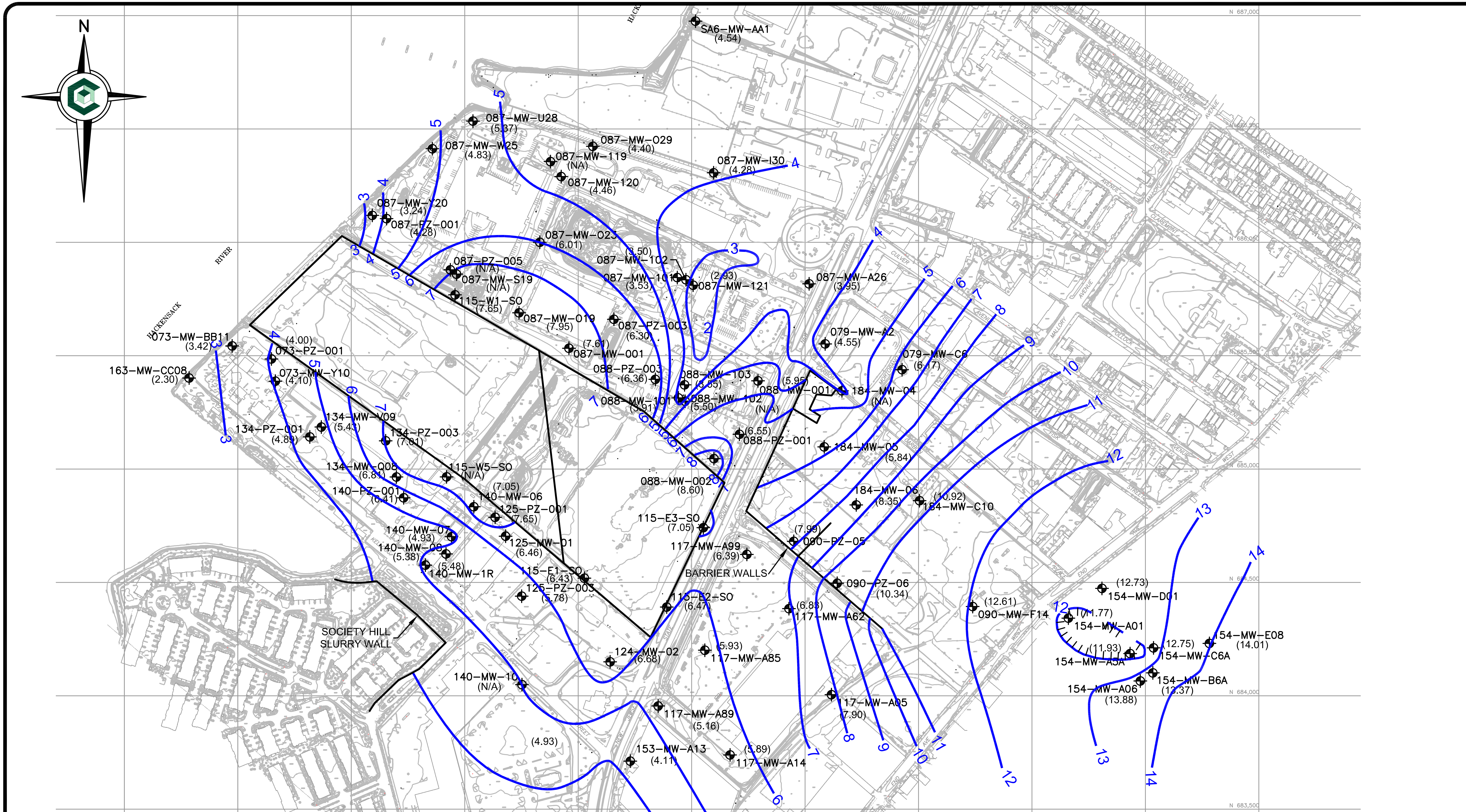
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7
GROUNDWATER ELEVATIONS IN CROSS-SECTION DECEMBER 12, 2011

FIGURE NO.
2-1

PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONSF-01.dwg Layout: FIGURE 2-2 SHALLOW ZONE User: magda.mendola Mar 15, 2012 - 9:12am



LEGEND:

154-MW-E08	SHALLOW MONITORING WELL
(14.01)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)

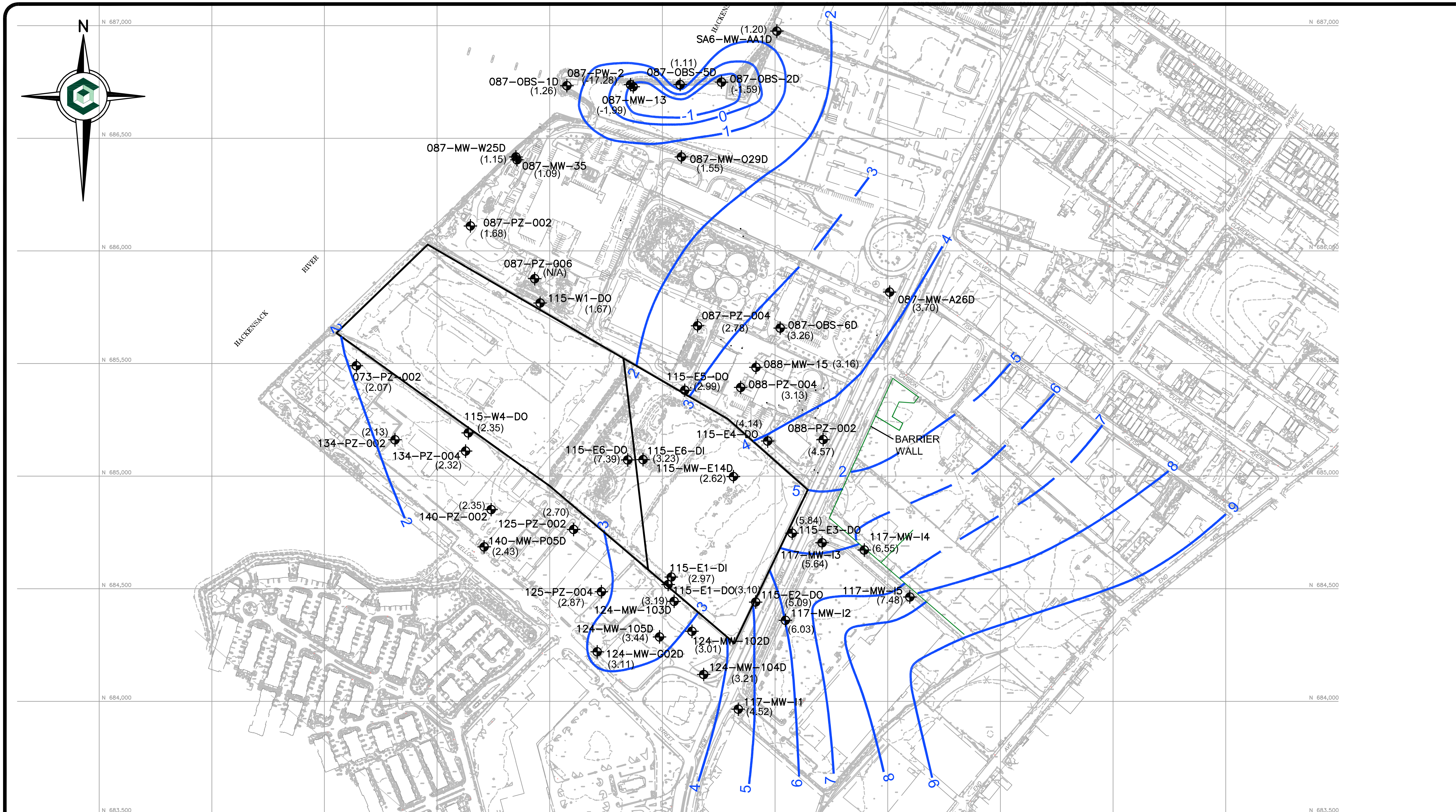
0 400 800
SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS
SHALLOW ZONE - DECEMBER 12, 2011

FIGURE NO.
2-2
PROJECT NO.
120040



LEGEND:

087-MW-029D	INTERMEDIATE ZONE MONITORING WELL
(2.17)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)

0 400 800

SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS
INTERMEDIATE ZONE - DECEMBER 12, 2011

FIGURE NO.
2-3

PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONSF-02.dwg Layout: FIGURE 2-3 INTERMEDIATE ZONE User: blayne.gibbons Feb 21, 2012 - 4:33pm

0 400 800
SCALE IN FEET

LEGEND:

087-MW-01	DEEP ZONE MONITORING WELL
(3.94)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)
*	DATA SUSPECT - NOT USED IN CONTOURING

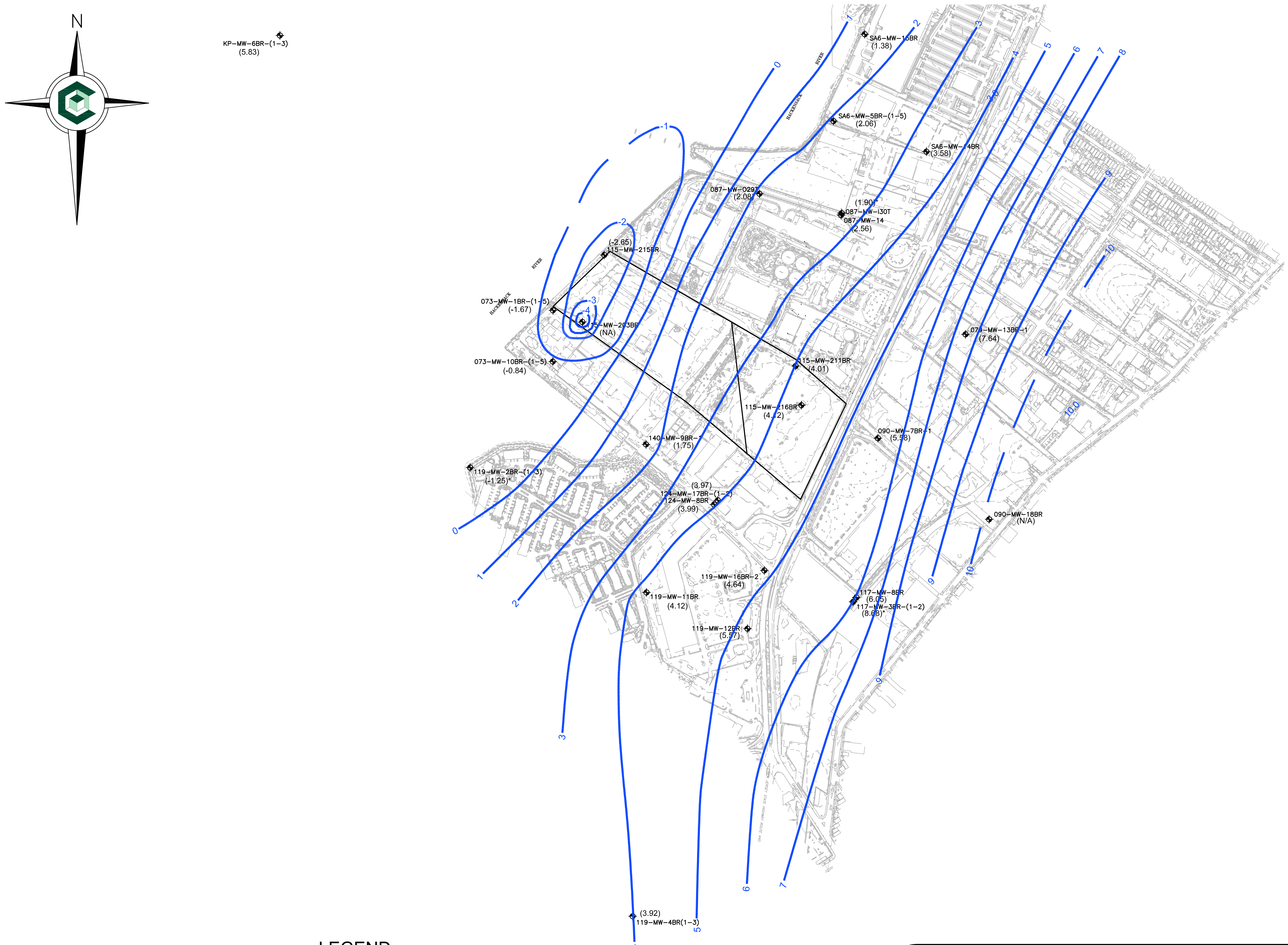
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS
DEEP ZONE - DECEMBER 12, 2011

FIGURE NO.
2-4
PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONSF-03.dwg Layout: FIGURE 2-4 DEEP ZONE User: blayne.gibbons Feb 21, 2012 - 4:26pm



File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONSF-04.dwg Layout: FIGURE 2-5 BEDROCK ZONE User: magda.mendola Mar 15, 2012 - 8:52am

LEGEND:

119-MW-11BR	BEDROCK ZONE MONITORING WELL
(4.12)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)
*	DATA SUSPECT - NOT USED IN CONTOURING

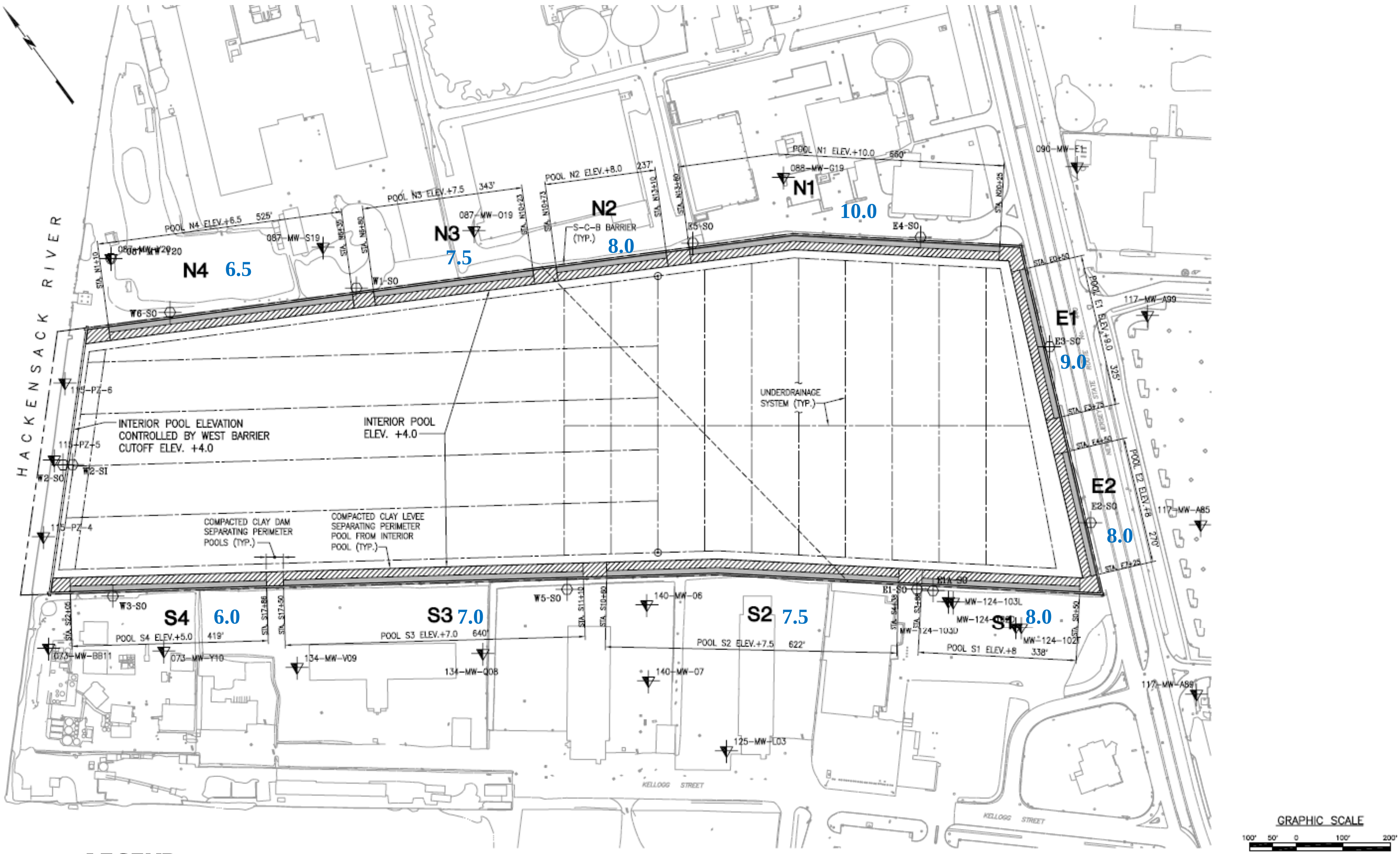
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS
BEDROCK ZONE - DECEMBER 12, 2011

FIGURE NO.
2-5

PROJECT NO.
090354



LEGEND:

N2 – Perimeter Pool

8.0 – Design Elevation of Perimeter Pool Water Level (ft, msl)

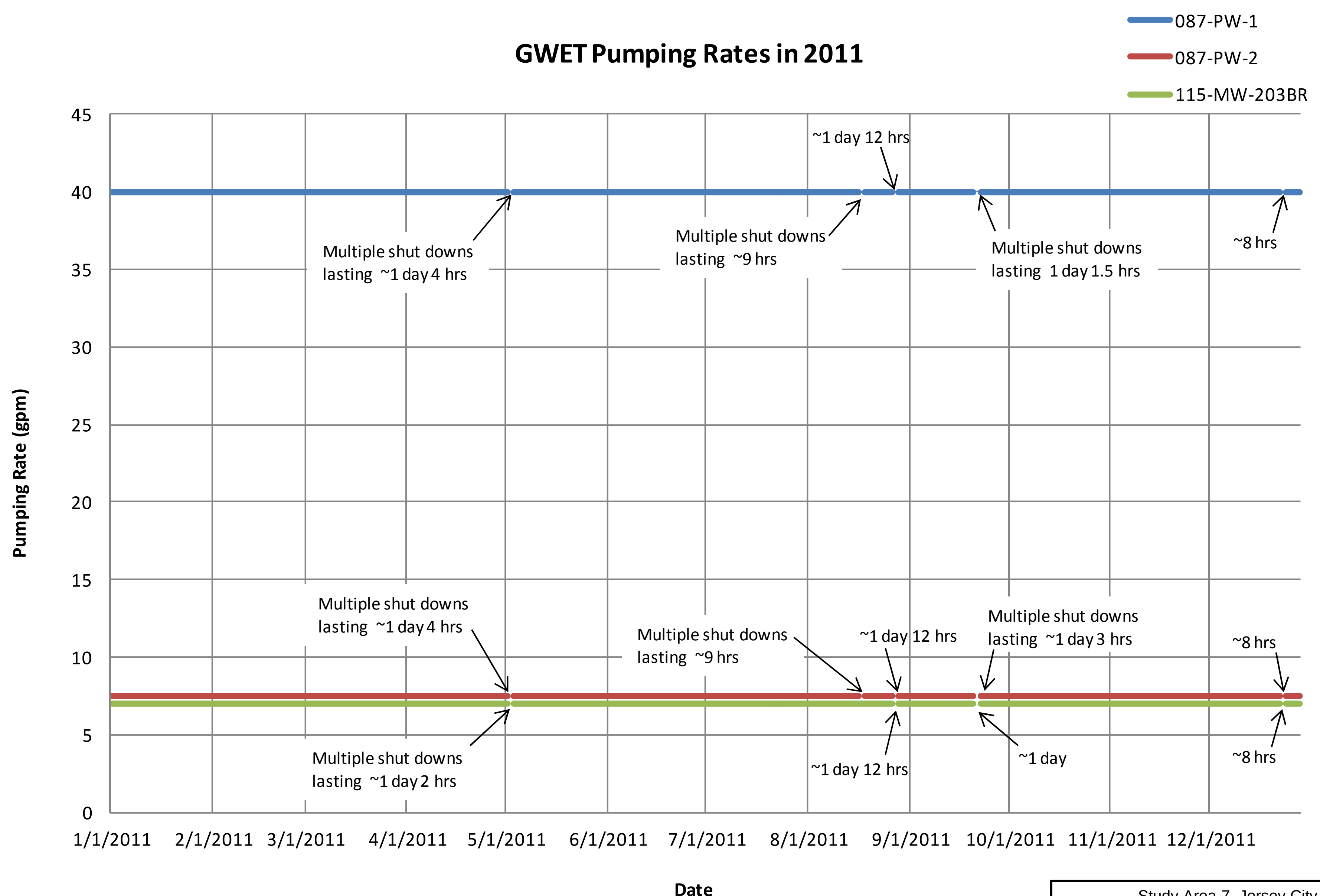
Study Area 7, Jersey City, NJ

Annual Progress Report

Figure 2-6

Location of SA-7 Perimeter Pools

CORNERSTONE Environmental Group, LLC



1. Outages exceeding 8 hour duration shown on graph.
2. For outages details see Table 2-2.

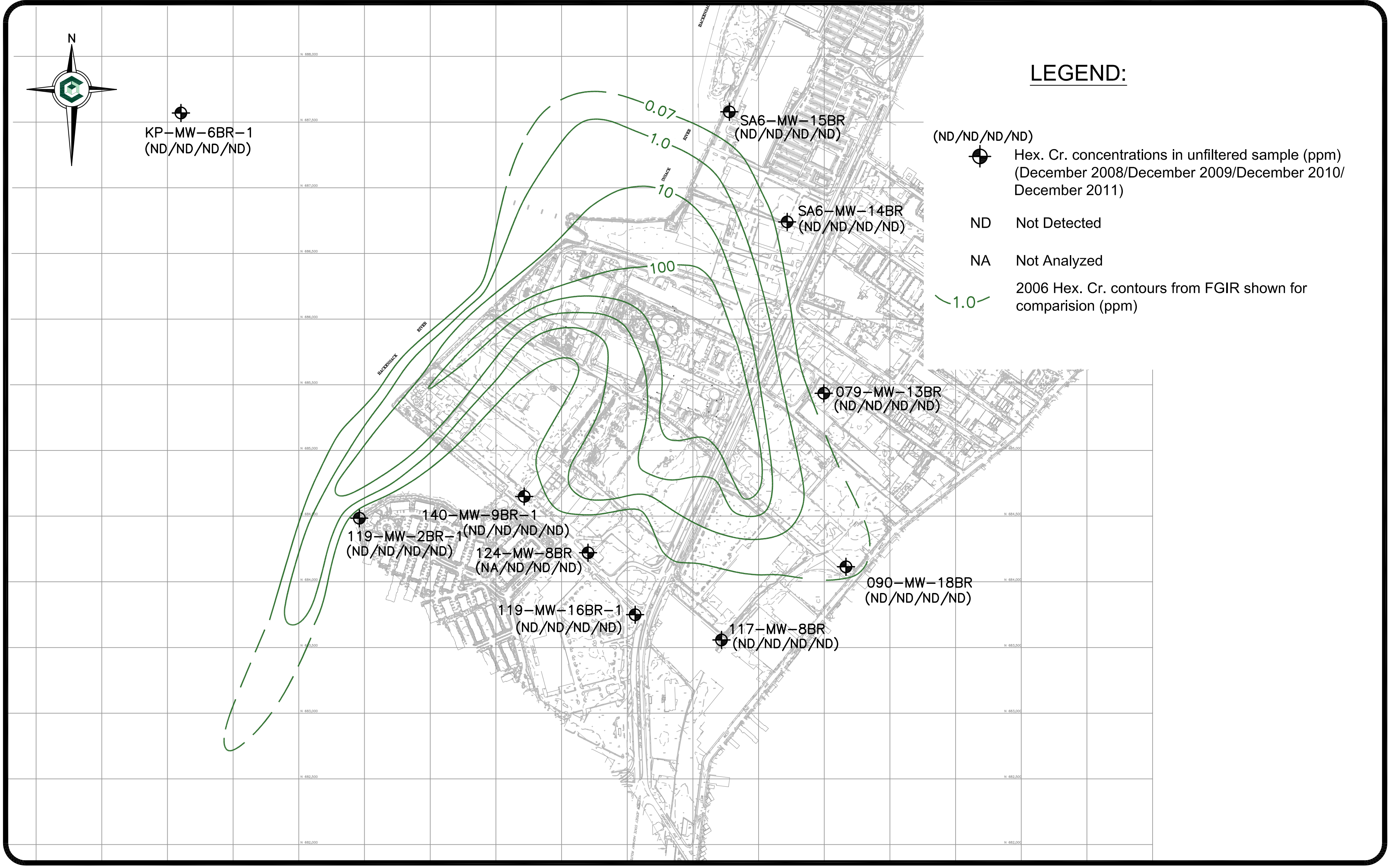
Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 2-7

GWET Pumping Rates in 2011

CORNERSTONE Environmental Group, LLC

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONBRHEX-01.dwg Layout: FIGURE 3-1 HEX CHROM BEDROCK ZONE User: magda.mendola Feb 17, 2012 - 4:55pm



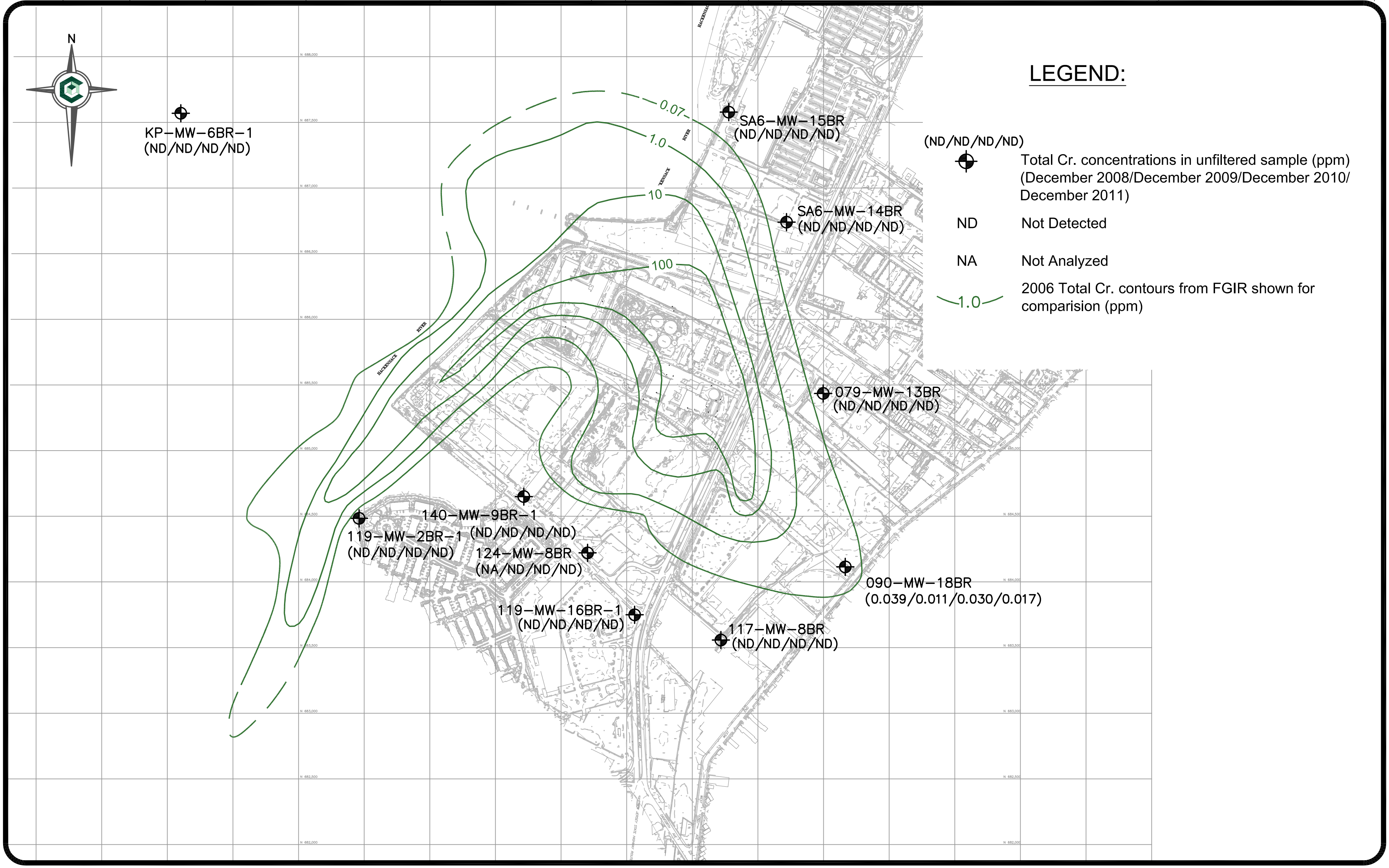
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Bedrock Groundwater

FIGURE NO.
3-1
PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONBRTOT-01.dwg Layout: FIGURE 3-2 TOTAL CHROM BEDROCK ZONE User: magda.mendola Feb 17, 2012 - 5:01pm



0 1000 2000

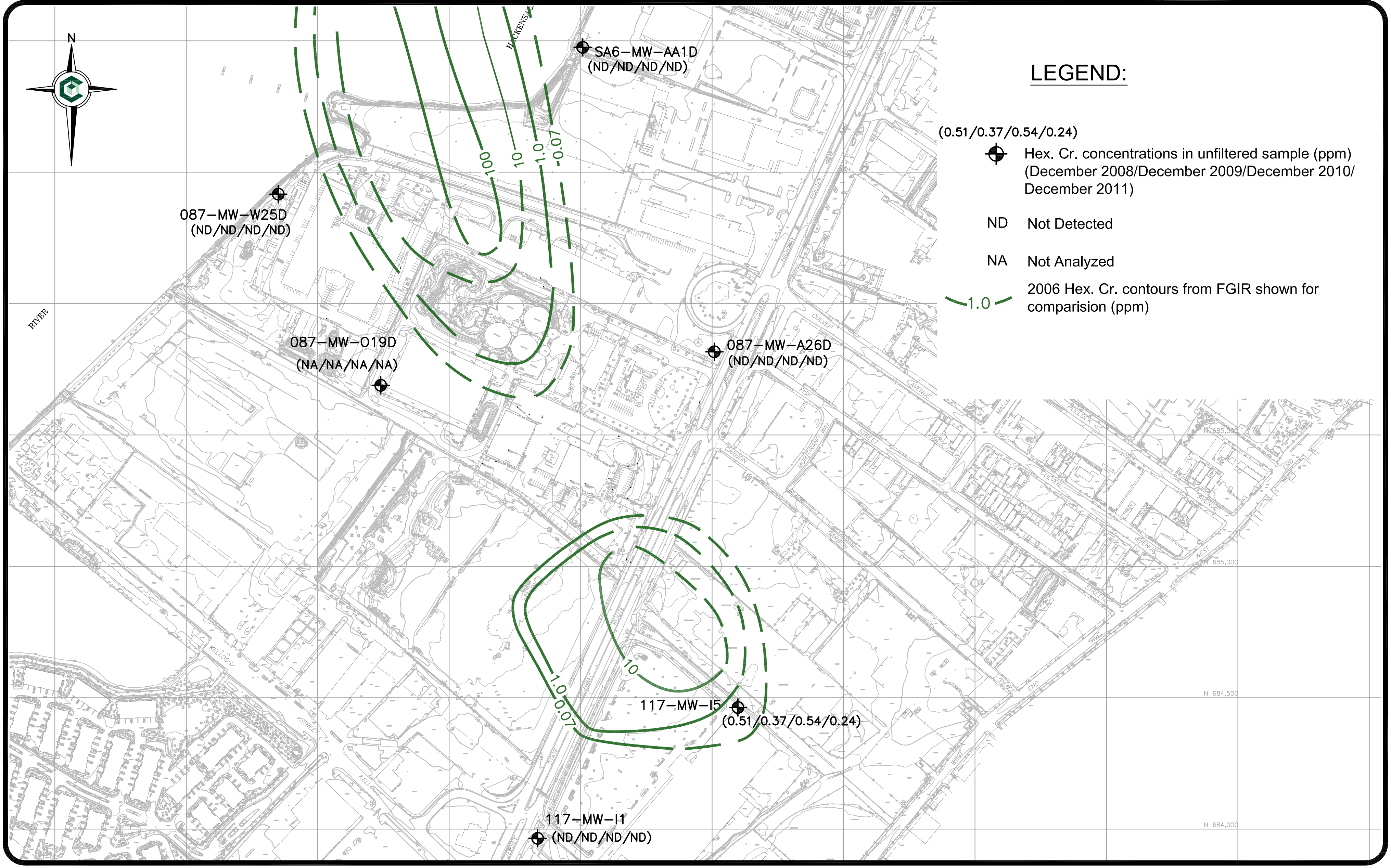
SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Bedrock Groundwater

FIGURE NO.
3-2
PROJECT NO.
120040



0 500 1000

SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

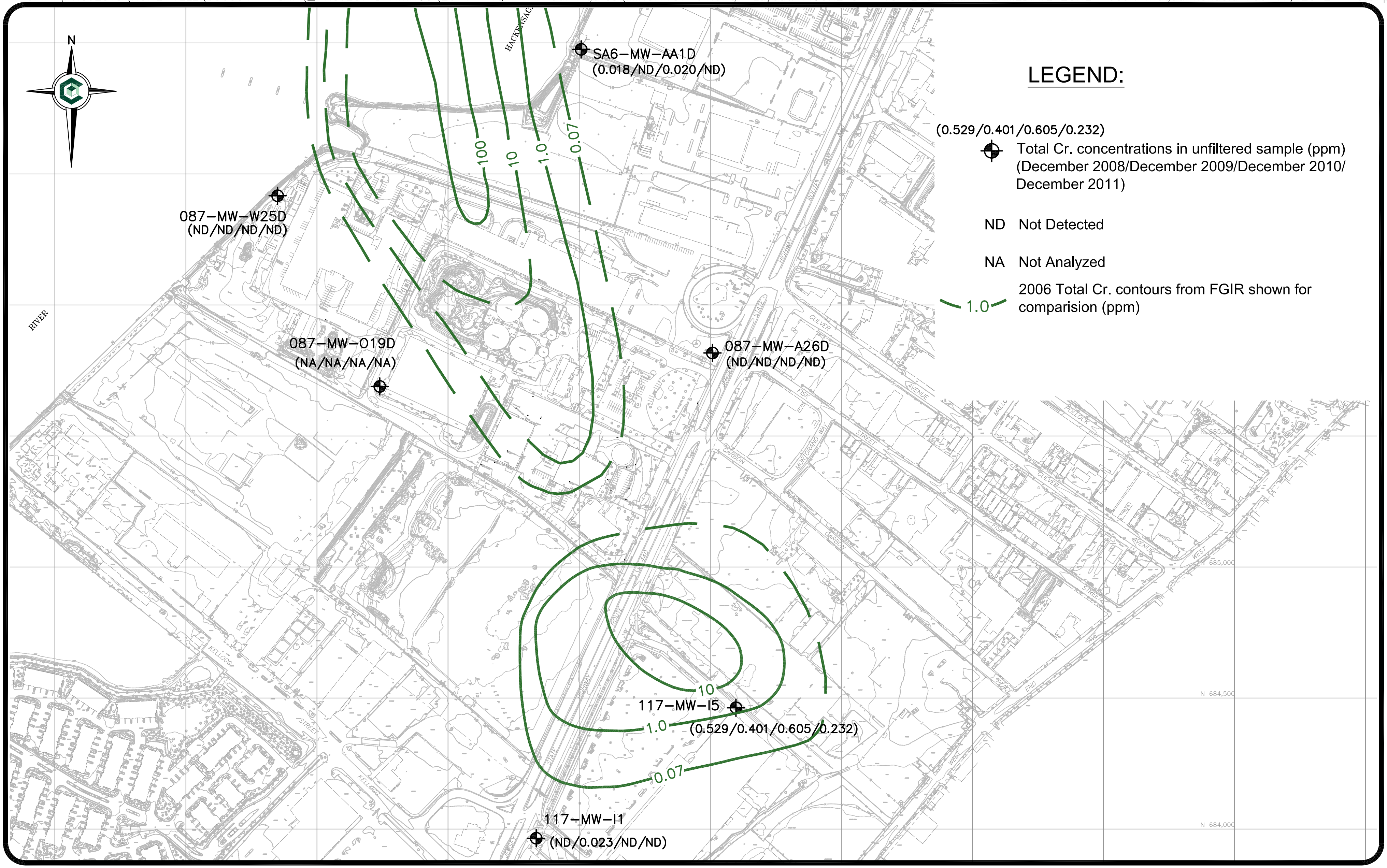
HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Intermediate Zone Groundwater

FIGURE NO.
3-3

PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONITOT-01.dwg Layout: FIGURE 3-4 TOTAL CHROM INTERMEDIATE ZONE User: magda.mendola Feb 17, 2012 - 5:07p



0 500 1000

SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

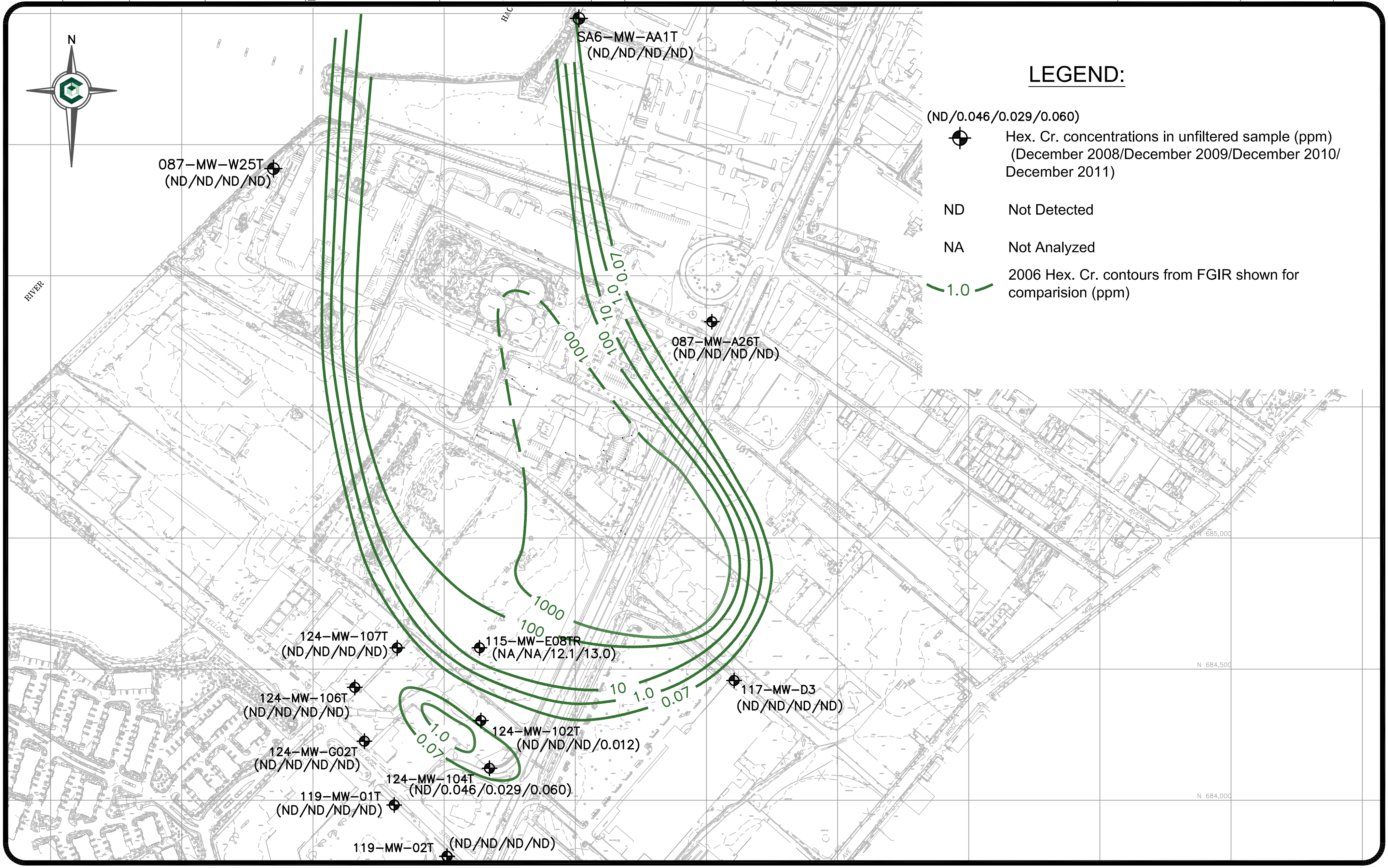
HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Intermediate Zone Groundwater

FIGURE NO.
3-4

PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONDHEX-01.dwg Layout: FIGURE 3-5 HEX CHROM DEEP ZONE User: magda.mendola Mar 13, 2012 - 6:16pm



0 500 1000

SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

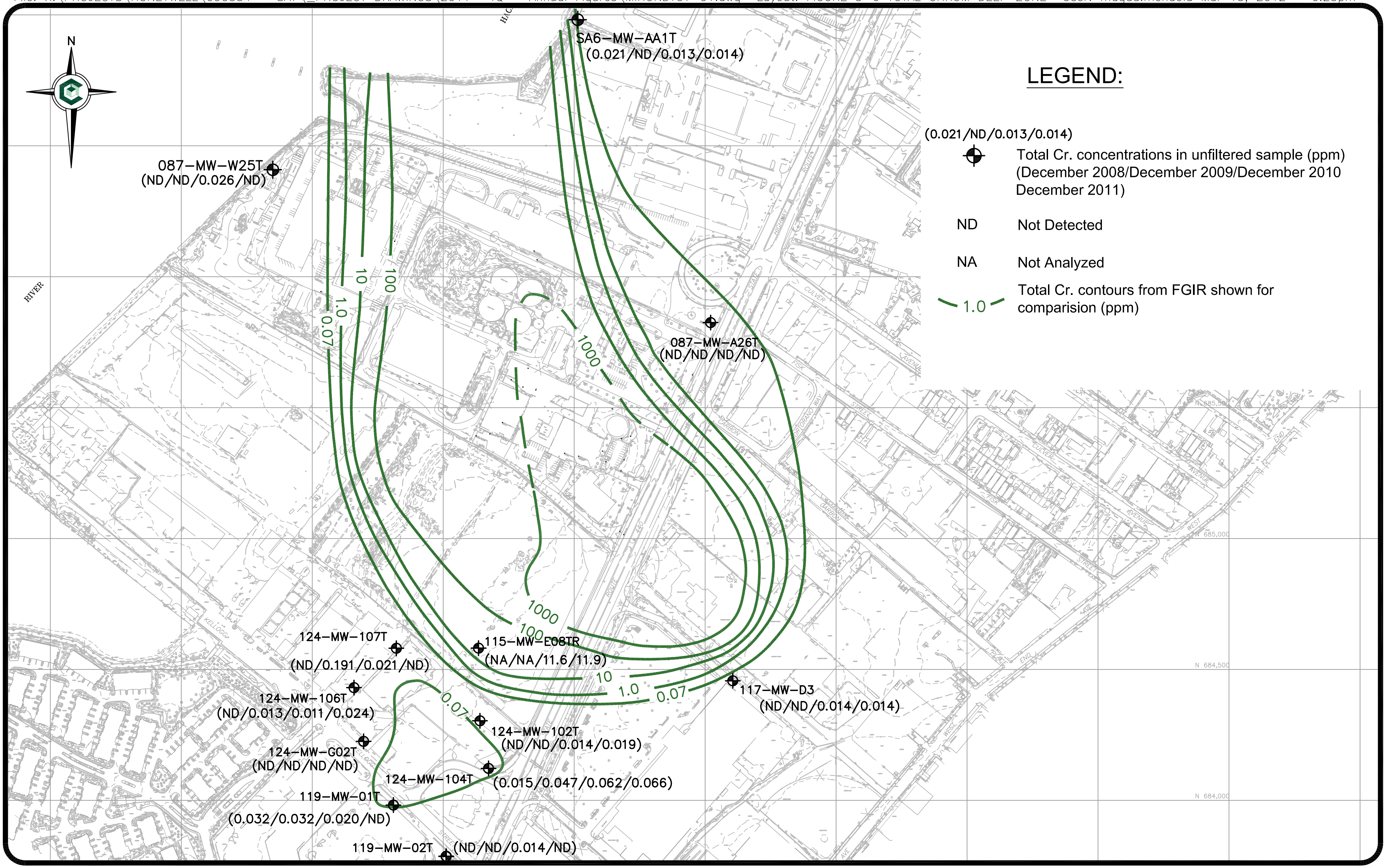
HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Deep Groundwater

FIGURE NO.
3-5

PROJECT NO.
120040

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2011- 4Q - Annual Figures\MIHONDTOT-01.dwg Layout: FIGURE 3-6 TOTAL CHROM DEEP ZONE User: magda.mendola Mar 13, 2012 - 6:25pm

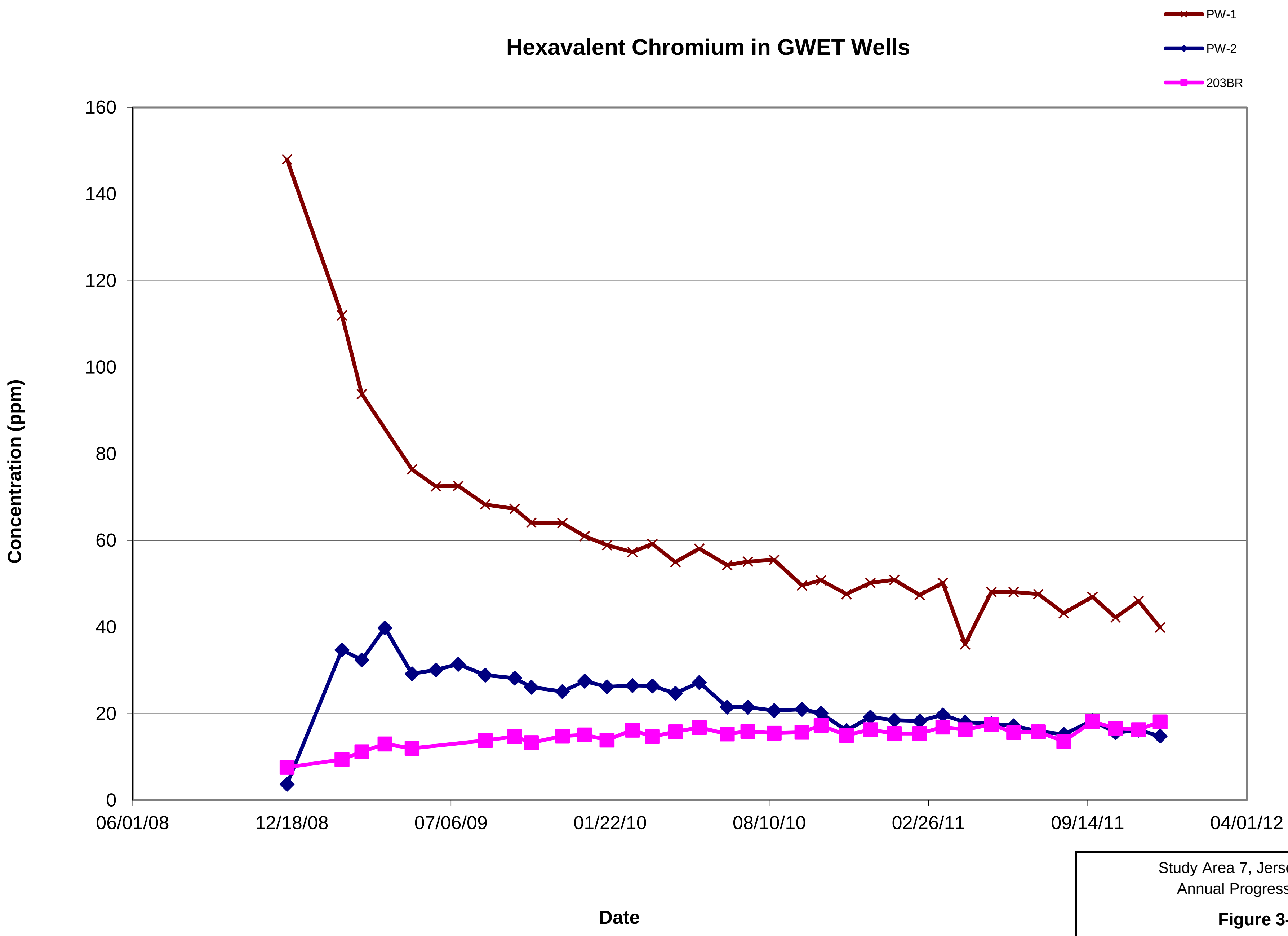


CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Deep Groundwater

FIGURE NO.
3-6
PROJECT NO.
120040

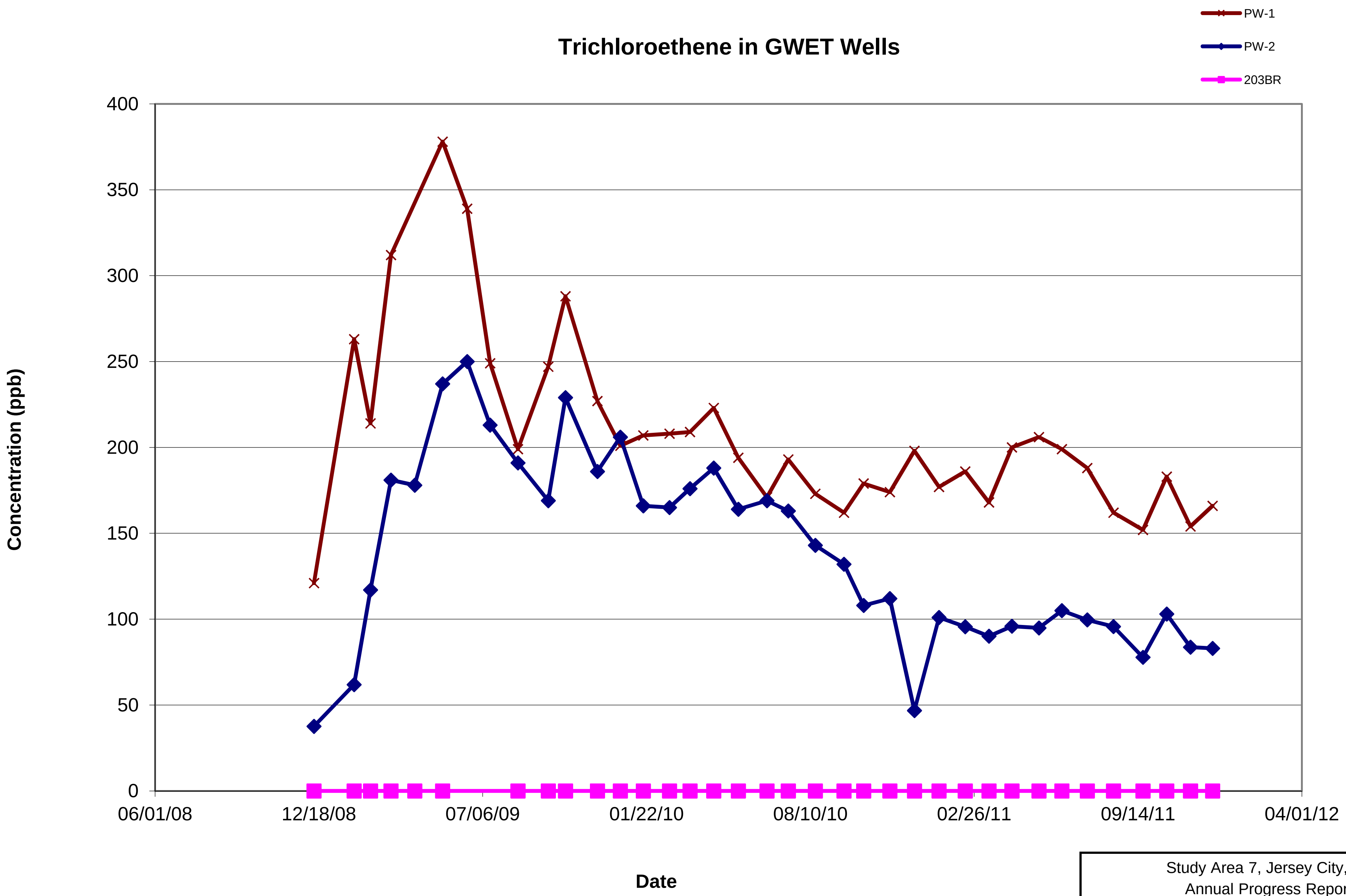


Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 3-7

Hexavalent Chromium Concentrations in GWET Pumping Wells

CORNERSTONE Environmental Group, LLC



Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 3-8

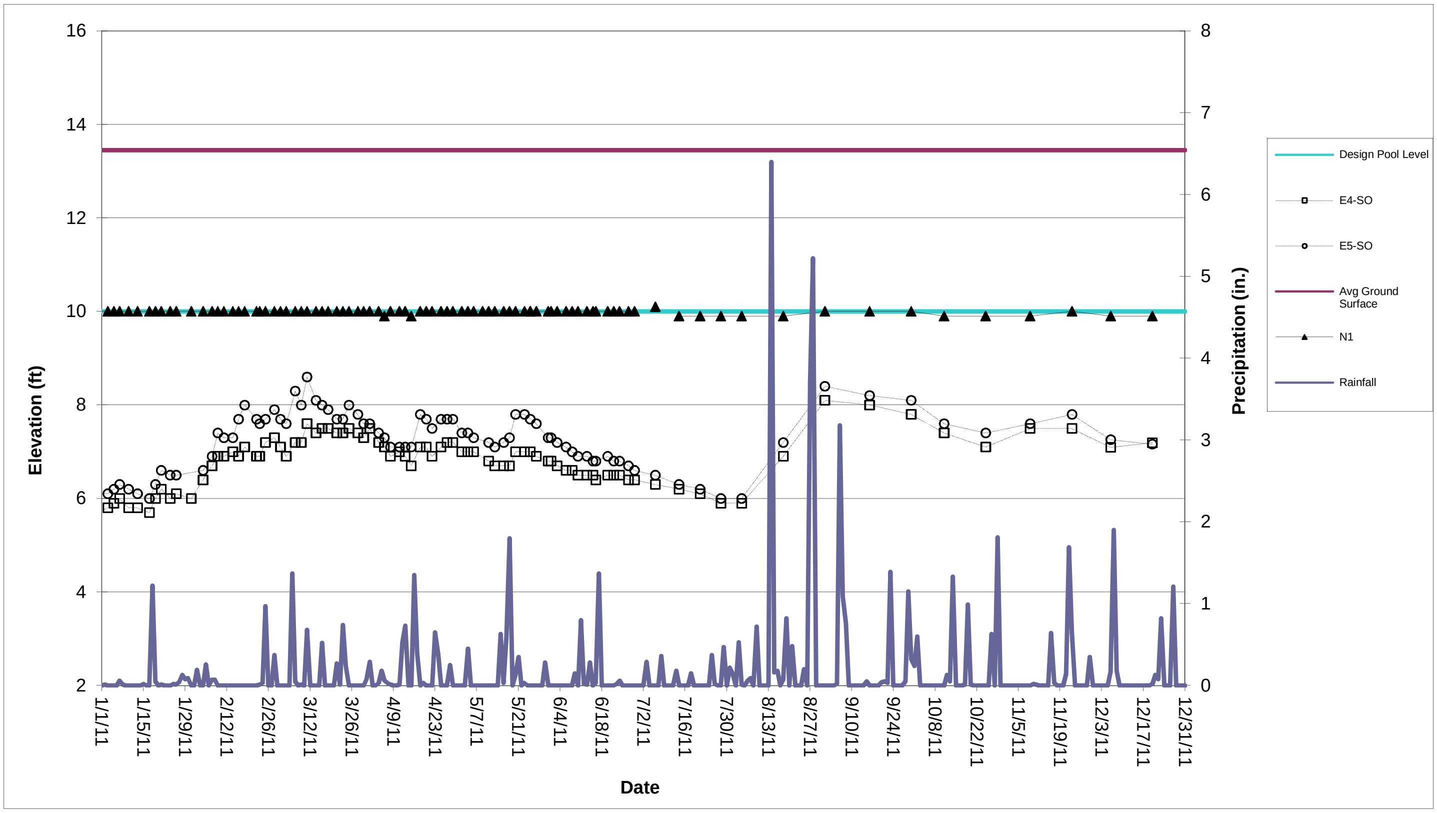
Trichloroethylene Concentrations
in GWET Pumping Wells

CORNERSTONE Environmental Group, LLC

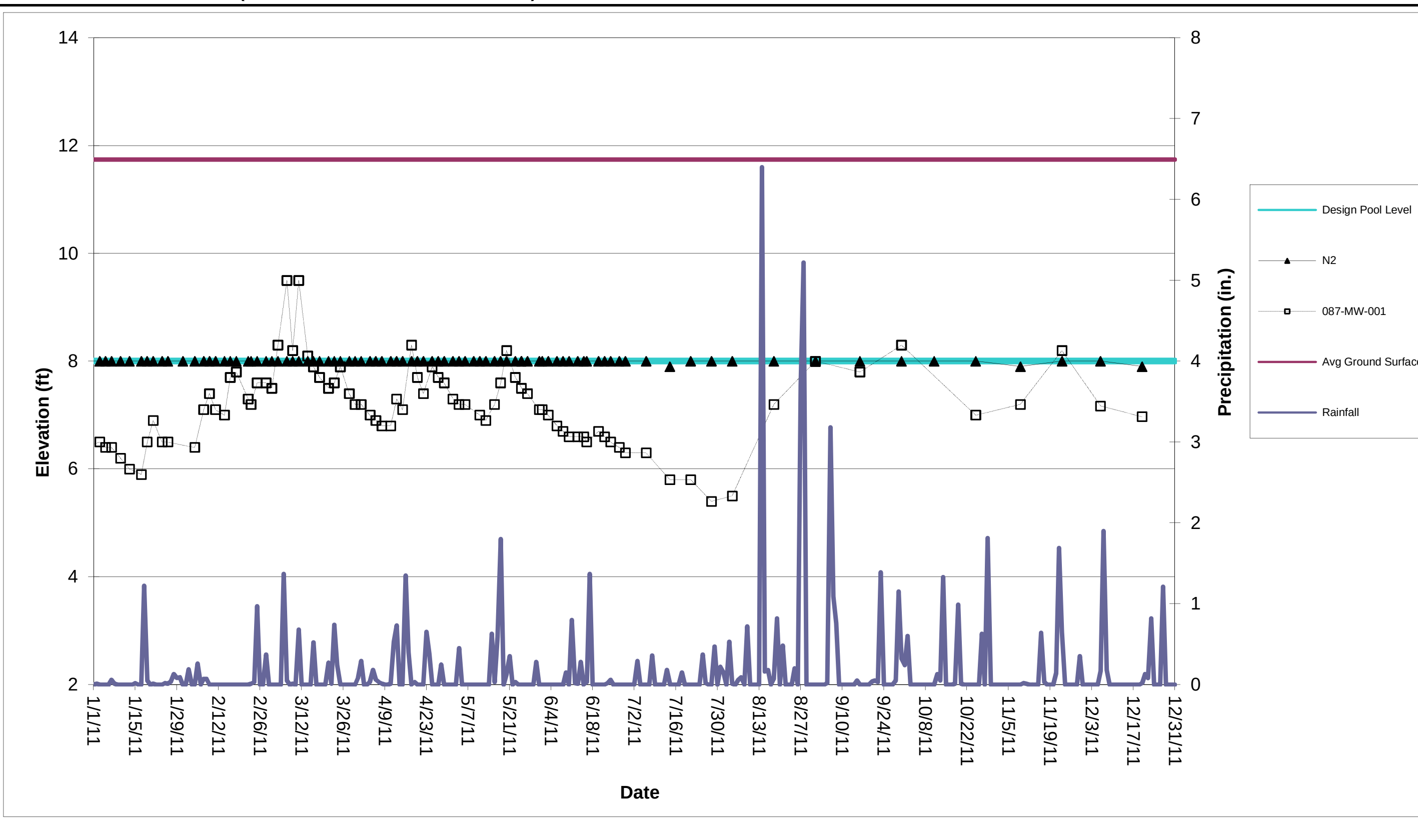
APPENDIX C

SA-7 PERIMETER POOL HYDROGRAPHS

Attachment C: Perimeter Pools

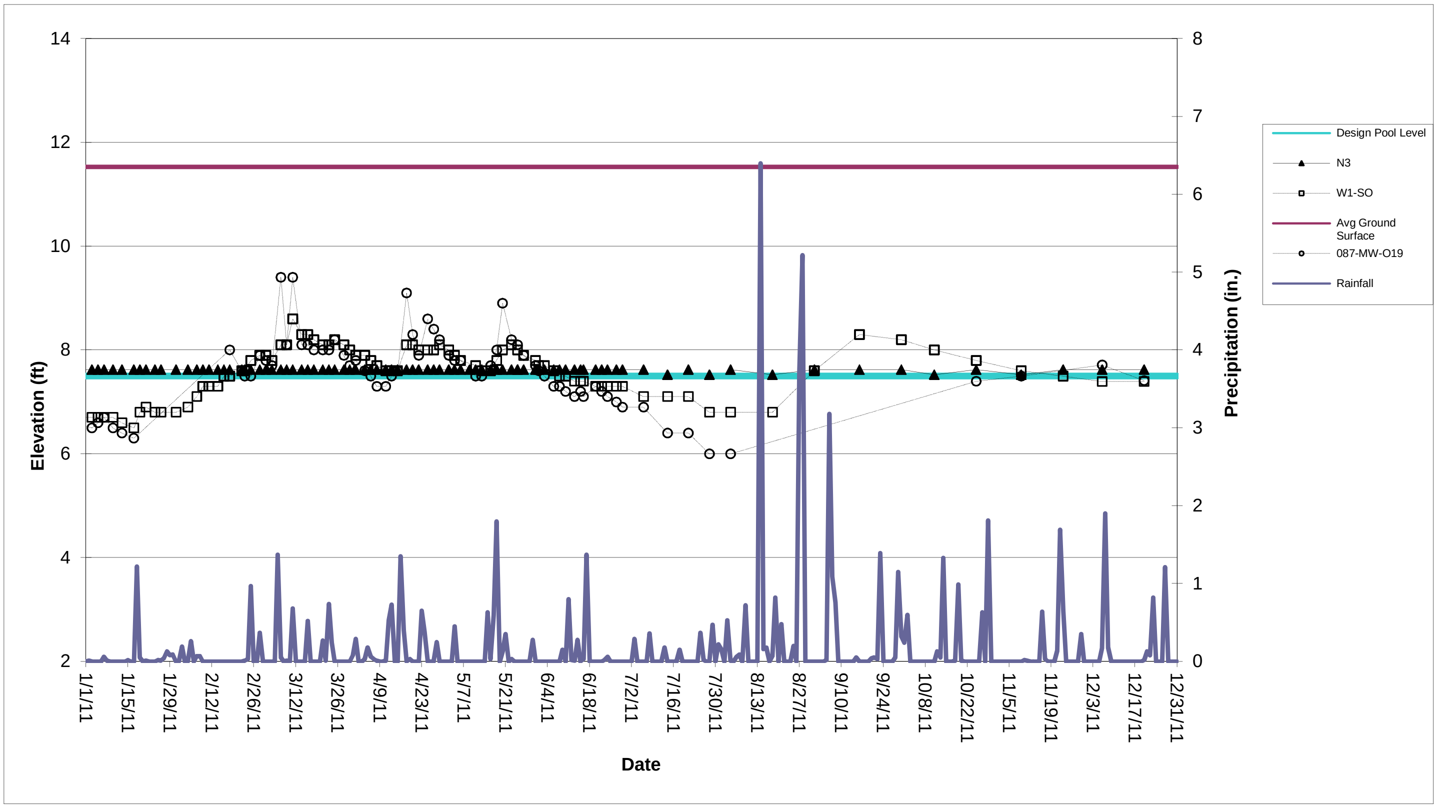


Perimeter Pool N1 (Sta. N13+60 to N20+25)

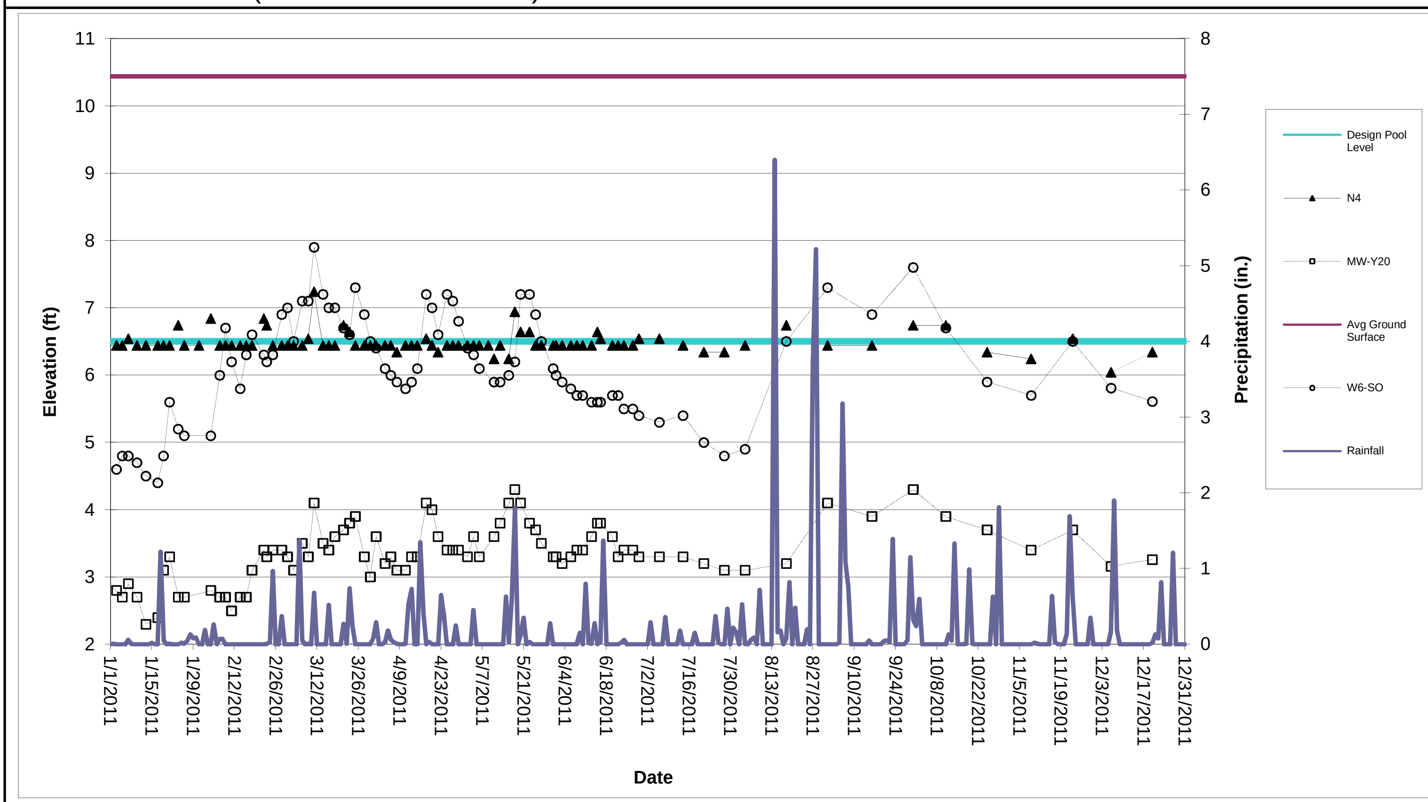


Perimeter Pool N2 (Sta. N10+73 to N13+10)

Attachment C: Perimeter Pools

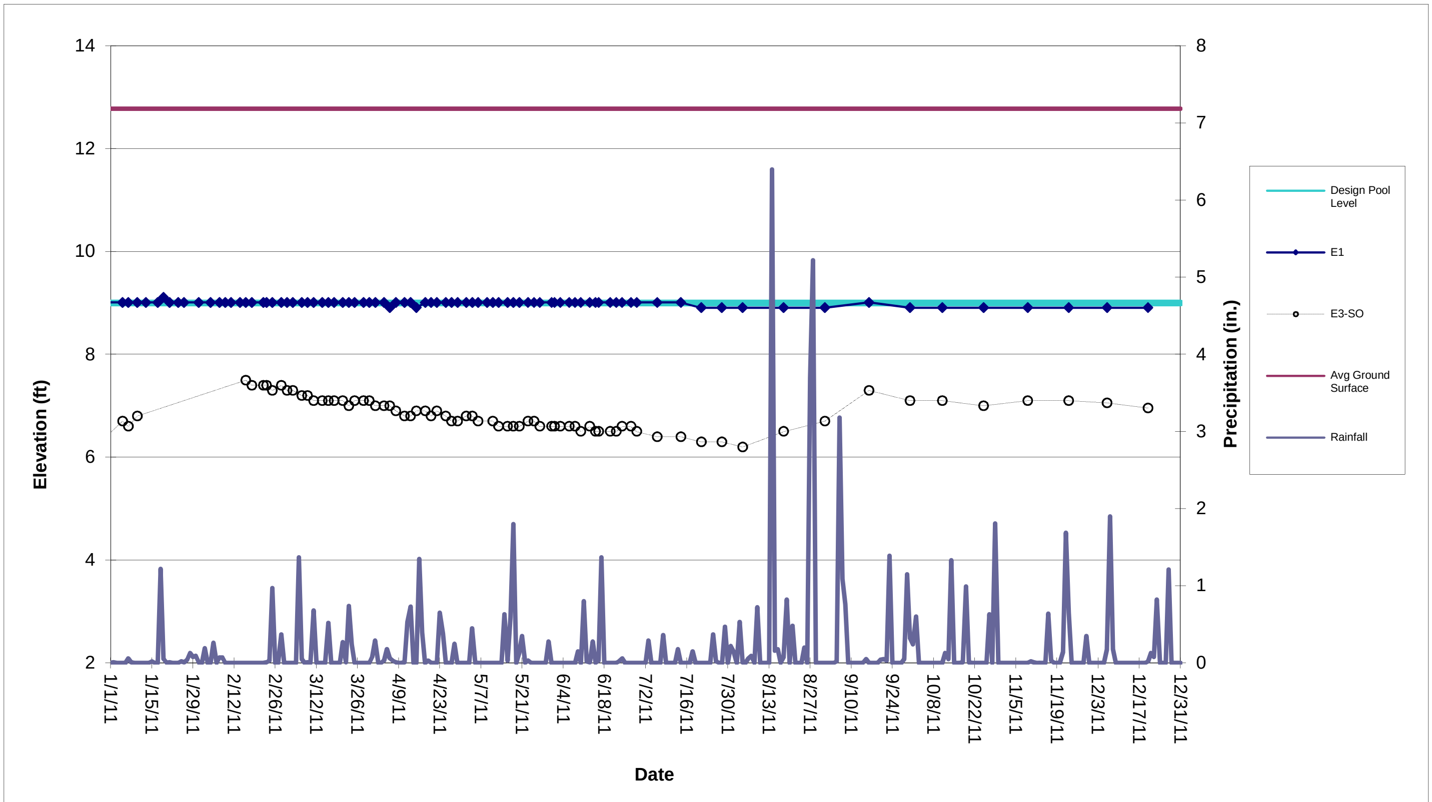


Perimeter Pool N3 (Sta. N6+80 to N10+23)

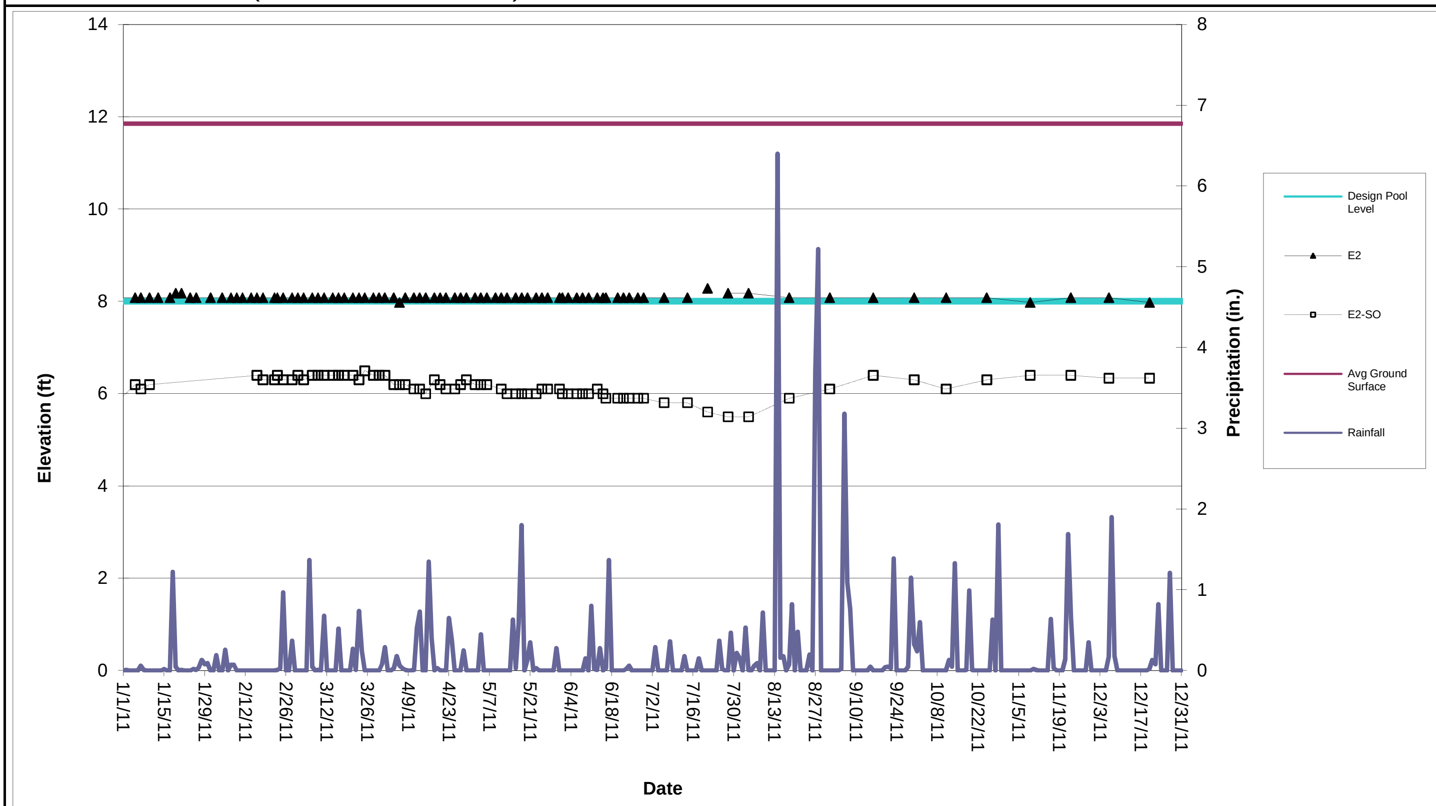


Perimeter Pool N4 (Sta. N6+80 to N10+23)

Attachment C: Perimeter Pools

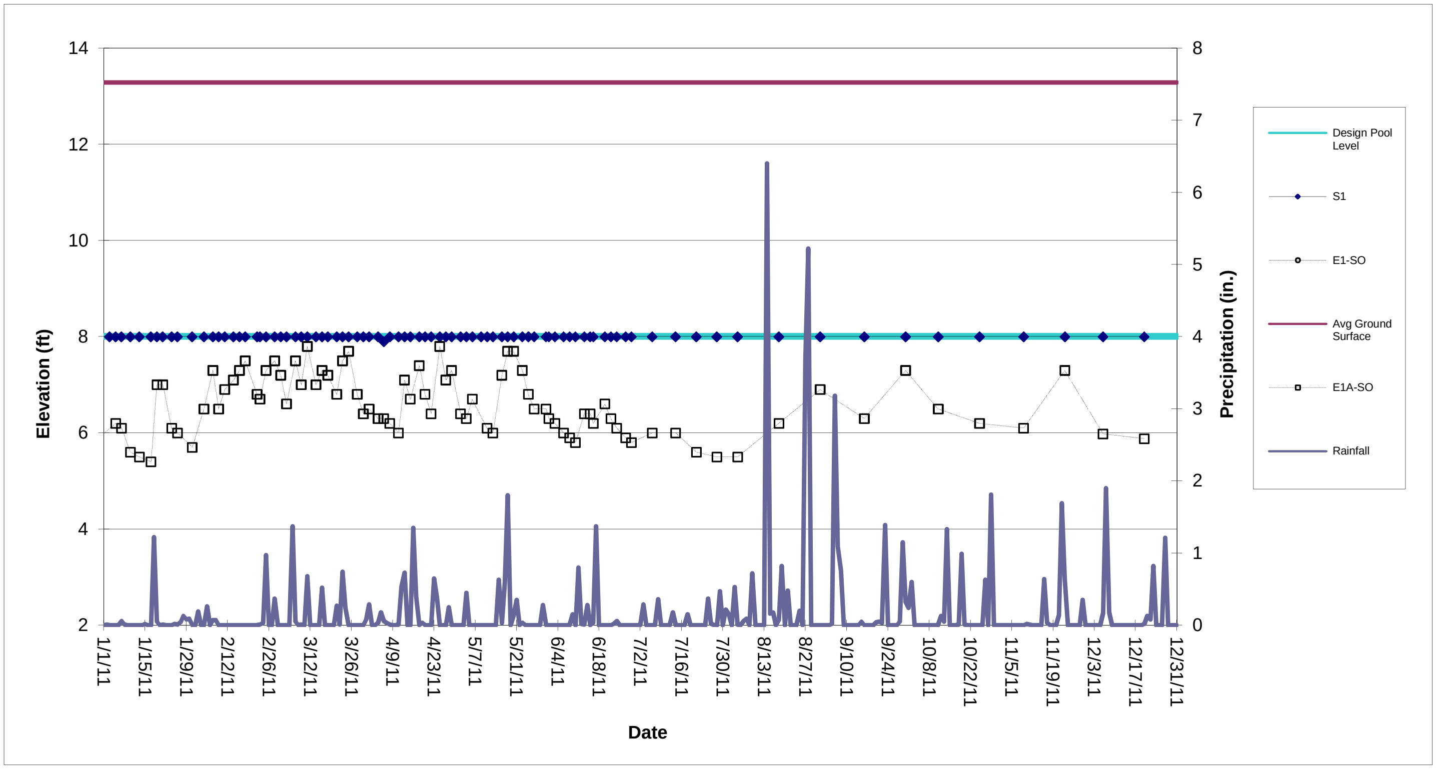


Perimeter Pool E1 (Sta. E0+50 to E3+75)

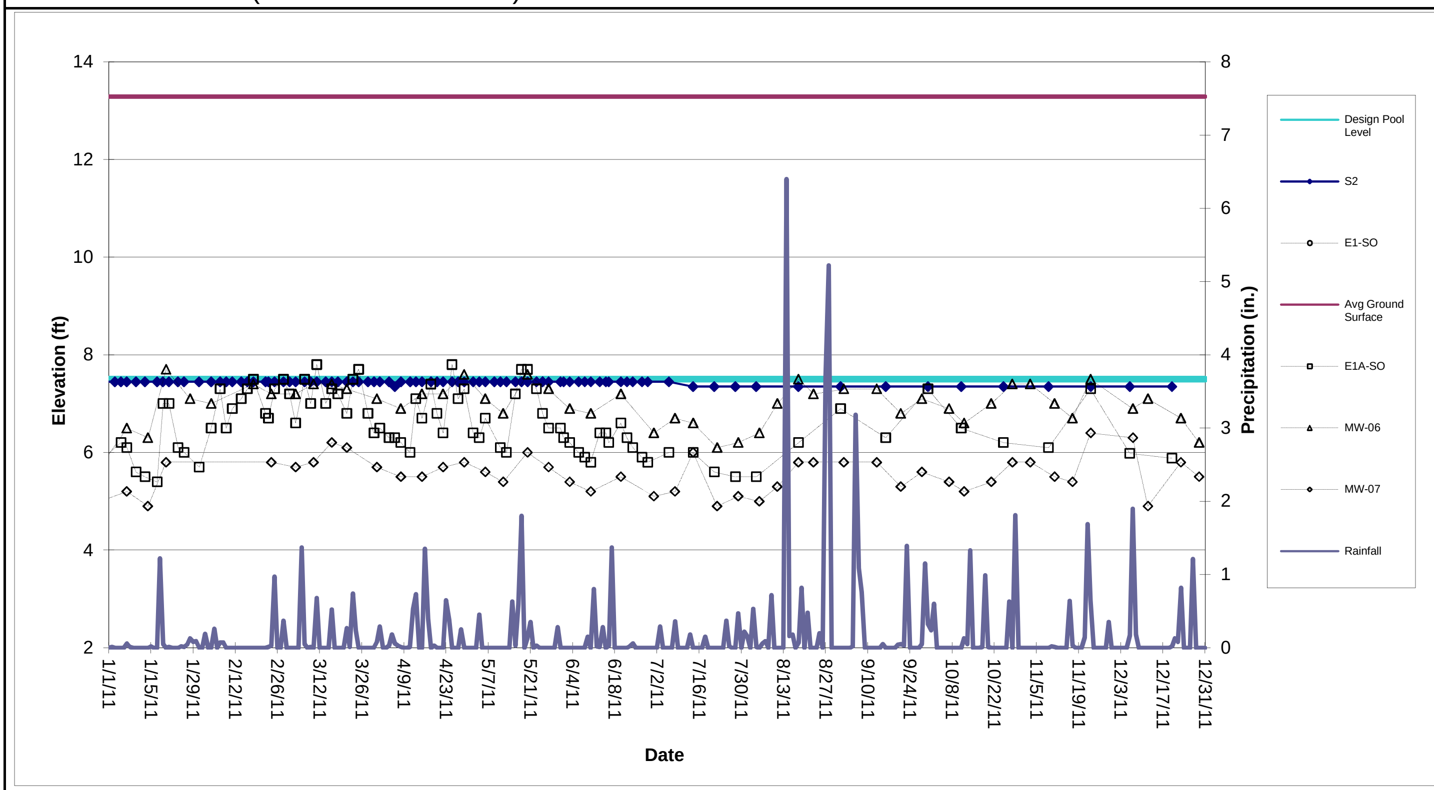


Perimeter Pool E2 (Sta. E4+50 to E7+25)

Attachment C: Perimeter Pools

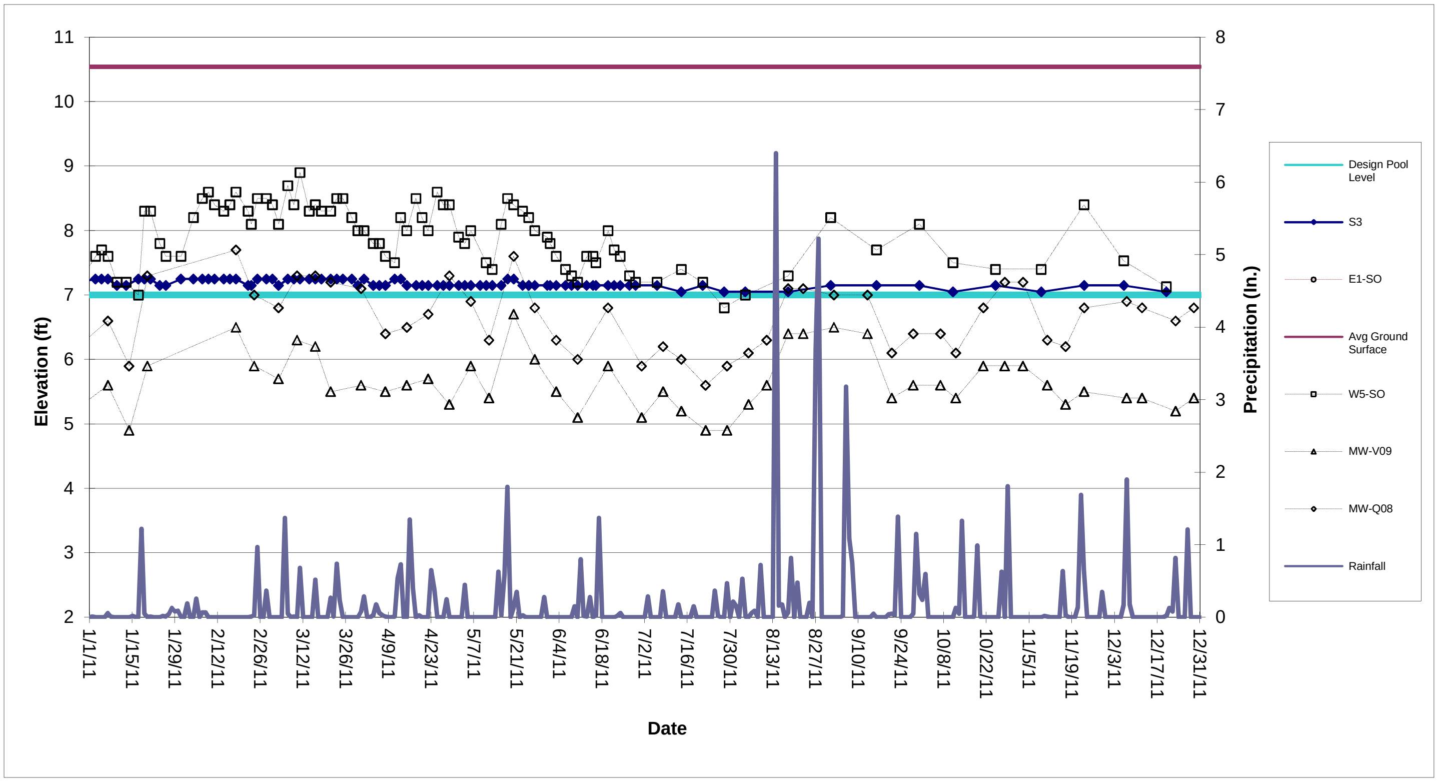


Perimeter Pool S1 (Sta. S0+50 to S3+88)

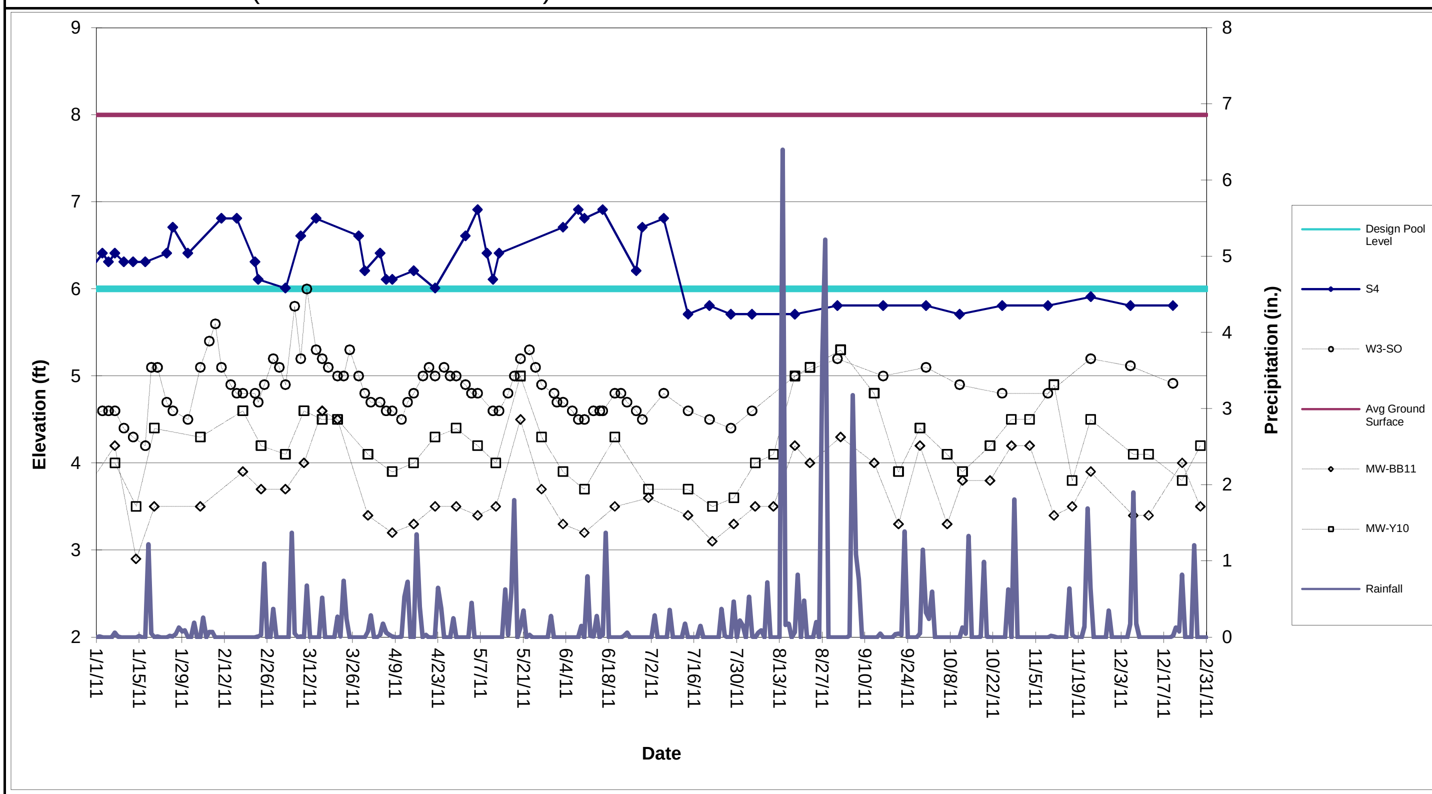


Perimeter Pool S2 (Sta. S4+38 to S10+60)

Attachment C: Perimeter Pools



Perimeter Pool S3 (Sta. S11+10 to S17+50)



Perimeter Pool S4 (Sta. S17+86 to S22+05)