DuPont Pompton Lakes Works
2000 Cannonball Road
Pompton Lakes, NJ 07442

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August 31, 2011

Mr. Anthony Cinque
New Jersey Department of Environmental Protection
Division of Responsible Party Site Remediation
401 East State Street
P.O. Box 028
Trenton, New Jersey 08625-0028

RE: Hydraulic Testing Evaluation Summary Report for Well 128 Field Pilot Study/IRM
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
PI #007411

Dear Mr. Cinque:

Enclosed for your review is the *Hydraulic Testing Evaluation Summary Report for Well 128 Field Pilot Study/IRM* for the Pompton Lakes Works Site located in Pompton Lakes, New Jersey. One bound copy and three CDs are included herein.

If you have any questions, please contact me at (973) 492-7733.

Sincerely,

David E. Epps, P.G.
Project Director, Pompton Lakes Works
DuPont Corporate Remediation Group

cc: Clifford Ng – USEPA Region II (1 hard copy, 3 CDs)
PLW Central File

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HYDRAULIC TESTING EVALUATION SUMMARY REPORT FOR WELL 128 FIELD PILOT STUDY / INTERIM REMEDIAL MEASURE

POMPTON LAKES WORKS, POMPTON LAKES, NEW JERSEY

Prepared for

DuPont Corporate Remediation Group
2000 Cannonball Road
Pompton Lakes, NJ 07442

Prepared by

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Project Number TR0352

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%	percent
DuPont	DuPont Corporate Remediation Group
EAB	enhanced anaerobic bioremediation
EW	extraction well
FPS	Field Pilot Study
ft	feet
ft bgs	feet below ground surface
ft btoc	feet below top of casing
ft/day	feet per day
ft^2/day	square feet per day
ft/ft	feet per foot
gal	gallon
Geosyntec	Geosyntec Consultants, Inc.
gpm	gallons per minute
gpm/ft	gallons per minute per foot
IDW	investigation-derived waste
IRM	Interim Remedial Measure
ISCO	in situ chemical oxidation
IW	injection well
JSA	job safety analysis
K	hydraulic conductivity
mg/L	milligrams per liter
ML	multilevel monitoring well
NJDEP	New Jersey Department of Environmental Protection
OBG	O'Brien & Gere
PLW	Pompton Lakes Works
PPE	personal protective equipment
PSA	probabilistic safety assessment
PVC	polyvinyl chloride
PVP	point velocity probe
PW	Parratt Wolff, Inc.
SGP	soil gas probe
Site	Pompton Lakes Works, Pompton Lakes, New Jersey
TTA	target treatment area
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1. INTRODUCTION

Geosyntec Consultants, Inc. (Geosyntec), at the request of DuPont Corporate Remediation Group (DuPont), has prepared this summary report to describe activities associated with recent activities completed as part of the proposed approach to conducting a Field Pilot Study/Interim Remedial Measure (FPS/IRM) at the former E. I. du Pont de Nemours and Company (DuPont) Pompton Lakes Works (PLW) site (the Site). The work plan for these activities was submitted previously (Geosyntec, 2010c). The objective of this effort was to collect data to assist in evaluation of amenable remedial technologies as well as potentially reduce concentrations of chlorinated volatile organic compound (VOC) concentrations in the intermediate groundwater zone of off-Site groundwater in the area of well 128. The location of the Site is presented in Figure 1.

1.1 Background

In January 2010, DuPont submitted a Technology Evaluation Report at the request of the New Jersey Department of Environmental Protection (NJDEP) that presented potential technologies that could be used to address groundwater contamination south of the former manufacturing area. The conclusion of this report was that operation of the existing groundwater extraction/treatment system has reduced concentrations in the eastern portion of the off-Site plume area. In addition, natural reductive dechlorination was occurring in the western portion of the off-Site plume area which had also reduced concentrations as measured in monitoring wells located in the shallow and intermediate portion of the aquifer. A recommendation in the report was to complete a high resolution characterization within the well 128 area so as to obtain information with respect to aquifer characteristics (e.g., total organic carbon, nutrient concentration, and vertical profile of contaminants). This information would then be used to plan activities for a pilot study using either enhanced anaerobic bioremediation (EAB) or in situ chemical oxidation (ISCO).

Results of the characterization investigation were reported to NJDEP and United States Environmental Protection Agency (USEPA) in October 2010 (Geosyntec, 2010b). Activities included screening for VOCs using a membrane interface probe at eight locations, collection of groundwater samples from six locations using the Waterloo^{APS} sampling system and two continuous soil cores near well 128 area. The shallow zone of the aquifer is significantly more permeable compared to the intermediate zone. A total of 76 groundwater samples were collected for analysis of VOCs (43 were submitted for confirmatory analysis by Lancaster Laboratories). Significant conclusions of the study

were that Site-related contaminants are distributed vertically from approximately 30 to 80 feet below ground surface (ft bgs) with higher concentrations in the 45 to 75 ft bgs interval. Concentrations decreased below this depth and the presence of ethene indicates that complete dechlorination is occurring. Based on the work completed as part of this investigation, a detailed evaluation of the intermediate portion of the aquifer was recommended to determine the effects of hydraulic conductivity and permeability on the implementability of injection based remedial technologies to address zones where elevated VOC concentrations are present.

A work plan was submitted to NJDEP and USEPA on November 9, 2010 that outlined those tasks to complete a pilot study using EAB in the well 128 area. Approval of this plan was received on January 5, 2011. The first step in the pilot study was to conduct Site-specific tests of hydraulic conductivity in order to evaluate the effect on delivery of amendments to those portions of the aquifer where sufficient concentrations are present such that the technology will be effective. This report presents results of that testing and evaluation.

1.1 Rationale and Objectives

Since the prevailing geochemical conditions near well 128 at the intermediate depth are generally reducing, and the distribution of VOCs (predominantly partially dechlorinated) suggests some native microbial activity, the preferred technology for the IRM is EAB. However, the implementation sequence is such that ISCO may be selected for the active remediation phase.

Successful application of either remedial technology in the off-Site plume is contingent upon achieving delivery of reagent chemicals throughout the treatment zone. Hence, understanding the intermediate zone aquifer hydraulic properties as they currently exist will be necessary to both the design and eventual interpretation of collected data. A decision flow chart was developed and submitted the NJDEP. The decision flow chart suggested that the final design and operation of the IRM pilot test would only proceed after the hydraulic testing was completed. If conditions were found to be unfavorable, then other technologies may be considered. This portion of the 128 FPS/IRM provides the results of the Site-specific tests to evaluate the Site conditions in the intermediate groundwater near well 128. In addition, the shallow zone was also tested and evaluated.

The following sections describe the current Site conditions, well installation and development, hydraulic testing activities, results and provide recommendations for the proposed next steps.

2. SITE DESCRIPTION

2.1 Geology

The Remedial Technology Evaluation for Off-Site Groundwater Contamination (Parsons Corporation [Parsons], 2010) and the Characterization Work-Plan for Off-Site Groundwater (Geosyntec, 2010a) describes the geology, hydrogeology, and distribution of contaminants at the Site.

The Facility is situated within the Highlands Physiographic Province adjacent to the northwestern boundary of the Newark Basin. Two primary geologic units, crystalline bedrock and alluvial deposits consisting of colluviums and stratified glacial drift, underlie the Site.

The alluvial deposits in the Acid Brook Valley are up to 170 feet (ft) thick and have been described as a fining downward stratified glacial sequence without distinct lithologic contacts. It has been divided into three zones in past reports, termed shallow, intermediate and deep.

The shallow alluvial zone is composed of colluvium, fill and glacial till deposits, which are generally poorly sorted coarse- to medium-grained sand and gravel, and may contain layers of very coarse gravel. This zone ranges from 5 to 20 ft thick. The existing shallow monitoring wells include 20 ft screens that span the shallow alluvium.

The intermediate alluvial zone consists of glacio-fluvial deposits, which are generally very fine- to medium-grained sand, and ranges from 15 to 80 ft thick.

The deep alluvial zone consists of glacio-lacustrine deposits, which are generally very fine-grained silty sand and very fine-grained sandy silt. The thickness of the deep zone varies widely and may be up to 90 ft thick where the bedrock surface is structurally low.

The Off-Site Groundwater IRM Characterization Report (Geosyntec, 2010b) contains a summary of the lithology in the vicinity of well 128. In general, the upper 20 ft of alluvium consists of light olive brown, generally poorly sorted sand. This is underlain by an olive brown poorly to moderately well sorted sand between 20 and 38 ft bgs. Together these sands comprise the shallow zone; well 128-S is screened across this zone, from about 7 to 27 ft bgs. The intermediate zone at this location spans the interval from about 38 ft bgs to approximately 78 ft bgs and is composed of olive and dark gray, moderately well-sorted sand containing silt layers. In the upper portion of this interval (approximately 38 to 48 ft bgs), the sands are gray-brown and poorly

sorted. Well 128-I is screened in the lower portion of the intermediate zone, from 62 to 72 ft bgs. The deep zone at this location is below about 78 ft bgs and composed of dark gray-brown silt with some clay and dark brown interbeds; well 128-D is screened from 126 to 146 ft bgs.

2.2 Hydrogeology

Water depths in wells in the Acid Brook Valley at Facility range from approximately 3 to 25 ft bgs under natural conditions. The saturated thickness of the alluvial aquifer ranges from approximately 5 ft in the northern operating valley to 165 ft near the Pompton Lake shore. At location 128-I, the depth to the water table is approximately 10 ft bgs. The alluvial deposits appear to respond to pumping as a single unit aquifer system. The pump-and-treat system is currently operating to limit further off-Site migration of VOCs. Therefore, the pattern of groundwater flow on-Site indicates a south to southeasterly flow with cones of depression focused locally at the recovery wells and water table mounds at the injection beds.

2.3 Groundwater Chemistry

Site investigation data reveal VOC-impacted groundwater both on- and off-Site at the Facility (Parsons, 2010). The Off-Site Groundwater IRM Characterization Report (Geosyntec, 2010b) presented the findings of the detailed characterization of the 128 area and confirmed that the highest concentrations of VOCs are present in the intermediate zone.

3. APPROACH AND METHODS

3.1 Pre-Field Activities

3.1.1 Health and Safety

In advance of each phase of the 128 FPS/IRM (i.e., well installation/development and hydraulic testing), the project team would meet to conduct a probabilistic safety assessment (PSA) and job safety analysis (JSA) for the work to be conducted. All applicable team members representing DuPont, Geosyntec, O'Brien & Gere (OBG) and Parratt Wolff, Inc. (PW; Syracuse, New York) were in attendance. The proposed scope of work, roles and responsibilities, and applicable hazards were discussed.

At the start of each field day, the team established an exclusion zone surrounding the immediate work area utilizing traffic cones and barricades. Police detail was also present to assist with traffic flow around the exclusion zone. All team members entering the exclusion zone were dressed in Level D personal protective equipment (PPE). Precautions were taken to mitigate heat stress.

3.1.2 Permitting

Prior to commencing FPS/IRM activities, all necessary permits were obtained. Well permits for the installation of one extraction well, three injection wells, four multi-level wells, and one soil gas probe were obtained from the NJDEP on March 1, 2011. A Permit-By-Rule application for the discharge/addition of tracer during hydraulic testing was submitted to the NJDEP on May 12, 2011 and subsequent approval was obtained on June 10, 2011. Approval for the installation of the point velocity probe (PVP) was received from the NJDEP on June 28, 2011. Copies of the approved NJDEP permits are provided in Appendix A. Traffic permits to perform work in city streets and rights-of-way were also obtained in advance of field activities.

3.1.3 Utility Clearance and Soft Dig

Utility verification and marking was performed in advance of drilling activities to identify underground utilities in the vicinity of the proposed borehole locations and to reduce the potential for encountering buried utility lines. Geophysical clearance was conducted by Naeva Geophysics, Inc. (Congers, New York) on May 16, 2011. The presence of both overhead and underground utility lines resulted in minor modifications to the proposed layout of the FPS/IRM. Soft digging and vacuum extraction was

conducted by PW at each of the proposed locations during the week of May 19, 2011. Figure 2 shows the actual installed locations of the 128 FPS/IRM wells.

3.2 Well Installation and Development

3.2.1 Drilling

A series of wells to be used for the field pilot study (EW01, IW01, IW02 and IW03) were installed between June 1 and 17, 2011. Drilling activities were conducted by PW (Syracuse, New York), a state-licensed driller, using a truck-mounted drill rig. The borings were advanced using direct push and hollow stem auger drilling methods, with a borehole diameter of 12 inches. The total depth of the borehole (approximately 75 ft bgs) was measured using a weighted tape to ensure that the borehole was drilled to the proper depth. The wells were installed directly above the glaciolacustrine silt that underlies the intermediate aquifer in this area of the Site. Each well was built up from the depth of this contact, installing the lower screen at the base of the intermediate aquifer, directly above the silt.

3.2.2 Well Construction

The wells were constructed with two separate screened intervals defining an upper zone (approximately 20 to 45 ft bgs) and lower zone (approximately 50 to 75 ft bgs). The wells were constructed of 4 inch diameter schedule 80 polyvinyl chloride (PVC) casing and two 25 ft sections of 0.030 inch screen. The two screened sections were connected by a 5 ft segment of blank casing. Table 1 presents a summary of the well construction details. Well construction logs for EW01, IW01, IW02 and IW03 are provided in Appendix B.

The filterpack in the wells consisted of sand size #1, extending from the bottom of the borehole to approximately 2 ft above the top of the screened interval. The transition sand consisted of sand size #00, extending approximately 1 ft above the top of the filterpack. The annular space above each transition sand was sealed with approximately 3 ft of hydrated bentonite pellets. Cement grout was placed above the upper bentonite seal to approximately 3 ft bgs.

A flush-mount surface completion was installed at each well location to be compatible with current and anticipated future conditions. All surface completions included watertight vaults, caps, well seals, and locking mechanisms. The work area was restored to pre-work conditions following each well completion.

3.2.3 Well Development

Well development was conducted using standard practices at EW01, IW01, IW02 and IW03 within two weeks of installation (Table 1), allowing sufficient time for the well seals to set. Development consisted of alternating sequences of surging and pumping to remove fines from the well. Field parameters were collected during development, including water level, pH, temperature, specific conductance, oxidation reduction potential, dissolved oxygen, and turbidity. All purge water generated during development was collected in a 300 gallon (gal) polyethylene tank positioned on the back of a support truck, and transported on-Site for disposal. Well development logs for EW01, IW01, IW02 and IW03 are provided in Appendix C.

3.3 Multilevel Monitoring Wells and Soil Gas Probe

Two multilevel monitoring wells (ML02 and ML04) were installed between June 20 and 30, 2011. Drilling activities were conducted by PW using a truck-mounted drill rig. The borings were advanced using a cathead/drive and wash method, with a borehole diameter of 7 inches. The total depth of the borehole (approximately 75 ft bgs) was measured using a weighted tape to ensure that the borehole was drilled to the proper depth.

Each monitoring well was completed with seven discrete sampling depth intervals; three in the lower zone (55, 65 and 75 ft bgs), three in the upper zone (25, 35 and 45 ft bgs) and one shallow zone (15 ft bgs) above the target depth interval of the FPS/IRM. The monitoring wells were constructed using the Solinst continuous multichannel tubing (CMT) system. Table 1 presents a summary of the well construction details. Well construction logs for ML02 and ML04 are provided in Appendix B.

The filterpack in the wells consisted of sand size #0, approximately 6 inches above and below the discrete interval. The annular space above each filterpack was sealed with approximately 8 ft of hydrated bentonite pellets. Cement grout was placed above the upper bentonite seal to approximately 3 ft bgs.

A flush-mount surface completion was installed at each well location to be compatible with current and anticipated future conditions. All surface completions included watertight vaults, caps, well seals, and locking mechanisms. The work area was restored to pre-work conditions following each well completion.

The two additional monitoring wells proposed in the work plan (ML01 and ML03) were not installed during this mobilization. These locations may be installed if needed and if

suitable locations are accessible. The NJDEP permits for the installation of the additional monitoring wells are valid until February 25, 2012.

3.3.1 Soil Gas Probe

The soil gas probe (SGP01) proposed in the work plan was not installed during this mobilization as it was not required as part of the hydraulic testing activities for the 128 FPS/IRM. The installation of the SGP is scheduled to take place during a second mobilization to be determined. The NJDEP permit for the installation of the SGP is valid until February 18, 2012.

3.4 Point Velocity Probe

The PVP is an in-situ device that monitors tracer movement at the scale of the instrument (Labaky *et al.*, 2009). A PVP was installed as part of the 128 FPS/IRM activities between July 5 and 12, 2011. Drilling activities were conducted by PW using a truck-mounted drill rig. The boring was advanced using a cathead/drive and wash method, with a borehole diameter of 3 inches. Sediment is believed to have entered the borehole through the annulus of the drive casing at depth. In addition, during installation, the drill casing was damaged and became unthreaded at 47 ft bgs allowing fine grained sediments to enter the borehole and accumulate at the bottom of the hole. The break in the casing was confirmed by a downhole camera. PW was able to re-thread the casing at that depth. Several attempts to flush the borehole were made to remove the sediment.

Waterloo Multilevel System PVC casing was used in the construction. The PVP diffusers through which tracer would be released were placed at equivalent depths to the multilevel monitoring well sampling ports (i.e., proposed depths of 15, 25, 35, 45, 55, 65, and 75 ft bgs). The PVC casing was joined in 10 ft lengths using zip ties and self-tapping screws prior to advancing the casing into the open borehole. A casing clamp was used at surface to secure the PVC pipe at surface. The tubing and wiring for each of the seven PVP intervals was threaded through inside of the PVC casing.

Water levels collected prior to the installation of PVP01 were used to calculate flow direction in order to correctly position the probe such that groundwater flow would pick up tracer at the injection port and deliver it to the detectors. A compass was used to identify the correct orientation (290 degrees) for the PVP installation.

Once the PVC casing was installed, the drill casing was pulled back out of the hole, allowing natural formation collapse to occur around the PVP. During drill casing

removal, approximately 15 ft of casing was found to have been left in the borehole. Preliminary testing results of the two deepest PVPs (i.e., 57 and 67 ft bgs) suggest that the casing became unthreaded and was lost at depth.

As a result of sediment accumulation, the PVP was installed approximately 8 ft higher than anticipated (i.e., 7, 17, 27, 37, 47, 57, and 67 ft bgs). Table 1 presents a summary of the well construction details. The well construction log for PVP01 is provided in Appendix B.

In order to remain consistent with the proposed construction and to comply with the NJDEP permit, the top 10 ft of the borehole annulus was grouted to approximately 3 ft bgs. This resulted in the loss of the upper PVP point (i.e., 7 ft bgs); however, this point is above the current water table at the Site and would not have provided any usable data.

A flush-mount surface completion was installed to be compatible with current and anticipated future conditions, and to provide sufficient space within the vault for tubing, wiring and instrumentation (i.e., datalogger). The surface completion included a watertight vault, cap, and well seal. The work area was restored to pre-work conditions following well completion.

3.5 Hydraulic Testing

Wells installed as part of this investigation were used to assess the hydraulic properties of the aquifer in the target treatment area (TTA). A sequence of monitoring and tests including collection of water level measurements, step-drawdown testing, pump testing, borehole dilution testing and preliminary PVP testing were conducted. These tests are designed to obtain relevant data about the hydraulic conductivity distribution and groundwater velocity within the TTA at a range of measurement scales (i.e., feet to tens of feet). Each phase of testing is described below.

3.5.1 Water Level Measurements

Water level measurements from newly installed and existing wells in the 128 FPS/IRM area were collected in order to determine the hydraulic gradient and direction of groundwater flow. Water levels were measured on a daily basis during the well installation and hydraulic testing activities. A standard Solinst water level meter was used to take measurements all the IWs, EW and the 128 wells. A narrow (1/4 inch diameter) Solinst water level meter was used to take measurements in the multilevel wells. Table D-1 in Appendix D presents a summary of the water level measurements in feet below top of casing (ft btoc). Water level elevations were calculated in order to

generate potentiometric surface maps of the intermediate zone in the well 128 area. Figures D-1 through D-7 in Appendix D present the contour maps generated for water levels collected between July 14 and 22, 2011 during hydraulic testing activities. Site wide potentiometric surface maps generated by OBG for water levels collected in May 2010 and November 2010 are also provided in Appendix D.

3.5.2 Step-Drawdown Testing

Step-drawdown testing was conducted in order to determine the specific capacity of the well as well as identify optimum extraction rates for the pumping tests. Step-testing was conducted using standard practices in the lower screened interval at IW01 on July 15, 2011, and in the upper and lower screened intervals at IW02 from July 18 to 19, 2011. Manual water level measurements collected during testing in the pumping well are summarized in Table E-2 in Appendix E.

The objective of the step-test was to maintain a constant-discharge during each step and obtain frequent water level measurements in the pumping well. To isolate the upper and lower zones, an inflatable packer was deployed in the pumping well within the section of blank PVC casing between the upper and lower screens (approximately 45 to 50 ft bgs). The Grundfos submersible pump was placed 5 ft above the bottom of the well during the lower step-tests and 5 ft above the top of the packer during the upper step-test. The pumping rate during the step-drawdown tests was systematically increased in a series of three steps of approximately equal duration. Each step consisted of a 30 to 70 minute pumping period. Pumping rates in the lower screen intervals ranged from 4 to 15 gallons per minute (gpm), and in the upper screen interval ranged from 5 to 18 gpm. Water levels were measured in both the upper and lower screened zones of the pumping well, using a combination of a levelogger and a water level tape. Leveloggers were also used to monitor the water levels in surrounding observation wells.

3.5.3 Pump Testing

Pump testing was conducted in order to identify aquifer properties of recharge, drawdown, storativity, transmissivity, specific and sustained yield, and aquifer boundaries. Pump testing was conducted using standard practices in the lower screened interval at IW02 on July 18, 2011, and in the upper screened interval at IW02 on July 19, 2011.

To isolate the upper and lower zones, an inflatable packer was deployed in the pumping well within the section of blank PVC casing between the upper and lower screens

(approximately 45 to 50 ft bgs). The Grundfos submersible pump was placed 5 ft above the bottom of the well during the lower pump test and 5 ft above the top of the packer during the upper pump test. The pumping rate during the pump test was selected based on the step-drawdown test. The pumping rate in the lower screen interval averaged 12.2 gpm and in the upper screen interval averaged 17.7 gpm. Water levels were measured in both the upper and lower screened zones of the pumping well, using a combination of a pressure transducer (levelogger) and a water level tape. Leveloggers were also used to monitor the water levels in surrounding observation wells. The lower and upper pump test consisted of a 50 and 90 minute pumping period, respectively, which was followed by a period of recovery until the water level approached the pre-pumping static water level.

3.5.4 Borehole Dilution Testing

A borehole dilution test using potassium bromide was conducted on July, 20 2011 to estimate the horizontal velocity of groundwater in the formation surrounding IW02. Interpretation of the borehole dilution test data proceeds by solving the decay of tracer over time for, providing multiple point dilution tests at 7 individual levels. The tests provide vertical profiling data of groundwater velocity at monitoring depths equivalent to the multilevel monitoring well sampling ports. The tracer was released in the borehole column and the decay of the tracer with time was used to determine the in-situ groundwater flow velocity (Pitrak *et al.*, 2007). A 500 milligram per liter (mg/L) solution of tracer (as bromide) was introduced across the entire borehole length. Figure F-1 presents the borehole dilution test equipment assembly. The depletion of the tracer concentration was monitored at seven different intervals (i.e., 10, 17, 27, 37, 47, 57 and 67 ft bgs) using an ion selective electrode. Groundwater samples for both field and laboratory analysis were collected over a three day period for the upper depth intervals (i.e., 10, 17, 27, and 37 ft bgs) and over a seven day period for the lower depth intervals (i.e., 47, 57 and 67 ft bgs), until tracer concentrations were at least 90 percent (%) depleted. Tables F-1 and F-2 in Appendix F present the sampling details and the sampling schedule for the borehole dilution test, respectively. Groundwater samples collected from the 17 and 57 ft bgs depth intervals were submitted for laboratory analysis (EPA Method 300.0) to validate the field data. Table F-3 presents a summary of the samples that were collected over the duration of the test. A copy of the laboratory analytical data report is provided in Appendix G. Figure F-2 presents the bromide concentration trend plot (in mg/L). Bromide was depleted in the upper depth intervals within 3 days following tracer release and within 7 days in the lower depth intervals.

3.5.5 Point Velocity Probe

Testing using sodium chloride (i.e., table salt) was conducted on July 21 and 22, 2011 at PVP01 to determine the groundwater velocity at the centimeter scale. The PVP methodology provides a complementary in-situ velocity measurement to the borehole dilution test, except that the measurement is in direct contact with the formation and not inferred via flow through an open well. The response of the tracer was measured using a Campbell Scientific CR1000 datalogger. The millivolt signals from the injected tracer solution are used to calculate average linear groundwater velocity and groundwater flow direction. Tracer injections completed to date have had a variable response, and therefore, the data will not be used in this assessment.

4. RESULTS

4.1 Hydraulic Testing

Hydraulic tests conducted on the newly-installed wells were used to assess the hydraulic properties of the aquifer in the TTA. The following information was gathered and/or calculated: hydraulic conductivity, gradient, velocity, flow direction, specific capacity, specific yield, transmissivity, storativity, well loss and aquifer loss.

4.1.1 Gradient

Manual water level measurements were collected routinely from the wells within the 128 well area (i.e., IW01, IW02, IW03, EW01, ML02, ML04, 128-S, and 128-I). Water levels collected from wells constructed with similar screen intervals (i.e., IW01, IW02, IW03 and EW01) were used to generate the potentiometric surface maps in Appendix D. Calculated horizontal gradient and groundwater flow direction from Figures D-1 to D-7 are summarized in Table 2. The average horizontal gradient during the 128 FPS/IRM activities was 0.00167 feet per foot (ft/ft) in a south-southeast direction (145 degrees). The horizontal gradient for the 128 FPS/IRM area is on the same order of magnitude as the Site Wide gradient, and generally in the same direction (Table 2). The horizontal gradient is small and very flat, which was found to be consistent over seven water level gauging events (collected between July 14 and July 21, 2011). The historic horizontal gradient presented by Geraghty & Miller (1986) was observed during pre-pump and treat conditions and was higher than the current gradient observed in the vicinity of 128-I.

Water level measurements collected from nested or multilevel wells can provide information with respect to vertical gradient. The water level data collected from the multilevel wells is summarized in Table D-1. Analysis of the vertical gradient (not shown) did not suggest a clear upward or downward trend; results were variable. It can take up to several months for multilevel wells to achieve stable in situ conditions (i.e., equilibrate). It is likely that the multilevels were exhibiting residual disturbance from nearby well installation and hydraulic testing activities. The day-to-day variability in magnitude and direction observed at each interval suggests that the multilevels have not yet achieved equilibrium. Due to this variability, the water level measurements collected at the multilevels were not used to generate the potentiometric surface maps, though the readings are generally consistent with those collected from the injection and extraction wells.

4.1.2 Hydraulic Conductivity

Step-test data was used to calculate the hydraulic conductivity using the time-drawdown data (i.e., method of Jacob [Cooper and Jacob, 1946]). Estimated hydraulic conductivity (K) values for the upper and lower zones generally fall within the range of values previously reported by Geraghty & Miller (1986). Data collected during the step-drawdown tests was modeled and analyzed using the AQTESOLV aquifer test analysis software. Both the pumping well and observation well data sets were analyzed. Table E-1 in Appendix E summarizes K values (feet per day [ft/day]) for each step-drawdown test scenario. Hydraulic conductivity values ranged from 43 to 73 ft/day in the upper zone, and from 3.7 to 12.6 ft day in the lower zone. The AQTESOLV outputs are provided in Figures E-1 through E-6 in Appendix E. Manual water level measurements collected during testing in the pumping well, both above and below the packer where possible, are summarized in Table E-2. Decreases in water level elevation were observed adjacent to the active pumping zone, suggesting some connectivity between the upper and lower zones.

The linear regression plots of the borehole dilution test data used to calculate hydraulic conductivity are presented in Figures F-2 to F-9. Table F-4 presents the borehole dilution test results. The hydraulic conductivity in the upper zones (i.e., 10, 17, 27 and 37 ft bgs) ranged from 48 to 59 ft/day and in the lower zones (i.e., 47, 57 and 67 ft bgs) ranged from 11 to 17 ft/day. These conductivities also generally fall within the range of values previously reported by Geraghty & Miller (1986)

4.1.3 Groundwater Velocity

Groundwater velocity was estimated from hydraulic conductivity, using best estimates of effective porosity (0.25%) and hydraulic gradient (0.00167 ft/ft), and is summarized in Table 2. Groundwater velocity values based on the AQTESOLV modeling ranged from 0.29 to 0.49 ft/day in the upper zone, and from 0.002 to 0.008 ft/day in the lower zone. Velocities calculated from the borehole dilution test data ranged from 0.32 to 0.41 ft/day in the upper zone and 0.08 to 0.11 ft/day in the lower zone. The flatter gradient observed in the 128 well area (compared to conditions prior to pump and treat activities) are slowing the groundwater velocity in this area, evidenced by velocity values in the lower range of historic data (Geraghty & Miller, 1986).

4.1.4 Additional Parameters

The productivity of a well is expressed in terms of specific capacity and is obtained from step-drawdown and pump test data. The specific capacity values for IW01 and

IW02, calculated based on AQTESOLV modeling and manual measurements, ranged from 6.37 to 7.21 gallons per minute per foot (gpm/ft) in the upper zone and from 0.66 to 1.22 gpm/ft in the lower zone.

Transmissivity is the volume of water flowing through a cross-sectional area of an aquifer under hydraulic gradient over time. Transmissivity values ranged from 1,046 to 1,810 square feet per day (ft^2/day) in the upper zone and from 90.5 to 503 ft^2/day. For the given aquifer thickness, these values are similar to those for sands.

Specific yield is defined as the volume of water than an unconfined aquifer releases from storage per unit surface area of aquifer per unit decline in the water table (Freeze et al., 1979. Specific yield values calculated from step-drawdown and pump test data ranged from 21% to 70% in the upper zone and from 16 to 35 % in the lower zone. Average specific yield values for fine to medium grained sands range from 23 to 28% (Kruseman *et al.*, 2000).

Aquifer loss and well loss are the two components of drawdown. Aquifer loss ranged from 0.73 to 2.21 ft in the upper zone and from 1.98 to 19.50 ft in the lower zone. Well loss ranged from 0.03 to 0.28 ft in the upper zone and from 0.27 to 3.02 ft in the lower zone.

4.2 Decontamination

Well drilling and development equipment, including drill pipe and development tools, was decontaminated prior to mobilization to the Site.

4.3 Investigation-Derived Wastes

Waste containers (i.e., 55 gal drums) for investigation-derived soils/wastes (IDW) generated during drilling activities were mobilized to the Site prior to the start of field activities. Waste water generated during development and hydraulic testing was containerized in 300 gal polyethylene and transported back to the Site for disposal.

4.4 Survey

At the completion of well installation activities, the coordinates (northings and eastings) and elevations (top of pipe and ground surface) were surveyed by Vargo Land Surveying Inc. on July 21, 2011. Locations and elevations were referenced to the New Jersey System of Plan Coordinates NAD 1983 and the vertical datum NAVD 1988.

Final survey information is summarized in Table 1 and is also provided on the individual well construction diagrams in Appendix B.

5. CONCLUSIONS

The overall objectives of the hydraulic tests were successful in confirming the hydraulic parameters (conductivity, gradient and ambient flow velocity) in the shallow and intermediate aquifer as they currently exist in the 128 area. The data collected will be used not only for the on-going work in the 128 well area but useful for other areas of the Site. The upper screens of the injection wells are within the shallow groundwater and the lower screens are within the intermediate groundwater zone. There is no distinct confining unit between the shallow and the intermediate groundwater and the dual screened wells helped to obtain information on the aquifer as a whole.

The hydraulic assessments have confirmed for hydraulic conductivity there is a reasonable difference between the upper (shallow) and lower (intermediate) zones (i.e., about 5 times but less than 1 order of magnitude). Hydraulic conductivity measurements are consistent with historical data. These results also confirm that the short term tests (i.e., one hour step tests and a two hour pump test) were adequate and able to provide relevant and useful data. The hydraulic conductivity measurements obtained in these tests tended to be in the higher end range of values reported by Geraghty & Miller (1986).

The gradients measured in the 128 area are small and typically closer to the lower range of values reported by Geraghty & Miller (1986). The low gradients in the intermediate zone along with the low groundwater flow velocity will limit the dispersion of amendments and extend the time needed to distribute electron donor or oxidant in the injection area. Furthermore, amendments (either ISCO or EAB) have half-lives and their degradation would limit the extent of treatment.

As described in the Sequence of Events Flowchart (see Figure 3), a decision point within the field pilot study was that if the hydraulic conditions within the aquifer were not amenable to injection based technologies, then the FPS/IRM would not move forward. Based on the results of the detailed testing, completed within the shallow and intermediate portions of the aquifer, the physical properties within the intermediate zone would preclude the successful implementation of an injection based technology. Specifically, groundwater velocities would not allow for sufficient dispersion of injected amendment to be effective in reducing concentrations in a reasonable time period. The lack of concentration of contaminants within the shallow would not provide enough mass for enhanced bioremediation or in-situ chemical oxidation to be successful.

Groundwater velocity data obtained for the shallow portion of the aquifer indicated that alternative remedial technologies may be effective at reducing concentrations within a reasonable time frame. An evaluation of potential technologies for the shallow aquifer was requested by NJDEP in April 2011. Data from testing completed as part of the FPS/IRM will be included in the Remedial Action Selection Report being submitted as a separate document to NJDEP.

5.1 Path Forward

Potential technologies that could be applicable to the intermediate groundwater zone will continue to be researched by the groundwater technical team. A summary of these efforts will be documented in the quarterly progress reports submitted to the NJDEP and the USEPA.

If the NJDEP and/or the USEPA require additional verification of the hydraulic testing data, a one-time passive addition of donor or oxidant to the existing wells (IW01, IW02, and IW03) followed by groundwater monitoring in nearby wells (e.g., 128-I, ML02 and ML04) based on expected arrival times could be completed. A field implementation plan would be prepared to outline the amendment and monitoring program as this verification step was not included in the original FPS/IRM work plan.

6. REFERENCES

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TABLES

TABLE 1
WELL CONSTRUCTION SUMMARY
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Well Identifier	Northing Coordinates	Easting Coordinates	Well Type	Installation Date	Development Date	Drilling Method	Borehole Diameter (inches)	Total Depth (ft bgs)	Upper Screen Interval (ft bgs)				Lower Screen Interval (ft bgs)		
									Interval 1	Interval 2	Interval 3	Interval 4	Interval 5	Interval 6	Interval 7
IW01	793356	552302	Injection	03-Jun-11	07-Jun-11	HSA	12	74.20	19.90 - 44.90				49.70 - 74.20		
IW02	793369	552325	Injection	17-Jun-11	29-Jun-11	HSA	12	75.00	21.60 - 45.92				50.69 - 75.00		
IW03	793377	552338	Injection	10-Jun-11	13-Jun-11	HSA	12	75.50	21.10 - 45.42				50.19 - 75.50		
EW01	793330	552353	Extraction	17-Jun-11	21-Jun-11	HSA	12	75.00	21.60 - 45.92				50.69 - 75.00		
ML02	793363	552333	Monitoring	30-Jun-11	NA	Drive and Wash / Cathead	7	74.95	14.42 - 14.92	24.39 - 24.89	34.36 - 34.86	44.39 - 44.89	54.38 - 54.88	64.40 - 64.90	74.45 - 74.95
ML04	793344	552334	Monitoring	27-Jun-11	NA	Drive and Wash / Cathead	7	75.25	14.62 - 15.12	24.69 - 25.19	34.59 - 35.09	44.32 - 44.82	54.62 - 55.12	64.66 - 65.16	74.75 - 75.25
PVP01*	793359	552328	Probe	12-Jul-11	NA	Drive and Wash / Cathead	3	77.00	7.00	17.00	27.00	37.00	47.00	57.00	67.00

Notes:

* Approximately 15 feet of drill casing remained in borehole during installation activities.

EW - extraction well

ft bgs - feet below ground surface

HSA - hollow stem auger

IRM - interim remedial measure

IW - injection well

ML - multilevel well

NA - not applicable

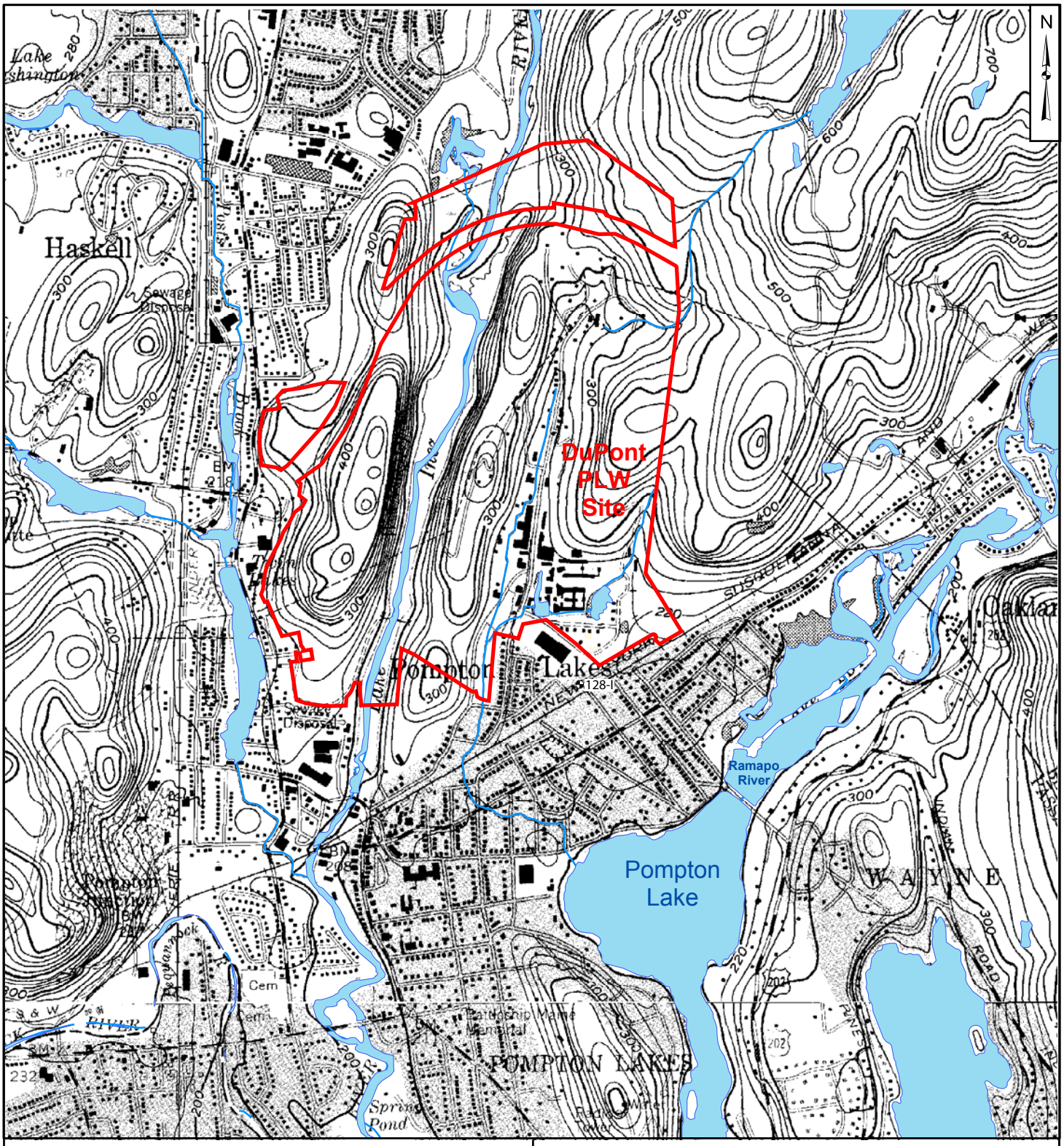
PVP - point velocity probe

TABLE 2
SUMMARY OF HYDRAULIC TESTING RESULTS
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Hydraulic Characterization Method	Upper Zone	Lower Zone
Hydraulic Conductivity, K	ft/day	
Borehole Dilution Test - IW02	48 - 62	11 - 17
AQTESOLV Modeling		
Step Test - IW01	--	3.7 - 3.9
Step Test - IW02	43.0 - 73.0	7.0 - 12.6
Geraghty & Miller (1986)	16 - 73	0.5 - 11.4
Groundwater Velocity, v	ft/day	
Borehole Dilution Test - IW02	0.32 - 0.41	0.08 - 0.11
AQTESOLV Modeling		
Step Test - IW01	--	0.02 - 0.03
Step Test - IW02	0.29 - 0.49	0.05 - 0.08
Geraghty & Miller (1986)	0.31 - 1.45	0.02 - 0.53
Specific Capacity	gpm/ft	
AQTESOLV Modeling		
Step Test - IW01	--	0.66 - 0.69
Step Test - IW02	6.70 - 7.21	0.76 - 1.21
Manual Measurements		
Step/Pump Test - IW01	--	0.67 - 0.69
Step/Pump Test - IW02	6.37 - 7.27	1.16 - 1.22
Geraghty & Miller (1986)	8.13 - 37.5	0.69 - 3.9
Transmissivity	ft^2/day	
AQTESOLV Modeling		
Step Test - IW01	--	90.5 - 156
Step Test - IW02	1046 - 1810	170 - 503
Manual Water Level Measurements		
Step/Pump Test - IW01	--	128 - 134
Step/Pump Test - IW02	1226 - 1400	224 - 234
Geraghty & Miller (1986)	1564 - 7219	134 - 749
Storativity	--	
AQTESOLV Modeling		
Step Test - IW01	--	0.00013 - 0.0012
Step Test - IW02	2.2E-9 - 0.0017	0.00088 - 0.0012
Specific Yield	%	
AQTESOLV Modeling		
Step Test - IW01	--	29 - 35
Step Test - IW02	21 - 70	16 - 20
Well Loss	ft	
Step Test - IW01	--	0.27 - 1.49
Step Test - IW02	0.03 - 0.28	0.99 - 3.02
Aquifer Loss	ft	
Step Test - IW01	--	9.07 - 19.50
Step Test - IW02	0.73 - 2.21	1.98 - 4.77
Horizontal Gradient	ft/ft, direction	
Manual Water Level Measurements		
128 IRM Pilot Test Area	0.00121 - 0.00207, SSE	
Site Wide	0.0034 - 0.0035, SE - SSE	
September 2010 Model	0.004, n/a	
Vertical Gradient	ft/ft	
Manual Water Level Measurements	Variable	

Notes:
Geraghty & Miller Assumptions. Upper: gradient = 0.003, porosity = 0.15; Lower: gradient = 0.007, porosity = 0.15
AQTESOLV Modeling Assumptions. Gradient = 0.00167, porosity = 0.25
Borehole Dilution Test Assumptions. Gradient = 0.00167, porosity = 0.25
-- - not available
% - percent
ft/day - feet per day
ft^2/day - square feet per day
ft/ft - feet per foot
gpm - gallons per minute
gpm/ft - gallons per minute per foot
SE - southeast
SSE - south-southeast

FIGURES



Legend:

- Site Areas
- Well Location

Notes:

Base is portions of the USGS Wanaque and Pompton Plains QUAD.
Figure from Parsons (2010).

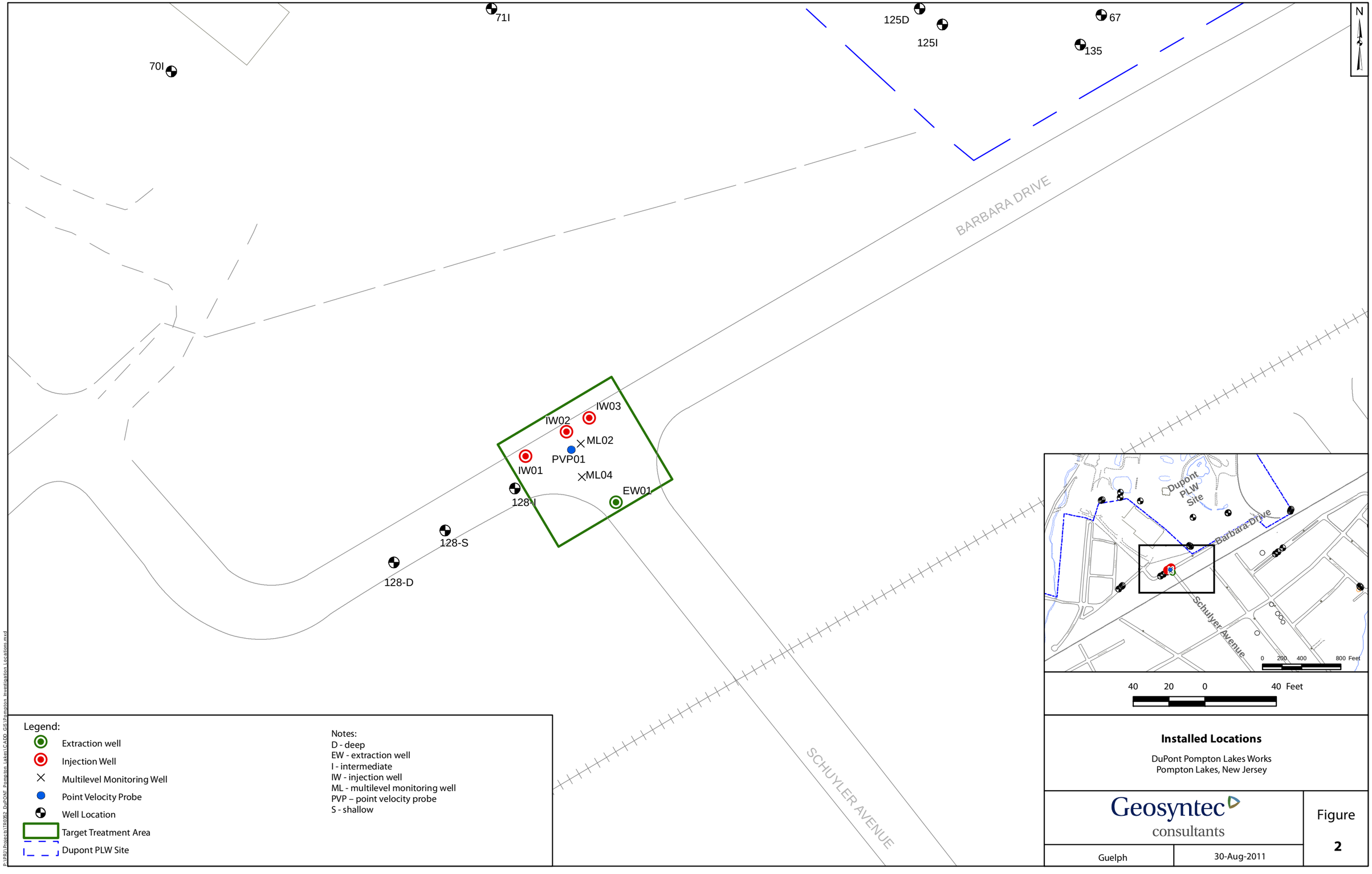
Site Location Map
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Geosyntec consultants

Guelph | 30-Aug-2011

Figure **1**

Site Location Map.ai



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Installed Locations

DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Geosyntec consultants

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Figure 2

Step 1

Project Initiation

When – Project will be initiated upon receipt of NJDEP/EPA work plan approval.

What – Obtain required permits from local, state and federal agencies finalize site conceptual model for pilot program area.

Duration – up to 6 weeks (permit approval).

Step 2

Well Installation (injection, extraction and monitoring wells)

Why – flow measurements, water quality, addition of bio reagents.

What – flush surface wells in 80' by 80' area near Schuyler and Barbara.

Duration – up to 3 weeks.

Hydraulic Testing

Why – Measure hydraulic conductivity of target treatment zones so that addition of bio-reagents is completed efficiently and effectively in Step 6 below.

What – (a) Slug tests, (b) short term pumping tests, (c) borehole dilution tests, and if necessary (d) hydraulic tomography and/or (e) conservative tracer test.

Duration – 3 weeks for a, b, and c . If d is necessary this would require 1 additional week. If e is necessary may require up to 4 months.

Steps 3&4

Hydraulic Testing Evaluation

Why – Collate data collected from previous step.

What – Refine injection volumes and flow rates to target zones. Conduct modeling to simulate addition of bio-reagents.

Duration – 3 weeks

Are hydraulic conditions amenable to technology?

No → Consider other technologies

Yes

Step 5

Pilot Test Operation Plan

Why – Incorporate hydraulic testing results to refine operating conditions for Pilot.

What – Develop operation plan (determine injection frequency, rate and amendment amounts. Install additional wells (if necessary). Complete baseline groundwater sampling.

Duration – 4 weeks (provide copy of Operation Plan to Regulatory Agencies).

Step 6

Pilot Test/IRM Operation

Why – Conduct pilot to simulate field operation/conditions.

What – Amend with bio-reagents and conservative tracer. Collect groundwater samples from wells for lab analysis. Confirm groundwater flow direction.

Duration – 6 months

Step 7

Pilot Test/IRM Evaluation

Why – Determine success of pilot test/IRM.

What – Collate site specific results for comparison to expected results simulate scale up design using groundwater flow model.

Duration – 6 weeks

Submit Report to Regulatory Agencies

Notes:
IRM – interim remedial measure

Groundwater Pilot - Sequence of Events Flowchart
Pompton Lakes Works, Pompton Lakes, New Jersey

Geosyntec consultants

Guelph | February 2011

Figure **3**

APPENDIX A

NJDEP PERMIT APPROVALS

PERMIT-BY-RULE

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BOB MARTIN
Commissioner

Bureau of Case Management
401-06F
P.O. Box 420
Trenton, NJ 08625-0420
Phone #: 609-633-1455
Fax #: 609-633-1439

E.I. Dupont De Nemours & Co
Attn: David E. Epps, Project Manager
2000 Cannonball Road
Pompton Lakes, NJ 07442

June 10, 2011

Approval

Re: E. I. DuPont De Nemours & Co
Pompton Lakes, Passaic County, New Jersey
SRP PI# 007411

Dear Mr. Epps:

This New Jersey Pollutant Discharge Elimination System/Discharge to Ground Water (NJPDES/DGW) permit-by-rule discharge authorization is hereby issued under the authority of the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq. and the implementing regulations, N.J.A.C. 7:14A-1 et seq. N.J.A.C. 7:14A-7.5(b)3iv authorizes discharges to ground waters associated with engineering design studies for a pilot test. Pursuant to N.J.A.C. 7:14A-22.4(b)5, a Treatment Works Approval is not required for discharges to ground water authorized pursuant to N.J.A.C. 7:14A-7.5(b). The discharge approved through this permit-by-rule authorization is to UIC Injection Wells and must be conducted in conformance with the following requirements.

This permit-by-rule discharge authorization is issued in order to facilitate the remedial activities conducted with oversight from the Site Remediation Program of the Department of Environmental Protection (Department). Pursuant to N.J.A.C. 7:14A-7.5(b)3iv, the discharge shall not exceed 180 days. The discharge proposal is found in DuPont's May 12, 2011 "Request for NJDEP Permit-by Rule for Hydraulic Testing Interim Remedial Measure Field Pilot Study near Well 128 DuPont Pompton Lakes Works Site".

Site Description

The location of the permit-by-rule is the DuPont Pompton Lakes Works Site, 2000 Cannonball Road, Pompton Lakes, Passaic County, NJ. The facility is a 570 acre property. The site is a former explosive manufacturing facility which closed in 1994. The ground water on-site and off-site is contaminated with volatile organic compounds. The off-site plume extends from the southern boundary of the DuPont property in the Eastern Manufacturing Area to Pompton Lake. The objective of this testing program is to collect engineering data on the hydraulic properties of the shallow and intermediate portions of the unconfined aquifer in the pilot study area near the MW 128 well cluster at the corner of Barbara Drive and Schuyler Avenue in the Borough of Pompton Lakes. If the engineering testing is successful, then an in-situ bioremediation pilot study will be proposed for this area. The overall goal is to determine a technology or technologies which can be used to remediate the off-site ground water plume.

Proposed Pilot Test

An evaluation of applicable hydraulic testing methods for the characterization of groundwater flow in the MW 128 area was conducted. Results of the evaluation indicated that indirect velocity measurements (slug tests and pump tests) and direct measurements (point velocity probes [PVPs], borehole dilution tests, and tracer tests) were best suited for this project. The discharge under this PBR will be conducted in two phases.

During the first phase, groundwater flow velocity in the pilot study area will be measured via a borehole dilution test completed in one of the injection wells. The test will proceed with the introduction of a conservative tracer, either potassium bromide with a target concentration of 500 milligrams per liter (mg/L) and maximum mass of 200 grams (g) or Brilliant Blue FCF with a target concentration of 200 mg/L and maximum mass of 200 g. The chosen tracer will be introduced across the entire borehole length followed by monitoring of the depletion of the tracer concentration at a number of levels. The test will provide vertical profiling data to determine groundwater velocity at predetermined depths across the aquifer.

For the second phase, a PVP will be installed to compare in-situ velocity results with the injection well borehole dilution test results. The PVP will provide a complementary in-situ velocity measurement point to the borehole dilution test, except that the measurement is in direct contact with the formation and not inferred via flow through an open well. Measurements of apparent groundwater velocity in the PVP will proceed by injecting a small volume of tracer to the injection point of the device followed by detection of the changes in electrical resistance at the PVP detectors. Approximately 10 milliliters (mL) of tracer (i.e. potassium bromide) will be injected per PVP detector. The target injection concentration of the potassium bromide will not exceed 500 mg/L per PVP detector and a maximum mass of 200 g of potassium bromide.

A recognized suite of hydraulic tests will also be conducted to determine hydraulic conductivity ranges and well efficiency (Q/s) including slug tests (falling or rising head), step drawdown tests, and constant rate abstraction (pumping) tests. The slug, step and pumping tests will provide design data to determine optimal pumping rates in the vicinity of the pilot study area.

Injection Well Construction Requirements

The permittee will comply with the provisions of the NJPDES regulations, N.J.A.C. 7:14A-8.16(b)1 when UIC-Class V injection wells are used.

All design plans and specifications for the injection wells shall be retained and made available to the Department upon request.

Injection Well Operation and Closure

UIC Class V injection wells shall be operated and maintained pursuant to N.J.A.C. 7:14A-8.16 (c). Upon termination of injection well operations, the UIC Class V injection wells will be properly closed and abandoned in accordance with N.J.A.C. 7:14A-8.16(d).

Site Monitoring Requirements

Well installation and construction methods will be pursuant to N.J.A.C. 7:D, N.J.A.C. 7:26E et. seq. and the current version of the NJDEP *Field Sampling Procedures Manual.*

All monitoring wells used to monitor the effectiveness of the injection events will be sampled in accordance with N.J.A.C. 7:26E et. seq. and the current version of the NJDEP *Field Sampling Procedures Manual.*

All groundwater samples will be handled in accordance with the current version of the NJDEP's *Field Sampling Procedures Manual.*

The 180 day PBR will begin on the day that the tracer is first introduced (discharged) and not on the date when the discharge approval letter is issued by NJDEP or received by DuPont. A record of the date discharging begins will be made in the field operation log and NJDEP will be notified within 24 hours of that first discharge day.

Pursuant to the schedule applicable to the site you shall submit the Hydraulic Testing Evaluation Technical Memorandum on August 31, 2011. Please submit the document by that date, or submit a written request for an extension at least 2 weeks prior to the due date. Failure to submit the document in accordance with the schedule may result in the initiation of enforcement action. For your convenience, the regulations concerning the Department's remediation requirements can be found at http://www.state.nj.us/dep/srp/regs/.

If you have any questions regarding this matter I may be contacted at (609) 633-1416.

Sincerely,

Anthony Cinque, Case Manager
Bureau of Case Management

c: Kathleen M. Cole, Mayor Pompton Lakes Borough
Mary Ann Orapello, Township of Wayne Health Department
Barry Tornick, USEPA Region II
Clifford Ng, USEPA Region II
Anne Pavelka, NJDEP/BGWPA
John Boyer, NJDEP/BEERA
Mindy Mumford, NJDEP/BCR

WELL INSTALLATION PERMITS

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102136

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

PROPERTY OWNER

Name: BOROUGH OF POMPTON LAKES RIGHT OF WAY

Organization: Borough of Pompton Lakes

Address: 27 Barbara Drive

City: Pompton Lakes Boro State: New Jersey Zip Code: 07442

PROPOSED WELL LOCATION

Facility Name: Borough of Pompton Lakes ROW

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: EW01

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: RECOVERY

Other Use(s):

Diameter (in.): 4

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: N

Drilling Method: Hollow Stem Augers

Attachments: Figure - EW and IW Detail.pdf
NJDEP compliance letter.pdf
ll installation documents).pdf
n for Ground Water (Cover).pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Approval Date: February 18, 2011
Expiration Date: February 18, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102136

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	
Unusual Conditions:	
Reason for Deviation:	
Proposed Well Construction	

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102091

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

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Facility Name: Borough of Pompton Lakes ROW

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: IW01

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: INJECTION

Other Use(s):

Diameter (in.): 4

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: N

Drilling Method: Hollow Stem Augers

Attachments: Figure - EW and IW Detail.pdf
NJDEP Letter.pdf
ll installation documents).pdf
n for Ground Water (Cover).pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Approval Date: February 18, 2011
Expiration Date: February 18, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102091

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	
Unusual Conditions:	
Reason for Deviation:	
Proposed Well Construction	

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102122

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

PROPERTY OWNER

Name: BOROUGH OF POMPTON LAKES RIGHT OF WAY

Organization: Borough of Pompton Lakes

Address: 27 Barbara Drive

City: Pompton Lakes Boro State: New Jersey Zip Code: 07442

PROPOSED WELL LOCATION

Facility Name: Borough of Pompton Lakes

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: IW02

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: INJECTION

Other Use(s):

Diameter (in.): 4

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: N

Drilling Method: Hollow Stem Augers

Attachments: Figure - EW and IW Detail.pdf
NJDEP Letter.pdf
ll installation documents).pdf
n for Ground Water (Cover).pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Approval Date: February 18, 2011
Expiration Date: February 18, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102122

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	
Unusual Conditions:	
Reason for Deviation:	
Proposed Well Construction	

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102132

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

PROPERTY OWNER

Name: BOROUGH OF POMPTON LAKES RIGHT OF WAY

Organization: Borough of Pompton Lakes

Address: 27 Barbara Drive

City: Pompton Lakes Boro State: New Jersey Zip Code: 07442

PROPOSED WELL LOCATION

Facility Name: Borough of Pompton lakes ROW

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: IW03

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: INJECTION

Other Use(s):

Diameter (in.): 4

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: N

Drilling Method: Hollow Stem Augers

Attachments: Figure - EW and IW Detail.pdf
NJDEP Letter.pdf
ll installation documents).pdf
n for Ground Water (Cover).pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Approval Date: February 18, 2011
Expiration Date: February 18, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102132

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	
Unusual Conditions:	
Reason for Deviation:	
Proposed Well Construction	

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102158

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

PROPERTY OWNER

Name: BOROUGH OF POMPTON LAKES RIGHT OF WAY

Organization: Borough of Pompton Lakes

Address: 27 Barbara Drive

City: Pompton Lakes Boro State: New Jersey Zip Code: 07442

PROPOSED WELL LOCATION

Facility Name: Pompton Lakes Borough ROW

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: ML02

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: MONITORING

Other Use(s):

Diameter (in.): 1.7

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: Y

Drilling Method: Driven

Attachments: CMT Well Deviation Form.pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Well must be built in accordance with submitted deviation [N.J.A.C. 7.9D-2.8]

Approval Date: February 25, 2011
Expiration Date: February 25, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102158

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	Install multilevel CMT monitoring well with a bentonite pellet seal between well screens. The use of bentonite pellets will allow continuous installation without the set up time required for grout seals.
Unusual Conditions:	The use of bentonite pellets is a deviation from the required materials for sealing annular space of any well found in section 2.9 of the NJ Regulations.
Reason for Deviation:	Allow installation of the multi level CMT well without the set up time required for grout seals.
Proposed Well Construction	See attached figure. Note: 6" S.S. screen describes the length of the CMT screen zone and not the diameter of the screen. The CMT screen has a 1.7" diam.

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102168

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

PROPERTY OWNER

Name: BOROUGH OF POMPTON LAKES RIGHT OF WAY

Organization: Borough of Pompton Lakes

Address: 27 Barbara Drive

City: Pompton Lakes Boro State: New Jersey Zip Code: 07442

PROPOSED WELL LOCATION

Facility Name: Pompton Lakes Borough ROW

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: ML04

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: MONITORING

Other Use(s):

Diameter (in.): 1.7

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: Y

Drilling Method: Driven

Attachments: CMT Well Deviation Form.pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Well must be built in accordance with submitted deviation [N.J.A.C. 7.9D-2.8]

Approval Date: February 25, 2011
Expiration Date: February 25, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201102168

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	Install multilevel CMT monitoring well with a bentonite pellet seal between well screens. The use of bentonite pellets will allow continuous installation without the set up time required for grout seals.
Unusual Conditions:	The use of bentonite pellets is a deviation from the required materials for sealing annular space of any well found in section 2.9 of the NJ Regulations.
Reason for Deviation:	Allow installation of the multi level CMT well without the set up time required for grout seals.
Proposed Well Construction	See attached figure. Note: 6" S.S. screen describes the length of the CMT screen zone and not the diameter of the screen. The CMT screen has a 1.7" diam.

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201107760

WELL PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: MICHAEL ELLINGWORTH, JOURNEYMAN LICENSE # 0002725

Permit Issued to: PARRATT-WOLFF INC

Company Address: PO BOX 56 5879 FISHER RD , NY 13057

PROPERTY OWNER

Name: BOROUGH OF POMPTON LAKES RIGHT OF WAY

Organization: Borough of Pompton Lakes

Address: 27 Barbara Drive

City: Pompton Lakes Boro State: New Jersey Zip Code: 07442

PROPOSED WELL LOCATION

Facility Name: Pompton Lakes Borough ROW

Address: 27 Barbara Drive

County: Passaic Municipality: Pompton Lakes Boro Lot: 33 Block: 100

Easting (X): 552350 Northing (Y): 793379
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: PVP-1

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: MONITORING

Other Use(s): Injection

Diameter (in.): 2

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 80

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: Y

Drilling Method: Driven

Attachments: Deviation Information.pdf
Point Velocity Probe_0352.pdf

SPECIFIC CONDITIONS/REQUIREMENTS

Well must be built in accordance with submitted deviation [N.J.A.C. 7.9D-2.8]

Approval Date: June 28, 2011
Expiration Date: June 27, 2012

Approved by the authority of:
Bob Martin
Commissioner

John Fields, Acting Bureau Chief
Bureau of Water Systems and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201107760

WELL PERMIT

DEVIATION INFORMATION	
Purpose:	See "Deviation Information" attached
Unusual Conditions:	See "Deviation Information" attached
Reason for Deviation:	See "Deviation Information" attached
Proposed Well Construction	See "Deviation Information" attached

GENERAL CONDITIONS/REQUIREMENTS
A copy of this permit shall be kept at the worksite / on the property and shall be exhibited upon request. [N.J.A.C. 7:9D-1]
A well record must be submitted by the well driller to the Bureau of Water Systems and Well Permitting. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the well record shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Record: within ninety (90) days after the well is completed.[N.J.A.C. 7:9D-1]
All well drilling/pump installation activities shall comply with N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
For this permit to remain valid, the well approved in this permit shall be constructed within one year of the effective date of the permit. [N.J.A.C. 7:9D-1]
If the pump capacity applied for is less than 70 gpm, no subsequent increase to 70 gpm or more shall be made without prior approval of the Bureau of Water Systems and Well Permitting. [N.J.A.C. 7:9D-1]
If the use of the well is to be changed a well permit for the proposed use of the well shall be submitted for review and approval. [N.J.A.C. 7:9D-1]
If you or a future property owner intend to redesignate this well as a Category 1 well (domestic, non-public, community water supply or public non-community water supply wells), the well must be constructed as a Category 1 well per the Well Construction and Abandonment Regulations at N.J.A.C. 7:0D-1.1 et seq. In addition, if the current or future property owner intends to have this well redesignated as a community water supply well, the well must be constructed by a Master well driller, which would include having a Master well driller on-site at all times during construction of the well, as specified in the Well Construction and Abandonment Regulations. Otherwise, the New Jersey Department of Environmental Protection will not allow the well to be redesignated, and a new well would have to be installed. [N.J.A.C. 7:9D-1.7((a))1i]
In accepting this permit the Property Owner and Driller agree to abide by the following terms and conditions [N.J.A.C. 7:9D-1]
In the event that this well is not constructed the well driller shall notify the Bureau of Water Systems and Well Permitting of the permit cancellation. Unless prior written approval is obtained from the Bureau of Water Systems and Well Permitting the Cancellation notification shall be submitted electronically through the New Jersey Department of Environmental Protection's Regulatory Services Portal Submit Well Permit Cancellation : by the expiration date of this permit.[N.J.A.C. 7:9D-1]
In the event this well is abandoned, the Owner or Well driller shall assume full responsibility for having the well decommissioned in a manner satisfactory to the New Jersey Department of Environmental Protection in accordance with the provisions of N.J.A.C. 7:9D-1 et seq. [N.J.A.C. 7:9D-1]
The granting of this permit shall not be construed in any way to affect the title or ownership of property, and shall not make the New Jersey Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:9D-1]
The issuance of this permit shall not be deemed to affect in any way action by the New Jersey Department of Environmental Protection on any future application. [N.J.A.C. 7:9D-1]
This permit conveys no rights, either expressed, or implied to divert water. [N.J.A.C. 7:9D-1]
This permit does not waive the obtaining of Federal or other State or local Government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:9D-1]
This permit is NONTRANSFERABLE [N.J.A.C. 7:9D]
This well shall not be used for the supply of potable / drinking water. [N.J.A.C. 7:9D-1]

APPENDIX B

WELL CONSTRUCTION LOGS

O'BRIEN & GERE

BORING LOG

WELL NO. EW01

PROJECT: Well 128 IRM Pilot Study
CLIENT: DuPont PLW
INSPECTOR: Nicole Moneta

SHEET 1 OF 1

JOB NO. 47723

DRILLING CONTRACTOR: Parratt Wolff, Inc.
DRILLER: Ian Grassie
PURPOSE: Pilot Study
DRILLING METHOD: Direct Push, HSA
DRILL RIG TYPE: HSA

GROUND ELEV. 219.11 ft msl

DATUM NAVD 1988

DATE STARTED 6/15/2011

DATE FINISHED 6/17/2011

	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	12"

DEPTH (ft)	USCS Symbol		MATERIAL DESCRIPTION
2–14	SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
14–29	SP	29.0	Fine to coarse brown SAND, trace gravel
29–38	SP-SM	38.0	Fine to coarse brown SAND, trace silt
38–41	SP-SM	41.0	Fine to medium brown SAND, trace silt
41–75	SP-SM	75.0	Fine brown SAND, trace silt
			End of Borehole at 75.0'.

WELL DIAGRAM

- Cap
- Grout
- 4-in Diameter Sch 80 PVC Casing
- Bentonite
- Choker (#00 SAND)
- Filter Pack (#1 SAND)
- 4-in Diameter Sch 80 PVC Slotted Screen (0.030-in)
- Choker (#00 SAND)
- Bentonite
- 4-in Diameter Sch 80 PVC Casing
- Choker (#00 SAND)
- Filter Pack (#1 SAND)
- 4-in Diameter Sch 80 PVC Slotted Screen (0.030-in)
- End Cap

Notes:

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

O'BRIEN & GERE

BORING LOG

WELL NO. IW01

PROJECT: Well 128 IRM Pilot Study
CLIENT: DuPont PLW
INSPECTOR: Nicole Moneta

SHEET 1 OF 1

JOB NO. 47723

DRILLING CONTRACTOR: Parratt Wolff, Inc.
DRILLER: Ian Grassie
PURPOSE: Pilot Study
DRILLING METHOD: Direct Push, HSA
DRILL RIG TYPE: HSA

GROUND ELEV. 218.08 ft msl

DATUM NAVD 1988

DATE STARTED 6/1/2011

DATE FINISHED 6/3/2011

	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	12"

DEPTH (ft)	GRAPHIC LOG	USCS Symbol		MATERIAL DESCRIPTION
2–14		SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
14–29		SP	29.0	Fine to coarse brown SAND, trace gravel
29–38		SP-SM	38.0	Fine to coarse brown SAND, trace silt
38–41		SP-SM	41.0	Fine to medium brown SAND, trace silt
41–74.2		SP-SM	74.2	Fine brown SAND, trace silt

End of Borehole at 74.2'.

WELL DIAGRAM

- Cap
- Grout
- 4-in Diameter Sch 80 PVC Casing
- Bentonite
- Choker (#00 SAND)
- Filter Pack (#1 SAND)
- 4-in Diameter Sch 80 PVC Slotted Screen (0.030-in)
- Choker (#00 SAND)
- Bentonite
- 4-in Diameter Sch 80 PVC Casing
- Choker (#00 SAND)
- Filter Pack (#1 SAND)
- 4-in Diameter Sch 80 PVC Slotted Screen (0.030-in)
- End Cap

Notes:

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

O'BRIEN & GERE

BORING LOG

WELL NO. IW02

PROJECT: Well 128 IRM Pilot Study
CLIENT: DuPont PLW
INSPECTOR: Nicole Moneta

SHEET 1 OF 1

JOB NO. 47723

DRILLING CONTRACTOR: Parratt Wolff, Inc.
DRILLER: Ian Grassie
PURPOSE: Pilot Study
DRILLING METHOD: Direct Push, HSA
DRILL RIG TYPE: HSA

GROUND ELEV. 218.07 ft msl

DATUM NAVD 1988

DATE STARTED 6/14/2011

DATE FINISHED 6/17/2011

	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	12"

DEPTH (ft)	GRAPHIC LOG	USCS Symbol		MATERIAL DESCRIPTION
2–14		SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
16–28		SP	29.0	Fine to coarse brown SAND, trace gravel
30–38		SP-SM	38.0	Fine to coarse brown SAND, trace silt
40		SP-SM	41.0	Fine to medium brown SAND, trace silt
42–74		SP-SM	75.0	Fine brown SAND, trace silt
76				End of Borehole at 75.0'.

WELL DIAGRAM

- Cap
- Grout
- 4-in Diameter Sch 80 PVC Casing
- Bentonite
- Choker (#00 SAND)
- Filter Pack (#1 SAND)
- 4-in Diameter Sch 80 PVC Slotted Screen (0.030-in)
- Choker (#00 SAND)
- Bentonite
- 4-in Diameter Sch 80 PVC Casing
- Choker (#00 SAND)
- Filter Pack (#1 SAND)
- 4-in Diameter Sch 80 PVC Slotted Screen (0.030-in)
- End Cap

Notes:

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

BORING LOG

WELL NO. IW03

PROJECT:	Well 128 IRM Pilot Study
CLIENT:	DuPont PLW
INSPECTOR:	Nicole Moneta
DRILLING CONTRACTOR:	Parratt Wolff, Inc.
DRILLER:	Ian Grassie
PURPOSE:	Pilot Study
DRILLING METHOD:	Direct Push, HSA
DRILL RIG TYPE:	HSA

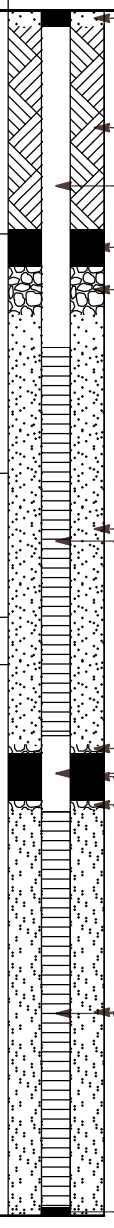
	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	12"

SHEET 1 OF 1	
JOB NO.	47723
GROUND ELEV.	218.16 ft msl
DATUM	NAVD 1988
DATE STARTED	6/8/2011
DATE FINISHED	6/10/2011

DEPTH (ft)	GRAPHIC LOG	USCS Symbol		MATERIAL DESCRIPTION
2–14		SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
16–28		SP	29.0	Fine to coarse brown SAND, trace gravel
30–38		SP-SM	38.0	Fine to coarse brown SAND, trace silt
40		SP-SM	41.0	Fine to medium brown SAND, trace silt
42–76		SP-SM	75.5	Fine brown SAND, trace silt

End of Borehole at 75.5'.

WELL DIAGRAM



Notes:

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

O'BRIEN & GERE

BORING LOG

WELL NO. ML02

PROJECT: Well 128 IRM Pilot Study
CLIENT: DuPont PLW
INSPECTOR: Nicole Moneta

SHEET 1 OF 1

JOB NO. 47723

DRILLING CONTRACTOR: Parratt Wolff, Inc.
DRILLER: Ian Grassie
PURPOSE: Pilot Study
DRILLING METHOD: Drive and Wash, Cathead
DRILL RIG TYPE: Cathead

GROUND ELEV. 218.14 ft msl

DATUM NAVD 1988

DATE STARTED 6/27/2011

DATE FINISHED 6/30/2011

	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	7"

DEPTH (ft)	GRAPHIC LOG	USCS Symbol		MATERIAL DESCRIPTION
2–14		SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
16–28		SP	29.0	Fine to coarse brown SAND, trace gravel
30–38		SP-SM	38.0	Fine to coarse brown SAND, trace silt
38–40		SP-SM	41.0	Fine to medium brown SAND, trace silt
42–76		SP-SM	76.8	Fine brown SAND, trace silt
78				End of Borehole at 76.8'.

WELL DIAGRAM

- Cap
- Grout
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Stainless Steel Screen (100 Mesh)
- Filter Pack (#0 SAND)

Notes:

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

O'BRIEN & GERE

BORING LOG

WELL NO. ML04

PROJECT: Well 128 IRM Pilot Study
CLIENT: DuPont PLW
INSPECTOR: Nicole Moneta

SHEET 1 OF 1

JOB NO. 47723

DRILLING CONTRACTOR: Parratt Wolff, Inc.
DRILLER: Ian Grassie
PURPOSE: Pilot Study
DRILLING METHOD: Drive and Wash, Cathead
DRILL RIG TYPE: Cathead

GROUND ELEV. 218.21 ft msl

DATUM NAVD 1988

DATE STARTED 6/20/2011

DATE FINISHED 6/27/2011

	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	7"

DEPTH (ft)	GRAPHIC LOG	USCS Symbol		MATERIAL DESCRIPTION
2–14		SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
16–28		SP	29.0	Fine to coarse brown SAND, trace gravel
30–38		SP-SM	38.0	Fine to coarse brown SAND, trace silt
40		SP-SM	41.0	Fine to medium brown SAND, trace silt
42–76		SP-SM	76.0	Fine brown SAND, trace silt
				End of Borehole at 76.0'.

WELL DIAGRAM

- Cap
- Grout
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)
- Bentonite
- Filter Pack (#0 SAND)
- Stainless Steel Screen (100 Mesh)

Notes:

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

O'BRIEN & GERE

BORING LOG

WELL NO. PVP01

PROJECT: Well 128 IRM Pilot Study
CLIENT: DuPont PLW
INSPECTOR: Nicole Moneta

SHEET 1 OF 1

JOB NO. 47723

DRILLING CONTRACTOR: Parratt Wolff, Inc.
DRILLER: Ian Grassie
PURPOSE: Pilot Study
DRILLING METHOD: Drive and Wash, Cathead
DRILL RIG TYPE: Cathead

GROUND ELEV. 218.09 ft msl

DATUM NAVD 1988

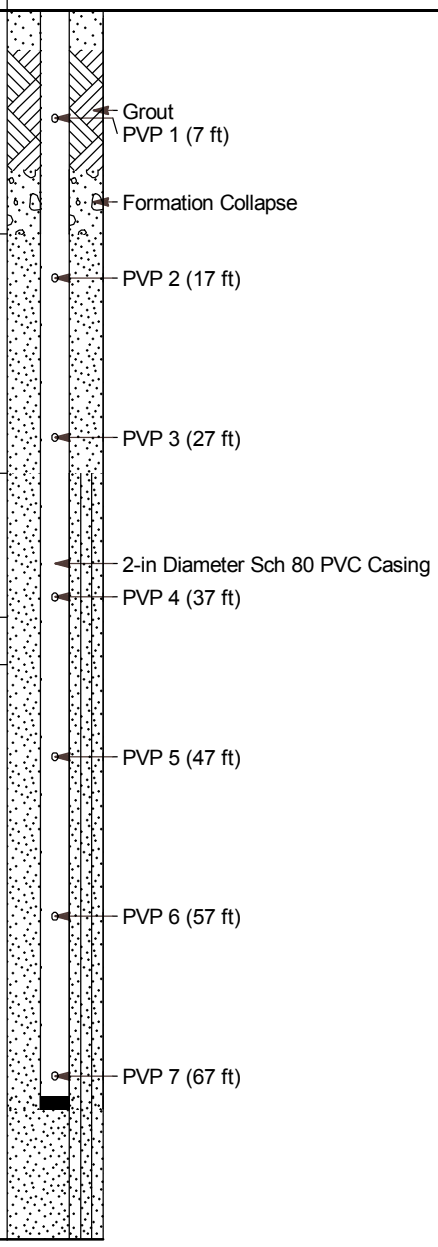
DATE STARTED 7/5/2011

DATE FINISHED 7/12/2011

	SAMPLE	CORE	CASING
TYPE	---	---	SS
DIA.	---	---	3"

DEPTH (ft)	GRAPHIC LOG	USCS Symbol		MATERIAL DESCRIPTION
2–14		SPG	14.0	Medium to coarse brown gravelly SAND, trace silt
16–28		SP	29.0	Fine to coarse brown SAND, trace gravel
30–38		SP-SM	38.0	Fine to coarse brown SAND, trace silt
40		SP-SM	41.0	Fine to medium brown SAND, trace silt
42–76		SP-SM	77.0	Fine brown SAND, trace silt
78				End of Borehole at 77.0'.

WELL DIAGRAM



Notes: 15 ft of casing left in the borehole.

Report Name: OBG BORING LOG Data Template: OBG GINT STD US.GDT

APPENDIX C

WELL DEVELOPMENT LOGS

O'BRIEN & GERE

Monitoring Well Development Log

Date:	6/21/2011	Personnel:	N.Moneta	Weather:	80° F Cloudy
Site Name:	DuPont PLW	Pump/Controller ID#:	Airlift Pump	Well #:	**EW-01**
Site Location:	Pompton Lakes, NJ	Purging Method:	Airlift and Surge	Project #:	47723

Water Quality Equip. Used (include ID#):

Well information:

Initial Depth of Well: *	68.7 X	ft.	Final Depth of Well: *	75 ft	/	Top of Well Casing
Initial Depth to Water: *	9.4 /	ft.	Final Depth to Water: *	9.4 ft	X	Top of Protective Casing
Water Column Length:	59.30	ft.				(Other, Specify)
Well Volume:	38	gal.	Volumes to be purged:	3 + 150 gallons of drilling water		

* Measurements taken from

Start Purge Time: 1500

indicate units

Elapsed Time (min)	Depth To Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity (ms/Cm)	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (gal/min)
1510	12.02	18.69	7.58	0.828	130	15.56	315	6.5
1515	12.42	18.69	7.49	0.823	123	15.47	215	6.5
1525	12.17	17.75	7.68	0.750	86	13.13	90.4	6.5
1535	12.18	16.71	7.67	0.671	121	13.22	14.5	6.5

End Purge Time: 1540

Total volume of purged water removed: 300 gallons

Physical appearance at start:

Color: brown
Odor: none
Sheen/Free Product: none

Physical appearance at end:

Color: clear
Odor: none
Sheen/Free Product: none

Noles:

Surged for two hours prior to pumping.

Geologist Signature:

O'BRIEN & GERE

Monitoring Well Development Log

Date:	6/7/2011	Personnel:	N.Moneta	Weather:	89° F Sunny, humid
Site Name:	DuPont PLW	Pump/Controller ID#:	Airlift Pump	Well #:	**IW-01**
Site Location:	Pompton Lakes, NJ	Purging Method:	Airlift and Surge	Project #:	47723

Water Quality Equip. Used (include ID#):

Well information:

Initial Depth of Well: *	61.00	ft.	Final Depth of Well: *	74.2 ft	X	Top of Well Casing
Initial Depth to Water: *	7.81	ft.	Final Depth to Water: *	7.80 ft		Top of Protective Casing
Water Column Length:	60.19	ft.				(Other, Specify)
Well Volume:	39	gal.	Volumes to be purged:	3 + 150 gallons of drilling water		

* Measurements taken from

Start Purge Time: 1133

indicate units

Elapsed Time (min)	Depth To Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity (_ms/Cm_)	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (gal/min)
1245	NA	17.42	8.42	1.18	154	19.97	914	3
1300	NA	17.42	8.01	1.49	87	15.33	514	3
1315	NA	17.16	7.53	2.48	129	13.86	406	3
1430	NA	18.05	7.90	2.25	132	13.95	284	3
1445	NA	18.00	7.88	2.23	134	13.86	261	3
1500	NA	16.98	7.92	4.17	136	13.38	472	3
1510	NA	16.94	8.09	3.87	134	12.96	407	3
1520	NA	17.65	8.27	23.20	119	13.85	74.3	3
1525	NA	16.64	8.21	15.60	121	14.09	69.3	3

End Purge Time: 1530

Total volume of purged water removed: 500 gallons

Physical appearance at start:

Color: gray, silty

Odor: none

Sheen/Free Product: none

Physical appearance at end:

Color: clear

Odor: none

Sheen/Free Product: none

Noles:

Pumped and surged for an hour to remove sediments before readings were taken.

Depth to water readings were unable to be obtain due to surge blocks.

Geologist Signature:

O'BRIEN & GERE

Monitoring Well Development Log

Date:	6/29/2011	Personnel:	N.Moneta	Weather:	80° F Sunny
Site Name:	DuPont PLW	Pump/Controller ID#:	Airlift Pump	Well #:	**IW-02**
Site Location:	Pompton Lakes, NJ	Purging Method:	Airlift and Surge	Project #:	47723
Water Quality Equip. Used (include ID#):	Horiba U-52				

Well information:

						* Measurements taken from
Initial Depth of Well: *	64.90	ft.	Final Depth of Well: *	75 ft	X	Top of Well Casing
Initial Depth to Water: *	8.02	ft.	Final Depth to Water: *	8.43 ft		Top of Protective Casing
Water Column Length:	56.88	ft.				(Other, Specify)
Well Volume:	57	gal.	Volumes to be purged:	3 + 150 gallons of drilling water		

Start Purge Time: 1243

indicate units

Elapsed Time (min)	Depth To Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity (_ms/Cm_)	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (gal/min)
1251	9.35	19.23	6.43	0.753	139	12.31	159	8.5
1300	9.35	19.37	6.55	0.741	137	12.26	154	8.5
1305	9.35	18.58	6.88	0.651	80	12.17	34.9	8.5
1310	9.35	19.27	7.03	0.643	99	10.42	29.9	8.5
1315	9.35	17.62	7.17	0.624	84	11.34	24.5	8.5

End Purge Time: 1318

Total volume of purged water removed: 725 gallons

Physical appearance at start:

Color: silty, grey
Odor: none
Sheen/Free Product: none

Physical appearance at end:

Color: clear
Odor: none
Sheen/Free Product: none

Noles:

Pumped an extra 225 gallons to try and capture drilling water from CMT wells on 6/29/11.
Pumped an extra 300 gallons at the bottom 10 feet of screen on 6/30/11.

Geologist Signature: _____

O'BRIEN & GERE

Monitoring Well Development Log

Date:	6/13/2011	Personnel:	N.Moneta	Weather:	75° F Overcast
Site Name:	DuPont PLW	Pump/Controller ID#:	Airlift Pump	Well #:	**IW-03**
Site Location:	Pompton Lakes, NJ	Purging Method:	Airlift and Surge	Project #:	47723

Water Quality Equip. Used (include ID#):

Well information:

Initial Depth of Well: *	75.5 X	ft.	Final Depth of Well: *	75.5 ft X	/	Top of Well Casing
Initial Depth to Water: *	8.00 /	ft.	Final Depth to Water: *	8.00 ft /	X	Top of Protective Casing
Water Column Length:	67.50	ft.				(Other, Specify)
Well Volume:	43	gal.	Volumes to be purged:	3 + 150 gallons of drilling water		

* Measurements taken from

Start Purge Time: 1415

indicate units

Elapsed Time (min)	Depth To Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity (_ms/Cm_)	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (gal/min)
1420	8.07	17.50	9.13	1.63	74	18.51	835	7.5
1425	8.09	18.03	8.71	1.50	114	15.05	96.2	7.5
1430	8.09	16.91	8.67	1.52	128	14.79	75.6	7.5
1435	8.09	15.60	8.59	1.55	133	15.54	70.7	7.5
1440	8.09	15.81	8.53	1.53	135	15.73	63.1	7.5
1445	8.09	17.18	8.59	0.999	138	14.30	62.7	7.5
1450	8.09	16.67	8.44	1.43	138	13.94	52.7	7.5
1455	8.09	15.73	8.52	1.66	138	13.95	51.1	7.5

End Purge Time: 1455

Total volume of purged water removed: 300 gallons

Physical appearance at start:

Color: cloudy grey

Odor: none

Sheen/Free Product: none

Physical appearance at end:

Color: clear

Odor: none

Sheen/Free Product: none

Noles:

Pumped silt out on 6/10/11 to gain depth of well prior to development.

Depth to water readings taken from IW-01.

Geologist Signature:

APPENDIX D

WATER LEVEL SUMMARY AND CONTOUR MAPS

TABLE D-1
WATER LEVEL MEASUREMENT SUMMARY
DuPont Pompton Lakes Works Site, Pompton Lakes, New Jersey

Location	Date	Time	Water Level (ft btoc)	Total Depth (ft btoc)
128-I	11-Jul-11	11:11	8.49	--
128-I	12-Jul-11	16:53	8.69	--
128-I	13-Jul-11	8:09	8.72	--
128-I	14-Jul-11	7:59	8.75	--
128-I	15-Jul-11	7:04	8.77	--
128-I	18-Jul-11	7:36	8.91	--
128-I	19-Jul-11	7:32	8.95	--
128-I	20-Jul-11	8:32	8.95	--
128-I	21-Jul-11	8:04	8.99	--
128-I	22-Jul-11	8:11	9.04	--
128-S	29-Jun-11	9:41	8.55	--
128-S	29-Jun-11	15:47	8.55	--
128-S	30-Jun-11	8:17	8.58	--
128-S	06-Jul-11	10:02	8.79	--
128-S	07-Jul-11	8:33	8.82	--
128-S	08-Jul-11	8:31	8.85	--
128-S	11-Jul-11	11:24	8.95	--
128-S	12-Jul-11	13:21	8.97	--
128-S	13-Jul-11	8:05	9.01	--
128-S	14-Jul-11	7:55	9.04	--
128-S	15-Jul-11	7:01	9.06	--
128-S	18-Jul-11	7:38	9.18	--
128-S	19-Jul-11	7:30	9.19	--
128-S	20-Jul-11	8:35	9.24	--
128-S	21-Jul-11	8:07	9.27	--
128-S	22-Jul-11	8:14	9.32	--
EW01	29-Jun-11	9:50	9.24	--
EW01	29-Jun-11	15:50	9.23	--
EW01	30-Jun-11	8:20	9.28	--
EW01	06-Jul-11	10:22	9.50	--
EW01	06-Jul-11	15:50	9.49	--
EW01	07-Jul-11	8:37	9.52	--
EW01	08-Jul-11	8:34	9.55	--
EW01	11-Jul-11	11:42	9.65	--
EW01	12-Jul-11	13:17	9.67	--
EW01	13-Jul-11	8:24	9.71	--
EW01	13-Jul-11	17:05	9.69	--
EW01	14-Jul-11	8:18	9.74	--
EW01	15-Jul-11	7:27	9.75	--
EW01	18-Jul-11	7:39	9.84	--
EW01	19-Jul-11	8:08	9.87	--
EW01	20-Jul-11	8:30	9.93	--
EW01	21-Jul-11	7:54	9.96	--
EW01	22-Jul-11	8:27	9.99	--

TABLE D-1
WATER LEVEL MEASUREMENT SUMMARY
DuPont Pompton Lakes Works Site, Pompton Lakes, New Jersey

Location	Date	Time	Water Level (ft btoc)	Total Depth (ft btoc)
IW01	29-Jun-11	9:30	8.08	--
IW01	29-Jun-11	15:41	8.10	--
IW01	30-Jun-11	8:08	8.11	--
IW01	06-Jul-11	9:32	8.33	--
IW01	06-Jul-11	15:32	8.33	--
IW01	07-Jul-11	8:24	8.36	--
IW01	08-Jul-11	8:26	8.38	--
IW01	11-Jul-11	13:44	8.47	--
IW01	12-Jul-11	8:48	8.50	--
IW01	13-Jul-11	8:46	8.55	--
IW01	13-Jul-11	17:15	8.53	--
IW01	14-Jul-11	8:08	8.58	--
IW01	15-Jul-11	7:06	8.59	--
IW01	18-Jul-11	7:34	8.71	--
IW01	19-Jul-11	7:35	8.73	--
IW01	20-Jul-11	8:20	8.78	--
IW01	21-Jul-11	7:47	8.81	--
IW01	22-Jul-11	8:08	8.86	--
IW02	29-Jun-11	9:59	8.02	--
IW02	29-Jun-11	15:21	8.02	--
IW02	30-Jun-11	8:10	8.10	--
IW02	06-Jul-11	9:18	8.28	--
IW02	06-Jul-11	11:38	8.27	--
IW02	06-Jul-11	15:40	8.27	--
IW02	07-Jul-11	8:28	8.30	--
IW02	08-Jul-11	8:24	8.33	--
IW02	11-Jul-11	13:37	8.42	--
IW02	12-Jul-11	8:43	8.44	--
IW02	13-Jul-11	8:44	8.49	--
IW02	14-Jul-11	8:07	8.52	--
IW02	15-Jul-11	7:08	8.53	--
IW02	18-Jul-11	7:40	8.65	--
IW02	19-Jul-11	7:37	8.66	--
IW02	20-Jul-11	8:17	8.71	--
IW02	21-Jul-11	7:28	8.75	--
IW02	22-Jul-11	7:59	8.79	--
IW03	29-Jun-11	9:14	8.02	--
IW03	29-Jun-11	15:29	8.02	--
IW03	30-Jun-11	8:13	8.06	--
IW03	06-Jul-11	8:54	8.27	--
IW03	06-Jul-11	15:44	8.26	--
IW03	07-Jul-11	8:20	8.30	--
IW03	08-Jul-11	8:20	8.33	--
IW03	11-Jul-11	12:39	8.41	--
IW03	12-Jul-11	8:51	8.44	--
IW03	13-Jul-11	8:42	8.49	--
IW03	14-Jul-11	8:03	8.52	--
IW03	15-Jul-11	7:10	8.53	--
IW03	18-Jul-11	7:41	8.65	--
IW03	19-Jul-11	7:40	8.66	--
IW03	20-Jul-11	8:16	8.71	--
IW03	21-Jul-11	7:31	8.74	--
IW03	22-Jul-11	7:57	8.79	--

TABLE D-1
WATER LEVEL MEASUREMENT SUMMARY
DuPont Pompton Lakes Works Site, Pompton Lakes, New Jersey

Location	Date	Time	Water Level (ft btoc)	Total Depth (ft btoc)
ML02-1	06-Jul-11	16:06	8.21	14.42
ML02-1	08-Jul-11	7:54	8.27	14.42
ML02-1	11-Jul-11	11:03	8.37	14.42
ML02-1	12-Jul-11	12:53	8.32	14.42
ML02-1	13-Jul-11	8:37	8.41	14.42
ML02-1	14-Jul-11	8:13	8.47	14.42
ML02-1	15-Jul-11	7:18	8.52	14.42
ML02-1	18-Jul-11	7:43	8.63	14.42
ML02-1	19-Jul-11	7:48	8.65	14.42
ML02-1	20-Jul-11	8:21	8.70	14.42
ML02-1	21-Jul-11	7:43	8.71	14.42
ML02-1	22-Jul-11	8:05	8.75	14.42
ML02-2	06-Jul-11	15:58	8.20	64.40
ML02-2	08-Jul-11	7:53	8.25	64.40
ML02-2	11-Jul-11	11:03	8.35	64.40
ML02-2	12-Jul-11	12:51	8.36	64.40
ML02-2	13-Jul-11	8:37	8.41	64.40
ML02-2	14-Jul-11	8:12	8.46	64.40
ML02-2	15-Jul-11	7:17	8.50	64.40
ML02-2	18-Jul-11	7:44	8.92	64.40
ML02-2	19-Jul-11	7:47	8.61	64.40
ML02-2	20-Jul-11	8:21	8.68	64.40
ML02-2	21-Jul-11	7:43	8.70	64.40
ML02-2	22-Jul-11	8:05	8.74	64.40
ML02-3	06-Jul-11	16:08	8.18	54.38
ML02-3	08-Jul-11	7:53	8.24	54.38
ML02-3	11-Jul-11	11:02	8.35	54.38
ML02-3	12-Jul-11	12:51	8.35	54.38
ML02-3	13-Jul-11	8:37	8.39	54.38
ML02-3	14-Jul-11	8:12	8.45	54.38
ML02-3	15-Jul-11	7:16	8.51	54.38
ML02-3	18-Jul-11	7:45	8.91	54.38
ML02-3	19-Jul-11	7:47	8.62	54.38
ML02-3	20-Jul-11	8:20	8.67	54.38
ML02-3	21-Jul-11	7:42	8.68	54.38
ML02-3	22-Jul-11	8:04	8.72	54.38
ML02-4	06-Jul-11	16:01	8.20	44.39
ML02-4	08-Jul-11	7:52	8.23	44.39
ML02-4	11-Jul-11	11:01	8.36	44.39
ML02-4	12-Jul-11	12:50	8.36	44.39
ML02-4	13-Jul-11	8:36	8.40	44.39
ML02-4	14-Jul-11	8:11	8.46	44.39
ML02-4	15-Jul-11	7:15	8.50	44.39
ML02-4	18-Jul-11	7:46	8.91	44.39
ML02-4	19-Jul-11	7:46	8.63	44.39
ML02-4	20-Jul-11	8:19	8.67	44.39
ML02-4	21-Jul-11	7:42	8.69	44.39
ML02-4	22-Jul-11	8:04	8.73	44.39

TABLE D-1
WATER LEVEL MEASUREMENT SUMMARY
DuPont Pompton Lakes Works Site, Pompton Lakes, New Jersey

Location	Date	Time	Water Level (ft btoc)	Total Depth (ft btoc)
ML02-5	06-Jul-11	16:02	8.20	34.36
ML02-5	08-Jul-11	7:51	8.24	34.36
ML02-5	11-Jul-11	11:00	8.35	34.36
ML02-5	12-Jul-11	12:49	8.36	34.36
ML02-5	13-Jul-11	8:36	8.40	34.36
ML02-5	14-Jul-11	8:10	8.46	34.36
ML02-5	15-Jul-11	7:14	8.50	34.36
ML02-5	18-Jul-11	7:47	8.91	34.36
ML02-5	19-Jul-11	7:45	8.62	34.36
ML02-5	20-Jul-11	8:18	8.67	34.36
ML02-5	21-Jul-11	7:41	8.69	34.36
ML02-5	22-Jul-11	8:03	8.74	34.36
ML02-6	06-Jul-11	16:04	8.17	24.39
ML02-6	08-Jul-11	7:50	8.24	24.39
ML02-6	11-Jul-11	11:00	8.35	24.39
ML02-6	12-Jul-11	12:48	8.36	24.39
ML02-6	13-Jul-11	8:35	8.40	24.39
ML02-6	14-Jul-11	8:10	8.46	24.39
ML02-6	15-Jul-11	7:14	8.52	24.39
ML02-6	18-Jul-11	7:48	8.91	24.39
ML02-6	19-Jul-11	7:45	8.63	24.39
ML02-6	20-Jul-11	8:17	8.68	24.39
ML02-6	21-Jul-11	7:40	8.69	24.39
ML02-6	22-Jul-11	8:02	8.73	24.39
ML02-7	06-Jul-11	15:56	8.16	74.45
ML02-7	08-Jul-11	7:50	8.23	74.45
ML02-7	11-Jul-11	10:59	8.34	74.45
ML02-7	12-Jul-11	12:45	8.35	74.45
ML02-7	13-Jul-11	8:34	8.40	74.45
ML02-7	14-Jul-11	8:09	8.45	74.45
ML02-7	15-Jul-11	7:13	8.49	74.45
ML02-7	18-Jul-11	7:49	8.91	74.45
ML02-7	19-Jul-11	7:44	8.63	74.45
ML02-7	20-Jul-11	8:16	8.70	74.45
ML02-7	21-Jul-11	7:43	8.69	74.45
ML02-7	22-Jul-11	8:02	8.73	74.45
ML04-1	30-Jun-11	13:51	7.84	14.62
ML04-1	08-Jul-11	7:46	8.09	14.62
ML04-1	11-Jul-11	10:55	8.20	14.62
ML04-1	12-Jul-11	16:49	8.20	14.62
ML04-1	13-Jul-11	8:21	8.23	14.62
ML04-1	14-Jul-11	8:25	8.29	14.62
ML04-1	15-Jul-11	7:24	8.33	14.62
ML04-1	18-Jul-11	7:51	8.70	14.62
ML04-1	19-Jul-11	8:04	8.46	14.62
ML04-1	20-Jul-11	8:34	8.52	14.62
ML04-1	21-Jul-11	8:01	8.52	14.62
ML04-1	22-Jul-11	8:22	8.57	14.62

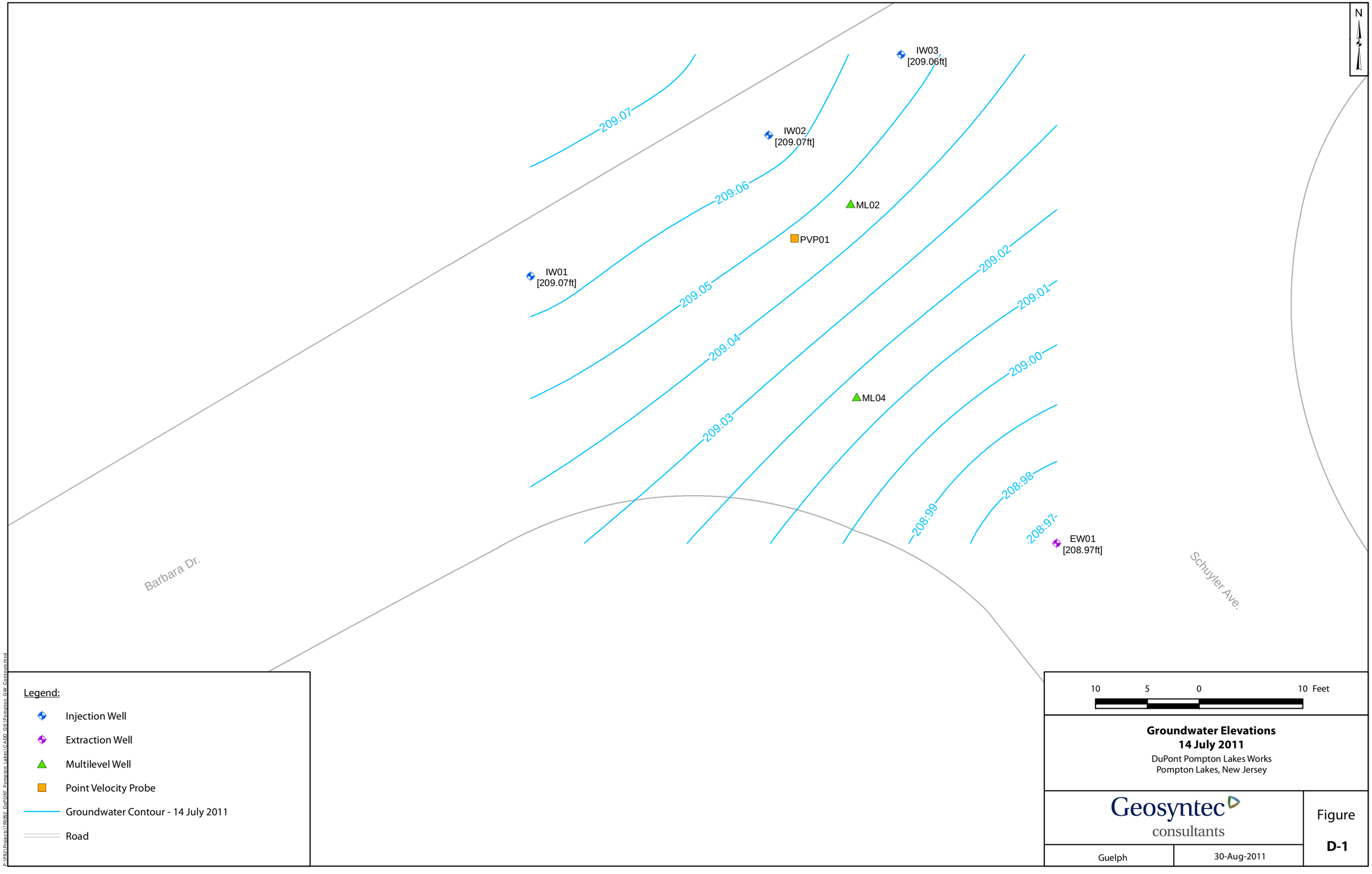
TABLE D-1
WATER LEVEL MEASUREMENT SUMMARY
DuPont Pompton Lakes Works Site, Pompton Lakes, New Jersey

Location	Date	Time	Water Level (ft btoc)	Total Depth (ft btoc)
ML04-2	30-Jun-11	13:42	7.69	64.66
ML04-2	08-Jul-11	7:46	8.04	64.66
ML04-2	11-Jul-11	10:55	8.14	64.66
ML04-2	12-Jul-11	16:48	8.18	64.66
ML04-2	13-Jul-11	8:20	8.18	64.66
ML04-2	14-Jul-11	8:24	8.24	64.66
ML04-2	15-Jul-11	7:23	8.28	64.66
ML04-2	18-Jul-11	7:52	8.75	64.66
ML04-2	19-Jul-11	8:01	8.37	64.66
ML04-2	20-Jul-11	8:34	8.47	64.66
ML04-2	21-Jul-11	8:01	8.48	64.66
ML04-2	22-Jul-11	8:22	8.51	64.66
ML04-3	30-Jun-11	13:44	7.87	54.62
ML04-3	08-Jul-11	7:45	8.10	54.62
ML04-3	11-Jul-11	10:54	8.21	54.62
ML04-3	12-Jul-11	16:48	8.21	54.62
ML04-3	13-Jul-11	8:20	8.24	54.62
ML04-3	14-Jul-11	8:24	8.31	54.62
ML04-3	15-Jul-11	7:23	8.35	54.62
ML04-3	18-Jul-11	7:53	8.85	54.62
ML04-3	19-Jul-11	8:00	8.45	54.62
ML04-3	20-Jul-11	8:33	8.53	54.62
ML04-3	21-Jul-11	8:00	8.53	54.62
ML04-3	22-Jul-11	8:21	8.57	54.62
ML04-4	30-Jun-11	13:54	6.47	44.32
ML04-4	08-Jul-11	7:44	7.53	44.32
ML04-4	11-Jul-11	10:53	7.75	44.32
ML04-4	12-Jul-11	16:47	7.79	44.32
ML04-4	13-Jul-11	8:20	7.83	44.32
ML04-4	14-Jul-11	8:23	7.90	44.32
ML04-4	15-Jul-11	7:23	7.96	44.32
ML04-4	18-Jul-11	7:54	8.50	44.32
ML04-4	19-Jul-11	7:59	8.13	44.32
ML04-4	20-Jul-11	8:31	8.20	44.32
ML04-4	21-Jul-11	8:00	8.21	44.32
ML04-4	22-Jul-11	8:20	8.26	44.32
ML04-5	30-Jun-11	13:48	7.86	34.59
ML04-5	08-Jul-11	7:44	8.11	34.59
ML04-5	11-Jul-11	10:53	8.22	34.59
ML04-5	12-Jul-11	16:45	8.20	34.59
ML04-5	13-Jul-11	8:19	8.24	34.59
ML04-5	14-Jul-11	8:23	8.31	34.59
ML04-5	15-Jul-11	7:22	8.35	34.59
ML04-5	18-Jul-11	7:55	8.80	34.59
ML04-5	19-Jul-11	7:57	8.47	34.59
ML04-5	20-Jul-11	8:30	8.54	34.59
ML04-5	21-Jul-11	7:59	8.54	34.59
ML04-5	22-Jul-11	8:20	8.57	34.59

TABLE D-1
WATER LEVEL MEASUREMENT SUMMARY
DuPont Pompton Lakes Works Site, Pompton Lakes, New Jersey

Location	Date	Time	Water Level (ft btoc)	Total Depth (ft btoc)
ML04-6	30-Jun-11	13:50	7.85	24.69
ML04-6	08-Jul-11	7:43	8.09	24.69
ML04-6	11-Jul-11	10:52	8.19	24.69
ML04-6	12-Jul-11	16:45	8.20	24.69
ML04-6	13-Jul-11	8:19	8.22	24.69
ML04-6	14-Jul-11	8:22	8.28	24.69
ML04-6	15-Jul-11	7:21	8.33	24.69
ML04-6	18-Jul-11	7:56	8.70	24.69
ML04-6	19-Jul-11	7:56	7.78	24.69
ML04-6	20-Jul-11	8:30	8.52	24.69
ML04-6	21-Jul-11	7:59	8.52	24.69
ML04-6	22-Jul-11	8:19	8.56	24.69
ML04-7	30-Jun-11	13:39	7.89	74.75
ML04-7	08-Jul-11	7:43	8.14	74.75
ML04-7	11-Jul-11	10:51	8.25	74.75
ML04-7	12-Jul-11	16:44	8.23	74.75
ML04-7	13-Jul-11	8:18	8.29	74.75
ML04-7	14-Jul-11	8:21	8.34	74.75
ML04-7	15-Jul-11	7:21	8.38	74.75
ML04-7	18-Jul-11	7:57	8.75	74.75
ML04-7	19-Jul-11	7:54	8.49	74.75
ML04-7	20-Jul-11	8:29	8.58	74.75
ML04-7	21-Jul-11	7:58	8.57	74.75
ML04-7	22-Jul-11	8:18	8.62	74.75

Notes:
* Water level measurement is not representative of static conditions
EW - extraction well
ft btoc - feet below top of casing
I - intermediate
IW - injection well
ML - multilevel monitoring well
S - shallow


N
IW03
[209.06ft]
IW02
[209.07ft]
IW01
[209.07ft]
ML02
PVP01
ML04
EW01
[208.97ft]
209.07
209.06
209.05
209.04
209.03
209.02
209.01
209.00
208.99
208.98
208.97
Barbara Dr.
Schuyler Ave.
Legend:
Injection Well
Extraction Well
Multilevel Well
Point Velocity Probe
Groundwater Contour - 14 July 2011
Road
10 5 0 10 Feet
Groundwater Elevations
14 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
Geosyntec consultants
Guelph
30-Aug-2011
Figure
D-1
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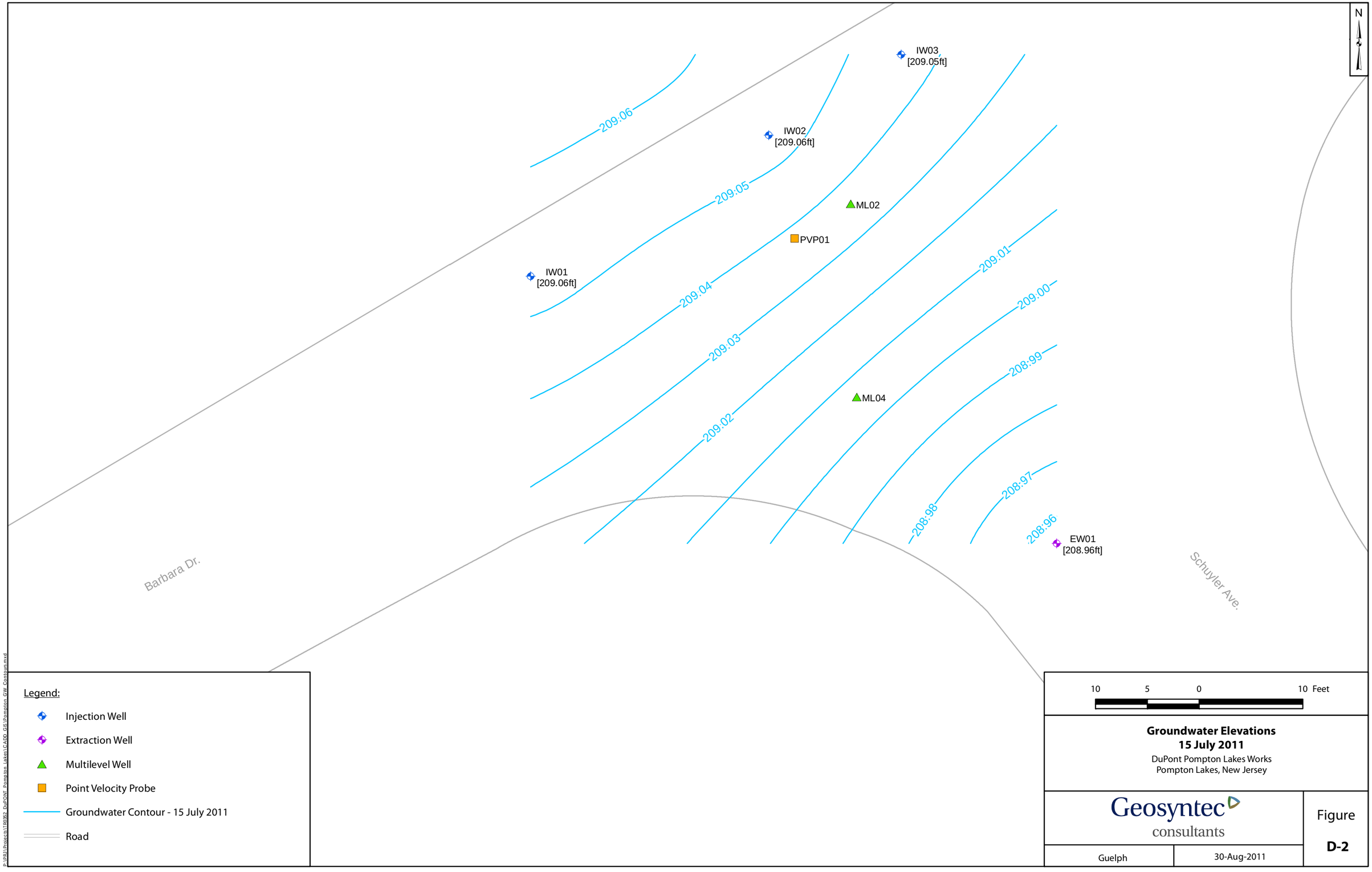
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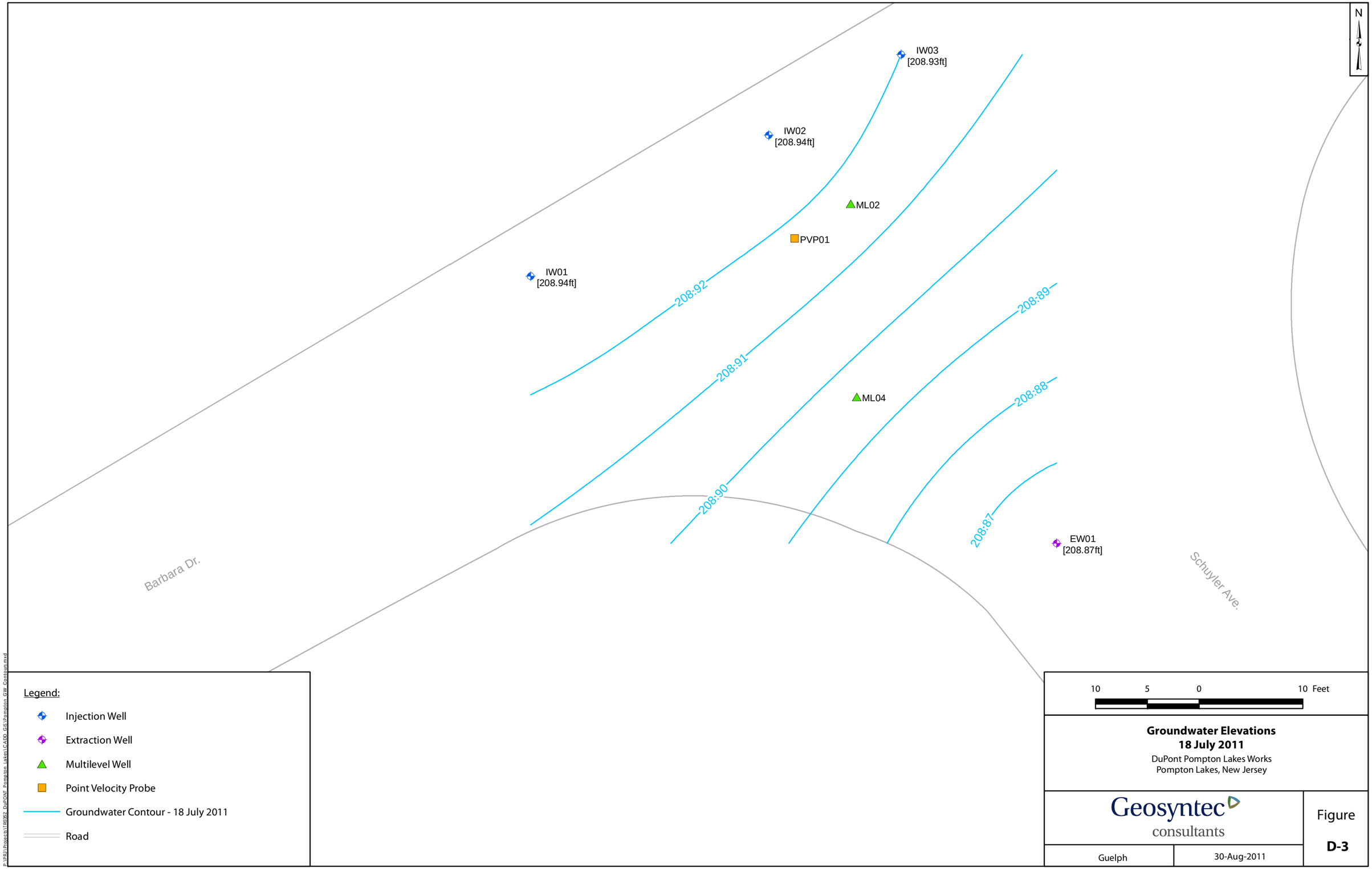
IW03
[209.05ft]
IW02
[209.06ft]
IW01
[209.06ft]
ML02
PVP01
ML04
EW01
[208.96ft]
209.06
209.05
209.04
209.03
209.02
209.01
209.00
208.99
208.98
208.97
208.96
Barbara Dr.
Schuyler Ave.
Legend:
Injection Well
Extraction Well
Multilevel Well
Point Velocity Probe
Groundwater Contour - 15 July 2011
Road
10 5 0 10 Feet
Groundwater Elevations
15 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
Geosyntec consultants
Guelph
30-Aug-2011
Figure
D-2
P:\PBJ1\Projects\TR0352_DuPONT_Pompton_Lakes\CADD_GIS\Pompton_GW_Contours.mxd


N
IW03
[208.93ft]
IW02
[208.94ft]
ML02
PVP01
IW01
[208.94ft]
208.92
208.91
208.90
208.89
208.88
208.87
ML04
EW01
[208.87ft]
Barbara Dr.
Schuyler Ave.
Legend:
Injection Well
Extraction Well
Multilevel Well
Point Velocity Probe
Groundwater Contour - 18 July 2011
Road
10 5 0 10 Feet
Groundwater Elevations
18 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
Geosyntec consultants
Guelph
30-Aug-2011
Figure
D-3
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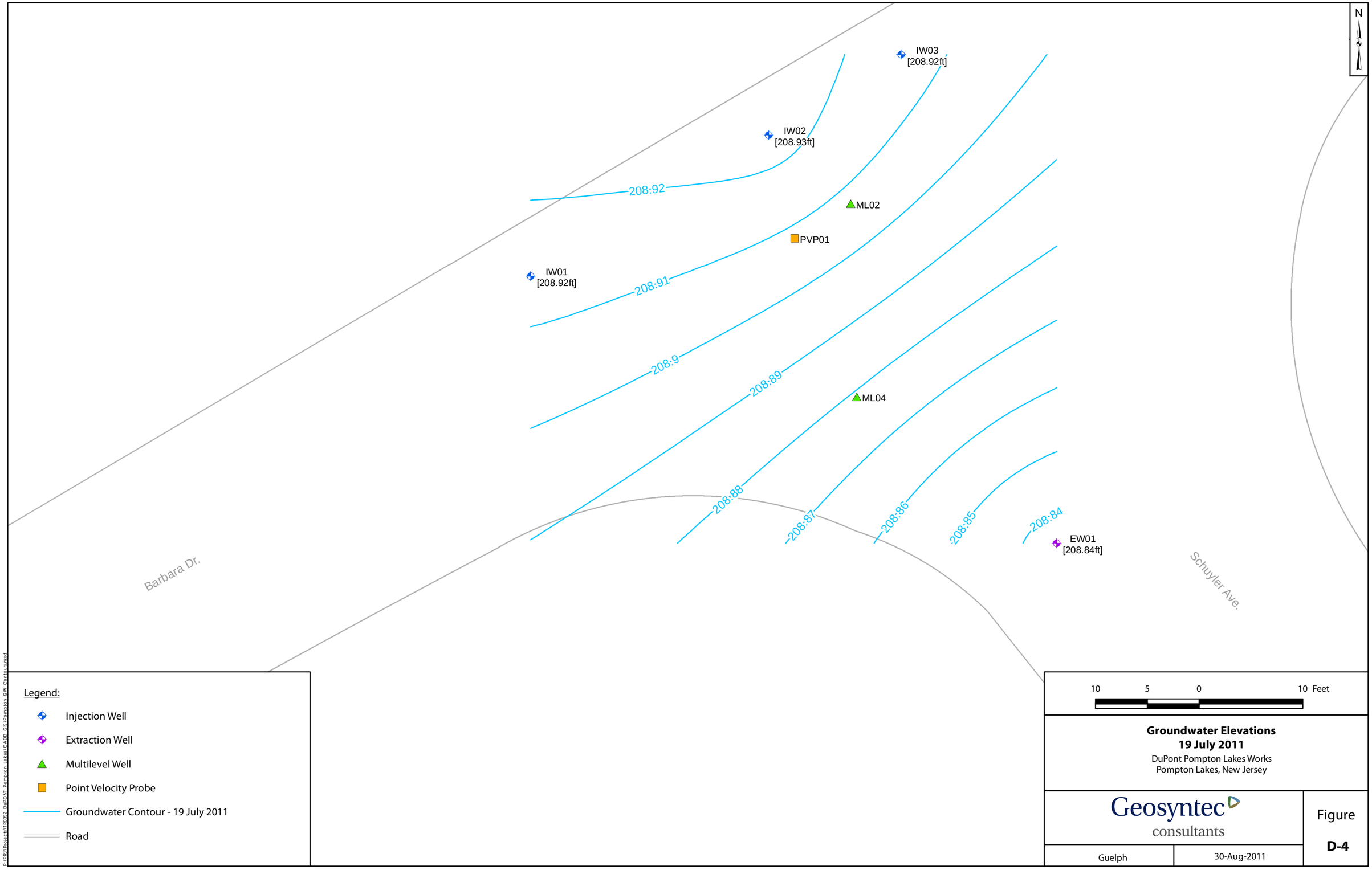
N
IW03
[208.92ft]
IW02
[208.93ft]
208:92
ML02
PVP01
IW01
[208.92ft]
208:91
208:9
208:89
ML04
208:88
208:87
208:86
208:85
208:84
EW01
[208.84ft]
Barbara Dr.
Schuyler Ave.
Legend:
Injection Well
Extraction Well
Multilevel Well
Point Velocity Probe
Groundwater Contour - 19 July 2011
Road
10 5 0 10 Feet
Groundwater Elevations
19 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
Geosyntec consultants
Guelph
30-Aug-2011
Figure
D-4
P:\PR\Projects\1TR\262 DuPONT Pompton Lakes\CADD GIS\Pompton GW Contours.mxd

N

IW03
[208.87ft]

IW02
[208.88ft]

208:87

ML02

PVP01

IW01
[208.87ft]

208:86

208:85

208:84

208:83

ML04

208:82

208:81

208:80

208:79

208:78

EW01
[208.78ft]

Barbara Dr.

Schuyler Ave.

Legend:

- Injection Well
- Extraction Well
- Multilevel Well
- Point Velocity Probe
- Groundwater Contour - 20 July 2011
- Road

10 5 0 10 Feet

Groundwater Elevations
20 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Geosyntec consultants

Guelph | 30-Aug-2011

Figure
D-5

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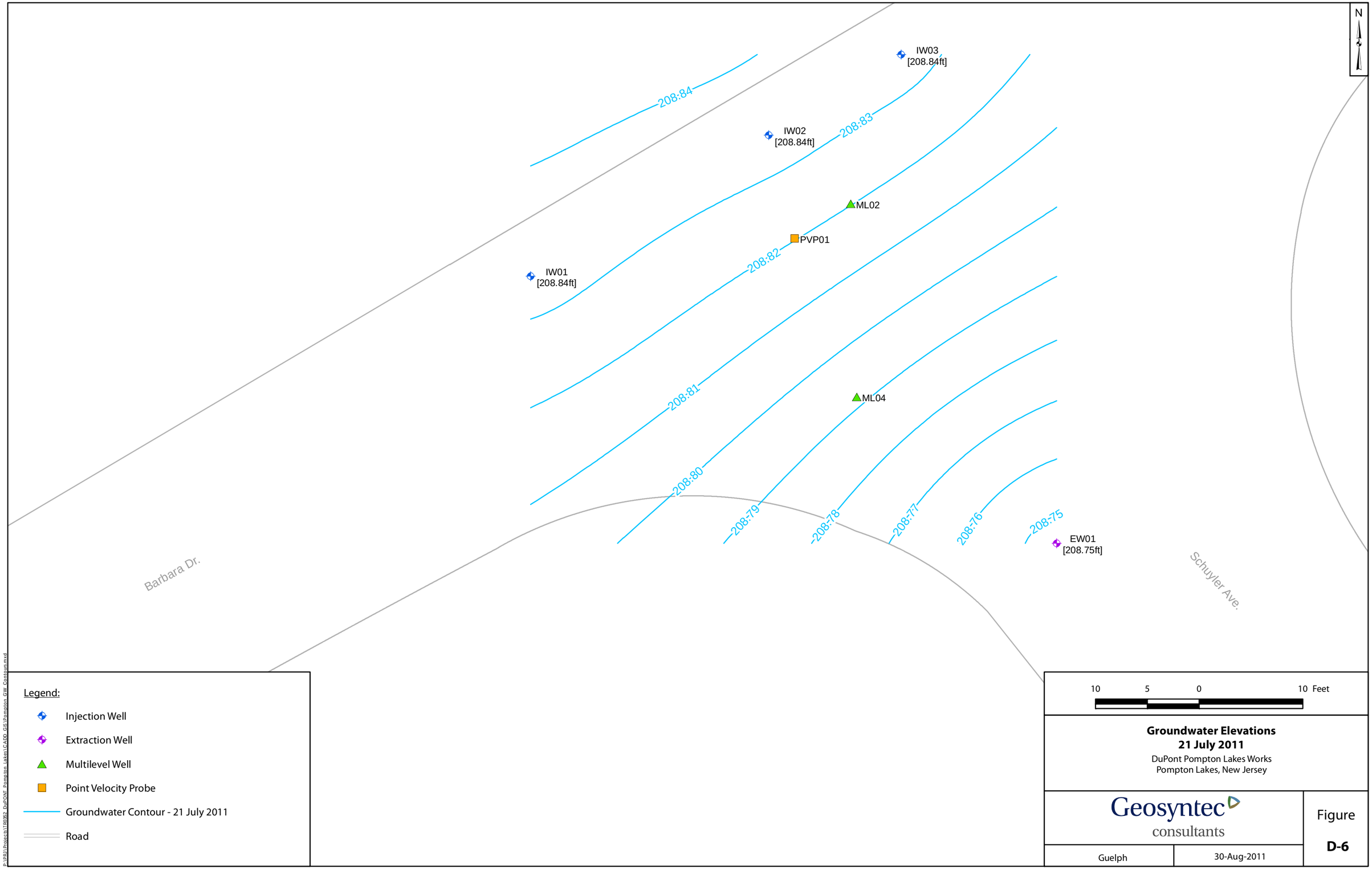
N
IW03
[208.84ft]
IW02
[208.84ft]
IW01
[208.84ft]
ML02
PVP01
ML04
208.84
208.83
208.82
208.81
208.80
208.79
208.78
208.77
208.76
208.75
EW01
[208.75ft]
Barbara Dr.
Schuyler Ave.
Legend:
Injection Well
Extraction Well
Multilevel Well
Point Velocity Probe
Groundwater Contour - 21 July 2011
Road
10 5 0 10 Feet
Groundwater Elevations
21 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
Geosyntec consultants
Guelph
30-Aug-2011
Figure
D-6
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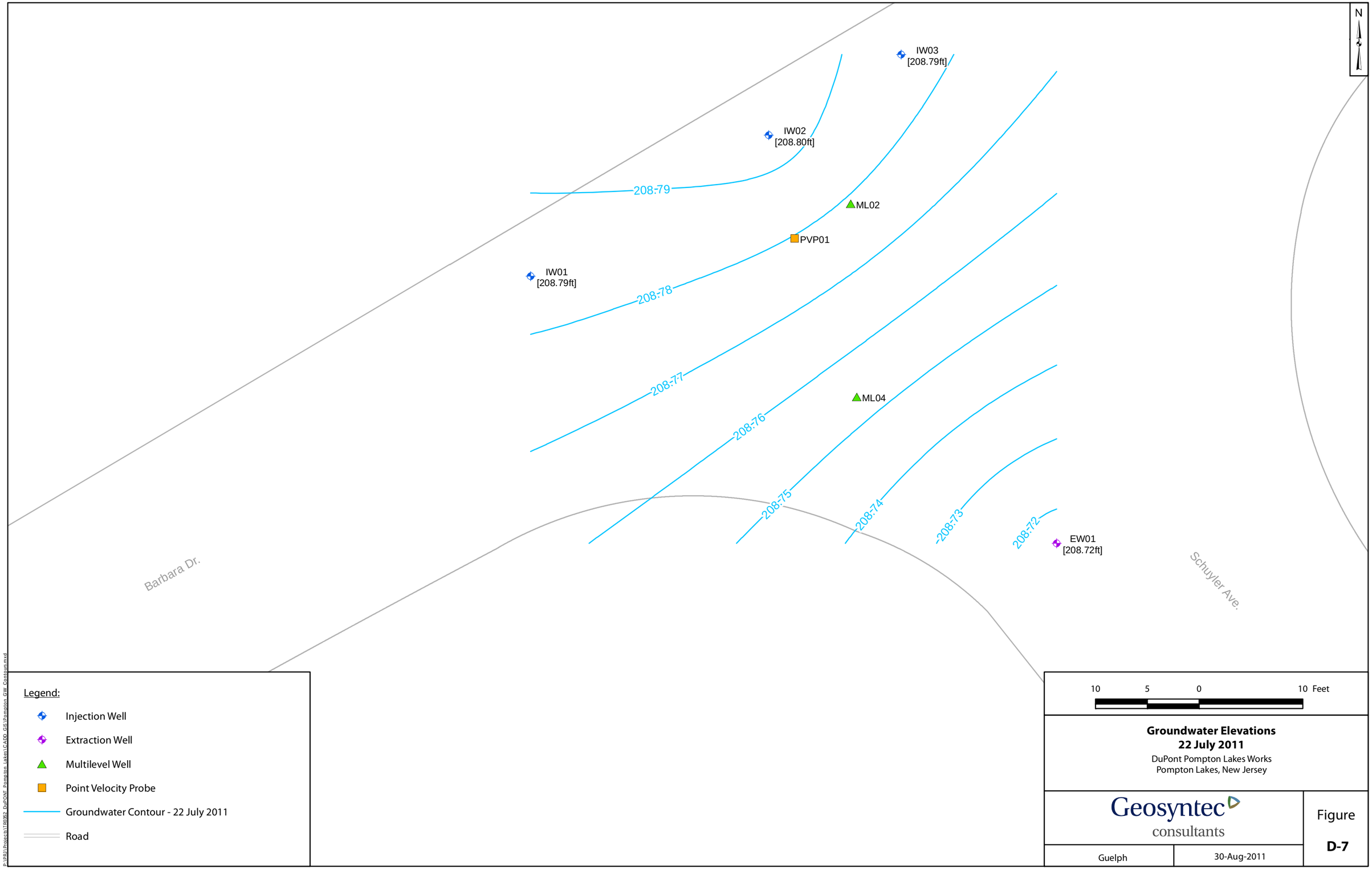
N
IW03
[208.79ft]
IW02
[208.80ft]
208-79
ML02
PVP01
IW01
[208.79ft]
208-78
208-77
ML04
208-76
208-75
208-74
208-73
208-72
EW01
[208.72ft]
Barbara Dr.
Schuyler Ave.
Legend:
Injection Well
Extraction Well
Multilevel Well
Point Velocity Probe
Groundwater Contour - 22 July 2011
Road
10 5 0 10 Feet
Groundwater Elevations
22 July 2011
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
Geosyntec consultants
Guelph
30-Aug-2011
Figure
D-7
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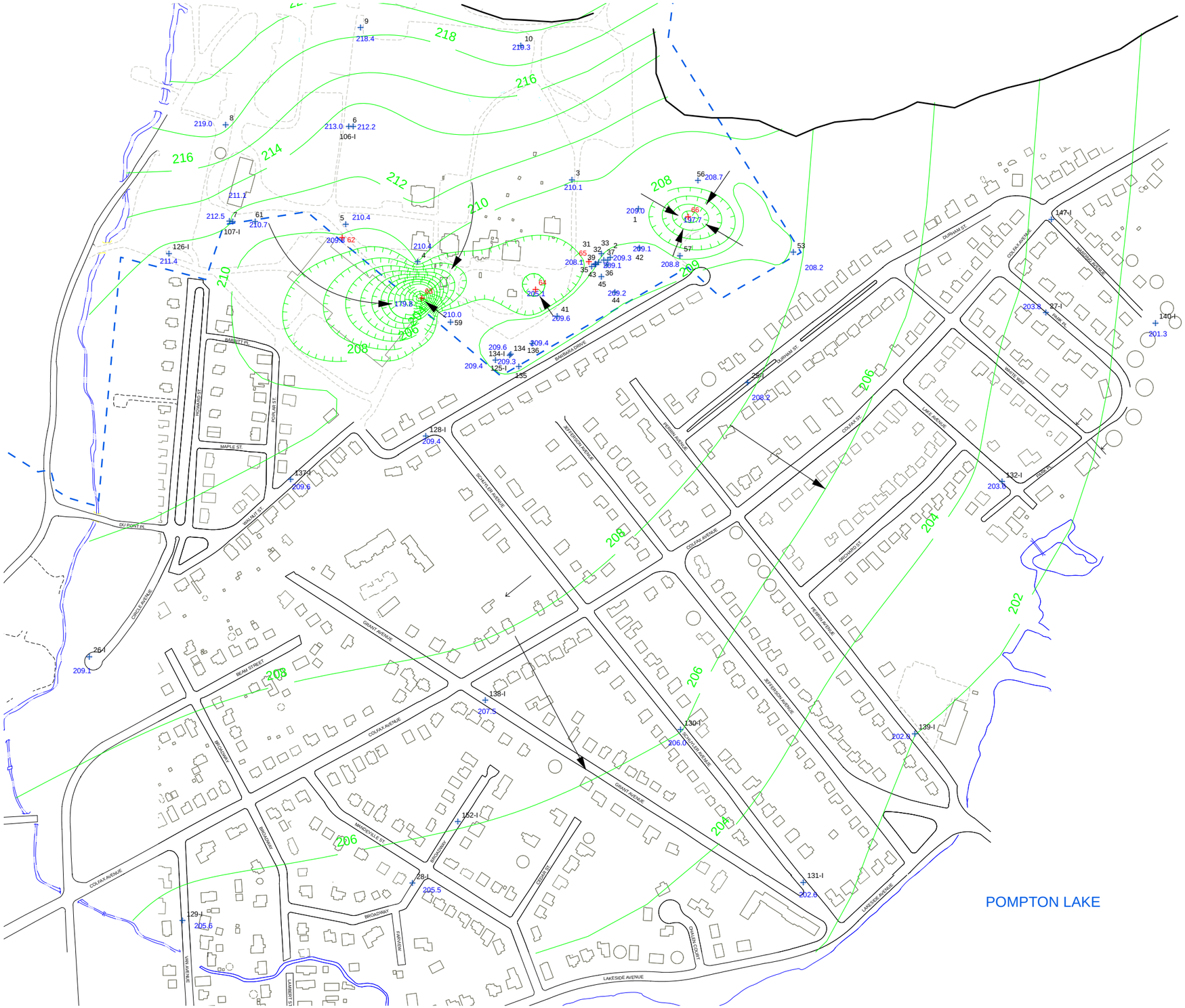
NAME: GROUNDWATER POTENTIOMETRIC SURFACE, INTERMEDIATE ZONE, MAY 2010

DATE: 2/22/2011



This document was developed in color. Reproduction in B/W may not represent the data as intended.

Legend

- Property Boundary
- Open Waters
- WELL ID
- Well Location
- Pumping Well Location

Elevation

Groundwater Elevation Rounded to nearest 0.1'

- Groundwater Elevation Countour Line (approximated)

Groundwater elevation contour interval is 2-foot except around infiltration beds where additional contours have been added to show better detail.

- Direction of groundwater flow

N

0 125 250 500 750 1,000

Feet

DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

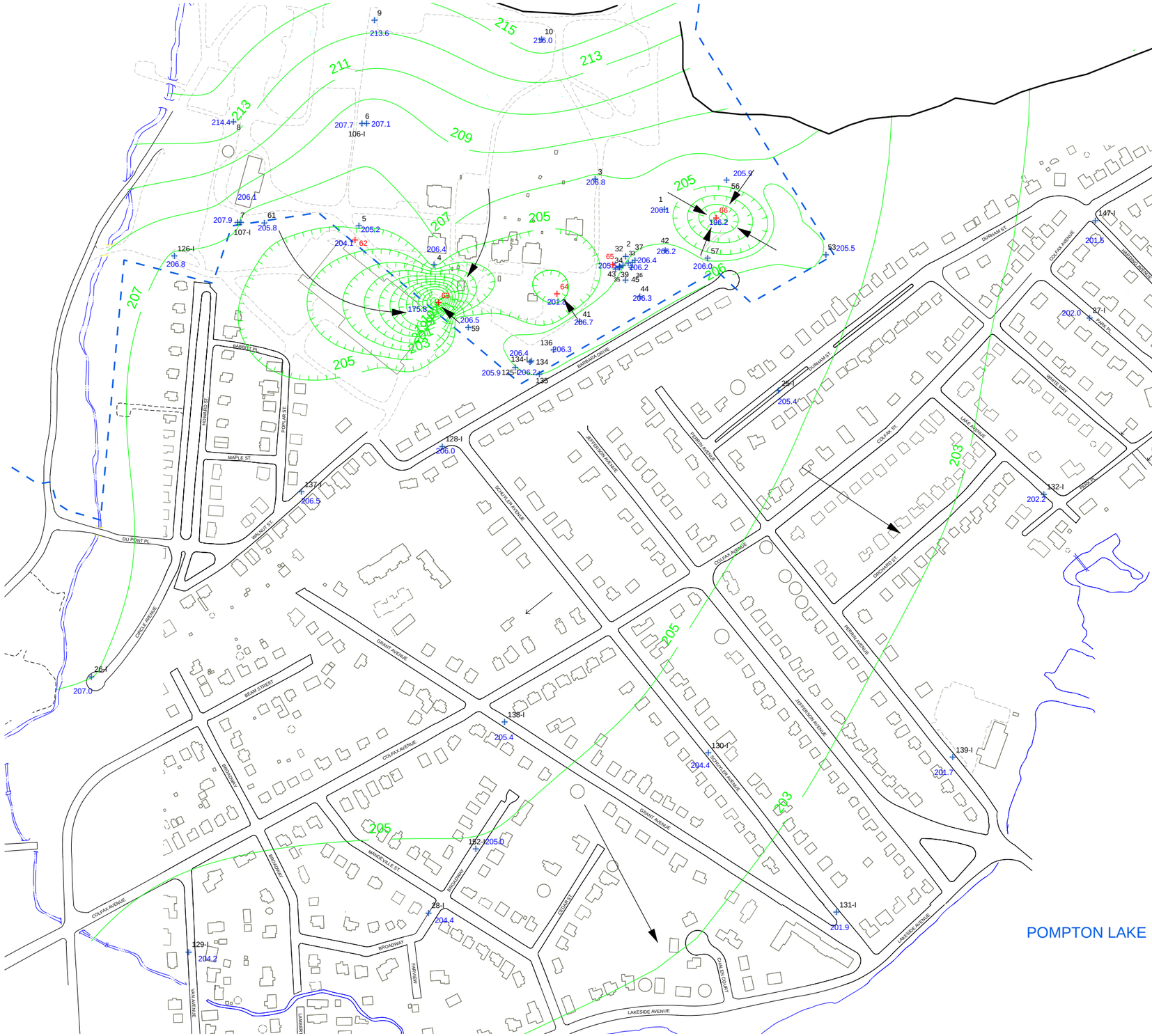
Figure 5
Groundwater Potentiometric Surface
Intermediate Alluvial Zone
May 2010

O'BRIEN & GERE

PATH:P:\05 - Reports & Plans\2010 PLW GW Report\Figures\Figure6.MXD

NAME: GROUNDWATER POTENTIOMETRIC SURFACE, INTERMEDIATE ZONE, NOVEMBER 2010

DATE: 2/22/2011



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Legend

- Property Boundary
- Open Waters
- WELL ID — Well Location
- Pumping Well Location

Elevation

Groundwater Elevation Rounded to nearest 0.1'

- Groundwater Elevation Countour Line (approximated)

Groundwater elevation contour interval is 2-foot except around infiltration beds where additional contours have been added to show better detail.

- Direction of groundwater flow

N

0 125 250 500 750 1,000

Feet

DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Figure 6
Groundwater Potentiometric Surface
Intermediate Alluvial Zone
November 2010

O'BRIEN & GERE

APPENDIX E

STEP-DRAWDOWN AND PUMP TESTING ANALYSIS

TABLE E-1
SUMMARY OF STEP-DRAWDOWN TEST ANALYSIS
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Pumping Well	Unit	Observation Well	Specific Storage [-]	Specific Yield (Sy) (%)	Transmissivity (ft^2/day)	Aquifer Thickness (ft)	K (ft/day)
IW01	Lower	Single-well step test	1.30E-04	35	90.5	24.5	3.7
IW01	Lower	128-I	1.20E-03	29	155.6	40	3.9
IW02	Lower	Single-well step test	8.80E-04	20	169.7	24.3	7
IW02	Lower	128-I	1.20E-03	16	503.0	40	12.6
IW02	Upper	Single-well step test	2.70E-03	21	1,045.6	24.3	43
IW02	Upper	EW01	2.20E-09	70	1,808.2	24.8	72.9
			1.70E-03	40	1,810.0	24.8	73

Notes:
% - percent
ft - feet
ft/day - feet per day
ft^2/day - square feet per day
K - hydraulic conductivity
Sy - specific yield

TABLE E-2
SUMMARY OF MANUAL WATER LEVEL MEASUREMENTS DURING STEP-DRAWDOWN AND PUMP TESTING
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Pumped Well Name	Pumped Zone	Date	Step	Elapsed Time (min)	Actual Time	Depth to Water (ft bmp) Below Packer	Depth to Water (ft bmp) Above Packer	Pumping Rate Q (gpm)	Specific Capacity (gpm/ft)	Comments
IW01	Lower	15-Jul-11		-19	12:00	12.79	12.17	0.0	--	
				-14	12:05	12.79	12.20	0.0	--	
				-9	12:10	12.79	12.20	0.0	--	
				-4	12:15	12.79	12.20	0.0	--	
				0	12:19	12.79	12.20	--	--	Start pump
				1	12:20	21.42	12.22	--	--	
				1.5	12:20	21.43	12.22	--	--	
				2	12:21	21.43	12.22	--	--	
				2.5	12:21	21.44	12.22	--	--	
				3	12:22	21.40	12.22	6.2	--	
				4	12:23	21.44	12.22	--	--	
				5	12:24	21.44	12.22	--	--	
				6	12:25	21.39	12.22	--	--	
			Step 1	7	12:26	21.41	12.21	--	--	
				8	12:27	21.44	12.21	6.1	--	
				10	12:29	21.51	12.22	--	--	
				15	12:34	21.69	12.20	--	--	
				20	12:39	21.74	12.21	6.5	--	
				25	12:44	21.80	12.22	--	--	
				30	12:49	21.74	12.23	6.5	--	
				35	12:54	21.74	12.23	--	--	
				40	12:59	21.77	12.23	6.0	--	
				45	13:04	21.90	12.23	--	--	
				50	13:09	21.95	12.23	--	--	
				55	13:14	21.99	12.23	--	--	
				60	13:19	22.05	12.21	--	--	
				65	13:24	22.07	12.21	6.0	--	T (ft^2/day) =
				69	13:28	22.13	12.21	--	0.67	128
				70	13:29	22.13	12.21	--	--	
				71	13:30	27.73	12.22	10.5	--	
				71.5	13:30	27.71	12.22	--	--	
				72	13:31	27.78	12.22	--	--	
				72.5	13:31	27.80	12.22	--	--	
				73	13:32	27.85	12.23	--	--	
				74	13:33	27.81	12.23	--	--	
				75	13:34	27.81	12.23	--	--	
				76	13:35	27.80	12.23	--	--	
			Step 2	77	13:36	27.77	12.23	--	--	
				78	13:37	27.75	12.23	--	--	
				80	13:39	27.77	12.24	10.5	--	
				85	13:44	27.83	12.24	--	--	
				90	13:49	27.90	12.24	--	--	
				95	13:54	27.98	12.24	10.5	--	
				100	13:59	28.04	12.24	--	--	
				105	14:04	28.15	12.25	--	--	
				110	14:09	28.07	12.25	--	--	T (ft^2/day) =
				115	14:14	28.13	12.25	--	0.68	132
				115	14:14	28.13	12.25	--	--	
				116	14:15	33.37	12.26	14.5	--	
				116.5	14:15	33.43	12.26	--	--	
				117	14:16	33.43	12.26	--	--	
				117.5	14:16	33.39	12.26	--	--	
				118	14:17	33.40	12.26	--	--	
				119	14:18	33.41	12.26	14.5	--	
			Step 3	120	14:19	33.41	12.26	--	--	
				121	14:20	33.41	12.26	--	--	
				122	14:21	33.43	12.26	--	--	
				123	14:22	33.47	12.26	--	--	
				125	14:24	33.53	12.26	--	--	
				130	14:29	33.66	12.26	--	--	
				135	14:34	33.66	12.26	--	--	T (ft^2/day) =
				140	14:39	33.70	12.26	--	0.69	133
				142	14:41	--	--	--	--	Pump off at 14:43

TABLE E-2
SUMMARY OF MANUAL WATER LEVEL MEASUREMENTS DURING STEP-DRAWDOWN AND PUMP TESTING
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Pumped Well Name	Pumped Zone	Date	Step	Elapsed Time (min)	Actual Time	Depth to Water (ft bmp) Below Packer	Depth to Water (ft bmp) Above Packer	Pumping Rate Q (gpm)	Specific Capacity (gpm/ft)	Comments
IW02	Lower	18-Jul-11	Step 1	-9	12:45	12.64	12.24	--	--	
				-4	12:50	12.64	12.24	--	--	
				0	12:54	12.64	12.24	--	--	Pump on at 12:54
				1	12:55	18.42	--	--	--	
				1.5	12:55	16.38	--	--	--	
				2	12:56	16.21	12.29	--	--	
				2.5	12:56	16.18	12.29	4.5	--	
				3	12:57	16.16	12.29	--	--	
				4	12:58	16.15	12.29	--	--	
				5	12:59	16.17	12.29	--	--	
				6	13:00	16.17	12.29	--	--	
				7	13:01	16.17	12.29	--	--	
				8	13:02	16.18	12.29	--	--	
				10	13:04	16.20	12.30	--	--	
				15	13:09	16.22	12.30	--	--	
				20	13:14	16.25	12.30	4.3	--	
				25	13:19	16.27	12.30	--	--	T (ft^2/day) =
				29	13:23	16.28	12.30	--	1.21	233
			Step 2	30	13:24	16.29	12.30	--	--	
				31	13:25	18.83	12.30	--	--	
				31.5	13:25	18.92	12.32	--	--	
				32	13:26	19.25	12.33	--	--	
				32.5	13:26	19.26	12.34	--	--	
				33	13:27	19.26	12.34	8.2	--	
				34	13:28	19.26	12.34	--	--	
				35	13:29	19.26	12.34	--	--	
				36	13:30	19.27	12.34	--	--	
				37	13:31	19.29	12.34	--	--	
				38	13:32	19.30	12.34	--	--	
				40	13:34	19.31	12.34	--	--	
				45	13:39	19.32	12.34	--	--	
				50	13:44	19.35	12.34	--	--	
				55	13:49	19.36	12.34	8.2	--	T (ft^2/day) =
				59	13:53	19.38	12.34	--	1.22	234
			Step 3	60	13:54	19.34	12.34	--	--	
				61	13:55	23.43	12.39	--	--	
				61.5	13:55	23.45	12.39	13.2	--	
				62	13:56	23.45	12.39	--	--	
				62.5	13:56	23.45	12.39	--	--	
				63	13:57	23.46	12.39	--	--	
				64	13:58	23.46	12.40	--	--	
				65	13:59	23.46	12.39	--	--	
				66	14:00	23.47	12.39	--	--	
				67	14:01	23.58	12.39	--	--	
				68	14:02	23.59	12.39	--	--	
				70	14:04	23.60	12.40	13.4	--	
				75	14:09	23.58	12.40	--	--	
				80	14:14	23.60	12.40	--	--	T (ft^2/day) =
				85	14:19	23.63	12.40	--	--	232
				90	14:24	23.66	12.40	--	1.21	Pump off at 14:24

TABLE E-2
SUMMARY OF MANUAL WATER LEVEL MEASUREMENTS DURING STEP-DRAWDOWN AND PUMP TESTING
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Pumped Well Name	Pumped Zone	Date	Step	Elapsed Time (min)	Actual Time	Depth to Water (ft bmp) Below Packer	Depth to Water (ft bmp) Above Packer	Pumping Rate Q (gpm)	Specific Capacity (gpm/ft)	Comments
IW02	Lower	18-Jul-11	Pump Test	0	14:38	12.65	12.27	--	--	
				1	14:39	22.87	12.38	--	--	
				1.5	14:39	22.54	12.38	--	--	
				2	14:40	22.57	12.38	12.1	--	
				2.5	14:40	22.62	12.38	--	--	
				3	14:41	22.64	12.38	--	--	
				4	14:42	22.68	12.38	--	--	
				5	14:43	22.71	12.38	--	--	
				6	14:44	22.74	12.38	--	--	
				7	14:45	22.76	12.39	--	--	
				8	14:46	22.79	12.39	--	--	
				10	14:48	22.81	12.39	--	--	
				15	14:53	22.90	12.39	12.3	--	
				20	14:58	22.94	12.39	--	--	
				25	15:03	22.96	12.39	--	--	
				30	15:08	23.01	12.39	--	--	
				35	15:13	23.03	12.40	--	--	
				40	15:18	23.05	12.40	--	--	T (ft^2/day) =
				45	15:23	23.13	12.40	--	--	224
				50	15:28	23.15	12.40	--	1.16	Pump off at 14:38

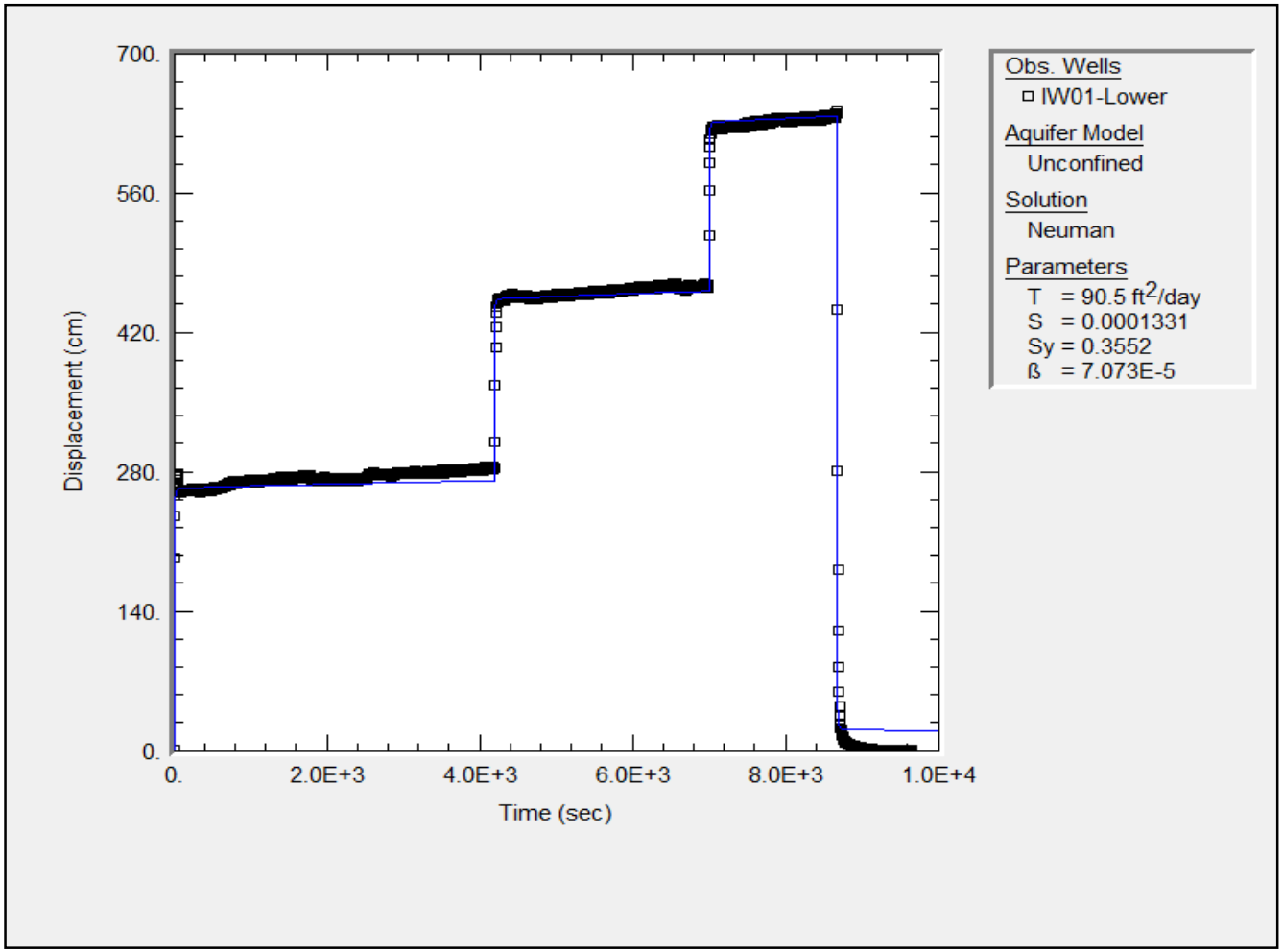
TABLE E-2
SUMMARY OF MANUAL WATER LEVEL MEASUREMENTS DURING STEP-DRAWDOWN AND PUMP TESTING
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Pumped Well Name	Pumped Zone	Date	Step	Elapsed Time (min)	Actual Time	Depth to Water (ft bmp) Below Packer	Depth to Water (ft bmp) Above Packer	Pumping Rate Q (gpm)	Specific Capacity (gpm/ft)	Comments
IW02	Upper	19-Jul-11	Step 1	-5	9:45	8.69	--	--	--	
				-2	9:48	8.68	--	--	--	
				0	9:50	8.68	--	--	--	
				1	9:51	9.52	--	--	--	
				1.5	9:51	9.44	--	--	--	
				2	9:52	9.44	--	--	--	
				2.5	9:52	9.43	--	5.4	--	
				3	9:53	9.43	--	--	--	
				4	9:54	9.43	--	--	--	
				5	9:55	9.43	--	--	--	
				6	9:56	9.43	--	--	--	
				7	9:57	9.43	--	--	--	
				8	9:58	9.43	--	--	--	
				10	10:00	9.43	--	--	--	
				15	10:05	9.43	--	--	--	
				20	10:10	9.44	--	5.5	--	
				25	10:15	9.44	--	--	--	T (ft^2/day) =
				29	10:19	9.44	--	--	7.17	1,381
			Step 2	30	10:20	9.44	--	--	--	
				31	10:21	9.90	--	--	--	
				31.5	10:21	9.90	--	8.8	--	
				32	10:22	9.90	--	--	--	
				32.5	10:22	9.91	--	--	--	
				33	10:23	9.90	--	--	--	
				34	10:24	9.89	--	--	--	
				35	10:25	9.89	--	8.8	--	
				36	10:26	9.89	--	--	--	
				37	10:27	9.89	--	--	--	
				38	10:28	9.89	--	--	--	
				40	10:30	9.89	--	--	--	
				45	10:35	9.89	--	--	--	
				50	10:40	9.89	--	--	--	
				55	10:45	9.89	--	--	--	T (ft^2/day) =
				59	10:49	9.89	--	--	7.27	1,400
			Step 3	60	10:50	9.89	--	--	--	
				61	10:51	10.83	--	--	--	
				61.5	10:51	10.84	--	--	--	
				62	10:52	10.85	--	--	--	
				62.5	10:52	11.06	--	--	--	
				63	10:53	11.01	--	--	--	
				64	10:54	11.11	--	--	--	
				65	10:55	11.11	--	--	--	
				66	10:56	11.11	--	16.6	--	
				67	10:57	11.12	--	--	--	
				68	10:58	11.13	--	--	--	
				70	11:00	11.13	--	--	--	
				75	11:05	11.15	--	--	--	
				80	11:10	11.15	--	--	--	T (ft^2/day) =
				85	11:15	11.17	--	16.7	--	1,277
				90	11:20	11.19	--	--	6.63	Pump off at 11:20

TABLE E-2
SUMMARY OF MANUAL WATER LEVEL MEASUREMENTS DURING STEP-DRAWDOWN AND PUMP TESTING
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Pumped Well Name	Pumped Zone	Date	Step	Elapsed Time (min)	Actual Time	Depth to Water (ft bmp) Below Packer	Depth to Water (ft bmp) Above Packer	Pumping Rate Q (gpm)	Specific Capacity (gpm/ft)	Comments
IW02	Upper	19-Jul-11	Pump Test	0	12:29	8.69	--	--	--	
				1	12:30	11.23	--	--	--	
				1.5	12:30	11.31	--	--	--	
				2	12:31	11.31	--	--	--	
				2.5	12:31	11.31	--	17.60	--	
				3	12:32	11.31	--	--	--	
				4	12:33	11.32	--	--	--	
				5	12:34	11.33	--	--	--	
				6	12:35	11.34	--	--	--	
				7	12:36	11.34	--	--	--	
				8	12:37	11.35	--	--	--	
				10	12:39	11.36	--	--	--	
				15	12:44	11.37	--	--	--	
				20	12:49	11.37	--	--	--	
				25	12:54	11.38	--	--	--	
				30	12:59	11.40	--	17.70	--	
				35	13:04	11.40	--	--	--	
				40	13:09	11.41	--	--	--	
				45	13:14	11.42	--	--	--	
				50	13:19	11.43	--	17.80	--	
				55	13:24	11.42	--	--	--	
				60	13:29	11.43	--	--	--	
				65	13:34	11.43	--	--	--	
				70	13:39	11.44	--	--	--	
				75	13:44	11.44	--	--	--	
				80	13:49	11.47	--	--	--	T (ft^2/day) =
				85	13:54	11.46	--	--	--	1,226
				90	13:59	11.47	--	--	6.37	Pump off at 13:59

Notes:
ft bmp - feet below measuring point
ft^2/day - square feet per day
gpm - gallons per minute
gpm/ft - gallons per minute per foot
IW - injection well
T - transmissivity



Notes:

Unconfined Neuman Variable Rate, 1974

Using observations in pumping well

Fit to Steps 2 and 3 of the Step Test

Assumed well screen is equivalent to saturated thickness, b (i.e., fully penetrating)

b = 24 ft, therefore **K = 3.7 ft/d**

Step-Drawdown Test - IW01 Lower (Pumping Well)

DuPont Pompton Lakes Works

Pompton Lakes, New Jersey

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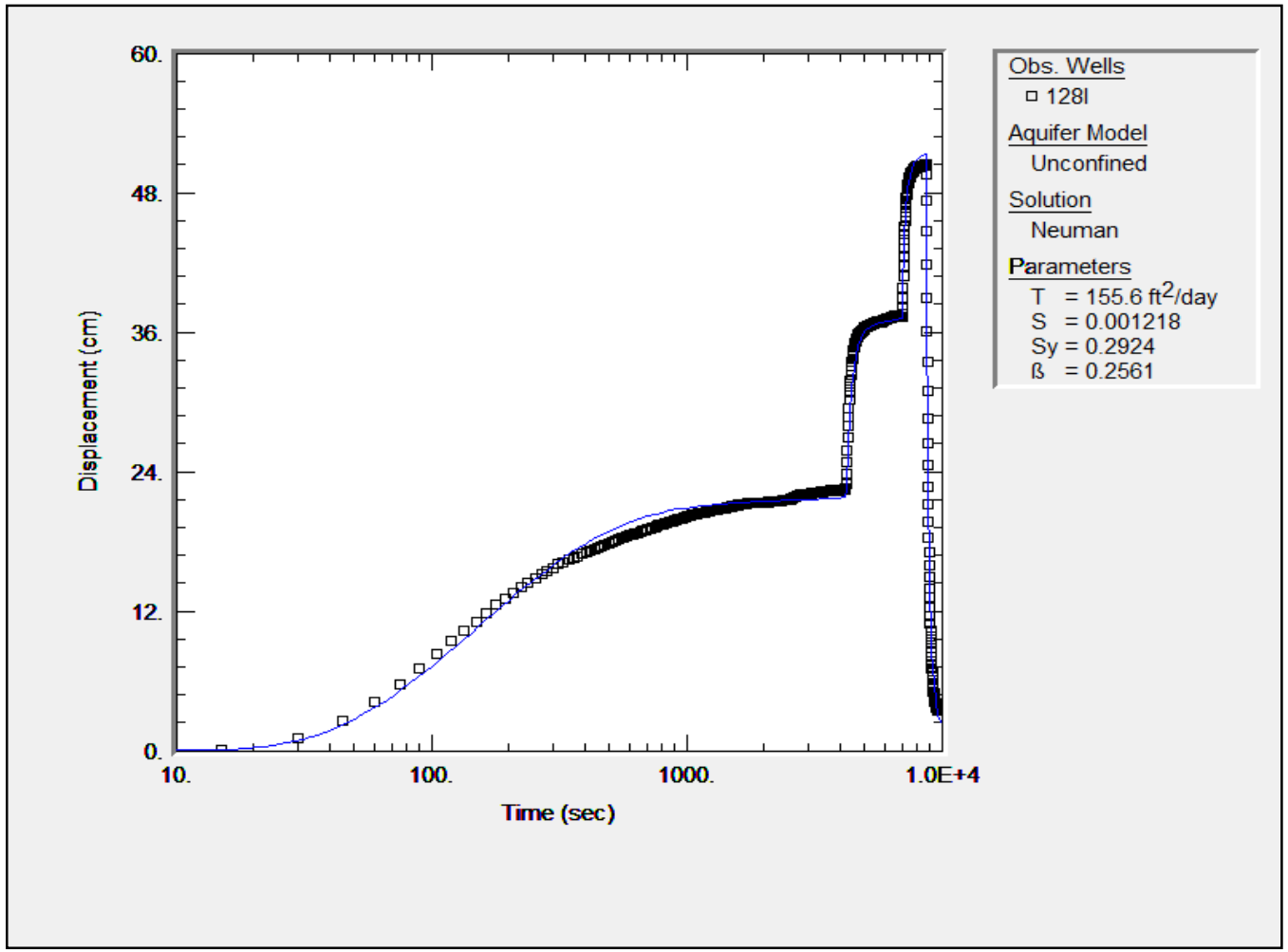
Figure

E-1



Notes:

Unconfined Neuman Variable Rate, 1974

Using observations in well 128I

Fit to Steps 2 and 3 of the Step Test

Assumed 128I well screen is equivalent to saturated thickness, b (i.e., IW01 is partially penetrating)

b = 40 ft, therefore **K = 3.9 ft/d**

Step-Drawdown Test - IW01 Lower (Observation Well)

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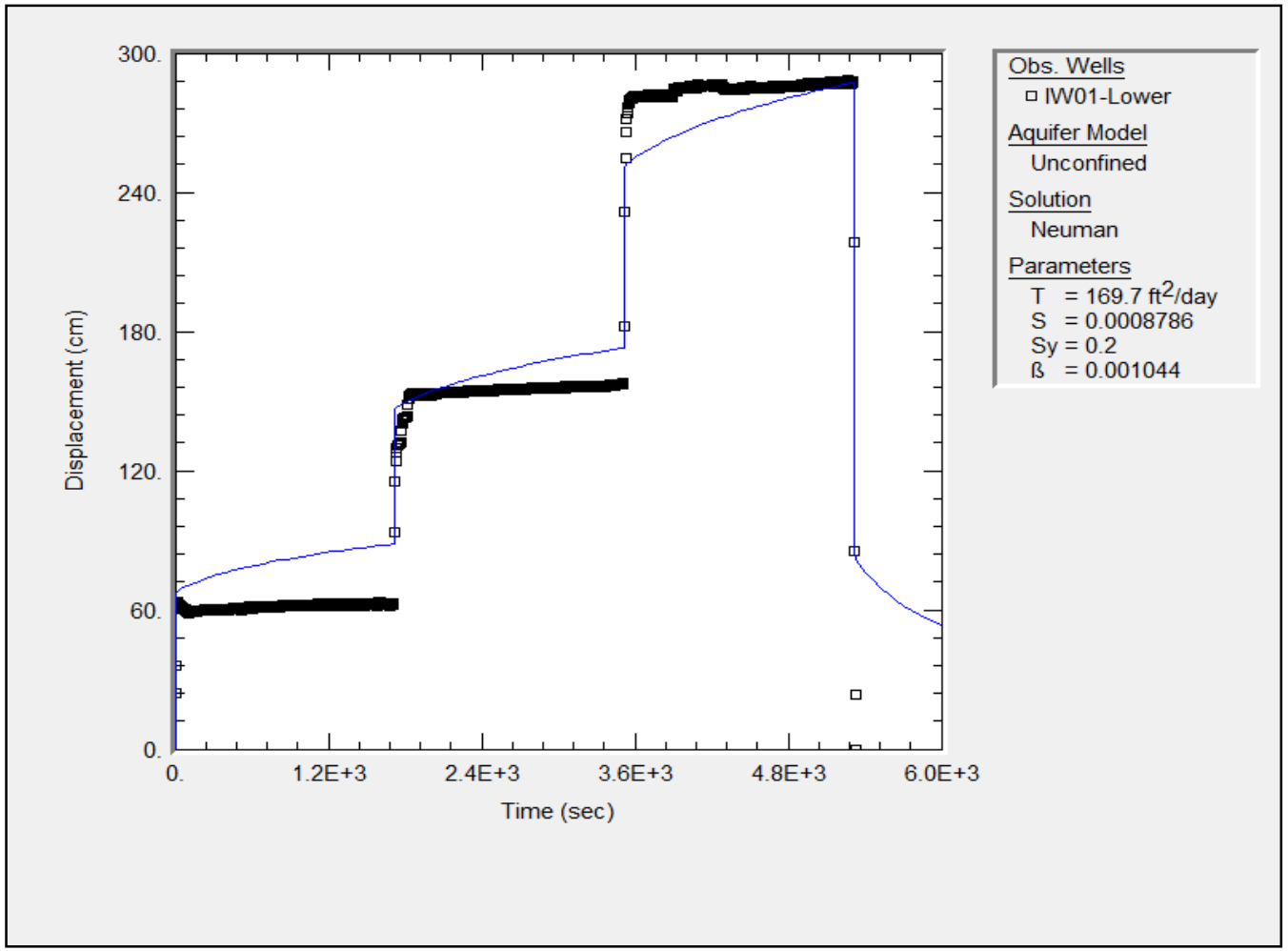
Figure

E-2



Notes:
Unconfined Neuman Variable Rate, 1974
Using observations in pumping well
Fit to Steps 2 and 3 of the Step Test
Assumed well screen is equivalent to saturated thickness, b (i.e., fully penetrating)
b = 24 ft, therefore **K = 7.0 ft/d**

Step-Drawdown Test - IW02 Lower (Pumping Well)
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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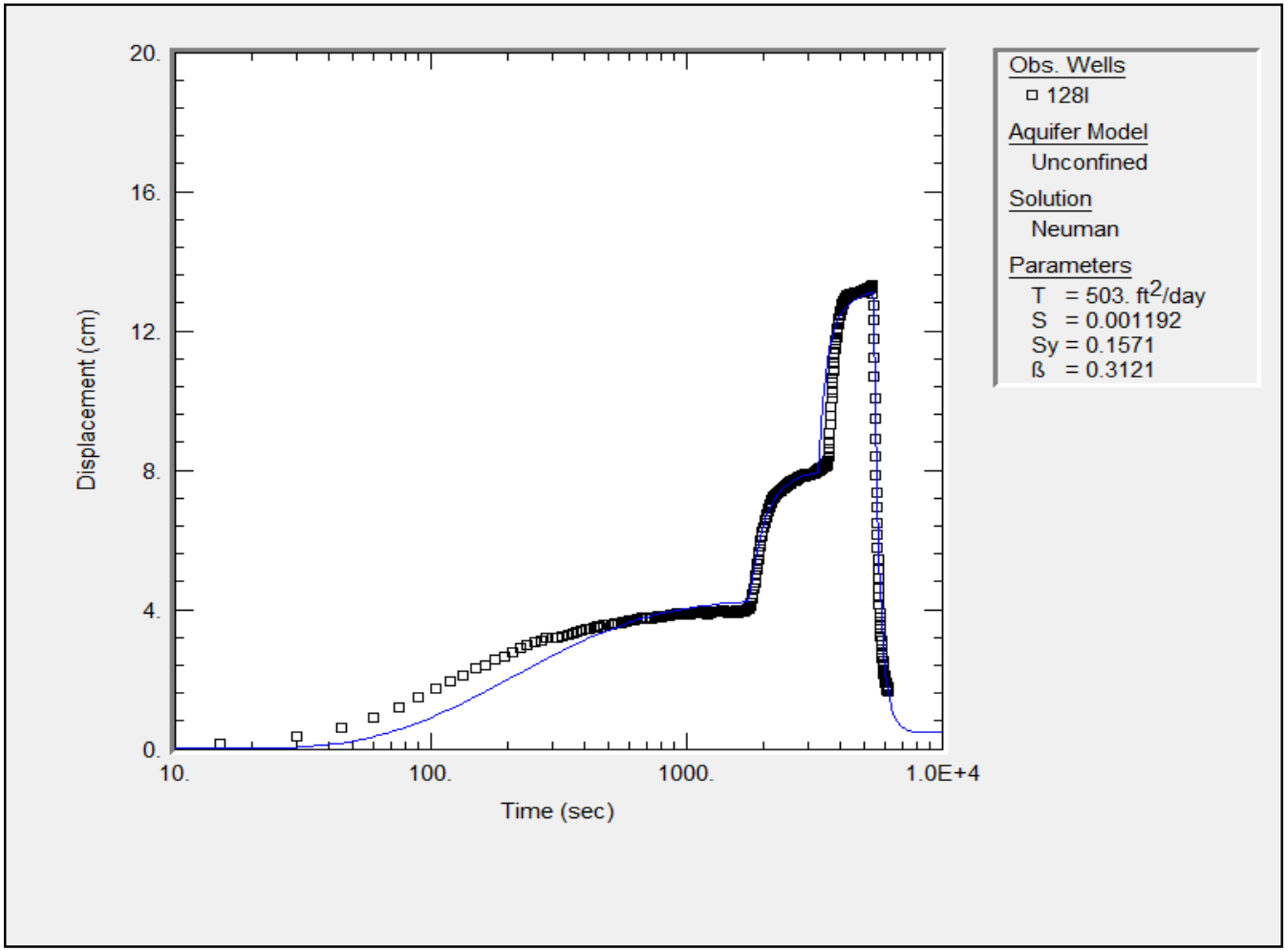
Figure
E-3



Notes:
Unconfined Neuman Variable Rate, 1974
Using observations in well 128I
Fit to Steps 2 and 3 of the Step Test
Assumed well screen is equivalent to saturated thickness, b (i.e., fully penetrating)
b = 40 ft, therefore **K = 12.6 ft/d**

Step-Drawdown Test - IW02 Lower (Observation Well)
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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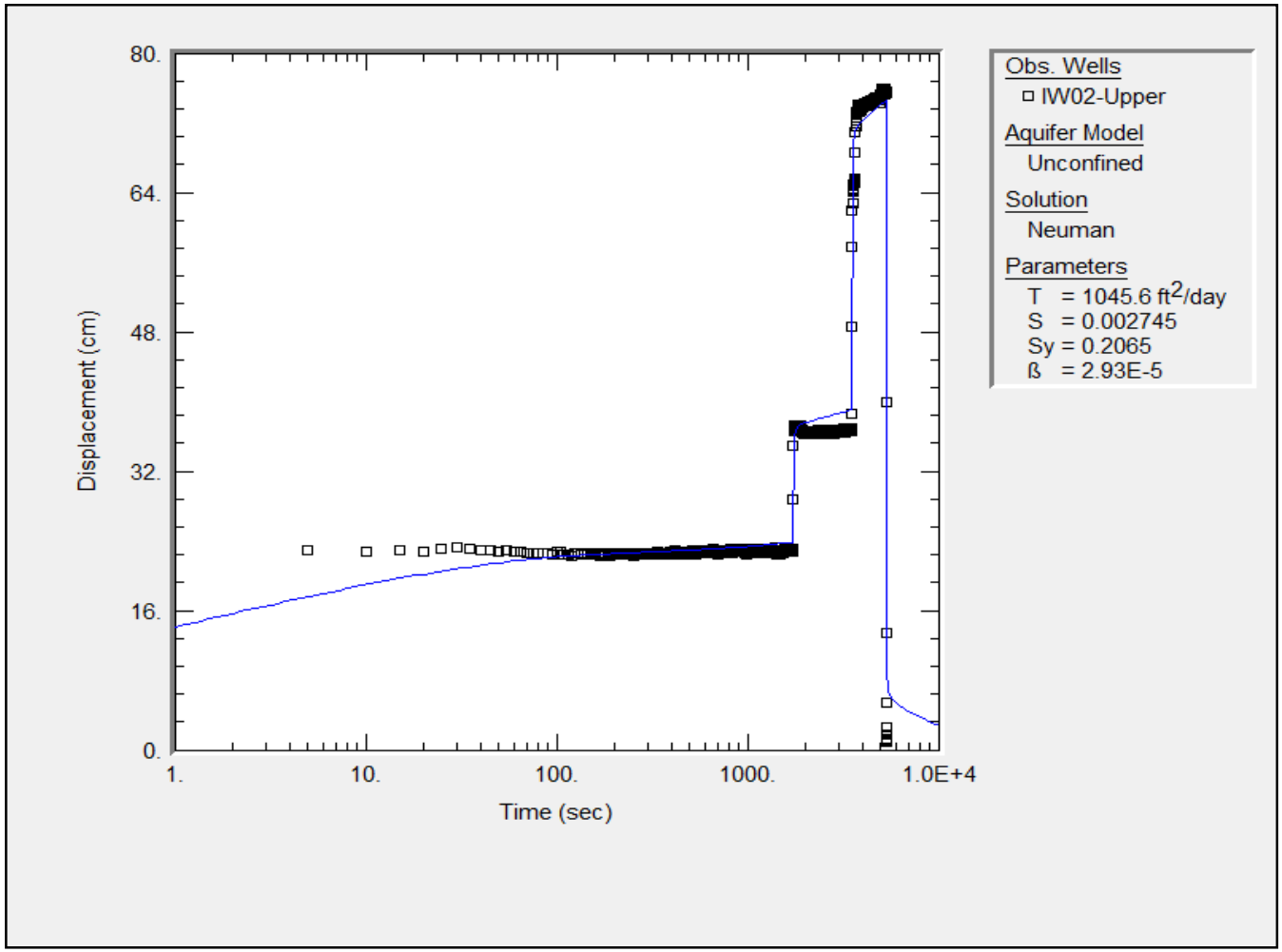
Figure
E-4



Notes:

Unconfined Neuman Variable Rate, 1974

Using observations in pumping well

Fit to Steps 2 and 3 of the Step Test

Assumed well screen is equivalent to saturated thickness, b (i.e., fully penetrating)

b = 24 ft, therefore **K = 43 ft/d**

Step-Drawdown Test - IW02 Upper (Pumping Well)

DuPont Pompton Lakes Works

Pompton Lakes, New Jersey

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Figure **E-5**

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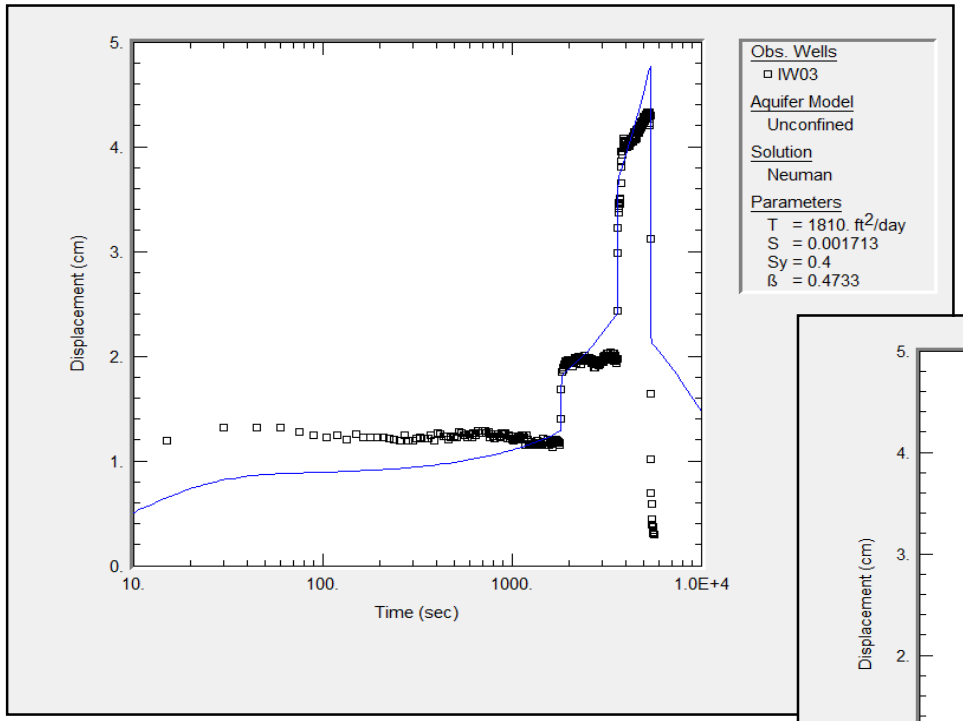

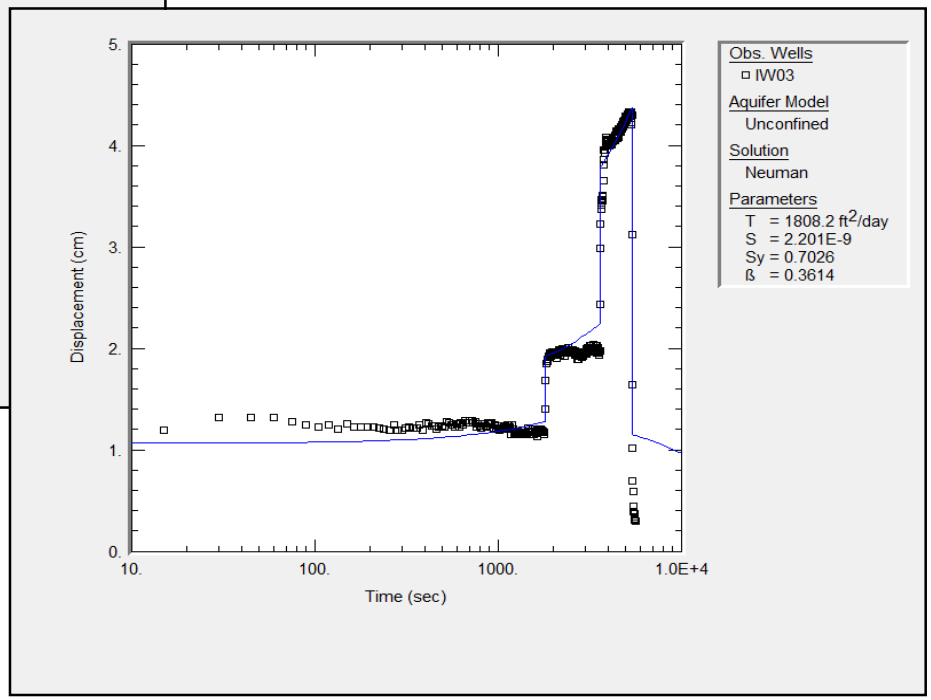

Notes:
Unconfined Neuman Variable Rate, 1974
Using observations in well EW01
Fit to Steps 2 and 3 of the Step Test
Assumed well screen is equivalent to saturated thickness, b (i.e., fully penetrating)
b = 24 ft, therefore **K = 44.5 ft/d**

Step-Drawdown Test - IW02 Upper (Observation Well)
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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Figure
E-6

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APPENDIX F

BOREHOLE DILUTION TESTING ANALYSIS

TABLE F-1
BOREHOLE DILUTION TEST SAMPLING DETAILS
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Location	Tubing ID (m)	Tubing Radius (m)	Depth (ft bgs)	Depth (m bgs)	Total Tubing Length (ft)	Total Tubing Length (m)	Tubing Volume (mL)	Flow Rate (mL/min)	Estimated Sample Time (min)	Sample Volume (mL)	Total Volume Purged (mL)	Estimated Total Purge/Sample Time (min)
IW02-01	0.004	0.002	10	3	16	5	60	60	1.0	75	140	2.4
IW02-02	0.004	0.002	17	5	23	7	90	60	1.5	75	170	2.9
IW02-03	0.004	0.002	27	8	33	10	130	60	2.2	75	210	3.5
IW02-04	0.004	0.002	37	11	43	13	170	60	2.9	75	250	4.2
IW02-05	0.004	0.002	47	14	53	16	210	60	3.5	75	290	4.9
IW02-06	0.004	0.002	57	17	63	19	240	60	4.0	75	320	5.4
IW02-07	0.004	0.002	67	20	73	22	280	60	4.7	75	360	6.0

Notes:

ft - feet

ft - feet below ground surface

ID - inner diameter

IW - injection well

m - meters

m bgs - meters below ground surface

min - minutes

mL - milliliters

mL/min - milliliters per minute

TABLE F-2
BOREHOLE DILUTION TEST SAMPLING SCHEDULE
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Event	Baseline		Round 1*		Round 2		Round 3		Round 4		Round 5		Round 6	
Approximate Time Elapsed	Before Tracer Addition		0 min (Start of Tracer Test)		0 min		30 min		90 min		190 min		390 min	
Location	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}
IW02-01	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IW02-02	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IW02-03	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IW02-04	X	X	X	X	X	X	X	X	X	X	X	X		
IW02-05	X	X	X	X	X	X	X	X	X	X	X	X		
IW02-06	X	X	X	X	X	X	X	X	X	X	X	X		
IW02-07	X	X	X	X	X	X	X	X	X	X	X	X		

TABLE F-2
BOREHOLE DILUTION TEST SAMPLING SCHEDULE
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Event	Round 7		Round 8		Round 9		Round 10		Round 11		Round 12		Round 13	
Approximate Time Elapsed	1,100 min		1,500 min		1,800 min		2,600 min		7,000 min		8,300 min		9,800 min	
Location	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}	Br_{field}	Br_{lab}
IW02-01	X	X	X	X	X	X	X	X						
IW02-02	X	X	X	X	X	X	X	X						
IW02-03	X	X	X	X	X	X	X	X						
IW02-04	X	X	X	X	X	X	X	X						
IW02-05	X	X					X	X	X	X	X	X	X	X
IW02-06	X	X					X	X	X	X	X	X	X	X
IW02-07	X	X					X	X	X	X	X	X	X	X

Notes:

* Samples removed from analysis; mixing of tracer within the borehole was incomplete at time of sampling

Br - bromide

IW - injection well

min - minutes

TABLE F-3
BOREHOLE DILUTION TEST SAMPLE SUMMARY
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Location	Sample Identifier	Sample Date	Sample Time	Depth (ft bgs)	Sampling Round	Submitted to Lab
IW02-10	POM-G-IW02-10-1230	20-Jul-11	1230	10	Baseline	--
IW02-10	POM-G-IW02-10-1258	20-Jul-11	1258	10	Round 1	--
IW02-10	POM-G-IW02-10-1328	20-Jul-11	1328	10	Round 2	--
IW02-10	POM-G-IW02-10-1358	20-Jul-11	1358	10	Round 3	--
IW02-10	POM-G-IW02-10-1457	20-Jul-11	1457	10	Round 4	--
IW02-10	POM-G-IW02-10-1641	20-Jul-11	1641	10	Round 5	--
IW02-10	POM-G-IW02-10-1953	20-Jul-11	1953	10	Round 6	--
IW02-10	POM-G-IW02-10-0736	21-Jul-11	0736	10	Round 7	--
IW02-10	POM-G-IW02-10-1344	21-Jul-11	1344	10	Round 8	--
IW02-10	POM-G-IW02-10-1934	21-Jul-11	1934	10	Round 9	--
IW02-10	POM-G-IW02-10-0849	22-Jul-11	0849	10	Round 10	--
IW02-17	POM-G-IW02-17-1234	20-Jul-11	1234	17	Baseline	27-Jul-11
IW02-17	POM-G-IW02-17-1259	20-Jul-11	1259	17	Round 1	27-Jul-11
IW02-17	POM-G-IW02-17-1329	20-Jul-11	1329	17	Round 2	27-Jul-11
IW02-17	POM-G-IW02-17-1359	20-Jul-11	1359	17	Round 3	27-Jul-11
IW02-17	POM-G-IW02-17-1459	20-Jul-11	1459	17	Round 4	27-Jul-11
IW02-17	POM-G-IW02-17-1642	20-Jul-11	1642	17	Round 5	27-Jul-11
IW02-17	POM-G-IW02-17-1954	20-Jul-11	1954	17	Round 6	27-Jul-11
IW02-17	POM-G-IW02-17-0738	21-Jul-11	0738	17	Round 7	27-Jul-11
IW02-17	POM-G-IW02-17-1345	21-Jul-11	1345	17	Round 8	27-Jul-11
IW02-17	POM-G-IW02-17-1936	21-Jul-11	1936	17	Round 9	27-Jul-11
IW02-17	POM-G-IW02-17-0850	22-Jul-11	0850	17	Round 10	27-Jul-11
IW02-27	POM-G-IW02-27-1236	20-Jul-11	1236	27	Baseline	--
IW02-27	POM-G-IW02-27-1300	20-Jul-11	1300	27	Round 1	--
IW02-27	POM-G-IW02-27-1330	20-Jul-11	1330	27	Round 2	--
IW02-27	POM-G-IW02-27-1400	20-Jul-11	1400	27	Round 3	--
IW02-27	POM-G-IW02-27-1459	20-Jul-11	1459	27	Round 4	--
IW02-27	POM-G-IW02-27-1643	20-Jul-11	1643	27	Round 5	--
IW02-27	POM-G-IW02-27-1955	20-Jul-11	1955	27	Round 6	--
IW02-27	POM-G-IW02-27-0739	21-Jul-11	0739	27	Round 7	--
IW02-27	POM-G-IW02-27-1347	21-Jul-11	1347	27	Round 8	--
IW02-27	POM-G-IW02-27-1937	21-Jul-11	1937	27	Round 9	--
IW02-27	POM-G-IW02-27-0854	22-Jul-11	0854	27	Round 10	--
IW02-37	POM-G-IW02-37-1238	20-Jul-11	1238	37	Baseline	--
IW02-37	POM-G-IW02-37-1302	20-Jul-11	1302	37	Round 1	--
IW02-37	POM-G-IW02-37-1332	20-Jul-11	1332	37	Round 2	--
IW02-37	POM-G-IW02-37-1401	20-Jul-11	1401	37	Round 3	--
IW02-37	POM-G-IW02-37-1500	20-Jul-11	1500	37	Round 4	--
IW02-37	POM-G-IW02-37-1644	20-Jul-11	1644	37	Round 5	--
IW02-37	POM-G-IW02-37-0741	21-Jul-11	0741	37	Round 7	--
IW02-37	POM-G-IW02-37-1349	21-Jul-11	1349	37	Round 8	--
IW02-37	POM-G-IW02-37-1939	21-Jul-11	1939	37	Round 9	--
IW02-37	POM-G-IW02-37-0856	22-Jul-11	0856	37	Round 10	--

TABLE F-3
BOREHOLE DILUTION TEST SAMPLE SUMMARY
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Location	Sample Identifier	Sample Date	Sample Time	Depth (ft bgs)	Sampling Round	Submitted to Lab
IW02-47	POM-G-IW02-47-1240	20-Jul-11	1240	47	Baseline	--
IW02-47	POM-G-IW02-47-1303	20-Jul-11	1303	47	Round 1	--
IW02-47	POM-G-IW02-47-1334	20-Jul-11	1334	47	Round 2	--
IW02-47	POM-G-IW02-47-1402	20-Jul-11	1402	47	Round 3	--
IW02-47	POM-G-IW02-47-1501	20-Jul-11	1501	47	Round 4	--
IW02-47	POM-G-IW02-47-1645	20-Jul-11	1645	47	Round 5	--
IW02-47	POM-G-IW02-47-0743	21-Jul-11	0743	47	Round 7	--
IW02-47	POM-G-IW02-47-0859	22-Jul-11	0859	47	Round 10	--
IW02-47	POM-G-IW02-47-0934	25-Jul-11	0934	47	Round 11	--
IW02-47	POM-G-IW02-47-0830	26-Jul-11	0830	47	Round 12	--
IW02-47	POM-G-IW02-47-0849	27-Jul-11	0849	47	Round 13	--
IW02-57	POM-G-IW02-57-1242	20-Jul-11	1242	57	Baseline	27-Jul-11
IW02-57	POM-G-IW02-57-1304	20-Jul-11	1304	57	Round 1	27-Jul-11
IW02-57	POM-G-IW02-57-1336	20-Jul-11	1336	57	Round 2	27-Jul-11
IW02-57	POM-G-IW02-57-1403	20-Jul-11	1403	57	Round 3	27-Jul-11
IW02-57	POM-G-IW02-57-1503	20-Jul-11	1503	57	Round 4	27-Jul-11
IW02-57	POM-G-IW02-57-1647	20-Jul-11	1647	57	Round 5	27-Jul-11
IW02-57	POM-G-IW02-57-0744	21-Jul-11	0744	57	Round 7	27-Jul-11
IW02-57	POM-G-IW02-57-0901	22-Jul-11	0901	57	Round 10	27-Jul-11
IW02-57	POM-G-IW02-57-0936	25-Jul-11	0936	57	Round 11	27-Jul-11
IW02-57	POM-G-IW02-57-0833	26-Jul-11	0833	57	Round 12	27-Jul-11
IW02-57	POM-G-IW02-57-0852	27-Jul-11	0852	57	Round 13	27-Jul-11
IW02-67	POM-G-IW02-67-1245	20-Jul-11	1245	67	Baseline	--
IW02-67	POM-G-IW02-67-1305	20-Jul-11	1305	67	Round 1	--
IW02-67	POM-G-IW02-67-1338	20-Jul-11	1338	67	Round 2	--
IW02-67	POM-G-IW02-67-1405	20-Jul-11	1405	67	Round 3	--
IW02-67	POM-G-IW02-67-1504	20-Jul-11	1504	67	Round 4	--
IW02-67	POM-G-IW02-67-1648	20-Jul-11	1648	67	Round 5	--
IW02-67	POM-G-IW02-67-0747	21-Jul-11	0747	67	Round 7	--
IW02-67	POM-G-IW02-67-0902	22-Jul-11	0902	67	Round 10	--
IW02-67	POM-G-IW02-67-0938	25-Jul-11	0938	67	Round 11	--
IW02-67	POM-G-IW02-67-0836	26-Jul-11	0836	67	Round 12	--
IW02-67	POM-G-IW02-67-0854	27-Jul-11	0854	67	Round 13	--
Tracer Solution	POM-G-IW02-Tracer-1138	20-Jul-11	1138	--	Tracer Solution	27-Jul-11

Notes:

-- - not applicable

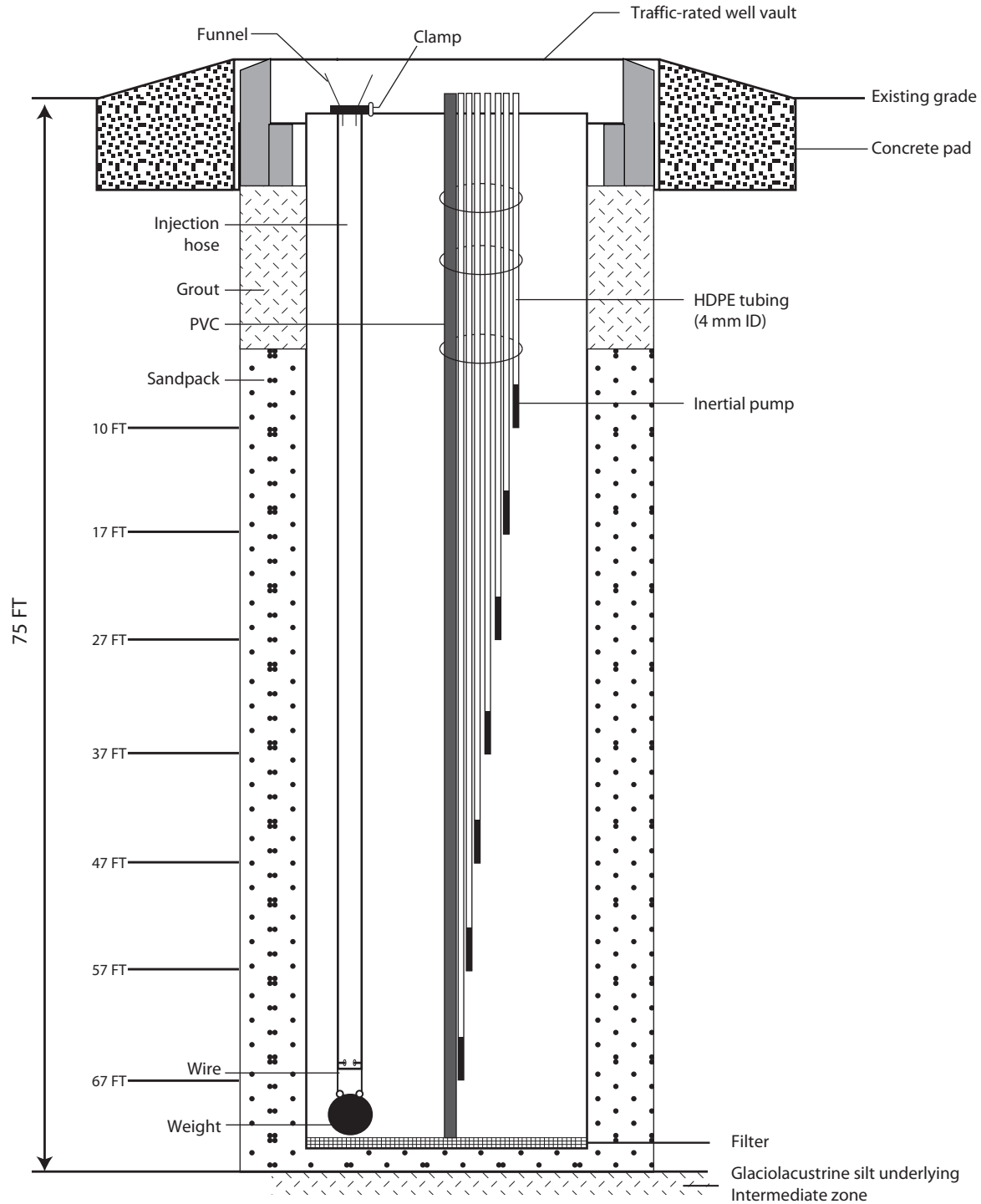
ft bgs - feet below ground surface

IW - injection well

TABLE F-4
BOREHOLE DILUTION TEST SUMMARY OF RESULTS
DuPont Pompton Lakes Works, Pompton Lakes, New Jersey

Location	Depth (ft bgs)	Data Type	Velocity (ft/day)	Calculated K (ft/day)
IW02-01	10	Field	0.34	51
IW02-02	17	Field	0.40	59
		Lab	0.32	48
IW02-03	27	Field	0.36	54
IW02-04	37	Field	0.36	54
IW02-05	47	Field	0.11	17
IW02-06	57	Field	0.09	14
		Lab	0.09	14
IW02-07	67	Field	0.08	11

Notes:
ft bgs - feet below ground surface
ft/day - feet per day
IW - injection well
K - hydraulic conductivity
Assumptions:
Porosity = 0.25
Hydraulic gradient = 0.00167
r = 2 inches



Notes:

1. Borehole was drilled to the top of the glaciolacustrine silt that underlies the intermediate aquifer (approximately 75 ft bgs).

2. Borehole diameter is exaggerated to show detail

3. Well casing diameter is 4 inches (casing + the sand pack on either side is 12 inches total)

Borehole Dilution Assembly - IW02
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Geosyntec consultants

Figure **F-1**

Not to scale

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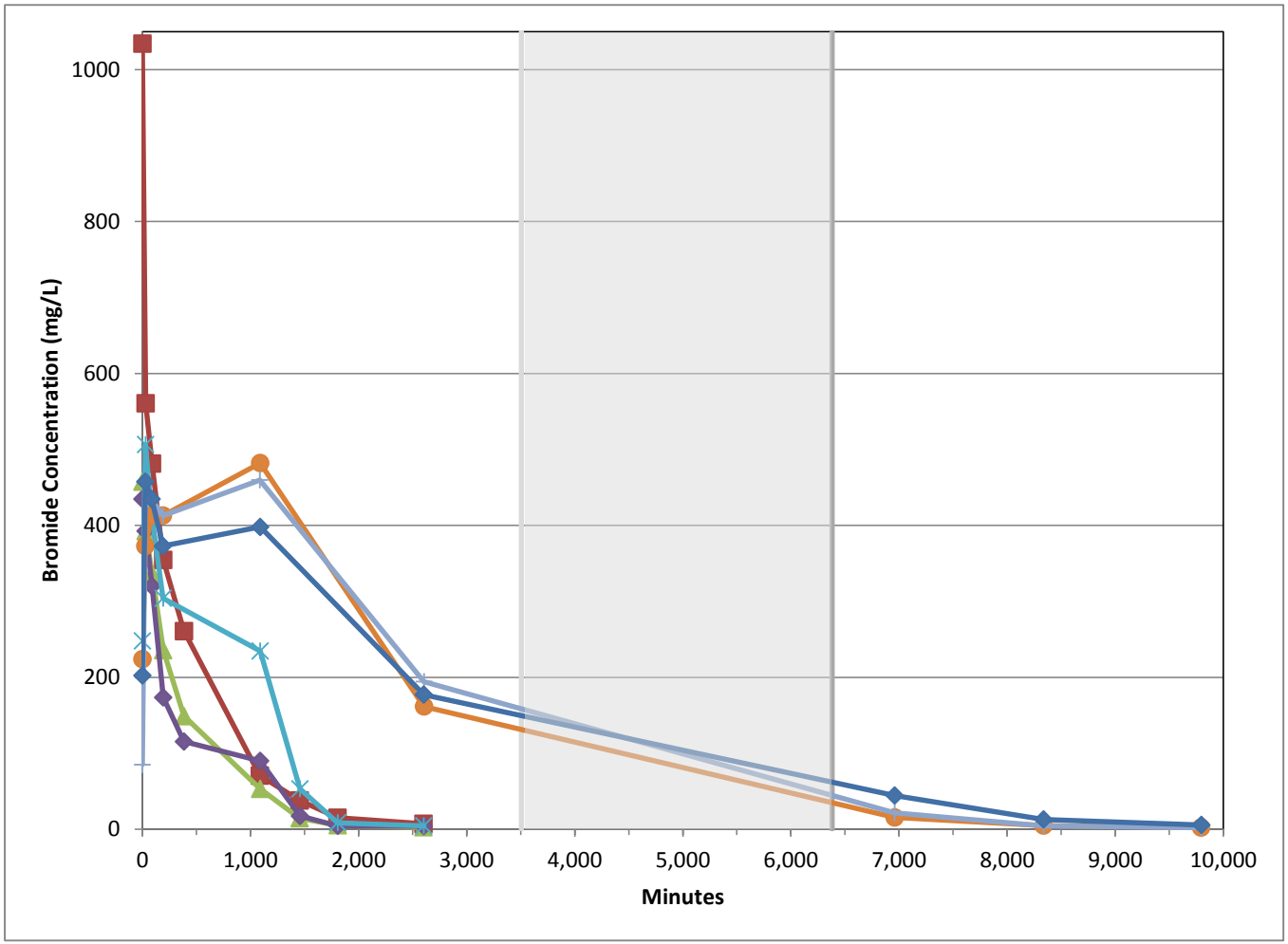
Point Velocity Probe Detail_0352.ai



Legend

- IW02-01
- IW02-02
- IW02-03
- IW02-04
- IW02-05
- IW02-06
- IW02-07
- Weekend, samples not collected

Bromide Concentration Trends at IW02
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Geosyntec consultants

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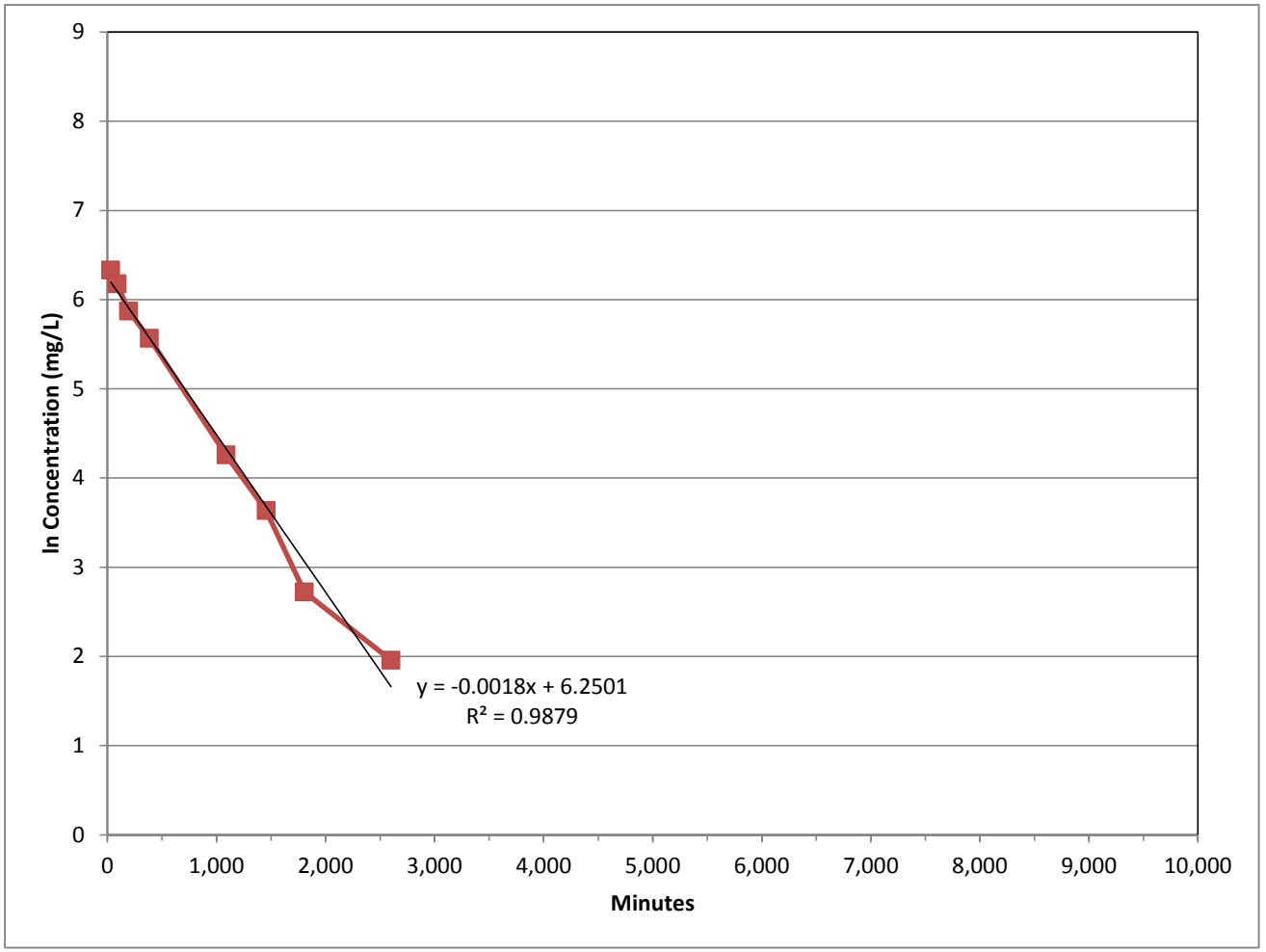
Figure
F-2



Legend

IW02-01 Field Data

Depletion of Bromide IW02-01
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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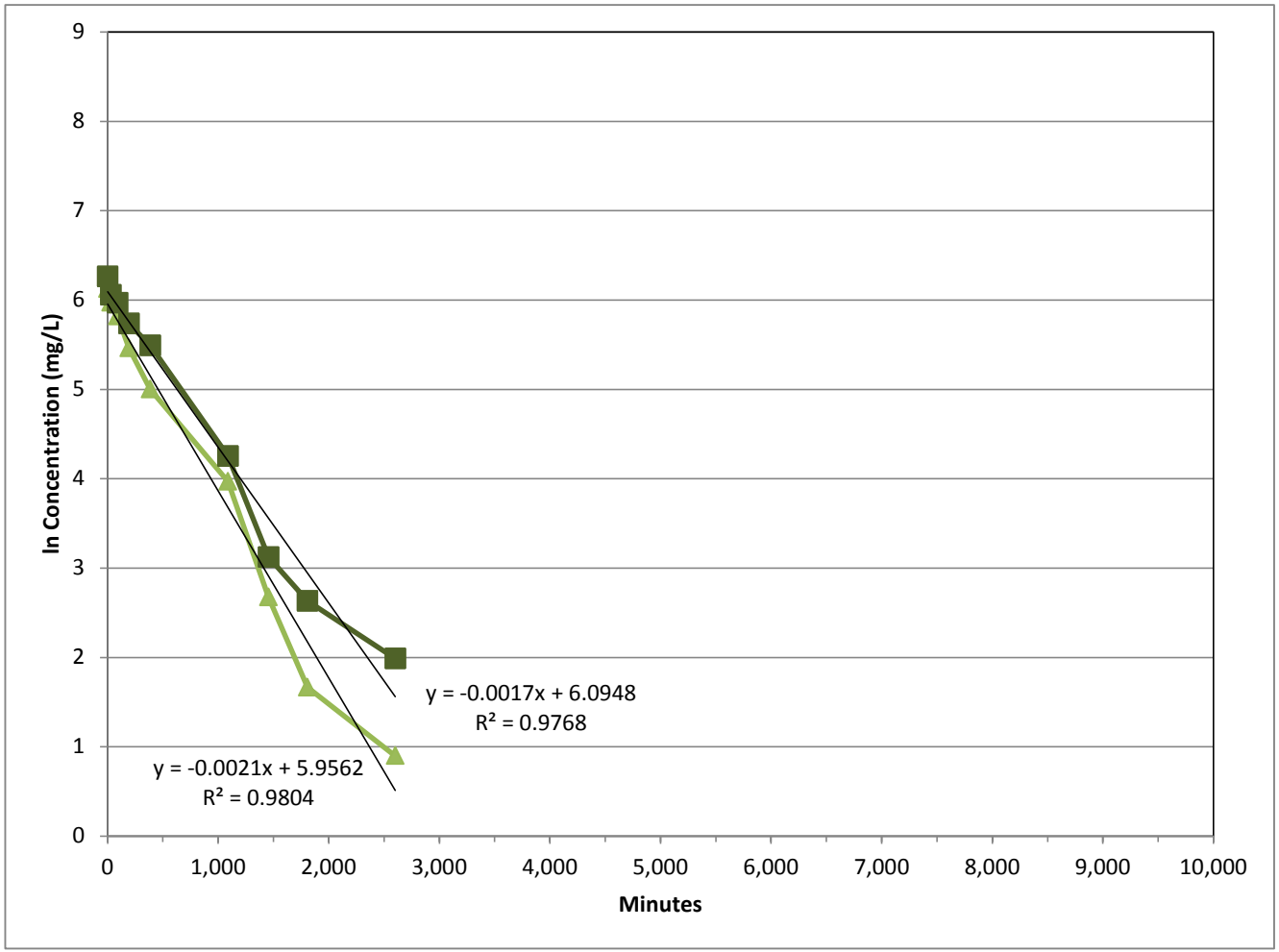
Figure
F-3



Legend

IW02-02 Field Data
IW02-02 Lab Data

Depletion of Bromide IW02-02
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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Figure
F-4

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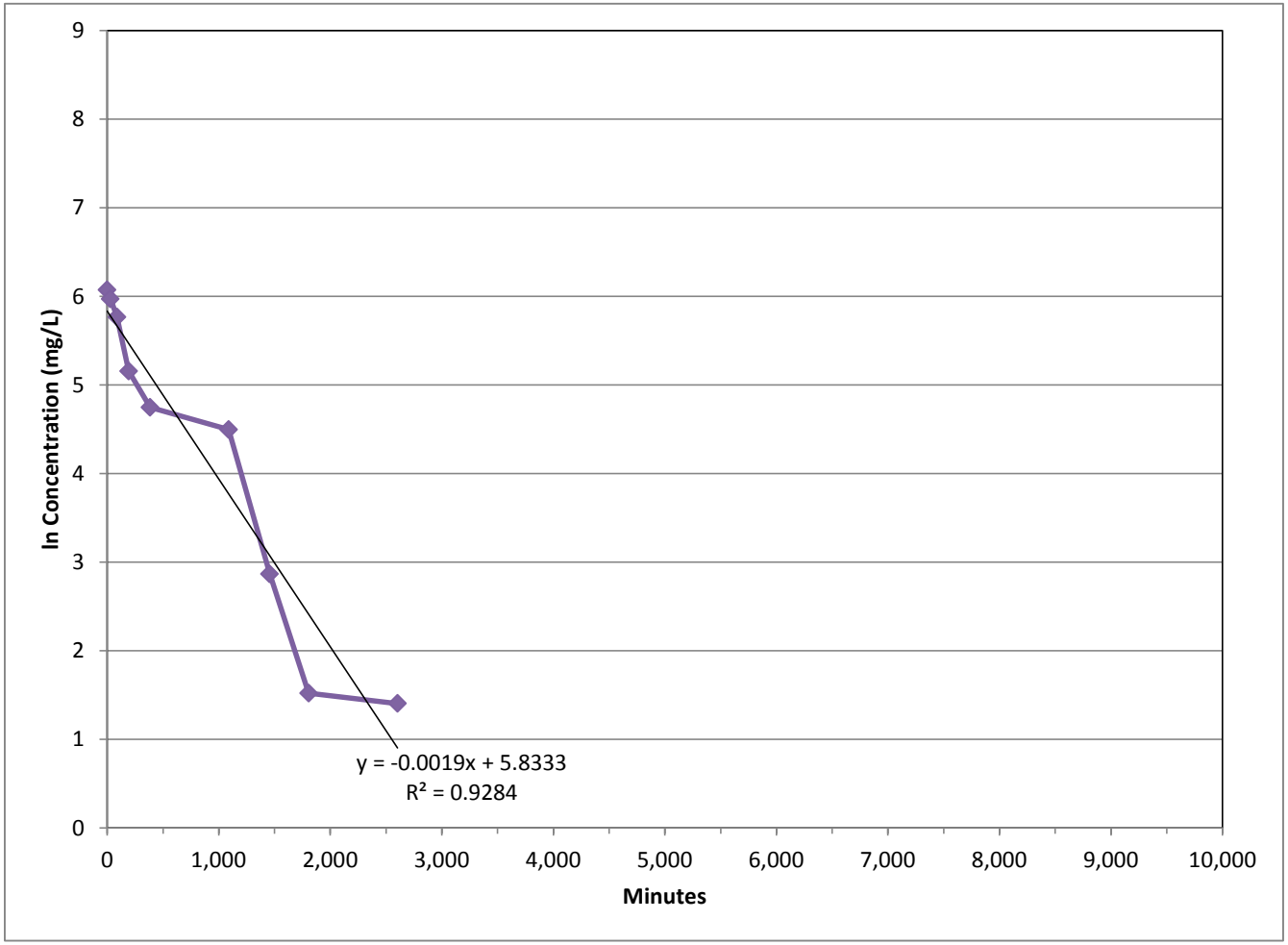

Legend

IW02-03 Field Data

Depletion of Bromide IW02-03
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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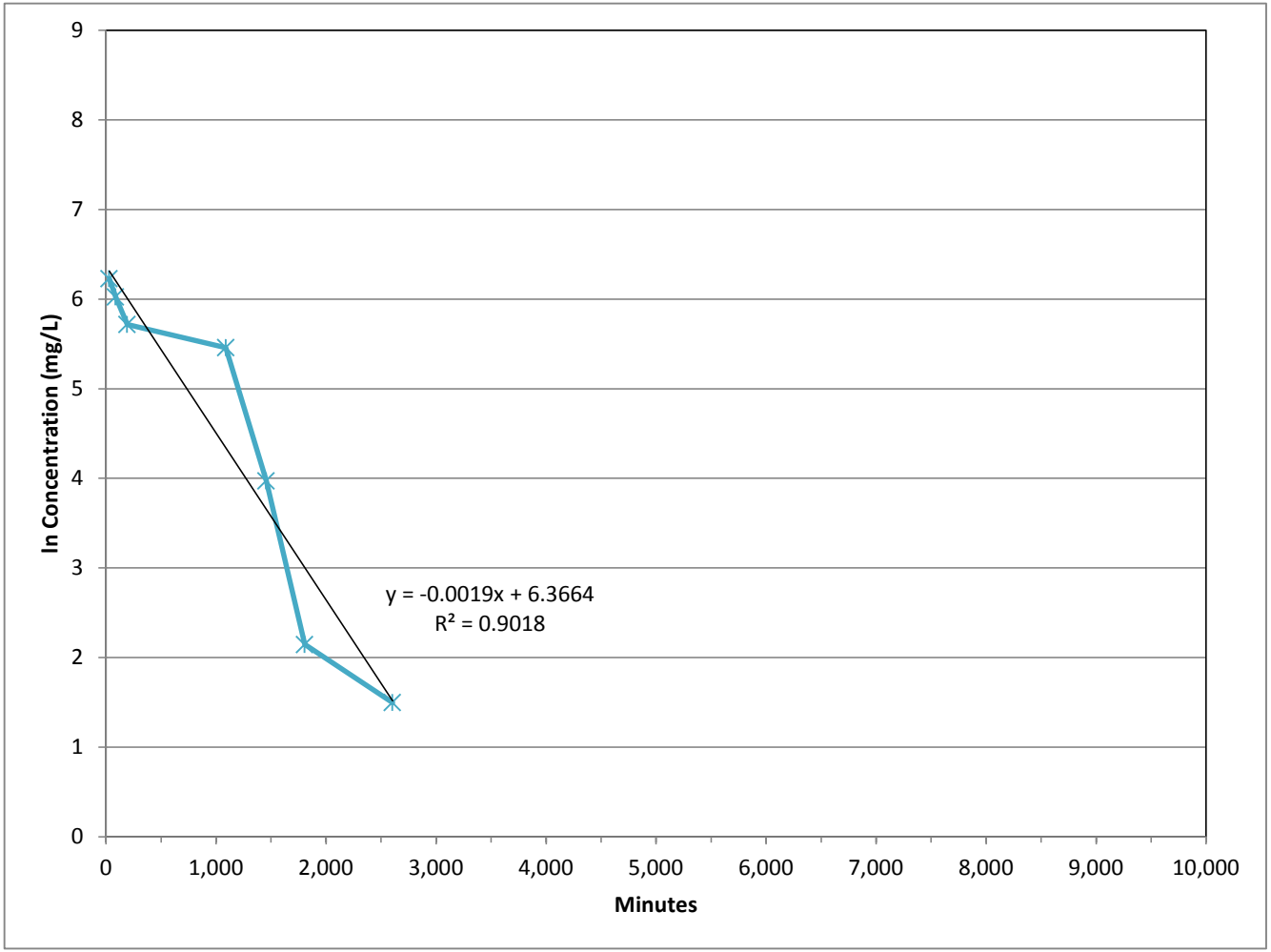
Figure

F-5



Legend

IW02-04 Field Data

Depletion of Bromide IW02-04
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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Figure
F-6

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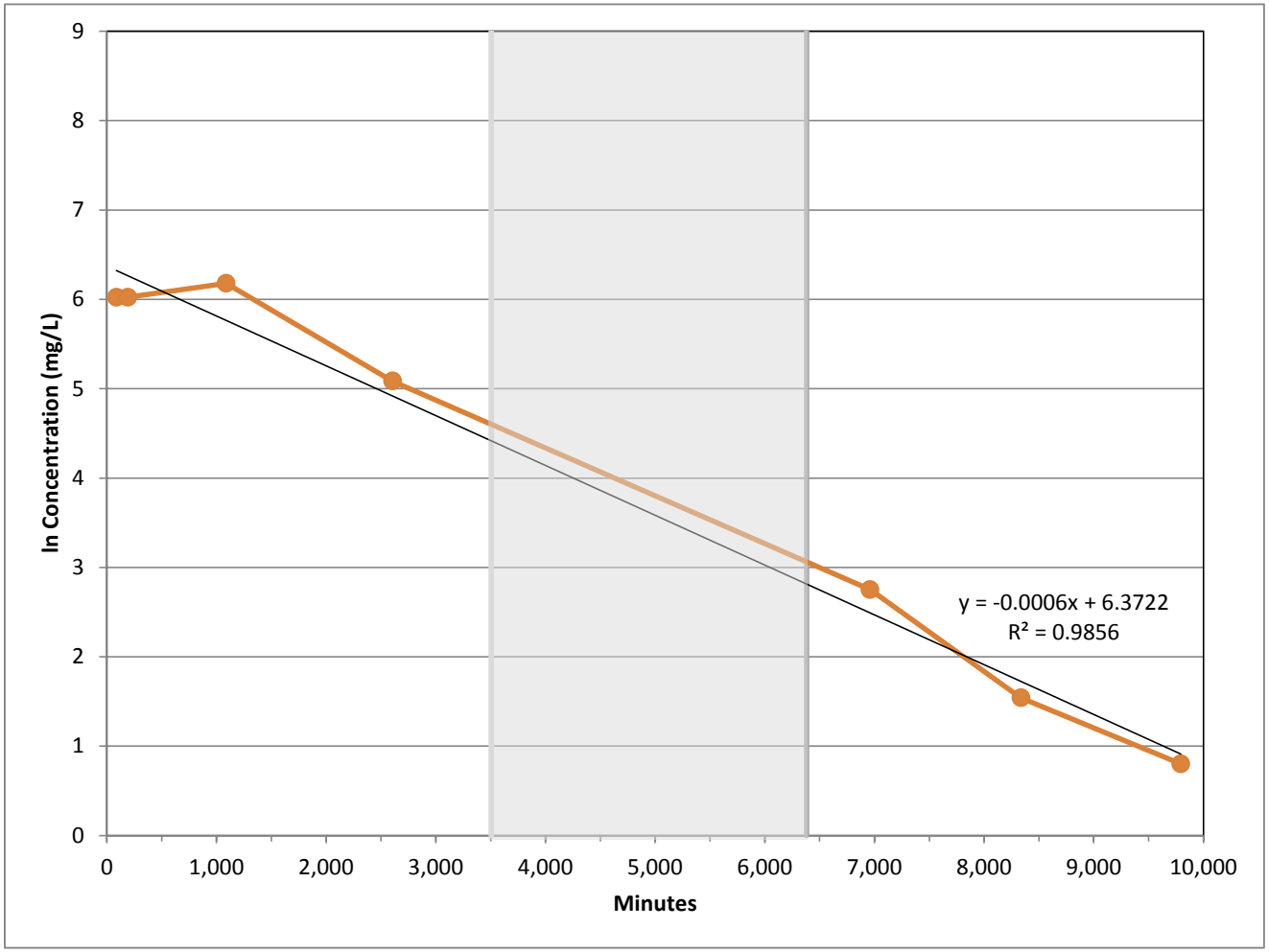

Legend

IW02-05 Field Data

Weekend, samples not collected

Depletion of Bromide IW02-05

DuPont Pompton Lakes Works

Pompton Lakes, New Jersey

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Figure

F-7

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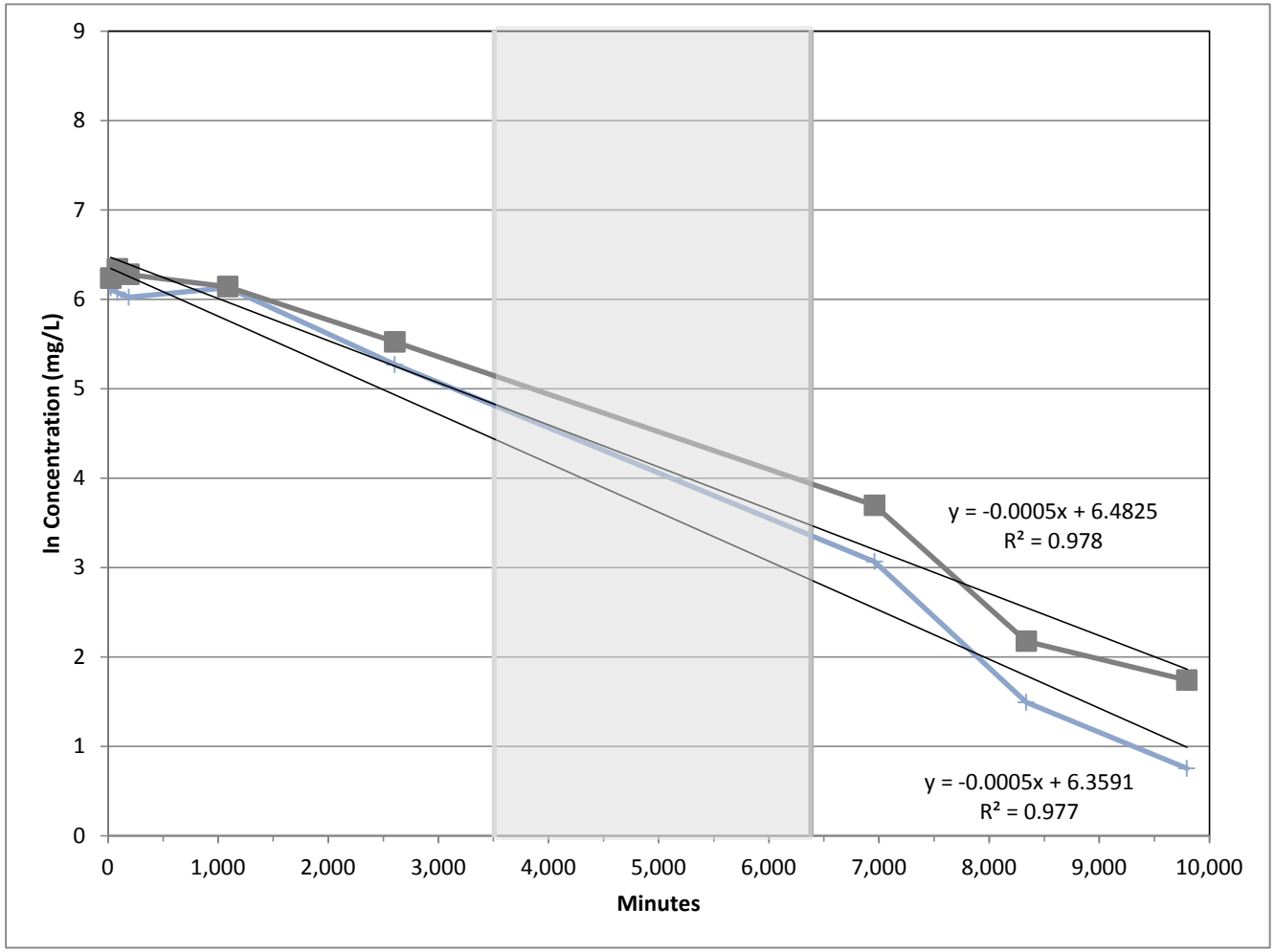

Legend

- IW02-06 Field Data
- IW02-06 Lab Data
- Weekend, samples not collected

Depletion of Bromide IW02-06
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

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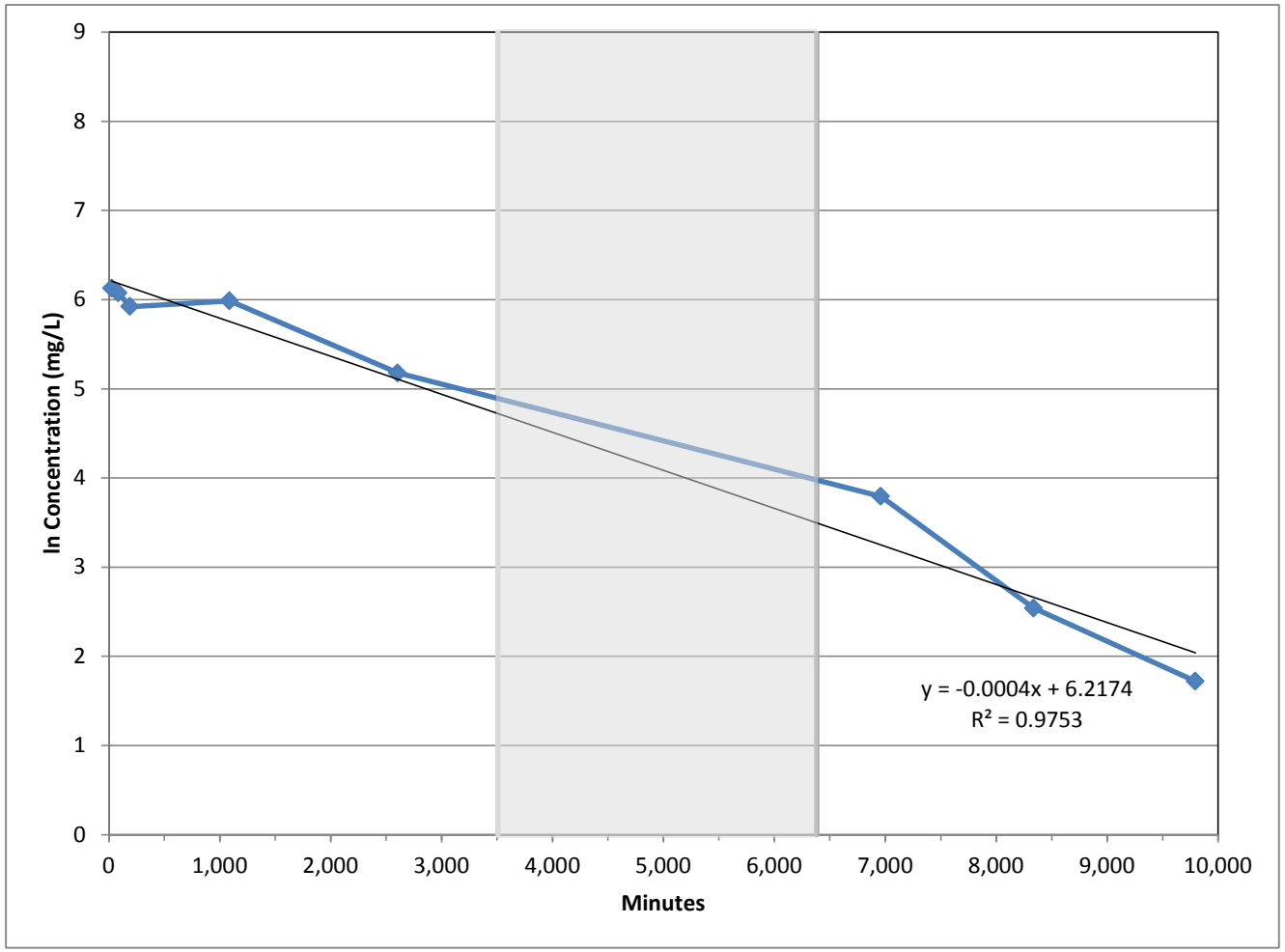
Figure **F-8**



Legend

IW02-07 Field Data

Weekend, samples not collected

Depletion of Bromide IW02-07

DuPont Pompton Lakes Works

Pompton Lakes, New Jersey

Geosyntec consultants

Figure

F-9

Guelph

30-Aug-2011

APPENDIX G

ANALYTICAL LABORATORY DATA

DUPONT POMPTON LAKES WORKS
WELL 128 IRM PILOT STUDY
JULY 2011

POMPTON LAKES, NJ

August 22, 2011

Prepared for

Norma Eichlin, OBG

Prepared by

DuPont CRG
Laboratory Services – Candia A. Carle
URS Corporation
Newark, Delaware

Memorandum

DATE: **August 22, 2011**

TO: Norma Eichlin

FROM: Candia A. Carle

RE: **WELL 128 IRM PILOT STUDY, JULY 2011, POMPTON LAKES WORKS, POMPTON LAKES, NJ**

Enclosed is the final data report for Well 128 IRM Pilot Study samples collected at the Pompton Lakes Work site in July, 2011. Samples were collected on July 20 – 22 and 25 - 27, 2011 for the analytical method referenced in the table below:

Analysis	Method Reference
Bromide	EPA 300.0

Sample Receipt

Samples were received at Lancaster Laboratories, Lancaster, PA, on July 28, 2011. All samples were received in satisfactory condition and within EPA temperature guidelines.

Data Review

The electronic data submitted for this sampling event was reviewed via the automated DuPont Data Review (DDR) process.

No QC exceptions were noted during the review.

The Lancaster Laboratories data report is included in this report as an attachment. Please do not hesitate to contact me if you have any questions regarding this report.

DuPont In-House Review (DDR)

The DDR is an automated internal review process used by the ADQM group to determine if the data is usable. The data is run through this automated program where a series of checks are performed on the data. The data is evaluated against hold time criteria, checked for blank contamination, assessed against matrix spike(MS)/matrix spike duplicate (MSD) recoveries, assessed against relative percent differences (RPDs) between these samples, assessed against laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries, assessed against RPDs between these samples, assessed against RPDs between laboratory replicates, and assessed against surrogate spike recoveries. The DDR applies the following data qualifiers to analysis results, as warranted:

Qualifier	Definition
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

Corporate Environmental Database
DDR Narrative Report

Site: POM - POMPTON LAKES WORKS
Project: WELL 128 IRM PILOT STUDY
Reporting Limit: MDL

The DDR process was executed, but no data qualifiers were applied for this project.

Corporate Environmental Database
Summary of Positive Results
with Laboratory and DDR Qualifiers

Site: POM - POMPTON LAKES WORKS
Project: WELL 128 IRM PILOT STUDY
Reporting Limit: MDL

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Detection Limit MDL	Detection Limit PQL	Analytical Methods Analysis	Analytical Methods Preprep-	Analytical Methods Prep-
Sampling Point: IW02-17-0738		Sampleno:	POM-G-IW02-17-0738						
Date sampled: Jul 21, 2011		Sample type:	Groundwater						
BROMIDE	70.4			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-17-0850		Sampleno:	POM-G-IW02-17-0850						
Date sampled: Jul 22, 2011		Sample type:	Groundwater						
BROMIDE	7.3			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-17-1259		Sampleno:	POM-G-IW02-17-1259						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	70.4			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-17-1329		Sampleno:	POM-G-IW02-17-1329						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	526			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-17-1345		Sampleno:	POM-G-IW02-17-1345						
Date sampled: Jul 21, 2011		Sample type:	Groundwater						
BROMIDE	22.7			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-17-1359		Sampleno:	POM-G-IW02-17-1359						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	427			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-17-1459		Sampleno:	POM-G-IW02-17-1459						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	391			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-17-1642		Sampleno:	POM-G-IW02-17-1642						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	310			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-17-1936		Sampleno:	POM-G-IW02-17-1936						
Date sampled: Jul 21, 2011		Sample type:	Groundwater						
BROMIDE	13.9			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-17-1954		Sampleno:	POM-G-IW02-17-1954						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	243			MG/L	20.0	25.0	300.0		

Corporate Environmental Database
Summary of Positive Results
with Laboratory and DDR Qualifiers

Site: POM - POMPTON LAKES WORKS
Project: WELL 128 IRM PILOT STUDY
Reporting Limit: MDL

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Detection Limit MDL	Detection Limit PQL	Analytical Methods Analysis	Preprep-	Prep-
Sampling Point: IW02-57-0744		Sampleno:	POM-G-IW02-57-0744						
Date sampled: Jul 21, 2011		Sample type:	Groundwater						
BROMIDE	465			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-57-0833		Sampleno:	POM-G-IW02-57-0833						
Date sampled: Jul 26, 2011		Sample type:	Groundwater						
BROMIDE	8.8			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-57-0852		Sampleno:	POM-G-IW02-57-0852						
Date sampled: Jul 27, 2011		Sample type:	Groundwater						
BROMIDE	5.7			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-57-0901		Sampleno:	POM-G-IW02-57-0901						
Date sampled: Jul 22, 2011		Sample type:	Groundwater						
BROMIDE	251			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-57-0936		Sampleno:	POM-G-IW02-57-0936						
Date sampled: Jul 25, 2011		Sample type:	Groundwater						
BROMIDE	40.3			MG/L	2.0	2.5	300.0		
Sampling Point: IW02-57-1336		Sampleno:	POM-G-IW02-57-1336						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	140			MG/L	8.0	10.0	300.0		
Sampling Point: IW02-57-1403		Sampleno:	POM-G-IW02-57-1403						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	512			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-57-1503		Sampleno:	POM-G-IW02-57-1503						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	568			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-57-1647		Sampleno:	POM-G-IW02-57-1647						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	533			MG/L	20.0	25.0	300.0		
Sampling Point: IW02-TRACER-1138		Sampleno:	POM-G-IW02-TRACER-1138						
Date sampled: Jul 20, 2011		Sample type:	Groundwater						
BROMIDE	2740			MG/L	200	250	300.0		

Corporate Environmental Database
Lab Analysis Report
with Laboratory and DDR Qualifiers

Site: POM - POMPTON LAKES WORKS
Project: WELL 128 IRM PILOT STUDY
Reporting Limit: MDL

Location: IW02-17-1234
Date Sampled: 7/20/2011 12:34:00
Lab Sample ID: 6358093-BR FS
Field Sample ID: POM-G-IW02-17-1234
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	< 2.0	U		MG/L	5	2.5	2.0	07/31/11	300.0		

Location: IW02-17-1259
Date Sampled: 7/20/2011 12:59:00
Lab Sample ID: 6358094-BR FS
Field Sample ID: POM-G-IW02-17-1259
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	70.4			MG/L	5	2.5	2.0	07/31/11	300.0		

Location: IW02-17-1329
Date Sampled: 7/20/2011 13:29:00
Lab Sample ID: 6358095-BR FS
Field Sample ID: POM-G-IW02-17-1329
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	526			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-17-1359
Date Sampled: 7/20/2011 13:59:00
Lab Sample ID: 6358096-BR FS
Field Sample ID: POM-G-IW02-17-1359
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	427			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-17-1459
Date Sampled: 7/20/2011 14:59:00
Lab Sample ID: 6358097-BR FS
Field Sample ID: POM-G-IW02-17-1459
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	391			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-17-1642
Date Sampled: 7/20/2011 16:42:00
Lab Sample ID: 6358098-BR FS
Field Sample ID: POM-G-IW02-17-1642
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	310			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-17-1954
Date Sampled: 7/20/2011 19:54:00
Lab Sample ID: 6358099-BR FS
Field Sample ID: POM-G-IW02-17-1954
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	243			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-17-0738
Date Sampled: 7/21/2011 07:38:00
Lab Sample ID: 6358100-BR FS
Field Sample ID: POM-G-IW02-17-0738
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	70.4			MG/L	5	2.5	2.0	07/31/11	300.0		

Location: IW02-17-1345
Date Sampled: 7/21/2011 13:45:00
Lab Sample ID: 6358101-BR FS
Field Sample ID: POM-G-IW02-17-1345
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	22.7			MG/L	5	2.5	2.0	07/31/11	300.0		

Location: IW02-17-1936
Date Sampled: 7/21/2011 19:36:00
Lab Sample ID: 6358102-BR FS
Field Sample ID: POM-G-IW02-17-1936
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	13.9			MG/L	5	2.5	2.0	07/31/11	300.0		

Location: IW02-17-0850
Date Sampled: 7/22/2011 08:50:00
Lab Sample ID: 6358103-BR FS
Field Sample ID: POM-G-IW02-17-0850
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	7.3			MG/L	5	2.5	2.0	07/31/11	300.0		

Location: IW02-57-1242
Date Sampled: 7/20/2011 12:42:00
Lab Sample ID: 6358104-BR FS
Field Sample ID: POM-G-IW02-57-1242
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	< 2.0	U		MG/L	5	2.5	2.0	08/01/11	300.0		

Location: IW02-57-1304
Date Sampled: 7/20/2011 13:04:00
Lab Sample ID: 6358105-BR FS
Field Sample ID: POM-G-IW02-57-1304
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	< 2.0	U		MG/L	5	2.5	2.0	08/01/11	300.0		

Location: IW02-57-1336
Date Sampled: 7/20/2011 13:36:00
Lab Sample ID: 6358106-BR FS
Field Sample ID: POM-G-IW02-57-1336
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	140			MG/L	20	10.0	8.0	08/02/11	300.0		

Location: IW02-57-1403
Date Sampled: 7/20/2011 14:03:00
Lab Sample ID: 6358107-BR FS
Field Sample ID: POM-G-IW02-57-1403
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	512			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-57-1503
Date Sampled: 7/20/2011 15:03:00
Lab Sample ID: 6358108-BR FS
Field Sample ID: POM-G-IW02-57-1503
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	568			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-57-1647
Date Sampled: 7/20/2011 16:47:00
Lab Sample ID: 6358109-BR FS
Field Sample ID: POM-G-IW02-57-1647
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	533			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-57-0744
Date Sampled: 7/21/2011 07:44:00
Lab Sample ID: 6358110-BR FS
Field Sample ID: POM-G-IW02-57-0744
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	465			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-57-0901
Date Sampled: 7/22/2011 09:01:00
Lab Sample ID: 6358111-BR FS
Field Sample ID: POM-G-IW02-57-0901
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	251			MG/L	50	25.0	20.0	08/02/11	300.0		

Location: IW02-57-0936
Date Sampled: 7/25/2011 09:36:00
Lab Sample ID: 6358112-BR FS
Field Sample ID: POM-G-IW02-57-0936
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	40.3			MG/L	5	2.5	2.0	08/01/11	300.0		

Location: IW02-57-0833
Date Sampled: 7/26/2011 08:33:00
Lab Sample ID: 6358113-BR FS
Field Sample ID: POM-G-IW02-57-0833
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	8.8			MG/L	5	2.5	2.0	08/01/11	300.0		

Location: IW02-TRACER-1138
Date Sampled: 7/20/2011 11:38:00
Lab Sample ID: 6358114-BR FS
Field Sample ID: POM-G-IW02-TRACER-1138
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	2740			MG/L	500	250	200	08/02/11	300.0		

Location: IW02-57-0852
Date Sampled: 7/27/2011 08:52:00
Lab Sample ID: 6358115-BR FS
Field Sample ID: POM-G-IW02-57-0852
Sample Type: Groundwater

Analyte/Parameter	Result	Qualifiers LAB	Qualifiers DDR	Unit	Dil.	Detection Limit PQL	Detection Limit MDL	Analysis Date	Analytical Methods Analysis-	Analytical Methods Prep-	Analytical Methods Preprep-
Analytes											
BROMIDE	5.7			MG/L	5	2.5	2.0	08/01/11	300.0		

Corporate Environmental Database
Lab Analysis QAQC Report

Site: POMPTON LAKES WORKS
Project: WELL 128 IRM PILOT STUDY

Batch Identifier 305590 300.0 31-JUL-11 11212196601A 10913

Method Number: 300.0 Prep Method: Pre-prep:
Batch Start Date: 07/31/2011 Intrument: 10913

Analyte/Parameter		Result	Unit	MDL	PQL	RPR	RPR Limits Min	RPR Limits Max	RPD	RPD Max
Sample Type	LCS	Lab Sample ID: P21296AQQ-BR LCS			Lab: LANCAS					
BROMIDE		7.0	MG/L	0.40	0.50	93	90	110		
Sample Type	MB	Lab Sample ID: P21296ABB-BR MB			Lab: LANCAS					
BROMIDE		< 0.40	MG/L	0.40	0.50					
Sample Type	MS	Lab Sample ID: 6358093-BR MS			Lab: LANCAS					
BROMIDE		49.0	MG/L	4.0	5.0	98	90	110		
Sample Type	REP	Lab Sample ID: 6358093-BR REP			Lab: LANCAS					
BROMIDE		< 2.0	MG/L	2.0	2.5				0	20

The following field samples are included in this batch:

Sampleno	Datesmpl	Lab Id	Lab
POM-G-IW02-17-0738	7/21/2011	6358100-BR FS	LANCAS
POM-G-IW02-17-1234	7/20/2011	6358093-BR FS	LANCAS
POM-G-IW02-17-1259	7/20/2011	6358094-BR FS	LANCAS
POM-G-IW02-17-1329	7/20/2011	6358095-BR FS	LANCAS
POM-G-IW02-17-1345	7/21/2011	6358101-BR FS	LANCAS
POM-G-IW02-17-1359	7/20/2011	6358096-BR FS	LANCAS
POM-G-IW02-17-1459	7/20/2011	6358097-BR FS	LANCAS
POM-G-IW02-17-1642	7/20/2011	6358098-BR FS	LANCAS
POM-G-IW02-17-1936	7/21/2011	6358102-BR FS	LANCAS
POM-G-IW02-17-1954	7/20/2011	6358099-BR FS	LANCAS

Batch Identifier 305591 300.0 31-JUL-11 11212196601B 10913

Method Number: 300.0 Prep Method: Pre-prep:
Batch Start Date: 07/31/2011 Intrument: 10913

Analyte/Parameter		Result	Unit	MDL	PQL	RPR	RPR Limits Min	RPR Limits Max	RPD	RPD Max
Sample Type	LCS	Lab Sample ID: P21296AQQ-BR LCS			Lab: LANCAS					
BROMIDE		7.0	MG/L	0.40	0.50	93	90	110		
Sample Type	MB	Lab Sample ID: P21296ABB-BR MB			Lab: LANCAS					
BROMIDE		< 0.40	MG/L	0.40	0.50					
Sample Type	MS	Lab Sample ID: 6358103-BR MS			Lab: LANCAS					
BROMIDE		53.8	MG/L	4.0	5.0	93	90	110		
Sample Type	REP	Lab Sample ID: 6358103-BR REP			Lab: LANCAS					
BROMIDE		7.1	MG/L	2.0	2.5				3	20

The following field samples are included in this batch:

Sampleno	Datesmpl	Lab Id	Lab
POM-G-IW02-17-0850	7/22/2011	6358103-BR FS	LANCAS
POM-G-IW02-57-0744	7/21/2011	6358110-BR FS	LANCAS
POM-G-IW02-57-0901	7/22/2011	6358111-BR FS	LANCAS
POM-G-IW02-57-0936	7/25/2011	6358112-BR FS	LANCAS
POM-G-IW02-57-1242	7/20/2011	6358104-BR FS	LANCAS
POM-G-IW02-57-1304	7/20/2011	6358105-BR FS	LANCAS
POM-G-IW02-57-1336	7/20/2011	6358106-BR FS	LANCAS
POM-G-IW02-57-1403	7/20/2011	6358107-BR FS	LANCAS
POM-G-IW02-57-1503	7/20/2011	6358108-BR FS	LANCAS
POM-G-IW02-57-1647	7/20/2011	6358109-BR FS	LANCAS

Corporate Environmental Database
Lab Analysis QAQC Report

Site: POMPTON LAKES WORKS
Project: WELL 128 IRM PILOT STUDY

Batch Identifier 305592 300.0 01-AUG-11 11212196602A 10913

Method Number: 300.0 Prep Method: Pre-prep:
Batch Start Date: 08/01/2011 Intrument: 10913

Analyte/Parameter		Result	Unit	MDL	PQL	RPR	RPR Limits Min	RPR Limits Max	RPD	RPD Max
Sample Type	LCS	Lab Sample ID: P21296BQQ-BR LCS			Lab: LANCAS					
BROMIDE		7.4	MG/L	0.40	0.50	99	90	110		
Sample Type	MB	Lab Sample ID: P21296BBB-BR MB			Lab: LANCAS					
BROMIDE		< 0.40	MG/L	0.40	0.50					
Sample Type	MS	Lab Sample ID: 6358113-BR MS			Lab: LANCAS					
BROMIDE		58.0	MG/L	4.0	5.0	98	90	110		
Sample Type	REP	Lab Sample ID: 6358113-BR REP			Lab: LANCAS					
BROMIDE		8.4	MG/L	2.0	2.5				5	20

The following field samples are included in this batch:

Sampleno	Datesmpl	Lab Id	Lab
POM-G-IW02-57-0833	7/26/2011	6358113-BR FS	LANCAS
POM-G-IW02-57-0852	7/27/2011	6358115-BR FS	LANCAS
POM-G-IW02-TRACER-1138	7/20/2011	6358114-BR FS	LANCAS

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

August 04, 2011

Project: POM - WELL 128 IRM PILOT STUDY

Submittal Date: 07/28/2011
Group Number: 1258684
PO Number: LBIO-66380
Release Number: LA33
State of Sample Origin: NJ

Client Sample Description	Lancaster Labs (LLI) #
POM-G-IW02-17-1234 Groundwater Sample	6358093
POM-G-IW02-17-1259 Groundwater Sample	6358094
POM-G-IW02-17-1329 Groundwater Sample	6358095
POM-G-IW02-17-1359 Groundwater Sample	6358096
POM-G-IW02-17-1459 Groundwater Sample	6358097
POM-G-IW02-17-1642 Groundwater Sample	6358098
POM-G-IW02-17-1954 Groundwater Sample	6358099
POM-G-IW02-17-0738 Groundwater Sample	6358100
POM-G-IW02-17-1345 Groundwater Sample	6358101
POM-G-IW02-17-1936 Groundwater Sample	6358102
POM-G-IW02-17-0850 Groundwater Sample	6358103
POM-G-IW02-57-1242 Groundwater Sample	6358104
POM-G-IW02-57-1304 Groundwater Sample	6358105
POM-G-IW02-57-1336 Groundwater Sample	6358106
POM-G-IW02-57-1403 Groundwater Sample	6358107
POM-G-IW02-57-1503 Groundwater Sample	6358108
POM-G-IW02-57-1647 Groundwater Sample	6358109
POM-G-IW02-57-0744 Groundwater Sample	6358110
POM-G-IW02-57-0901 Groundwater Sample	6358111
POM-G-IW02-57-0936 Groundwater Sample	6358112
POM-G-IW02-57-0833 Groundwater Sample	6358113
POM-G-IW02-TRACER-1138 Groundwater Sample	6358114
POM-G-IW02-57-0852 Groundwater Sample	6358115

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Analysis Report

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO LLI Attn: EDD Group

Questions? Contact your Client Services Representative
Nancy J Bornholm at (717) 656-2300 Ext. 1310

Respectfully Submitted,

Erik J. Frederiksen
Manager

Lancaster Laboratories

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Analysis Report

Sample Description: POM-G-IW02-17-1234 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358093
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 12:34 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	N.D.	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	07/31/2011 20:37	Ashley M Adams	5

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: POM-G-IW02-17-1259 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358094
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 12:59 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	70.4	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	07/31/2011 21:19	Ashley M Adams	5

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: POM-G-IW02-17-1329 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358095
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 13:29 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	526	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	08/02/2011 06:42	Ashley M Adams	50

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: POM-G-IW02-17-1359 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358096
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 13:59 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	427	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	08/02/2011 06:56	Ashley M Adams	50

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Analysis Report

Sample Description: POM-G-IW02-17-1459 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358097
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 14:59 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	391	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	08/02/2011 07:10	Ashley M Adams	50

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Analysis Report

Sample Description: POM-G-IW02-17-1642 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358098
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 16:42 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	310	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	08/02/2011 07:25	Ashley M Adams	50

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Analysis Report

Sample Description: POM-G-IW02-17-1954 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358099
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 19:54 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	243	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	08/02/2011 07:39	Ashley M Adams	50

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Analysis Report

Sample Description: POM-G-IW02-17-0738 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358100
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/21/2011 07:38 by NM

Submitted: 07/28/2011 09:25

Reported: 08/04/2011 16:33

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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	70.4	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	07/31/2011 23:13	Ashley M Adams	5

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Analysis Report

Sample Description: POM-G-IW02-17-1345 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358101
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/21/2011 13:45 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	22.7	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	07/31/2011 23:27	Ashley M Adams	5

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Analysis Report

Sample Description: POM-G-IW02-17-1936 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358102
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/21/2011 19:36 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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URS Corporation
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4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	13.9	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601A	07/31/2011 23:41	Ashley M Adams	5

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Analysis Report

Sample Description: POM-G-IW02-17-0850 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358103
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/22/2011 08:50 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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URS Corporation
Iron Hill Corporate Center
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Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	7.3	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	07/31/2011 23:55	Ashley M Adams	5

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Analysis Report

Sample Description: POM-G-IW02-57-1242 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358104
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 12:42 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
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CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	N.D.	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/01/2011 01:06	Ashley M Adams	5

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Analysis Report

Sample Description: POM-G-IW02-57-1304 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358105
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 13:04 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	N.D.	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/01/2011 01:20	Ashley M Adams	5

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: POM-G-IW02-57-1336 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358106
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 13:36 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	140	8.0	10.0	20

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/02/2011 07:53	Ashley M Adams	20

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: POM-G-IW02-57-1403 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358107
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 14:03 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	512	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/02/2011 08:07	Ashley M Adams	50

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Lancaster Laboratories

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Analysis Report

Sample Description: POM-G-IW02-57-1503 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358108
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 15:03 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

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4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	568	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/02/2011 08:21	Ashley M Adams	50

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: POM-G-IW02-57-1647 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358109
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 16:47 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	533	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/02/2011 08:36	Ashley M Adams	50

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: POM-G-IW02-57-0744 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358110
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/21/2011 07:44 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	465	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/02/2011 08:50	Ashley M Adams	50

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

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Analysis Report

Sample Description: POM-G-IW02-57-0901 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358111
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/22/2011 09:01 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	251	20.0	25.0	50

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/02/2011 09:32	Ashley M Adams	50

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

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Analysis Report

Sample Description: POM-G-IW02-57-0936 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358112
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/25/2011 09:36 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	40.3	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196601B	08/01/2011 03:00	Ashley M Adams	5

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

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Analysis Report

Sample Description: POM-G-IW02-57-0833 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358113
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/26/2011 08:33 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	8.8	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196602A	08/01/2011 04:11	Ashley M Adams	5

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: POM-G-IW02-TRACER-1138 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358114
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/20/2011 11:38 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	2,740	200	250	500

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196602A	08/02/2011 09:47	Ashley M Adams	500

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: POM-G-IW02-57-0852 Groundwater Sample
WELL 128 IRM PILOT STUDY

LLI Sample # WW 6358115
LLI Group # 1258684
Account # 07032

Project Name: POM - WELL 128 IRM PILOT STUDY

Collected: 07/27/2011 08:52 by NM

Submitted: 07/28/2011 09:25
Reported: 08/04/2011 16:33

CRG-E.I.DuPont de Nemours & Co
URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark DE 19713

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
01505	Bromide	24959-67-9	5.7	2.0	2.5	5

General Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01505	Bromide	EPA 300.0	1	11212196602A	08/01/2011 05:08	Ashley M Adams	5

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Quality Control Summary

Client Name: CRG-E.I.DuPont de Nemours & Co
Reported: 08/04/11 at 04:33 PM

Group Number: 1258684

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 11212196601A	Sample number(s): 6358093-6358102								
Bromide	N.D.	0.40	0.50	mg/l	93		90-110		
Batch number: 11212196601B	Sample number(s): 6358103-6358112								
Bromide	N.D.	0.40	0.50	mg/l	93		90-110		
Batch number: 11212196602A	Sample number(s): 6358113-6358115								
Bromide	N.D.	0.40	0.50	mg/l	99		90-110		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 11212196601A	Sample number(s): 6358093-6358102				UNSPK: 6358093		BKG: 6358093		
Bromide	98		90-110			N.D.	N.D.	0 (1)	20
Batch number: 11212196601B	Sample number(s): 6358103-6358112				UNSPK: 6358103		BKG: 6358103		
Bromide	93		90-110			7.3	7.1	3 (1)	20
Batch number: 11212196602A	Sample number(s): 6358113-6358115				UNSPK: 6358113		BKG: 6358113		
Bromide	98		90-110			8.8	8.4	5 (1)	20

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories

For Lancaster Laboratories Use Only
Group No.: 1258684 Sample Nos.: 6358093-115
Acc't: 07032 SCR No.: 108230 Cooler No.: CC9924 19851
Cooler Temperature upon receipt: 3.8 °C Container No.: 1

Facility Name: Pompton Lakes	Project Manager: George Nemeth
Facility Contact: George Nemeth	Facility Contact Phone No.: 973-492-7735
Facility Address: Pompton Lakes Works	Job No.: 9267-7720100C WH06 50
2000 Cannonball Road	Release No.: LA32
Pompton Lakes NJ 07442	PO Number: LBIO-66380
Sampler(s): Nicole Moneta / George Nemeth / Natasha B.	
Project Name: WELL 128 IRM PILOT STUDY	

Sample Identification	Date Collected	Time Collected	Matrix	Containers Volume (ml)	Preserv	No.	Analyses Required: Br- (300.0)	Comments: / Condition upon receipt:
POM-G-IW02-17-1234	7/20/11	1234	WW	40	None	1	X	
POM-G-IW02-17-1259		1259	WW	40	None	1	X	
POM-G-IW02-17-1329		1329	WW	40	None	1	X	
POM-G-IW02-17-1359		1359	WW	40	None	1	X	
POM-G-IW02-17-1459		1459	WW	40	None	1	X	
POM-G-IW02-17-1642		1642	WW	40	None	1	X	
POM-G-IW02-17-1954		1954	WW	40	None	1	X	
POM-G-IW02-17-0738	7/21/11	0738	WW	40	None	1	X	
POM-G-IW02-17-1345		1345	WW	40	None	1	X	
POM-G-IW02-17-1936		1936	WW	40	None	1	X	

Turnaround Time Requested (please circle): Normal (Rush) Number of days: 5

Special Instructions: Rush 5day TAT ALL Samples

	Date	Time		Date	Time
Bottles Relinquished by:	7-14-11	1045	Bottles Received by: George Nemeth	7/18/11	~1030
Bottles Relinquished by: George Nemeth	7/27/11	1550	Bottles Received by:	Date:	Time:
Bottles Relinquished by:	Date:	Time:	Bottles Received by:	Date:	Time:
Bottles Relinquished by:	Date:	Time:	Bottles Received by: Elizabeth Lehman	7/28/11	0925

Copies: White copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the samplers.

Lancaster Laboratories

Analysis Request / Environmental Services Chain of Custody

For Lancaster Laboratories Use Only
Group No.: 1258684 Sample Nos.: 6358093-115
Acc't: 07032 SCR No.: 108230 Cooler No.: C17796 19851
Cooler Temperature upon receipt: 3.8 °C Container No.: 1

Facility Name: Pompton Lakes	Project Manager: George Nemeth
Facility Contact: George Nemeth	Facility Contact Phone No.: 973-492-7735
Facility Address: Pompton Lakes Works	Job No.: 9267-7720100C WH06 50
2000 Cannonball Road	Release No.: LA32
Pompton Lakes NJ 07442	PO Number: LBIO-66380

Sampler(s): Nicole Moneta / George Nemeth / Natasha B.
Project Name: WELL 128 IRM PILOT STUDY

Sample Identification	Date Collected	Time Collected	Matrix	Containers Volume (ml)	Preserv	No.	Analyses Required: Br- (300.0)	Comments: / Condition upon receipt:
POM-G-IW02-17-0850	7/22/11	0850	WW	40	None	1	X	
POM-G-IW02-57-1242	7/20/11	1242	WW	40	None	1	X	
POM-G-IW02-57-1304		1304	WW	40	None	1	X	
POM-G-IW02-57-1336		1336	WW	40	None	1	X	
POM-G-IW02-57-1403		1403	WW	40	None	1	X	
POM-G-IW02-57-1503		1503	WW	40	None	1	X	
POM-G-IW02-57-1647	↓	1647	WW	40	None	1	X	
POM-G-IW02-57-0744	7/21/11	0744	WW	40	None	1	X	
POM-G-IW02-57-0901	7/22/11	0901	WW	40	None	1	X	
POM-G-IW02-57-0936	7/25/11	0936	WW	40	None	1	X	

Turnaround Time Requested (please circle): Normal (Rush) Number of days: 5

Special Instructions: Rush, 5 day TAT - All Samples

	Date	Time		Date	Time
Bottles Relinquished by:	7-14-11	1015	Bottles Received by: George Nemeth	7/18/11	~1030
Bottles Relinquished by: George Nemeth	7/27/11	1550	Bottles Received by:		
Bottles Relinquished by:			Bottles Received by:		
Bottles Relinquished by:			Bottles Received by: Suzette Lehman	7/28/11	0925

Copies: White copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the samplers.

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories

For Lancaster Laboratories Use Only
Group No.: 1258684 Sample Nos.: 6358093-115
Acc't: 07032 SCR No.: 108230 Cooler No.: C17796 19851
Cooler Temperature upon receipt: 3.8 °C Container No.: 1

Facility Name: Pompton Lakes	Project Manager: George Nemeth
Facility Contact: George Nemeth	Facility Contact Phone No.: 973-492-7735
Facility Address: Pompton Lakes Works	Job No.: 9267-7720100C WH06 50
2000 Cannonball Road	Release No.: LA32
Pompton Lakes NJ 07442	PO Number: LBIO-66380

Sampler(s): Nicole Moretta / George Nemeth / Natasha B.
Project Name: WELL 128 IRM PILOT STUDY

Sample Identification	Date Collected	Time Collected	Matrix	Containers Volume (ml)	Preserv	No.	Analyses Required: Br- (300.0)	Comments: / Condition upon receipt:
POM-G-IW02- 57-0833	7/26/11	0833	WW	40	None	1	X	
POM-G-IW02- Tracer-1138	7/20/11	1138	WW	40	None	1	X	
POM-G-IW02- 57-0852	7/27/11	0852	WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	
POM-G-IW02-			WW	40	None	1	X	

Turnaround Time Requested (please circle): Normal (Rush) Number of days: 5

Special Instructions: Rush 5 day TAT - All Samples

	Date	Time		Date	Time
Bottles Relinquished by: Ken Kunt	7-14-11	1015	Bottles Received by: George Nemeth	7/18/11	~1030
Bottles Relinquished by: George Nemeth	7/27/11	1550	Bottles Received by:		
Bottles Relinquished by:			Bottles Received by:		
Bottles Relinquished by:			Bottles Received by: Suzette Lehman	7/28/11	0925

Copies: White copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the samplers.

Lancaster Laboratories

Environmental Sample Administration
Receipt Documentation Log

Client/Project: Pompton Lakes

Date of Receipt: 7/28/11

Time of Receipt: 09:25

Source Code: 50-1

Shipping Container Sealed: (YES) NO

Custody Seal Present * : (YES) NO

* Custody seal was intact unless otherwise noted in the discrepancy section

Package: (Chilled) Not Chilled

Temperature of Shipping Containers							
Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1	2783	3.8	TB	WI	Y	B	
2							
3							
4							
5							
6							

Number of Trip Blanks received NOT listed on chain of custody: 0

Paperwork Discrepancy/Unpacking Problems:

Unpacker Signature/Emp#: Suzette Lehman 167 **Date/Time:** 7/28/11 10:15

Issued by Dept. 6042 Management

2174.06

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
ug	microgram(s)	**mg**	milligram(s)
ml	milliliter(s)	**l**	liter(s)
m3	cubic meter(s)	**ul**	microliter(s)

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

J estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

A	TIC is a possible aldol-condensation product
B	Analyte was also detected in the blank
C	Pesticide result confirmed by GC/MS
D	Compound quantitated on a diluted sample
E	Concentration exceeds the calibration range of the instrument
N	Presumptive evidence of a compound (TICs only)
P	Concentration difference between primary and confirmation columns >25%
U	Compound was not detected
X,Y,Z	Defined in case narrative

Inorganic Qualifiers

B	Value is <CRDL, but ≥IDL
E	Estimated due to interference
M	Duplicate injection precision not met
N	Spike sample not within control limits
S	Method of standard additions (MSA) used for calculation
U	Compound was not detected
W	Post digestion spike out of control limits
*****	Duplicate analysis not within control limits
+	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.