Dewatering Calculations, Treatment and Supporting Documentation

I. Purpose

AECOM conducted the following activities to determine the best approach for management of water generated during the proposed Interim Remedial Measures (IRM) excavation work.

- General review of treatment options and selection of methods to test,
- Pumping and chemistry testing, and
- Treatability tests completed by USFilter.

As discussed in more detail in the following sections, the results of this evaluation indicate that off-site disposal/treatment of water generated during the IRM excavation activities is the best management method. The high concentration of hexavalent chromium in groundwater (3,500 to 9,000 ppm) renders conventional on-site treatment very expensive. Further, plant design, construction, and permitting cannot be completed within the desired timeframe for completion of the excavation phase of IRM#1. However, this option is being evaluated for future remedial activities and pilot tests.

II. Review of Treatment Options and Selection of Options to Test

In evaluating on-site treatment options, AECOM reviewed previous projects, conducted a general literature search, and held discussions with USFilter. The most commonly used treatment method for concentrated chromium impacted water (either groundwater or plating wastes) is chemical reduction followed by precipitation. Potential reducing agents include sodium bisulfite, hydrosulfite, hydrazine, sulfur dioxide gas, ferrous sulfate, iron filings and other agents. Sodium bisulfite is likely the most commonly used reductant. Sodium bisulfite reduction is used extensively for plating wastes and was recommended for testing by USFilter. Essentially, this process reduces the highly soluble Cr6+ anion complexes to Cr3+ which then forms low solubility complexes/compounds, and the Cr3+ precipitates and is filtered-out. Settling and filtration are the most challenging steps in the process.

Ion exchange treatment was also considered for testing. In this process, water bearing Cr6+ is passed through a resin bed that exchanges the Cr6+ complexes for another ion such as chloride or hydroxide. Ion exchange is capable of achieving very low treatment levels and is best suited to relatively low influent concentrations. For the Garfield Ave site, the rate of resin usage would be very high due to the high water table. With an estimated influent hexavalent chromium concentration of 3,500 ppm observed from the pumping test described in the following section, the estimated resin cost for treatment of groundwater in the IRM#1 Area is $4.30/gallon. Thus, ion exchange was ruled out as a viable treatment option for the IRM#1 Area.

III. Pumping and Chemistry Testing

For treatment testing, groundwater extracted from piezometer PZ-8 was provided to USFilter. Piezometer PZ-8 is located within future proposed IRM excavation area and groundwater samples collected from this piezometer exhibited a high hexavalent chromium concentration (9,250 ppm) and pH (12.2). However, these conditions likely reflect an unrealistic scenario for water conditions expected to be observed for the duration of proposed dewatering activities. In an effort to refine these parameters and thus develop a more realistic cost estimate for on-site treatment, a groundwater extraction test was conducted within future proposed area of remediation.
Well Construction

Extraction well PW-1 was installed in an area proposed for future proposed remediation, as shown on Figure 1, to a depth of 18 feet. The 4-inch diameter extraction well was constructed and developed to allow accommodation of a 2-inch diameter submersible pump, provide the maximum flow rate, and minimize silt or other solids in the extracted water. Well construction consisted of 3 feet of PVC riser, 15 feet of 0.040-slot well screen, #1 sand pack and a flush-mount road box. Soil logging was performed continuously starting at a depth of 10 feet below grade during installation to ensure that the boring did not penetrate the meadow mat layer. The well was developed until an obvious improvement in turbidity was observed.

Two new piezometers were also installed and used as observation wells for the groundwater extraction test. The locations of the piezometers are also shown in Figure 1. Piezometers OW-1, and OW-2 were installed around well PW-1 at horizontal distances of 5 and 10 feet from well PW-1, respectively. Each new piezometer was installed to a depth of 16 feet. The newly-installed piezometers were constructed with 2-inch diameter PVC riser with a 5-foot long well screen (0.010-slot size), medium sand (#1 Morie) filter pack, and flush-mount road box. Form Bs, Well Construction and Boring Logs, and Well Records for the new wells are included at the end of this Appendix.

As discussed in the previously submitted IRM Work Plan, subsequent to the groundwater extraction test, these three wells (PW-1, OW-1 and OW-2) were abandoned in June 2007 in preparation for future IRM activities.

Extraction Test

The extraction test was conducted over a 5-day period. While groundwater was pumped from extraction well PW-1, pH measurements and sampling for chromium were conducted at several points during the test. Drawdown of water levels was measured in nearby wells and piezometers. Analytical results, water level data, and pumping flow rates documented as part of this test are depicted in Tables 1 and 2.

Wastes from the drilling activities, which included soil cuttings, well development water, and decontamination water were drummed and disposed off-site. Groundwater extracted as part of the test was stored temporarily in a frac tank on-site, and was subsequently transported off-site for disposal. Disposal documentation will be provided in a future report detailing IRM excavation activities and results.

Results

Both the pH and chromium concentrations during the pumping test remained elevated throughout the extraction test. Total suspended solids concentrations varied throughout the test. Based upon the results of the extraction test, a hexavalent chromium concentration of 3,500 ppm and a pH of 12 are considered to represent average values for groundwater in the pump test area. In general, these conditions represent a worst-case scenario for groundwater that will be removed during dewatering activities in the 900 Garfield Avenue Slab and 2 Dakota Street Slab IRM areas, where concentrations are typically lower than in the pump test area.

Pumping at well PW-1 yielded less than 1 gpm over the course of the test and the area of influence was relatively small (<10-foot radius).
IV. Dewatering Calculations

The rate of water to be removed during excavation activities was calculated using the results of the pumping test and a simple analytical groundwater flow model.

Conceptual Model

As the basis for the analytical model, the hydrogeologic conceptual model for the 900 Garfield Avenue Slab IRM area is presented in Table 3.

A simple analytical groundwater flow model called “WELFLO” was used to simulate expected groundwater dewatering rates for the 900 Garfield Avenue Slab IRM Area. This model was published in: Analytical Groundwater Modeling: Flow and Contaminant Migration by William C. Walton, CRC Press, 1988. The model allows simulation of pumping wells located at grid nodes in a user-specified grid to predict drawdown or mounding from groundwater extraction or injection, respectively. A series of pumping wells arranged in a rectangular array are used to simulate dewatering from a rectangular-shaped excavation area. The pumping rate of each simulated well is varied until the target drawdown (dewatering) level is achieved. The total pumping rates of all wells are then summed to calculate the total dewatering rate for the simulated excavation under the designated duration or time period.

In general, the initial design for the proposed excavation activities in the 900 Garfield Avenue Slab IRM area includes excavation of the upper 10 feet of impacted soil down to the top of the Meadow Mat layer. The actual depth of the Meadow Mat layer may vary, but on average, is approximately 15 feet in most areas beneath 900 Garfield Avenue Slab. However, in the area of the former Morris Canal, located along the southeastern edge of 900 Garfield Avenue Slab, the Meadow Mat layer is missing. In the areas where the Meadow Mat layer is missing, the depth of the excavation will likely extend down to 20 to 25 feet in places. In general, excavations will proceed in strips measuring 20 feet wide and 30 feet long. The anticipated maximum size of an open area of an excavation will be approximately 20 feet by 30 feet. However, due to the need to collect confirmation samples, the actual size of open excavation area may be larger for a short period of time. As soon as the results of confirmation sampling indicate that target soil cleanup levels have been achieved, the completed excavation area will be backfilled with clean fill.

In an effort to reduce the amount recharge into the 900 Garfield Avenue Slab IRM area from areas upgradient, a relatively watertight sheet pile wall will be driven along the southeastern side of Garfield Avenue, directly upgradient of 900 Garfield Avenue Slab. The approximate location of the proposed wall is shown in Figure 1. The sheet pile wall will be driven approximately to a depth of 30 feet below grade into an underlying silt unit that is approximately 6 feet thick. Since the WELFLO model is a simple analytical solution, it is unable to simulate the effect of the sheet pile wall, nor the expected flows from the subsurface utility beds below Garfield Avenue.

Model Assumptions

Based upon the hydrogeologic conceptual model and the initial design of the proposed excavation scheme for the 900 Garfield Avenue Slab IRM area, modeling assumptions and input parameters were selected for the WELFLO model simulations. A summary of the modeling assumptions is presented in Table 4 and the WELFO input parameters are presented in Table 5. The model runs were simulated for a period of 5 continuous work days to generate average weekly dewatering rates.
In an effort to evaluate the ranges of dewatering rates that may be expected due to seasonal effects, the model simulated both late summer and early spring conditions. Based on water levels collected at the site over time, low and high groundwater conditions are experienced in the late summer and early spring periods, respectively. For the modeling effort, it was assumed that the dewatering level (thickness of the saturated zone to be dewatered) varied from 5 to 10 feet in locations outside of the former Morris Canal and from 15 to 20 feet in the former Morris Canal of the 900 Garfield Avenue Slab (see Table 4).

Not surprisingly, the fine-grained nature of the fill material in the shallow aquifer beneath the 900 Garfield Avenue Slab IRM area results in a relatively low aquifer permeability. As previously discussed, the measured hydraulic conductivity (K) of this material ranges from 1 to 3 ft/d. Previous numerical modeling efforts (using MODFLOW) suggest that a K = 1.5 ft/d provides a good match between observed and simulated heads. The pumping test results conducted in the area proposed for future remediation indicate a K = 3 ft/d. Therefore, the WELFLO modeling effort used a range of K values (1.5 and 3 ft/d) to predict dewatering rates.

**Model Results**

As expected, the simulated dewatering rates varied depending upon aquifer permeability, season, and location (inside or outside of the former Morris Canal). The majority of the 900 Garfield Avenue Slab IRM area is outside of the former Morris Canal, and predicted weekly dewatering rates in this area varied from 4,320 to 7,776 gpd in the summer versus 8,640 to 15,552 in early spring. In areas within the former Morris Canal, the predicted dewatering rates varied from 12,960 to 23,328 gpd in late summer versus 17,280 to 31,104 gpd in early spring. Since the K=3 ft/d dewatering rates are more conservative, these rates should be used for design purposes. A summary of the WELFLO dewatering modeling results is presented in Table 6. The WELFLO output screens are presented as an attachment to this appendix.

**V. Treatability Testing**

USFilter conducted a series of tests on groundwater collected from well PZ-8 to evaluate the most appropriate process to reduce chromium concentrations in the groundwater to below 0.1 ppm. The selected process consisted of the following:

- Reduce pH to 2-2.5 with sulfuric acid
- Reduce chromium with sodium bisulfite
- Increase pH with lime to 10.3
- Add flocculating agent
- Settle for one hour and filter (separation method for full-scale treatment may include settling tanks, conventional filtration of microfiltration)

The estimated cost for chemicals and sludge disposal using the data provided during the extraction test is $0.14/gallon. The estimated cost for plant operation, utilities, and discharge fees is $0.30/gallon. Thus, the cost to treat water removed during the IRM is approximately $0.44/gallon. USFilter estimates the cost to design and install a 17 gpm plant is approximately $500,000 to $750,000. Because of the high chemical demand and poor economics of the conventional sodium bisulfite treatment, USFilter experimented with other processes. Those tests included:

- Sodium bisulfite treatment at higher pH values – as pH increased, sodium sulfite demand increased
VI. Conclusions

For the IRM work, minimizing the generation of water by extending relatively watertight sheet piling along Garfield Avenue and off-site disposal of water is recommended. It is estimated that the cost of off-site disposal/treatment of extracted water from the 900 Garfield Avenue Slab IRM area would be $0.62/gallon ($1.12MM per 1,800,000 gallons). The cost of a conventional sodium bisulfite treatment system is approximately $500,000 to $750,000 for construction plus $0.44/gallon for treatment (total cost $1.29MM to $1.54MM). Onsite treatment and discharge to municipal sewer is currently being evaluated for future remedial activities including a potential full site remediation at a later date. Because the sewer system in Jersey City is a combined system, provision to store groundwater onsite is required during and up to 24 hours following a rain event. Proceeding with onsite treatment would also result in schedule delays related to permitting the facility with the PVSC and plant construction; however, the proper permits and treatment options are being pursued. Thus, comparing treatment options, costs, and potential scheduling and permitting issues, off-site disposal of dewatering water will be initially utilized for the 900 Garfield Avenue Slab IRM.
Table 1
Groundwater Levels and Pumping Rates During Extraction Test

Privileged and Confidential
Attorney-Client Communication
Attorney Work Product
Prepared at Request of Counsel

<table>
<thead>
<tr>
<th>Well ID</th>
<th>Notes</th>
<th>Weather</th>
<th>Prerequisites</th>
<th>After 21 hrs.</th>
<th>After 25 hrs.</th>
<th>After 43 hrs</th>
<th>After 50 hrs</th>
<th>After 72 hrs</th>
<th>After Deactivation</th>
<th>After 3 Day Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW6A</td>
<td>0.90</td>
<td>Sunny</td>
<td>Light rain in AM</td>
<td>12:00</td>
<td>2.18</td>
<td>15:59</td>
<td>2.05</td>
<td>9:25</td>
<td>2.15</td>
<td>16:00</td>
</tr>
<tr>
<td>MW11A</td>
<td>1.53</td>
<td>Sunny</td>
<td>Light rain in AM</td>
<td>10:42</td>
<td>5.32</td>
<td>11:50</td>
<td>5.43</td>
<td>15:59</td>
<td>5.51</td>
<td>9:20</td>
</tr>
<tr>
<td>PZ7</td>
<td>5.20</td>
<td>Sunny</td>
<td>Light rain in AM</td>
<td>10:47</td>
<td>5.03</td>
<td>11:58</td>
<td>5.3</td>
<td>15:52</td>
<td>5.34</td>
<td>9:27</td>
</tr>
<tr>
<td>PZ8</td>
<td>3.55</td>
<td>Sunny</td>
<td>Light rain in AM</td>
<td>10:37</td>
<td>3.72</td>
<td>11:45</td>
<td>3.88</td>
<td>16:03</td>
<td>3.98</td>
<td>9:17</td>
</tr>
<tr>
<td>PZ13</td>
<td>5.12</td>
<td>Sunny</td>
<td>Light rain in AM</td>
<td>10:49</td>
<td>5.18</td>
<td>12:00</td>
<td>5.2</td>
<td>15:50</td>
<td>5.24</td>
<td>9:30</td>
</tr>
<tr>
<td>OW1</td>
<td>3.95</td>
<td>Sunny</td>
<td>Light rain in AM</td>
<td>13:00</td>
<td>3.95</td>
<td>10:52</td>
<td>4.85</td>
<td>11:33</td>
<td>4.85</td>
<td>16:05</td>
</tr>
<tr>
<td>Frac tank water depth (ft)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.30</td>
<td>11:41</td>
<td>0.38</td>
<td>16:22</td>
<td>0.32</td>
<td>9:10</td>
<td>0.70</td>
<td>15:50</td>
</tr>
<tr>
<td>Est'd volume in tank (gal.)</td>
<td>1475</td>
<td>1468</td>
<td>1458</td>
<td>1634</td>
<td>2222</td>
<td>2222</td>
<td>2222</td>
<td>2222</td>
<td>2222</td>
<td>2222</td>
</tr>
<tr>
<td>Measured Flow Rate (gpm)</td>
<td>0.8</td>
<td>0.8</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Measured Flow Rate (gpm) = measured with bucket and stopwatch
Approx. Avg. flow rate = flow rate based upon (Est'd volume in tank) / (number of minutes test has run)
Table 2
Analytical Results During Extraction Test

Privileged and Confidential
Attorney-Client Communication
Attorney Work Product
Prepared at Request of Counsel

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Date</th>
<th>Analysis</th>
<th>Result</th>
<th>Reporting Limit</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-INIT</td>
<td>8/15/2006</td>
<td>Total Suspended Solids</td>
<td>20</td>
<td>10</td>
<td>mg/l</td>
</tr>
<tr>
<td>PT-INIT</td>
<td>8/15/2006</td>
<td>Chromium</td>
<td>2550000</td>
<td>1400</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-INIT</td>
<td>8/15/2006</td>
<td>Chromium VI (7196A)</td>
<td>2300000</td>
<td>200000</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-INIT</td>
<td>8/15/2006</td>
<td>pH</td>
<td>12.26</td>
<td>-</td>
<td>SU</td>
</tr>
<tr>
<td>PT-21HR</td>
<td>8/16/2006</td>
<td>Total Suspended Solids</td>
<td>13</td>
<td>10</td>
<td>mg/l</td>
</tr>
<tr>
<td>PT-21HR</td>
<td>8/16/2006</td>
<td>Chromium</td>
<td>3470000</td>
<td>1600</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-21HR</td>
<td>8/16/2006</td>
<td>Chromium VI (7196A)</td>
<td>2860000</td>
<td>200000</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-21HR</td>
<td>8/16/2006</td>
<td>pH</td>
<td>12.00</td>
<td>-</td>
<td>SU</td>
</tr>
<tr>
<td>PT-41HR</td>
<td>8/17/2006</td>
<td>Total Suspended Solids</td>
<td>U</td>
<td>10</td>
<td>mg/l</td>
</tr>
<tr>
<td>PT-41HR</td>
<td>8/17/2006</td>
<td>Chromium</td>
<td>3540000</td>
<td>1600</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-41HR</td>
<td>8/17/2006</td>
<td>Chromium VI (7196A)</td>
<td>2990000</td>
<td>200000</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-41HR</td>
<td>8/17/2006</td>
<td>pH</td>
<td>12.02</td>
<td>-</td>
<td>SU</td>
</tr>
<tr>
<td>PT-72HR</td>
<td>8/18/2006</td>
<td>Total Suspended Solids</td>
<td>43</td>
<td>10</td>
<td>mg/l</td>
</tr>
<tr>
<td>PT-72HR</td>
<td>8/18/2006</td>
<td>Chromium</td>
<td>3320000</td>
<td>1500</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-72HR</td>
<td>8/18/2006</td>
<td>Chromium VI (7196A)</td>
<td>3640000</td>
<td>200000</td>
<td>ug/l</td>
</tr>
<tr>
<td>PT-72HR</td>
<td>8/18/2006</td>
<td>pH</td>
<td>11.95</td>
<td>-</td>
<td>SU</td>
</tr>
</tbody>
</table>

INIT - collected at initiation of pumping
21HR - collected after 21 hours of pumping
41HR - collected after 41 hours of pumping
72HR - collected after 72 hours of pumping (test terminus)
Table 3. Hydrogeologic Conceptual Model for 900 Garfield Avenue Slab IRM Area

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Surface Elevation:</td>
<td>15 ft amsl</td>
</tr>
<tr>
<td>Average groundwater elevation (late summer):</td>
<td>9 ft amsl</td>
</tr>
<tr>
<td>Average depth to water (late summer):</td>
<td>6 ft</td>
</tr>
<tr>
<td>Average groundwater elevation (early spring):</td>
<td>13 ft amsl</td>
</tr>
<tr>
<td>Average depth to water (early spring):</td>
<td>2 ft</td>
</tr>
<tr>
<td>Bottom of aquifer elevation (top of 2’ silty-clay unit):</td>
<td>-2 ft amsl</td>
</tr>
<tr>
<td>Aquifer thickness:</td>
<td>11 to 15 ft</td>
</tr>
<tr>
<td>Aquifer Hydraulic conductivity:</td>
<td>1.5 to 3 ft/d</td>
</tr>
<tr>
<td>Aquifer Specific Yield</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Amsl = above mean sea level

Table 4. WELFLO Modeling Assumptions for 900 Garfield Avenue Slab IRM Area

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer type</td>
<td>water table that is homogeneous and isotropic</td>
</tr>
<tr>
<td>Maximum excavation area open at any one time</td>
<td>20 ft x 30 ft</td>
</tr>
<tr>
<td>Target saturated zone dewatering interval (outside Morris Canal Area in late summer):</td>
<td>5 ft</td>
</tr>
<tr>
<td>Target saturated zone dewatering interval (outside Morris Canal Area in early spring):</td>
<td>10 ft</td>
</tr>
<tr>
<td>Target saturated zone dewatering interval (inside Morris Canal Area in late summer):</td>
<td>15 ft</td>
</tr>
<tr>
<td>Target saturated zone dewatering interval (inside Morris Canal Area in early spring):</td>
<td>20 ft</td>
</tr>
<tr>
<td>Starting aquifer thickness:</td>
<td>20 ft</td>
</tr>
<tr>
<td>Aquifer hydraulic conductivity:</td>
<td>1.5 to 3 ft/d</td>
</tr>
<tr>
<td>Aquifer specific yield</td>
<td>0.1</td>
</tr>
<tr>
<td>Wells for dewatering simulation</td>
<td>fully penetrate the designated aquifer thickness</td>
</tr>
<tr>
<td>Duration of dewatering period</td>
<td>Assumed 5-day construction work week to generate an average weekly dewatering rate</td>
</tr>
</tbody>
</table>
Table 5. WELFLO Model Input Parameters for 900 Garfield Avenue Slab IRM Area

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer type</td>
<td>water table</td>
</tr>
<tr>
<td>Well type</td>
<td>Fully penetrating wells with no wellbore storage</td>
</tr>
<tr>
<td>Number of simulation periods</td>
<td>1</td>
</tr>
<tr>
<td>Duration of simulation period</td>
<td>5 days</td>
</tr>
<tr>
<td># of grid columns</td>
<td>10</td>
</tr>
<tr>
<td># of grid rows</td>
<td>10</td>
</tr>
<tr>
<td>Grid spacing</td>
<td>10 ft</td>
</tr>
<tr>
<td>x-coordinate of upper left grid node</td>
<td>10</td>
</tr>
<tr>
<td>y-coordinate of upper left grid node</td>
<td>10</td>
</tr>
<tr>
<td># of production wells for simulation</td>
<td>12</td>
</tr>
<tr>
<td>Coordinates of production wells (3 rows of 4)</td>
<td>30, 40 - 60,40 then 30,50 – 60,50 then 30,60 – 60,60</td>
</tr>
<tr>
<td>Well discharge</td>
<td>Varies from 0.25 gpm to 1.8 gpm</td>
</tr>
<tr>
<td>Duration of pump operation during simulation</td>
<td>5 days</td>
</tr>
<tr>
<td>Well radius</td>
<td>0.3 ft</td>
</tr>
<tr>
<td># of observation wells</td>
<td>0</td>
</tr>
<tr>
<td>Aquifer transmissivity</td>
<td>224.4 gpd/ft for K = 1.5 ft/d</td>
</tr>
<tr>
<td></td>
<td>448.8 gpd/ft for K = 3.0 ft/d</td>
</tr>
<tr>
<td>Aquifer specific yield</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Note: Used screen capture program to capture output of drawdowns at each grid node.
ATTACHMENT 1

MODEL RESULTS AND WELFLO OUTPUT SCREENS
Table 6
PPG Garfield Avenue Site 114
Summary of Dewatering Calculations for 900 Garfield Avenue Slab IRM Area

<table>
<thead>
<tr>
<th>Excavation Dimensions</th>
<th>Season</th>
<th>Inside or Outside Morris Canal Area</th>
<th>Target Dewatering Interval (feet)</th>
<th>Average Dewatering Rate Over 5-Day Period*</th>
<th>Average Dewatering Rate Over 5-Day Period*</th>
</tr>
</thead>
<tbody>
<tr>
<td>20' x 30'</td>
<td>late summer</td>
<td>outside</td>
<td>5</td>
<td>3</td>
<td>4320</td>
</tr>
<tr>
<td>20' x 30'</td>
<td>early spring</td>
<td>outside</td>
<td>10</td>
<td>6</td>
<td>8640</td>
</tr>
<tr>
<td>20' x 30'</td>
<td>late summer</td>
<td>inside</td>
<td>15</td>
<td>9</td>
<td>12960</td>
</tr>
<tr>
<td>20' x 30'</td>
<td>early spring</td>
<td>inside</td>
<td>20</td>
<td>12</td>
<td>17280</td>
</tr>
</tbody>
</table>

Notes:
It is assumed that the initial water levels are 5 feet higher on average in early spring than in late summer.
* It is assumed that dewatering is continuous over a 5-day work week.
### Early Spring Scenario

- **K:** 3.0 FT/D
- **Excavation Size:** 20'x30'
- **Target Dewatering Level:** 10'
- **12 Wells Pumping:** 0.9 GPM Each
- **5-Day Pumping Duration**
- **Average Flow Rate Over 5-Day Period:** 15,552 GPD

**Simulation Period Duration in Days:** 5.000

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### Late Summer Scenario

- **K:** 3.0 FT/D
- **Excavation Size:** 20'x30'
- **Target Dewatering Level:** 5'
- **12 Wells Pumping:** 0.45 GPM Each
- **5-Day Pumping Duration**
- **Average Flow Rate Over 5-Day Period:** 7,776 GPD

**Simulation Period Duration in Days:** 5.000

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**WELFLO OUTPUT**

K = 3.0 FT/D

EXCAVATION SIZE = 20'X30'

LATE SUMMER SCENARIO

TARGET DEWATERING LEVEL = 15'

12 WELLS PUMPING 1.35 GPM EACH

5-DAY PUMPING DURATION

AVERAGE FLOW RATE OVER 5-DAY PERIOD = 23,328 GPD

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### Simulation Period Duration in Days: 5.000

#### Values of Drawdown or Recovery (ft) at Nodes:

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**WELFLO OUTPUT**

K = 3.0 FT/D

EXCAVATION SIZE = 20'X30'

EARLY SPRING SCENARIO

TARGET DEWATERING LEVEL = 20'

12 WELLS PUMPING 1.8 GPM EACH

5-DAY PUMPING DURATION

AVERAGE FLOW RATE OVER 5-DAY PERIOD = 31,104 GPD

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### Simulation Period Duration in Days: 5.000

#### Values of Drawdown or Recovery (ft) at Nodes:

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### WELFLO OUTPUT
**Excavation Size = 20' x 30'**

### Late Summer Scenario
- **Target Dewatering Level = 5'**
- **12 Wells Pumping 0.25 GPM Each**
- **5-Day Pumping Duration**
- **Average Flow Rate over 5-Day Period = 4,320 GPD**

---

#### Simulation Period Duration in Days: 5.000

#### Values of Drawdown or Recovery (ft) at Nodes:

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### WELFLO OUTPUT
**Excavation Size = 20' x 30'**

### Early Spring Scenario
- **Target Dewatering Level = 10'**
- **12 Wells Pumping 0.5 GPM Each**
- **5-Day Pumping Duration**
- **Average Flow Rate over 5-Day Period = 8,640 GPD**

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#### Simulation Period Duration in Days: 5.000

#### Values of Drawdown or Recovery (ft) at Nodes:

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### Late Summer Scenario

**WELFLO OUTPUT**

EXCAVATION SIZE = 20'x30'

K = 1.5 ft/d

TARGET DEWATERING LEVEL = 15'

12 WELLS PUMPING 0.75 GPM EACH

5-DAY PUMPING DURATION

AVERAGE FLOW RATE OVER 5-DAY PERIOD = 12,960 GPD

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### Early Spring Scenario

**WELFLO OUTPUT**

EXCAVATION SIZE = 20'x30'

K = 1.5 ft/d

TARGET DEWATERING LEVEL = 20'

12 WELLS PUMPING 1.0 GPM EACH

5-DAY PUMPING DURATION

AVERAGE FLOW RATE OVER 5-DAY PERIOD = 17,280 GPD

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ATTACHMENT 2

WELL ABANDONMENT REPORTS
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Supply - Bureau of Water Systems & Well Permitting

WELL ABANDONMENT REPORT

MAIL TO: Bureau of Water Systems & Well Permitting
PO Box 426
Trenton, NJ 08625-0426

PROPERTY OWNER: HAMPTON GROUP

ADDRESS: 16 MAPLE AVENUE, MEXICO STATION, NJ 07960

WELL LOCATION: GARRIGUS CARTERET AVE, JERSEY CITY, HUNSON CITY

Well No. 1
Lot No. 20204A
Block No. 20204A

USE OF WELL PRIOR TO ABANDONMENT: MONITORING

REASON FOR ABANDONMENT: NO LONGER REQUIRED

WAS A NEW WELL DRILLED? NO

PERMIT # OF NEW WELL

TOTAL DEPTH OF WELL: 40' DIA. 4''
CASING LENGTH: 40'
SCREEN LENGTH: 40'
NUMBER OF CASINGS: 1

MATERIAL USED TO DECOMMISSION WELL:

- Gallons of Water: 4.4
- Lbs. of Cement: 3.5
- Lbs. of Bentonite: (none if well is contaminated)
- Lbs. of Sand/Gravel: (none if well is contaminated)

FORMATION: Consolidated

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only acceptable method.

WAS CASING LEFT IN PLACE? NO

CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS LEFT IN WELL? NO

WHAT WERE THE OBSTRUCTIONS?

IF "YES", AUTHORIZATION GRANTED BY (NJDEP Official)

Was an alternative decommissioning method used and/or approval to decommission granted by a DEP official? YES NO

IF "YES", authorization granted by (NJDEP Official)

I certify that this well was sealed in accordance with 7ACR 799D-3 et seq.

SCOTT A. BERELA
Advanced Drilling, Inc.
3 COLT ROAD
PITSTOWN, NJ 08867

Performing Work (Print or Type)

Name of NJ Licensed Well Driller

Signature of NJ Licensed Well Driller Performing Work

COPIES: White - Water Allocation Yellow - Owner Pink - Health Dept. Goldenrod - Driller

DATE WELL SEALED: 6/4/07

WELL PERMIT # 2600080103

AS-BUILT WELL LOCATION

NJ STATE PLACE COORDINATE IN US SURVEY FEET

NORTHING: 4080836.47 EASTING: 311975.68

OR

LATITUDE: 40'47.67'N LONGITUDE: 074'08.12'W

Registration # 1375

Mailing Date: 7/10/07

Name of NJ Licensed Well Driller Performing Work

Signature of NJ Licensed Well Driller Performing Work
New Jersey Department of Environmental Protection  
Division of Water Supply - Bureau of Water Systems & Well Permitting

WELL ABANDONMENT REPORT

MAIL TO: Bureau of Water Systems & Well Permitting  
PO Box 426  
Trenton, NJ 08625-0426

PROPERTY OWNER: HAMPSHIRE GROUP  
ADDRESS: 15 MAPLE AVENUE  
MORRISVILLE, NJ 07960

WELL LOCATION:  
Street & No., Township, County  
Well No.  Lot No.  Block No.

USE OF WELL PRIOR TO ABANDONMENT: NO  
REASON FOR ABANDONMENT: MONITORING

WAS A NEW WELL DRILLED? ☐ YES ☐ NO  
PERMIT # OF NEW WELL:

TOTAL DEPTH OF WELL: 161'  
DIAMETER: 9.5"  
CASING LENGTH: 161'  
SCREEN LENGTH: 161'  
NUMBER OF CASINGS: 1

MATERIAL USED TO DECOMMISSION WELL:

- Gallons of Water: 4,875
- Lbs. of Cement: 1,950
- Lbs. of Bentonite: 1,400
- Lbs. of Sand/Gravel: (none if well is contaminated)

FORMATION: Consolidated ☐  
Unconsolidated ☑

Cross-section of sealed well

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

AS-BUILT WELL LOCATION  
(NAD 83 HORIZONTAL DATUM)  
NJ STATE PLACE COORDINATE IN US SURVEY FEET

NORTHING:  
EASTING:  
OR

LATITUDE:  
LONGITUDE:

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☐ YES ☐ NO  
CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS LEFT IN WELL? ☐ YES ☐ NO  
WHAT WERE THE OBSTRUCTIONS: N/A

IF "YES", AUTHORIZATION GRANTED BY ______________________ ON ______________________ (NJDEP Official)  
(Date)

Was an alternative decommissioning method used and/or approval to decommission granted by a DEP official? ☐ YES ☐ NO

IF "YES", authorization granted by ______________________ ON ______________________ (NJDEP Official)  
(Date)

I certify that this well was sealed in accordance with N.J.A.C. 7:9D:7-8  

Performing Work (Print or Type)  
Name of NJ Licensed Well Driller  
Address  
Signature of NJ Licensed Well Driller Performing Work

Copies: White - Water Allocation  Yellow - Owner  Pink - Health Dept.  Goldenrod - Driller

Signature  Registration #

PITTSTOWN, NJ 08867  
7-10-07
WELL ABANDONMENT REPORT

MAIL TO: Bureau of Water Systems & Well Permitting
PO Box 426
Trenton, NJ 08625-0426

PROPERTY OWNER: HAMPSHIRE GROUP

ADDRESS: 15 MAIZE AVENUE, MORRISVILLE, NJ 07960

WELL LOCATION: GARFIELD & CARPENTER AVE, JERSEY CITY, HUSETX CT

Well No. 1
Lot No. 5026A
Block No.

DATE WELL SEALED: 6-4-07

USE OF WELL PRIOR TO ABANDONMENT: MONITORING

REASON FOR ABANDONMENT: NO LONGER REQUIRED

WAS A NEW WELL DRILLED? NO

TOTAL DEPTH OF WELL: 18' 4"
DIAMETER:
CASING LENGTH: 13'
SCREEN LENGTH: 13'
NUMBER OF CASINGS:

MATERIAL USED TO DECOMMISSION WELL:
- Gallons of Water
- Lbs. of Cement
- Lbs. of Bentonite
- Lbs. of Sand & Gravel
(none if well is contaminated)

FORMATION: Consolidated

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? YES

CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS LEFT IN WELL? NO

WHAT WERE THE OBSTRUCTIONS: N/A

IF "YES", AUTHORIZATION GRANTED BY:
(NJDEP Official)
ON ________ (Date)
Was an alternative decommissioning method used and/or approval to decommission granted by a DEP official? YES NO

IF "YES", authorization granted by:
(NJDEP Official)
Performing Work (Print or Type):
Name of NJ Licensed Well Driller:
Signature of NJ Licensed Well Driller Performing Work:

COPIES:  White - Water Allocation  Yellow - Owner  Pink - Health Dept.  Goldenrod - Driller

7/10/07

7/13/07

ADVANCED DRILLING, INC.
POTT'S ALBRECHT
130 COLT ROAD
PITTS TOWN, NJ 08867

Address

Mailing Date

Registration 

7/10/07
WELL ABANDONMENT REPORT

MAIL TO: Bureau of Water Systems & Well Permitting
PO Box 426
Trenton, NJ 08625-0426

PROPERTY OWNER: HAMPSHIRE GROUP

ADDRESS: 19 MAPLE AVE., MORRISTOWN, NJ 07960

WELL LOCATION: 872-931 GARFIELD AVE., JERSEY CITY, HUDSON COUNTY

Well No. 124, Lot No. 2A, Block No. 202A-1

DATE WELL SEALED: 6-4-07

USE OF WELL PRIOR TO ABANDONMENT: MONITORING

REASON FOR ABANDONMENT: DO LONGER REQUIRED

WAS A NEW WELL DRILLED? □ YES □ NO

TOTAL DEPTH OF WELL: 110 ft.
DIAMETER: 4-1/2 in.
CASING LENGTH: 100 ft.
SCREEN LENGTH: 50 ft.
NUMBER OF CASINGS: 1

MATERIAL USED TO DECOMMISSION WELL:

- Gallons of Water: 47
- Lbs. of Cement: 265
- Lbs. of Bentonite: 65
- Lbs. of Sand/Gravel: (none if well is contaminated)

FORMATION: Consolidated

PERMIT # OF NEW WELL

Cross-section of sealed well

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

AS-BUILT WELL LOCATION
(NAD 83 HORIZONTAL DATUM)
NJ STATE PLACE COORDINATE IN US SURVEY FEET

NORTHING: ___________ OR EASTING: ___________

LATITUDE: ___ __’ __"" LONGITUDE: ___ __’ __"

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? □ YES □ NO

CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS LEFT IN WELL? □ YES □ NO

WHAT WERE THE OBSTRUCTIONS: LVA

IF "YES", AUTHORIZATION GRANTED BY _______________ ON _______________

(NJDEP Official) (Date)

Was an alternative decommissioning method used and/or approval to decommission granted by a DEP official? □ YES □ NO

IF "YES", authorization granted by _______________ ON _______________

(NJDEP Official) (Date)

Performing Work (Print or Type):

Name of NJ Licensed Well Driller:

Signature of NJ Licensed Well Driller Performing Work:

COPIES: White - Water Allocation Yellow - Owner Pink - Health Dept. Goldenrod - Driller

ADVANCED DRILLING, INC.
PITTSTOWN, NJ 08867
7-4-07
7-10-07
7-13-07

Registration #: 147086

147086
### Monitoring Well Construction Detail

<table>
<thead>
<tr>
<th>Depth from G.S. (feet)</th>
<th>Elevation(Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>16.18</td>
</tr>
</tbody>
</table>

**Datum:** Existing Site

**Top of Steel Guard Pipe**

**Top of Riser Pipe**

**Ground Surface (G.S.)**

**Riser Pipe:**
- **Length:** 3'
- **Inside Diameter (ID):** 4''
- **Type of Material:** PVC sch. 40

**Top of Sand Seal**

**Sand Seal Thickness:** 1'

**Top of Filter Sand**

**Top of Screen**

**Stabilized Water Level**

**Screen:**
- **Length:** 15' 40-slot
- **Type of Material:** PVC

**Type/Size of Sand:** #1

**Sand Pack Thickness:** 18''

**Bottom of Screen**

**Bottom of Tail Pipe:**

**Bottom of Borehole:**

**Borehole Diameter:** 12.25''

**Measured Point for Surveying & Water Levels**

**Cement, Bentonite, Bentonite Slurry, Grout, or Native Materials:**
- 100% Cement
- % Bentonite
- % Native Materials

**Describe Measuring Point:**

**Signature**

**Date**
MONITORING WELL CONSTRUCTION DETAIL

- **Top of Steel Guard Pipe**: Depth from G.S. (feet) 0, Datum: Existing Site 16.37
- **Top of Riser Pipe**: Depth from G.S. (feet) 0.0, Datum: Existing Site 15.88
- **Ground Surface (G.S.)**

**Riser Pipe:**
- **Length**: 11'
- **Inside Diameter (ID)**: 2'
- **Type of Material**: PVC sch 40

**Top of Sand Seal**: 9'
- **Sand Seal Thickness**: 1'
- **Top of Filter Sand**: 10'
- **Top of Screen**: 11'
- **Stabilized Water Level**: 4.5'

**Screen:**
- **Length**: 5'
- **Inside Diameter (ID)**: 2'
- **Slot Size**: 40-slox
- **Type of Material**: PVC
- **Type/Size of Sand**: #1
- **Sand Pack Thickness**: 6'

**Borehole Diameter**: 12.25'

Describe Measuring Point:

Top of riser pipe

Approved:

Signature

Date
MONITORING WELL CONSTRUCTION DETAIL

Measuring Point for Surveying & Water Levels

Top of Steel Guard Pipe

Depth from G.S. (feet)

0

Datum: Existing Site

16.34

Top of Riser Pipe

0.0

15.82

Ground Surface (G.S.)

0.0

Riser Pipe:

Length

11'

Inside Diameter (ID)

2'

Type of Material

PVC sch 40

100% Cement

% Bentonite

% Native Materials

Cement, Bentonite, Bentonite Slurry, Grout, or Native Materials

Top of Sand Seal

5'

Sand Seal Thickness

1'

Top of Filter Sand

10'

Top of Screen

11'

▲ Stabilized Water Level

4.5'

Screen:

Length

5'

Inside Diameter (ID)

2'

Slot Size

40-slot

Type of Material

PVC

Type/Size of Sand

#1

Sand Pack Thickness

6'

Borehole Diameter

12.25'

Bottom of Screen

16'

Bottom of Tail Pipe:

16'

Bottom of Borehole

16'

Describe Measuring Point:

Approved:

Top of riser pipe

Signature

Date
**Client:** PPG Industries  
**Site:** Site 114  
**BORING ID:** PW1

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<tr>
<th>Depth (ft)</th>
<th>Lithology</th>
<th>Description</th>
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<th>Sample ID</th>
<th>Sample Parameters</th>
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<tbody>
<tr>
<td>0</td>
<td>ASPHALT: ASPHALT</td>
<td>CONCRETE: CONCRETE, Crushed stone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td>0.0 ppm</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: Dark Brown (7.5YR 3/2) coarse SAND, some crushed Stone, dry. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td>0.0 ppm</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>FILL: Light Brownish Gray (10YR 6/2) rotted WOOD, some Cinders and coarse Sand, trace fine-medium Gravel and Silt, wet. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>FILL: Light Brownish Gray (10YR 6/2) rotted WOOD, some Cinders and coarse Sand, trace fine-medium Gravel and Silt, wet. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>FILL: Pale Green (5G 7/2) rotted WOOD, some</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:** Coordinates are provided in New Jersey State Plane NAD 1983 Feet.

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## BORING ID: PW1

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<tbody>
<tr>
<td>10</td>
<td>Cinders and coarse Sand, trace fine-medium Gravel and Silt, wet. FILL</td>
<td>FILL: No Recovery</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Dark Brown (10YR 3/3) fine SAND, some Silt, trace Clay, wet. FILL</td>
<td>FILL: No Recovery</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Dark Brown (10YR 3/3) fine SAND, some Silt, trace Clay, wet. FILL</td>
<td>FILL: No Recovery</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Dark Brown (10YR 3/3) fine-very fine SAND, some Silty Clay, wet to dry. FILL</td>
<td>FILL: No Recovery</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
</tr>
</tbody>
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<tbody>
<tr>
<td>18</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>PEAT: PEAT</td>
<td>69.2 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NULL: End of Boring at 20 ft.

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### BORING ID: OW1

**Client:** PPG Industries  
**Site:** Site 114  
**Start Date:** 8/10/2006  
**End Date:** 8/10/2006  
**Project:** Site Investigation  
**Coordinates:** X-611320.9, Y-683861.8  
**Elevation:** 15.88  
**Drill Subcontractor:** ADI  
**Depth of Boring:** 16.00  

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<tr>
<td>0</td>
<td>ASPHALT: ASPHALT</td>
<td>CONCRETE: CONCRETE, Crushed stone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: Very Dark Grayish Brown (10YR 3/2) coarse SAND and fine GRAVEL, some medium Sand, dry. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: Very Dusky Red (2.5YR 2.5/2) coarse SAND and fine GRAVEL, some glass and cinders, ~15% COPR, wet. FILL</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: Reddish Black (10R 2.5/1) SILTY CLAY, some fine-very fine Sand, trace Gass and Cinders, wet. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: Pale Olive (5Y 6/3) coarse-medium SAND, some Silt, trace Gravel, wet. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>FILL: Pale Olive (5Y 6/3) coarse-medium SAND, some Silt, trace Gravel, wet. FILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>FILL: Pale Yellow (5Y 7/3) medium-fine SAND, some</td>
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Silt, trace coarse Sand and Cinders, wet. FILL

FILL: Yellow (5Y 8/8) coarse-medium GRAVEL, some coarse Sand, trace Silt, wet. FILL

FILL: No Recovery

FILL: Yellow (5Y 8/8) coarse-medium GRAVEL, some coarse Sand, trace Silt, wet. FILL

FILL: Rotted WOOD

FILL: No Recovery

FILL: Dark Brown (7.5YR 3/2) fine-very fine SAND, some Silt, trace very fine Gravel, wet. FILL

FILL: No Recovery

NULL: End of Boring at 16 ft.

NOTES: Coordinates are provided in New Jersey State Plane NAD 1983 Feet.

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<tr>
<td>2</td>
<td>CONCRETE: CONCRETE, Crushed stone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>FILL: Dark Brown (7.5YR 3/2) coarse SAND, some crushed Stone, dry. FILL</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: Dark Brown (7.5YR 3/2) coarse SAND, some crushed Stone, dry. FILL</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>FILL: CONCRETE, Crushed stone</td>
<td></td>
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<tr>
<td>6</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8</td>
<td>FILL: Pale Green (5G 7/2) coarse-medium SAND, some fine Sand and Silt, trace very fine Gravel, wet. FILL</td>
<td>0.0 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>FILL: No Recovery</td>
<td></td>
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<tbody>
<tr>
<td>0.0 ppm</td>
<td></td>
<td>FILL: Olive Gray (5Y 4/2) CINDERS, some coarse Sand and Glass, wet. FILL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0 ppm</td>
<td></td>
<td>FILL: Olive (5Y 4/4) coarse-fine SAND, some Silt, trace very-fine Gravel and Clay, moist. FILL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0 ppm</td>
<td></td>
<td>FILL: Dark Yellowish Brown (10YR 3/4) SILTY SAND, some coarse Sand, wet. FILL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0 ppm</td>
<td></td>
<td>FILL: No Recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0 ppm</td>
<td></td>
<td>FILL: Dark Yellowish Brown (10YR 3/4) SILTY SAND, some coarse Sand, wet. FILL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>FILL: Rotted WOOD</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>NULL: End of Boring at 16 ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:** Coordinates are provided in New Jersey State Plane NAD 1983 Feet.

**THIS IS A PRELIMINARY DRAFT. IT HAS BEEN PREPARED BASED ON PRELIMINARY INFORMATION AND ON ASSUMPTIONS. NO ONE MAY RELY ON THIS DRAFT. IT IS SUBJECT TO CHANGE AS ADDITIONAL INFORMATION BECOMES AVAILABLE OR IS CLARIFIED.**
CERTIFICATION FORM B - LOCATION CERTIFICATION

Name of Owner: ________________________________
Name of Facility: __PPG INDUSTRIES (SITE 114)___
Location: Garfield Ave, Jersey City, NJ
NJDEP Incident number: _________________________ Permit number: _________________________

LAND SURVEYOR'S CERTIFICATION

Well Permit Number: __________________________
(This number must be permanently affixed to the well casing.)

Owner's Well Number (as shown on application or plans): OW-1

Geographic Coordinate NAD 83 (to nearest 1/10 of a second):

Longitude: West 74° 04' 12.07" Latitude: North 40° 42' 36.21"

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North: 683861.8 East 611320.9

Elevation of Top of Inner Casing (cap off) at reference mark (nearest 0.01') : 15.88' (Steel=16.37')

Source of elevation datum:
Existing site datum, as shown on entitled plan provided by client. Held PK-12 elevation 11.48'.

AUTHENTICATION:
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

______________________________
Professional Land Surveyor's Signature

September 18, 2006

Date

J. Peter Borbas, P.L.S., NJ License No. 24GSO3165300
Professional Land Surveyor's Name and License Number

402 Main Street, Boonton, NJ 07005 (973) 316-8743
Professional Land Surveyor's Address and Phone Number
CERTIFICATION FORM B - LOCATION CERTIFICATION

Name of Owner: __________________________
Name of Facility: PPG INDUSTRIES (SITE 114)
Location: Garfield Ave, Jersey City, NJ
NJDEP Incident number: __________________ Permit number: __________________

LAND SURVEYOR'S CERTIFICATION

Well Permit Number: ____________________
(This number must be permanently affixed to the well casing.)

Owner's Well Number (as shown on application or plans): OW-2

Geographic Coordinate NAD 83 (to nearest 1/10 of a second):

Longitude: West 74° 04' 12.20" Latitude: North 40° 42' 36.19"

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North: 683859.3 East 611310.5

Elevation of Top of Inner Casing (cap off) at reference mark (nearest 0.01'): 15.82'
(Steel=16.34')

Source of elevation datum:
Existing site datum, as shown on untitled plan provided by client. Held PK-12 elevation 11.48'.

AUTHENTICATION:
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

[Signature]
Professional Land Surveyor's Signature Date

September 18, 2006

J. Peter Borbas, P.L.S., NJ License No. 24GSO3165300
Professional Land Surveyor's Name and License Number

402 Main Street, Boonton, NJ 07005 (973) 316-8743
Professional Land Surveyor's Address and Phone Number
CERTIFICATION FORM B - LOCATION CERTIFICATION

Name of Owner: 
Name of Facility: PPG INDUSTRIES (SITE 114)
Location: Garfield Ave, Jersey City, NJ
NJDEP Incident number:
Permit number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number:
(This number must be permanently affixed to the well casing.)

Owner's Well Number (as shown on application or plans): PW-1

Geographic Coordinate NAD 83 (to nearest 1/10 of a second):

Longitude: West 74° 04' 12.10"
Latitude: North 40° 42' 36.16"

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North: 683856.4 East 611318.7

Elevation of Top of Inner Casing (cap off) at reference mark (nearest 0.01'): 15.82' (Steel=16.18')

Source of elevation datum:
Existing site datum, as shown on untitled plan provided by client. Held PK-12 elevation 11.48'.

AUTHENTICATION:
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

[Signature]
[Seal]
September 18, 2006

Professional Land Surveyor's Signature  Date

J. Peter Borbas, P.L.S., NJ License No. 24GS03165300
Professional Land Surveyor's Name and License Number

402 Main Street, Boonton, NJ 07005  (973) 316-8743
Professional Land Surveyor's Address and Phone Number
<table>
<thead>
<tr>
<th>DEPTH</th>
<th>SAMPLE NUMBER</th>
<th>BLOWS/&quot;N&quot; ON SAMPLE SPOON</th>
<th>&quot;N&quot; VALUE</th>
<th>LAYER ELEV.</th>
<th>DEPTH GRAPHIC LOG</th>
<th>SAMPLE DESCRIPTION AND CLASSIFICATION</th>
<th>DRILLING NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>1</td>
<td>5/6</td>
<td>11</td>
<td>2</td>
<td>2&quot; ASPHALT</td>
<td>Moist black/brown SAND, GRAVEL, CINDERS, GLASS, WOOD FILL</td>
<td></td>
</tr>
<tr>
<td>2-4</td>
<td>2</td>
<td>3/2/1/1/1</td>
<td>3</td>
<td>5</td>
<td>Wet black/grey fine to coarse SAND FILL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8</td>
<td>3</td>
<td>6/12</td>
<td>27</td>
<td>5-5.25</td>
<td>Wet grey/green fine to coarse SAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8</td>
<td>4</td>
<td>18/21, 15/17</td>
<td>44</td>
<td>5</td>
<td>Wet black/brown organic SILT (peat)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-10</td>
<td>5</td>
<td>5/4/6/5/5</td>
<td>9</td>
<td>10</td>
<td>Bottom complete &amp; 20 Feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-12</td>
<td>6</td>
<td>3/2/3/4</td>
<td>5</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-14</td>
<td>7</td>
<td>8/8, 10/10/14</td>
<td>18</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-16</td>
<td>8</td>
<td>3/4/8/5</td>
<td>10</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-18</td>
<td>9</td>
<td>3/4/5/6</td>
<td>9</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>10</td>
<td>3/2/3/3</td>
<td>5</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Soil Boring Cross-Reference: PW-1

Town and City: Jersey City
County and State: Hudson, New Jersey

Installation Date(s): 8-9-06

Drilling Method: Hollow Stem Augers
Driller: Roger Logel
Drilling Fluid: None

Static water level after drilling: 4.5 ft.
Well developed for: 6 hours at: 2 gpm
Method of development: Pump

Well Purpose: Monitoring

Remarks:

Prepared By: Roger Logel
Date Prepared: 6/30/06
## Advanced Drilling, Inc.

**Project:** PPG Industries Site 114  
**Client:** ENSR Corporation  
**Project No.:** ADV-1475  
**Hole Number:** ON-1

### Geographical Information

- **Municipality:** Jersey City  
- **County:** Hudson  
- **State:** New Jersey  
- **Coordinates:** 26° 23.295"
- **Well Permit No.:** 2600080103

### Drilling Details

- **Start Date:** 8-10-06  
- **Completion Date:** 8-10-06  
- **Driller:** Roger L. Gei  
- **Driller License No.:** M-1868  
- **Boring Dia.:** 12.25"  
- **Total Depth:** 16 Feet  
- **Lot:** 1  
- **Block:** 2026A  
- **Drilling Method:** Hollow Stem Augers  
- **Sample Type:** Split Spoon  
- **Depth of Groundwater:** 4.5 Feet

### Protective Casing

- **Flush:**

### Notes

- **Drilling Notes:**
  - Water levels, water return, character of drilling, etc.

### Drilling Log

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample Number</th>
<th>B/W On Sample Spoon</th>
<th>N Value</th>
<th>Layer Elev. Depth</th>
<th>Graphic Log</th>
<th>Description and Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>1</td>
<td>1/1</td>
<td>1</td>
<td>0.8</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>2&quot; Asphalt + 6&quot; Crushed Stone</td>
</tr>
<tr>
<td>2-4</td>
<td>2</td>
<td>1/4/5/5</td>
<td>0</td>
<td>5</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>Moist Black/brown fine to medium Sand &amp; Gravel (Fill)</td>
</tr>
<tr>
<td>4-6</td>
<td>3</td>
<td>2/2/3/4</td>
<td>5</td>
<td>6.0</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>Wet Brown/grey fine to coarse Sand, Gravel &amp; Wood (Fill)</td>
</tr>
<tr>
<td>6-8</td>
<td>4</td>
<td>2/3/5/4</td>
<td>8</td>
<td>8.0</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>Wet Grey/green fine to coarse Sand</td>
</tr>
<tr>
<td>8-10</td>
<td>6</td>
<td>2/3/8/9</td>
<td>11</td>
<td>10.0</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>Wet Grey Silty &amp; Fine Sand</td>
</tr>
<tr>
<td>10-12</td>
<td>6</td>
<td>5/7/12/12</td>
<td>12</td>
<td>16.0</td>
<td>Bottom complete at 16 Feet</td>
<td></td>
</tr>
<tr>
<td>12-14</td>
<td>7</td>
<td>5/7/12/12</td>
<td>12</td>
<td>16.0</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>Bottom complete at 16 Feet</td>
</tr>
<tr>
<td>14-16</td>
<td>8</td>
<td>5/6/6/5</td>
<td>12</td>
<td>16.0</td>
<td><img src="image" alt="Graphic Log" /></td>
<td>Bottom complete at 16 Feet</td>
</tr>
</tbody>
</table>
Soil Boring Cross-Reference **ON-1**

**Location**
- **Town and City**: Jersey City
- **County and State**: Hudson, New Jersey
- **Installation Date (s)**: 8-10-06
- **Drilling Method**: Hollow Stem Augers
- **Driller**: Roger Logel
- **Drilling Fluid**: None
- **Static water level after drilling**: 4.5 ft.
- **Well developed for**: 15 hours at 1 gpm
- **Method of development**: Pump
- **Well Purpose**: Piezometer
- **Remarks**: Water green/cloudy/silty to green

**Sample Type**: Split Spoon

**Protective Casing**: Flush

**Flush protective casing**
- Chime Cap

**Concrete**
- Depth: 18.0 ft.

**Cement Grout Seal**

**2" Schedule 40 Blank PVC Riser Pipe**

**2" Schedule 40 Slotted (10 slot) PVC Well Screen**

**#00 Sand Seal**

**#1 Filter Sand**

**Bottom of Well & Bottom of Boring**: 16.0 ft.
# Soil Test Results

## Advanced Drilling, Inc.

### Project Information
- **Project:** PPG Industries Site 114
- **Client:** ENSR Corporation
- **Project No.:** ADV-1475
- **Hole Number:** OW-2

### Geographical Details
- **Municipality:** Jersey City
- **County:** Hudson
- **State:** New Jersey
- **Coordinates:** 26° 23' 28.6"
- **WELL PERMIT NO.:** 2600080104

### Drilling Details
- **Start Date:** 8-10-06
- **Completion Date:** 8-10-06
- **Driller:** Roger Logel
- **Driller License No.:** M 1166
- **Boring Dia.:** 12.25
- **Total Depth:** 46 Feet
- **Lot:** 1
- **Block:** 2026A
- **Drilling Method:** Hollow Stem Augers
- **Sample Type:** Split Spoon
- **Depth of Groundwater:** 6 Feet

### Protective Casing
- **Flush:**

### Notes
- **Sheet:** 1 of 1

### Table: Soil Test Results

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample Number</th>
<th>Blows/6&quot; on Sample Spoon</th>
<th>&quot;N&quot; Value</th>
<th>Layer Elev. Depth</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>1</td>
<td>7/8</td>
<td>15</td>
<td>1.8</td>
<td>2&quot; ASPHALT + 7&quot; CRUSHED STONE</td>
</tr>
<tr>
<td>2-4</td>
<td>2</td>
<td>12/35</td>
<td>SPOON</td>
<td>3.5</td>
<td>CONCRETE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100/4</td>
<td>REFUSAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-7</td>
<td>3</td>
<td>100/5</td>
<td>SPOON</td>
<td>5.0</td>
<td>Wet green/grey fine to coarse SAND</td>
</tr>
<tr>
<td>7-9</td>
<td>4</td>
<td>1/1/2/1</td>
<td>REFUSAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-11</td>
<td>5</td>
<td>3/4/3/3</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-13</td>
<td>6</td>
<td>2/3/3/2</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-15</td>
<td>7</td>
<td>17/17</td>
<td>23/34</td>
<td>40</td>
<td>Wet green fine SAND, traces of wood</td>
</tr>
<tr>
<td>15-18</td>
<td>8</td>
<td>21/32</td>
<td>53</td>
<td>16.0</td>
<td>Bottom complete @ 16 Feet</td>
</tr>
</tbody>
</table>

### Drilling Notes
- Water levels, water return, character of drilling, etc.
Soil Boring Cross-Reference OW-2
Town and City Jersey City
County and State Hudson, New Jersey
Installation Date(s) 8-10-06

Drilling Method: Hollow Stem Augers
Driller: Roger Logel
Drilling Fluid: None

Static water level after drilling 4.5 ft.
Well developed for 15 hours at 1 gpm
Method of development: Pump

Well Purpose: Fissometer

Remarks: Water green/cloudy/silty to green

Prepared By: Roger Logel
Date Prepared: 8/30/06
New Jersey Department of Environmental Protection
Bureau of Water Systems and Well Permitting

MONITORING WELL RECORD

OWNER IDENTIFICATION
HAMPShire GROUP

Address 15 MAPLE AVE
City Morristown
State New Jersey
Zip Code 07960

WELL LOCATION - If not the same as owner please give address
Owner’s Well No. PW-1
County Hudson
Municipality Jersey City
Lot No. 1
Block No. 2026A
Address GARFIELD & CARTERET AVES PPG GARFIELD AVE.

WELL USE Monitoring

DATE WELL STARTED 8/9/06
DATE WELL COMPLETED 8/9/06

WELL CONSTRUCTION
Total Depth Drilled 20 ft.
Finished Well Depth 18 ft.

Borehole Diameter:
Top 12.25 in.
Bottom 12.25 in.

Well was finished: [ ] above grade
[ ] flush mounted

if finished above grade, casing height (stick up) above land surface __________ ft.

Steel protective casing installed?
[ ] Yes   [ ] No

Static Water Level after drilling 4.5 ft.

Water Level was Measured Using TAPE

Well was developed for __________ hours at __________ gpm

Method of development __________

Pump Capacity __________ gpm

Pump Type __________

Drilling Fluid __________

Type of Rig __________

Health and Safety Plan Submitted? [ ] Yes   [ ] No

Level of Protection used on site (circle one)
[ ] None [ ] C [ ] B [ ] A

I certify that I have constructed the above referenced well in accordance with all well permit requirements and applicable State rules and regulations.

Drilling Company ADVANCED DRILLING INC

Well Driller (Print) ROGien LOGE

Driller’s Signature __________

registration No. 11166 Date 8/9/06

Note: Measure all depths from land surface

<table>
<thead>
<tr>
<th>Depth to</th>
<th>Depth to</th>
<th>Diameter</th>
<th>Material</th>
<th>Wgt./Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top (ft.)</td>
<td>Bottom (ft.)</td>
<td>(inches)</td>
<td></td>
<td>(lbs/sq ft.)</td>
</tr>
<tr>
<td>Single/Inner Casing</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>PVC</td>
</tr>
<tr>
<td>Middle Casing (for triple cased wells only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outer Casing (largest diameter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Hole or Screen (No. Used 10)</td>
<td>3</td>
<td>18</td>
<td>4</td>
<td>PVC</td>
</tr>
<tr>
<td>Blank Casings (No. Used )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Piece</td>
<td>2</td>
<td>20</td>
<td></td>
<td>Sand</td>
</tr>
<tr>
<td>Gravel Pack</td>
<td>1</td>
<td>2</td>
<td></td>
<td>100% Sand</td>
</tr>
<tr>
<td>Grout</td>
<td>0</td>
<td>1</td>
<td></td>
<td>Neat Cement Bentonite</td>
</tr>
</tbody>
</table>

Grouting Method Trench
Drilling Method Trench

GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations

1'- Aquifer

2'- 5' - Muck Sand, Gravel, Under, Skirt, Wood - Fill

3'-18' - Wet F-C Sand

18'-20' - Wet Organic Silt

AS-BUILT WELL LOCATION

(NAD 83 HORIZONTAL DATUM)

NJ STATE PLANE COORDINATE IN US SURVEY FEET

NORTHING: __________   EASTING: __________

OR

LATITUDE: __________   LONGITUDE: __________
**New Jersey Department of Environmental Protection**  
**Bureau of Water Systems and Well Permitting**  
**MONITORING WELL RECORD**

**OWNER IDENTIFICATION**  
**HAMPSHIRE GROUP**

**Address**  
15 MAPLE AVE.

**City**  
Morristown

**State**  
New Jersey

**Zip Code**  
07960

**WELL LOCATION**  
If not the same as owner please give address

**County**  
Hudson

**Municipality**  
Jersey City

**Owner’s Well No.**  
OW-1

**Lot No.**  
1

**Block No.**  
2026A

**Address**  
GARFIELD & CARTERET AVES PPG GARFIELD AVE.

**WELL USE**  
Piezometer

**DATE WELL STARTED**  
8/10/06

**DATE WELL COMPLETED**  
8/10/06

### WELL CONSTRUCTION

- **Total Depth Drilled**  
16 ft.

- **Finished Well Depth**  
16 ft.

- **Borehole Diameter:**
  - Top  
  12.25 in.
  - Bottom  
  12.25 in.

- **Well was finished:**
  - [ ] above grade
  - [ ] flush mounted

- **Steel protective casing installed?**
  - [ ] Yes
  - [ ] No

- **Static Water Level after drilling**  
40.5 ft.

- **Water Level was Measured Using**  
TAPE

- **Well was developed for**  
1.5 hours

- **at**  
1 gpm

- **Method of development:**  
Pump

- **Pump Capacity**
  - [ ] Apt

- **Drilling Fluid**
  - [ ] Nude

- **Type of Rig**
  - [ ] Manual

- **Health and Safety Plan Submitted?**
  - [ ] Yes

- **Level of Protection used on site (circle one)**
  - [ ] None
  - [ ] C
  - [ ] B
  - [ ] A

---

### GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations

- **2'--4' - Gravel + 6' - Stone**
- **8'-10'-- Wet F-C Sand + Gravel**
- **6'-8'-- Wet F-C Sand**
- **10'-16'-- Wet Silt & F-Sand**

---

### AS-BUILT WELL LOCATION

(NAD 83 HORIZONTAL DATUM)

- **NJ STATE PLANE COORDINATE IN US SURVEY FEET**
  - NORTHING:_________  
  - EASTING:_________

  OR

  - LATITUDE:___°___'___"  
  - LONGITUDE:___°___'___"
**New Jersey Department of Environmental Protection**  
Bureau of Water Systems and Well Permitting

**MONITORING WELL RECORD**

**OWNER IDENTIFICATION**  
HAMPshire group

**Address**  
15 Maple Ave.

**City**  
Morristown

**State**  
New Jersey

**Zip Code**  
07960

**WELL LOCATION**  
If not the same as owner please give address

**Owner's Well No.**  
DW-2

**County**  
Hudson

**Municipality**  
Jersey City

**Lot No.**  
1

**Block No.**  
2026 A

**Address**  
Garfield & Carteret Aves PPG Garfield Ave.

**WELL USE**  
Piezometer

**DATE WELL STARTED**  
08/10/06

**DATE WELL COMPLETED**  
08/10/06

---

**WELL CONSTRUCTION**

<table>
<thead>
<tr>
<th>Total Depth Drilled</th>
<th>ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

**Finished Well Depth**  
16 ft.

**Borehole Diameter**

<table>
<thead>
<tr>
<th>Top</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.25</td>
<td>12.25</td>
</tr>
</tbody>
</table>

**Well was finished:**
- □ above grade
- □ flush mounted

**Well was developed for:**  
1.5 hours

**Static Water Level after drilling**  
41.5 ft.

**Water Level was Measured Using**  
TAPE

**Method of development**  
Pump

**Pump Capacity**  
gpm

**Drilling Fluid**  
Type of Rig  
Tilerry

**Health and Safety Plan Submitted?**  
No

**Level of Protection used on site (circle one):**  
None (D C B A)

---

**Note:** Measure all depths from land surface

<table>
<thead>
<tr>
<th>Depth to Top (ft.)</th>
<th>Depth to Bottom (ft.)</th>
<th>Diameter (inches)</th>
<th>Material</th>
<th>Wgt./Rating (lbs/sch no.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single/Inner Casing</td>
<td>0</td>
<td>11</td>
<td>PVC</td>
<td>40</td>
</tr>
<tr>
<td>Middle Casing</td>
<td>11</td>
<td>16</td>
<td>PVC</td>
<td>40</td>
</tr>
<tr>
<td>Outer Casing</td>
<td>16</td>
<td>2</td>
<td>PVC</td>
<td>40</td>
</tr>
<tr>
<td>Open Hole Screen</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank Casings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top Plug</td>
<td>10</td>
<td>16</td>
<td>#1 Sand</td>
<td></td>
</tr>
<tr>
<td>Gravel Pack</td>
<td>9</td>
<td>10</td>
<td>#00 Sand</td>
<td></td>
</tr>
<tr>
<td>Grout</td>
<td>0</td>
<td>9</td>
<td>Neat Cement</td>
<td></td>
</tr>
</tbody>
</table>

**Grouting Method**  
[Signature]

**Drilling Method**  
[Signature]

---

**GEOLOGIC LOG**

Note each depth where water was encountered in consolidated formations.

\[2'-4" Asphalt + 7' Stone\]

\[9'-3.5'- Hort F - M Sand\]

\[Wood, Wood, Conifer\]

\[3.5' - Concrete\]

\[5'-13' - Wet F - M Sand\]

\[13'-16' - Wet F - M Sand, + 6 ft. above\]

---

**AS-BUILT WELL LOCATION**

(NAD 83 HORIZONTAL DATUM)

**NJ STATE PLANE COORDINATE IN US SURVEY FEET**

NORTHING: _______  EASTING: _______

OR

LATITUDE: __° __' __"  LONGITUDE: __° __' __"

---

**Drilling Company**  
ADVANCED DRILLING INC

**Well Driller (Print)**  
[Signature]

**Driller's Signature**  
[Signature]

**Registration No.**  
M116C

**Date**  
08/30/06

---

**ORIGINAL: DEP**  
**COPIES: DRILLER**  
**OWNER**  
**HEALTH DEPARTMENT**
Mail To:
NJDEP
BUREAU OF WATER ALLOCATION
PO BOX 426
TRENTON, NJ 08625-0426

Owner
THE HAMPSHIRE GROUP
Address
15 MAPLE AVE
MORENO, NJ 07960

Name of Facility
PG GARFIELD AVE
Address
JENSEN CYN, GARFIELD, NJ

Driller
ADVANCED DRILLING INC
Address
3 ONSLAUGHT, NJ 08867

LOCATION OF WELL(S)

Lot # 1 Block # 3
Municipality GARFIELD
County Passaic

State Atlas Map No. 2.0

PROPOSED WELL LOCATION (NAD 83 HORIZONTAL DATUM)
NJ STATE PLANE COORDINATE IN US SURVEY FEET

NORTHING: -
EASTING: -
OR
LATITUDE: 
LONGITUDE: 

FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY
THE APPLICANT PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

☐ RCRA Site
☐ Split Site
☐ Underground Storage Tank Site
☐ ISRA Site
☐ Operational Ground Water Permit Site
☐ CERCLA (Superfund) Site
☐ Pretreatment and Residuals Site
☐ Water and Hazardous Waste Enforcement Case
☐ Other (explain) ACG

CASE I.D. Number

FOR D.E.P. USE
☐ Issuance of this permit is subject to the conditions attached. (see next page)
☐ For monitoring purposes only

Date 7/12/2020
Signature of Driller
Signature of Property Owner

COPYIES: Water Allocation - White  Health Dept. - Yellow  Owner - Blue  Driller - White

This Space for Approval Stamping

WELL PERMIT APPROVED
N.J. D.E.P.
JUL 25 2006

BUREAU OF WATER SYSTEMS & WELL PERMITTING
MONITORING WELL PERMIT

VALID ONLY AFTER APPROVAL BY THE D.E.P.

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON, NJ

Mail To:
NJDEP
BUREAU OF WATER ALLOCATION
PO BOX 426
TRENTON, NJ 08625-0426

Owner: THE HAMPSHIRE GROUP
Address: 15 MAPLE AVE

MORRIS COUNTY, NJ 07960

Driller: ADVANCED DRILLING INC
Address: 3 COLT RD

PITTSBURGH, PA 08847

COORD #:

Lot # 1
Block # 0020A
Municipality JERSEY CITY
County HUDSON

State Atlas Map No. 260

Name of Facility PPG GARFIELD AVE
Address GARFIELD (CAIERT I). AVE

JERSEY CITY, NJ 07306

Diameter Proposed
of Wells) 1"
Depth of Wells) 20 Feet

Diameter Proposed
of Wells) 1"
Depth of Wells) 20 Feet

Diameter Proposed
of Wells) 1"
Depth of Wells) 20 Feet

Diameter Proposed
of Wells) 1"
Depth of Wells) 20 Feet

LOCATION OF WELL(S)

Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.

PROPOSED WELL LOCATION (NAD 83 HORIZONTAL DATUM)
NJ STATE PLANE COORDINATE IN US SURVEY FEET

NORTHING: 0000000
EASTING: 0000000

LATITUDE: 0000000
LONGITUDE: 0000000

FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT: PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

☐ RCRA Site
☐ Underground Storage Tank Site
☐ Operational Ground Water Permit Site
☐ Pretreatment and Residuals Site
☐ Water and Hazardous Waste Enforcement Case
☐ Water Supply Aquifer Test Observation Well
☐ Other (explain), AC W

☐ Spill Site
☐ ISRA Site
☐ CERCLA (Superfund) Site

CASE ID Number

FOR D.E.P. USE

☐ Issuance of this permit is subject to the conditions attached. (see next page)
☐ For monitoring purposes only

Signature of Driller

Date 7-17-06

Signature of Property Owner

Registration No. 11598

COPIES: Water Allocation - White Health Dept. - Yellow Owner - Blue Driller - White

WELL PERMIT APPROVED
N.J., D.E.P.

JUL 25 2006

BUREAU OF WATER SYSTEMS & WELL PERMITTING