

LONG TERM MONITORING PLAN

STUDY AREA 5
NJDEP SITE 079 ROUTE 440 VEHICLE CORP.
SITE 153 SOUTH (UPPER & LOWER SEGMENTS),
FORMER MORRIS CANAL

JERSEY CITY, NEW JERSEY

Prepared for

Honeywell

101 Columbia Road
Morristown, New Jersey 07962

Prepared by



AMEC Environment & Infrastructure, Inc.
200 American Metro Boulevard, Suite 113
Hamilton, New Jersey 08619

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

Honeywell has prepared this Long Term Monitoring Plan (LTMP) for Study Area 5 (SA-5), New Jersey Department of Environmental Protection (NJDEP) Site 079 Route 440 Vehicle Corporation and Site 153 South (Lower & Upper Segments), Former Morris Canal, Jersey City, Hudson County, New Jersey, to satisfy the requirements of the “Consent Decree Regarding Sites 79 and 153 South” (Consent Decree) paragraphs 78, 79, 80 and 81.

Honeywell has conducted environmental investigations and/or remediation activities at Sites 079 and 153 South, which are part of the sites referred to by the NJDEP as the Hudson County Chromium Sites. This work is being conducted in accordance with the Administrative Consent Order (ACO) between Honeywell (formerly Allied Signal, Inc.) and the NJDEP dated June 17, 1993 as modified by the Consent Judgment between Honeywell and the NJDEP dated 9/7/2011, the New Jersey Technical Requirements for Site Remediation (TRSR) (N.J.A.C. 7:26E), NJDEP’s Chromium Policy Directive, and the Consent Decree Regarding Sites 79 and 153 South (Consent Decree) between the Bayonne Municipal Utilities Authority (BMUA), Hackensack Riverkeeper Inc. (Riverkeeper), Robert G. Ciasulli (Ciasulli) and Honeywell dated January 21, 2010. [The Riverkeeper, Honeywell, BMUA and Ciasulli are referred to as the “Parties” as designated under the Consent Decree].

According to the terms of the Consent Decree, *“Honeywell shall be responsible for implementing, monitoring, maintaining, repairing, and replacing the Site 079 Ciasulli Property and Site 153 South Chromium Remedies until an Unrestricted Use No Further Action Determination is issued for the respective site pursuant to the terms of this Consent Decree. Honeywell shall satisfy this responsibility through establishment and implementation of a Long Term Monitoring Plan.”*

The objectives of the LTMP are as follows:

- Provide monitoring to document that the integrity and effectiveness of the Chromium Remedies are maintained; and

- Provide monitoring to document that the restrictions of the institutional controls are being satisfied, including the deed notices for the sites.

1.2 DOCUMENT ORGANIZATION

This document was prepared in accordance with the requirements specified in the Consent Decree, the NJDEP TRSR and applicable provisions of the EPA Comprehensive Five-Year Review Guidance (Office of Solid Waste & Emergency Response [OSWER] Directive 9355.7-03B-P, dated June 2001), and contains the following sections:

Section 1: Introduction. This section describes the document purpose, scope, and organization.

Section 2: Site Background. This section provides site background information including location, contaminants of concern and remedial action work implemented.

Section 3: Monitoring Plan. This section provides details of the monitoring program and contingency plan.

Section 4: Reporting. This section describes the annual monitoring and biennial certification reporting requirements.

Section 5: Honeywell Program Organization. This section describes Honeywell's program organization for the monitoring program.

Section 6: References. This section lists references used in preparing this document.

Section 7 - List of Acronyms/Abbreviations. This section includes a list of commonly referenced acronyms found throughout this document.

2.0 SITE BACKGROUND

This section presents background information for Sites 079 and 153 South.

2.1 SITE DESCRIPTION

2.1.1 Site 079

Site 079 (Route 440 Vehicle Corp.) is located at 540 Route 440 in Jersey City, New Jersey. Site 079 is occupied by a Honda automobile dealership and vehicle storage lot and encompasses approximately three acres between Carbon Place and Fisk Street and is designated as Block 1291, Lot 76 (the subject of this document) and Lot 1F on the City of Jersey City tax map. Lot 76 contains the main car dealership facility, front parking lot area between Route 440 and the car dealership building and rear parking lot area between the building and Mortorano Way. Lot 1F consists of a vehicle storage lot on the east side of Mortorano Way. Most of the ground surface is covered with building structures and asphalt pavement. A few small grassy areas are present near the perimeter of Site 079 along the sidewalk and curb. The current use of the property as a car dealership is expected to continue for the foreseeable future. This LTMP applies to the front parking lot area between the car dealership building and Route 440. A site location map is included as **Figure 1**. A map showing site features, boundaries and restricted area for Site 079 is included as **Figure 2**.

2.1.2 Site 153 South

Site 153 South, a part of the Former Morris Canal, consists of a narrow strip of land located along the northbound lane of Route 440 between Carbon Place and Danforth Avenue (see **Figure 1**). Site 153 is designated as Block 1289.5, Lot E on the City of Jersey City tax map and contains a 36-inch sewer line owned and operated by the BMUA. In 1990, the City of Bayonne excavated a section of the former Morris Canal, installed a sewer pipeline, and backfilled the excavation with fill. No buildings are present on Site 153. Utilities along the length of Site 153 include overhead electrical lines, storm and sanitary sewer lines, and multiple gas and water lines that provide service to the adjacent commercial and industrial sites. According to the BMUA, the depth of the sewer line ranges from approximately 4 to 14 feet below ground surface (bgs).

For operational purposes Site 153 is divided into three segments (from north to south):

- Site 153 North Segment extends from Carbon Place to the northern property limit of Home Depot.
- Site 153 South Upper Segment is located along the frontage of Home Depot, and includes part of the NJDOT Right of Way between the parcel proper and Route 440.
- Site 153 South Lower Segment extends from the southern property limit of Home Depot to Danforth Avenue.

This document addresses Site 153 South (Lower and Upper Segments). A separate LTMP has been prepared for Site 153 North in accordance with the requirements of the Consent Decree Regarding Remediation of the New Jersey City University (NJCU) Redevelopment Area.

2.1.2.1 Site 153 South Upper Segment

Site 153 South Upper Segment (Upper Segment) encompasses a 955 feet long by nominal 24 feet wide area along Route 440 and is located along the frontage of Home Depot. The Upper Segment begins at the northern property limit of the former Garfield Home Furnishings (Eden Wood Realty Property), and ends at the northern property limit of Home Depot. The defined area includes the north and south entrances to Home Depot, vegetated areas south of the southern entrance to Home Depot and north of the northern entrance to Home Depot, an asphalt shoulder and vegetative soil bank with trees across the center, and an island landscaped with mulch and evergreens in the middle of the southern entrance. Minor extensions to the Upper Segment include the New Jersey Department of Transportation right-of-way (NJDOT ROW) shoulder between this parcel and Route 440. A map showing site features, boundaries and interim remedial measures is included as **Figure 3**.

2.1.2.2 Site 153 South Lower Segment

Site 153 South Lower Segment (Lower Segment) consists of a nominal 24 feet wide by 1,150 feet long area from Danforth Avenue to the northern property limit of Langer Transport, and a nominal 24 feet wide by 425 feet long area from the Langer Transport northern property limit to the southern property limit of Home Depot. A

map showing site features, boundaries and interim remedial measures is included as **Figure 4**.

2.2 CONTAMINANTS OF CONCERN

2.2.1 Site 079 Data

2.2.1.1 Soil

For the purposes of this LTMP, and as provided in NJDEP work plan documents, the contaminant of concern for Site 079 is hexavalent chromium (Cr[VI]).

Remedial investigation (RI) results indicate that shallow fill soils on portions of Site 079 contain low-levels of Cr(VI) above the current NJDEP soil cleanup criterion of 20 milligrams per kilogram (mg/kg). In addition, results show that soils contain zones of low concentrations of Cr(VI), generally less than 240 mg/kg, with some areas ranging from several hundred mg/kg to the highest concentration of about 1,770 mg/kg.

Data for Site 079 also indicate that low levels of non-chromium contaminants are present in shallow fill soils, including PAHs and metals (i.e., arsenic, lead, mercury). Some of these historic fill contaminants are above the NJDEP soil cleanup criteria.

2.2.1.2 Groundwater

Historical data, as well as data collected during 2009, confirm that groundwater in Site 079 is not impacted above the NJDEP groundwater quality standards (GWQS) for total chromium (70 micrograms per liter [$\mu\text{g/L}$]). Historic sampling indicates that volatile and/or semi-volatile contaminants are not present in groundwater above the GWQS.

2.2.2 Site 153 South Data

2.2.2.1 Soil

RI soil sample results indicate that Cr(VI) was detected above 20 mg/kg at the majority of sample locations. The highest concentrations (up to approximately 10,000 mg/kg) were detected within Site 153 South Upper Segment (portion adjacent to Home Depot). Lower concentrations were detected within Site 153 South Lower Segment (generally less than 1,000 mg/kg).

2.2.2.2 Groundwater

There are two shallow wells (153-MW-A13 and 153-MW-A15) located within Site 153 South. Historical data indicate that chromium concentrations in the groundwater have been detected at levels above the NJDEP GWQS for total chromium. Data for the southernmost well (153-MW-A15) located within the portion of Site 153 South Lower Segment (next to Langer Transport Property) indicate that chromium concentrations meet the NJDEP GWQS.

2.3 CURRENT AND FUTURE LAND USE

2.3.1 Site 079

Site 079 is owned by Robert G. Ciasulli and is currently occupied by a Honda automobile dealership facility. The current use of the property is expected to continue for the foreseeable future.

2.3.2 Site 153 South

Site 153 South contains a 36-inch sewer line owned and operated by the BMUA. Honeywell purchased the property comprising Site 153 in August 2007. The use of Site 153 South is not expected to change in the foreseeable future.

2.4 REMEDIAL ACTIONS IMPLEMENTED TO DATE

2.4.1 Site 079 Remedy

The following remedial actions were completed at Site 079:

- In-situ chemical reduction treatment of soils impacted by Cr(VI) in the area between Route 440 and the car dealership building. No treatment occurred in the vicinity of the 138KV subsurface power transmission line, to avoid damage to the line bedding;
- Milling of existing asphalt pavement and repaving of the entire area between Route 440 and the dealership building, following the chemical reduction treatment;
- Excavation and offsite disposal of soils containing hexavalent chromium above the current NJDEP soil cleanup criterion of 20 mg/kg at the corner of Fisk Street and Mortorano Way; and
- Backfilling and restoration of the excavated areas.

The work was completed in accordance with the Remedial Action Work Plan (RAWP) approved by NJDEP in its letter dated September 30, 2009. Subsequently, Honeywell submitted a “Discharge to Groundwater Permit Request and In-Situ Chemical Reduction (ISCR) Injection Treatment Program (ITP) Field Implementation Work Plan” (DGW WP) dated July 2010 which was approved by the NJDEP on July 28, 2010. NJDEP approvals of these documents are included in **Appendix A**. Work was carried out in accordance with the provisions of the approved DGW WP, with the following modifications:

- Injection points IP-5, -10, -17, -21, -24, -32, -37, -42 and -47 that were proposed to be installed within 10 feet of the Public Service Electric and Gas (PSE&G) 138KV subsurface power transmission line were not installed. Instead, as directed by PSE&G, these locations were utilized as sentinel well points, to directly monitor the groundwater for reagent migration towards the transmission line. This is a major transmission line, supplying power to the western half of Jersey City and Bayonne. No treatment occurred in the vicinity of the PSE&G 138KV subsurface power transmission line. The approximate limits of treatment and locations of the sentinel well points are shown on **Figure 5**.
- Injection point IP-3 could not be installed due to repeated refusals and constraints due to the presence of water utilities, the sewer line and adjacent injection points proximate to this injection point.
- To control mounding, daylighting and incursion into the sewer, it was necessary to reduce the total volume of solution injected in the subsurface. This was achieved by reducing Calcium Polysulfide solution (CAPS) dilution to 1:1 so that all CAPS stoichiometrically necessary for treatment was delivered to the subsurface, but the amount of water was reduced.
- These field modifications are consistent with the provisions of Section 3.0 of the NJDEP approved DGW WP.

The soil removal was completed on August 19, 2010. The In-Situ Chemical Reduction treatment was implemented on October 9, 10, 11, and 16, 2010 and completed October 17, 2010. The injection area was completely repaved on October 31, 2010. The asphalt pavement serves as an engineering control. In accordance with the RAWP and the Consent Decree, a Deed Notice was recorded April 29, 2010

with the Hudson County Register of Deeds. An updated Deed Notice was recorded on June 25, 2013, which reflects completion of remedial actions, current block and lot number, and current NJDEP deed notice format. A copy of the deed notice is included for reference in **Appendix B**.

The remedial actions are documented in detail in the “Remedial Action Report and Confirmatory Sampling Work Plan” dated September 2011. The Remedial Action Report (RAR) was approved by the NJDEP on February 21, 2012. In accordance with the RAR, a post-treatment confirmatory sampling and analysis program will be carried out approximately three years from completion of the ITP.

2.4.2 Site 153 South Remedy

2.4.2.1 Site 153 South Lower Segment

The following remedial actions were completed at Site 153 South Lower Segment between October 29, 2009 and December 18, 2009. The technical approach was consistent with the provisions of the NJDEP “Sewer Protocol” Guidance (January 2005), which specifies remedial action requirements for sewer sites including removal of the top three feet of impacted soil and replacement with at least three feet of clean fill where hexavalent chromium concentrations exceed the current NJDEP soil cleanup criterion of 20 mg/kg.

These activities were documented in the Study Area 5 Site 153 South Lower Segment “Interim Remedial Measures (IRM) Report,” dated October 13, 2010 (Honeywell, 2010). A map showing the IRM is included as **Figure 4**.

- Pre-trenching to locate utilities prior to commencing excavation.
- Excavation and offsite removal of soil up to a depth of 3 feet bgs.
- Excavation of top six inches of existing grass areas within the NJDOT ROW in front of Langer Transport Property and restoration with six inches of soil vegetative cap.
- Excavation in the area adjacent to Route 440 ROW at a sufficient slope of 1:2 (one foot vertical for every two feet lateral) to prevent subsidence of soil beneath Route 440.
- Excavation to six inches within a 4-foot radius around existing utility poles and structures as an aesthetic improvement only, since the poles are not

located within Morris Canal Property but are entirely within the NJDOT ROW.

- Placement of a durable orange demarcation material at the base and side slopes of all excavation areas to provide distinctive warnings in English and Spanish that inform future workers not to dig below that layer due to the potential presence of chromium impacted soils.
- Backfilling with clean granular fill and restoration of soil vegetative or asphalt cap as appropriate to pre-remedy surface types.

2.4.2.2 Site 153 South Upper Segment

Site 153 South Upper Segment has been separated into six areas. A map showing the IRM areas is included as **Figure 3**. Because asphalt already exists on most of Site 153 South Upper Segment, areas where asphalt was in good condition were used as an engineering control, and areas where the asphalt needed maintenance were repaired or replaced. Vegetated areas were remediated using the same approach as was used on Site 153 South Lower Segment. All clean granular fill and dense graded aggregate (DGA) will contain less than 1 ppm Cr(VI).

The following activities were completed during 2011, in accordance with the “Sewer Protocol” and as detailed in the Study Area 5 Site 153 South Upper Segment IRM Work Plan, dated April 21, 2010:

- **Excavation areas:** Soils were excavated to 3 ft bgs and an orange-colored demarcation geotextile (a.k.a. warning layer) was installed at the bottom of the excavation. The excavated areas were backfilled with clean certified granular fill and/or DGA and restored with a soil vegetative cap.
- **NJDOT ROW:** In areas within the NJDOT ROW, which extends to the edge of Route 440, the upper 6 inches of material were removed, an orange demarcation layer installed, and the area was backfilled and vegetated in accordance with the procedures described above. The existing concrete sidewalk and the curb were protected and maintained and, similarly, monitoring wells and other subsurface utilities present in the area were protected. The excavation included a small area between the property limits and sidewalk.
- **Paved asphalt areas:** Remediation for areas containing paved asphalt consisted of either repairing any damaged sections of the asphalt and milling

2-inches from the surface and repaving the asphalt cap, or replacing existing asphalt that was in poor condition. Seams between the new asphalt and the road were sealed.

- Missing asphalt areas: In areas of missing asphalt, if impacted soils existed within the top 3 feet, then those soils were removed, a warning layer was installed and the areas were backfilled and restored as described above. If no impacted soils were present within the top 3 feet of this segment, then the upper 12 inches of material were removed, and the area was backfilled with 6 inches of clean certified DGA and restored with 6 inches of asphalt cap.

The remedial actions were documented in an IRM Report dated November 26, 2013. As-built drawings for the remedial actions are included for reference in **Appendix D2**.

In accordance with the Consent Decree, a Deed Notice was recorded for the entire Site 153 on November 30, 2010 with the Hudson County Register of Deeds and is included for reference in **Appendix C**. A modified Deed Notice has been prepared to reflect the completed remedial actions, current block and lot information, and current NJDEP deed notice format. When recorded, a copy of the modified Deed Notice will be included in **Appendix C**.

3.0 MONITORING PLAN

This section provides the details of the Annual Inspection Monitoring and Contingency Plan that is required by Paragraph 80 of the Consent Decree, which addresses the long-term integrity of the chromium remedies for Sites 79 and 153 South. **Table 1** provides a timetable containing the LTMP inspection/monitoring and reporting requirements.

Details of the Contingency Plan are provided in Section 3.2, which describes the remedy procedure to be implemented when the inspection program identifies evidence of degradation or disturbance to the chromium remedies.

The Annual Inspection Monitoring requirements specified in the Consent Decree (paragraph 80[a]) include:

- Annual inspections of the Site 079 capped area and Site 153 South to document that the pavement is in good condition and does not have potholes or cracks penetrating it. .
- Annual inspection monitoring of the vegetative cover at Site 153 South.
- Annual inspection of the capped areas at Site 153 South isolating chromium-contaminated soil left in place for the slope-back and around utility poles.
- Annual inspection of warning signs at sewer and/or other utility access points within Site 153 South, including under manhole covers that inform the reader of the presence of chromium at the Site.
- Groundwater level measurements at Site 079 to evaluate groundwater flow direction in the area between Route 440 and the car dealership building.

3.1 ANNUAL INSPECTIONS

3.1.1 *Timing of Inspections*

The annual visual inspection of the asphalt, vegetative cap and warning signs will take place in April or May of each year as set forth in Paragraph 80(a)(i) of the Consent Decree.

In accordance with Paragraph 80(a)(vi) of the Consent Decree, groundwater level measurements will be taken annually from the Site 079 wells (079-MW-001 and 079-MW-A02). The water level measurements will be taken to coincide with the regional water level measurement round conducted in accordance with the *LTMP for the Deep Overburden and Bedrock Groundwater Remedy for Study Area 7*. Details regarding the inspection program are provided in the following sections.

The contingency plan, referenced in Section 3.2, will be implemented if inspection reveals evidence of erosion, deterioration of the integrity of the cap remedy or recent construction activities impacting the remedy.

3.1.2 Cap Visual Inspections

Annual visual inspections of the asphalt caps (pavement) installed on Sites 079 and 153 South will be conducted to verify the integrity of the caps. Evidence of deterioration such as cracks and potholes, or other evidence of disturbance such as excavation, will be recorded and evaluated. Field observations will include information on the extent of deterioration including dimensions and depth of cracks, potholes, or other disturbance of the capped area. The observations will be recorded on an inspection form and will be photo-documented. The NJDEP August 2005 Field Sampling Procedures Manual provides guidance for recordkeeping and photo-documentation. An example annual inspection form is included in **Appendix F**.

3.1.3 Site 079 Elevation Monument Surveys

Four monuments (surveying PK nails with shiners) were installed across the asphalt cover in Site 079 and the initial elevations were measured and recorded by a State of New Jersey Licensed Surveyor to the nearest one-tenth of one foot. Survey measurements will be taken three years after completion of the field treatment activities as part of the post-treatment monitoring requirements, as indicated in the in-situ treatment plan in Exhibit C of the Consent Decree. The survey work was completed in 2013 by a New Jersey Licensed Surveyor and is included under **Appendix D1**.

3.1.4 Site 079 Groundwater Level Measurements

Annual groundwater level measurements will be recorded from the two monitoring wells on Site 079 (079-MW-001 and 079-MW-A02) to coincide with shallow zone water level measurements conducted as part of the LTMP for the Deep Overburden

and Bedrock Groundwater Remedy for Study Area 7 in accordance with Paragraph 80(a)(vi) of the Consent Decree. Monitoring will be consistent with the overall approach for the Study Area 7 Deep Overburden and Bedrock Groundwater Remedy LTMP. As referenced in Section 4.1, copies of the recorded water level measurements in the vicinity of Site 079 will be provided annually to the Parties, as required in Paragraph 80(d) of the Consent Decree.

3.1.5 Site 153 South Soil Vegetative Cap

Annual inspection monitoring of the vegetative cover at Site 153 South will be performed in order to document the cap's continual conformance with Paragraph 67(b) of the Consent Decree. The vegetative cover will be inspected for slope and grade, soil erosion and for missing vegetation. Field observations will include information on the extent of degradation or disturbance including dimensions and depth of erosion or missing vegetation. In the event of soil erosion or change in slope and/or missing vegetation, Honeywell will undertake necessary measures to restore the integrity of the vegetative cap.

3.1.6 Site 153 South Cap Areas at Slope-Back & Around Utility Poles

Annual inspection of the capped areas at Site 153 South to isolate chromium-contaminated soil left in place for the slope-back and around utility poles will be performed in order to document the cap's continual conformance with Paragraph 67(b) of the Consent Decree.

Slope-back and utility poles will be checked for cracks or damage which may lead to the penetration of the cap. Depending upon the nature of damage Honeywell will either repair or replace the damaged cap area as necessary.

3.1.7 Site 153 South Warning Signs

Annual inspection of all warning signs located at sewer and/or other utility access points within Site 153 South, including manhole covers, will be conducted.

When necessary, warning signs must be repaired and/or replaced. A figure showing utility manhole locations with warning signs is provided for reference in **Appendix E**. As-built drawings for the IRM work are provided for reference in **Appendix D2**. Applicable portions of the plan will be updated as may be necessary when utility repair or replacement occurs for Site 153 Upper Segment.

3.2 CONTINGENCY PLAN

The contingency plan addresses requirements to provide for the continued integrity of the capped areas in the event of: (a) any planned penetration of the Site 079 Capped Area or the remedial measures at Site 153 South; or (b) any unplanned event or accident that penetrates the Site 79 Capped Area or otherwise compromises the integrity of the Initial Chromium Remedies at the Site 79 Ciasulli Property or Site 153 South. The Consent Decree requires that the Contingency Plan contain an annually updated plan to notify NJDEP and the Non-Honeywell Parties for: (a) any event penetrating or compromising the cap or chromium remedial actions at Site 079 and Site 153 South; (b) steps taken to identify the extent of the problem; and (c) remedial actions to address the problem. Annual plan updates and notification requirements are discussed in Section 4.0.

3.2.1 Asphalt Cap Degradation

Paragraph 80(a)(i) of the Consent Decree requires that potholes, cracks, or other degradation that do not fully penetrate the asphalt cap be repaired at least annually. Potholes or cracks that do not fully penetrate the pavement will be repaired, in coordination with the facility, to avoid further deterioration of the pavement, and in a manner so as not to interfere with regular business operations. In most cases such repairs will be made with a sealant or pre-mixed, cold-placed asphalt, using appropriate hand tools, following manufacturers' specifications for placement and curing. An alternate method meeting standard engineering practices may be implemented by the repair contractor, subject to approval by Honeywell and the facility/owner.

Potholes or cracks that fully penetrate the pavement must be repaired immediately (as soon as practicable and in coordination with the facility) and in a manner which avoids interference with regular business operations. Such repairs may be carried out using sealant or pre-mixed, cold-placed asphalt, using appropriate hand tools, or, at the discretion of the repairing engineer, other appropriate materials and application methods, following manufacturers' specifications for placement and curing. In accordance with the Consent Decree, if 10% or greater of a localized area or 25% or greater of the entire paved area has been impacted by potholes or cracks that penetrate the pavement, Honeywell will repave such portions as necessary to maintain the pavement in good condition, using material and methods that will be specified on a case-by-case basis by the repairing engineer. If field observations

during the monitoring program indicate that tree roots are causing damage to nearby paved areas, then the vegetation causing the damage will be promptly removed and the pavement repaired as soon as practicable, in coordination with the facility.

3.2.2 Asphalt Cap Penetration

3.2.2.1 Planned Cap Penetration

In the event of any planned penetrations of the asphalt cap of either Site 079 or Site 153 South (e.g. utility work, installation of signs, etc.), the owner/operator of the site in question shall notify the Parties reasonably in advance of the planned actions in accordance with Paragraph 63 of the Consent Decree. In accordance with the Deed Notices, the owner/operator is obligated to obtain the express written consent of NJDEP prior to disturbance of engineering controls, except for certain situations such as emergencies where immediate notification of the emergency to the NJDEP Hotline is required (as discussed in Section 3.3.2.2 Unplanned Cap Penetration). The owner/operator is also required to notify any tenants and/or contractors intending to conduct ground intrusive activities of the nature and location of contamination and precautions necessary to mitigate exposure to contaminants in accordance with Deed Notice requirements. Refer to the Deed Notice for specific details regarding requirements for alterations, improvements, or disturbances of engineering controls.

Upon notification by the owner/operator, Honeywell will assess the proposed disturbance and advise the site owner/operator of the requirements to maintain integrity of the remedy. Depending on the scope of the activities, Honeywell may elect to have its representatives observe the penetration and restoration activities. In all cases, the owner/operator of the site in question will be responsible for restoring the cap in a manner consistent with the Consent Decree and Deed Notices to maintain continued protectiveness.

The site owner/operator must advise the contractor performing the work of the presence of the Cr(VI) impacted soils in portions of the capped area. The owner/operator is responsible for contractor training requirements in accordance with the Worker Training Manual prepared by Honeywell. As a condition of the Deed Notices the owner/operator must document that all applicable worker health and safety laws and regulations are followed during the alteration, improvement, or disturbance, and during the restoration. The owner/operator will document that the

contractor restores the disturbed portions of the cap. In accordance with Deed Notice requirements, the engineering control is required to be restored to pre-disturbance conditions within 60 days after the initiation of the disturbance activities and a report filed with the NJDEP within that time period. If such disturbance is expected to last beyond 60 days, the owner/operator shall provide additional notification to NJDEP and obtain approval for said disturbance activity. During the period of disturbance, the site owner/operator will take measures to protect public health and safety and mitigate risk of exposure to contaminants, such as restricting public access to the disturbed area by use of fencing (or other appropriate measures that cannot be bypassed by a trespasser) and measures to minimize erosion, dust generation and water run-on by the use of silt fences, temporary covers (e.g. tarps), sand bags or other appropriate engineering measures.

The owner/operator will document that the contractor's written plans are patterned after the Worker Training Manual and are at least as stringent as Honeywell's manual. The plan shall describe the nature and extent of the work, identify the work activities that may result in contact with contaminated soils, measures to mitigate or control such contact, worker training requirements, health and safety requirements, and waste handling and disposal requirements. Once finalized, the Worker Training Manual will be provided as **Appendix H** to this LTMP.

3.2.2.2 Unplanned Cap Penetration

In the event of any emergency or other unplanned disturbance of the capped areas, the owner/operator of the site in question will be required to provide notification to the NJDEP in accordance with Deed Notice requirements.

In the event of an emergency that presents the potential for exposure to workers, the public or environment to contaminated materials, the owner/operator shall provide notification to the NJDEP Hot Line (1-877-WARNDEP or 1-877-927-6337) immediately upon discovery of such conditions. The Honeywell Remediation Manager (contact information provided in Section 5.0) must also be notified by the owner/operator immediately upon discovery of such conditions. Arrangements must be made by the owner/operator to have properly qualified personnel or contractor(s) respond and take measures to mitigate impacts to workers, the public or the environment from the contaminated materials. Upon conclusion of the emergency, the cap must be restored by the owner/operator and any required reports must be prepared and filed, as may be necessary for the particular emergency.

Deed Notice requirements for emergency situations include taking measures to limit the disturbance of engineering controls and minimizing the time of such disturbance as needed to respond to the emergency; taking measures to limit the risk of exposure to contaminants; restoring the engineering control to pre-emergency conditions as soon as possible; and submittal of report to the NJDEP within 60 days after completion of the restoration of the engineering control (refer to the Deed Notice for specific requirements for emergency situations).

3.2.3 Site 079 Elevation Monument Deflection

If a horizontal or vertical deflection is measured during the survey, the monument will be inspected to assess whether the deflection is due to damage to the monument. Any such damage will be documented in the inspection log and the monument will be reset.

The area near the monument and the condition of the cap will be evaluated to determine whether the observed deflection is resulting in damage to the cap. At the discretion of Honeywell, additional monuments or control points may be established, to obtain additional measurements. Field observations from the cap inspection and monument survey data will be evaluated together to assess the need for mitigation or response action.

Data will be assessed and an action plan will be formulated, if needed, to assess the need for and the type of mitigation that may be needed. Any corrective actions that may be needed will be implemented to provide a level of protection that is equivalent to the original Chromium Remedy. Honeywell will keep written logs and records of monitoring and remediation activities pertaining to this LTMP.

3.2.4 Site 079 Groundwater Levels

In the event that groundwater level monitoring indicates that contaminated shallow groundwater is migrating from Route 440 easterly toward the Site 079 Ciasulli Property, Honeywell will either undertake water quality monitoring to determine whether the groundwater moving toward Site 079 Ciasulli Property is contaminated, or undertake action to reverse the flow direction. If contaminated groundwater is migrating into the Site 079 Ciasulli Property, Honeywell shall undertake remedial action to prevent such migration pursuant to Paragraph 80(a)(vi) of the Consent Decree. Groundwater levels from onsite monitoring wells 079 (079-MW-001 and

079-MW-A02) will be measured annually to coincide with the regional water level round conducted in accordance with the Study Area 7 LTMP. The water level measurements along with a determination of flow direction at Site 079 will be provided annually to the Parties, as required in Paragraph 80(d) of the Consent Decree.

3.2.5 Vegetative Cap Degradation

Degradation in the vegetative cap area, such as soil erosion or missing vegetation, will be promptly corrected by either regrading, repairing or replacement as may be appropriate to provide a level of protection that is equivalent to the original remedy.

If site conditions do not permit prompt vegetative cap repairs, appropriate interim measures will be taken (e.g. geotextile mesh, silt fence or straw bales) such that the affected area is adequately protected until site conditions allow for the implementation of the appropriate corrective actions.

4.0 REPORTING

This section provides requirements for reporting and periodic plan updates. **Table 1** provides a timetable of the LTMP inspection/monitoring and reporting requirements.

4.1.1 Annual Reporting

Honeywell will maintain written logs and/or other records to document monitoring and remediation activities undertaken as part of this LTMP. Monitoring and remediation activities will be documented in writing, utilizing industry standard methods (such as bound field books). Copies of records will be provided annually to the Parties, as required in Paragraph 80(d) of the Consent Decree. The Parties include BMUA, Ciasulli, Riverkeeper, NJDEP and Honeywell. Based on the timing for implementation of the LTMP including annual cap inspections which are scheduled to begin April 2011 in compliance with Deed Notice requirements, Honeywell anticipates that annual copies of inspection logs/records will be provided on or about January 31 of each year.

4.1.2 Biennial Certification Reports

Biennial Certification Reports will be prepared summarizing the observations of the annual inspections and documenting any changes or alteration to the engineering controls. The reporting form(s) required by the TRSR will be used for this report. The current form is included in **Appendix G**.

As required by the TRSR the report will compare New Jersey laws, remediation standards, and other regulations applicable at the time the engineering or institutional controls were established with any relevant subsequently promulgated or modified laws, regulations or remediation standards to determine whether any changes in applicable laws, regulations, or remediation standards have occurred, and whether the institutional controls comply with the requirements of any new laws and regulations. The report will also assess whether the remedy is functioning as intended, whether the exposure assumptions and remedial action objectives used at the time of the remedy selection are still valid and whether any other information has come to light that requires a reassessment of the protectiveness of the remedy. If necessary, any such decision points will be documented in the appropriate attachments of the NJDEP forms.

In accordance with Paragraphs 59 and 73 of the Consent Decree, copies of the Biennial Certification Report will be provided to Riverkeeper and all Parties mandated by the TRSR including:

- Office of the City Clerk
- Hudson County Clerk
- Hudson County Dept. of Health & Human Services
- Owner of Property indicated on the Deed Notice
- Current Property Owner/Operator

The Biennial Certification Reports are required to be submitted to NJDEP every two years following recording of Deed Notice and NJDEP issuance of a Remedial Action Soil Permit.

Site	Deed Notice Recording Date	First Biennial Certification Due Date
Site 079	June 25, 2013	April 29, 2012 ⁽¹⁾
Site 153	November 30, 2010 ⁽²⁾	November 30, 2012 ⁽²⁾

(1) Next biennial report is due May 4, 2014 and every 2 years thereafter as specified in the NJDEP Remedial Action Soil Permit dated May, 4, 2012.

(2) Modified Deed Notice in progress; timing of future biennial reports will be based on NJDEP issuance of Remedial Action Soil Permit.

4.1.3 Monitoring Plan Update and Procedures for Changes

In accordance with Paragraph 80(a)(v) of the Consent Decree, the LTMP will be reviewed annually and updated as needed based on changes to field conditions, regulatory requirements, and/or other relevant project documents for Site 079 and Site 153 South. The process for making changes to the LTMP is described below.

Any Party to the Consent Decree may propose changes to the scope of monitoring activities in the LTMP. If the Parties agree to proposed changes, then the LTMP will be revised to incorporate the agreed upon changes, subject to approval by the NJDEP or a New Jersey Licensed Site Remediation Professional. If the Parties are unable to reach agreement, the Party proposing the change may submit the dispute to the court for resolution.

4.1.4 Contingency Plan Update/Notice to Stakeholders

In accordance with Paragraph 80(c) of the Consent Decree, Contingency Plan requirements include annual notification to the relevant Parties (NJDEP and Non-Honeywell Parties) of any event penetrating/compromising the cap or harming the integrity of the chromium remedy; the steps taken to identify the problem; and the standards for remedying the problem. This notification will be coordinated with annual notification to Riverkeeper documenting compliance with the requirement to notify other stakeholders (including owners, tenants, and utilities) regarding conditions and activities affecting Site 079 and Site 153 South pursuant to Paragraph 81 of the Consent Decree:

- Notice, updated annually, to New Jersey One Call and any other underground alert hotlines that exist now or are implemented in the future identifying the location of Cr(VI) contaminated fill at or near pipelines or other utilities within Site 79 and Site 153 South. In order to address this requirement, Honeywell has provided notice to New Jersey One Call. However, New Jersey One Call has informed Honeywell that it cannot function as a hotline service for Cr(VI) issues as it is purely a utility hotline. As a result, in order to assure proper notification of affected entities, Honeywell has been providing notification to individual utility companies identified as having utilities within Sites 79 and Site 153 South. The notification indicates that if a given utility company is contemplating work in the affected areas, it needs to notify Honeywell in advance of implementing such work. Honeywell will strive to remain informed about any changes in the presence of utilities in the affected sites and will continue to provide appropriate annual updates.
- Notice describing any owner/operator or Honeywell planned or emergency excavation and safety measures implemented to protect individuals near Site 079 and/or Site 153 South.
- Annual summary notice of the chromium remedy that is made available on any Honeywell developed website to inform the public of contamination at Study Area 5, Study Area 6 North and Study Area 6 South. This notice will include a description of remedial actions undertaken and contamination remaining at the Site 079 Ciasulli and Site 153 South Property. This annual update is required upon completion of the annual long-term monitoring requirements.

Honeywell will provide a letter to the Riverkeeper documenting compliance with the above notification requirements on an annual basis beginning one year after issuance of initial notices to stakeholders (completed by April 26, 2010 and October 29, 2010 for Sites 153 and 079, respectively). Honeywell has coordinated annual notification of compliance for both sites simultaneously beginning in April 2012.

5.0 HONEYWELL PROGRAM ORGANIZATION

This section provides Honeywell's program organization and key personnel.

Honeywell Project Manager – Maria Kaouris, Remediation Manager

Honeywell has designated Maria Kaouris as the Remediation Manager and primary contact for this project. Her business address and telephone number follow:

Honeywell
101 Columbia Road
Morristown, NJ 07962
Phone (973) 445-3302

NJDEP Primary Contact – David Doyle

The primary contact for the NJDEP for this project will be the NJDEP Case Manager, David Doyle. His business address and telephone number is:

New Jersey Department of Environmental Protection
Site Remediation Program
401 E. State Street, P.O. Box 420, Mail Code 401-06
Trenton, NJ 08625-0420
(609) 292-2173

Environmental Consultant – Amec

Amec is responsible for conducting annual inspections and preparing the biennial certification reports. At the direction of Honeywell, Amec may also provide other services, such as oversight of cap repair, if necessary. Amec's address and telephone number are provided below:

AMEC Environment & Infrastructure, Inc.
American Metro Center
200 American Metro Blvd, Suite 113
Hamilton, NJ 08619
Phone: (609) 689-2829

Amec primary contacts are as follows:

Project Responsibility	Name	Telephone Number
Program Manager	Ed Gaven	609-631-2905
Project Manager	Kinjal Shah	609-631-6096
Designated Local Health & Safety Officer	Andrew Shust	609-631-2921
Field/Technical Support	Dave Ambrose	484-542-0980
	Brian Shea	201-323-2557

6.0 REFERENCES

- Honeywell, October 2010. Site 153 Former Morris Canal Lower Segment, Interim Remedial Measures Report. Letter Report dated October, 13, 2010.
- Honeywell, November 2013. Site 153 Former Morris Canal Upper Segment, Interim Remedial Measures Report. Letter Report dated November 26, 2013.
- Mactec Engineering and Consulting, Inc., April 2010, Site 153 Former Morris Canal Upper Segment, Interim Remedial Measures Workplan. Letter Report dated April 21, 2010.
- Amec Environment & Infrastructure, Inc., September 2011. Remedial Action Report and Confirmatory Sampling Work Plan; Study Area 5; NJDEP Site 079; Route 440 Vehicle Corp.; Jersey City, New Jersey.
- Mactec Engineering and Consulting, Inc., July 2009, Remedial Action Selection Report/Remedial Action Work Plan for Study Area 5, NJDEP Site 079 Route 440 Vehicle Corp., Jersey City, New Jersey. July 2009.
- Mactec Engineering and Consulting, Inc., August 2006. Supplemental Remedial Investigation Report for Study Area 5, NJDEP Site 079 Route 440 Vehicle Corp., Jersey City, New Jersey. July 2006.
- New Jersey Department of Environmental Protection, 2012. Technical Requirements for Site Remediation: N.J.A.C. 7:26E. TetraTech NUS, 1999. Draft Remedial Investigation Report for Study Area 5, Sites 079, 090, 117, 153 and 184. Jersey City, New Jersey. November 1999.

7.0 LIST OF ACRONYMS AND ABBREVIATIONS

ACO	Administrative Consent Order	NJDOT	New Jersey Department of Transportation
bgs	below ground surface	OSWER	Office of Solid Waste & Emergency Response
BMUA	Bayonne Municipal Utilities Authority	PSE&G	Public Service Electric and Gas
CAPS	Calcium Polysulfide	RAR	Remedial Action Report
Cr(VI)	Hexavalent Chromium	RAWP	Remedial Action Work Plan
DGW	Discharge to Groundwater	RI	Remedial Investigation
EPA	Environmental Protection Agency	ROW	right-of-way
GWQS	Groundwater Quality Standards	SA	Study Area
IRM	Interim Remedial Measure	TRSR	Technical Requirements for Site Remediation
ISCR	In-Situ Chemical Reduction	WP	Work Plan
ITP	Injection Treatment Program		
LTMP	Long Term Monitoring Plan		
µg/L	micrograms per liter		
mg/kg	milligrams per kilogram		
N.J.A.C.	New Jersey Administrative Code		
NJCU	New Jersey City University		
NJDEP	New Jersey Department of Environmental Protection		

TABLE

FIGURES

APPENDICES

APPENDIX A

RELEVANT REGULATORY CORRESPONDENCE

APPENDIX B

**DEED NOTICE
SITE 079 CIASULLI PROPERTY**

APPENDIX C

DEED NOTICE

SITE 153 FORMER MORRIS CANAL

APPENDIX D

SITE 079 SURVEY AND SITE 153 SOUTH AS-BUILT DRAWINGS

APPENDIX D1

SITE 079 MONUMENT SURVEY AND TOPOGRAPHIC SURVEY

APPENDIX D2

**SITE 153 SOUTH LOWER AND UPPER SEGMENT IRM AS-BUILT
DRAWINGS**

APPENDIX E

SITE 153 SOUTH WARNING SIGN DOCUMENTATION

APPENDIX F

EXAMPLE ANNUAL INSPECTION FORM

APPENDIX G

NJDEP BIENNIAL CERTIFICATION FORM

APPENDIX H

**WORKER TRAINING PLAN MANUAL
(TO BE PROVIDED WHEN FINALIZED)**