FORMER CHROMALLOY FACILITY

169 Western Highway
West Nyack, Rockland County, New York 10994

Interim Site Management Plan

NYSDEC Site Number: 3-44-039
NYSDEC Index Number: W3-0080-99-05

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TABLE OF CONTENTS

TABLE OF CONTENTS TOC-1

LIST OF TABLES TOC-2

LIST OF FIGURES TOC-2

LIST OF APPENDICES TOC-2

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM 1

1.1 Introduction 1
1.2 Site Background 3
1.3 Summary of Remedial Investigation Findings 9
1.4 Summary of Remedial Actions 14

2.0 ENGINEERING CONTROL PLAN 17

2.1 Introduction 17
2.2 Engineering Controls 17
2.3 Soil Vapor Intrusion Evaluation 19
2.4 Inspections and Notifications 19
2.5 Contingency Plan 21

3.0 SITE MONITORING PLAN 24

3.1 Introduction 24
3.2 Cover System Monitoring 25
3.3 Groundwater Monitoring Program 25
3.4 Site-Wide Inspection 28
3.5 Monitoring Quality Assurance/Quality Control 29
3.6 Monitoring Reporting Requirements 30

4.0 OPERATION AND MAINTENANCE PLAN 32

4.1 Introduction 32
4.2 Engineering Control System Operation and Maintenance 32
4.3 Engineering Control System Performance Monitoring 35
4.4 Maintenance and performance monitoring Reporting Requirements 37

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS 39

5.1 Site Inspections 39
5.2 Certification of Engineering Controls 40
5.3 ~~Periodic Review~~ Annual Monitoring Report 41
5.4 Corrective Measures Plan 42

LIST OF TABLES

Table 1 – Summary of Remedial Investigation Soil and Groundwater Contamination (1994-1998)
Table 2 – Emergency Contact Numbers
Table 3 – Contact Numbers
Table 4 – Inspection and Monitoring Programs
Table 5 – List of Monitoring Wells and Surface Water Sampling Frequency
Table 6 – Schedule of Monitoring/Inspection Reports

LIST OF FIGURES

Figure 1 – Site Plan
Figure 2 – Dual Phase Extraction Well Locations
Figure 3a – Geologic Cross section D-D′
Figure 3b – Geologic Cross Section E-E′
Figure 4 – Potentiometric Surface Map of Overburden Wells
Figure 5 – Potentiometric Surface Map of Bedrock Wells
Figure 6 –TCE Concentration Data for Bedrock Wells
Figure 7a – TCE Concentration for Overburden Wells and Surface Water
Figure 7b – TCE Concentration for Overburden Wells and Surface Water contd.
Figure 8 – Chromium in Soil Area Map
Figure 9 – Asphalt Cap Inspection Area
Figure 10 - Map of Directions from Site to Hospital (in text)

LIST OF APPENDICES

Appendix A – DPE Well Decommissioning Plan
Appendix B – Remediation System As-Built Report and O&M Plan (Alliance 2002)
Appendix C – Monitoring Well Construction Logs
Appendix D – Field Groundwater Purge/Sample Form
Appendix E – HASP
Appendix F – Site-Wide Inspection Form
Appendix G – Quality Assurance Project Plan / Field Sampling Plan
Appendix H – Inspection Checklist
Appendix I – Excavation Work Plan
Appendix J – Effluent Limitations Monitoring Requirements
Appendix K – Chronological Listing of Primary Documents (OU1 and 2)

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 Introduction

This document is required as an element of the remedial program at the Former Chromalloy Facility (hereinafter referred to as the "Site") under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program, administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with Order on Consent Index Number W3-0080-99-05, Site Number 344039, which was executed on March 30, 2001.

1.1.1 General

Chromalloy Gas Turbine Corporation entered into an Order on Consent with the NYSDEC to remediate the property located at 169 Western Highway in West Nyack, Town of Clarkson, Rockland County, New York. Chromalloy Gas Turbine Corporation is a wholly owned subsidiary of Chromalloy American Corporation and is organized under the laws of the State of Delaware, and is authorized to do business in New York. Chromalloy American Corporation is a wholly owned subsidiary of Sequa Corporation. This Order on Consent required the Remedial Party, Chromalloy Gas Turbine Corporation, to investigate and remediate contaminated media at the Site. A figure showing the site location and boundaries of this 6.5-acre site is provided in Figure 1.

After completion of the remedial action for the Site, some contamination will be left in the subsurface at this Site, which is hereafter referred to as "remaining contamination." This Interim Site Management Plan (SMP) was prepared to manage remaining contamination at the Site using the Engineering Controls (ECs) currently in place in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. All reports associated with the Site can be viewed at the Site Repository (West Nyack Public Library) or by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This Interim SMP was prepared by TRC Environmental Corporation (TRC), on behalf of Sequa Corporation (Sequa) in accordance with the requirements in NYSDEC Division of Environmental Remediation DER-10 Technical Guidance for Site Investigation and Remediation, dated May, 2010, and the guidelines provided by NYSDEC. This Interim SMP addresses the means for implementing the ECs that are currently in-place for the

Site following the issuance of the Record of Decision (ROD) for Operable Unit[1] I (OU1) in March 1999. OU1 is defined by the predominate contaminant, trichloroethene (TCE), in the soil and groundwater. Operable Unit 2 (OU2) consists of trivalent chromium in on-Site surficial soils.

1.1.2 Purpose

The Site contains remaining contamination following completion of the remedial action. Engineering Controls have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. Any future Environmental Easements, Deed Restrictions or Environmental Notices granted to the NYSDEC, and recorded with the Rockland County Clerk, will be added to this Interim SMP. This Interim SMP specifies the methods necessary to ensure compliance with all ECs to ensure any remaining contamination remains at the Site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of any future Environmental Easement, Deed Restriction or Environmental Notice and the grantor's successors and assigns. This Interim SMP may only be revised with the approval of the NYSDEC.

This Interim SMP provides a detailed description of all procedures required to manage remaining contamination at the Site after completion of the Remedial Action, including: (1) implementation and management of Engineering Controls; (2) media monitoring; (3) operation and maintenance of treatment and capture system; (4) submittal of ~~Periodic Review Report~~ Annual Monitoring Reports; and (5) defining criteria for termination of treatment system operation.

To address these needs, this Interim SMP includes three plans: (1) an Engineering Control Plan for management of the in-place EC, (2) a Monitoring Plan for implementation of Site Monitoring; and, (3) an Operation and Maintenance Plan for implementation of remedial treatment and capture system.

This plan also includes a description of ~~Periodic Review Report~~ Annual Monitoring Reports for the submittal of data, information, recommendations, and certifications to ~~Periodic Review Report~~ Annual Monitoring Reports NYSDEC.

It is important to note that:

[1] An operable unit represents a portion of the site remedy which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release, or exposure pathway resulting from the Site contamination.

- Failure to comply with this Interim SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index Number W3-0080-99-05; Site Number 344039) for the Site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan shall be proposed in writing to the NYSDEC's project manager. The NYSDEC will provide a notice of any approved changes to the Interim SMP, and append these notices to the Interim SMP that is retained in its files.

1.2 Site Background

1.2.1 Site Location and Description

The Site is located at 169 Western Highway, in West Nyack, in the Town of Clarkson, County of Rockland, New York and is identified as Lot 11 on the 2013 Rockland County Tax Map 65.13. The Site is an approximately 6.5-acre area that forms the northern end of a larger industrially zoned property owned by Bradley Corporate Park. Residences are located to the north of the Industrial Park, along Pineview Road. The Pineview Road right-of-way runs through a portion of the property. The Hackensack River is north and west of the residences. The Hackensack River flows south and is 700 feet to the northwest of the Site. The Greenbush Brook flows north and is a tributary to the Hackensack River. The Greenbush Brook separates the Site from the Clarkstown Landfill which is located approximately 350 feet to the east of the Site (Figure 1).

1.2.2 Site History

1.2.2.1 Operational/Disposal History

- 1926: The Site was acquired by Kay Research Co., Inc. and Kay Laboratories, Inc.
- 1927: A 40-gallon spill of an unknown chemical occurred that resulted in taste problems in the local public water company's downstream water plant and required the abandonment of four nearby wells.
- 1946: The property was passed through a number of individuals and corporations including the Infra Insulation, Inc. which sold the Site to Chromalloy American Corporation (Chromalloy) in August 1960. Chromalloy personnel reported that the well water on property was not drinkable because of its taste, which may have been attributed to the 1927 Kay Research spill.

- 1982: Chromalloy sold the Site to Alloy Technology.
- 1984: Alloy Technology sold the property to Bradley Industrial Park.
- 1986: Chromalloy merged with Sun Chemical Corporation and Sun Chemical subsequently changed its name to Sequa Corporation.

Two different Chromalloy Divisions operated at the Site: Sintercast, which operated throughout Chromalloy's tenure, and the Coatings Operation which operated until 1971 and then was transferred to Chromalloy's Orangeburg plant, also in Rockland County.

The Sintercast Division machined titanium carbide, carbon, chromium, and iron as raw materials. The machining process entailed milling, mixing with hexane, vacuum drying, drying with hexane recovery, pressing with 2% paraffin, sintering, annealing and machining. Sintering is a heat and pressure treatment process that turns a milled product into a coherent mass without melting it. Annealing is a heating and cooling process that renders metals and alloys more malleable and less brittle. These operations used trichloroethene (TCE) which was applied with wiping rags for degreasing. It has been reported that only one 55-gallon drum of TCE was purchased every eight (8) to twelve (12) months and, at most, three (3) 55-gallon drums were stored on the property. This degreasing operation reportedly ceased in 1971. Alloy Technology prepared specialty metal products and utilized many of the operations formerly employed by Sintercast. Alloy Technology reported that it did not use TCE.

At the Coatings Operation, TCE was also used as a degreasing agent, and spent TCE was reportedly returned to the supplier, Detrex Corporation. Sequa personnel have indicated that the degreasing units may have been located inside the eastern and possibly the southern portion of the Main Building. The location of the Main Building in shown on Figure 1.

1.2.2.2 Remedial History

In July 1978, a Pineview Road resident reported to the Rockland County Health Department (RCHD) of a taste and odor in the well water on his property. RCHD's inspector confirmed the odor in the well water and initiated several rounds of well-water sampling at multiple Pineview Road residences in August and September of 1978. Samples collected from the residential wells exhibited elevated concentrations of TCE. Following the receipt of the analytical results, the RCHD established a temporary water supply for the Pineview Road residents and instructed them not to use their well water.

In 1979, homes on Pineview Road were connected to a permanent water supply with funding from New York State and local government, and with cooperation of Spring Valley Water Co. and Chromalloy, which permitted a tie-in to their existing supply connection. In 1979, RCHD held a series of hearings to identify possible sources of chemical pollution in the Pineview Road wells.

In 1983 and 1985, the NYSDEC completed Phase I and Phase II investigations at the Pineview Road Residential Area. Based on the results of those investigations, the Pineview Road site was listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry) and assigned the Site Number 344022.

In July 1989 Sequa entered into an Order on Consent (Index Number W3-0080-87-01) to develop and implement a field investigation program to determine if soil and groundwater underlying the Site were impacted with volatile organic compounds (VOCs) and/or priority pollutant metals and to determine groundwater flow directions in both the unconsolidated and bedrock aquifers. In 1991 and 1992, as a result of the 1989 Order on Consent, Sequa conducted a series of extensive tests on and near the Site. Subsequently, on October 13, 1992, the Chromalloy Site was listed on the Registry as a Class 2 Site, given Site Number 344039 and an EPA Number NYD980454877. The Pineview Road site, Number 344022, was delisted because it was determined that the contamination found in the Pineview Road wells resulted from migration of contaminants from source(s) which were up-gradient of the Pineview Road wells. Therefore, elevated concentrations of TCE in groundwater detected in the Pineview Road wells would be investigated as part of the Chromalloy Site Remedial/Investigation Feasibility Study under a revised Order on Consent.

In February 1994, Sequa entered into a revised Order on Consent (Index Number W3-0080-87-01) to develop and implement a Remedial Investigation and Feasibility Study (RI/FS) for the Site. Remedial Investigations (RIs) were conducted at the Site which included multiple investigations (completed as "modifications" under the RI/FS referred to as RI/FS modifications 1-13) and data collection events between 1994 and 2009. The purpose of the RIs were to characterize the physical conditions at the Site, determine the type and source of contamination, assess risk to human health and the environment, and conduct treatability testing as necessary to evaluate the potential performance and cost of applicable treatment technologies. Refer to Appendix K for a chronological listing of the primary documents related to these investigations. The investigations identified OU1 (TCE groundwater contamination), OU2 (trivalent

chromium in soil), and the potential for vapor intrusion. A brief summary of the findings is listed below:

- Based on the results of investigations conducted to date, the primary contaminants of concern for OU1 include trichloroethene (TCE) and its breakdown products. Concentrations of TCE were found on-Site in groundwater were as high as 160,000 parts per billion (ppb). TCE concentrations exceeding the groundwater standard of 5 ppb were found in overburden and bedrock groundwater around the site and to the north and west of the site. Elevated concentrations of TCE were found in soil along the south side of the Main Building.
- Based on the results of investigations conducted to date, the primary contaminant of concern for OU2 is trivalent chromium in soil. Trivalent chromium was found on-Site in soil around the Main Building of the former Chromalloy facility. Trivalent chromium concentrations have been found as high as 1,960 parts per million (ppm) which exceed the Part 375 commercial standard of 1,500 ppm.
- Based on the results of soil vapor intrusion investigations conducted to date, no mitigation measures were determined to be necessary based on the NYSDOH Guidance for Evaluating Soil Vapor Intrusion. Refer to Section 1.3.3 for a discussion of the vapor intrusion investigations.

Based on the results of the RI/FS (s) for OU1 and the criteria identified during evaluation of alternatives for OU1, the NYSDEC selected a Groundwater Recovery and Treatment System for the Deeper Aquifer and a Dual-Phase Extraction (DPE) System for the Shallow Aquifer and soil as the preferred remedy for OU1. The selected remedy was presented in the Record of Decision (ROD) for OU1 in March 1999. In March 2001 Sequa entered into an Order on Consent (Index Number W3-0080-99-05) to develop and implement a remedial program for OU1.

The Pump and Treat (P&T) and DPE remedial system specifications were presented in the DPE Remedial Design Report dated May 4, 2001 and the P&T Remedial Design Report dated June 1, 2001. Modifications made in the location and construction for the treatment building and the Operation and Maintenance Plan for the remedial systems were presented in the As-Built Construction Details and O&M Plan Report in December 2002.

The OU1 remedial systems have been in operation since October 2002 and have shown to be effective in capture of TCE to the Site area. The DPE system (Figure 2) has maximized it effectiveness in addressing the residual impacts to soil and surficial groundwater near the southeast corner of the Main Building and will be decommissioned per consultation with the NYSDEC. This Interim SMP describes the steps required to decommission the DPE remedial system (Appendix A) and operate the existing P&T Remedial system.

1.2.3 Geologic Conditions

The subsurface at the Site consists of a very dense glacial till overlying a sequence of alternating sandstones, shales and conglomerates. Because of deep weathering, resulting from poor cementation, determination of the depth to top of bedrock has been uncertain, and has variously been reported to be between 22 feet and 43 feet at the south side of the Main Building. A description of the lithology from the 1999 RIR is provided below.

1.2.3.1 Bedrock Monitoring Well Lithology Description

During the installation of monitoring well MW-llB, shown on Figure 1, brown to red brown silty clay with some sand and rock fragments was encountered in recovered soil samples from the ground surface to 23 feet below ground surface (bgs). This material was underlain by hard and dry red brown clay with rock fragments (lodgment till) to approximately 39 feet bgs. Weathered, red sandstone was encountered from 39 to 50 feet bgs and subsequently underlain by competent, dry red brown siltstone. The remainder of the well bore consisted of alternating units of sandstone and siltstone to a depth of 120 feet bgs.

While drilling at location MW-12B, shown on Figure 1, fill material was encountered to a depth of eight (8) feet bgs, which was underlain by three (3) feet of peat moss. The peat moss was in turn underlain by sandy gravel to 20 feet bgs, then clayey sand to a depth of 32 feet bgs (lodgment till). The clayey sand was underlain by two (2) feet of weathered sandstone followed by more competent sandstone (bedrock) to 65 feet bgs. The remainder of the strata identified in the well bore consisted of alternating units of siltstone and sandstone.

The boring completed for monitoring well MW-13B, shown on Figure 1, encountered fill material to a depth of eight (8) feet bgs, which was underlain by 15 feet of silty sand and gravel. The sand and gravel from above contained weathered sandstone from

23 to 25 feet bgs. The remaining 55 feet of the borehole consisted of alternating units of siltstone and sandstone (bedrock).

Geologic sections were presented in the Environmental Alliance (Alliance)'s RI/FS Modification Number 8 (June 2001) for the Site and select cross sections are presented in Figures 3A and 3B.

1.2.3.2 Groundwater Flow

Previous studies conducted prior to the RI by Geraghty and Miller, Inc. (G&M) (1992, 1992) and Lawler, Matusky, and Skelly (LMS, 1994-1995) provided a general hydrogeological framework for the study area. Groundwater flow in the overburden occurs between grains of uncemented silt, sand, and gravel. Groundwater may also flow within joints and fractures within clay which potentially serve as conduits for the downward migration of fluids, as suggested by LMS (1994).

Overburden and bedrock groundwater elevation measurements (Datum – National Geodetic Vertical Datum 1929, (NGVD 29)) were collected by Alliance during the RI in June 1998 from the entire study area monitoring network. The following results were summarized in the RIR:

- Upper portion of the groundwater flows in a semi-radial direction to the northwest, north, and east, similar to the 1991 groundwater flow illustrated by G&M. Groundwater flow data has been extended into the residential area using the installed shallow wells MW-llA and MW-12A.
- The highest water table elevation identified was at MW-lA (85.14 feet) and the lowest groundwater elevation in the overburden was at MW-12A (56.08 feet). The location of the high water table elevation is consistent with the historical G&M groundwater data. However, the November 18, 1991 data collected by G&M reported MW-lA at 77.37 feet. This is a difference of 8.26 feet, which could be the result of seasonal fluctuations. Over a horizontal distance of 1,610 feet between these two wells, a hydraulic gradient of 0.01 is calculated.

Subsequent collection of groundwater surface elevation measurements since the completion of the RI indicates that groundwater flow is generally consistent with historical evaluation summaries. During operation of the P&T system drawdown is evident near and around recovery well (RW-1).

A groundwater flow figure for the overburden and a groundwater flow figure for the bedrock are shown in Figures 4 and 5, respectively.

1.3 Summary of Remedial Investigation Findings

Multiple RIs were performed to characterize the nature and extent of contamination at the Site. The results of the RIs were described in detail in the Remedial Investigation Report, and subsequent Modifications (1-12), prepared December 1998 through November 2003. Refer to Section 1.2.2.2 Remedial History above for additional detail and the attached Appendix K for a list of documents. Generally, the RIs determined the primary contaminant of concern (COCs) at the Site is TCE in groundwater and soil and trivalent chromium in shallow on-Site soil. Lower levels of PCE and breakdown products of TCE like cis and trans 1, 2 dichloroethene (DCE) were also present in groundwater and soils. Tests were performed for other potential contaminants as well. Other than trivalent chromium in soil, there were no significant concentrations of other metals, semivolatile organic compounds (SVOCs), pesticides, or polychlorinated biphenyls (PCBs) detected in soil and groundwater at the Site. Impacts to soil vapor, surface water, fish and wildlife were also evaluated as part of the RI. A qualitative human health exposure assessment was also performed and potential exposure pathways were evaluated. Below is a summary of site conditions during performance of the RI.

1.3.1 VOCs in Soil

Elevated concentrations of Site related contaminants of concern (PCE, TCE, cis and trans 1,2,-DCE) were detected in soil during the RI. To further evaluate the extent of these impacts to soil, test pits were excavated to investigate several potential contaminant source areas near to the Main Building on-site. Six test pits were excavated in September 1994. The locations and findings of these test pit investigations were described in the Interim Data Report prepared by LMS in 1994. Soil borings were also completed in September 1994 using direct push drilling equipment to collect soil samples to further evaluate subsurface conditions on-site. Samples were collected from twenty six (26) borings and analyzed using an on-Site mobile laboratory for VOCs. Additionally, selected samples submitted to an off-site laboratory (Aquatec Laboratories) for analysis of VOCs and Target Analyte List (TAL) metals.

The results of the soil analyses identified VOCs in several samples, particularly adjacent to the south wall of the Main Building. The VOCs identified include TCE, PCE, and their degradation products (cis- and trans- 1,2 DCE). The highest reported concentration of TCE was identified at depths of 3-3.5 feet bgs from soil borings

completed near the southeast corner of the Main Building. Benzene, toluene, ethylbenzene and xylene (BTEX) concentrations were also identified in soil samples collected from 11-12 feet bgs. The occurrence of BTEX was attributed to a 9,000-gallon fuel oil underground storage tank (UST) along the east side of the Main Building. These analytical results were also presented in the Interim Data Report (LMS 1994), and in Modification No. 2 (LMS 1995). Selected soil analyses for TAL metals were also performed (LMS 1994) in accordance with the approved Work Plan. The only two metals detected above their applicable guidance criteria[2] were chromium and mercury which were detected in concentrations that exceeded the NYSDEC soil cleanup guidelines of 10 milligram per kilogram (mg/kg) and 0.1 mg/kg, respectively.

Based on the investigations described above, the excavation of TCE-impacted soil was conducted November thru December 1995. An estimated 93 cubic yards of soil were removed. The soil removal was performed in an area south and adjacent to the Main Building to depths of approximately 6 to 8 feet bgs (refer to Figure 2).

1.3.2 Trivalent Chromium in Soil

Elevated concentrations of trivalent chromium were identified in two areas (Area SS4 located on the west of the Main Building and Area SS8 is located southeast of the Main Building) shown on Figure 8.

- In the SS4 Area 76 soil samples were collected and analyzed for chromium from depths of 0 to 5 feet bgs. Approximately 50% of the detections were above the Part 375 unrestricted standard of 30 ppm; however, only one sample was detected above the Part 375 commercial standard of 1,500 ppm. The highest concentration of trivalent chromium detected in the SS4 Area was from sample SS4F(0.8-0.25') at a concentration of 3,690 ppm. This is above the Part 375 commercial standard of 1,500 ppm. All other sample concentrations detected were below the commercial standard of 1,500 ppm in the SS4 area.
- In the SS8 Area 114 soil samples were collected and analyzed for chromium from depths of 2 inches to 9 feet bgs. Approximately 60% of the detections were above the Part 375 unrestricted standard of 30 ppm; however, only one sample was detected above the Part 375 commercial standard of 1,500 ppm. The highest concentration of trivalent chromium detected in the area SS8 was from sample

[2] Guidance criteria at the time of the report was the New York State Department of Environmental Conservation, "Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels", January 1994.

SS8N(5-5.17') at a concentration of 1,690 ppm. However, this result was flagged by the laboratory with an N (Reported as spiked sample recovery not within control limits (Alliance 2008)) and analyzed a second time with a concentration of 667 ppm which is below the Part 375 commercial standard of 1,500 ppm. Therefore, all the sample concentrations in the SS8 Area are below the commercial standard of 1,500 ppm.

These areas are covered by asphalt and landscaping. Area SS8 is covered with approximately five (5) or more feet of fill.

1.3.3 Site-Related Groundwater

The analysis of groundwater from bedrock monitoring wells exhibit VOCs, particularly TCE within the study area. The highest groundwater VOC impact was observed in monitoring wells near the southwestern portion of the Main Building as historically observed in groundwater in MW-1B. The P&T system is operational and designed to capture VOCs on-Site to further reduce on-Site residual groundwater contamination and prevent off-site migration. The analysis of groundwater collected from monitoring wells screened within the overburden have generally exhibited a decline of site related VOCs across the site area with the exception of MW-12A and several DPE wells. These concentrations will continue to be monitored as described in Section 3.3.

Groundwater flow within the bedrock at the Site is predominantly north/northwest. (Figures 4 and 5).

1.3.4 Site-Related Soil Vapor Intrusion

Previous soil vapor intrusion investigations have been conducted at the Site and at several residences along Pineview Road by Alliance from 2006 through 2008 as part of the Remedial Investigation/Feasibility Study Modification No. 13 (RI/FS Modification 13). The following is a summary of previous correspondence regarding Alliance's implementation of the RI/FS Modification No. 13:

- Soil Vapor Intrusion Investigation Report dated May 11, 2007 (May 2007 SVI Report) to the NYSDEC and the New York State Department of Health (NYSDOH). The May 2007 SVI Report presents soil vapor analytical data for sampling events that took place in 2006 as part of RI/FS Work Plan Modification No. 13.
- NYSDOH letter dated July 19, 2007 provides comments and additional investigation requirements in response to Alliance's May 11, 2007 Report.

- NYSDEC letter dated December 21, 2007 to Alliance notes that additional sampling planned for the Site could not be fully implemented due the inability of Alliance to gain access to three properties located on Pineview Road. The letter further stated that due to changes in certain circumstances, the property owners were willing to allow Alliance access and that they should proceed as soon as practical.
- Alliance's RI/FS Modification No. 13 Soil Vapor Intrusion Investigation Update Report, dated November 24, 2008. This report summarized VI investigation activities conducted by Alliance in February, March and April, 2008.
- The Payne Firm's RI/FS Modification No. 13, Soil Vapor Intrusion (SVI) Investigation Update Report dated February 11, 2009. This report provided an analysis of the 2006 and the 2008 VI data collected by Alliance at the residences at #12 and #41 Pineview Road, and addressed comments from the NYSDOH from their letter dated July 19, 2007.
- NYSDEC letter dated April 15, 2009 to the Payne Firm documents the NYSDEC's review of the February 11, 2009 report, and requires additional VI investigation sampling at the residence at 41 Pineview Road.
- The Payne Firm's VI Investigation Update Report, dated December 11, 2009. This update was provided in response to NYSDEC's letter, and provided a scope of work to execute the required VI sampling at 41 Pineview Road.

A review of the 2006 PCE data in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York indicates that all of results are placed into the category requiring "No Further Action," except for the July 2006 sampling event from the Main Building, which is placed in the category requiring "Reasonable and practical action to identify sources and reduce exposures." In this sampling event, the indoor air PCE concentration was 4.3 ug/m3, associated with a sub-slab sample result of <1.4 ug/m3. Similar to the TCE results discussed above, this data indicates that there may be sources of VOCs in the Main Building that are not attributable to SVI.

The PCE data from the 2008 indicates that the reported laboratory detection limits (<1.4 ug/m3 for the #12 Pineview Road location and <2.7 ug/m3 for the #41 Pineview location) are sufficiently low enough to provide for a comparison of the data to the Guidance values. A comparison of the concentrations of PCE detected in samples from the Main

Building and the two Pineview Road properties to the PCE Guidance values from Matrix #2 indicates that all of the sample results fall into the "No Further Action" category.

Additional samples were collected in January 2010 at the 41 Pineview Road residence and within the Anaerobic Reductive Dechlorination (ARD) area, where VI was perceived as a potential concern as a result of the remedial enhancement process. Based on these sampling results and in consideration of previous VI investigation work completed Site wide between 2006 and 2008, no further investigation of VI at the Site, including the Facility and any off-Site areas, was recommended.

1.3.5 Sediments

Sediment samples were collected at four (4) locations, shown on Figure 1, in June 1998 as part of the RI (RI Report November 5, 1999, Alliance). The samples were analyzed for VOCs and metals. The VOC analysis indicated the presence of TCE and 2-butanone in the samples collected. The locations exhibiting concentrations of VOCs in 1998 were sampled again in September 1998 and there were no VOCs detected. The metal analysis for the samples collected in June 1998 all reported metals below their respective NYSDEC guidelines.

1.3.6 Surface Water

Surface water in the area of the Site was initially characterized using information provided by the investigation of the Clarkstown Landfill in 1993. Four (4) surface water samples were collected from the same locations as the four (4) sediment sampling locations as part of the RI. The samples were analyzed for VOCs and metals. TCE was detected at 7 parts per billion (ppb) and cis-1, 2-dichloroethene was detected at 7.1 ppb, both above their guidance value of 5 ppb. Surface water samples continued to be collected after the issuance of the March 1999 ROD for the Site and have consistently to date exhibited VOC values below applicable guidance criteria (Figure 7a and 7b).

All metals were below their respective NYSDEC guidance values in the four (4) surface water samples collected except copper and lead at SW-2 which is upstream of the Site (Figure 7a and 7b)

1.3.7 Underground Storage Tanks

The removal of one underground storage tank from the southwest corner of the Main Building was reportedly performed by the property owner under guidance by the Rockland County Health Department after Alloy Technology ceased operations at the

Facility in the fall of 2001. The tank was reportedly used for the storage of hexane. No detailed information regarding the UST history, including size or removal, is available.

1.4 Summary of Remedial Actions

The site was remediated in accordance with the NYSDEC-approved Remedial Action Work Plan and subsequent modifications, between 1994 and 1998.

The following is a summary of the Remedial Actions performed at the Site:

- **Removal of On-Site Soil with TCE**: In December 1995, soil removal was conducted to remove impacted soils encountered during the RI outside the south wall of the Main Building (Figure 2). An estimated 93 cubic yards of soil were excavated to an approximate depth of six to eight feet bgs.
- **TCE in the On-Site Shallow Aquifer and Soil:** A Dual-Phase Extraction (DPE) System was installed to address the shallow aquifer and on-Site soil. The As-Built Construction Details and O&M Plan Report in December 2002 detail the installation of this system which operated for more than 11 years.
- **TCE in the Deeper Aquifer:** The Pump and Treat (P&T) system was installed to address the deeper bedrock aquifer. The As-Built Construction Details and O&M Plan Report in December 2002 detail the installation of this system which has operated for more than 12 years and continues to operate.
- **TCE in the Off-Site Shallow Aquifer:** A groundwater remediation activities were also conducted in response to residual VOCs in the shallow overburden unit at the northern end of Pineview Road. An anaerobic reductive dechlorination (ARD) injection system was implemented in 2008 and included the installation of multiple injection wells and observation wells. The use of RegenOx™ was utilized to initially reduce VOCs (mainly TCE) in this area, followed up with the injection of a substrate (NewmanZone ™) to promote an anaerobic groundwater environment to allow for continued degradation of TCE. The enhanced dechlorination process was effective in the reduction of TCE in monitoring wells located at the northern end of Pineview Road with the exception of MW-12A. This exception may have been the result of inefficient introduction of the substrate in the immediate vicinity of MW-12A.

In addition to the selected remedy at the Site a composite cover system consisting of fill, asphalt, and landscaping is in place at the site to prevent exposure to remaining contaminated soil/fill remaining at the Site.

Remedial activities, including the operation of the P&T system and monitoring activities are on-going at the Site at the date of submission of this Interim SMP.

1.4.1 Removal of Contaminated Materials from the Site

Based on the results of the soil analyses described above, an excavation plan was prepared for the Site to remove the soil containing the highest concentrations of TCE from the area on the south side of the Main Building (DPE area). The removal criteria selected was 0.70 mg/kg of TCE, based on the NYSDEC soil cleanup guidelines for protection of groundwater. The 0.70 mg/kg cleanup concentration was developed based on Total Organic Carbon (TOC) concentrations of 1% in soil. The mean TOC concentration was identified as 1.17%. Therefore, the site-specific soil cleanup target was recalculated to be 0.82 mg/kg of TCE. The proposed excavation was designed to excavate the most heavily contaminated soil to a depth of six (6) to eight (8) feet, if possible.

Based on the results of the investigations described above, excavation of TCE contaminated soils was conducted during November and December 1995. The excavations were completed by Environmental Products & Services (EPS), under the observation of LMS personnel. An estimated 93 cubic yards of soil were removed for off-site disposal along with five drums of water from the excavation.

1.4.2 Site-Related Treatment Systems

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) and the criteria identified for evaluation of alternatives the NYSDEC selected groundwater recovery and treatment (P&T) of the contamination in the lower aquifer, and a dual phase system extraction (DPE) system for the contamination in the upper aquifer and the unsaturated soil as the appropriate remedy. The components of the selected remedy were as follows:

- A groundwater recovery and treatment system consisting of a pumping well, connected to an air stripping tower system and granulated activated carbon (GAC) vessels (these GAC vessels are no longer in line, all historic changes to the system were conducted in consultation with the

NYSDEC) was installed in the lower aquifer to remove TCE and other dissolved organic compounds.

- A DPE system to remove dissolved VOCs in the unsaturated soils and the upper aquifer was installed adjacent to the Main Building. The DPE system reduced the VOCs the shallow aquifer significantly and has reached the limits of its effectiveness. The DPE will be decommissioned following acceptance of this Interim SMP by the NYSDEC in 2014. The decommissioning plan for the DPE system is included in Appendix A of this Interim SMP.

1.4.3 Remaining Contamination

OU1 at the Site has been characterized and the TCE impacted soils were removed during the completion of the RI. Chromium impacted soils, addressed under OU2, were characterized as presented TRC's September 2011 Interim Report and Field Delineation Plan. Remaining soil with chromium above the Part 375 commercial standard for trivalent chromium (1,500 parts per million (ppm)) exist in two areas (Figure 8) on site and will be addressed under a proposed Interim Remedial Measure (IRM) and planned FS utilizing future institutional and engineering controls to be submitted in 2014.

Groundwater analytical data collected annually from the selected list of monitoring wells has indicated that the existing P&T remedial system is effective in limiting migration of COCs off-site. Analytical groundwater data suggests that impacted groundwater is limited to the upper bedrock. One area, just southwest of the Main Building and near DPE Well-4, also indicates concentrations of COCs above applicable guidance criteria. The DPE system will be decommissioned as part of this Interim SMP (Figure 2).

2.0 ENGINEERING CONTROL PLAN

2.1 Introduction

2.1.1 General

Since remaining contaminated groundwater and soil exists beneath the Site, Engineering Controls (ECs) are required to remain in place to protect human health and the environment. This Engineering Control Plan describes the procedures for the implementation and management of the ECs at the Site. The EC Plan is one component of the Interim SMP and is subject to revision by NYSDEC. The ECs put in place on the Site are currently being re-evaluated and ultimately optimized. Any changes to the existing ECs following a system optimization review will be included in the Final SMP prepared for the Site.

2.1.2 Purpose

This plan provides:

- A description of the ECs on the Site;
- The basic implementation and intended role of each EC;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC, and
- Any other provisions necessary to identify or establish methods for implementing the EC required by the site remedy, as determined by the NYSDEC.

2.2 Engineering Controls

2.2.1 Engineering Control Systems

2.2.1.1 Site Cover

Exposure to remaining contamination at the Site and limits to migration due to increased infiltration to groundwater is prevented by existing asphalt paving over the site (Figure 9). This cover system is comprised of 5 feet of clean soil (in the SS8 Area), asphalt pavement, concrete-covered sidewalks, landscaping and concrete building slabs.

Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 3 of this Interim SMP.

2.2.1.2 Pump and Treat System

A Remediation System As-Built Report and Operations and Maintenance Plan for the Site was prepared by Alliance in December 2002. The report contained construction details of the treatment building, the installed P&T system, DPE system and operation of each system. The report is included in Appendix B for reference.

Procedures for operating and maintaining the groundwater treatment system are documented in the Operation and Maintenance Plan (Section 4 of this Interim SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this Interim SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the Site, occurs.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. It is anticipated that the ROD for this Site will be amended and the remedial action objectives will be modified. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Composite Cover System

The composite cover system (Figure 9) is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.2 Pump and Treat System (P&T)

The P&T system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the P&T system is no longer required, a proposal to discontinue the system will be submitted for approval. Conditions that warrant discontinuing the P&T system include contaminant concentrations in groundwater that: (1) reach levels that are consistently below ambient water quality standards, (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC, or (3) the NYSDEC has determined that the P&T system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the Site. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

2.3 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified, an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. Validated SVI data will be transmitted to the property owner within 30 days of validation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the next ~~Periodic Review Report~~ Annual Monitoring Report following receipt of the validated data.

2.4 Inspections and Notifications

2.4.1 Inspections

Inspections of all remedial components installed at the Site will be conducted at the frequency specified in the Interim SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the ~~Periodic Review Report~~ Annual Monitoring Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this Interim SMP;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this Interim SMP (Section 3). The reporting requirements are outlined in the ~~Periodic Review Report~~ Annual Monitoring Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC implemented at the Site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6NYCRR Part 375, and/or Environmental Conservation Law.
- Notice within 48-hours of any damage or defect to the foundation, structures or engineering control that reduces or has the potential to reduce the effectiveness of an Engineering Control and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this Interim SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Order on Consent, , and all approved work plans and reports, including this Interim SMP
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. Tables 2 and 3 have site related contact numbers listed.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to Marc Flanagan. These emergency contact lists must be maintained in an easily accessible location at the Site.

2.5.2 Map and Directions to Nearest Health Facility

Site Location: 169 Western Turnpike, West Nyack, NY 10994

Nearest Hospital Name: Nyack Hospital

Hospital Location: 160 N Midland Ave Nyack, NY 10960

Hospital Telephone: (845) 348-2000

Directions to the Hospital:

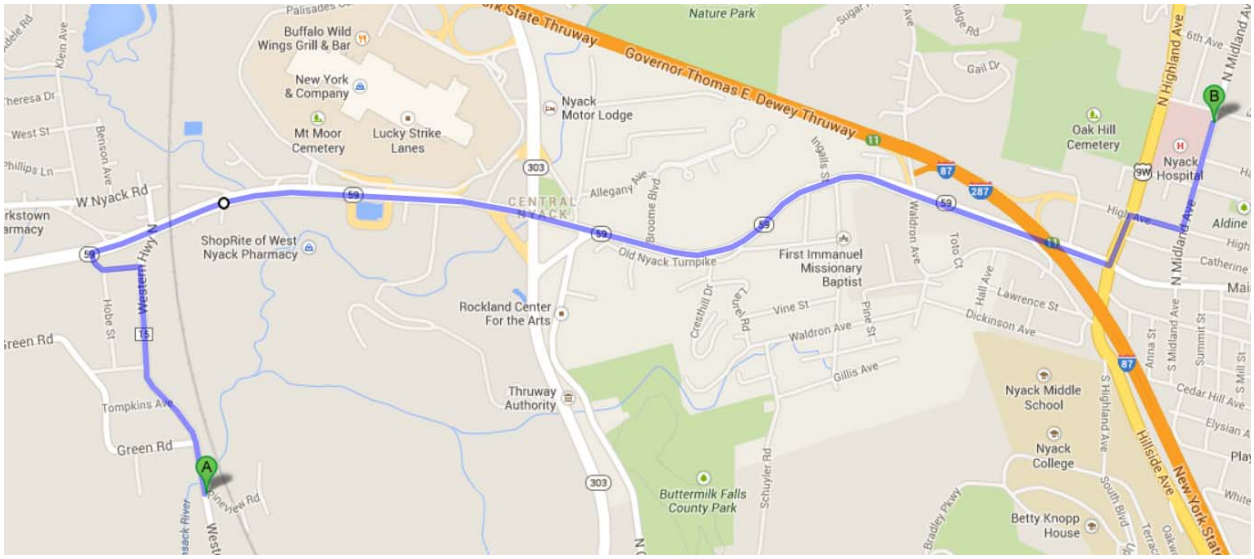
- Head north on Western Hwy N 0.5 mi
- Turn left onto Doscher Ave 0.1 mi
- Turn right onto NY-59 E 2.1 mi
- Turn left onto N Highland Ave 0.1 mi
- Take the 2nd right onto High Ave 0.1 mi
- Take the first left onto N Midland Ave 0.2 mi

Destination will be on the left

Total Distance: 3.1 mi

Total Estimated Time: 7 min

Figure 10 - Map Showing Route from Site to Hospital:



2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Tables 2 and 3). The list will also be posted prominently at the Site and made readily available to all personnel at all times.

3.0 SITE MONITORING PLAN

3.1 Introduction

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, the soil cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Section 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of groundwater;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Inspection and monitoring programs for the Site are summarized in Table 4 and outlined in detail in Sections 3.2 and 3.3 below.

3.2 Cover System Monitoring

The cover system for the Site consists of asphalt paving, building foundation slabs, and landscaped areas. The system minimizes exposure to impacted groundwater and soil still present at the Site and will be inspected annually to identify any disturbances or impairments.

3.3 Groundwater Monitoring Program

3.3.1 Groundwater Monitoring

The network of monitoring wells has been installed to monitor both overburden and bedrock groundwater conditions at the Site. The network of on-site and off-site wells was designed and installed during the RI (Alliance, 1999). A total of 44 monitoring wells were selected for groundwater monitoring during the remedial action. Additionally, the monitoring wells were selected based on previous VOC detections, groundwater gradients and groundwater flow direction. Monitoring well construction logs are presented in Appendix C. The layout of the groundwater monitoring well network is depicted in Figure 1. A reduction in the number of monitoring well samples is anticipated as shown in Table 5.

Groundwater monitoring is to be performed annually in 2014 and 2015 and every other year thereafter unless otherwise directed by the NYSDEC. Table 5 shows which wells will be sampled in 2014, 2015 and thereafter. Groundwater is to be analyzed for VOCs (Method SW8260B). The monitoring wells to be sampled as part of the groundwater monitoring program for the Site are summarized on Table 5.

The sampling frequency may be modified with the approval NYSDEC. The Interim SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

Deliverables for the groundwater monitoring program are specified below.

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be conducted in accordance with the QAPP (Appendix G) and will be recorded in a field book and a groundwater-sampling log presented in Appendix D. Other observations (e.g., well integrity, etc.) will be noted on

the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Prior to sampling, all monitoring wells shall be inspected and gauged to obtain the static water levels for the site. Monitoring well purging will be performed and groundwater samples will be collected from the monitoring wells using a submersible pump and dedicated section of polyethylene tubing. A water quality meter (Horiba U-52 or similar) with flow-through cell (flushed with distilled water before use at each well) will be used during well purging for field measurement of pH, specific conductance, temperature, oxidation-reduction potential, turbidity, and dissolved oxygen. Each well shall be purged three well volumes or until field parameters stabilize, whichever occurs first. Purge water is to be brought back to the remedial system and processed. In the event that a strong odor or sheen is evident, water is to be drummed, characterized, handled, and disposed of at a licensed treatment, storage, and disposal facility.

The following procedures will be used for monitoring well groundwater sampling:

- Wear appropriate personal protective equipment (Level D) per the Site Specific HASP (Appendix E). In addition, samplers will use new nitrile sampling gloves for the collection of each sample.
- Unlock and remove the well cap where necessary.
- Measure the static water level in the well with an electronic water level indicator.
- The water level indicator will be washed with Alconox detergent and water, then rinsed with deionized water between individual monitoring wells to prevent cross- contamination.
- Calculate the volume of water in the well.
- Place polyethylene sheeting around the well casing to prevent contamination of sampling equipment in the event sampling equipment is dropped.
- Purge water from the well until water quality parameters are stabilized or 3-5 well volumes of water (unless otherwise approved), using USEPA Low-Flow methodology as described below.
- Pump with a submersible pump (RediFlo or similar) equipped with new polyethylene tubing dedicated to each well. Set pump/tubing intake at the

approximate mid-point of the monitoring wells screened interval and start pump.

- Allow field parameters of pH, reduction-oxidation potential (Eh), dissolved oxygen, specific conductivity, turbidity, and temperature to stabilize before sampling. Purging will be considered complete if the following conditions are met:
    - Three consecutive pH readings ±0.1 pH units of each other
    - Three consecutive readings of specific conductance ±3 percent of each other
    - Three consecutive dissolved oxygen readings ±10 percent of each other (for values > 0.5 mg/L)
    - Three consecutive oxidation-reduction potential readings are ±0.10 millivolts of each other
    - Three consecutive turbidity readings±10 percent of each other (for values > 5.0 nephelometric turbidity units (NTUs)
    - Drawdown is < 0.3 feet
    - Purge rate is 200 to 500 milliliters per minute
    - Sample rate is 100 to 250 milliliters per minute

If these parameters are not met after purging a volume equal to three (3) times the volume of standing water in the well, the Remedial Project Manager will be contacted to determine the appropriate action(s).

- If the well is purged dry before the required volumes are removed, the well may be sampled when it recovers (recovery period up to 24 hours).
- Place analytical samples in cooler and chill to 4°C. Samples will be shipped to the analytical laboratories within 24 hours.
- Pump will be decontaminated and the polyethylene suction/discharge line will be properly discarded.
- Re-lock well cap.

- Fill out field sampling form, labels, custody seals, and chain-of-custody forms. Groundwater samples will be placed in appropriate sample containers, sealed, and submitted to the laboratory for analysis.

3.3.1.2 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3.1.3 Surface Water Monitoring

Four surface water samples will be collected during the annual groundwater monitoring event in 2014 from the areas shown on Figure 1 and analyzed for VOCs. After review of the 2014 surface water sampling results, discontinue of surface water sampling is anticipated. Laboratory provided glassware will be used when collecting surface waters. A non-preserved amber glass bottle received from the laboratory will be used to fill vials required for the VOC analysis at each surface water sample location as shown on Figure 1. All sample containers submitted for analysis will be labeled in the field, entered properly onto a chain of custody, and placed in a cooler and chilled to 4°C in accordance with the QAPP provided in Appendix G.

3.4 Site-Wide Inspection

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an

inspection form will be completed (Appendix F). The form will compile sufficient information to assess the following:

- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.5 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (Appendix G). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
- Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
- Sample holding times will be in accordance with the NYSDEC ASP requirements.
- Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody.
- Calibration Procedures.
- All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.

- The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures.
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks.
- QA Performance and System Audits.
- Preventative Maintenance Procedures and Schedules.
- Corrective Action Measures.

3.6 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the ~~Periodic Review Report~~ Annual Monitoring Report, as specified in the Reporting Plan of this Interim SMP.

All monitoring results will be reported to NYSDEC on an annual basis in the ~~Periodic Review Report~~ Annual Monitoring Report. The report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);

- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (o be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized on Table 6.

4.0 OPERATION AND MAINTENANCE PLAN

4.1 Introduction

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the P&T system;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the P&T system are operated and maintained.

Information on non-mechanical Engineering Controls (i.e. cover system) is provided in Section 3 - Engineering Control Plan. A copy of this Operation and Maintenance Plan, along with the complete Interim SMP, will be kept at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the Interim SMP and should be used in concert with Appendix B to ensure system efficiency.

4.2 Engineering Control System Operation and Maintenance

4.2.1 P&T System Maintenance

4.2.1.1 Scope

The P&T system is continuously operational, and requires maintenance and oversight; (both using remote telemetry and in-person) to verify continuous and effective operation. The following sections detail system startup, inspections, and maintenance. Discharge monitoring of remedial system operations will be in compliance with the NYSDEC communicated Effluent Limitations and Monitoring Requirements (ELMR) (refer to Appendix J for effluent discharge monitoring requirements).

4.2.1.2 System Start-Up and Testing

The P&T system start-up and testing procedures are described below.

- Be sure all valves are in their proper open or closed positions.

- Be sure all breakers and switches are off.
- Check for proper voltage at disconnect.
- Place disconnect in the on position.
- Place all breakers in the on position.
- Check for proper rotation of motors by momentarily bumping with hand switch, if this is the very first time system has been started. **DO NOT RUN ANY MOTOR BACKWARDS OR DAMAGE MAY OCCUR.** Correct the problem by changing power leads.
- After the rotation is checked on the Moyno, recouple the connection between the pump and motor.
- Push reset button.
- Be sure all valves at extraction wells are open.
- Place all HOA switches in the AUTO position.
- Regulate flow from the extraction wells with valves at the wells.
- Adjust automatic vacuum relief valves to open at vacuum levels greater than the normal operating vacuum of the system but less than the maximum vacuum rating of the equipment. Adjust operating vacuum using the manual bleed in valve.
- Throttle stripper transfer pump, if necessary, for discharge option.
- Follow instructions in detailed in Appendix B for startup of the air stripper. The system should now operate properly.

4.2.1.3 System Operation: Routine Operation Procedures

Quarterly, the P&T system should be shut down and the stripper trays allowed to drain into sump. The field technician should then inspect the internal trays by removing the 4-inch rubber covers aside each tray. Check for fouling of the aeration holes in the bottom of the trays in particular. If air distributor fouling occurs, the stripper must be drained and disassembled using the following procedure.

- Loosen and remove the four clamping rods.
- Note the orientation of the stripper lid nozzle with respect to the down-comer in the first tray.

- Again noting orientation, remove the top tray, followed by the next two. The last tray does not need to be removed unless the sump needs inspection.
- Clean the trays using wire brushes, pressurized water, or any combination as necessary.
- If gasket material between trays was damaged during disassembly, it should be replaced. Any 3/8" thick by 2" wide closed cell foam weather-stripping will be sufficient.
- Reassemble trays using lineup arrows and numbers to get correct orientation. Reinstall top and clamp rods. Tighten clamp rods just enough to create seal between trays, but do not distort tabs.
- Re-start stripper blower, groundwater pumps, and OWS transfer pump.
- After stripper has filled, re-tighten the clamp rods as the weight of the water will have settled the trays somewhat. Lock the rods in place using the top nut.

4.2.1.4 System Operation: Routine Equipment Maintenance

Routine maintenance for the P&T system will be performed on a bi-monthly or as needed basis. Typical maintenance items may include, but are not limited to, bag-filter change out, flow totalizer checks, flow and pressure measurement collection along the treatment train, and air stripper cleaning.

During normal operations, the bag filters may become loaded with sediment and will need to be changed. During normal operations, the pre-and post-bag filters pressure gauges will not register a pressure reading. Once 2 pounds per square inch (psi) differential between the pre and post- bag filters pressure gauges is observed, the bag filters will be replaced. During servicing, the flow of water will be set to bypass the bag filter assembly. The bags removed will be placed in a 55-gallon drum for proper disposal.

The air stripper maintenance (cleaning) schedule will be determined, as system operation proceeds and required routine maintenance becomes apparent. The determining factor which indicates that an air stripper may need cleaning is a decrease in air flow rate from the design specification, thus diminishing the removal efficiency or upon visual inspection. This occurs when the flow of air to the stripper decreases due to increased back-pressure. The main cause of increased back-pressure is the

clogging of the air stripper trays. This is the result of sediment settling out on the trays (most of which should be captured by the bag filters), iron precipitate fouling, or biological fouling. An indication that the air stripper requires cleaning will be when the back pressure of air flow into the stripper increases 20% from its startup (clean) condition. To confirm that the trays are fouled, an internal inspection via the ports on the air strippers will be performed. Before opening the ports, the stripper to be inspected will be isolated from the treatment train and the power to its equipment will be locked-out. Once this safety process is complete, employees will look in the ports with a flashlight to inspect the trays for fouling and sediment. If cleaning of the air strippers is required, the air strippers will be taken apart to power wash the individual trays. Prior to reassembling the strippers once clean, the foam gaskets between the trays will be inspected for integrity and be replaced if needed. Once the trays are reassembled, the clamp rods will be tightened as needed to prevent leaks. Fluids generated during the cleaning process will be containerized for proper disposal.

4.2.1.5 System Operation: Non-Routine Equipment Maintenance

Non-routine equipment maintenance may include service to the recover well pump, transfer pumps, or to the electrical control panel. Each service will be evaluated in consultation with both the equipment manufacturer and a licensed electrician. Any non-routine maintenance will be summarized in the periods summary reporting.

4.3 Engineering Control System Performance Monitoring

4.3.1 Monitoring Schedule

Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the P&T system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the P&T systems are specified in Section 5.1.2 of this Plan.

4.3.2 General Equipment Monitoring

A visual inspection of the complete system will be conducted during the bi-monthly monitoring event. Pump and Treat (P&T) system components to be monitored include, but are not limited to, the following:

- Recover well pump operation
- Transfer pump operation

- Air-Stripper blower operation
- Leaks along treatment train
- Flow totalizer reading
- Pump hour totalizer
- Remote telemetry operation

A complete list of components to be checked is provided in the Inspection Checklist, presented in Appendix H. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan are required immediately, and the pump and treat system restarted.

4.3.3 System Monitoring Devices and Alarms

The P & T system has a warning device to indicate that the system is not operating properly. In the event that the warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the P & T system restarted. Operational problems will be noted in the subsequent ~~Periodic Review Report~~ Annual Monitoring Report.

4.3.4 Sampling Event Protocol

The P&T system extracts, treats and discharges groundwater from recovery well RW-1. Water samples are collected quarterly from the influent port, mid port (between the two Air Stripper Towers) and the effluent port.

The following procedures will be used for P&T system sampling:

- Wear appropriate personal protective equipment (Level D) per the Site Specific HASP (Appendix E). In addition, samplers will use new nitrile sampling gloves for the collection of each sample.
- Place analytical samples in cooler and chill to 4°C. Samples will be shipped to the analytical laboratories within 24 hours.
- Fill out field sampling form, labels, custody seals, and chain-of-custody forms. Groundwater samples will be analyzed for VOCs via method 8260.

4.4 Maintenance and performance monitoring Reporting Requirements

Maintenance reports and any other information generated during regular operations at the Site will be kept on-file on-site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the ~~Periodic Review Report~~ Annual Monitoring Report, as specified in the Section 5 of this Interim SMP.

4.4.1 Routine Maintenance Reports

Checklists or forms (see Appendices F and H) will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;
- Other repairs or adjustments made to the system;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 Site Inspections

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this Interim SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system which are contained in Appendix H (P&T Inspection Form). Additionally, a general site-wide inspection form will be completed during the site-wide inspection (see Appendix F). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format in the ~~Periodic Review Report~~ Annual Monitoring Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,
- The site remedy continues to be protective of public health and the environment and is performing as designed in the Pump and Treat Remedial Design (Alliance, June 2001) and the March 1999 ROD for the Site.

5.2 Certification of Engineering Controls

After the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the engineering controls required by the remedial program was performed under my direction;
- The engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Name of Inspector, of Business and Address am certifying as Owner's Designated Site Representative I have been authorized and designated by all site owners to sign this certification for the site.

The signed certification will be included in the ~~Periodic Review Report~~ Annual Monitoring Report described below.

5.3 ~~Periodic Review~~ Annual Monitoring Report

An ~~Periodic Review Report~~ Annual Monitoring Report will be submitted to the Department every year, In the event that the Site is subdivided into separate parcels with different ownership, a single ~~Periodic Review Report~~ Annual Monitoring Report will be prepared that addresses the site presented in Figure 1. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each ~~certification~~ monitoring period. Media sampling results will also incorporated into the ~~Periodic Review Report~~ Annual Monitoring Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific ROD;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

- Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
- The overall performance and effectiveness of the remedy.

A performance summary for all treatment systems at the Site during the calendar year, including information such as:

- The number of days the system was run for the reporting period;
- The average, high, and low flows per day;
- A description of breakdowns and/or repairs along with an explanation for any significant downtime;
- A description of the resolution of performance problems;
- A summary of the performance, effluent and/or effectiveness monitoring; and
- Comments, conclusions, and recommendations based on data evaluation.

The ~~Periodic Review Report~~ Annual Monitoring Report will be submitted, in hard-copy format and in electronic format to, to the NYSDEC Central Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

TABLES

Table 1
Former Chromalloy Facility
West Nyack, New York
Summary of Remedial Investigation Soil and Groundwater Contamination (1994-1998)

Media	Contaminant of Concern	Concentration Range	Frequency of Exceeding SCGs	SCGs
Groundwater (ppb)	Trichloroethylene	ND to 160,000	43 of 62	5
	Perchloroethylene	ND to 130	15 of 62	5
	cis 1,2 Dichloroethene	ND to 8,000	20 of 62	5
	Trans 1,2 Dichloroethene	ND to 220	18 of 62	5
Soils (ppm)	Trichloroethylene	ND to 35,000	21 of 97	0.7
	Perchloroethylene	ND to 58	6 of 97	1.2
	cis 1,2-Dichloroethene	ND to 61	23 of 97	0.3
	Trans 1,2-Dichloroethene	ND to 5.6	2 of 97	0.3

Notes:
ppb - parts per billion
ppm - parts per million
ND - non detect
SCG - Soil Clean-Up Goals (1999 ROD)

Table 2
Former Chromalloy Facility
West Nyack, New York
Emergency Contact Numbers

Agency	Contact Number
Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 3
Former Chromalloy Facility
West Nyack, New York
Contact Numbers

Representative	Contact Number
Owner – Mr. John Magee Bradley Corporate Park (Pontiac Holding, LLC) 500 Bradley Hill Rd. Blauvelt, NY 10913	518-281-5436
NYSDEC Site Manager: Mr. Randy Whitcher	518-402-9662 (Office)
Sequa Representative: Brian Buniva	845-230-7374 (Direct) 804-873-0610 (Mobile)
Operations and Maintenance Technician: Joseph Menetti (TRC Engineers, Inc.)	516-417-7819 (Cell)
Project Manager: Marc Flanagan (TRC Engineers, Inc.)	518-894-1182 (Cell)
Senior Project Manager: Jennifer Miranda (TRC Engineers, Inc.)	212-221-7822 (Office)

Table 4
Former Chromalloy Facility
West Nyack, New York
Inspection and Monitoring Programs

Monitoring Program	2014 Frequency	Matrix	Analysis
P&T System Sampling	Quarterly	Groundwater	VOCs by 8260B (GW)
Surface water Sampling	Annual*	Surface water	VOCs by 8260B (GW)
Groundwater Sampling	Annual**	Groundwater	VOCs by 8260B (GW)
Site-wide Inspection	Annual	Not Applicable	None

* Discontinue surface water sampling based on the 2014 sampling event results.
** Existing plan includes collection of 44 groundwater samples. Refer to Table 5 showing the wells and proposed frequencies.

Table 5
Former Chromalloy Facility
West Nyack, New York
List of Monitoring Wells and Surface Water Sampling Frequency

Well ID	Type	Frequency		
Performance	**Monitoring Wells**	**2014**	**2015**	**2017***
MW- 1A	Overburden	X	X	X
MW- 1B	Bedrock	X	X	X
MW- 4B	Bedrock	X	X	X
MW- 11B	Bedrock	X	X	X
MW- 12A	Overburden	X	X	X
MW- 12B	Bedrock	X	X	X
Other Site Wells				
MW- 2A	Overburden	X	--	--
MW- 2B	Bedrock	X	X	X
MW- 3A	Overburden	X	--	--
MW- 3B	Bedrock	X	X	X
MW- 4A	Overburden	X	--	--
MW- 5A	Overburden	X	--	--
MW- 5B	Bedrock	X	X	X
MW- 6A	Overburden	X	X	X
MW- 6B	Bedrock	X	X	X
MW- 7B	Bedrock	X	X	X
MW- 8B	Bedrock	X	X	X
MW- 9B	Bedrock	X	--	--
MW- 11A	Overburden	X	--	--
MW- 14A	Overburden	X	--	--
MW- 14B	Bedrock	X	X	X
MW- 16A	Overburden	X	--	--
MW- 16B	Bedrock	X	--	--
MW- 17A	Overburden	X	--	--
MW- 18B	Bedrock	X	--	--
MW- 25A(S)	Overburden	X	--	--
Anaerobic Reductive				
MW- 19A	Overburden	X	--	--
MW- 20A	Overburden	X	--	--
MW- 21A(S)	Overburden	X	X	X
MW- 21A(I)	Overburden	X	--	--
MW- 22A(S)	Overburden	X	--	--
MW- 22A(I)	Overburden	X	--	--
MW- 23A(S)	Overburden	X	X	X
MW- 23A(I)	Overburden	X	--	--
MW- 23A(D)	Bedrock	X	X	X
MW- 24A(S)	Overburden	X	--	--
MW- 24A(I)	Overburden	X	--	--
MW- 24A(D)	Bedrock	X	X	X
MW- 26A	Overburden	X	--	--
MW- 27A	Overburden	X	--	--
Converted Residential Wells				
Well 25	Residential / Bedrock	X	X	X
Well 35	Residential / Bedrock	X	X	X
Well 36	Residential / Bedrock	X	X	X
Well 41	Residential / Bedrock	X	--	--
Surface Water Samples				
SW-1	Surface Water	X	--	--
SW-2	Surface Water	X	--	--
SW-3	Surface Water	X	--	--
SW-4	Surface Water	X	--	--
	Total Samples	48	21	21

* Every 2 years thereafter unless otherwise approved by the NYSDEC.

Table 6
Former Chromalloy Facility
West Nyack, New York
Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Quarterly P&T System Sampling	Annual
Site Cover Inspection	Annual
Surface Water and Groundwater Monitoring	Annual

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

FIGURES

APPENDICES

Appendix A

DPE Well Decommissioning Plan

APPENDIX A

Dual Phase Extraction (DPE) System Decommissioning Plan

A total of 22 dual phase extraction wells (DPE-1 through DPE-22) will be decommissioned according to the procedures in *CP-43: Groundwater Monitoring Well Decommissioning Policy*. Each of the 22 DPE wells will be decommissioned by grouting the well to ground surface as shown on Figure 2 of the policy. This procedure will minimize investigation derived waste.

Well decommissioning procedures are as follows:

- Remove the steel manhole or protective casing. Remove any equipment or debris and the drop tube and well seal.
- Measure total depth of the well to ensure the well depth is consistent with the recorded construction depth.
- The bottom of the casing shall be punctured using suitable equipment (i.e., drill rig or direct push rod system).
- The well shall be tremie- or pressure-grouted with a cement bentonite grout.
- The surface will be patched to match the surrounding surface type (i.e., concrete, asphalt, or seed) as appropriate.

The NYSDEC will be notified prior to decommissioning of monitoring wells and the decommissioning process will be documented in a brief summary letter report.

Appendix B

Remediation System As-Built Report and O&M Plan (Alliance 2002)

Appendix C

Monitoring Well Construction Logs

Appendix D

Field Groundwater Purge/Sample Form

Appendix E

HASP

Appendix F

Site-Wide Inspection Form

Appendix G

Quality Assurance Project Plan / Field Sampling Plan

Appendix H

Inspection Checklist

Appendix J

Effluent Limitations Monitoring Requirements

Appendix K

Chronological Listing of Primary Documents (OU1 and 2)