PSC - Chemical Pollution Control, LLC of New York

Corrective Measures Work Plan

Bay Shore Facility

(NYSDEC Permit No: 1-4728-00086/00002)

AUGUST 2011

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

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August 11, 2011

ELECTRONIC SUBMISSION

Heide-Marie Dudek, P.E.
Environmental Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau E
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Albany, NY 12233-7017

Re: PSC - Chemical Pollution Control, LLC of New York
Bay Shore, New York
EPA ID No. NYD082785429
NYSDEC Permit No. 1-4728-00086/00002

Dear Ms. Dudek:

Enclosed please find an electronic copy of the document entitled:

"Corrective Measures Work Plan
for
PSC – Chemical Pollution Control, LLC of New York"

If you have any questions and/or comments regarding the enclosed information, please do not hesitate to contact me at (631) 586 - 0333.

Very truly yours,

Gary Scoppio
Location Manager

GS/MDt/jmy
Enclosure
cc: A. Maloy (PSC)
B. Veith (D&B)

CORRECTIVE MEASURES WORK PLAN

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

(SITE NO. 1-52-015)

Prepared for:

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

AUGUST 2011

CORRECTIVE MEASURES WORK PLAN
PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

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1.0 INTRODUCTION

PSC - Chemical Pollution Control, LLC of New York (CPC) recently completed a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at its facility located at 120 South Fourth Street in Bay Shore, Suffolk County, New York. CPC retained the services of Dvirka and Bartilucci Consulting Engineers (D&B) to oversee the field activities and perform the soil and groundwater sampling specified in the New York State Department of Environmental Conservation (NYSDEC) approved RFI Work Plan dated August 2010, which also served as the NYSDEC permit-required Current Conditions Report. The field activities associated with this investigation were completed in August and September 2010, with a supplemental round of sampling completed in October 2010.

Subsequent to the field investigation, D&B prepared an RFI Report presenting a summary of all data obtained during the investigation, including identification and location of contaminants of concern, and comparison of contaminant concentrations to applicable standards, criteria and guidance (SCGs). The RFI Report contained conclusions based on the findings of the investigation, and recommendations regarding corrective action of identified impacts (i.e., remediation). A Focused Corrective Measures Study (CMS) was also incorporated into the RFI Report that evaluated and developed a corrective action remedy recommended for the site. The final RFI Report and Focused CMS was submitted to the NYSDEC dated November 2010.

As requested by the NYSDEC, this Corrective Measures Work Plan (CMWP) has been prepared by D&B for the CPC Bay Shore Facility to describe the implementation of the remedy selected in the Focused CMS. This remedy generally includes the excavation and off-site transportation and disposal of soil exceeding the 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives for select volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides and metals. Also included in the remedy is in-situ chemical oxidation to address groundwater exceeding the NYSDEC Class GA Groundwater Standards.

It should be noted that implementation of the corrective measures described herein will be performed by two separate contractors. In addition, CPC and D&B will have distinct

responsibilities during this project. Please refer to Section 7.0 of this report for a breakdown of the responsibilities for key participants that will be involved during this project.

1.1 Project Background

The CPC Bay Shore facility is a commercial hazardous waste treatment, storage and disposal facility that accepts and manages a variety of hazardous and nonhazardous waste including acids, alkalis, flammables, cyanides/sulfides, oxidizers, toxic waste, oily waste, photochemical waste, laboratory packaged waste, universal waste and polychlorinated biphenyl (PCB) waste under its existing Part 373/360 Permit (NYSDEC Permit No. 1-4728-00086/00002). Waste is received from both industrial and commercial generators, as well as from households. Following on-site processing, all waste is transported to authorized off-site treatment and disposal facilities. The facility has operated continuously at this location since 1976.

The CPC facility is currently in the permitting and planning phases of a facility upgrade that includes properly closing all of its existing hazardous waste storage areas in accordance with the requirements of 6 NYCRR Part 373, demolishing and removing its existing facility building, and constructing a new improved facility that meets its current operational needs and ensures compliance with all applicable environmental regulations. In implementing this CMWP, CPC intends to satisfy the corrective action requirements of its existing 6 NYCRR Part 373 Permit in support of the facility upgrade, remediate soil located on-site requiring removal during the construction of the new building at the facility and remediate any groundwater contamination that may need to be addressed. The overall goal of the remediation program at the facility is to satisfy the corrective action requirements presented in Module II of the facility's existing Part 373 Permit and to allow the facility to be delisted from New York State's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 1-52-015).

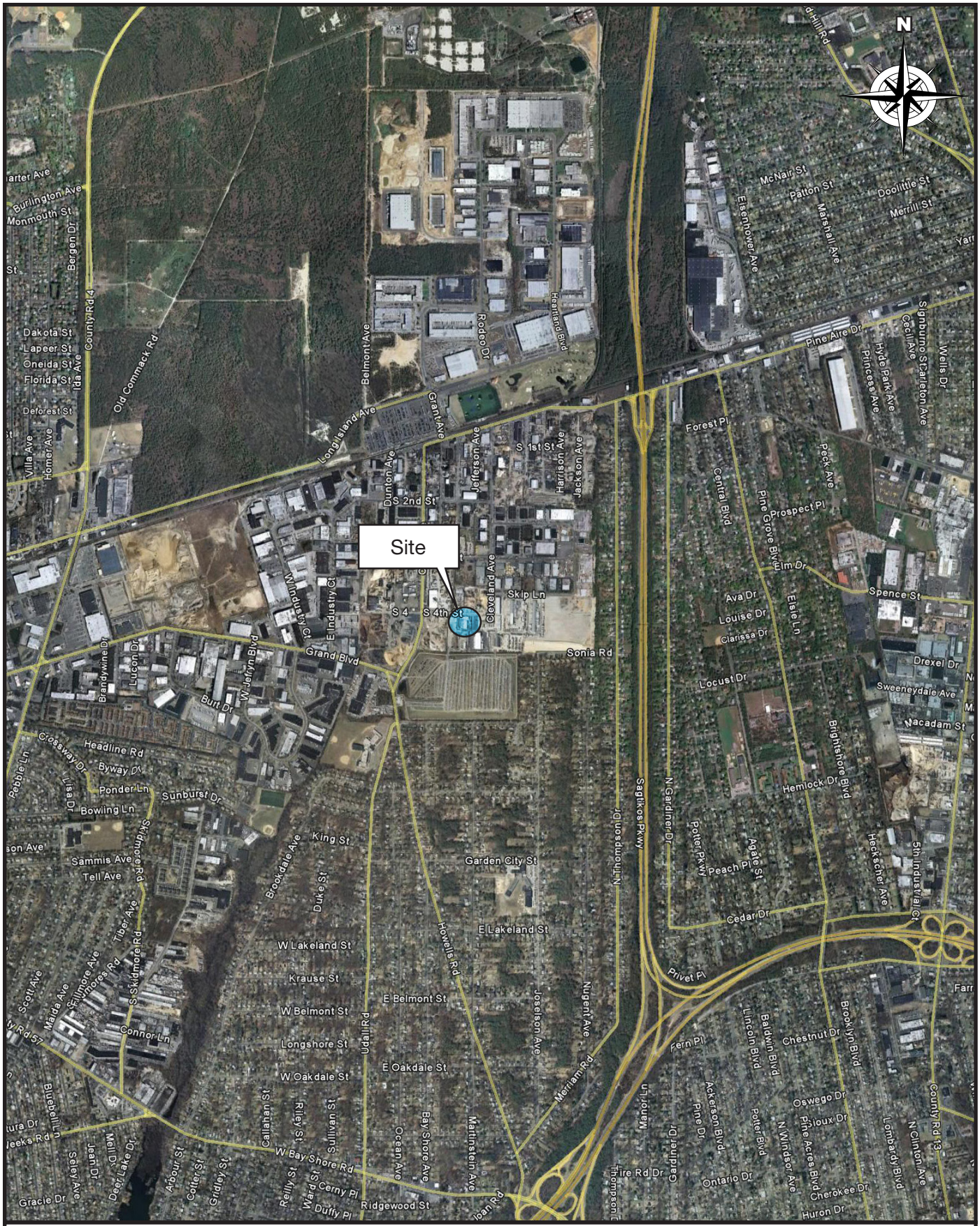
1.2 Site Description

The CPC facility is located at 120 South Fourth Street in Bay Shore, New York in an urban portion of the Town of Islip, Suffolk County, New York, approximately 2,500 feet west of the Sagtikos State Parkway. The CPC facility occupies a parcel approximately 1 acre in size. Primary access to the site is from South Fourth Street, which borders the north side of the facility. A site location map is provided as Figure 1-1.

The areas adjoining and surrounding the CPC facility consist of developed industrial properties. The CPC facility is bound by South Fourth Street to the north and by industrial properties to the east, south and west. The property immediately south of the CPC facility was formerly used by the Town of Islip as a landfill (Sonia Road Landfill) in the late 1960's. The former landfill itself is approximately 500 feet to the south of the CPC facility.

The CPC facility is a commercial hazardous waste treatment, storage and transfer facility and is a fully owned subsidiary of PSC, LLC. The CPC facility consists of a one-story masonry building and an asphalt-paved exterior area. The building contains office and maintenance areas and waste treatment and storage areas. Seven individually bermed drum storage areas, a diked drum storage area and six aboveground storage tanks are located adjacent to the building. The six storage tanks are located within three separate diked containment areas. The tanks are used to store and blend non-halogenated solvents, ignitable hazardous waste, various organic wastewaters, and various acid and alkali mixtures. A site plan for the CPC Bay Shore facility is provided as Figure 1-2.

The CPC facility receives and picks up hazardous waste and nonhazardous waste from a variety of waste generators and industries for shipment to off-site treatment and disposal facilities. This waste is transported to the facility in drum lots or as bulk loads primarily by CPC's transport vehicles and trained drivers. The CPC facility has a total of 12 container storage areas and six storage tanks. The facility accepts halogenated and non-halogenated hydrocarbons, organic waste waters, acids, caustics, ignitable hazardous waste, and listed hazardous waste for storage or consolidation in tanks. All waste is transported by CPC to authorized off-site treatment and disposal facilities. Toxic, flammable, corrosive and other various household waste



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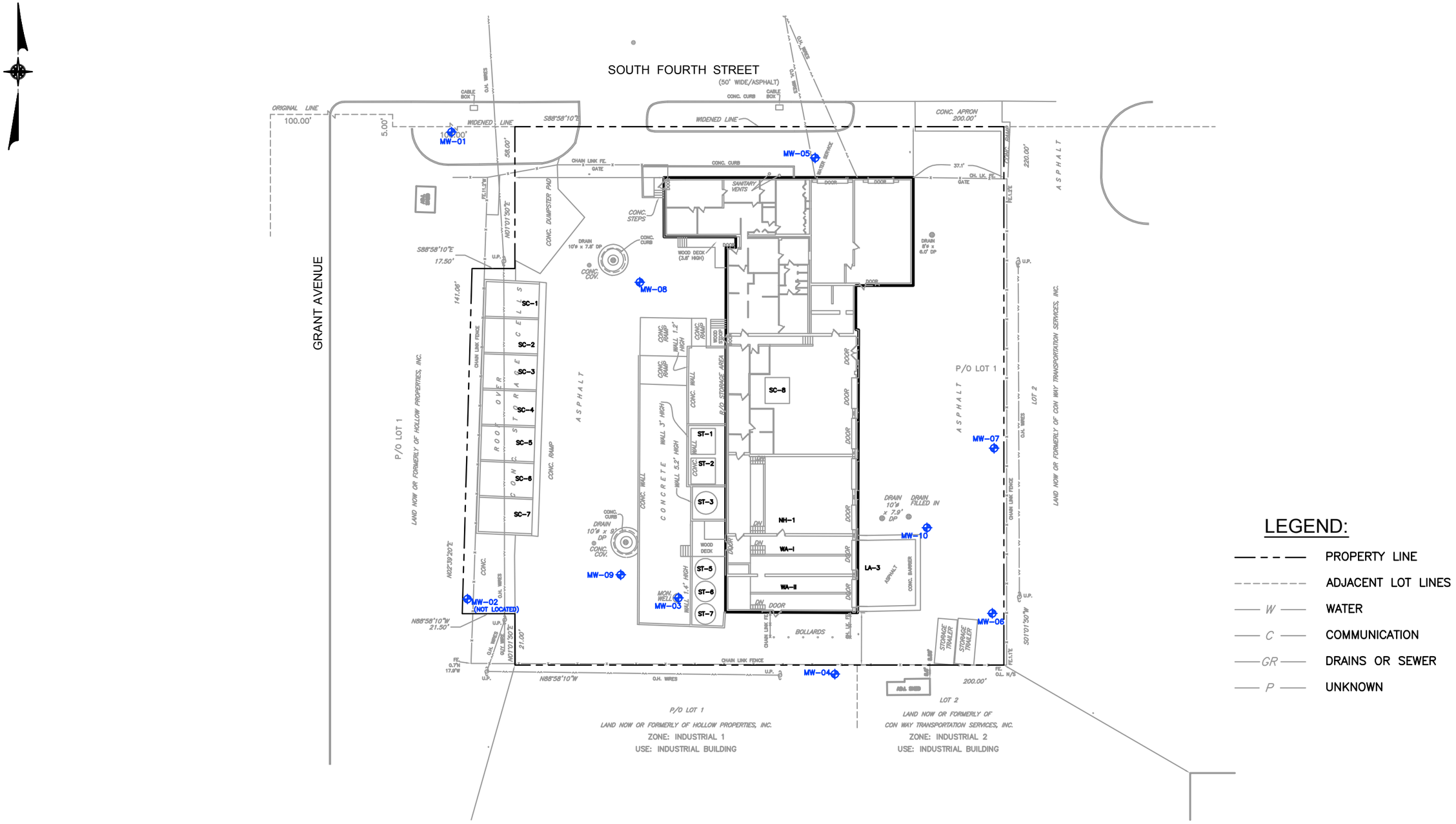
PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

SITE LOCATION MAP

FIGURE 1-1

2786-C2 - Site Location Map (Fig 1-1).indd (06/14/11 - 3:31 PM)



LEGEND:

- PROPERTY LINE
- ADJACENT LOT LINES
- W — WATER
- C — COMMUNICATION
- GR — DRAINS OR SEWER
- P — UNKNOWN

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SITE PLAN

SCALE: 1" = 40'

FIGURE 1-2

is accepted at the CPC facility from household waste generators. Lab-packed waste accepted at the CPC facility for storage may be repackaged without opening the individual inner containers. The CPC facility also treats photochemical waste fixer (e.g., spent silver bearing solution) on-site using automated electrolysis units and passive filter units to recover metallic silver. The CPC facility may occasionally store PCBs in containers at a volume less than 495 gallons for up to 10 days in compliance with 40 CFR Part 761 without a separate Toxic Substances Control Act (TSCA) facility storage permit. Specific storage requirements, procedures for consolidation in tanks and treatment processes are discussed in the facility's Part 373 Permit.

Based on the results of the RFI, the depth to groundwater at this site is approximately 9 feet below grade.

1.3 Summary of Prior Investigations

A Current Conditions Report (CCR) was prepared by Arcadis G&M, Inc. for Chemical Pollution Control, Inc., dated November 22, 2006. The CCR summarizes all known relevant information regarding the CPC facility. The findings of D&B's review of this document were presented in the NYSDEC-approved RFI Work Plan dated August 2010. As described in the Work Plan, the following environmental investigations were previously completed at the CPC facility:

- Phase II Environmental Site Assessment – 1987
- Monitoring Well Installation and Groundwater Sampling – 1994 through 1995
- Phase II Environmental Site Assessment – 1997
- Quarterly Groundwater Monitoring – 2002
- Soil and Groundwater Investigation – 2007

A brief summary of the findings of these investigations with regard to soil and groundwater impacts is provided below.

Soil

The 1987 Phase II Environmental Site Assessment (ESA) involved collecting surface soil samples from five locations and subsurface soil samples from two soil borings. The surface soil samples were analyzed for volatile organic compounds (VOCs), inorganic compounds, phenols and PCBs, and the subsurface soil samples were analyzed for inorganic compounds and pesticides. All detected concentrations were below the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Recommended Soil Cleanup Objectives (RSCOs).

The 1997 Phase II ESA involved collecting soil samples from three 30-foot deep soil borings. The soil samples exhibiting the highest photoionization detector (PID) reading or evidence of visual impact were submitted to a laboratory and analyzed for VOCs. Trace concentrations of VOCs were detected in the soil samples, all below the NYSDEC TAGM 4046 RSCOs.

The Soil and Groundwater Investigation performed in August 2007 involved the collection of subsurface soil samples from four dry wells and six soil borings, with laboratory analysis for VOCs, semivolatile organic compounds (SVOCs), inorganic compounds, PCBs and pesticides. The results indicated VOC and SVOC compounds detected in the subsurface soil samples at concentrations below the NYSDEC's Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs), which became effective December 14, 2006 and replaced the TAGM 4046 RSCOs. Chromium was detected at a maximum concentration of 180 mg/kg in subsurface soil sample SB-03 (1.5 to 3.5 feet), above the Unrestricted Use SCO of 30 mg/kg. In addition, silver was detected in SB-02 (5 to 7 feet) at a concentration of 3.4 mg/kg, which is above the Unrestricted Use SCO of 2 mg/kg. SB-02 and SB-03 are located in the central and southern portion of the truck load/unload area on the western side of the facility building, respectively.

One subsurface soil sample collected from a dry well, DW-04 (8 to 9 feet), exhibited concentrations of lead, silver, zinc and several pesticides above their respective Unrestricted Use SCOs. DW-04 is located on the east side of the facility building.

Groundwater

Between 1987 and 1997, 10 groundwater monitoring wells (MW-1 thorough MW-10) were installed at the CPC facility. The surveyed locations of these wells are shown on Figure 1-2. It should be noted that monitoring well MW-2 was apparently destroyed sometime prior to 2007. Groundwater flow direction across the site is generally to the southeast.

At least 13 rounds of groundwater sampling were performed at the CPC facility from 1987 through 2007. At a minimum, these samples were analyzed for VOCs. However, some samples were also analyzed for SVOCs, inorganic compounds, pesticides and/or PCBs. The groundwater results indicated that chlorinated VOCs (CVOCs) are the class of compounds most frequently detected in on-site groundwater above NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA Groundwater Standards and Guidance Values, including trichloroethene (TCE), cis-1,2-dichloroethene (1,2-DCE) and, to a lesser degree, tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA). Historically, these compounds have been most frequently detected, and detected at the highest concentrations, in monitoring wells MW-3, MW-4 and MW-6, located on the southern, downgradient side of the facility. Concentrations of these same CVOCs have also been elevated in well MW-9, located in the vicinity of and to the west of MW-3.

With the exception of the sampling round conducted in 1987, CVOCs have generally not been detected in upgradient wells MW-1 and MW-5 during the historical monitoring period. The groundwater sample results from the 1987 sampling round indicated that upgradient monitoring well MW-5 exhibited CVOC concentrations similar to that of downgradient monitoring wells MW-3 and MW-4. However, only low-level concentrations were detected in upgradient monitoring well MW-1.

During the August 2007 sampling event, MW-4 exhibited the maximum concentrations of TCE (330 ug/l), 1,2-DCE (320 ug/l) and PCE (14 ug/l) detected at the facility. The Class GA Standard for these compounds is 5 ug/l. Unlike previous sampling rounds, in August 2007, PCE and 1,2-DCE were not detected in wells MW-3 and MW-6 above their respective Class GA

Standards. However, TCE was detected at a concentration of 7 ug/l in these wells, and 6 ug/l in MW-9. 1,1,1-TCA was not detected above its Class GA Standard in any of the monitoring wells during the August 2007 sampling round.

Although lead and chromium have been occasionally detected above Class GA Standards in wells MW-2 and MW-3, these metals were not detected at elevated concentrations during the August 2007 sampling event. Iron and sodium were detected at concentrations above their respective Class GA Standards of 300 and 20,000 ug/l at several wells during the August 2007 sampling event. The maximum concentration of iron was 1,100 ug/l (MW-6) and the maximum concentration of sodium was 27,000 ug/l (MW-9).

Light non-aqueous phase liquid (LNAPL) was observed in monitoring well MW-3 in May 2002 at a thickness of less than 0.5 inch. The LNAPL was very light brown to tan colored, had a low viscosity and a mild organic odor. The analytical results indicated that the LNAPL contained fairly high concentrations of total sulfur and total halogens, but very low concentrations of the chlorinated compounds present in the groundwater samples collected from the facility monitoring wells. Subsequent groundwater sampling events conducted during 2002 and in August 2007 did not detect any LNAPL in monitoring well MW-3.

RCRA Facility Investigation

As previously indicated, D&B completed an RFI at the CPC Bay Shore facility. The field activities associated with this investigation were completed in August and September 2010, with a supplemental round of sampling completed in October 2010. The RFI Report was submitted to the NYSDEC in November 2010.

During the RFI, four test pits (TP-1 through TP-4) were excavated to determine the presence of suspected underground storage tanks. TP-1 was terminated at 1.2 feet below grade where a cement cover for an active leaching pool associated with the facility's sanitary waste disposal system was identified. Two single-walled steel USTs, each estimated at 4,000 gallons in capacity, were encountered in test pits TP-2 and TP-3. Due to their proximity to each other

and UST removal activities, test pits TP-2 and TP-3 became one large test pit, designated TP-2/3 for sampling purposes. Each UST was removed for proper off-site management in accordance with NYSDEC and Suffolk County requirements, except for the western end of the UST in TP-3. This part of the UST was located in close proximity to the northeast corner of the facility building. As a result, the westernmost 6 feet of the tank was filled with concrete and left in place to be excavated and removed during construction of the new facility building. No USTs or other subsurface structures were identified during the excavation of TP-4. Evidence of contaminated soil was not identified in any of the test pits based on visual observations and field instrument measurements. Soil samples were collected and analyzed from the sidewalls and bottom of each test pit for Target Compound List (TCL) VOCs, TCL SVOCs and Target Analyte List (TAL) metals. One soil sample was collected from TP-1, nine soil samples were collected from TP-2/3 and five soil samples were collected from TP-4. The soil samples collected from the test pits did not contain any VOC, SVOC or metal concentrations exceeding the 6 NYCRR Part 375 Unrestricted Use SCOs.

In addition to the test pits, a total of 42 soil probes (B-1 through B-42) were advanced at the CPC facility in order to characterize subsurface soil conditions. A total of 96 subsurface soil samples were selected for chemical analysis from the 42 soil probes. All subsurface soil samples collected from the soil probes were analyzed for one or more of the following: TCL VOCs, TCL SVOCs, TCL PCBs, TCL pesticides, TAL metals and cyanide. The nine existing monitoring wells (MW-1 and MW-3 through MW-9) were sampled for TCL VOCs, TCL SVOCs, TAL metals and cyanide. In addition, MW-1, MW-3, MW-4 and MW-6 were sampled for natural attenuation parameters. The results of the soil probe investigation and groundwater sampling completed during the RFI are summarized below.

The soil probe investigation completed during the RFI indicated the presence of VOCs in subsurface soil at concentrations above the Unrestricted Use SCOs, but below the Commercial Use SCOs. The VOC soil contamination was primarily detected in soil probes completed to the west of the facility building, specifically B-9, B-10, B-11, B-19, B-37 and B-41, from surface to a maximum depth of 4 feet below grade. The VOCs of concern include three CVOCs (i.e., TCE, 1,2-DCE and PCE), toluene, ethylbenzene, total xylene and 1,2-dichlorobenzene. CVOCs were

detected in all of the above-referenced soil probes while the other contaminants were detected only in soil probes B-10 and B-19, at the same depths where elevated PID readings were recorded. In addition, acetone and xylene were detected in soil probe B-27, which was advanced through the building floor in storage area WA-I, at a depth of 4 to 6 feet below ground surface exceeding the Unrestricted Use SCOs. The area of VOC-impacted soil was well delineated, with deeper soil samples in these probes and surrounding soil probes exhibiting VOC concentrations below the Unrestricted Use SCOs.

Groundwater sampling of the nine existing monitoring wells located on the CPC facility indicated elevated concentrations of four CVOCs above their respective Class GA Standards in three wells, specifically MW-3, MW-4 and MW-9. The CVOCs detected above their respective Class GA Standards were TCE and 1,2-DCE in all three wells, PCE in MW-4 and MW-9, and 1,1,1-TCA in MW-3. MW-4 exhibited the maximum concentrations of TCE (280 ug/l), 1,2-DCE (350 ug/l) and PCE (12 ug/l) at the facility, all above their Class GA Standard of 5 ug/l. These are the same CVOCs detected above their respective Unrestricted Use SCOs in the subsurface soil samples. The other VOCs detected above the Unrestricted Use SCOs in soil were not detected in groundwater.

A few SVOCs, pesticides and metals were detected at concentrations above their respective Unrestricted Use SCOs in the shallow soil samples collected from soil probes, including:

- Several PAHs, one pesticide (4,4'-DDT) and seven heavy metals (chromium, cadmium, copper, lead, mercury, silver and zinc) were detected above their respective Unrestricted Use SCOs in soil sample B-33 (0 to 2 feet). Soil probe B-33 was completed through a filled dry well located on the east side of the facility building and the elevated concentrations are likely related to the nature of the material utilized to fill the last two feet of the dry well. Soil samples collected deeper than 2 feet did not exhibit elevated concentrations of these contaminants.

- With the exception of B-33, pesticides exceeding the Unrestricted Use SCOs in shallow soil included 4,4'-DDT and 4,4'-DDE in B-36 (0 to 2 feet and 2 to 4 feet) and 4,4'-DDT in B-2 (0 to 2 feet) and B-7 (2 to 4 feet).

- With the exception of B-33, metals exceeding the Unrestricted Use SCOs in shallow soil included chromium, lead, silver and zinc. Chromium was detected above its Unrestricted Use SCO in all three soil samples collected from B-14.

- With the exception of chromium in B-14, the extent of shallow soil contamination is generally delineated with deeper soil samples and surrounding soil probes exhibiting contaminant concentrations below the Unrestricted Use SCOs.

Iron, manganese and sodium were detected above their respective Class GA Standards in one or more of the nine groundwater monitoring well samples, including samples collected from the upgradient wells. Typically, these metals are naturally elevated in Long Island groundwater. In addition, the metals detected above the Class GA Standards in groundwater are not the same as those detected above the Unrestricted Use SCOs in shallow soil. Therefore, there is no evidence that elevated metal concentrations in soil are impacting facility groundwater quality.

April 2011 Groundwater Sampling Event

In April 2011, D&B sampled the nine monitoring wells located at the site for TCL VOCs, TCL SVOCs and priority pollutant metals. This sampling was conducted in accordance with the Groundwater Monitoring Plan dated January 2010 for the CPC Bay Shore facility, and as required by the facility's Part 373 Permit. Six of the nine groundwater samples collected from the monitoring wells exhibited detectable concentrations of VOCs. The detected VOCs consisted entirely of three CVOCs, specifically TCE, 1,2-DCE and PCE. Only the samples collected from wells MW-3, MW-4 and MW-9 exhibited concentrations of these CVOCs above their respective Class GA Standards.

These CVOCs are the same contaminants detected during the August 2010 sampling conducted as part of the RFI, as well as available historical groundwater results for the site. However, overall, total VOC concentrations were significantly lower than the August 2010 sampling event.

SVOCs were not detected in any of the groundwater samples collected during the April 2011 groundwater sampling event.

Priority pollutant metals were not detected at concentrations exceeding their respective Class GA Standards in any of the nine monitoring well samples, with the exception of iron in two wells (MW-7 and MW-8) and total chromium in one well (MW-03). Iron was detected at a concentration of 1,190 ug/l in well MW-7 and 668 ug/l in well MW-8, which exceed its Class GA Standard of 300 ug/l. Total chromium was detected at a concentration of 66.5 ug/l in well MW-3, which exceeds its Class GA Standard of 50 ug/l.

1.4 Summary of Environmental Conditions at the Site

This section briefly describes the current and future conditions of the CPC Bay Shore facility. As described in Section 1.2, the CPC facility is a commercial hazardous waste treatment, storage and transfer facility. The CPC facility consists of a one-story masonry building with office and maintenance areas, waste treatment and storage areas, and exterior bermed drum storage areas and diked tank storage areas. The entire facility is surrounded by a chain-link fence with locking gates. As a result, the facility is only accessible to CPC personnel and authorized waste transporters delivering or picking-up waste from the facility. The areas adjoining and surrounding the CPC facility consist of developed industrial properties. The property surrounding the existing facility building is generally paved or concrete, with limited areas of vegetation.

Four active dry wells, two located west of the facility building and two located east of the facility building, are utilized to manage storm water runoff. The CPC facility is serviced by public water and on-site groundwater is not used for any purpose. Sanitary waste is discharged to an on-site septic system.

Based on the results of the RFI, eleven areas beneath and surrounding the CPC facility building will require remediation. The depth of required remediation varies from approximately 2 feet below grade to 8 feet below grade. In addition, shallow groundwater in the vicinity of monitoring wells MW-3, MW-4 and MW-9 requires remediation. The nature and extent of the required remediation is further described in Section 2.0 of this CMWP.

As previously indicated, the CPC facility is currently in the permitting and planning phases of a facility upgrade that includes properly closing all of its existing hazardous waste storage areas in accordance with the requirements of 6 NYCRR Part 373, demolishing and removing its existing facility building, and constructing a new improved facility that meets its current operational needs and ensures compliance with all applicable environmental regulations. Additional soil will require excavation and removal to construct the new facility, including soil beneath the existing Part 373 permitted storage areas that will require RCRA Closure. In order to support RCRA Closure of these storage areas, confirmation soil samples will be collected and analyzed from the excavation areas beneath the storage areas, even though concentrations of constituents of concern exceeding the 6 NYCRR Part 375 Unrestricted Use SCOs were not identified in these areas during the RFI. This additional work is also addressed by this CMWP, as more fully described in Section 2.0.

1.5 Contemplated Use of the Site

The contemplated use of the site post-remediation will be the same as the current use of the site, as a commercial hazardous waste treatment, storage and transfer facility. In implementing this CMWP, CPC intends to satisfy the corrective action requirements of its existing 6 NYCRR Part 373 Permit in support of the facility upgrade, remediate soil located on-site requiring removal during the construction of the new building at the facility, and remediate any groundwater contamination that may need to be addressed. The overall goal of the remediation program at the facility is to satisfy the corrective action requirements presented in Module II of the facility's existing Part 373 Permit and to allow the facility to be delisted from New York State's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 1-52-015).

The overall project will occur in five distinct phases: abovegrade RCRA Closure of the existing Part 373 permitted storage areas at the facility; demolition and removal of the existing facility building and structures; excavation and removal of contaminated soil followed by in-situ chemical oxidation to address groundwater contamination; excavation and removal of soil beneath the closed storage areas; and, construction of the new facility.

All remedial activities will be overseen by a representative of D&B and will be completed in accordance with the Health and Safety Plans (HASPs) prepared by each major party involved in the remedial program (i.e., D&B, Building Contractor, In-situ Chemical Oxidation Contractor) as detailed in Section 5.0. In addition, full-time air monitoring will be performed in accordance with a Community Air Monitoring Plan (CAMP) (see Section 5.0).

2.0 CORRECTIVE MEASURES SELECTION

The purpose of this section is to provide an engineering evaluation of the selected remedial alternative to address the subsurface soil and groundwater contamination identified in the RFI Report. The selected remedy was described in the Focused CMS which accompanied the RFI Report dated November 2010. The goal of this evaluation is to demonstrate how the selected remedy meets the remedial goals and remedial action objectives presented in Section 2.1 below.

The existing facility will be demolished in the near future and a new facility constructed. Due to the limited extent of contamination across the site as presented in the RFI and briefly summarized in this report, it was determined that excavation of impacted soil was the most practical and cost effective means for remediating impacted soil. This is due to the fact that the identified impacts were relatively shallow and the existing building would not affect the removal of impacted soil since the building will be demolished. As a result, this alternative coupled with in-situ chemical oxidation to address groundwater quality was the only remedy considered practical for the site. This "presumptive remedy" approach formed the basis of the Focused CMS prepared for the facility. It is the intent of the remedy presented in the Focused CMS and described in this CMWP to satisfy the existing corrective action requirements contained in Module II of the facility's Part 373 Permit and to allow the site to be delisted from the Registry of Inactive Hazardous Waste Disposal Sites (the site is currently designated as a Class 2 site).

2.1 Remedial Goals and Remedial Action Objectives

Remedial action objectives (RAOs) are goals developed for the protection of human health and the environment. Definition of these objectives requires an assessment of the media of concern, migration pathways, exposure routes and potential receptors. Typically, remedial goals are established based on standards, criteria and guidance (SCGs) to protect human health and the environment. SCGs for the site were developed in the RFI Work Plan. The SCGs for soil are the NYSDEC's Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs). The SCGs selected for groundwater are the NYSDEC's Technical and Operational Guidance Series

(TOGS) 1.1.1 Class GA Groundwater Standards and Guidance Values, hereinafter referred to as Class GA Standards. These SCGs have been utilized to define areas requiring remediation.

Figure 2-1 presents a summary of the soil sample locations and soil data where exceedances of the Unrestricted Use SCOs were detected during the RFI. Figures 2-2 and 2-3 present a summary of the groundwater sample locations and groundwater data where exceedances of the Class GA Standards were detected during the RFI and April 2011 Semiannual Groundwater Monitoring Program sampling event, respectively. Based on the nature of the contaminants associated with the site and the findings of the exposure assessment, the RAOs for this CMWP include the following:

RAOs for Public Health Protection

- Mitigate ingestion/direct contact with contaminated soil and dust.
- Mitigate inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

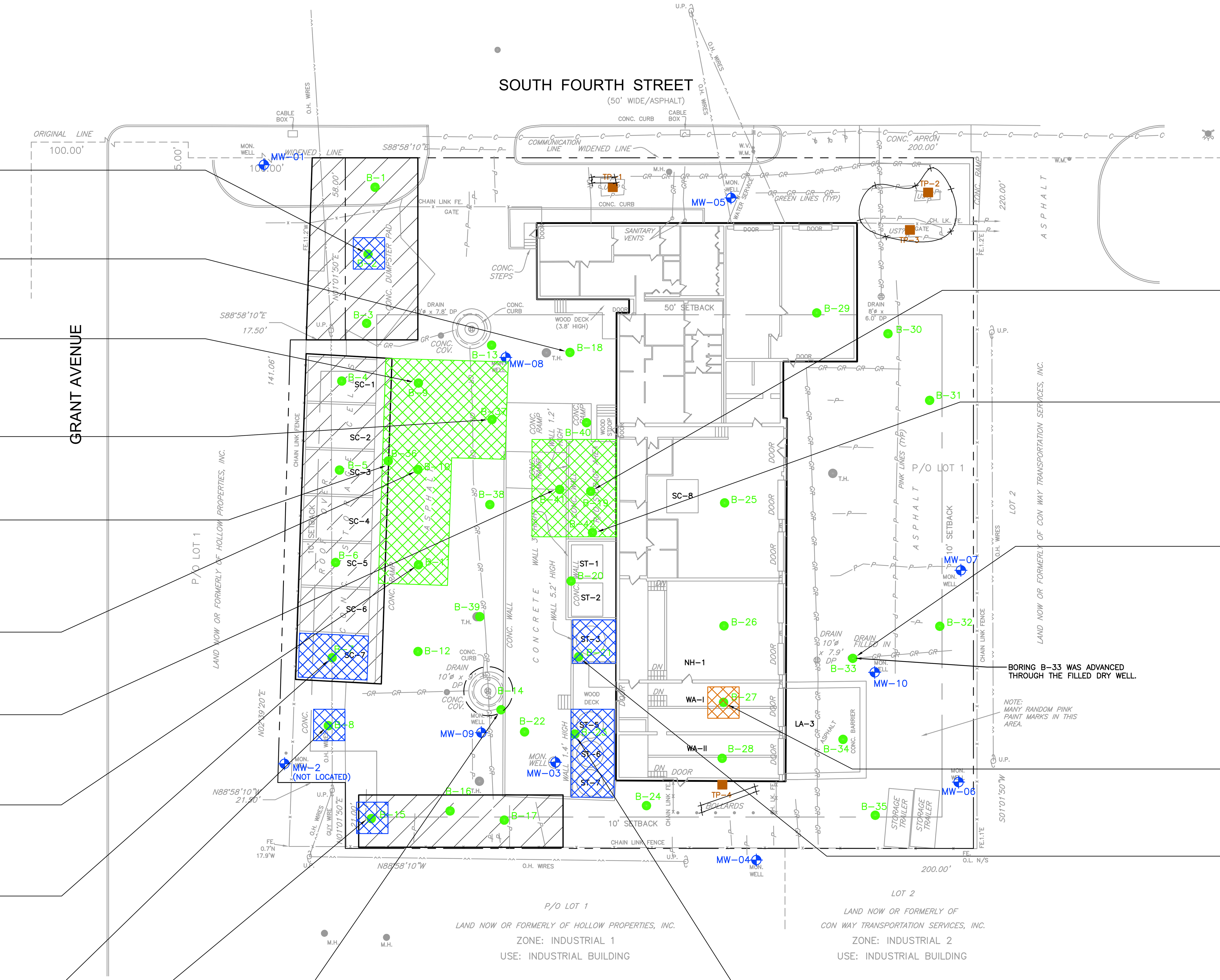
- Mitigate further migration of contaminants that would result in groundwater or surface water contamination.
- Mitigate migration of groundwater contamination.

2.2 Summary of Remedy

As indicated above, the remedy selected for use at this site involves excavating impacted soil for off-site disposal and applying a chemical oxidant to address groundwater impacts. It should be noted that it is the intent of the chemical oxidant application to reduce CVOC concentrations through focused application of chemical oxidant followed by groundwater monitoring. The application of chemical oxidant will be accomplished through injection using direct push techniques, direct application into an excavation or some other technique. CPC has

NOTES:

1. VOCs – VOLATILE ORGANIC COMPOUNDS
2. SVOCs – SEMIVOLATILE ORGANIC COMPOUNDS
3. SCG – NYSDEC PART 375 UNRESTRICTED USE SOIL CLEANUP OBJECTIVES (SCO)
4. ONLY EXCEEDANCES OF THE SCG ARE SHOWN. DASH INDICATES NOT DETECTED OR DETECTED BELOW SCG.



B-2

	CONSTITUENT	SCG	0'-2'	UNITS
PESTICIDES	4,4'-DDT	3.3	5.8	ug/kg

B-18

	CONSTITUENT	SCG	2'-4'	UNITS
VOCs	ACETONE	50	60	ug/kg

B-9

	CONSTITUENT	SCG	2'-4'	UNITS
VOCs	CIS-1,2-DICHLOROETHENE	250	2,100	ug/kg

B-37

	CONSTITUENT	SCG	2'-4'	UNITS
VOCs	CIS-1,2-DICHLOROETHENE	250	500	ug/kg

B-36

	CONSTITUENT	SCG	0'-2'	2'-4'	UNITS
PESTICIDES	4,4'-DDE	3.3	3.7	5.4	ug/kg
	4,4'-DDT	3.3	6.0	9.1	ug/kg

B-10

	CONSTITUENT	SCG	0'-2'	2'-4'	UNITS
VOCs	ETHYLBENZENE	1,000	16,000	–	ug/kg
	TOTAL XYLENE	260	91,000	–	ug/kg
	1,2-DICHLOROBENZENE	1,100	46,000	1,400	ug/kg
	TRICHLOROETHENE	470	–	1,900	ug/kg

B-41

	CONSTITUENT	SCG	2'-4'	UNITS
VOCs	CIS-1,2-DICHLOROETHENE	250	3,400	ug/kg

B-11

	CONSTITUENT	SCG	2'-4'	UNITS
VOCs	TRICHLOROETHENE	470	12,000	ug/kg

B-7

	CONSTITUENT	SCG	2'-4'	UNITS
PESTICIDES	4,4'-DDT	3.3	17	ug/kg

B-8

	CONSTITUENT	SCG	0'-2'	UNITS
METALS	LEAD	63	107	mg/kg
	ZINC	109	304	mg/kg

B-15

	CONSTITUENT	SCG	2'-4'	UNITS
METALS	CHROMIUM	30	40	mg/kg

B-14

	CONSTITUENT	STANDARD	0'-2'	2'-4'	4'-6'	UNITS
METALS	CHROMIUM	30	105	213	84.8	mg/kg

B-23

	CONSTITUENT	STANDARD	0'-2'	UNITS
METALS	SILVER	2	36.6	mg/kg

B-19

	CONSTITUENT	SCG	0'-2'	2'-4'	UNITS
VOCs	TRICHLOROETHENE	470	2,500	–	ug/kg
	TETRACHLOROETHENE	1,300	14,000	–	ug/kg
	1,2-DICHLOROBENZENE	1,100	10,000	23,000	ug/kg
	TOTAL XYLENE	260	–	37,000	ug/kg
	ETHYLBENZENE	1,000	–	10,000	ug/kg
	TOLUENE	700	–	5,500	ug/kg
	CIS-1,2-DICHLOROETHENE	250	–	600	ug/kg
SVOCs	PHENOL	330	1,300	–	ug/kg

B-42

	CONSTITUENT	SCG	0'-2'	UNITS
METALS	CHROMIUM	30	483	mg/kg

B-33

	CONSTITUENT	SCG	0'-2'	UNITS
SVOCs	BENZO(a)ANTHRACENE	1,000	2,900	ug/kg
	CHRYSENE	1,000	2,400	ug/kg
	BENZO(b)FLUORANTHENE	1,000	3,300	ug/kg
	BENZO(k)FLUORANTHENE	800	1,600	ug/kg
	BENZO(a)PYRENE	1,000	2,200	ug/kg
	INDENO(1,2,3-cd)PYRENE	500	1,400	ug/kg
	DIBENZO(a,h)ANTHRACENE	330	620	ug/kg
PESTICIDES	4,4'-DDT	3.3	9.1	ug/kg
METALS	CADMIUM	2.5	4.6	mg/kg
	CHROMIUM	30	65.7	mg/kg
	COPPER	50	162	mg/kg
	LEAD	63	641	mg/kg
	MERCURY	0.18	0.3	mg/kg
	SILVER	2	6	mg/kg
	ZINC	109	305	mg/kg

B-27

	CONSTITUENT	SCG	4'-6'	UNITS
VOCs	ACETONE	50	54	ug/kg
	TOTAL XYLENE	260	310	ug/kg

B-21

	CONSTITUENT	SCG	0'-2'	UNITS
METALS	SILVER	2	2.5	mg/kg

LEGEND

- PROPERTY LINE
- ADJACENT LOT LINES
- WATER
- COMMUNICATION
- DRAINS OR SEWER
- UNKNOWN
- B-1 SOIL SAMPLE LOCATION
- TP-2 TEST PIT LOCATION
- LIMITS OF COMPLETED TEST PIT
- MW-1 MONITORING WELL

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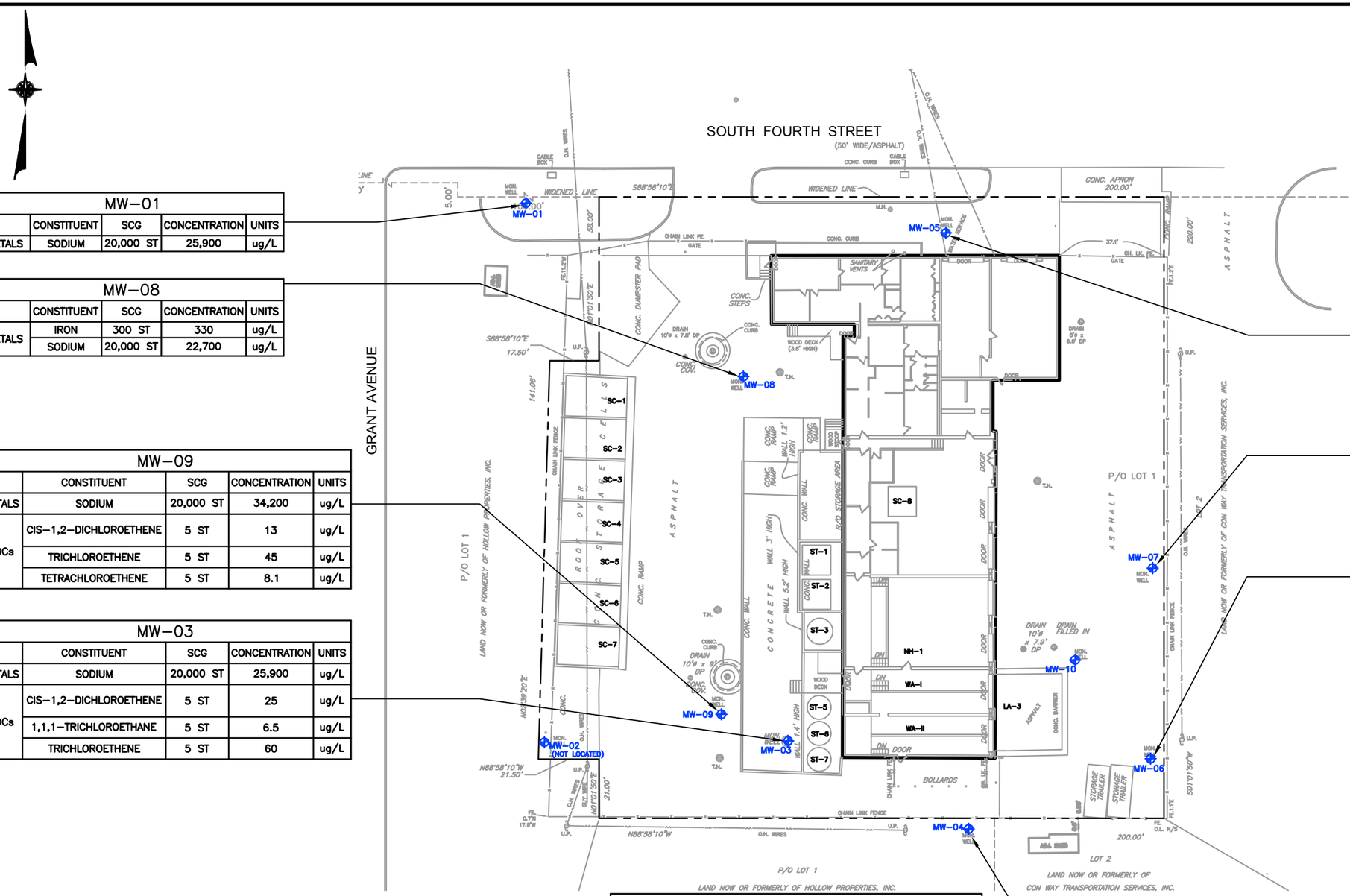
CORRECTIVE MEASURES WORK PLAN

SUMMARY OF SOIL SAMPLE EXCEEDANCES

SCALE: 1" =20'

FIGURE 2-1



NOTES:

1. VOCs – VOLATILE ORGANIC COMPOUNDS
2. SCG – TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES
3. ST – STANDARD
4. GV – GUIDANCE VALUE
5. ONLY EXCEEDANCES OF THE SCG ARE SHOWN

MW–01				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	SODIUM	20,000 ST	25,900	ug/L

MW–08				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	IRON	300 ST	330	ug/L
	SODIUM	20,000 ST	22,700	ug/L

MW–09				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	SODIUM	20,000 ST	34,200	ug/L
VOCs	CIS–1,2–DICHLOROETHENE	5 ST	13	ug/L
	TRICHLOROETHENE	5 ST	45	ug/L
	TETRACHLOROETHENE	5 ST	8.1	ug/L

MW–03				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	SODIUM	20,000 ST	25,900	ug/L
VOCs	CIS–1,2–DICHLOROETHENE	5 ST	25	ug/L
	1,1,1–TRICHLOROETHANE	5 ST	6.5	ug/L
	TRICHLOROETHENE	5 ST	60	ug/L

MW–04				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	SODIUM	20,000 ST	27,100	ug/L
VOCs	CIS–1,2–DICHLOROETHENE	5 ST	350	ug/L
	TRICHLOROETHENE	5 ST	280	ug/L
	TETRACHLOROETHENE	5 ST	12	ug/L

MW–05				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	MANGANESE	300 ST	522	ug/L

MW–07				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	MANGANESE	300 ST	930	ug/L
	SODIUM	20,000 ST	21,100	ug/L

MW–06				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	SODIUM	20,000 ST	24,200	ug/L

LEGEND:

- PROPERTY LINE
- ADJACENT LOT LINES
- W – WATER
- C – COMMUNICATION
- GR – DRAINS OR SEWER
- P – UNKNOWN
- MW-1 – MONITORING WELL

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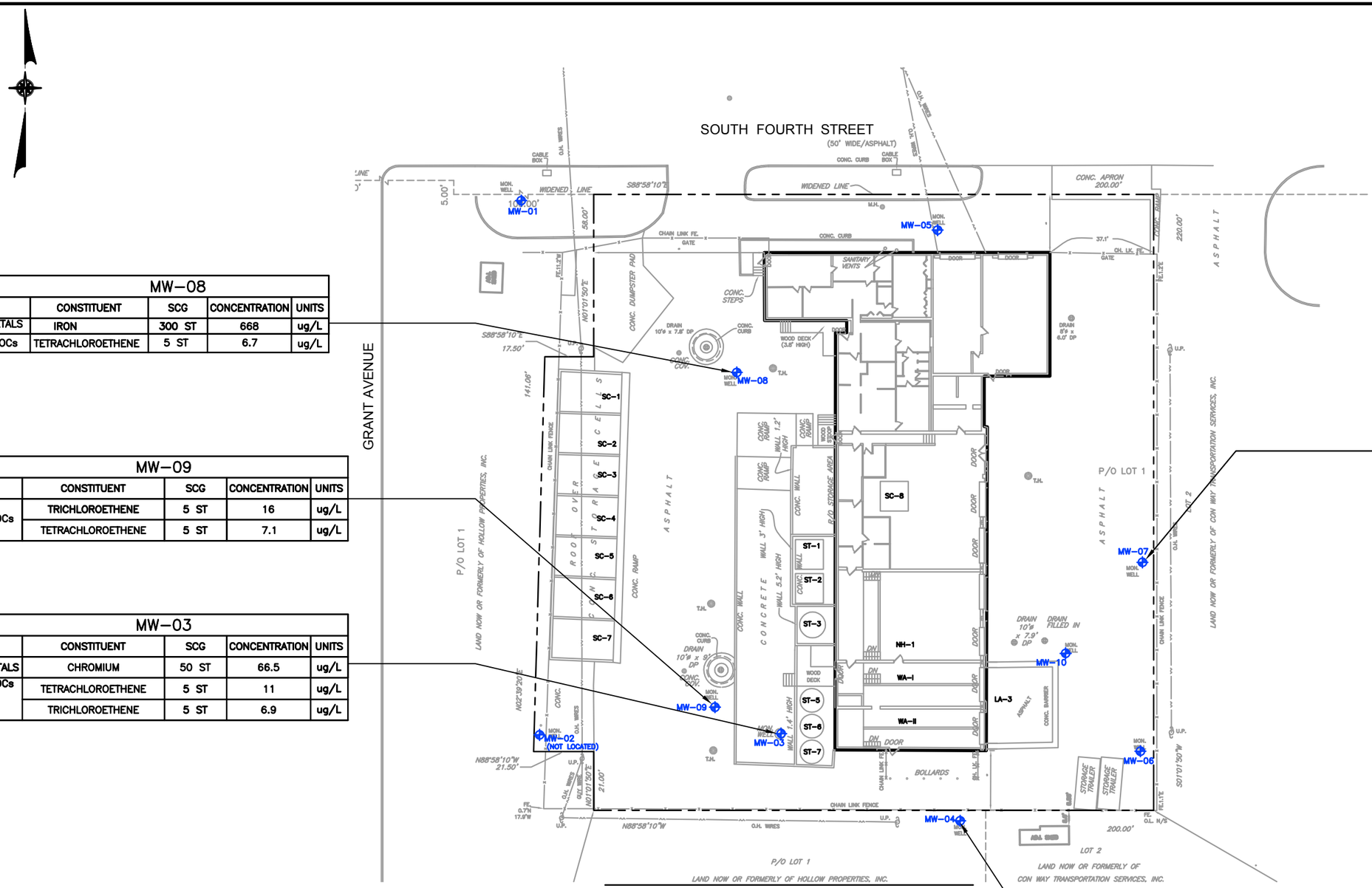
CORRECTIVE MEASURES WORK PLAN

SUMMARY OF GROUNDWATER SAMPLE EXCEEDANCES - AUGUST 2010

SCALE: 1" = 40'

FIGURE 2-2



NOTES:

1. VOCs – VOLATILE ORGANIC COMPOUNDS
2. SCG – TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES
3. ST – STANDARD
4. GV – GUIDANCE VALUE
5. ONLY EXCEEDANCES OF THE SCG ARE SHOWN

MW–08				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	IRON	300 ST	668	ug/L
VOCs	TETRACHLOROETHENE	5 ST	6.7	ug/L

MW–09				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
VOCs	TRICHLOROETHENE	5 ST	16	ug/L
	TETRACHLOROETHENE	5 ST	7.1	ug/L

MW–03				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	CHROMIUM	50 ST	66.5	ug/L
VOCs	TETRACHLOROETHENE	5 ST	11	ug/L
	TRICHLOROETHENE	5 ST	6.9	ug/L

MW–07				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
METALS	IRON	300 ST	1,190	ug/L

MW–04				
	CONSTITUENT	SCG	CONCENTRATION	UNITS
VOCs	CIS–1,2–DICHLOROETHENE	5 ST	45	ug/L
	TRICHLOROETHENE	5 ST	54	ug/L
	TETRACHLOROETHENE	5 ST	5.5	ug/L

LEGEND:

- PROPERTY LINE
- ADJACENT LOT LINES
- MW–1 MONITORING WELL

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CORRECTIVE MEASURES WORK PLAN

SUMMARY OF GROUNDWATER SAMPLE EXCEEDANCES - APRIL 2011

SCALE: 1" = 40'

FIGURE 2-3

agreed to monitor groundwater quality semiannually at the Bay Shore facility for the effective period of its existing Part 373 Permit (expiration date June 21, 2015). As a result, the natural degradation of any residual CVOC concentrations remaining following the proposed chemical oxidant application will be monitored and additional activities may be explored if CVOC concentrations persist or increase significantly in the future.

Drawing EN1 provided in the map pocket at the end of this section indicates the extent of soil to be removed as part of the proposed remedy. This drawing indicates the proposed horizontal and vertical limits of soil to be removed to satisfy both the corrective action and RCRA Closure requirements contained in CPC's existing Part 373 Permit. These areas are described in more detail below, but generally contain the 11 areas of impacted soil identified during the RFI (Area IDs: A, C, D, E, G, H, J, M, O, Q, and S), three additional areas of excavation surrounding existing dry wells at the site requested by NYSDEC (Area IDs: I, V, S), and the areas beneath the existing Part 373 Permitted storage areas (Area IDs: B, F, K, L, N, P, R). It should be noted that Area S includes both the B-33 Area (former southeast dry well) identified during the RFI and the active Southeast Dry Well, where excavation was requested by the NYSDEC. These areas also include excavation required for Underground Injection Control (UIC) closure (Area IDs: I, J, S, T, V) and the approximately 6-foot long section of single walled steel storage tank previously filled with concrete and left in place near the northeast corner of the existing CPC building (Area ID: U). It should be noted that some of these excavation areas will be completed to satisfy multiple program areas and, as a result, overlap each other.

Following removal of the impacted soil, confirmation soil samples will be collected at the frequency prescribed in the NYSDEC's DER-10 (Technical Guidance for Site Investigation and Remediation) to verify satisfactory removal of impacted soil. The soil samples will be analyzed for the constituents of concern within each area of excavation, as indicated on the table below. It should be noted that while the intent of the remedy is to remediate soil impacts to achieve the Part 375 Unrestricted Use Soil Cleanup Objectives, upon consultation with the NYSDEC, CPC may choose to use the Commercial Use Soil Cleanup Objectives based on the confirmation soil sample results. The Commercial Use Soil Cleanup Objectives are appropriate for the site since

the property is used for commercial and industrial uses and there are no adjacent or surrounding residential properties.

As indicated on Drawing EN1, 14 areas at the facility have been identified for soil excavation to satisfy corrective action. These 14 areas include the 11 areas identified in the RFI, as well as three additional areas requested by the NYSDEC in its February 3, 2011 correspondence in which the NYSDEC provided recommendations for the preparation of the CMWP. The depth and surface area of each excavation were determined based on the results of the RFI sampling. A basic summary of the proposed excavation areas is as follows:

Area ID	Approximate Surface Area (sq. ft.)	Approximate Depth (ft)	Constituent(s) of Concern
B-2 Area (A)	100	2	4,4'-DDT
Area East of Storage Cells (C)	2,289	4	1,2-DCE, TCE, ethylbenzene, xylene, 1,2-dichlorobenzene, 4,4'-DDE, 4,4'-DDT
B-7 Area (SC-7) (D)	330	4	4,4'-DDT
B-8 Area (E)	100	2	Lead, zinc
B-15 Area (G)	100	2	Chromium (total and Cr [VI])
B-19 Area (FS-1) (H)	864	4	Various VOCs, phenol, chromium
B-14 Area (southwest dry well) (J)	79	9	Chromium (total and Cr [VI])[(1)]
B-21 Area (ST-3) (M)	196	4	Silver
B-23 Area (ST-5, ST-6 and ST-7) (O)	392	4	Silver
B-27 Area (WA-I) (Q)	100	6	Xylene
B-33 Area (former southeast dry well) (S)	79	9	Various SVOCs and metals, 4,4'-DDT[(1)]

Area ID	Approximate Surface Area (sq. ft.)	Approximate Depth (ft)	Constituent(s) of Concern
B-13 Area (northwest dry well) (I)	79	9	None[1] (excavation requested by NYSDEC)
B-30 Area (northeast dry well) (V)	79	9	None[1] (excavation requested by NYSDEC)
Southeast Dry Well (S)	79	9	None[1] (excavation requested by NYSDEC)

[1]: For the dry wells, confirmation samples will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide, consistent with the existing RCRA Closure Plan for the facility, in addition to the constituents of concern (if they differ).

Based on the above, a total of approximately 725 cubic yards of soil will be excavated and transported off-site for proper management in accordance with all applicable federal, state and local regulations to satisfy corrective action. The confirmation soil samples collected from each area will be analyzed for the constituent(s) of concern indicated above to verify the adequate removal of impacted soil from each area. Prior to off-site transportation, the soil will be characterized for full RCRA characteristics including the Toxicity Characteristic Leaching Procedure (TCLP), as well as any other requirements of the selected disposal facility.

The chemical oxidant application activities will be focused in two primary areas of the facility where CVOCs were detected at significant concentrations in the soil samples collected during the RFI. These two areas include the excavation area immediately to the east of the storage cells on the west side of the facility, and the excavation area in the vicinity of B-19 (FS-1). The application will be targeted within these areas, as well as immediately upgradient and downgradient of these areas to the southern property boundary. A detailed description of the proposed chemical oxidation injection program is provided in Section 3.6.

It should be noted that, in addition to the soil remediation specified above, in order to construct the building footings, load/unload area and install the drainage structures, a significant quantity of soil (approximately 5,000 cubic yards) will be excavated and removed from the site. As part of the specifications prepared to govern construction of the new building, the Building

Contractor will be prohibited from reusing any excavated soil. All excavated soil will be properly characterized and disposed off-site in accordance with all applicable federal, state and local regulations. Likewise, in areas where soil or grass will be present at the new facility, soil will be removed in these areas to allow installation of an appropriate amount of topsoil and plantings. As a result, a minimum of approximately 1 foot of soil will be removed from the majority of the facility as part of the planned building construction activities; it should be noted that the extent of soil removal will be deeper in the area of the proposed building and drainage structures. The additional excavation includes approximately 1,000 cubic yards of soil beneath the existing Part 373 permitted storage areas that will require RCRA Closure. In order to support RCRA Closure of these storage areas, confirmation soil samples will be collected and analyzed from the excavation areas beneath the storage areas, even though concentrations of constituents of concern exceeding the 6 NYCRR Part 375 Unrestricted Use SCOs were not identified in these areas during the RFI. These additional excavation areas to support RCRA Closure are shown on Drawing EN1 along with the corrective action excavation areas. Confirmation samples collected in support of RCRA Closure will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide, consistent with the existing RCRA Closure Plan for the facility.

The following additional miscellaneous remedial work will be completed during the corrective measures:

- Four dry wells and one septic system, including a septic tank and leaching pool, will require UIC closure in accordance with Suffolk County Department of Health Services (SCDHS) and United States Environmental Protection Agency (USEPA) requirements. The Building Contractor will be required to excavate and remove all existing dry well structures at the CPC facility. Subsequent to the removal of each dry well structure, an additional 2 feet of soil will be excavated from the sidewalls of the dry well and 1 foot of soil will be excavated from the bottom of the dry well for off-site transportation and disposal. Confirmation soil samples will be collected by D&B for analysis after excavation is complete. The septic tank and leaching pool will also be excavated and removed, with confirmation soil samples collected by D&B for analysis after excavation is complete.

- As previously described, an approximately 6-foot long section of a single-walled steel storage tank was filled with concrete and left in place near the northeast corner of the existing CPC building during the UST removal activities completed during the RFI.

This was due to the proximity of the excavation area to the existing building. This section of tank will be excavated and removed by the Building Contractor with post-excavation confirmation sampling by D&B after demolition of the facility building.

The generation of dust and VOCs during implementation of the remedy will be monitored utilizing a digital dust monitor and photoionization detector (PID) and, if necessary, controls will be implemented in accordance with the HASPs governing the work. Air monitoring is discussed further in Section 5.0 of this CMWP.

Confirmation samples will be collected from the excavation areas to determine the characteristics of the remaining soil prior to site restoration. The proposed location of each confirmation sample is shown on Drawing EN1. Confirmation sample results will be provided to NYSDEC for review. Based on the results of the confirmation sampling, a determination will be made by CPC and NYSDEC with regard to the need for further excavation.

2.3 Evaluation of Remedy

The following discussion presents the engineering evaluation of the remedy against the five remedy selection criteria included in Module II of CPC's existing Part 373 Permit.

Long-Term Reliability and Effectiveness

It is the intended goal of the remedy to remove compound and constituent concentrations in soil to achieve the Unrestricted Use Soil Cleanup Objectives as presented in 6 NYCRR Part 375-6. While the site meets the definition of a commercial/industrial property allowing the Commercial Use Soil Cleanup Objectives to be used given that there are no adjoining or nearby residential properties, CPC has selected the Unrestricted Use Soil Cleanup Objectives as a goal of the remediation project. As a result, it is not anticipated that hazardous waste or hazardous constituents would remain at any concentration that is a concern to human health or the environment following remediation. Additionally, since the site will be primarily impervious following construction of the new building (the site will be mostly covered by the building itself and associated parking areas), any residual concentrations will effectively be capped in place.

With regard to groundwater, the remedy is intended to reduce CVOC concentrations through focused chemical oxidant application followed by groundwater monitoring. In accordance with its existing Part 373 Permit, CPC has agreed to conduct a Semiannual Groundwater Monitoring Program through the termination date of its existing permit (i.e., June 21, 2015) and will reevaluate the remedy in the future if CVOC concentrations persist or increase significantly.

Since it is the intended goal of the remedy to remove soil concentrations in excess of the Unrestricted Use Soil Cleanup Objectives, long-term management, operation and maintenance is not necessary for the remedy to satisfy its goal. The only additional requirement is to monitor groundwater quality by means of the groundwater monitoring program discussed above.

Since it is the intended goal of the remedy to remove soil concentrations in excess of the Unrestricted Use Soil Cleanup Objectives and given that the majority of the proposed facility will be impervious, human and environmental receptor exposure to the site contamination is unlikely. Since public and/or private water supply wells are not located within 1 mile downgradient of the site, human receptors would not be exposed to the constituent concentrations presently observed in groundwater, which will be addressed as part of the remedy. A surface water body, Sampawams Creek, is located approximately 0.75 mile southwest of the site. However, since this creek is located southwest of the site, it is not hydraulically downgradient of the site and does not appear to be affecting the groundwater flow direction in the vicinity of the site.

The remedy is reliable long-term since the soil contaminants and the apparent CVOC source areas will be removed preventing future impact to groundwater from the site. As a result, the groundwater quality is anticipated to improve in the future.

Since the remedy involves removal of impacted soil and chemical oxidant application, there is no need to replace the remedy in the future. Additionally, the chemical oxidant application program is being viewed as a one-time application to reduce CVOC concentrations followed by groundwater monitoring.

Reduction of Toxicity, Mobility or Volume

As part of this remedy, impacted soil will be excavated from the site for proper off-site transportation and disposal which will reduce the volume of constituents of concern present in soil thereby preventing their mobility to groundwater. With regard to groundwater quality, the CVOCs detected in the groundwater will be treated with a chemical oxidant thereby destroying these compounds and reducing their toxicity and volume.

This remedy is irreversible in that the constituents present in the soil will be removed from the site to prevent future impact and the CVOCs currently present in groundwater will be destroyed.

As noted previously, it is the intent of this remedy to remove constituent of concern concentrations to below the Unrestricted Use Soil Cleanup Objectives. As a result, any residuals present on-site following the remediation should not have an adverse impact on human health or the environment. It is anticipated that residuals will be present in groundwater following the chemical oxidant application, and may initially "rebound" following the application. However, the residuals will be monitored during the Semiannual Groundwater Monitoring Program established for the site and corrective action will be evaluated if the CVOC concentrations persist or significantly increase in the future. Since there are no public or private drinking water supply wells located within 1 mile downgradient of the site, this remedy is protective of human health and will hasten the natural degradation of the constituents.

Short-Term Effectiveness

The soil excavation and chemical oxidant application activities will have an immediate effect on reducing any potential risks from the on-site contamination. However, it should be noted that since the site is fully paved and no public or private water supply wells are located within 1 mile downgradient of the site, the site does not currently pose a significant risk to human health.

Workers could potentially come into contact with the impacted soil during the on-site excavation activities. Additionally, the neighboring community could potentially be exposed to dust from the excavation activities and transportation of the excavated soil to the off-site disposal facility. All on-site workers will be required to don the appropriate personal protective equipment (PPE) during the excavation activities, as required by the Occupational Safety and Health Administration (OSHA). In addition, a CAMP will be implemented during the excavation activities and the excavations will be wet if dust concentrations exceed action levels. The wetting will be performed by misting the soil with potable water, while exercising care to avoid creating any runoff water that could mobilize contamination. With regard to the oxidant application activities, on-site workers who could potentially come into contact with the chemical oxidant itself will be required to don the appropriate PPE to ensure their protection. A HASP will be prepared by each major party in the remedial program (i.e., D&B, Building Contractor, In-situ Chemical Oxidation Contractor) for the site to protect workers during the activities included in this remedy.

Full protection from the soil and groundwater impacts will be achieved once the impacted soil is removed from the site and the groundwater oxidant injections are complete. With respect to groundwater, it is common for contaminant concentrations in groundwater to initially "rebound" following chemical oxidant application as dissolved contaminants are destroyed and others begin to desorb from the soil particles. However, typically these concentrations will decrease over time. Following the application, groundwater will be monitored during the Semiannual Groundwater Monitoring Program and corrective action will be considered if the concentrations persist or increase significantly.

Implementability

Due to the location of the existing on-site structures, this corrective measure is typically difficult to implement without compromising the structural integrity of adjacent buildings, drainage structures and storage cells. However, since this corrective measure will be performed immediately prior to or concurrently with the planned demolition of the on-site building and structures, the complications typically encountered with implementing this type of corrective

measure are lessened. In addition, complications are further reduced by the lack of existing utilities in the area of remediation. As a result, the remedy is technically feasible since construction complications are reduced and the ability to appropriately monitor the effectiveness of the remedy are unhampered. Likewise, the degree of difficulty is relatively minor with this remedy.

The expected operational reliability of the remedy is sound. Source removal through the excavation of impacted soil coordinates best with the planned facility reconstruction activities for addressing the groundwater impacts detected on-site since a significant portion of the facility will have to be excavated to construct the proposed building and associated structures. Likewise, chemical oxidant application has a well established reputation for treating CVOC contamination in groundwater.

The Town of Islip requires approval for excavation other than for new construction (i.e., footings and slabs) such as remedial excavation. Approval for this additional excavation will be obtained through the Building Permit review process for the proposed construction. Since soil will have to be excavated within the areas of remediation anyway in order to construct the proposed building and its related storm water drainage system, D&B does not foresee any additional difficulties in obtaining this approval relative to selecting this remedy over any other remedy. The only other approvals necessary to perform this work are from the NYSDEC and SCDHS. Approval from the NYSDEC will be obtained prior to initiating this remedy through the NYSDEC's approval of this CMWP. SCDHS approval will be required for the UIC closure activities described herein. This will be accomplished through the submittal of this CMWP which describes the closure of the dry wells and septic system.

All necessary equipment and specialty workers for implementing this remedy are readily available. The Building Contractor or a specialized remediation subcontractor will have the equipment and properly trained and certified personnel necessary to implement this remedy and CPC will retain the services of an environmental consultant to ensure that the remediation activities are performed as outlined in this CMWP.

CPC is in the waste transportation and disposal business. As a result, CPC is familiar with the appropriate permitted disposal facilities and can select the appropriate disposal location with the required available capacity to accept the soil excavated as part of this remedy.

Prior to implementation of this remedy, all hazardous waste storage units affected by this remedial alternative will be properly closed in accordance with the facility's existing closure plan included in its Part 373 Permit. All equipment utilized to implement the remedy will be properly decontaminated prior to arrival on-site and prior to removal from the site to prevent cross-contamination. All excavated soil will be properly characterized for off-site disposal in accordance with 6 NYCRR Part 371.

Cost

The capital cost for soil excavation is not prohibitive since the areas of excavation are required to facilitate construction of the proposed building and installation of the drainage features for the new facility. Likewise, the chemical oxidant application cost is not prohibitive due to the size of the treatment area and given its anticipated benefit.

There are no operation and maintenance costs associated with this remedy since the soil excavation and chemical oxidant application activities are planned to be one-time events and remediation equipment will not be installed on the property. As discussed previously, if the groundwater CVOC concentrations persist or increase significantly in the future, then CPC will consider further corrective measures following complete evaluation of the data.

Since this remedy is planned as a one-time event, net present value and potential future corrective measure costs were not calculated. The costs associated with the Semiannual Groundwater Monitoring Program were not considered during the evaluation of this remedy since the monitoring program and therefore, its cost, are required by the facility's existing Part 373 Permit.

SCOPE OF WORK

THIS SCOPE OF WORK PROVIDES A GENERAL OVERVIEW OF THE REMEDIAL WORK TO BE PERFORMED BY THE CONTRACTOR. THIS SCOPE OF WORK DOES NOT RELIEVE CONTRACTOR FROM PROVIDING A DETAILED CONSTRUCTION SCHEDULE TO THE ENGINEER FOR APPROVAL, AS REQUIRED BY THE TECHNICAL SPECIFICATIONS. IT ALSO DOES NOT RELIEVE THE CONTRACTOR OF PERFORMING ALL THE WORK AS SHOWN ON THE PLANS AND INCLUDED IN THE TECHNICAL SPECIFICATIONS.

* THE CONTRACTOR MAY CONDUCT MOBILIZATION AND SITE DEMOLITION ACTIVITIES PRIOR TO THE REMEDIAL EXCAVATION. HOWEVER, REMEDIAL EXCAVATION SHALL BE COMPLETED PRIOR TO ANY OTHER SOIL DISTURBANCE OR EXCAVATION ACTIVITIES REQUIRED FOR CONSTRUCTION OF THE PROPOSED SITE FEATURES AND/OR STRUCTURES.

* THE CONTRACTOR SHALL SURVEY THE EXISTING SURFACES PRIOR TO EXCAVATION, FINAL SURFACES OF THE EXCAVATION PRIOR TO FILLING, CONFIRMATION SAMPLE LOCATIONS AND THE FINAL SURFACES OF GENERAL FILL/TOPSOIL FOR "AS–BUILT" CONDITIONS, CONFORMING TO THE REQUIREMENTS PROVIDED IN THE TECHNICAL SPECIFICATIONS.

* THE CONTRACTOR SHALL UTILIZE THE PROVIDED SURVEY COORDINATES TO LOCATE EXCAVATION LIMITS PRIOR TO PERFORMING THE WORK. THE HORIZONTAL COORDINATE SYSTEM SHOWN ON THIS DRAWING FOR THE CONTRACTOR TO LOCATE EXCAVATION LIMITS IS ARBITRARY. TWO REFERENCE POINTS ARE SHOWN SO THE CONTRACTOR CAN ESTABLISH THE COORDINATE SYSTEM IN THE FIELD.

* EXCAVATION SHALL BE MADE TO THE HORIZONTAL AND VERTICAL LIMITS AS SHOWN HEREIN, OR AS DIRECTED BY THE ENGINEER, AND TO SUCH WIDTHS AS SHALL PROVIDE SUITABLE ROOM FOR ALL REQUIRED BRACING, SHORING, SLOPING AND SUPPORTING. WHERE SHOWN, HORIZONTAL COORDINATES SHALL BE USED TO LOCATE THE LIMITS OF EXCAVATION. HORIZONTAL LIMITS OF EXCAVATION REPRESENT THE LIMITS OF THE REQUIRED EXCAVATION AT THE BOTTOM OF THE EXCAVATION AREA.

* EXCAVATIONS SHALL BE OPEN EXCAVATIONS, SHEETED AND BRACED WHERE NECESSARY TO PREVENT POSSIBLE INJURY TO PERSONNEL, EQUIPMENT AND STRUCTURES. THE CONTRACTOR SHALL SHEET AND BRACE EXCAVATIONS WHERE SLOPING IS NOT POSSIBLE EITHER BECAUSE OF SPACE RESTRICTIONS OR STABILITY. ALL SHEETING, WALERS, SHORING AND BRACING SHALL BE DESIGNED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF NEW YORK. THE OWNER WILL NOT REIMBURSE THE CONTRACTOR FOR REMOVAL, HANDLING, DISPOSAL AND BACKFILL AND COMPACTION OF ANY OVER EXCAVATED MATERIALS.

* THE OWNER SHALL COLLECT AND ANALYZE WASTE CHARACTERIZATION SAMPLES REQUIRED FOR DISPOSAL.

* THE ENGINEER SHALL COLLECT CONFIRMATION SAMPLES FROM THE EXCAVATION AREAS AT THE SIDEWALL AND BASE OF THE EXCAVATION AREAS. CONTRACTOR SHALL ASSIST THE ENGINEER WITH THE COLLECTION OF THE CONFIRMATION SAMPLES.

* WITHIN 72 HOURS POST–SAMPLING, THE ENGINEER SHALL INSTRUCT THE CONTRACTOR WHETHER TO CONTINUE WITH ADDITIONAL EXCAVATION.

*CONTRACTOR SHALL TEMPORARILY STORE EXCAVATED MATERIAL IN AN APPROVED LOCATION AND MANNER. THE CONTRACTOR SHALL ALSO BE REQUIRED TO LOAD EXCAVATED MATERIAL FROM TEMPORARY STORAGE INTO OWNER'S CONTAINERS AND/OR TRUCKS FOR OFF–SITE TRANSPORTATION AND DISPOSAL BY OWNER. ALTERNATIVELY, AND AT THE OWNER'S OPTION, CONTRACTOR SHALL DIRECT LOAD EXCAVATED MATERIAL INTO OWNER'S CONTAINERS AND/OR TRUCKS FOR OFF–SITE TRANSPORTATION AND DISPOSAL. ALL SUCH TEMPORARY STORAGE AND LOADING OF EXCAVATED MATERIAL SHALL BE AT NO ADDITIONAL COST TO THE OWNER. REFER TO SPECIFICATION SECTION 02111, EXCAVATION, HANDLING AND REMOVAL OF CONTAMINATED MATERIALS, FOR ADDITIONAL INFORMATION.

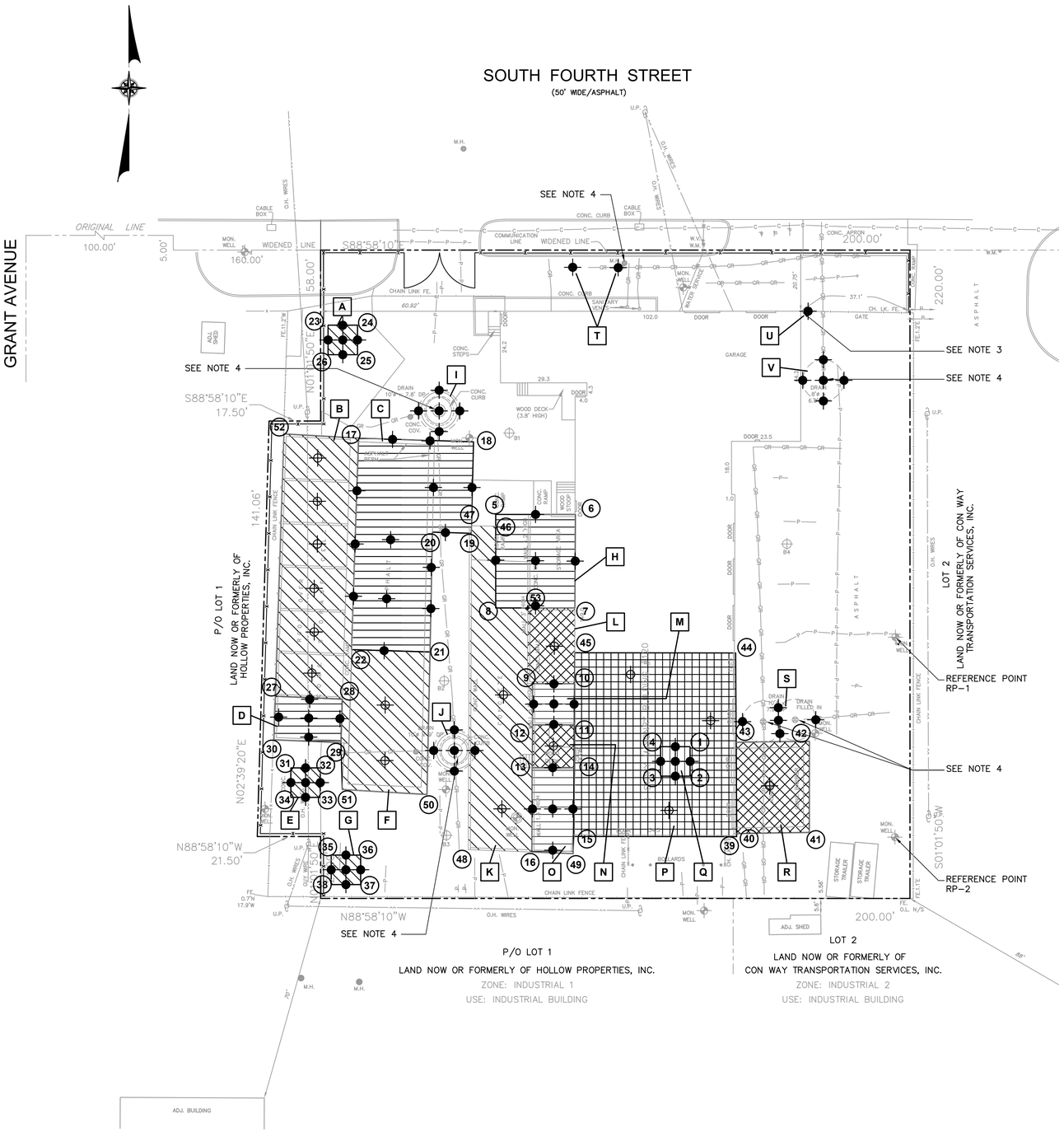
NOTES

1. THIS DRAWING IS ONLY INTENDED TO SHOW EXCAVATION LIMITS OF AREAS TO BE REMEDIATED. REFER TO CIVIL DRAWINGS FOR CONSTRUCTION SEQUENCING AND DEMOLITION PROCEDURES AND REQUIREMENTS.

2. ACCORDING TO HISTORICAL DATA, GROUNDWATER ELEVATION AT THE SITE IS APPROXIMATELY 9 FEET BELOW GROUND SURFACE. THEREFORE, IT IS NOT EXPECTED THAT GROUNDWATER WILL BE ENCOUNTERED DURING REMEDIAL ACTIVITIES.

3. CONTRACTOR SHALL EXCAVATE AND DISPOSE OFF–SITE THE APPROXIMATELY 6' LONG x 5'–4"ø PORTION OF SINGLE WALLED STEEL UNDERGROUND STORAGE TANK FILLED WITH CONCRETE. ENGINEER SHALL COLLECT AND ANALYZE CONFIRMATION SAMPLES FROM BENEATH THE TANK.

4. CONTRACTOR SHALL EXCAVATE AND REMOVE ALL EXISTING DRY WELL AND SEPTIC STRUCTURES AND AS REQUIRED BY THE SPECIFICATIONS. CONTRACTOR SHALL BE REQUIRED TO EXCAVATE AN ADDITIONAL TWO FEET OF SOIL FROM THE SIDEWALLS AND ONE FOOT OF SOIL FROM THE BOTTOM OF ALL REMOVED DRY WELLS IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED ABOVE. SOIL SHALL BE REMOVED FROM ANY FILLED DRY WELLS FOR OFF–SITE TRANSPORTATION AND DISPOSAL BY THE OWNER.



SAMPLE SUMMARY

AREA ID	PROGRAM	NO. OF CONFIRMATION SAMPLES	CONFIRMATION SAMPLE ANALYSES
A	CORRECTIVE ACTION	5	PESTICIDES: 4,4'-DDT
B	RCRA CLOSURE	6	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
C	CORRECTIVE ACTION	13	VOCs: CIS-1,2DCE, TCE, ETHYLBENZENE, XYLENE, 1,2-DICHLOROBENZENE PESTICIDES: 4,4'-DDE, 4,4-DDT
D	CORRECTIVE ACTION	5	PESTICIDES: 4,4'-DDT
E	CORRECTIVE ACTION	5	METALS: LEAD, ZINC
F	RCRA CLOSURE	2	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
G	CORRECTIVE ACTION	5	METALS: CHROMIUM (TOTAL AND CR (VI))
H	CORRECTIVE ACTION	5	VOCs: TRICHLOROETHENE, TETRACHLOROETHENE, 1,2-DICHLOROBENZENE, TOTAL XYLENE, ETHYLBENZENE, TOLUENE, CIS-1,2-DICHLOROETHENE SVOCs: PHENOL METALS: CHROMIUM
I	CORRECTIVE ACTION AND UIC	5	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
J	CORRECTIVE ACTION AND UIC	5	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS, CYANIDE AND CR (M)
K	RCRA CLOSURE	2	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
L	RCRA CLOSURE	1	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
M	CORRECTIVE ACTION	5	METALS: SILVER
N	RCRA CLOSURE	1	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
O	CORRECTIVE ACTION	5	METALS: SILVER
P	RCRA CLOSURE	3	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
Q	CORRECTIVE ACTION	5	VOCs: XYLENE
R	RCRA CLOSURE	1	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
S	CORRECTIVE ACTION AND UIC	5	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
T	UIC	2	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
U	CORRECTIVE ACTION	1	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE
V	CORRECTIVE ACTION AND UIC	5	TCL VOCs, TCL SVOCs, TCL PESTICIDES, TCL PCBs, TAL METALS AND CYANIDE

SURVEY COORDINATES

PT. NO.	NORTHING	EASTING
1	5389.3993	5293.3293
2	5379.395	5293.1495
3	5379.5748	5283.1511
4	5389.5793	5283.3309
5	5469.3645	5228.8026
6	5468.8789	5255.7982
7	5437.1634	5255.0693
8	5437.6504	5228.2311
9	5411.7293	5240.2617
10	5411.4601	5254.5719
11	5397.4627	5254.3011
12	5397.7396	5299.991
13	5383.2445	5239.6116
14	5382.9654	5254.0205
15	5359.6495	5253.2266
16	5354.6269	5238.9777
17	5496.1219	5182.7398
18	5494.1196	5221.6983
19	5463.1329	5220.3989
20	5463.744	5207.2233
21	5423.1092	5205.6394
22	5424.4058	5179.075
23	5534.5961	5173.0564
24	5534.4162	5183.0547
25	5524.4178	5182.8749
26	5524.5977	5172.8765
27	5409.0583	5152.9134
28	5407.6642	5175.6135
29	5392.8839	5174.8691
30	5394.287	5152.1696
31	5384.6402	5157.7273
32	5384.4603	5167.7257
33	5374.462	5167.5459
34	5374.6418	5157.5475
35	5354.8008	5170.8768
36	5354.6209	5180.8752
37	5344.6225	5180.6953
38	5344.8024	5170.6969
39	5358.5781	5308.5976
40	5359.5758	5308.61
41	5359.5912	5333.2769
42	5390.4943	5333.8458
43	5390.6326	5308.996
44	5420.9136	5309.3723
45	5421.9701	5254.7753
46	5465.3747	5228.7308
47	5465.6947	5220.4691
48	5355.838	5217.4594
49	5353.8361	5253.0287
50	5374.7807	5209.7557
51	5376.9927	5175.0475
52	5497.9896	5157.3915
53	5437.4722	5239.1091
RP-1	5424.9149	5363.7746
RP-2	5357.5643	5362.2798

LEGEND:

- LIMITS OF SOIL TO BE EXCAVATED TO 2 FEET BELOW EXISTING GROUND SURFACE
- LIMITS OF SOIL TO BE EXCAVATED TO 3 FEET BELOW EXISTING GROUND SURFACE
- LIMITS OF SOIL TO BE EXCAVATED TO 3.5 FEET BELOW EXISTING GROUND SURFACE
- LIMITS OF SOIL TO BE EXCAVATED TO 4 FEET BELOW EXISTING GROUND SURFACE
- LIMITS OF SOIL TO BE EXCAVATED TO 6 FEET BELOW EXISTING GROUND SURFACE
- CONFIRMATORY SOIL SAMPLE LOCATION FOR CORRECTIVE ACTION PROGRAM TO BE COLLECTED AND ANALYZED BY THE ENGINEER. (ACTUAL LOCATION WILL BE BIASED TOWARD SUSPECTED IMPACTED AREAS AS DETERMINED IN THE FIELD.)
- CONFIRMATORY SOIL SAMPLE LOCATION FOR RCRA CLOSURE PROGRAM TO BE COLLECTED AND ANALYZED BY THE ENGINEER. (ACTUAL LOCATION WILL BE BIASED TOWARD SUSPECTED IMPACTED AREAS AS DETERMINED IN THE FIELD.)

NO.	DATE	REVISION	INT.

STATE OF NEW YORK · BRIAN M. VAUN · 071687 · LICENSED PROFESSIONAL ENGINEER

PROJECT ENGINEER:	DRAWN BY:
BMV	LVG/KDS
DESIGNED BY:	CHECKED BY:
MRD	MRH

Dvirka and Bartilucci CONSULTING ENGINEERS
a Division of D&B Engineers and Architects, P.C.

PSC - CHEMICAL POLLUTION CONTROL, LLC of NY
BAY SHORE FACILITY
SUFFOLK COUNTY — NEW YORK

PROPOSED TSD FACILITY

REMEDIATION PLAN

ENVIRONMENTAL

PROJECT NO.	DRAWING NO.
2786	EN1
DATE: AUGUST 2011	
SCALE: 1" = 20'	

3.0 REMEDIAL CONSTRUCTION

As described in Section 2.0, CPC has identified the following areas that require remediation at its Bay Shore facility:

- Fourteen areas requiring soil excavation and off-site transportation and disposal.
- CVOCs in groundwater will be addressed using chemical oxidation injections.
- Four dry wells and one septic system require closure.
- A portion of a single-walled steel UST requires excavation and removal subsequent to demolition of the existing facility building.
- Soil beneath the existing Part 373 permitted storage areas requires removal for construction of the new CPC facility.

This section describes the activities to be undertaken to complete the implementation of the remedy.

3.1 Mobilization

Site mobilization activities by the contractor(s) will occur prior to initiation of the implementation of the remedial measure. Staging areas for construction equipment and materials, storage and handling areas for excavated material, decontamination areas and temporary facilities will be established on-site as directed by CPC.

Equipment and personnel decontamination facilities will be described in detail in the HASPs to be provided by the contractors. All equipment exposed to contaminated soil will be decontaminated on-site in accordance with the HASPs and removed at the conclusion of remedial activities.

All personnel and visitors will be required to sign in and sign out upon arrival and departure. Personnel and visitors entering the site during corrective action will be required to have 40-hour HAZWOPER training and participate in a medical surveillance program.

Prior to the initiation of the ground intrusive remedial activities, utilities will be identified and located by the Building Contractor in accordance with local and state requirements. This will include a private utility markout.

3.2 Excavation and Material Handling

As discussed in Section 2.0, excavation activities will commence after RCRA Closure of the existing Part 373 permitted storage areas and demolition and removal of the existing facility building. The approximate areas of soil to be excavated as part of the corrective measures presented as part of this CMWP are presented in Drawing EN1. The areas shown on Drawing EN1 include both the corrective action excavation areas and the areas to be excavated in support of RCRA Closure for the existing Part 373 permitted storage facilities. Procedures for implementing the soil excavation are also provided on Drawing EN1. The Building Contractor conducting the excavation work will be required to either temporarily store excavated material in accordance with the contract documents governing the work, or direct load the soil into containers or transport vehicles for off-site transportation and disposal. Methods for temporary storage of excavated materials will include stockpiles and roll-off containers. Stockpiles of excavated materials will be provided with a geomembrane liner and cover to prevent contaminating clean areas of the site. Roll-off containers will be in good condition, water-tight and constructed of materials that are compatible with the materials to be stored. Roll-off containers will be covered when material is not being actively placed into the containers.

In addition to the corrective action and RCRA Closure excavations shown on Drawing EN1, a significant amount of excavation work will be conducted at the facility in support of construction of the new facility building. As part of the specifications prepared to govern construction of the new building, the Building Contractor will be prohibited from reusing any excavated soil. All excavated soil will be properly characterized and disposed off-site in accordance with all applicable federal, state and local regulations. If free product or stained soil is encountered during any excavation work, it will be removed and segregated from the other materials for proper characterization and disposal.

Air monitoring will be performed throughout the duration of the work and will dictate actions required to control emissions. A detailed air-monitoring program for contractor personnel, including action levels, will be included in the Building Contractor's HASP. D&B will be responsible for implementing the CAMP for this project, which is provided in D&B's HASP (see Section 5.0). The CAMP complies with the requirements of the NYSDOH Generic CAMP and NYSDEC Fugitive Dust and Particulate Monitoring requirements included in Appendix A of this CMWP.

If dust or VOCs are generated during implementation of the remedy at levels that exceed minimum action levels, standard dust and vapor suppression techniques will be employed. Standard dust suppression and emission control techniques that may be employed during excavation activities, as well as any other material handling activities, include:

- Application of wetting agents to soil, stockpiles, buckets and equipment;
- Covering/tarping of containers, excavations and stockpiles; and,
- Utilizing emission control foam products to reduce VOC emissions.

If suppression and control techniques do not lower the particulate and VOC concentrations to acceptable levels, work will be suspended until acceptable corrective measures are implemented.

3.3 Soil Characterization

Prior to off-site transportation, the soil excavated as part of the corrective measures will be characterized for full RCRA characteristics including TCLP, as well as any other requirements of the selected disposal facility. CPC will be responsible for all waste characterization sampling and off-site transportation and disposal. Characterization samples will either be collected in-situ prior to excavation or will be collected from the stockpiled or containerized soil post-excavation.

3.4 Waste Transportation and Disposal

CPC will be responsible for the proper off-site transportation and disposal of all excavated soil. Prior to the off-site transportation of the excavated material, CPC will properly characterize the soil and obtain confirmation from the selected disposal facility that the contaminated soil will be accepted at the facility. Only properly permitted transporters will be utilized transport the soil to permitted off-site disposal facilities. All trucks will have functional intact tarps to cover their loads. CPC will be the generator of record. Documentation of transportation and disposal of all material will be maintained in the project files.

3.5 Confirmation Sampling

Upon reaching the final excavation depth, samples will be collected by D&B from the base and sidewalls of each excavation area to verify satisfactory removal of impacted soil. Drawing EN1 provides the proposed location of each confirmation sample location. Confirmation soil samples will be collected at the frequency prescribed in the NYSDEC's DER-10 (Technical Guidance for Site Investigation and Remediation).

Samples for corrective action will be analyzed for the constituents of concern indicated in Section 2.0 and shown on Drawing EN1. Samples to support RCRA Closure and the removal of the concrete filled portion of the UST will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide. Expedited 2-day turnaround analysis will be provided to facilitate rapid determination of the quality of remaining soil prior to completion of site redevelopment and site restoration. The Part 375 SCOs for Unrestricted Use will be used to screen the confirmation samples. The need for additional remediation will be determined by CPC in consultation with the NYSDEC. When available, CPC will transmit the data to the NYSDEC for review, along with a sample location map. The NYSDEC will be available for a conference call with the CPC to discuss the provided data and to determine if additional remediation is necessary within 1 day of receipt of the confirmation sample analysis data. Field sampling procedures and quality assurance protocols will be conducted in accordance with the Quality Assurance Project Plan (QAPP) prepared by D&B (see Section 4.0).

3.6 Chemical Oxidation Injection Program

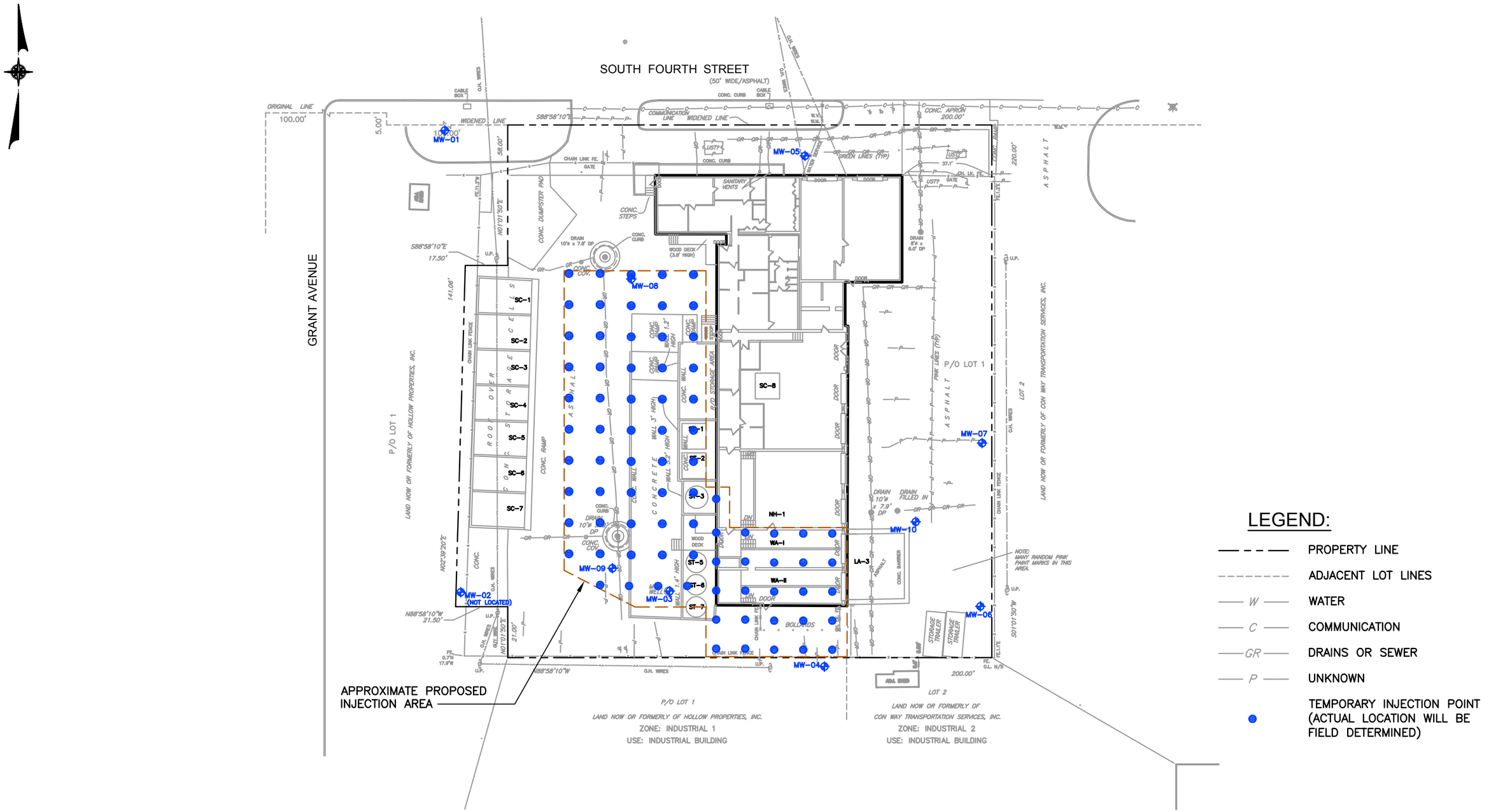
Following the remedial excavation activities, an In-situ Chemical Oxidation Injection Program (ISCO) will be implemented in order to address the saturated soil and groundwater at the CPC facility that is impacted with CVOCs, specifically PCE, TCE and 1,2-DCE. The primary goal of the ISCO is to reduce groundwater concentrations of these contaminants.

As shown on Figure 3-1, the ISCO program will involve the injection of a sodium permanganate solution into the subsurface environment at several targeted areas of contamination. Compared with other chemical oxidants typically used in ISCO applications, permanganate exhibits several advantages for the environmental conditions at the CPC facility. Permanganate is generally more effective for lower-concentration, dissolved-phase plumes, primarily due to the persistence of the oxidant in the subsurface. As a result, this allows greater oxidant dispersion and allows dispersion into less permeable zones. Once the permanganate has been consumed, the aquifer will remain in an elevated redox state (high oxidation-reduction potential). In addition, permanganate injections are short-term events and do not appear to have any long-term effects on bioremediation, allowing anaerobic conditions to return relatively quickly.

Permanganate is supplied as a soluble salt in solution, either as potassium permanganate ($KMnO_4$) or sodium permanganate ($NaMnO_4$). The two salts differ primarily by solubility; however, in aqueous solution, both forms dissolve to release the cation (either Na^+ or K^+) and the anion (MnO_4^-):

$$NaMnO_4 \rightarrow Na^+ + MnO_4^- \quad (1)$$
$$KMnO_4 \rightarrow K^+ + MnO_4^- \quad (2)$$

The active oxidant for either salt is the permanganate anion (MnO_4^-), which is a strong and persistent oxidant in the subsurface.



LEGEND:

- PROPERTY LINE
- ADJACENT LOT LINES
- W — WATER
- C — COMMUNICATION
- GR — DRAINS OR SEWER
- P — UNKNOWN
- TEMPORARY INJECTION POINT (ACTUAL LOCATION WILL BE FIELD DETERMINED)

Dvirka and Bartilucci CONSULTING ENGINEERS
a Division of D&B Engineers and Architects, P.C.

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES WORK PLAN

CHEMICAL OXIDATION INJECTION PLAN

SCALE: 1" = 40'

FIGURE 3-1

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The permanganate oxidation pathway for alkenes such as PCE and TCE begins with electrophilic attack on the carbon-carbon double bond, producing a cyclic hypomanganate diester as a reaction intermediate. There are two potential oxidation pathways for the diester intermediate, via either hydrolysis to glycol aldehyde or bond cleavage to formaldehyde. Both compounds continue to degrade to carboxylic acids.

The ISCO program at the CPC facility will target an approximately 10,100-square-foot area with a vertical treatment interval from approximately 10 to 20 feet bgs, to encompass the capillary fringe and shallow groundwater at the site. The primary goal of the treatment program is to address the CVOC contamination that is present in MW-03, MW-04, MW-08 and MW-09. The vadose zone contamination will be excavated and the building and site structures will be demolished as described above prior to the initiation of injection activities.

The 2% sodium permanganate solution will be applied via 80 direct push temporary points. The In-situ Chemical Oxidation Contractor will utilize two 4-foot vertical intervals (i.e., 10 to 14 feet bgs and 16 to 20 ft bgs) to inject the reagent throughout the 10-foot treatment zone. It is assumed that approximately 4,400 gallons of 2% sodium permanganate can be injected with one mobile treatment unit and one direct push drill rig per day. Therefore, it is anticipated that the treatment program will require approximately 5 days of active injection, with an additional 2 days for mobilization, site setup and demobilization.

Based on the In-situ Chemical Oxidation Contractor's knowledge and experience at similar sites, it has been estimated that approximately 11,365 lbs. of 40% sodium permanganate will be required for the treatment program, which will be diluted to approximately 19,735 gallons of 2% sodium permanganate solution for injection. This estimation is based upon an assumed natural oxidant demand of 2 grams of permanganate per kilogram of soil. However, in order to determine the actual quantity of sodium permanganate that will be required for treatment, samples will be collected for natural oxidant demand analytical testing prior to implementation of the ISCO program. Upon receipt of the analytical results, the ISCO program will be adjusted as necessary.

Upon the completion of the ISCO treatment program, routine process monitoring and performance monitoring will be conducted on-site. Process monitoring includes groundwater sampling and system monitoring. The analytes measured, purpose and typical frequency of each type of monitoring is as follows:

- Groundwater sampling entails collecting groundwater samples and visually inspecting them for a pink or purple color. The pink or purple color is imparted by the permanganate and disappears as the permanganate is consumed. Once permanganate is detected, no additional process monitoring is conducted at that monitoring well location. During ISCO injections, monitoring wells within and downgradient of the injection area will be monitored daily.

- Systems monitoring includes injection pressure monitoring and regular inspections. The injection pressure is a function of the permeability of the subsurface and the rate of injection. Pressure is also affected by precipitation of manganese dioxide from the permanganate, which can clog well screens. The pressure is monitored in order to ensure that there are no blockages or other problems, and is observed and recorded regularly during each day of injection. Example injection pressures for this type of application are typically between 0 and 20 psi. System components (e.g., hoses, fittings, valves, pumps, etc.) are constantly monitored and observed to ensure proper operation and to check for leaks.

Performance monitoring consists of pre- and post-injection sampling conducted to evaluate overall treatment effectiveness, and typically consists of groundwater and/or soil VOC sampling. In addition, the natural degradation of any residual CVOC concentrations remaining following the ISCO program will be monitored and additional activities may be explored if CVOC concentrations persist or increase significantly in the future. In order to accomplish these goals, CPC will continue to implement its existing Groundwater Monitoring Plan, which requires semiannual groundwater sampling throughout the effective period of the site's Part 373 Permit; however, some of the groundwater monitoring wells included in the Groundwater Monitoring Plan will require decommissioning during construction of the new CPC facility. In addition, monitoring wells MW-1, MW-4, MW-6 and MW-7, which are the wells that will still remain at the site after facility construction, will be sampled for TCL VOCs to document the effectiveness of the groundwater remediation greater than 30 days after completion of injections. The exact time of sampling will be determined during implementation of the remedy in coordination with NYSDEC and the In-situ Chemical Oxidation Contractor. However, groundwater samples will

not be collected for chemical analysis or monitored for field parameters if the presence of permanganate is noted (pink or purple color identified during purging) or if a 50% increase in ORP is detected in the well. Groundwater sampling procedures will otherwise follow the procedures outlined in the NYSDEC-approved RFI Work Plan dated August 2010.

The Groundwater Monitoring Plan will be revised following implementation of the soil and groundwater remediation described herein and this limited groundwater sampling event. At this time, sufficient, up-to-date environmental characterization data will be available to determine the need for the installation of new groundwater monitoring wells at the proposed facility.

3.7 Underground Injection Control Structure Closure

As shown on Drawing EN1, six UIC structures located at the CPC facility need to be properly closed as part of the planned remediation. All structures will be closed during the corrective action work. The UIC structures comprise the four active dry wells, and the septic tank and associated leaching pool. The closure procedures utilized to decommission these structures will be in accordance with all USEPA and SCDHS UIC regulations.

The following provides the procedures to be followed by the Building Contractor to properly close the identified UIC structures.

Dry Wells

The contents of the dry wells, if present, will be pumped out and contained within Department of Transportation (DOT)-approved 55-gallon drums or other suitable containers. The entire dry well will be excavated and removed for off-site disposal. Soil will be excavated to a depth of 1 foot below the former inverts of the dry wells and an additional 2 feet of soil will be excavated from the sidewalls. The contract documents require the Building Contractor to remove all pipes and seal storm and/or sanitary sewer lines leading from the structures.

Five confirmation soil samples will be collected from the sidewalls (4) and bottom (1) of each excavation, and analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide. In addition, the southwest dry well (B-14 area) confirmation samples will also be analyzed for chromium (VI). The analytical results will be provided to the NYSDEC and SCDHS. Following approval of the results, the excavations will be backfilled with clean fill to grade.

Septic Tank and Leaching Pool

The contents of the septic tank and leaching pool, if present, will be pumped out and contained within DOT-approved 55-gallon drums or other suitable containers. The septic tank, leaching pool and associated sanitary sewer piping will be excavated and removed for off-site disposal. Two confirmation samples will be collected from the area of the septic system. One sample will be collected from beneath the septic tank and one sample will be collected from the bottom of the leaching pool. The confirmation samples will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide. The analytical results will be provided to the NYSDEC and SCDHS. Following approval of the results, the excavations will be backfilled with clean fill to grade.

Soil excavated during UIC Closure will be characterized and disposed off-site by CPC as described above. All other waste generated as a part of the closures will be properly characterized by the Building Contractor in accordance with NYSDEC regulations and disposed off-site by the Building Contractor in accordance with all applicable federal, state and local regulations.

3.8 Backfill

As discussed in Section 2.0, the existing facility will be demolished in the near future and a new facility constructed. As part of the specifications prepared to govern construction of the new building, the Building Contractor will be prohibited from reusing any excavated soil. All excavated soil (whether for remediation, to support RCRA Closure or for construction purposes)

will be properly characterized and disposed off-site in accordance with all applicable federal, state and local regulations. The Building Contractor will be required to import general and select fill for construction purposes. The specifications prepared to govern construction of the new building require the Building Contractor to obtain prequalification samples from each source and each stockpile at a frequency of no less than one composite sample for every 1,000 cubic yards to be imported. The soil will be tested for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide. The results of the sample analysis must meet the NYSDEC's Unrestricted Use Soil Cleanup Objectives found at 6 NYCRR Part 375-6. The Building Contractor's laboratory will be required to be an independent New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. In addition, the specifications require the Building Contractor to obtain approval of the intended source of imported fill.

3.9 Site Restoration

The excavated areas will be restored as part of site redevelopment. Areas outside the excavation area disturbed during implementation of the remedy will be restored as necessary to coincide with site redevelopment. The contract documents governing construction of the new facility building provide detailed requirements for site restoration.

3.10 Erosion Controls

Storm water management, and soil erosion and sediment control will be performed in accordance with the New York State Guidelines for Urban Erosion and Sediment Controls. The Building Contractor will be responsible for preventing off-site migration of storm water during implementation of the remedy. D&B has prepared a Storm Water Pollution Prevention Plan to be implemented by the Building Contractor throughout the performance of the work.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

During performance of the work, the Building Contractor will be required to collect and analyze samples of the backfill to be utilized on the site for site restoration and construction. In addition, the Building Contractor will be required to collect and analyze waste characterization samples for all waste materials generated other than excavated soil, which will be characterized by CPC. A Sampling Plan will be prepared by the Building Contractor for review by CPC and D&B. The Sampling Plan will be made available to NYSDEC, if requested. The Sampling Plan will include, at a minimum, the following:

- The location, number and type of each sample to be collected and analyzed.
- The list of analytes to be identified and quantified for each analysis.
- Description of sample collection methods for each sample matrix including sample containers, sample custody, sample packaging, storage and shipping procedures.
- The analytical protocols to be utilized.
- The name, address and qualifications of each proposed testing laboratory and the intended project-specific function.
- A description of all instrumentation and equipment to be used for testing on-site, as well as operating and calibration procedures.
- A description of all equipment decontamination procedures.
- Method for notification of changes.

The Building Contractor will be responsible for implementing the Sampling Plan.

As previously indicated, D&B will be responsible for collecting and analyzing confirmation soil samples and groundwater samples during the completion of the corrective measures for the CPC facility. Provided as Appendix B of this CMWP is a copy of D&B's Quality Assurance Project Plan governing the soil and groundwater sampling to be completed by D&B during the completion of this project.

5.0 HEALTH AND SAFETY

The contract documents require the Building Contractor to prepare a HASP. Site personnel performing remedial work will be required to read and comply with the requirements of the HASP. In addition, the In-situ Chemical Oxidation Contractor will be required to prepare a HASP to govern its project personnel.

These HASPs will be submitted to CPC and D&B for review prior to initiation of the project. The HASPs will be made available to NYSDEC, if requested. The HASPs will be required to address all the appropriate federal, state and local regulatory requirements necessary to undertake and successfully complete implementation of the remedy. The HASPs will be prepared in accordance with 29 CFR 1910.129 and will include, at a minimum, the following items:

- Health and safety organization, including résumés of personnel responsible for health and safety
- Project site description and hazard assessment
- Training requirements
- Medical surveillance requirements
- Project site control procedures
- Standard operating procedures and engineering controls
- Personnel protective equipment requirements
- Personnel hygiene and decontamination protocols
- Equipment decontamination procedures
- Air monitoring requirements
- Emergency equipment/first aid requirements
- Emergency responses/contingency procedures
- Heat and cold stress procedures

- Record keeping requirements
- Community protection plan

The Building Contractor and In-situ Chemical Oxidation Contractor will be responsible for ensuring that their HASPs and all work associated with the implementation of the remedy is performed in accordance with safe working practices including all Occupational Safety and Health Administration (OSHA) requirements. All site personnel will be trained and certified in the proper use of personal protective equipment and will have knowledge and understanding of construction standards. Certifications regarding training and expertise will be required prior to the start of work.

In addition, D&B has prepared a HASP for D&B's personnel that will be involved in the project. D&B's HASP is provided as Appendix C of this CMWP and includes a CAMP that will be implemented by D&B during the corrective measures activities. The CAMP complies with the requirements of the NYSDOH Generic CAMP and NYSDEC Fugitive Dust and Particulate Monitoring requirements included as Appendix A of this CMWP.

6.0 REPORTING AND DOCUMENTATION

The Building Contractor will be required to prepare progress reports every 2 weeks during the project. Each report will include information on the work completed during the week, the anticipated schedule for the following weeks, and a description of any problems encountered which will impact project progress as well as their resolution. Progress reports will be available for regulatory agency review. These progress reports will consist of minutes prepared by the contractor subsequent to each bi-weekly construction meeting.

Throughout implementation of the corrective measures, records will be maintained by the Building Contractor, In-situ Chemical Oxidation Contractor, D&B and CPC to document activities completed on-site. Records that will be maintained include the following:

- Daily field activity reports (D&B)
- Visitor sign-in/sign-out logs (Building Contractor)
- Construction photographs (contractors and D&B)
- Instrument calibration logs (contractors and D&B)
- Waste manifests/bills of lading and disposal facility receipts (CPC)
- Waste characterization sampling results and waste treatment/ disposal facility prequalification forms (CPC)
- Chain of Custody forms (D&B)
- Air monitoring forms (Building Contractor and D&B)
- Contractor submittals (contractors and D&B)
- Measurements of material quantities for progress payments (contractors)
- Incident/accident reports (contractors)
- Meeting minutes (Building Contractor)
- Confirmation sampling results (D&B)

Following completion of the corrective measures and in accordance with Module II of CPC's Part 373 Permit, within 45 days of completion of the corrective measures, a Corrective Measures Final Report will be prepared. This report will include the following:

- Description of corrective measures performed;

- Deviations from the CMWP, if any;
- Copies of records maintained during the remediation;
- Problems encountered during construction and their resolution;
- A discussion of the quantification and listing of soil removed from the site;
- Detailed "as-built" drawings showing the limits of the excavation and the locations of confirmation samples;
- Copies of the Certificates of Clean Fill;
- Copies of all records documenting off-site disposal of soil; and
- Confirmation sampling results.

The report will include a certification by a Professional Engineer registered in New York State, stating that the work was implemented and construction activities were completed in substantial conformance with this CMWP.

Once complete, the report will be submitted to the NYSDEC for approval.

7.0 PROJECT MANAGEMENT

7.1 Key Participants and Responsibilities

Key participants involved in the corrective action program for the CPC Bay Shore facility include the following:

Key Participants	Primary Responsibilities
PSC - Chemical Pollution Control, LLC of New York	Oversee planning, implementation and reporting for corrective action in accordance with the approved CMWP, including procuring and directing contractors and consultants for design, corrective measure implementation and site development in accordance with approved CMWP. CPC will also be responsible for the characterization and off-site transportation and disposal of all excavated soil generated during the performance of the corrective measures.
Regulatory Agencies: New York State Department of Environmental Conservation and Suffolk County Department of Health Services	Regulatory oversight.
Remedial Engineer: Dvirka and Bartilucci Consulting Engineers	Construction inspection, record keeping, community air monitoring, collection and analysis of confirmation samples and groundwater samples, reporting, and preparation of the Corrective Measures Final Report.
Building Contractor: [to be determined]	Furnish labor, materials, supplies, etc. for construction in accordance with the approved plans, including, but not limited to, HASP preparation, soil excavation and handling, excavation and removal of UIC structures and concrete filled tank, characterization and off-site transportation and disposal of waste other than soil, demolition, testing, importing and placement of backfill, erosion controls, and site restoration.
In-Situ Chemical Oxidation Contractor [to be determined]	Furnish labor, materials, supplies, etc. for HASP preparation and implementation of the in-situ chemical oxidation injections to address CVOCs in groundwater as described in this CMWP.

7.2 Project Communication and Management

Throughout the project, project meetings will be held to discuss work progress, plan upcoming activities for the week and discuss any unanticipated site conditions encountered. The Building Contractor's superintendent, as well as CPC's Project Manager, will be required to attend the project meetings. As necessary, representatives of the In-situ Chemical Oxidation Contractor will attend the project meetings. Representatives of NYSDEC will be made aware of the schedule for project meetings. Following an initial pre-construction meeting, project meetings will be held once every 2 weeks at the site during the project.

During implementation of the corrective measures, D&B will provide full-time on-site inspection of the work, engage in day-to-day communications with the Building Contractor's superintendent and In-situ Chemical Oxidation Contractor, and maintain records and prepare reports as described in Section 6.0.

8.0 PROJECT SCHEDULE AND KEY MILESTONES

The NYSDEC has been provided with a construction schedule under separate cover that outlines the anticipated schedule for the implementation of the corrective measures described in this CMWP. Due to the extensive number of agencies involved in this project with approval authority over various aspects of the project (e.g., NYSDEC, Suffolk County Department of Health, Town of Islip, Fire Marshal, etc.), the overall project schedule has not been incorporated into this CMWP. However, the schedule previously provided to NYSDEC under separate cover will be updated, as necessary, so that NYSDEC is fully apprised of the intended project schedule. However, in general, the corrective measures program described in this CMWP will be undertaken following building and storage cell demolition but prior to excavation for building footing and loading dock construction.

APPENDIX A

NEW YORK STATE DEPARTMENT OF HEALTH
GENERIC COMMUNITY AIR MONITORING PLAN AND
NYSDEC FUGITIVE DUST AND PARTICULATE MONITORING

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50° C (14 to 122° F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX B

QUALITY ASSURANCE PROJECT PLAN

PSC – CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

QUALITY ASSURANCE PROJECT PLAN
FOR
CORRECTIVE MEASURES PROGRAM

Prepared for:

PSC – CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
120 SOUTH FOURTH STREET
BAY SHORE, NEW YORK

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

AUGUST 2011

PSC – CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
QUALITY ASSURANCE PROJECT PLAN FOR
CORRECTIVE MEASURES PROGRAM

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1.0 QUALITY ASSURANCE PROJECT PLAN

1.1 Project Identification

Facility Name:	PSC - Chemical Pollution Control, LLC of New York Bay Shore Facility Bay Shore, New York
Project Names:	Corrective Measures Program PSC - Chemical Pollution Control, LLC of New York Bay Shore Facility
Project Managers:	Heide-Marie Dudek, P.E. *(New York State Department of Environmental Conservation)* Michael Hofgren *(Dvirka and Bartilucci Consulting Engineers)*
Quality Assurance Officer:	Robbin A. Petrella or Donna M. Brown *(Dvirka and Bartilucci Consulting Engineers)*
Field Operations Manager:	Keith Robins *(Dvirka and Bartilucci Consulting Engineers)*

1.2 Objective and Scope

The objective of this Corrective Measures Program for the PSC – Chemical Pollution Control, LLC of New York (CPC) facility located in Bay Shore, New York is to satisfy the corrective action requirements presented in Module II of the facility's existing Part 373 Permit and to allow the facility to be delisted from New York State's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 1-52-015).

The purpose of this Quality Assurance Project Plan (QAPP) is to develop and describe the detailed sample collection and analytical procedures that will ensure high quality data for the confirmation soil and groundwater sampling program to be implemented by D&B during implementation of the Corrective Measures Work Plan (CMWP).

1.3 Data Usage

The data generated from the confirmation soil sampling program will be used to determine whether additional soil removal is required after the excavation limits shown in the CMWP have been reached. In addition, groundwater samples will be collected from the four monitoring wells that will exist on-site at the time of oxidant injection (i.e., MW-1, MW-4, MW-6 and MW-7) to document the effectiveness of the groundwater remediation.

1.4 Sampling Program Design and Rationale

The following presents a general discussion of the sampling to be conducted at the CPC facility during the sampling portion of the program.

- Ninety-two grab soil samples will be collected from the excavation areas. In addition, five sets of MS/MSD samples will be collected for laboratory analysis.
- Four groundwater samples from existing on-site monitoring wells, one set of MS/MSDs and up to three trip blanks will be collected.

1.5 Analytical Methods

Laboratory analysis of all confirmation soil samples collected from the corrective action excavation areas will include the constituents of concern identified in the CMWP. Laboratory analysis of all confirmation soil samples collected from the Underground Injection Control (UIC) and RCRA Closure areas will include Target Compound List (TCL) volatile organic compounds (VOCs) (utilizing NYSDEC's requested Method 5035), TCL semivolatile organic compounds (SVOCs), TCL polychlorinated biphenyls (PCBs), TCL pesticides, Target Analyte List (TAL) metals and cyanide. An expedited laboratory turnaround time of 48 hours will be utilized for all confirmation soil samples.

Laboratory analysis for all groundwater samples will include TCL VOCs utilizing a laboratory turnaround time of 28 days.

Table 1-1 presents a summary of the parameters/sample fractions to be analyzed. The table also lists the sample location, type of sample, sample matrix, number of samples, frequency of sample collection, type of sample container, method of preservation, holding time and analytical method.

1.6 Data Quality Requirements and Assessment

Data quality requirements and assessment are provided in the 2005 NYSDEC ASP, which includes the detection limit for each parameter and sample matrix (see Exhibit A). Note that quantification limits, estimated accuracy, accuracy protocol, estimated precision and precision protocol are determined by the laboratory and will be in conformance with the requirements of the 2005 NYSDEC ASP, where applicable. Table 1-2 presents a summary of the data quality requirements.

In addition to meeting the requirements provided in the 2005 NYSDEC ASP, the data must also be useful in evaluating the nature and extent of contamination. Data obtained during the field program will be compared to specific Standards, Criteria and Guidelines (SCGs). The SCGs to be utilized include:

Matrix	**SCG**
Groundwater Samples	NYSDEC's TOGS 1.1.1 Class GA Groundwater Standards/Guidance Values.
Confirmation Soil Samples	NYSDEC's Part 375 Unrestricted Use and Commercial Use Soil Cleanup Objectives.

1.6.1 Data Representativeness

Representative samples will be collected as follows:

- Confirmation Soil Samples – Subsurface soil samples will be collected from the excavation floor and each excavation sidewall utilizing the bucket of the excavator.

Table 1-1

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
SUMMARY OF MONITORING PARAMETERS/SAMPLE FRACTIONS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	# Samples	Frequency	Container Type/Size/No.	Sample Preservation	Maximum Holding Time	Analytical Method
Groundwater Samples (plus MS/MSD)	Grab	Water	TCL VOCs	4	1	Glass/clear/40 ml/3 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	7/05 NYSDEC ASP, USEPA Method 8260b
Site	Trip Blank	Water	VOCs	TBD	1 Per Shipment of Water Samples	Glass, clear/40 ml/1 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	7/05 NYSDEC ASP, USEPA Method 8260b

VTSR - Verified time of sample receipt at the laboratory.
MS/MSD samples will be collected based upon the frequency specified in the QAPP and the final number and schedule of samples collected.

Table 1-1 (continued)

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
SUMMARY OF MONITORING PARAMETERS/SAMPLE FRACTIONS

Sample Location	Sample Type	Sample Matrix	Sample Fraction*	# Samples	Frequency	Container Type/Size/No.	Sample Preservation	Maximum Holding Time	Analytical Method
Confirmation Sampling (plus MS/MSD)	Grab	Soil	TCL VOCs	62	1	Glass, clear/2 oz./2 ICHEM 200 series or equivalent	Cool to 4°C	10 days after VTSR	7/05 NYSDEC ASP, USEPA Methods 5035 and 8260b
	Grab	Soil	TCL SVOCs	44	1	Glass, clear/8 oz./1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, USEPA Method 8270c
	Grab	Soil	TCL Pesticides/ PCBs	62	1	Glass, clear/8 oz./1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, USEPA Methods 8081B/8082A
	Grab	Soil	TAL Metals	64	1	Glass, clear/8 oz./1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for mercury analysis, 6 months for all others	7/05 NYSDEC ASP, USEPA Methods 6010b/7471b
	Grab	Soil	Cyanide	39	1	Glass, clear/8 oz./1 ICHEM 200 series or equivalent	Cool to 4°C	14 days after VTSR for analysis	7/05 NYSDEC ASP, USEPA Method 9012
	Grab	Soil	Cr (VI)	10	1	Glass, clear/8 oz./1 ICHEM 200 series or equivalent	Cool to 4°C	1 month after collection for extraction, 4 days after extraction for analysis	7/05 NYSDEC ASP, USEPA Method 7196A

VTSR - Verified time of sample receipt at the laboratory.
* Confirmation samples will only be analyzed for the constituents of concern and, as a result, the entire TCL/TAL may not be reported for each sample.
MS/MSD samples will be collected based upon the frequency specified in the QAPP and the final number and schedule of samples collected.

Table 1-2

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY

Parameter	Sample Matrix	CRDL*	Estimated Accuracy	Accuracy Protocol**	Estimated Precision	Precision Protocol**
Volatile Organics	Liquid Solid	5-10 ug/l 5-10 ug/kg	0.87 – 2.48 ug/l	Vol. IB, Chapter 4, Method 8260b, Table 7	0.11 – 4.00 ug/l	Vol. IB, Chapter 4, Method 8260b, Table 7
Base Neutrals	Solid	330-1,600 ug/kg	0.29 – 1.23 ug/l	Vol. IB, Chapter 4, Method 8270c, Table 7	0.13 – 1.05 ug/l	Vol. IB, Chapter 4, Method 8270c, Table 7
Acid Extractables	Solid	330-1,600 ug/kg	0.29 – 1.23 ug/l	Vol. IB, Chapter 4, Method 8270c, Table 7	0.13 – 1.055 ug/l	Vol. IB, Chapter 4, Method 8270c, Table 7
Pesticides/PCBs	Solid	8.0-160 ug/kg	0.69 – 10.79 ug/l	Vol. IB, Chapter 4, Method 8082, Table 4	0.16 – 3.50 ug/l	Vol. IB, Chapter 4, Method 8082, Table 4
Metals	Solid	0.2-5,000 ug/kg	--	Vol. IA, Chapter 3, Method 6010b and SW-846 Methods for: Mercury, 7471a-Solid, Table 4	--	Vol. IA, Chapter 3, Method 6010b and SW-846 Methods for: Mercury, 7471a-Solid, Table 4
Cyanide	Solid	1,000 ug/kg	--	--	--	--

*Contract Required Detection Limits.

**Ref. NYSDEC 7/05 ASP.

Table 1-2 (continued)

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY

Matrix/Parameter	Precision %	Accuracy %
Groundwater		
VOCs[(a)]	See Table 1-2a	See Table 1-2a
Soil		
VOCs[(a)]	See Table 1-2a	See Table 1-2a
Extractables[(a)]	See Table 1-2b	See Table 1-2b
Pesticides/PCBs[(a)]	See Table 1-2c	See Table 1-2c
Metals[(b)/(c)]	±35	75–125
Cyanide[(b)/(c)]	±35	75–125

Notes:

(a) Accuracy will be determined as percent recovery of surrogate spike compounds and matrix spike compounds. Surrogate and matrix spike compounds for VOCs, extractables, and pesticides/PCBs are listed in Tables 1-2a, 1-2b and 1-2c, respectively. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.
(b) Accuracy will be determined as percent recovery of matrix spikes when appropriate or the percent recovery of a QC sample if spiking is inappropriate. Precision will be determined as relative percent difference of matrix spike duplicate samples, or duplicate samples if spiking is inappropriate.
(c) Precision will be determined as the average percent difference for replicate samples. Accuracy will be determined as the percent recovery of matrix spike samples or laboratory control samples, as appropriate.

* As per USEPA CLP Inorganic National Functional Guidelines (10/2004)
Source: NYSDEC ASP

Table 1-2a

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
DATA QUALITY REQUIREMENTS
ACCURACY AND PRECISION REQUIREMENTS FOR VOCs

	Water		Low/Medium Soil	
	Spike Recovery Limits (%)	Precision %	Spike Recovery Limits (%)	Precision %
Surrogate Compound				
Toluene-d8	88 – 110	--	84 – 138	--
4-Bromofluorobenzene	86 – 115	--	59 – 113	--
1,2-Dichloroethane-d4	76 – 114	--	70 – 121	--
Matrix Spike Compound				
1,1-Dichloroethene	61 – 145	≤ 14	59 – 172	≤ 22
Trichloroethane	71 – 120	≤ 14	62 – 137	≤ 24
Chlorobenzene	75 – 130	≤ 13	60 – 133	≤ 21
Toluene	76 – 125	≤ 13	59 – 139	≤ 21
Benzene	76 – 127	≤ 11	66 – 142	≤ 21

Source: NYSDEC ASP

Table 1-2b

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS
BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

	Soil	
Surrogate Compound	Accuracy %	Precision %
Nitrobenzene-d_5	23 – 120	--
2-Fluorobiphenyl	30 – 115	--
Terphenyl-d_{14}	18 – 137	--
Phenol-d_5	24 – 113	--
2-Fluorophenol	25 – 121	--
2,4,6-Tribromophenol	19 – 122	--
2-Chlorophenol-d_4	20 – 130	--
1,2-Dichlorobenzene-d_4	20 – 130	--
Matrix Spike Compound		
Phenol	26 – 90	≤ 35
2-Chlorophenol	25 – 102	≤ 50
1,4-Dichlorobenzene	28 – 104	≤ 25
N-Nitroso-di-n-propylamine	41 – 126	≤ 38
1,2,4-Trichlorobenzene	38 – 107	≤ 25
4-Chloro-3-methylphenol	26 – 103	≤ 33
Acenaphthene	31 – 137	≤ 19
4-Nitrophenol	11 – 114	≤ 50
2,4-Dinitrotoluene	28 – 89	≤ 47
Pentachlorophenol	17 – 109	≤ 47
Pyrene	35 – 142	≤ 36

*Accuracy will be determined as percent recovery of these compounds. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

Source: NYSDEC ASP

Table 1-2c

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
CORRECTIVE MEASURES PROGRAM
DATA QUALITY REQUIREMENTS
ADVISORY RECOVERY LIMITS
SURROGATE AND MATRIX SPIKE COMPOUNDS
FOR PESTICIDES/PCBs*

	Soil	
	Advisory Recovery Limits (%)	Precision %
Surrogate Compound		
Decachlorobiphenyl	30 – 150	--
Tetrachloro-m-xylene	30 – 150	--
Matrix Spike Compound		
Lindane	46 – 127	≤ 50
Heptachlor	35 – 130	≤ 31
Aldrin	34 – 132	≤ 43
Dieldrin	31 – 134	≤ 38
Endrin	42 – 139	≤ 45
4,4'-DDT	23 – 134	≤ 50
Aroclor 1015 mix	29 – 135	≤ 15
Aroclor 1260 mix	29 - 135	≤ 20

*Samples do not have to be reanalyzed if these recovery limits are not met.

Source: NYSDEC ASP

- Groundwater (Monitoring Wells) – Samples will be obtained after the monitoring well has been purged using low-flow purging techniques and field measurements (i.e., pH, conductivity, temperature and turbidity) have stabilized. Groundwater samples will be collected using the dedicated discharge hosing from the low-flow pump.

- Equipment Calibration – Field equipment used for air monitoring or to measure field parameters during well development, purging and soil screening will be calibrated daily before use according to the manufacturer's procedures.

- Equipment Decontamination – Non-disposable sampling equipment will be decontaminated prior to use at each location according to the NYSDEC-approved procedures described in Section 1.8 of this QAPP.

1.6.2 Data Comparability

All data will be presented in the units designated by the methods specified by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory and the 2005 NYSDEC ASP. In addition, sample locations, collection procedures and analytical methods from earlier studies will be evaluated for comparability with current procedures/ methods.

1.6.3 Data Completeness

The acceptability of 100% of the data is desired as a goal for this project. The acceptability of less than 100% complete data, meeting all laboratory Quality Assurance/Quality Control (QA/QC) protocols/standards, will be evaluated on a case-by-case basis.

The laboratory utilized to perform the analyses on the soil and groundwater samples will provide NYSDEC ASP Category B Deliverables. All data will be provided in the NYSDEC EQuIS format.

1.7 Detailed Sampling Procedures

Groundwater samples and soil samples will be collected as part of the Corrective Measures Program at CPC. Detailed sampling procedures for groundwater and soil samples are provided below.

When collecting the samples, care will be taken to maintain sample integrity by preserving its physical form and chemical composition to as great an extent as possible. First, the equipment utilized to collect the samples must be new and sterile or properly decontaminated. An appropriate piece of sampling equipment (e.g., disposable polyethylene tubing, disposable polyethylene sampling scoops, etc.) will be utilized to collect the sample and transfer it to the laboratory-supplied sample container. The sample should reflect and contain a good representation of the area from which it was collected. The sample will be transferred into the sample container as quickly as possible.

There are several steps performed after the transfer of the sample into the sample container that are necessary to properly complete the collection activities. Once the sample is transferred into the appropriate container, the container will be capped and, if necessary, the outside of the container will be wiped with a clean paper towel to remove any grime. A clean paper towel moistened with distilled/deionized water will be used for this purpose.

Prior to sample collection, the sample container will be properly labeled. Information such as the sample identification number, location, collection time and sample description will be recorded in the field log book. Associated paper work (e.g., Chain of Custody forms) will then be completed and will stay with the sample. The samples will be packaged in a manner that will allow the appropriate storage temperature to be maintained during transportation to the laboratory. Samples will be delivered to the laboratory within 48 hours of collection.

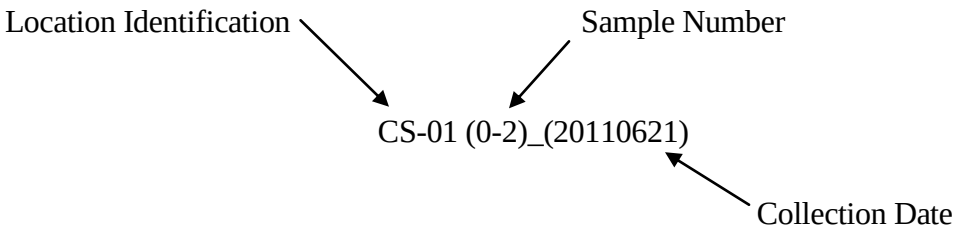
Proper personal protective equipment and monitoring equipment (if determined to be necessary) will be used at all times during sample collection to further maintain sample integrity and protection of worker health and safety.

1.7.1 Sample Identification

All samples collected during the field activities undertaken at the CPC facility will be labeled with a sample identification code. The code will identify the sample type (sample matrix), sample location, sample depth and collection date, as appropriate. Samples will be labeled according to the following system:

Sample Location Type:	–	Each sample location will be assigned an identifier based on the unit from which the sample was collected: Soil samples will be denoted with an "CS" and monitoring wells will be denoted with an "MW."
Location Number:	–	Each sample location will be designated with a number.
Sample Number:	–	For soil samples, the sample number will correspond to the depth in feet at which the sample was collected below grade (e.g., 0-2). This number will likely be recorded in parentheses.
Collection Date:	–	The date of collection will be included in the sample identification as an eight-digit number as follows (year, month, day).
Quality Assurance/ Quality Control (QA/QC):	–	An "MS" for Matrix Spike, "MSD" for Matrix Spike Duplicate or "TB" for Trip Blank, as appropriate, will be attached to the end of the sample identification name

Based on the above sample identification procedures, an example of a sample label may be:



1.7.2 Sample Handling, Packaging and Shipping

All analytical samples will be placed in the appropriate sample containers as specified in Exhibit I of the NYSDEC July 2005 ASP. The holding time criteria identified in the ASP will be followed, as specified in Table 1-1.

Prior to packaging any samples for transportation to the laboratory, the sample containers will be checked for proper identification and compared to the field log book for accuracy. The samples will then be wrapped with a cushioning material (e.g., bubble wrap) and placed in a cooler (or laboratory shuttle) with a sufficient quantity of bagged ice or "blue ice" packs to maintain the samples at 4°C until arrival at the laboratory.

All necessary documentation required to accompany the samples during transportation will be placed in a sealed plastic bag and taped to the underside of the cooler lid. The cooler will then be sealed with fiber (duct) tape and custody seals will be placed in such a manner that any opening of the cooler prior to arrival at the laboratory can be detected.

All samples will be shipped to ensure receipt at the laboratory within 48 hours of sample collection in accordance with ASP requirements.

1.7.3 Groundwater Samples

The following protocol will be adhered to for the collection of groundwater samples:

1. Be certain that the sample location is noted on Location Sketch (see Section 1.10.1).
2. Groundwater sampling following this procedure shall be performed using nondedicated bladder pumps fitted with disposable polyethylene discharge tubing.
3. The sample pump intake shall be positioned within the well's screened section. For wells screened across the water table, the pump should be set just below the water table interface.

4. New, clean, disposable gloves shall be worn when handling any dedicated or decontaminated sampling equipment, sample containers, and during the collection of samples.

5. All nondedicated sampling and measuring equipment must be decontaminated before use. At a minimum, equipment should be disassembled (when appropriate) and scrubbed in a nonphosphate, laboratory-grade detergent and distilled water solution, then rinsed with copious amounts of distilled water.

6. All sample vials and containers shall be stored in a clean carrying case. Remove the sample containers only when needed.

7. Field analysis equipment used for the measurement of field parameters, including pH, conductivity, temperature, turbidity and dissolved oxygen probes, shall be calibrated in accordance with the manufacturer's procedures. All calibration methods, procedures and results shall be documented in the calibration log and field notebook.

8. Document the date, well identification and any unusual occurrences in the field log. Document all field measurements in the field log.

9. Inspect the protective casing and general well condition and document any items of concern in the field log.

10. Unlock the protective casing. Refer to the Health and Safety Plan for air monitoring or other health and safety requirements.

11. Check the monitoring well for the presence of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) using an optical oil/water interface probe. Measure the depth to water (DTW) and depth to bottom of the well (DTB) from the measuring point (MP) located on the well (inner) casing using an electronic fluid-level measuring device. Record the DTW and DTB measurements in the field log. As required, the water level measuring device can be left to monitor changes in DTW during well purging.

12. Prior to purging, use a clean, disposable polyethylene bailer to collect a groundwater grab sample. Transfer the groundwater directly from the bailer to a clean, decontaminated or dedicated sample container. Measure the initial field parameters (e.g., dissolved oxygen, pH, temperature, turbidity and specific conductance) to establish pre-purge water quality.

13. Purge Volume Determination:

    – Minimum Purge Volume: A minimum of two times the volume of the discharge tubing shall be purged prior to the sampling of the well. The calculation for determining this volume of water to be removed from the pump and tubing is as follows:

$$PV_{min} = (TL \times TF) \times 2$$

where:

PV_{min} = The minimum volume of water to be purged from a well
TL = Tubing Length
TF = Tubing Factor which is 0.0102 gal/ft (39 ml/ft) for tubing diameter of 3/8 inch, or 0.0159 gal/ft (60 ml/ft) for tubing diameter of 5/8 inch

– Maximum Purge Volume: The maximum purge volume for most wells will be 0.25 (1/4) of one well casing volume. For some shallow wells, the PV_{min} may be greater than 0.25 casing volume. In these cases, the PV_{min} shall be purged followed by the measurement of field water quality parameters and collection of samples. The maximum purge volume (PV_{max}) is calculated as follows:

$$PV_{max} = (DTB_{LS} - DTW_{LS})\ F_c \times 0.25$$

where:

PV_{max} = One quarter of one well casing volume (gal)
DTB_{LS} = Depth to Bottom from Land Surface (feet)
DTW_{LS} = Depth to Water from Land Surface (feet)
F_c = Casing factor (gal/ft) which is 0.16 for a 2-inch diameter well and 0.65 for a 4-inch diameter well

14. Begin purging the well according to the manufacturer's instructions for operating the pump. The purge rate should be kept to less than 500 milliliters per minute (ml/m). Variation of the purge rate should be minimized. Note: Purged water will be collected in 55-gallon drums for subsequent off-site transportation and disposal.

15. Following the removal of the minimum purge volume, begin monitoring the field water-quality indicator parameters (i.e., temperature, conductivity, pH, dissolved oxygen and turbidity). It is recommended that the water quality meter be attached to a flow-through cell to allow for continuous readings. Monitor the indicator parameters approximately once every 5 minutes and record the results in the field log. (Note: A minimum of 500 ml of purge water is required to fully exchange the water in the flow-through cell between measurements.) The well shall be considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings.

    If one or more key indicator parameters fail to stabilize after purging 0.25 well casing volume (the maximum purge volume), purging will be discontinued, and sampling will be initiated. In cases where the calculated minimum purge volume is greater than 0.25 casing volume, monitor the indicator parameters following the removal of PV_{min} approximately every 2 minutes (approximately every 0.5 gallon) for a maximum of 6 minutes (i.e., three sets of readings). Any parameters that fail to achieve stabilization should be noted in the field log. Turbidity should be less than 50 NTUs prior to collection of a sample for metals analysis.

16. Turn pump off and disconnect the flow-through cell. Turn pump on and reduce the pump discharge rate to the minimum capabilities of the pump (approximately 100 milliliters per minute or less). Collect the appropriate samples from the pump discharge hose. Label all sample containers and immediately place samples in a laboratory-supplied cooler with bagged ice sufficient to cool samples to 4°C.

17. If the turbidity exceeds 50 NTUs, the well can still be sampled since the analysis is for VOCs only.

18. Slowly fill the sample container taking care not to spill on outside of bottle or overfill container and replace cover on the sample container. Samples for VOC analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully, slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

19. Return sample container to sample cooler.

20. Record notes in field log book as described in Section 1.10.3.

21. If reusable sampling equipment was utilized, decontaminate the sampling equipment according to the procedures described in Section 1.8.

22. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum or other approved container for disposal.

1.7.4 Confirmation Soil Samples

The following protocol will be adhered to for the collection of soil samples:

1. Be certain that the sample location is noted on a sample location sketch (see Section 1.10.1).

2. Remove a set of laboratory-supplied, pre-cleaned sample containers from the sample cooler, label containers with an indelible marker and fill out a Chain of Custody form (refer to Section 1.10.2).

3. Be certain that the sampling equipment is either new or has been decontaminated utilizing the procedures outlined in Section 1.8.

4. Don a new pair of disposable gloves (nitrile) and remove a set of polyethylene disposable scoops.

5. The bucket of the excavation equipment will be used to retrieve a sample from the desired sampling depth.

6. Immediately obtain an organic vapor measurement from the sample with a PID (11.7 eV Lamp).

7. Samples for VOC analysis will be collected immediately using the Encore sampling method in accordance with USEPA Method 5035. The remaining soil fraction will be homogenized prior to collecting the sample for the remaining analyses. Remove a sample aliquot from the excavator bucket using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover.

8. Return the sample containers to the cooler.

9. Record notes in field log book as described in Section 1.10.3.

10. If reusable sampling equipment was utilized, decontaminate the sampling equipment according to the procedures described in Section 1.8.

11. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum or other approved container for disposal.

1.8 Decontamination Procedures

Whenever feasible, all field sampling equipment should be dedicated to a particular sampling location. In instances where this is not possible, a field cleaning (decontamination) procedure will be used in order to reduce the risk of cross-contamination between sample locations. A decontamination station will be established for all field activities if field decontamination is necessary. This will be an area located at some distance from the sampling locations so as not to adversely impact the decontamination procedure while still allowing the sampling teams to keep equipment handling to a minimum.

1.8.1 Field Decontamination Procedures

All non-disposable equipment will be decontaminated at appropriate intervals (e.g., prior to initial use, prior to moving to a new sampling interval or location, and prior to leaving the site). Different decontamination procedures are used for the various types of equipment utilized to perform the field activities. When designing a field decontamination program, it is advisable to initiate environmental sampling in the area of the site with the lowest contaminant probability and proceed through to the areas of highest suspected contamination.

1.8.2 Decontamination Procedure for Sampling Equipment

All Teflon, polyvinyl chloride (PVC), high density polyethylene (HDPE) and stainless steel sampling equipment will be decontaminated utilizing the following procedure:

- Wash thoroughly with non-residual detergent (e.g., Alconox) and clean potable tap water using a brush to remove particulate matter or surface film.
- Rinse thoroughly utilizing clean potable tap water.
- Rinse thoroughly utilizing distilled or deionized water.
- Wrap completely in clean aluminum foil with dull side against the equipment.

The first step, a soap and water wash, is designed to remove all visible particulate matter and residual oils and grease. The distilled/deionized water rinse ensures complete removal of residual cleaning products and the aluminum wrap protects the equipment from contamination and keeps it clean for use at another sampling location.

1.8.3 Decontamination Procedure for Excavation and Purging Equipment

All equipment such as excavators and other mobile equipment will receive an initial cleaning prior to use at the site. The frequency of subsequent cleanings while on-site will depend on how the equipment is actually used in relation to collecting environmental samples. All wash/rinse solutions will be collected in 55-gallon drums for off-site disposal.

After the initial decontamination, cleaning may be reduced to those areas that are in close proximity to materials being sampled. The bucket of the excavator will be cleaned between sample locations.

The bucket of the excavator will be decontaminated in the following manner:

- Wash thoroughly with nonresidual detergent (Alconox) and tap water using a brush to remove particulate matter or surface film. Pressure washing will be utilized, if necessary, to remove any oil and/or tar accumulations on probe rods, bucket of the excavator, etc. Any loose paint chips, paint flakes and rust must also be removed.

- Once decontaminated, remove all items from the decontamination area.

Materials and equipment that will be used for the purposes of well development and/or purging shall also be decontaminated.

The low-flow submersible pump will be decontaminated by the following procedures:

- Place pump in Alconox and water solution and wash the outside of the pump with a scrub brush.

- Pump approximately five gallons of Alconox and water solution through the pump.

- Place pump in bucket of clean water and pump 5 gallons of water through pump.

- Wipe down the cable with deonized water and a paper towel.

1.9 Laboratory Sample Custody Procedures

A NYSDOH ELAP certified laboratory meeting the requirements for sample custody procedures, including cleaning and handling sample containers and analytical equipment, will be used. The laboratory will be NYSDOH ELAP certified for the parameters of interest and matrices that will be collected (e.g., water and soil.). The Standard Operating Procedures of the laboratory selected to undertake the analysis of environmental samples for this program will be available upon request.

1.10 Field Management Documentation

Proper management and documentation of the field activities is essential to ensure that all necessary work is conducted in accordance with this Quality Assurance Project Plan in an efficient and high quality manner. Field management procedures include following proper chain

of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if required), completing Chain of Custody forms and maintaining a Daily Field Log Book. Proper completion of the Chain of Custody and the field log book are necessary to support the future actions that may result from the sample analysis. This documentation will support that the samples were properly collected and handled.

1.10.1 Location Sketch

Each sampling point shall have its own location sketch with measurements and permanent references if possible. This sketch will be recorded in the field log book. Photographs may also be utilized.

1.10.2 Chain of Custody

A Chain of Custody (COC) form is initiated at the laboratory with container preparation and transportation to the site. The COC must remain with the samples at all times and bear the name of the person assuming responsibility for the samples. This person is tasked with ensuring secure and proper handling of the containers and samples. When the form is complete, it should indicate that there were no lapses in sample accountability.

A sample is considered to be in an individual's custody if any of the following conditions are met:

- It is in the individual's physical possession; or
- It is in the individual's view after being in his or her physical possession; or
- It is secured by the individual so that no one can tamper with it; or
- The individual puts it in a designated and identified secure area.

In general, Chain of Custody forms are provided by the laboratory contracted to perform the analytical services. At a minimum, the following information shall be provided on these forms:

- Project name and address
- Project number
- Sample identification number of each sample contained in the sample cooler
- Date of sample collection
- Time of sample collection
- Sample location
- Sample type/matrix
- Analyses requested
- Number of containers and volume collected
- Remarks (e.g., preservation, special handling, etc.)
- Sampler(s) name(s) and signature(s)
- Spaces for relinquished by/received by signature and date/time.

For this particular study, Chain of Custody forms provided by the laboratory will be utilized.

The Chain of Custody form is completed and signed by the person performing the sampling activities. The original form travels with the samples and is signed and dated each time the samples are relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler maintains a copy of the Chain of Custody form and a copy is retained for the project file. Each sample container must also be labeled with an indelible marker with a minimum of the following information:

- Sample identification number

- Project name/location
- Analysis to be performed
- Date and time of collection
- Sampler's initials

A copy of the completed Chain of Custody form is returned by the laboratory with the analytical results.

1.10.3 Field Log Book

Field log books must be bound and should have consecutively numbered, water resistant pages. All pertinent information regarding the site, project and sampling procedures must be documented. Notations should be made in log book fashion, noting the time and date of all entries. Information recorded in the log book should include, but is not necessarily be limited to, the following:

The first page of the log book will contain the following information:

- Project name and address
- Name, address and phone number of field contact
- Name, address and phone number of subcontractors and contact persons

Daily entries are made for the following information:

- Purpose of sampling
- Sampling location
- Number(s) and volume(s) of sample(s) collected
- Description of sample location and sampling methodology

- Date and time of sample collection and personnel arrival and departure
- Geologic description of each sample interval, if applicable
- Collector's sample identification number(s)
- Sample distribution and method of storage and transportation
- References, such as sketches of the sample location or photographs of sample collection with dimensions
- Field observations such as weather conditions, visual signs of staining and/or stressed vegetation
- Signature of personnel responsible for completing log entries.

1.11 Calibration Procedures and Preventive Maintenance

The following information regarding equipment will be maintained at the project site if monitoring is deemed necessary for health and safety purposes:

1. Equipment calibration and operating procedures which will include provisions for documentation of frequency, conditions, standards and records reflecting the calibration procedures, methods of usage and repair history of the measurement system. Calibration of field equipment will be completed daily at the sampling site so that any background contamination can be taken into consideration and the instrument calibrated accordingly.

2. A schedule of preventive maintenance tasks, consistent with the instrument manufacturer's specific operation manuals that will be carried out to minimize down time of the equipment.

3. Critical spare parts, necessary tools and manuals will be on hand to facilitate equipment maintenance and repair.

1.12 Performance of Field Audits

During field activities, if determined to be necessary, the QA/QC Officer will accompany sampling personnel into the field, verify that the site sampling program is being properly

implemented and detect and define problems so that resolutions can be determined and implemented. All findings will be documented and provided to the Field Operations Manager.

1.13 Control and Disposal of Contaminated Material

Contaminated materials generated during this field program will primarily be limited to spent protective clothing, spent disposable sampling equipment and wastes generated as a result of equipment decontamination.

Any contaminated materials generated as a result of the field program will be contained in U.S. Department of Transportation (DOT) 55-gallon drums and staged in a designated area for subsequent waste characterization. Each drum will be identified by the type of material contained.

Decisions regarding the disposal of drummed material will be made, at least in part, based on the analytical results of the samples collected during this program. At the present time, there is no provision for separate analysis of contained material.

Decontamination water and sediment, if any, will be contained in 55-gallon drums. A decision regarding disposal of this material will be made following receipt of the sample results. Analysis of decontamination water/sediment may be required for proper management.

DOT-approved 55-gallon drums will be available for disposal of spent protective clothing and disposable sampling equipment, if any. These drums will be marked and labeled as containing personnel protective and sampling equipment. These drums will not be sampled. All drums will be sealed and staged on-site to await proper off-site disposal.

1.14 Data Validation

Data validation will be performed in order to define and document analytical data quality in accordance with NYSDEC requirements that project data must be of known and acceptable

quality. The USEPA Functional Guidelines for Evaluating Organics and Inorganics Analyses for the CLP or the USEPA - Region 2 SOPs will be used for the data validation process. The data validation process will ensure that all analytical requirements specific to this sampling program, including this Quality Assurance Project Plan, are followed. Procedures will address validation of routine analytical services (RAS) results based on the NYSDEC Target Compound List (TCL) for standard sample matrices. The validation will be performed by an individual meeting the qualification requirements for a data validator for the NYSDEC.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual requirements and applicable analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results. The overall level of effort and specific data validation procedure to be used will be equivalent to a "20% validation" of all analytical data in any given data package.

During the review process, it will be determined whether the contractually-required laboratory submittals for sample results are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of data. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewer will develop a QA/QC data validation report for each analytical data package.

"Qualified" analytical results for any one field sample are established and presented based on the results of specific QC samples and procedures associated with its sample analysis group or batch. Precision and accuracy criteria (i.e., QC acceptance limits) are used in determining the need for qualifying data. Where test data have been reduced by the laboratory, the method of reduction will be described in the report. Reduction of laboratory measurements and laboratory reporting of analytical parameters shall be verified in accordance with the procedures specified in the NYSDEC program documents for each analytical method (i.e., recreate laboratory calculations and data reporting in accordance with the method specific procedure). The standard operating guideline manuals and any special analytical methodology

required are expected to specify documentation needs and technical criteria and will be taken into consideration in the validation process. Copies of the complete ASP Category B Deliverables will be submitted to the NYSDEC for review. Copies of the validation report, including the laboratory results data report sheets, with any qualifiers deemed appropriate by the data reviewer, and a supplementary field QC sample result summary statement, will be submitted to the NYSDEC, if requested. All data will be provided to the NYSDEC in EQuIS format.

Examples of standard data validation reporting formats and completeness inventory lists which are proposed for use on this project are contained in Exhibit B. These report forms will be modified as necessary and made appropriate for any project specific or NYSDEC requirements.

The following is a description of the two-phased approach to data validation planned to be used on this project. The first phase is called "checklisting" and the second phase is the analytical quality review, with the former being a subset of the latter.

- Checklisting - The data package is checked for correct submission of the contract required deliverables, correct transcription from the raw data to the required deliverable summary forms and proper calculation of a number of parameters.

- Analytical Quality Review - The data package is closely examined to recreate the analytical process and verify that proper and acceptable analytical techniques have been performed. Additionally, overall data quality and laboratory performance is evaluated by applying the appropriate data quality criteria to the data to reflect conformance with the specified, accepted QA/QC standards and contractual requirements.

At the completion of the data validation, a Summary Data Validation/Usability Report will be prepared and included in the final report submitted to the NYSDEC.

1.15 Performance and System Audits

A NYSDOH ELAP certified laboratory, which has satisfactorily completed performance audits and performance evaluation samples, shall be used on this project.

1.16 Corrective Action

A NYSDOH ELAP certified laboratory shall meet the requirements for corrective action protocols, including sample "cleanup" to attempt to eliminate/mitigate "matrix interference." Sample "cleanup" is not required for samples to be analyzed for volatile organic compounds or metals. However, sample "cleanup" is required for samples to be analyzed for semivolatile organic compounds, pesticides and polychlorinated biphenyls (PCBs).

1.17 Trip Blanks

The primary purpose of a trip blank sample is to detect additional sources of contamination that might potentially influence contaminant values reported in actual samples both quantitatively and qualitatively. Trip blanks are collected with water samples and analyzed for volatile organic compounds. Trip blanks will be collected during this sampling program since groundwater samples are to be collected for volatile organic compound analyses.

A trip blank will consist of a set of 40 milliliter (ml) sample vials filled at the laboratory with laboratory demonstrated analyte-free water. Trip blanks will be handled, transported and analyzed in the same manner as the samples acquired that day, except that the sample containers themselves are not opened in the field. Rather, these sample containers only travel with the sample cooler. The temperature of the trip blanks will be maintained at 4°C while on-site and during shipment. Trip blanks will return to the laboratory with the same set of bottles they accompanied in the field.

The purpose of a trip blank is to control sample bottle preparation and blank water quality as well as sample handling. Thus, the trip blank will travel to the site with the empty sample bottles and back from the site with the collected samples in an effort to simulate sample handling conditions. Contaminated trip blanks may indicate inadequate bottle cleaning or blank water of questionable quality.

1.18 Matrix Spike/Matrix Spike Duplicate and Spikes Blanks

Matrix spike samples and blanks are quality control procedures, consistent with the July 2005 NYSDEC ASP specifications, used by the laboratory as part of its internal Quality Assurance/Quality Control program. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) samples are aliquots of a designated environmental sample (water or soil) which are spiked with known quantities of specified compounds. These samples are used to evaluate the matrix effect of the sample upon the analytical methodology, as well as to determine the precision of the analytical method used. A matrix spike blank (MSB) is an aliquot of analyte-free water, prepared in the laboratory, and spiked with the same solution used to spike the MS and MSD. The MSB is subjected to the same analytical procedure as the MS/MSD and used to indicate the appropriateness of the spiking solution by calculating the spike compound recoveries. The procedure and frequency regarding the MS, MSD and MSB are defined in the July 2005 NYSDEC ASP. Site-specific MS and MSD samples should be collected at a frequency of one per 20 samples or each day (one for each sample delivery group), for each sample matrix collected (i.e., water, soil, etc.). The laboratory is required to analyze an MSB at the same frequency as the MS/MSD.

EXHIBIT A

DETECTION LIMITS

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
1.	Dichlorodifluoromethane	75-71-8		0.50	5.0
2.	Chloromethane	74-87-3		0.50	5.0
3.	Vinyl Chloride	75-01-4		0.50	5.0
4.	Bromomethane	74-83-9		0.50	5.0
5.	Chloroethane	75-00-3		0.50	5.0
6.	Trichlorofluoromethane	75-69-4		0.50	5.0
7.	1,1-Dichloroethene	75-35-4		0.50	5.0
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.50	5.0
9.	Acetone	67-64-1		5.0	10.0
10.	Carbon Disulfide	75-15-0		0.50	5.0
11.	Methyl Acetate	79-20-9		0.50	5.0
12.	Methylene chloride	75-09-2		0.50	5.0
13.	trans-1,2-Dichloroethene	156-60-5		0.50	5.0
14.	Methyl tert-Butyl Ether	1634-04-4		0.50	5.0
15.	1,1-Dichloroethane	75-34-3		0.50	5.0
16.	cis-1,2-Dichloroethene	156-59-2		0.50	5.0
17.	2-Butanone	78-93-3		5.0	10.0
18.	Bromochloromethane	74-97-5		0.50	5.0
19.	Chloroform	67-66-3		0.50	5.0
20.	1,1,1-Trichloroethane	71-55-6		0.50	5.0
21.	Cyclohexane	110-82-7		0.50	5.0
22.	Carbon tetrachloride	56-23-5		0.50	5.0
23.	Benzene	71-43-2		0.50	5.0
24.	1,2-Dichloroethane	107-06-2		0.50	5.0
25.	1,4-Dioxane	123-91-1	1.0	25	125
26.	Trichloroethane	79-01-6		0.50	5.0

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
27.	Methylcyclohexane	108-87-2		0.50	5.0
28.	1,2-Dichloropropane	78-87-5		0.50	5.0
29.	Bromodichloromethane	75-27-4		0.50	5.0
30.	cis-1,3-Dichloropropene	10061-01-5		0.50	5.0
31.	4-methyl-2-pentanone	108-10-1		5.0	10.0
32.	Toluene	108-88-3		0.50	5.0
33.	Trans-1,3-Dichloropropene	10061-02-6		0.50	5.0
34.	1,1,2-Trichloroethane	79-00-5		0.50	5.0
35.	Tetrachloroethene	127-18-4		0.50	5.0
36.	2-Hexanone	591-78-6		5.0	10.0
37.	Dibromochloromethane	124-48-1		0.50	5.0
38.	1,2-Dibromoethane	106-93-4	0.05	0.50	5.0
39.	Chlorobenzene	108-90-7		0.50	5.0
40.	Ethylbenzene	100-41-4		0.50	5.0
41.	Xylenes (Total)	1330-20-7		0.50	5.0
42.	Styrene	100-42-5		0.50	5.0
43.	Bromoform	75-25-2		0.50	5.0
44.	Isopropylbenzene	98-82-8		0.50	5.0
45.	1,1,2,2-Tetrachloroethane	79-34-5		0.50	5.0
46.	1,3-Dichlorobenzene	541-73-1		0.50	5.0
47.	1,4-Dichlorobenzene	106-46-7		0.50	5.0
48.	1,2-Dichlorobenzene	95-50-1		0.50	5.0
49.	1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.50	5.0
50.	1,2,4-Trichlorobenzene	120-82-1		0.50	5.0
51.	1,2,3-Trichlorobenzene	87-61-6		0.50	5.0

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples

	Volatile Analyte	CAS Number	Low Level Soil (µg/Kg)	Med. Level Soil (µg/Kg)
1.	Dichlorodifluoromethane	75-71-8	5.0	500
2.	Chloromethane	74-87-3	5.0	500
3.	Vinyl Chloride	75-01-4	5.0	500
4.	Bromomethane	74-83-9	5.0	500
5.	Chloroethane	75-00-3	5.0	500
6.	Trichlorofluoromethane	75-69-4	5.0	500
7.	1,1-Dichloroethene	75-35-4	5.0	500
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5.0	500
9.	Acetone	67-64-1	10.0	1000
10.	Carbon Disulfide	75-15-0	5.0	500
11.	Methyl Acetate	79-20-9	5.0	500
12.	Methylene chloride	75-09-2	5.0	500
13.	trans-1,2-Dichloroethene	156-60-5	5.0	500
14.	Methyl tert-Butyl Ether	1634-04-4	5.0	500
15.	1,1-Dichloroethane	75-34-3	5.0	500
16.	cis-1,2-Dichloroethene	156-59-2	5.0	500
17.	2-Butanone	78-93-3	10.0	1000
18.	Bromochloromethane	74-97-5	5.0	500
19.	Chloroform	67-66-3	5.0	500
20.	1,1,1-Trichloroethane	71-55-6	5.0	500
21.	Cyclohexane	110-82-7	5.0	500
22.	Carbon tetrachloride	56-23-5	5.0	500
23.	Benzene	71-43-2	5.0	500
24.	1,2-Dichloroethane	107-06-2	5.0	500
25.	1,4-Dioxane	123-91-1	125	12500
26.	Trichloroethane	79-01-6	5.0	500
27.	Methylcyclohexane	108-87-2	5.0	500
28.	1,2-Dichloropropane	78-87-5	5.0	500

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Volatile Analyte	CAS Number	Low Level Soil (µg/Kg)	Med. Level Soil (µg/Kg)
29.	Bromodichloromethane	75-27-4	5.0	500
30.	cis-1,3-Dichloropropene	10061-01-5	5.0	500
31.	4-methyl-2-pentanone	108-10-1	10.0	1000
32.	Toluene	108-88-3	5.0	500
33.	Trans-1,3-Dichloropropene	10061-02-6	5.0	500
34.	1,1,2-Trichloroethane	79-00-5	5.0	500
35.	Tetrachloroethene	127-18-4	5.0	500
36.	2-Hexanone	591-78-6	10.0	1000
37.	Dibromochloromethane	124-48-1	5.0	500
38.	1,2-Dibromoethane	106-93-4	5.0	500
39.	Chlorobenzene	108-90-7	5.0	500
40.	Ethylbenzene	100-41-4	5.0	500
41.	Xylenes (Total)	1330-20-7	5.0	500
42.	Styrene	100-42-5	5.0	500
43	Bromoform	75-25-2	5.0	500
44.	Isopropylbenzene	98-82-8	5.0	500
45.	1,1,2,2-Tetrachloroethane	79-34-5	5.0	500
46.	1,3-Dichlorobenzene	541-73-1	5.0	500
47.	1,4-Dichlorobenzene	106-46-7	5.0	500
48.	1,2-Dichlorobenzene	95-50-1	5.0	500
49.	1,2-Dibromo-3-chloropropane	96-12-8	5.0	500
50.	1,2,4-Trichlorobenzene	120-82-1	5.0	500
51.	1,2,3-Trichlorobenzene	87-61-6	5.0	500

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
1.	Benzaldehyde	100-52-7		5.0
2.	Phenol	108-95-2	0.10	5.0
3.	Bis-(2-chlorothyl) ether	111-44-4		5.0
4.	2-Chlorophenol	95-57-8	0.10	5.0
5.	2-Methylphenol	95-48-7	0.10	5.0
6.	2,2'-Oxybis (1-chloropropane)[3]	108-60-1		5.0
7.	Acetophenone	98-86-2		5.0
8.	4-Methylphenol	106-44-5	0.10	5.0
9.	N-Nitroso-di-n-propylamine	621-64-7		5.0
10.	Hexachloroethane	67-72-1		5.0
11.	Nitrobenzene	98-95-3		5.0
12.	Isophorone	78-59-1		5.0
13.	2-Nitrophenol	88-75-5	0.10	5.0
14.	2,4-Dimethylphenol	105-67-9	0.10	5.0
15.	Bis (2-chloroethoxy) methane	111-91-1		5.0
16.	2,4-Dichlorophenol	120-83-2	0.10	5.0
17.	Naphthalene	91-20-3	0.10	5.0
18.	4-Chloroaniline	106-47-8		5.0
19.	Hexachlorobutadiene	87-68-3		5.0
20.	Caprolactam	105-60-2		5.0
21.	4-Chloro-3-methylphenol	59-50-7	0.10	5.0
22.	2-Methylnaphthalene	91-57-6		5.0
23.	Hexachlorocyclopentadiene	77-47-4		5.0
24.	2,4,6-Trichlorophenol	88-06-2	0.10	5.0
25.	2,4,5-Trichlorophenol[4]	95-95-4	0.20	10.0
26.	1,1'-Biphenyl	92-52-4		5.0
27.	2-Chloronaphthalene	91-58-7		5.0

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
28.	2-Nitroaniline[4]	88-74-4		10.0
29.	Dimethylphthalate	131-11-3		5.0
30.	2,6-Dinitrotoluene	606-20-2		5.0
31.	Acenaphthylene	208-96-8	0.10	5.0
32.	3-Nitroaniline[4]	99-09-2		10.0
33.	Acenaphthene	83-32-9	0.10	5.0
34.	2,4-Dinitrophenol[4]	51-28-5	0.20	10.0
35.	4-Nitrophenol[4]	100-02-7	0.20	10.0
36.	Dibenzofuran	132-64-9		5.0
37.	2,4-Dinitrotoluene	121-14-2		5.0
38.	Diethylphthalate	84-66-2		5.0
39.	Fluorene	86-73-7	0.10	5.0
40.	4-Chlorophenyl-phenyl ether	7005-72-3		5.0
41.	4-Nitroaniline[4]	100-01-6		10.0
42.	4,6-Dinitro-2-methylphenol[4]	534-52-1	0.20	10.0
43.	N-Nitrosodiphenylamine	86-30-6		5.0
44.	1,2,4,5-Tetrachlorobenzene	95-34-3		5.0
45.	4-Bromophenyl-phenylether	101-55-3		5.0
46.	Hexachlorobenzene	100-52-7		5.0
47.	Atrazine	108-95-2	0.10	5.0
48.	Pentachlorophenol	111-44-4	0.20	10.0
49.	Phenanthrene	95-57-8	0.10	5.0
50.	Anthracene	95-48-7	0.10	5.0
51.	Carbazole	108-60-1		5.0
52.	Di-n-butylphthalate	98-86-2		5.0

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
53.	Fluoroanthene	106-44-5	0.10	5.0
54.	Pyrene	621-64-7		5.0
55.	Butylbenzylphthalate	67-72-1		5.0
56.	3,3'-Dichlorobenzidine	98-95-3		5.0
57.	Benzo (a) anthracene	78-59-1		5.0
58.	Chrysene	88-75-5	0.10	5.0
59.	Bis (2-ethylhexyl) phthalate	105-67-9	0.10	5.0
60.	Di-n-octylphthalate	111-91-1		5.0
61.	Benzo (b) fluoranthene	120-83-2	0.10	5.0
62.	Benzo (k) fluoranthene	91-20-3	0.10	5.0
63.	Benzo (a) pyrene	106-47-8		5.0
64.	Indeno (1,2,3-cd) pyrene	87-68-3		5.0
65.	Benzo (a,h) anthracene	105-60-2		5.0
66.	Benzo (g,h,i) perylene	59-50-7	0.10	5.0

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples

	Semivolatile Analyte	CAS Number	Low Level By SIM[1] (µg/Kg)	Low Level Solids[2] (µg/Kg)	Med. Level Solids[2] (µg/Kg)
1.	Benzaldehyde	100-52-7		170	50000
2.	Phenol	108-95-2	3.3	170	50000
3.	Bis-(2-chlorothyl) ether	111-44-4		170	50000
4.	2-Chlorophenol	95-57-8	3.3	170	50000
5.	2-Methylphenol	95-48-7	3.3	170	50000
6.	2,2'-Oxybis (1-chloropropane)[3]	108-60-1		170	50000
7.	Acetophenone	98-86-2		170	50000
8.	4-Methylphenol	106-44-5	3.3	170	50000
9.	N-Nitroso-di-n-propylamine	621-64-7		170	50000
10.	Hexachloroethane	67-72-1		170	50000
11.	Nitrobenzene	98-95-3		170	50000
12.	Isophorone	78-59-1		170	50000
13.	2-Nitrophenol	88-75-5	3.3	170	50000
14.	2,4-Dimethylphenol	105-67-9	3.3	170	50000
15.	Bis (2-chloroethoxy) methane	111-91-1		170	50000
16.	2,4-Dichlorophenol	120-83-2	3.3	170	50000
17.	Naphthalene	91-20-3	3.3	170	50000
18.	4-Chloroaniline	106-47-8		170	50000
19.	Hexachlorobutadiene	87-68-3		170	50000
20.	Caprolactam	105-60-2		170	50000
21.	4-Chloro-3-methylphenol	59-50-7	3.3	170	50000
22.	2-Methylnaphthalene	91-57-6		170	50000
23.	Hexachlorocyclopentadiene	77-47-4		170	50000
24.	2,4,6-Trichlorophenol	88-06-2	3.3	170	50000

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Level By SIM[1] (µg/Kg)	Low Level Solids[2] (µg/Kg)	Med. Level Solids[2] (µg/Kg)
25.	2,4,5-Trichlorophenol[4]	95-95-4	6.7	330	100000
26.	1,1'-Biphenyl	92-52-4		170	50000
27.	2-Chloronaphthalene	91-58-7		170	50000
28.	2-Nitroaniline[4]	88-74-4		330	100000
29.	Dimethylphthalate	131-11-3		170	50000
30.	2,6-Dinitrotoluene	606-20-2		170	50000
31.	Acenaphthylene	208-96-8	3.3	170	50000
32.	3-Nitroaniline[4]	99-09-2		330	100000
33.	Acenaphthene	83-32-9	3.3	170	50000
34.	2,4-Dinitrophenol[4]	51-28-5	6.7	330	100000
35.	4-Nitrophenol[4]	100-02-7	6.7	330	100000
36.	Dibenzofuran	132-64-9		170	50000
37.	2,4-Dinitrotoluene	121-14-2		170	50000
38.	Diethylphthalate	84-66-2		170	50000
39.	Fluorene	86-73-7	3.3	170	50000
40.	4-Chlorophenyl-phenyl ether	7005-72-3		170	50000
41.	4-Nitroaniline[4]	100-01-6		330	100000
42.	4,6-Dinitro-2-methylphenol[4]	534-52-1	6.7	330	100000
43.	N-Nitrosodiphenylamine	86-30-6		170	50000
44.	1,2,4,5-Tetrachlorobenzene	95-34-3		170	50000
45.	4-Bromophenyl-phenylether	101-55-3		170	50000
46.	Hexachlorobenzene	118-74-1		170	10000
47.	Atrazine	1912-24-9		170	50000
48.	Pentachlorophenol	87-86-5	6.7	330	100000

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Level By SIM[1] (µg/Kg)	Low Level Solids[2] (µg/Kg)	Med. Level Solids[2] (µg/Kg)
49.	Phenanthrene	85-01-8	3.3	170	50000
50.	Anthracene	120-12-7	3.3	170	50000
51.	Carbazole	86-74-8		170	50000
52.	Di-n-butylphthalate	84-74-2		170	50000
53.	Fluoroanthene	206-44-0	3.3	170	50000
54.	Pyrene	129-00-0	3.3	170	50000
55.	Butylbenzylphthalate	85-68-7		170	50000
56.	3,3'-Dichlorobenzidine	91-94-1		170	50000
57.	Benzo (a) anthracene	56-55-3	3.3	170	50000
58.	Chrysene	218-01-9	3.3	170	50000
59.	Bis (2-ethylhexyl) phthalate	117-81-7		170	50000
60.	Di-n-octylphthalate	117-84-0		170	50000
61.	Benzo (b) fluoranthene	205-99-2	3.3	170	50000
62.	Benzo (k) fluoranthene	207-08-9	3.3	170	50000
63.	Benzo (a) pyrene	50-32-8	3.3	170	50000
64.	Indeno (1,2,3-cd) pyrene	193-39-5	3.3	170	50000
65.	Benzo (a,h) anthracene	53-70-3	3.3	170	50000
66.	Benzo (g,h,i) perylene	191-24-2	3.3	170	50000

Semivolatile Notes

[1] CRQLs for optional analysis of water and soil samples using SIM (Selected Ion Monitoring) techniques for PAHs and phenols.

[2] Denotes soil, sediment, tissue, or mixed phase samples.

[3] Previously known as bis (2-Chloroisoproply) ether.

[4] Seven semivolatile compounds are calibrated using only a four point initial calibration, eliminating the lowest standard. Therefore, the CRQL values for these eight compounds are 2 times higher for all matrices and levels.

Pesticide Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Pesticide Analyte	CAS Number	Water (µg/L)	Solids[1] (µg/Kg)
1.	alpha-BHC	319-84-6	0.050	1.7
2.	beta-BHC	319-85-7	0.050	1.7
3.	delta-BHC	319-86-8	0.050	1.7
4.	gamma-BHC (Lindane)	58-89-9	0.050	1.7
5.	Heptachlor	76-44-8	0.050	1.7
6.	Aldrin	309-00-2	0.050	1.7
7.	Heptachlor epoxide[2]	1024-57-3	0.050	1.7
8.	Endosulfan I	959-98-8	0.050	1.7
9.	Dieldrin	60-57-1	0.10	3.3
10.	4,4'-DDE	72-55-9	0.10	3.3
11.	Endrin	72-20-8	0.10	3.3
12.	Endosulfan II	33213-65-9	0.10	3.3
13.	4,4'-DDD	72-54-8	0.10	3.3
14.	Endosulfan sulfate	1031-07-8	0.10	3.3
15.	4,4'-DDT	50-29-3	0.10	3.3
16.	Methoxychlor	72-43-5	0.10	3.3
17.	Endrin ketone	53494-70-5	0.10	3.3
18.	Endrin aldehyde	7421-93-4	0.10	3.3
19.	alpha-Chlordane	5103-71-9	0.050	1.7
20.	gamma-Chlordane	5103-74-2	0.050	1.7
21.	Toxaphene	8001-35-2	5.0	34

Pesticide Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of pesticides.

[2] Only the exo-epoxy isomer (isomer B) of heptachlor epoxide is reported on the data reporting forms (Exhibit B).

PCB Aroclor Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Aroclor Analyte	CAS Number	Water (µg/L)	Solids[1] (µg/Kg)
1.	Arochlor-1016	12674-11-2	1.0	33
2.	Arochlor-1221	11104-28-2	1.0	33
3.	Arochlor-1232	11141-16-5	1.0	33
4.	Arochlor-1242	53469-21-9	1.0	33
5.	Arochlor-1248	12672-29-6	1.0	33
6.	Arochlor-1254	11097-69-1	1.0	33
7.	Arochlor-1260	11096-82-5	1.0	33
8.	Arochlor-1262	37324-23-5	1.0	33
9.	Arochlor-1268	11100-14-4	1.0	33

Aroclor PCB Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Aroclor PCBs.

PART II – SUPERFUND-CLP INORGANICS

Inorganic Target Compound List (TCL) and Contract Required Quantitation Limits (CRQLs) For Aqueous and Solid Samples

	Analyte	CAS Number	ICP-AES[1] CRQL for Water (µg/L)	ICP-AES[1] CRQL for Solids (mg/Kg)	ICP-MS[1] for Water (µg/L)
1.	Aluminum	7429-90-5	200	40	30
2.	Antimony	7440-36-0	60	12	2
3.	Arsenic	7440-38-2	15	3	1
4.	Barium	7440-39-3	200	40	10
5.	Beryllium	7440-41-7	5	1	1
6.	Cadmium	7440-43-9	5	1	1
7	Calcium	7440-70-2	5000	1000	--
8.	Chromium	7440-47-3	10	2	2
9.	Cobalt	7440-48-4	50	10	0.5
10.	Copper	7440-50-8	25	5	2
11.	Iron	7439-89-6	100	20	--
12.	Lead	7439-92-1	10	2	1
13.	Magnesium	7439-95-4	5000	1000	--
14.	Manganese	7439-96-5	15	3	0.5
15.	Mercury[2]	7439-97-6	0.2	0.1	--
16.	Nickel	7440-02-0	40	8	1
17.	Potassium	7440-09-7	5000	1000	--
18.	Selenium	7782-49-2	35	7	5
19.	Silver	7440-22-4	10	2	1
20.	Sodium	7440-23-5	5000	1000	--
21.	Thallium	7440-28-0	25	5	1
22.	Vanadium	7440-62-2	50	10	1
23.	Zinc	7440-66-6	60	12	1
24.	Cyanide[2]	57-12-5	10	1	--

Inorganic Notes

[1] Any analytical method specified in Exhibit D, may be utilized as long as the documented instrument or method detection limits (IDLs or MDLs) are less than one half the Contract Required Quantitation Level (CRQL) requirements. Higher quantitation levels may only be used in the following circumstance:

If the sample concentration exceeds five times the quantitation limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Quantitation Limit. This is illustrated in the example below:

For lead:
Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample concentration = 220
Contract Required Quantitation Level (CRQL) = 3

The value of 220 may be reported even though instrument detection limit is greater than Contract Required Quantitation Limit. The instrument or method detection limit must be documented as described in Exhibit E.

[2] Mercury is analyzed by cold vapor atomic absorption. Cyanide is analyzed by colorimetry/spectrophotometry.

EXHIBIT B

DATA VALIDATION FORMS

DATA VALIDATION CHECKLIST

Project Name:	
Project Number:	
Sample Date(s):	
Sample Team:	
Matrix/Number of Samples:	Water/ Soil/ Field Duplicates/ Trip Blanks / Field Blanks/
Analyzing Laboratory:	
Analyses:	Volatile organic compounds (VOCs), by USEPA method SW846 8260B Semivolatile organic compounds (SVOCs), by USEPA method SW846 8270C Polychlorinated biphenyls PCBs by USEPA SW846 Method 8082 Metals: by SW846 Method 6010 and mercury (Hg) by Method 7471
Laboratory Report No:	Date:

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample results					
2. Parameters analyzed					
3. Method of analysis					
4. Sample collection date					
5. Laboratory sample received date					
6. Sample analysis date					
7. Copy of chain-of-custody form signed by Lab sample custodian					
8. Narrative summary of QA or sample problems provided					

QA - quality assurance

Comments:

The data packages have been reviewed in accordance with the NYSDEC 6/05 ASP Quality Assurance/ Quality Control (QA/QC) requirements. A validation was conducted on the data package and any applicable qualification of the data was determined using the USEPA National Functional Guidelines of June 2008, or USEPA National Functional Guidelines of Inorganic Data Review, January 2010, method performance criteria, and Dvirka and Bartilucci Consulting Engineers, a Division of D&B Engineers and Architects, P.C. professional judgment. The qualification of data discussed within this data validation checklist did not impact the usability of the sample results.

Laboratory Report:
SAMPLE AND ANALYSIS LIST

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent ID	Analysis				
					VOC	SVOC	PCB	Metals	Hg

ORGANIC ANALYSES
VOCS

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Holding times					
2. Blanks					
A. Method blanks					
B. Trip blanks					
C. Field blanks					
3. Matrix spike (MS) %R					
4. Matrix spike duplicate (MSD) %R					
5. MS/MSD precision (RPD)					
6. Laboratory Control Sample %R					
7. Surrogate spike recoveries					
8. Instrument performance check					
9. Internal standard retention times and areas					
10. Initial calibration RRF's and %RSD's					
11. Continuing calibration RRF's and %D's					
12. Transcriptions – quant report vs. Form I					
13. Tentatively Identified Compounds (TICs)					
14. Field duplicates RPD					

VOCs - volatile organic compounds
%R - percent recovery
%D - percent difference
%RSD - percent relative standard deviation
RRF - relative response factor
RPD - relative percent difference

Comments:
Performance was acceptable.

ORGANIC ANALYSES
SVOCS

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Holding times					
2. Blanks					
A. Method blanks					
B. Field blank					
3. Matrix spike (MS) %R					
4. Matrix spike duplicate (MSD) %R					
5. MS/MSD precision (RPD)					
6. Laboratory Control Sample %R					
7. Surrogate spike recoveries					
8. Instrument performance check					
9. Internal standard retention times and areas					
10. Initial calibration RRF's and %RSD's					
11. Continuing calibration RRF's and %D's					
12. Transcriptions – quant report vs. Form I					
13. Tentatively identified compounds (TICs)					
14. Field duplicates RPD					

SVOCs –Semivolatile organic compounds
%D - percent difference
RRF - relative response factor
%R - percent recovery
%RSD - percent relative standard deviation
RPD - relative percent difference

Comments:
Performance was acceptable

ORGANIC ANALYSES
PCBs

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Holding times					
2. Blanks					
A. Method blanks					
B. Field blanks					
3. Matrix spike (MS) %R					
4. Matrix spike duplicate (MSD) %R					
5. MS/MSD precision (RPD)					
6. Laboratory Control Sample %R					
7. Surrogate spike recoveries					
8. GC Surrogate retention time summary					
9. Initial calibration %RSD's					
10. Continuing calibration %D's					
11. Transcriptions – quant report vs. Form I					
12. Field duplicates RPD					

PCBs – Polychlorinated Biphenyls
%R - percent recovery
%D - percent difference
%RSD - percent relative standard deviation
RRF - relative response factor
RPD - relative percent difference

Comments:
Performance was acceptable.

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Holding times					
2. Blanks					
A. Preparation and calibration blanks					
B. Field blanks					
3. Initial calibration verification %R					
4. Continuing calibration verification %R					
5. CRDL standard %R					
6. Interference check sample %R					
7. Laboratory control sample %R					
8. Spike sample %R					
9. Post digestive spike sample %R					
10. Duplicate RPD					
11. Serial dilution check %D					
12. Total verse dissolved results					
13. Field duplicates RPD					

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:
Performance was acceptable

DATA VALIDATION AND QUALIFICATION SUMMARY

Laboratory Report:

Sample ID	Analyte(s)	Qualifier	Reason(s)
VOCS			
SVOCS			
PCBs			
METALS			

VALIDATION PERFORMED BY & DATE:	
VALIDATION PERFORMED BY SIGNATURE:	

APPENDIX C

SITE-SPECIFIC HEALTH AND SAFETY PLAN

PSC – CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

HEALTH AND SAFETY PLAN
FOR
CORRECTIVE MEASURES PROGRAM

Prepared for:

PSC – CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
120 SOUTH FOURTH STREET
BAY SHORE, NEW YORK

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

AUGUST 2011

HEALTH AND SAFETY PLAN
PSC – CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

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1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (HASP) was developed for safe completion of field work to be completed at the PSC – Chemical Pollution Control, LLC of New York (CPC) facility located in Bay Shore, New York. This plan must be re-evaluated should the project conditions change from those that are discussed below.

The procedures and protocols presented in this plan have been established to ensure that a mechanism is in place to assist project personnel in the event that hazards from site contamination are encountered. This plan addresses typical on-site activities such as soil and groundwater sampling and associated activities that will be completed by Dvirka and Bartilucci Consulting Engineers (D&B) and its subcontractors. The Building Contractor and In-Situ Chemical Oxidation Contractor will be required to prepare their own HASPs to cover their project personnel. This HASP is not designed to address each and every health and safety scenario that could be encountered during implementation of a typical project. However, this HASP addresses the specific health and safety situations resulting from actual or potential contact with contaminated materials consistent with the requirements pursuant to OSHA 1910 General Industry Standards, OSHA 1926 Construction Standards, and specifically, the OSHA Standard for Hazardous Waste Operations and Emergency Response (29 CFR 1910.120), where applicable.

Compliance with this HASP is required from all authorized D&B project personnel, project support personnel and visitors who enter the work areas of this project. Under no circumstances will any person enter an established restricted area or exclusion zone without first complying with the requirements of this HASP.

The contents of this HASP may change or undergo revision based upon field monitoring results, modifications to the technical scope of work or additional information made available to health and safety personnel. Any proposed changes must be reviewed and approved by CPC and the New York State Department of Environmental Conservation (NYSDEC), and reviewed by designated D&B personnel.

1.1 Project Location

SITE NAME: *PSC – Chemical Pollution Control, LLC of New York*

SITE LOCATION: *Bay Shore, Suffolk County, New York*

1.2 Project Personnel

This section specifically refers to D&B operations personnel, project management personnel and project support personnel. Project Personnel are divided into three categories including Contact Project Personnel, Non-Contact Project Personnel and Project Support Personnel.

Contact Project Personnel - Refers to project personnel who have a reasonable potential to come into contact with contaminated soil, groundwater or vapors. The specific job tasks will be evaluated to determine personnel classifications. The Health and Safety Coordinator (HSC) or his/her designee (i.e., Field Operations Manager [FOM]) will assist with this determination.

Non-Contact Project Personnel - Refers to Project Personnel who are not reasonably expected to come into contact with contaminated soil, groundwater or vapors. The specific job tasks will be evaluated to determine personnel classifications. The HSC or his/her designee (i.e., FOM) will assist with this determination.

Project Support Personnel - Refers to all other persons who may enter the project work zone such as truck drivers, utility workers and emergency crews (e.g., police, fire, ambulance, etc.), as well as any other personnel designated as a project visitor by D&B.

Project Personnel Assignments

Environmental Services
Dvirka and Bartilucci Consulting Engineers

Title	Name	Phone number
Project Director	Brian M. Veith	516-364-9890
Project Manager	Mike Hofgren	516-364-9890
Field Operations Manager	Keith Robins	516-364-9890
Corporate Health and Safety Coordinator	Stephen Tauss	516-364-9890
On-Site Health and Safety Representative	Keith Robins	516-364-9890

Other Project Support Organizations

Health and Safety Consultant

Emilcott Associates	Bruce Groves, President	973-765-0991

Building Contractor

[To Be Determined]

In-Situ Chemical Oxidation Contractor

[To Be Determined]

Laboratory Services

Mitkem Laboratories	Agnes Huntley	401-732-3400

Corporate Physician

Plainview Medical Group, P.C.	Dr. Moskowitz	516-822-2541

1.3 Emergency Phone Numbers

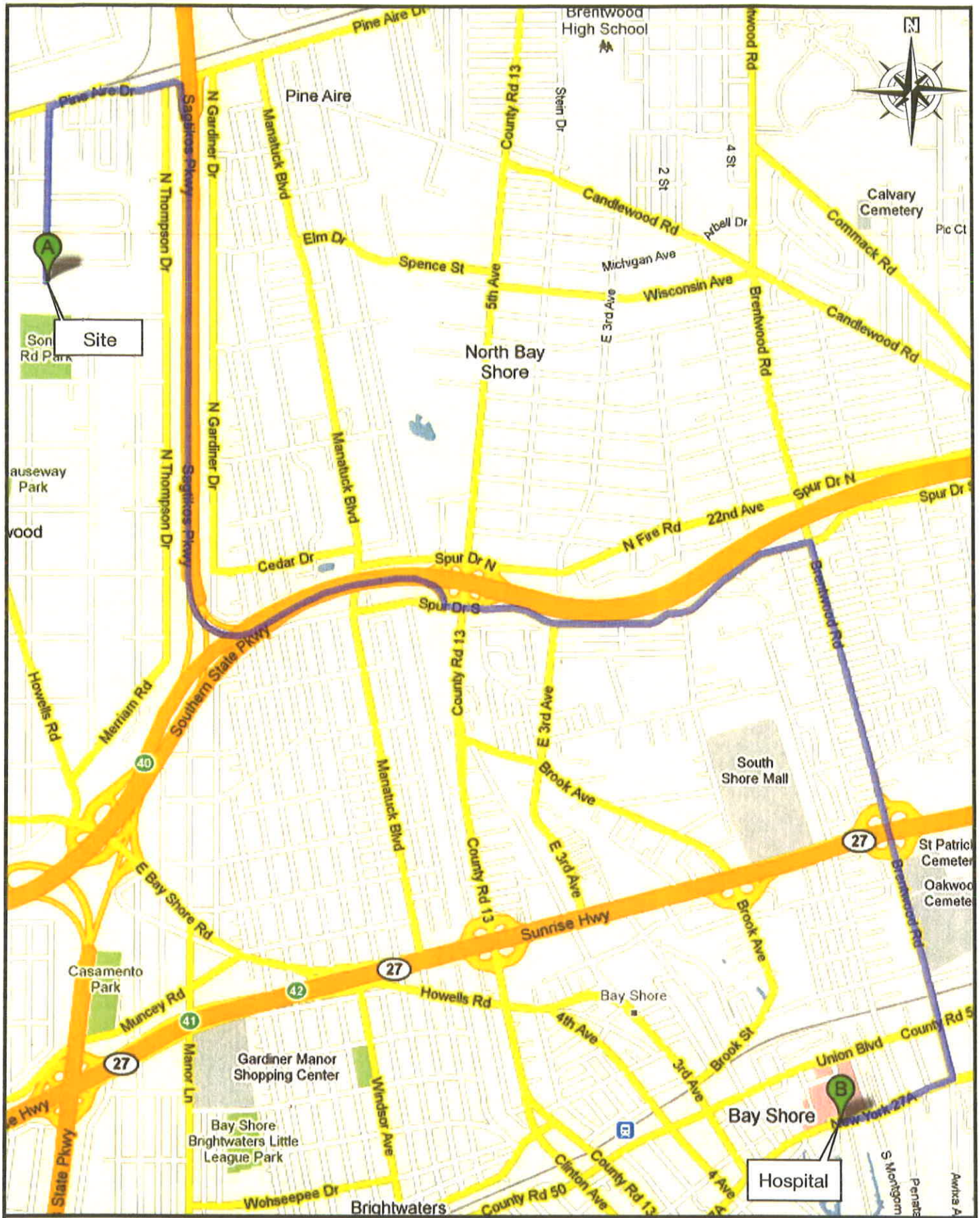
CPC Emergency Phone Line:		631-586-0333
Fire Department:	Bay Shore Fire Department	911 or 631-665-4227

Police Department:	East Islip Police Department	911 or 631-854-8300
Ambulance:	Bay Shore Ambulance	911 or 800-525-9788
Hospital:	Southside Hospital 301 East Main Street Bay Shore, New York	911 or 631-968-3000
Poison Control Center:		516-542-2323
USEPA Region 2 Hotline:		800-424-8802
National Response Center (NRC) for Oil/Chemical Spills:		800-424-8802

1.4 Hospital Route

From the project location, head east on South 4th Street toward Cleveland Avenue (South 4th Street turns left and becomes Cleveland Avenue). Turn right at Pine Aire Drive. Slight right to merge onto Sagtikos Parkway heading south. Take Exit S4 for Southern State Parkway East toward East Islip. Merge onto the Southern State Parkway. Take the exit towards Spur Drive South. Slight left at Spur Drive South. Turn right at Brentwood Road. Turn right at East Main Street/New York 27A West. The hospital will be on your right.

A map depicting the route to the hospital is provided in Figure 1-1.



Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

PSC - CHEMICAL POLLUTION CONTROL, LLC OF NEW YORK
BAY SHORE, NEW YORK

HOSPITAL ROUTE MAP

FIGURE 1-1

2786-F_Hospital Route Map.indd (05/10/10 - 2:26 PM)

2.0 HEALTH AND SAFETY PERSONNEL

The following briefly describes the health and safety designations and general responsibilities for this project.

2.1 Project Director - D&B

The Project Director (PD) has overall executive responsibility for all activities and personnel on the site during all project activities described in this HASP.

2.2 Corporate Health and Safety Coordinator - D&B

The D&B Corporate Health and Safety Coordinator (HSC) or designee has overall responsibility for the development, implementation and enforcement of this HASP. He/she will also approve any changes to this plan due to modification of procedures or newly proposed site activities.

The HSC or designee is responsible for the development of safety protocols and procedures, consistent with the hazardous waste aspects of this project, and will also be responsible for the resolution of any outstanding health and safety issues that arise during the performance of site work. Health and safety-related duties and responsibilities will be assigned only to qualified individuals by the HSC.

The HSC or designee will provide technical assistance for high hazard or other project tasks as required. He/she may periodically conduct audits of the health and safety procedures implemented at the site. Before personnel may work in designated exclusion zones, the status of medical clearance and applicable health and safety training must be presented to the HSC or designee, pursuant to those requirements specified in 29 CFR 1910.120.

2.3 Health and Safety Representative – D&B

The Health and Safety Representative (HSR) or designee will be on-site for all site activities that have the reasonable potential for bringing workers into contact with contaminated materials. The HSR will obtain and review applicable health and safety training and medical surveillance documents for personnel who may work in designated exclusion zones. The HSR has "stop-work authorization," which will be executed upon determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation, such as extreme weather conditions. Authorization to proceed with work will be issued by the HSR after such action. The HSR or designee will initiate and execute all contact with support facilities, such as hospitals, NYSDEC representatives and emergency response organizations.

2.4 Health and Safety Consultant

D&B's Health and Safety Consultant, Emilcott Associates, Inc., will be available to provide health and safety consulting services as needed for this project.

3.0 HAZARD ASSESSMENT

3.1 Introduction

At this project location, there may be areas where contaminated soil or groundwater are encountered. The probability of worker exposure to a chemical hazard varies with the job task. Site workers may be exposed to chemicals by inhalation, ingestion, and/or dermal contact. To protect personnel from being potentially exposed, the work zone may be divided into zones by a degree of contamination. Dust control measures may be implemented, respirators and personal protective equipment may be worn, real time and instantaneous air monitoring may be conducted and proper decontamination procedures will be followed.

3.2 Task Specific Hazard Assessment

At this site, potential exposure to contamination is dependent principally on the type of activity being undertaken. Those work tasks that involve significant disturbance and contact with subsurface soil and groundwater (e.g., excavation and groundwater sampling) have the highest project personnel exposure potential. As such, this plan has established two categories of work tasks based on worker exposure to potential site contaminants:

- Non-Contact - Work activities that have little or no reasonable potential for contact or exposure to hazardous site contaminants.
- Contact - Work activities that have some reasonable potential for contact or exposure to hazardous site contaminants.

3.2.1 Non-Contact Personnel

It is anticipated that the following activities involve minimal soil and groundwater contact, and should not result in contact with potentially contaminated soil, groundwater or soil gas and vapors. These tasks will include:

- site preparation;
- surface restoration;
- air monitoring activities; and
- project administration.

Potential exposure to contaminated soil or groundwater is not anticipated; however, the operations will be evaluated and monitored as necessary. In the event that contaminated materials are encountered, all project personnel involved in such areas will stop work until further instructions from the HSC.

Initially, exclusion zones will not be established for such activities. However, exclusion zones will be established if visual evidence of contamination is observed and/or instrument readings exceed the action levels detailed in Section 6.0. In the event that non-contract personnel must enter the exclusion zone, all intrusive work will be halted and will not continue until all non-contract personnel have exited the exclusion zone.

3.2.2 Contact Personnel

It is anticipated that personnel performing the following tasks have some reasonable potential to come into contact with potentially contaminated soil, groundwater and/or vapors:

- excavating;
- handling or sampling of soil and groundwater;
- equipment and personnel decontamination;
- liquid transfer activities; and
- material handling.

These activities will be evaluated and monitored by the HSR or designee. Construction exclusion zones will be established as required.

A hazard analysis was developed for the work activities that involve potential exposure to contamination at the site (contact work). The analysis was based on the potential for the hazard regardless of the contaminant concentrations. For example, the potential for an individual to come in contact with liquids or sediments during equipment decontamination is moderate to high. However, the actual hazard may be low if the liquids or sediments are not contaminated. Table 3-1 outlines the hazard analysis for the Contact Work Activities.

The following is a general discussion of the hazards that may be encountered on-site. Additional information on any contaminants encountered during this project may be found in standard health and safety references, such as the NIOSH "Pocket Guide to Chemical Hazards."

3.3 Chemical Hazards

Based on the results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) completed by D&B in the Fall 2010, site soil and/or groundwater contains the following constituents at concentrations exceeding applicable SCGs:

- In soil: cis-1,2-dichloroethene, trichloroethene, ethylbenzene, total xylene, 1,2-dichlorobenzene, acetone, toluene, tetrachloroethene, ethylbenzene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, 4,4'-DDT, 4,4'-DDE, cadmium, chromium, copper, lead, mercury, silver and zinc.

- In groundwater: cis-1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, chromium, iron, manganese and sodium.

Activities associated with excavation and soil and groundwater handling for sampling or disposal present a potential for personnel chemical exposure. Precautions should be taken to continuously assess the workplace environment by observation and use of real-time, direct reading instruments during site operations where there exists a potential for contact with contaminants. Measures must be taken to prevent an uncontrolled release or exposure to vapor,

Table 3-1

HAZARD ANALYSIS

Potential Hazard	Excavation	Sample Collection	Waste Handling (soil, groundwater)	Equipment Decontamination
Inhalation of volatiles	moderate to high	low to moderate	low to moderate	low
Skin and eye contact	moderate to high	moderate to high	moderate to high	moderate to high
Ingestion	low	low	low	low to moderate
Inhalation of dust	moderate to high	low	low	low to moderate
Heat stress	depends on temperature	depends on temperature	depends on temperature	depends on temperature
Cold stress	depends on temperature	depends on temperature	depends on temperature	depends on temperature
Confined space	not expected/ not allowed	not expected/ not allowed	not expected/ not allowed	not expected/ not allowed
Heavy equipment	moderate to high	low to moderate	low to moderate	low to moderate
Noise	moderate	low	low	moderate
Tripping	low	low	low	low
PPE	low	low	low	low to moderate
Utilities	high	low	low	low
Other physical hazards	moderate	moderate	moderate	moderate
Biological hazards	low	low	low	low
Flammable hazards	low	low	low	low

liquid or solid contaminants by workers and/or the general public. Assessment and prevention strategies are discussed below and must be practiced on a continual basis by all on-site personnel throughout this project. Table 3-2 contains the OSHA Permissible Exposure Limits and Primary Health Hazards associated with the materials found in the soil and groundwater.

A brief discussion of potential exposure pathways and exposure control methods is presented below.

Inhalation - An inhalation exposure to volatile organic compounds and other gases or vapors would typically occur from exposure to gases/vapors present in the interstitial soil via the installation of probeholes and excavations.

Contact with Skin and Eyes - Contaminated groundwater, soil and sediments may come into contact with skin and eyes during work activities. Cotton coveralls, work gloves and eye protection will be used, as necessary, to minimize and/or prevent skin and eye exposures.

Ingestion - Ingestion of contaminated materials may occur as a result of a hand-to-mouth contact (e.g., eating, drinking and smoking) in contaminated areas or prior to appropriate personal decontamination. Frequent and thorough washing of hands and face, prohibiting eating, drinking and smoking in the work area, proper use of work clothing and personal decontamination will control the potential for ingestion of contaminated soils.

3.4 Biological Hazards

The location of the CPC site is such that a limited number of biological hazards may exist. These hazards may include, but are not limited to: ticks, plants such as poison ivy, poison oak and poison sumac, and animals and rodents that may inhabit the site.

Table 3-2

PERMISSIBLE EXPOSURE LIMITS AND HEALTH HAZARDS OF CONTAMINANTS OF CONCERN

Chemical	OSHA Permissible Exposure Limits	IDLH	Primary Health Hazard (Target Organs)
Chromium	0.5 mg/m^3	250 mg/m^3	Eyes, skin, respiratory system (RS)
Lead	0.05 mg/m^3	100 mg/m^3	Eyes, gastrointestinal (GI) tract, central nervous system (CNS), kidneys, blood, gingival tissue
cis-1,2-dichloroethene	200 ppm	1,000 ppm	Eyes, RS, CNS
Trichloroethene	100 ppm	1,000 ppm	Eyes, skin, RS, heart, liver, kidneys, CNS
Ethylbenzene	100 ppm	800 ppm	Eyes, skin, RS, CNS
Total Xylene	100 ppm	900 ppm	Eyes, skin, RS, CNS, GI tract, blood, liver, kidneys
1,2-Dichlorobenzene	50 ppm	200 ppm	Eyes, skin, RS, CNS, liver, kidneys
Acetone	1,000 ppm	2,500 ppm	Eyes, skin, RS, CNS
Toluene	200 ppm	500 ppm	Eyes, skin, RS, CNS, liver, kidneys
Tetrachloroethene	100 ppm	150 ppm	Eyes, skin, RS, CNS, liver, kidneys
1,1,1-Trichloroethene	350 ppm	700 ppm	Eyes, skin, CNS, Cardiovascular system (CVS), liver
Bis(2-chloroethyl)ether	15 ppm	100 ppm	Eyes, RS, liver
Benzo(a)anthracene	--	--	--
Chrysene	0.2 mg/m^3	80 mg/m^3	RS, skin, bladder, kidneys
Benzo(b)fluoroanthene	--	--	--
Benzo(k)fluroanthene	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--
Dibenzo(a,h)anthracene	--	--	--
4-4'-DDT	1 mg/m^3	500 mg/m^3	Eyes, skin, CNS, kidneys, liver, Peripheral nervous (PNS)
Zinc	15 mg/m^3	--	Eyes, skin, RS
Silver	0.01 mg/m^3	10 mg/m^3	Nasal septum, skin, eyes
Cadmium	0.005 mg/m^3	9 mg/m^3	RS, kidneys, prostate, blood
Copper	1 mg/m^3	100 mg/m^3	Eyes, skin, RS, CNS, liver, kidneys

Table 3-2 (continued)

PERMISSIBLE EXPOSURE LIMITS AND HEALTH HAZARDS OF CONTAMINANTS OF CONCERN

Chemical	OSHA Permissible Exposure Limits	IDLH	Primary Health Hazard (Target Organs)
Mercury	0.01 mg/m^3	10 mg/m^3	Eyes, skin, RS, CNS, liver, PNS, kidneys
Iron	--/0.1 ppm (NIOSH)	--	Eyes, skin, RS, liver, GI tract
Manganese	5 mg/m^3	500 mg/m^3	RS, CNS, blood, kidneys
Sodium	--	--	--

IDLH: Immediately Dangerous to Life and Health
--: Not established

3.5 Physical Hazard Analysis

Potential hazards that are most likely to be encountered at the CPC site during field operations include, but are not limited to:

- Weather conditions (e.g., lightning, rain, excessive heat, excessive cold, high winds, etc.);
- Slips, trips and falls on uneven/overgrown surfaces;
- Heavy equipment traffic;
- Striking and struck-by (heavy equipment);
- Moving or rotating machinery;
- Flying debris from probing;
- Overhead power lines and underground utilities (e.g., water, gas and sewer) and related equipment.

Below is a summary of guidelines that may be used to eliminate/reduce the potential risk of physical hazards. A copy of the appropriate D&B standard operating procedure (SOP) is referenced where necessary, and included in Appendix A.

3.5.1 Weather

If severe weather occurs that may affect the safety of site workers, the D&B HSC or designee shall stop affected field operations. The HSC or designee will resume operations when weather conditions improve.

3.5.2 Heat and Cold Stress

Depending on the time of year and weather conditions, cold or heat stress may present a potential concern. The HSC or HSR will ensure that the heat and cold stress programs are implemented and that adequate rest breaks and liquid consumption is maintained.

Proposed work/rest schedules will be dependent upon the weather conditions encountered and the level of personal protective equipment being utilized by on-site personnel. The HSC will use his judgment to establish and adjust work/rest schedules.

3.5.3 Noise

Excessive noise can be a problem during certain activities on-site, such as probing, excavating or the use of machinery. If necessary, as designated by the HSC, earplugs or other hearing protection equipment will be made available for personnel use.

3.5.4 Illumination

If work activities occur before sunrise and/or after sunset, lighting will be provided at each work area to meet the requirements of 29 CFR 1910.120(m). This standard states that while any work is in progress, the general site areas shall be lighted to not less than 5 foot-candles[1]. In addition, any excavation areas, waste management areas, access ways, active storage areas, loading platforms and field maintenance areas shall be lighted to not less than 3 foot-candles. First aid areas should be lighted to not less than 30 foot-candles.

3.5.5 Slip, Trip and Fall Hazards

As in any work area, it is expected that the ground may be uneven, the surface may be unreliable due to settling, surface debris may be present, and wet or muddy areas may exist. Therefore, the potential for slipping, tripping and falling is present, especially considering the safety equipment that may be used which can impede vision. Severe trip hazards will be identified in site meetings and demarcated by flags or caution tape.

[1]One foot-candle equals 10.764 lux ($E=I/D^2$).

3.5.6 Electrical Hazards

Above and below ground electric hazards are present at the site. Note that prior to the initiation of work, One-Call utility mark outs will be conducted. To control the potential for hazardous electrical situations, operating heavy equipment will not be allowed within 15 feet of any live overhead electrical wires or equipment, unless prior CPC approval is granted. Ground fault circuit interrupters shall be used on portable electric-powered hand tools and gasoline generators.

3.5.7 Lockout/Tagout

A Lockout/Tagout Program has been established to protect employees from injuries that could result from the unexpected or unplanned start-up or movement of machinery or equipment during maintenance, installation, adjustment or servicing operations. This policy sets forth procedures, which will be used to ensure that employees are provided with the information and equipment they need to perform these tasks safely.

For more detailed requirements and procedures regarding lockout/tagout, refer to D&B SOP #C0018 provided in Appendix A.

3.5.8 Dust Control

During all activities, control measures will be implemented if visible dust at the perimeters of the construction exclusion zones is observed. Dust control measures may include wetting the soil and/or covering stockpiled soils.

3.5.9 Excavations

The safety requirements for each excavation must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are hazardous or dangerous to employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions.

Under no circumstances will any D&B personnel enter an excavation. Soil excavation will be conducted with excavators operated by the Building Contractor. All samples associated with open excavations will be collected from outside the excavation with hand tools and/or the bucket of the excavator. Building Contractor and/or In-Situ Chemical Oxidation Contractor personnel may be required to enter excavation areas. However, these contractors will be required to prepare their own HASPs to cover their project personnel.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of any excavation activity, the location of underground utilities will be determined through One-Call utility mark outs and a private markout. The one-call center will be contacted by the Building Contractor a minimum of 72 hours prior to excavation activities.
- All excavations will be inspected daily and documented by the competent person prior to commencement of work activities. Evidence of cave-ins, slides, sloughing or surface cracks of excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.
- Materials or equipment that could fall or roll into the excavation shall be placed at least 5 feet from the edge of open excavations.

3.5.10 Odor Control

Odors are not expected to be a significant issue due to excavation activities; however, in the event that odors of significance are detected due to excavation activities, excavation activities will be halted temporarily and air monitoring will be performed. Excavation work will continue in another area. The area identified as the source of the odors of significance will be temporarily

covered with plastic, and upwind or downwind air monitoring will be performed. In the event that air monitoring action levels are exceeded, appropriate actions will be taken. Excavation activities will resume in this area after the air monitoring levels indicate acceptable conditions, and any odors of significance are mitigated via work method changes and/or the application of foaming agents.

4.0 SITE CONTROLS

A Site Control Plan has been established to restrict access to work areas where potential contamination may be present, to select appropriate Personal Protective Equipment (PPE) for personnel working in each control zone and to prevent the accidental spread of contaminated material. As part of this plan, a number of separate zones may be used at this site. These zones are identified as: (1) the Work Zone (WZ); (2) the Exclusion Zone (EZ); (3) the Contamination Reduction Zone (CRZ); and (4) the Support Zone (SZ). Zone classifications may change as circumstances warrant. The WZ is the project work area. The EZ may be established within the WZ, if the air monitoring action levels will exceed the levels established for this project (refer to Section 6.0). The CRZ will be established within the WZ between the EZ and the SZ as determined by the HSR.

For more detailed procedures on work zones and site control, refer to SOP #HW002 provided in Appendix A.

4.1 Work Zone

The Work Zone (WZ) is the project work area. All physical project work activities will be conducted within the WZ. This zone is restricted to project (contact and non-contact) personnel, project support personnel and visitors as defined in this document. Access to the site will be controlled by fencing and/or caution tape and safety cones around the equipment and work area. In addition, equipment will be secured, covers will be placed over any open probeholes, and staged soil will be covered at the end of each work day and when not in use. Only authorized personnel will be permitted to enter the WZ.

All personnel entering the construction work zone will be briefed by the HSC or HSR prior to their initial entry. All Contact Project Personnel entering the WZ must meet the training and medical requirements as outlined below. Appropriate work clothing and equipment will be worn. All Contact Project Personnel and equipment exiting the WZ must be adequately cleaned

before leaving the site or as required by the HSC or HSR or his/her designee. The HSR will monitor non-contact activities performed within the construction work zone.

4.2 Exclusion Zone

An Exclusion Zone (EZ) may be established at active work sites where contamination is anticipated, observed or measured. The HSR will make the determination to establish an EZ based upon work activities, work conditions, visual evidence of contamination, air monitoring or sample results and/or other knowledge of the site that indicates an increase in the probability of worker exposure.

If implemented, the EZ will consist of an area with a 15 to 20-foot buffer area around the work area. However, the HSR will determine the extent of the EZ, depending on the potential hazards and site activities. The area will be marked using a physical barrier (e.g., flagging tape) or other means to readily identify the boundary of the zone.

Access to the EZ will be limited to Contact Project Personnel that meet the training and medical requirements as outlined below. All Contact Project Personnel entering the construction exclusion zones will be briefed by the HSR prior to initial entry.

Appropriate protective work clothing and equipment will be worn in the EZ. All personnel and equipment exiting the EZ will be decontaminated in the CRZ or as the HSC or HSR determines is necessary. Once the operations have been completed, the EZ will be removed by the HSR.

4.3 Contamination Reduction Zone

The Contamination Reduction Zone (CRZ) is the area just outside of the EZ where Contact Project Personnel undergo decontamination. If implemented, this zone will be contiguous with the EZ. The area will be marked using flagging tape or other means to readily identify the boundary of the zone. Access to this zone will be limited to Contact Project

Personnel exiting the EZ and personnel assisting with decontamination. A separate equipment decontamination area will be established as determined by the HSC, HSR or designee.

4.4 Support Zone

The Support Zone (SZ) is the area in which administrative and other support functions essential to site operations are conducted. Any function that need not or cannot be performed in a hazardous or potentially hazardous area is performed here. Personnel may wear normal work clothes within this zone because any potentially contaminated clothing, equipment and/or samples must remain in the CRZ until decontaminated.

5.0 WORK CLOTHING AND LEVELS OF PROTECTION

5.1 Work Clothing

The HSC or HSR will recommend appropriate levels of protective clothing to be worn in the event that hazardous materials are encountered. The levels of protection planned for this project are identified in Table 5-1. In general, typical work clothing will be worn on this project.

5.2 Levels of Protection

The level of protection to be worn by field personnel will be defined and controlled by the HSC or HSR (in consultation with the Corporate Health and Safety Consultant). Table 5-1 below contains a list of tasks and the respective levels of protection when working inside a project exclusion zone.

Definition of Levels of Protection:

Respirators:

Level D: A respirator is not required.

Level C: Full-face or half-face Air Purifying Respirator (APR) with combination HEPA - P,O,N 100 series (dusts, fumes, aerosols) and organic vapor cartridges (yellow).

PPE:

Level D: Long pants and/or work coveralls/uncoated tyvek

Nitrile gloves

Appropriate steel-toe work boots

Hardhat

Safety glasses, with side shields as needed

Table 5-1

PERSONAL PROTECTION LEVELS

Task	Level of Protection			
	Respirators		PPE	
	Initial	Contingent	Initial	Contingent
Sample Collection	D	C	D	C
Excavation	D	C	D	C
Waste Handling	D	C	D	C
Decontamination	D	C	D	C
Groundwater Sampling	D	C	D	C

Level C: Poly-coated Tyvek disposable coveralls or equal substitute vinyl, neoprene, nitrile rubber or butyl rubber outer gloves

Nitrile inner gloves

Appropriate leatherwork boots with chemically resistant outer boots or chemically resistant rubber boots

Hardhat

Safety glasses, with side shields as needed

Note: Modified Level D is used in this plan to refer to personnel using Level C PPE with no respirator.

5.3 Donning and Doffing

Manufacturer's recommended procedures for donning and doffing of PPE ensembles will be followed in order to prevent damage to PPE, reduce or eliminate migration of contaminants from the work area and reduce or eliminate transfer of contaminants to the wearer or others.

5.4 Storage and Inspection

Since storage facilities will not be readily available, only minimal quantities of protective equipment will be maintained on-site. Items such as gloves, protective suits and hearing protection will be kept within a suitable storage area. Respirators will be stored in plastic bags when not in use.

Employees are responsible for inspecting personal protective equipment prior to donning, during use and at the end of the shift. Defective equipment shall be removed from service and reported to the HSC or HSR. All reusable equipment will be maintained in a sanitary condition, in accordance with the manufacturer's recommendations.

6.0 AIR MONITORING PROCEDURES

6.1 Air Monitoring During Site Operations

As previously indicated, the Building Contractor and In-situ Chemical Oxidation Contractor will be required to prepare their own HASPs to cover their project personnel. The Building Contractor's HASP will include an Air Monitoring Program (AMP) to determine that the proper level of personnel protective equipment is used, to document that the level of work protection is adequate and to assess the migration of contaminants to off-site receptors as a result of site operations. The Building Contractor will be required to include real-time and documentation air monitoring in its AMP and establish action levels for organic vapors and dust. It is assumed that the In-situ Chemical Oxidation Contractor will not be required to conduct any air monitoring since their operations will be confined to chemical oxidant injection, and these activities are not anticipated to generate significant dust or organic vapor emissions that could not be adequately addressed through the Community Air Monitoring Plan described below.

6.2 Community Air Monitoring Plan

In addition to the monitoring of the work zone by the Building Contractor as outlined above, D&B will implement a Community Air Monitoring Plan (CAMP) during all demolition activities and any contractor work involving the handling of soil or groundwater. The CAMP will include continuous monitoring for VOCs and particulates using one upwind and two downwind air monitoring stations. Each monitoring station will include an aerosol monitor for the measurement of dust and particulate matter and a photoionization detector (PID) equipped with an 11.7 eV lamp for the measurement of VOCs.

The following outlines the action levels that will be enforced during implementation of the CAMP as part of the corrective measures to be implemented at the CPC facility:

1. If the downwind particulate level is 100 micrograms per cubic meter (ug/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed by the Building

Contractor. Work will continue with dust suppression techniques provided that downwind particulate levels do not exceed 150 ug/m^3.

2. If, after implementation of dust suppression techniques, downwind particulate levels are greater than 150 ug/m^3 above the upwind level for the 15-minute average at the perimeter of the work area, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing downwind particulate concentrations to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

3. If the ambient air concentration of total organic vapors exceeds 5 ppm above background for the 15-minute average at the perimeter of the work area, work activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities will resume with continued monitoring.

4. If the total organic vapor levels are greater than 5 ppm over background but less than 25 ppm, work activities will be halted, the source of the vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided:

    a. The total organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

5. If the organic vapor level is above 25 ppm at the perimeter of the work area, work activities will be shutdown.

The Building Contractor will be required to implement engineering controls to comply with the action levels specified in this CAMP.

6.3 Background Air Monitoring

Background air monitoring for VOCs and particulates will occur at a location upwind of the work zone prior to the initiation of work and continuously during performance of the CAMP described in Section 6.2. Background levels will be established prior to conducting air monitoring in any work area.

6.4 Instrument Calibration and Maintenance

All air monitoring equipment will be calibrated at the beginning of each workday and as needed during the day, if applicable. All calibration results will be recorded. Monitoring

equipment will be maintained on a schedule corresponding to the manufacturer's suggested maintenance schedule.

6.5 Dust and Organic Vapor Suppression Measures

Dust and organic vapor suppression measures will be implemented during remedial activities, as necessary based upon the results of the Building Contractor's AMP or D&B's CAMP. Dust and organic vapor suppression measures to be implemented, as required, include:

- Application of wetting agents to soil, stockpiles, excavation faces, buckets and equipment during excavation work.
- Installing gravel pads at vehicle egress points.
- Restricting vehicle speeds to 5 miles per hour.
- Application of foam suppressants to the excavation and/or stockpile.
- Covering of excavations or stockpiles after work activities and keeping wet as a measure to control wind-blown erosion, dust generation and odors.
- Direct loading excavated material to hauling vehicles and minimization of material stockpiling on-site.
- Construction of wind screens using solid wood fences or solid durable fabric attached to a construction fence to block the passage of wind and reduce dust.

7.0 TRAINING

7.1 Hazard Communication

The HSC or HSR is responsible for site-specific training and notifying employees and contractors of the hazards associated with non-routine tasks. The HSC shall inform D&B personnel of the potential hazards that may be encountered in the area where he/she will be working, should the HSC have such knowledge of these hazards.

For more detailed requirements and procedures regarding hazard communication, refer to D&B SOP # C002 provided in Appendix A.

7.2 Initial Site Training

The initial site briefing will be provided on-site by the HSC or his/her designee for all Project Personnel (Contact and Non-Contact) and Project Support Personnel prior to initial entry into the Work Zone of the site. Site training will also be provided as needed to address the specific activities, procedures, monitoring and equipment for the site operations. Such training will include site and facility layout, potential and recognized hazards and emergency services at the site, and will detail all provisions contained within this HASP. This training will be documented.

7.3 Contact Project Personnel Training

All Contact Project Personnel designated to work in the Exclusion Zone are required to have successfully met the initial and refresher training requirements pursuant to 29 CFR 1910.120(e).

8.0 MEDICAL SURVEILLANCE

All Contact Project Personnel engaged in on-site activities associated with this project must have baseline physical examinations and participate in their employer's medical surveillance program. This program must meet the requirements of 29 CFR 1910.120(f). Medical procedures beyond baseline physical and routine medical surveillance are not planned for this project. Medical records for employees are maintained at the corporate office and by the company's medical group. Medical records are maintained in accordance with the record keeping requirements of 29 CFR 1910.120. In addition, any employee required to wear a respirator for Level C PPE will be approved by a licensed health care provider for respirator use as defined in the OSHA Respiratory Standard 29 CFR 1910.134.

In the unlikely event of an exposure, the affected employee will be sent for any evaluation and treatment that may be needed to either the Corporate physician or the designated hospital. See Figure 1-1 for a hospital route map and Section 1.4 for written directions to the designated hospital.

9.0 COMMUNICATIONS

A means of communication will be provided at the project site. This may include two-way radios, portable telephones or existing nearby telephones. Project personnel will be informed of the communication procedures during site briefings.

10.0 DECONTAMINATION PROCEDURES

10.1 General

All personnel and equipment that have entered established exclusion zones shall be decontaminated. Decontamination activities may also occur for operations outside of the established exclusion zones. Such decontamination is part of typical monitoring and sampling, construction, and other support operations.

10.2 Personnel Decontamination

Personnel field decontamination will take place in the contamination reduction zones (CRZs). Based on the extent of personnel contamination, the HSR will establish site-specific decontamination procedures. Based on the expected activities, it is anticipated that limited personnel decontamination will be necessary.

Full field decontamination procedures, if utilized, would require all personnel exiting exclusion zones to undergo a wash and a rinse process and remove their PPE. This will consist minimally of two tubs: one wash tub and one rinse tub, placed on plastic sheeting. Personnel exiting the exclusion zone(s) will be required to wash their outer boots, outer gloves and protective clothing. This will be accomplished with an Alconox/water solution and scrub brushes in the first tub. Personnel will then proceed to the next tub, which will consist of a clean water rinse and subsequent spray-down with clean water. Personnel will stand in the tub and spray off their gloves, boots and protective clothing with clean water from the sprayer. After the rinse, personnel will then remove their outer boots, outer gloves, protective clothing and respiratory protection, if worn.

Once removed, disposable PPE will be collected at the field decontamination site in a large plastic bag. The plastic bag will be secured in order to prevent the accidental spread of contamination. Disposable PPE that has been worn in an exclusion zone must be removed and placed in the disposal container before leaving the CRZ. Disposable PPE may not be re-used.

All used PPE, disposable sampling equipment and decontamination water will be drummed for proper off-site disposal.

10.3 Instrument Decontamination

Instruments will be decontaminated whenever they have come into contact with soil, groundwater or dust. Instrument decontamination will occur in the same area for personnel decontamination and will consist of the removal of any dust or soil from the surface of the instruments.

10.4 Equipment Decontamination

Equipment utilized for this project may include:

- Support trucks for excavation activities;
- Guzzler units;
- Excavators; and
- Pumps.

Equipment decontamination will take place as needed. Water generated as part of decontamination will be drummed for proper off-site disposal. All field equipment that has been contaminated will be decontaminated before leaving the project site. The HSC, HSR or designee will be responsible for ensuring that equipment is decontaminated as needed.

For more detailed containment and disposal procedures, refer to SOP #HW005 provided in Appendix A.

11.0 EMERGENCY PLAN

Emergency situations can be characterized as a fire or explosion, environmental release, or accident or injury to the field personnel. For incidents other than minor injuries to on-site personnel, work will be halted and the situation will be evaluated. Emergency procedures appropriate to the situation will be implemented. The HSC will be notified immediately in the event of an evacuation.

Emergency telephone numbers and directions to the designated hospital are listed in Sections 1.3 and 1.4, respectfully, and a hospital route map is included as Figure 1-1. This information will be available to all workers on-site.

It is important to ensure the rapid and accurate transfer of information to appropriate personnel in the event of an emergency situation. To simplify the procedure, emergency situations can be reported by dialing **911**. This includes incidents requiring police, fire department or medical assistance. In the event that such an emergency occurs, CPC will be notified immediately following the report to 911 via the CPC emergency telephone number included in Section 1.3.

When reporting an emergency, be sure to provide the following information to the dispatcher:

1. Caller's full name;
2. The nature of the incident (e.g., "fire");
3. The location of the incident (i.e., "PSC - Chemical Pollution Control, LLC of New York, 120 South Fourth Street, Bay Shore, New York"). The more specific the better;
4. What you need (e.g., "fire department and first aid");
5. If you are able, where you will meet emergency responders (e.g., "at entrance of the facility on South Fourth Street");
6. If applicable, your cell phone number (e.g., "I'll be at the scene; my cell phone number is 123-4567");

7. Status of the situation. (e.g., is the situation stabilized or "I have the fire under control");

8. If anyone is injured or in need of emergency assistance (e.g., "a mechanic working on a pump was burned").

11.1 Evacuation

In the event of an emergency situation, all personnel will evacuate and assemble at a designated meeting area. For efficient and safe area evacuation and assessment of the emergency situation, the HSC, HSR or FOM will have the authority to initiate proper action if outside services are required. Access to emergency equipment will be provided and all combustion apparatus (e.g., operating machinery) will be shut down once an emergency situation has been identified.

11.2 Personnel Injury

In the event of an emergency situation, the local emergency response group will be called. Emergency first aid may be applied on-site as deemed necessary. If possible, the individual should be decontaminated and then transported to the nearest medical facility if needed.

The local rescue squad shall be contacted for transport as necessary in an emergency. Since some situations may require transport of an injured party by other means, transportation by automobile may be required.

11.3 Personnel Exposure

Skin Contact:	Use copious amounts of soap and water. Wash and/or rinse affected area thoroughly, then provide appropriate medical attention. Eyes should be thoroughly flushed with water for at least 15 minutes.

Inhalation:	Move to fresh air and, if necessary, decontaminate and transport to emergency medical facility.
Ingestion:	Decontaminate and transport to emergency medical facility.
Puncture Wound or Laceration:	Decontaminate, if possible, and transport to emergency medical facility.

11.4 Safety Equipment

Basic emergency and first aid equipment will be made available at the Project Work Zone and/or the CRZ, as appropriate. This shall include a first aid kit, an eye wash station and a fire extinguisher.

12.0 RECORD KEEPING

The HSC, HSR or designee will maintain health and safety information records for the site. The following information will be recorded as needed:

- Weather conditions (temperature, wind speed and direction);
- Air monitoring equipment calibration records;
- Air monitoring results (date, time, location, data, instrument and person conducting sampling);
- Training records;
- Medical surveillance records;
- Health and safety audit records;
- Description of operation(s);
- Description of accident(s), if any; and
- Non-compliance with the HASP, if any.

13.0 AUTHORIZATIONS

The HSC, HSR or designee must approve all personnel authorized to enter the project work zones and exclusion zones at the site. Authorization will involve completion of appropriate training courses and medical examination requirements as outlined by this HASP, as well as the signature of the individual on the Acknowledgement Form recognizing a complete understanding of this HASP.

14.0 APPROVALS

The undersigned certify that this Site Health and Safety Plan (HASP) is approved and will be utilized by Dvirka and Bartilucci Consulting Engineers for the CPC facility located in Bay Shore, New York.

For Dvirka and Bartilucci Consulting Engineers:

Title	Name	Signature	Date
Project Manager	Mike Hofgren		
Corporate Health and Safety Coordinator	Stephen Tauss		
Site Field Operations Manager	Keith Robins		

APPENDIX A

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
CORPORATE STANDARD OPERATING PROCEDURES

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1.0 PURPOSE

Lockout/Tagout guidelines have been established to protect D&B/WFC employees from injuries that could result from the unexpected or unplanned start-up or movement of machinery or equipment during inspections, maintenance, installation, adjustment, or servicing operations. These guidelines provide D&B/WFC personnel with information regarding the hazards and control measures associated with the release of such hazardous energy pursuant to OSHA Standard 29 CFR 1910.147.

If D&B/WFC is expected to take measures to control hazardous energy for site-specific operations, then a written Energy Control Procedure must be prepared for each site. Such procedures will include steps for equipment shutdown, isolation, application of locks and tags,

dissipation of stored energy, verification of equipment isolation, removal of locks and tags, and restoration of energy to machines.

The components of the Lockout/Tagout Program include:

a. Energy Control Procedures, if applicable

b. Employee notification

c. Contractor activities

d. Employee training

e. Periodic audits of the Energy Control Procedures, if applicable

2.0 SCOPE

These guidelines apply to all D&B/WFC employees who perform activities (such as surveying, construction, installation, set-up, adjustment, inspection, maintenance, and repair) where a hazardous energy release potential exists. This applies to any source of electrical, hydraulic, pneumatic, potential (stored), chemical, thermal, or other energy.

3.0 DEFINITIONS

Affected Employee - an employee who performs job duties in an area in which lockout or tagout is performed. An affected employee **does not** perform servicing or maintenance on machines or equipment and **is not** responsible for implementing energy control procedures or applying locks or tags.

Authorized Employee - an employee who performs servicing or maintenance on machines or equipment and who implements energy control procedures, including the application of locks or tags. (Note: A single employee may be both authorized and affected if he/she performs servicing or maintenance under Lockout/Tagout on a machine or equipment he/she normally operates).

Capable of Being Locked Out - an energy isolating device is considered to be capable of being locked out if it meets **one** of the following criteria:

- it is designed in such way so that a lock can be attached
- it is designed with any other integral part through which a lock can be affixed
- it has a locking mechanism built into it

- it can be locked without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability. (For example, although many valves are not designed with an integral locking device, they can be secured with chains, blocking braces, or wedges, which can then be locked).

Energized - machines and equipment are energized when they are connected to an energy source or they contain residual or stored energy.

Energy-Isolating Device - a mechanical device that physically prevents the transmission or release of energy -- including, but not limited to: manually operated circuit breakers; disconnect switches; valves, and blocks. The term does not apply to pushbuttons, selector switches, or other control circuit devices.

Energy Source - any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Energy Control Procedure - a written procedure which contains the information and steps an Authorized Employee needs to follow in order to safely isolate equipment to perform servicing or maintenance under Lockout/Tagout. Note, only Authorized Employees are permitted to use the Energy Control Procedures.

Lockout - the act of padlocking and tagging an energy-isolating device in the off or safe position. In cases where more than one employee is involved, provision will be made so that each Authorized Employee can affix his/her own lock and tag.

"Other" Employees - all D&B/WFC employees who are not Authorized or Affected Employees.

Tagout - the act of placing an energy-isolating device in the off or safe position and placing a tag on it to indicate that the equipment **may not** be operated until the tag is removed.

4.0 RESPONSIBILITIES

The ***Health and Safety Coordinator (HSC)*** has an overall responsibility for the Lockout/Tagout Program. The HSC will coordinate Lockout/Tagout training for all authorized and affected employees, if necessary, and assess authorized employee's knowledge of the Lockout/Tagout Program.

The ***On-Site Health and Safety Representative (HSR)*** will:

- Be knowledgeable about the types and magnitude of hazardous energy sources and the hazards associated with the unexpected or unplanned start-up or

movement of machinery or equipment during maintenance, installation, adjustment, or servicing operation.

- Be knowledgeable in the methods to control hazardous energy, verify that each authorized and affected D&B/WFC personnel has received Lockout/Tagout training before they begin work in an area where Energy Control Procedures are used
- Ensure that D&B /WFC personnel correctly obtain, review and apply the appropriate Energy Control Procedures, when required, and maintain adequate supply of Lockout devices and equipment
- Be responsible for developing new or modify existing Energy Control Procedures for each job site, if required, and attached them to the Site-Specific Health and Safety Plan (HASP)
- Coordinate Lockout/Tagout operations which, involve outside contractors.

Authorized Employees – D&B/WFC Authorized Employees, if designated, are responsible to correctly apply Energy Control Procedures, including the application of locks or tags. Authorized employees will:

- Be knowledgeable about the types and magnitude of hazardous energy and the hazards employed with the unexpected or unplanned start-up or movement of machinery or equipment during maintenance, installation, adjustment, or servicing operations
- Be knowledgeable in the methods used to control hazardous energy (Energy Control Procedures)
- Notify affected employees prior to application of Lockout/Tagout devices and after the devices are removed
- Coordinate the Lockout/Tagout activities when a Lockout/Tagout operation continues beyond one (1) shift.

Affected and "other" employees are generally responsible for operating or working near machines upon which Lockout/Tagout operations are performed. Affected employees will:

- Understand the purpose of Energy Control Procedures and the importance of not attempting to start-up or use machines that have been locked or tagged.
- Recognize when Energy Control Procedures are being implemented.

5.0 GUIDELINES FOR LOCKOUT/TAGOUT

5.1 General

It is anticipated that for most jobs, D&B/WFC personnel will not be responsible for developing Energy Control Procedures. However, when working in the areas of potential hazardous energy release, each employee must recognize the types and magnitudes of hazardous energy sources and the hazards associated with the unexpected or unplanned start-up or movement of machinery or equipment. They must also observe safe work practices.

Only authorized employees are permitted to implement the Energy Control Procedures.

5.2 Work Practices

Following is a typical sequence to implement the Lockout/Tagout procedures.

a. *Prepare for Shutdown* - Authorized employees must review the applicable Energy Control Procedure. If a specific Energy Control Procedure does not exist for a machine then the HSC or designee must ensure that a procedure is developed

b. *Notify Affected Employees* - Authorized employees must verbally notify affected employees prior to application of lockout or tagout devices

c. *Shut Down Machinery or Equipment*

d. *Isolate Machinery or Equipment from Energy Source* - Place manually operated circuit breakers, disconnect switches, valves and related equipment into the "off" or safe position. Place blocks where necessary to physically isolate the machinery or equipment from its energy source to prevent the transmission or release of energy.

e. *Apply Lockout and/or Tagout Devices* - Each authorized employee or outside contractor involved in the work which requires the use of Lockout/Tagout must personally place his/her lock and identification tag on each identified energy isolating device. The tag must be filled out with the authorized employee's name, the date it was placed, and the reason for the Lockout/Tagout operation. Each authorized employee must maintain possession of the key to his/her lock during the entire work operation. Where an energy-isolating device is not designed to accept a lock, a signed and dated tag may be used according to procedures specified in Section 5.4. After applying locks and tags, the energy isolating devices must be tested to make certain they cannot be moved into the "on" position.

f. *Release Stored Energy* in air lines, water lines, etc by bleeding off excess pressure. Bleed-off valves must be locked and/or tagged out in the open position. Disconnected lines must be tagged out. Restrain potential energy using safety blocks.

g. *Verify that Machinery or Equipment is De-energized* - Using normal operating controls, attempt to start the machinery or equipment to make sure that it has been completely de-energized.

5.3 Release from Lockout/Tagout

Upon completion of work requiring the use of Lockout/Tagout procedures, the following sequence can be used to restore machinery or equipment to service:

a. *Check Equipment* - Following completion of the work, the authorized employees who performed the work must inspect the area around the machinery or equipment to ensure that all tools or other nonessential items have been removed, machine guards have been reinstalled, and the machinery or equipment components are operationally intact and safe to energize.

b. *Check Work Area* - The authorized employees who performed the work must inspect the work area to make certain all employees are safely positioned away from the machinery or equipment.

c. *Removal of Lockout/Tagout Devices* - Locks and/or tags must be removed from each energy isolating device by the authorized employee or outside contractor who placed it. If the authorized employee or outside contractor is not available to remove his/her own lockout/tagout device, use the Emergency Lock or Tag Removal Procedures described in Section 5.7.

d. *Restore Energy to Machinery/Equipment* - Place manually operated circuit breakers, disconnect switches, valves, etc. into the "on" position. Remove safety blocks

e. *Notify Affected Employees* - Authorized employees must verbally notify affected employees following removal of locks and tags and the re-energization of the machinery or equipment.

5.4 Use of a Tagout System Only

In cases where machinery or equipment **is not** capable of being locked out, it will be necessary to use a completed "Do Not Operate" tag to provide the highest level of safety available without the use of locks. The tag must be filled out with the authorized employee's name, the date it was placed, and the reason for the Tagout operation. Note that tags alone **may not** be used as a

substitute when the use of locks is specified in the applicable Energy Control Procedure. Only authorized employees are permitted to implement tagout. The following conditions apply to the use of tags without locks:

a. Only authorized D&B/WFC employees are permitted to place a "Do Not Operate" tag;

b. The tag must be placed at the same location that a lock would have been attached with a self-locking plastic or nylon tie wrap capable of withstanding at least 50 pounds of force;

c. The lockout tag can only be removed by the authorized employee who installed it. If the authorized employee is not available to remove his/her own tag, use the emergency lock or tag removal procedures in section 5.7.

5.5 Energy Control Procedures

Generally, Energy Control Procedures are developed by the client or the owner of the equipment and made available to D&B/WFC project personnel. If such procedures are not available, D&B/WFC can develop, if required, a site-specific written Energy Control Procedure, which will contain the steps and techniques to be used by authorized employees to properly de-energize machinery and equipment prior to the initiation of work.

When the operations involves more than one (1) authorized employee or outside contractor, provision must be made to ensure that each individual can place his/her lock and tag on each energy isolating device identified in the applicable Energy Control Procedure.

5.6 Shifts or Personnel Change

When Lockout/Tagout must continue beyond one (1) shift or when there is personnel change, the following procedures apply:

a. At the end of the shift, each authorized employee who is leaving work must remove his/her "Do Not Operate" tag(s) from each energy isolating device. Each oncoming authorized employee must affix his/her own personal "Do Not Operate" tag(s) on the padlock(s) to which his/her key corresponds and maintain possession of the padlock key(s)

b. Verify that machinery or equipment is de-energized using the procedures described in Section 5.2 g

c. Proceed with operations.

5.7 Emergency Lock or Tag Removal

In the event that the authorized employee or outside contractor who attached a lock or tag is not available to unlock or remove a lock or tag, the HSC, HSR or a designee may remove the lock or tag only using the following procedures:

a. Verify that the authorized employee or outside contractor who placed the lock or tag is not at the facility

b. Attempt to contact the authorized employee or outside contractor whose lock is still in place

c. Ensure that all work has been completed and the equipment machinery is safe to return to service

d. The HSC, HSR or a designee may cut the lock off using a saw or bolt cutters. Where tagout only is being used, tags may be removed by designated personnel using appropriate methods

e. Ensure that the authorized employee or outside contractor whose lock or tag has been removed is informed before he/she returns to work

f. Review the lockout/tagout requirements with the authorized employee or outside contractor who left their lock or tag on the isolated equipment

5.8 Testing and Positioning of Machines and Equipment

In some situations, it may be necessary for authorized employees to operate equipment for testing or positioning before it is ready to be used. These situations require the temporary removal of Lockout/Tagout devices only during the limited time necessary for the testing or positioning. Use the following procedures for testing and positioning of machines or equipment:

a. Release the machine, equipment or component from Lockout/Tagout

b. Perform the testing and positioning

c. De-energize and re-apply locks and tags.

5.9 Hardware and Tags

If Logout/Tagout will be employed by D&B/WFC authorized employees, the HSC is responsible for providing the resources to ensure that an adequate supply of Lockout/Tagout devices and

equipment will be maintained for each project site. Lockout/Tagout hardware is issued to all authorized employees for use with this program. The HSC or his/hers designee will maintain a master list of all lockout padlocks and keys.

6.0 EMPLOYEE TRAINING

An initial training program will be provided to all authorized and affected employees, as required. The HSC has overall responsibility for coordinating employee training, including as needed "refresher" training.

Each HSR must verify that all employees have received initial lockout/tagout training prior to starting work involving the control of hazardous energy. The HSC must identify any employees who require re-training when there is a change in Energy Control Procedures, a change in equipment or processes which presents a new hazard, or when observations reveal that there are inadequacies in employees' knowledge or use of Energy Control Procedures.

Authorized employees will receive site specific training in the recognition of hazardous energy, the sources, types and magnitudes of energy and the elements of the Energy Control Procedures. Affected employees will receive training in the purpose and use of Energy Control Procedures.

7.0 CONTRACTORS/SUBCONTRACTORS

Outside contractors and subcontractors performing operations which require the use of Lockout/Tagout must use ***THEIR OWN*** Energy Control Procedures

8.0 PERIODIC INSPECTIONS OF ENERGY CONTROL PROCEDURES

D&B/WFC will conduct periodic evaluations of the Lockout/Tagout Program including a review of Energy Control Procedures, as applicable. Authorized Employee(s) (other than those utilizing the Energy Control Procedure) will perform periodic inspections.

Table of Contents

1.0 PURPOSE

The purpose of these guidelines is to provide general reference information regarding the establishment of site control procedures and work zones for hazardous waste sites.

2.0 SCOPE

These guidelines are applicable to D&B/WFC activities at hazardous waste sites. Additional precautions may be identified during the development of the site-specific HASP.

3.0 DEFINITIONS

Contaminated Materials - Contaminated materials are defined as any by-products of a field investigation that are suspected or known to be contaminated with hazardous substances. These by-products include such materials as decontamination solutions, disposable equipment and clothing, drilling muds, well-development fluids and spill-contaminated materials.

Exclusion Zone - Zone that contains or may contain contamination.

Contamination Reduction Zone - Zone located between the exclusion zone and the support zone that provides a transition between contaminated and clean zones.

Support Zone - A non-contaminated or clean part of the site.

4.0 RESPONSIBILITIES

The *Health and Safety Coordinator (HSC)* - The HSC is responsible for ensuring that these guidelines are incorporated in the Site-Specific HASP and that training is available to D&B/WFC site personnel in delineation of work zones.

The *Health and Safety Representative (HSR)* – The HSR or a designee is responsible for implementing/enforcing/designating zones on-site.

The *Employees* – all employees working at the site and visitors must comply with the requirements of the site zones, such as proper PPE and limited personnel access, as determined by the HSC or HSR.

5.0 GUIDELINES

5.1 Work Zones

5.1.1 Introduction

To reduce the accidental spread of hazardous substances by workers from the contaminated areas to non-contaminated or clean areas, work zones for specific types of operations should be delineated, and the flow of personnel and equipment among the zones should be controlled. Established work zones will ensure that personnel and equipment are properly protected against

the hazards present in their work area(s); that work activities and contamination are confined to appropriate areas; and that the personnel can be quickly located and evacuated in an emergency. Hazardous waste sites may be divided into as many zones as needed to meet operational and safety objectives. The typical work zones found at hazardous waste site are:

- Exclusion or Hot Zone - the contaminated or potentially contaminated area
- Contaminant Reduction Zone - the area where decontamination takes place
- Support Zone - The non-contaminated area where workers should not be exposed to site contaminants.

5.1.2 Exclusion Zone

The exclusion or hot zone contains or may contain contamination. The outer boundary of the Exclusion Zone is called the Hotline. It should be established following the guidelines below:

- The location of hazardous substances and surface drainage
- The data from the initial site survey
- The results of soil and water sampling
- The physical area necessary for site operations
- Meteorological conditions and the potential for contaminants to be carried by wind from the contaminated area.

The Hotline should be clearly marked by lines, placards, hazard tape, or signs and should be enclosed by physical barriers such as chains, fences, or ropes. Access control points on the periphery of the Exclusion Zone regulate the flow of personnel and equipment from zone to zone and ensure that proper procedures for entering and exiting the site are followed. Separate entrances and exits help to segregate movement into and out of the Exclusion Zone.

The Exclusion Zone can be subdivided into different areas of contamination based on known or anticipated hazard type and degree, or on the compatibility of waste streams. Such subdivision allows flexibility in health and safety requirements, operations, decontamination procedures, and use of resources. The level of PPE required in each subdivision may vary, as may the level of PPE required for different job assignments within a subdivision. The level of protection must be

specified and posted for each job assignment with each subdivision. When appropriate, different levels of PPE within the Exclusion Zone promote flexibility, effective and cost-effective operation while maintaining a higher degree of health and safety

5.1.3 Contaminant Reduction Zone (CRZ)

The Contaminant Reduction Zone or Decontamination Zone is the transition area between the contaminated and clean areas. The distance between the Exclusion and Support Zones provided by the CRZ and the proper decontamination of workers and equipment, limit the physical transfer of hazardous substances into the clean areas.

Decontamination procedures take place in a designated area within the CRZ, called the Contamination Reduction Corridor (CRC) that begins at the Hotline. Two decontamination areas may be set up within the CRC, one for personnel and small equipment and the other for heavy equipment. Access into and out of the CRZ and to and from the Exclusion Zone is through specified Access Control Points.

The boundary between the Support Zone and the CRZ is called the Contamination Control Line. This boundary separates the possibly low contamination area from the clean or non-contaminated Support Zone. Access to the CRZ from the Support Zone can be achieved through two Access Control Points, one for personnel and one for equipment. Personnel entering the CRZ must wear personnel protective clothing and equipment, as required by the Site-Specific HASP. To reenter the Support Zone, workers should remove any protective clothing and equipment and exit through the designated Access Control Point.

The CRZ must be designed to accommodate the following activities:

- Decontamination of equipment, personnel and samples;
- Emergency response, such as transport for injured personnel (safety harness, stretcher), first-aid equipment (bandages, blankets, eye wash, splints, water, etc.), containment equipment (absorbent, fire extinguisher, etc.);
- Equipment resupply, such as air tanks, personnel protective clothing and equipment (booties, gloves, chemical suits, etc.), sampling equipment (bottles, soil augers, coolers, drum thiefs, etc.), and tools;
- Sample packaging and preparation for on-site and off-site analysis;

- Worker temporary rest area, including toilet facilities, benches, chairs, liquids, shade and/or shelter. Water and other potable liquids should be clearly marked and stored properly to ensure that all glasses and cups are clean. Wash facilities should be located near drinking facilities to allow employees to wash before drinking. Drinking, washing, and toilet facilities should be located in a safe area where protective clothing can be removed. Facilities should be cleaned and inspected regularly. Maintenance workers should take appropriate protective measures; and

- Drainage of water and other liquids used during decontamination.

5.1.4 Support Zone

The Support Zone is the location in which administrative and other support functions essential to site operations are conducted. Any function that need not or cannot be performed in a hazardous or potentially hazardous area is performed here. Personnel may wear normal work clothes within this zone because any potentially contaminated clothing, equipment, and samples must remain in the CRZ until decontaminated.

Support Zone personnel must alert the proper agency in the event of an emergency. All emergency telephone numbers, change for telephones (if necessary), evacuation route maps, hospital route maps, and vehicle keys should be kept in an accessible location within the Support Zone.

Facilities located in the Support Zone should be placed after considering factors such as:

- Accessibility (topography, open space available, location of highways and railroad tracks, ease of access for emergency vehicles)

- Resources (adequate roads, power lines, telephones, shelter, and water)

- Visibility (line-of-sight to activities in the Exclusion Zone)

- Wind direction (upwind of Exclusion Zone, if possible)

- Distance (as far from the Exclusion Zone as practical).

5.2 Site Security

Effective site security prevents the exposure of unauthorized/unprotected people to site hazards, protects against increased risk from vandals or persons illegally abandoning waste on the site, prevents theft, and promotes safe working procedures.

Site security during working hours can consist of the following:

- Maintain security in the Support Zone and at Access Control Points
- Establish an identification system to identify authorized persons and limitations to their approved activities
- Assign responsibility for enforcing authority for entry and exit requirements
- Erect a fence or other physical barrier around the site, if possible
- If the site is not fenced, post signs around and have guards patrol the perimeter. Guards must be fully apprised of the hazards involved and be trained in emergency procedures
- Approve all visitors to the site. Make sure each has a valid purpose for entering the site. Have trained site personnel accompany site visitors at all times and provide them with appropriate PPE.

Site security after hours can consist of the following:

- If possible, assign trained in-house technicians for site surveillance. They should be familiar with the site, the nature of work, the site's hazards, and respiratory protection techniques.
- If necessary, use security guards to patrol the site boundaries. Such personnel may be less expensive than trained technicians, but may require additional training in safety procedures relative to hazardous waste sites;
- Enlist public enforcement agencies, such as the local police department if the site presents a significant risk to local health and safety; and
- Secure equipment

5.3 Site Control Methods

When site hazards and/or work activities may potentially create exposure to site workers and the public, control measures should be implemented. Control measures should be initiated at any time when air monitoring indicates the potential for migration of emissions off-site or outside the immediate work area. The procedures should be designed to control emissions before off-site migration, through implementation of engineering and work practice controls as well as defensive measures. Listed below are examples of control measures.

- Limit the area of open excavation or intrusive activities
- Areas excavated are backfilled or covered with a minimum 6 mil impermeable membrane
- Working face of excavation is a moderate slope in compliance with excavation regulations
- Exposed sides of excavation or intrusive activities where work is not conducted are covered
- Use fine mist to keep down dust as well as VOC's
- Keep haul distance of excavated materials to as short a distance as possible
- Immediately cover excavated material stockpile.

6.0 REFERENCES

1. CFR 29 1910.120

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1.0 PURPOSE

To provide guidance for the implementation of a comprehensive Hazard Communication Program in order to effectively communicate the chemical hazards to be encountered at D&B/WFC office and project locations.

2.0 SCOPE

Applies to all D&B/WFC sites.

3.0 DEFINITIONS

Affected Employees - an employee who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.

4.0 RESPONSIBILITIES

Employees - Observe label warning and adhere to established safety procedures.

Health and Safety Coordinator (HSC) - The HSC is responsible for the implementation of the Hazard Communication Program and compliance with the OSHA Hazard Communication Standards, 29 CFR 1910.1200 and 29 CFR 1926.

On-Site Health and Safety Representative (HSR) - The HSR is responsible for maintaining and updating site-specific chemical inventory list, assuring labeling is adequate, obtaining and maintaining MSDS, notifying D&B/WFC personnel of the hazards associated with specific assignments, and reviewing areas with D&B/WFC personnel where a potential hazard may be encountered.

5.0 GUIDELINES

5.1 Introduction

These guidelines should be used to communicate chemical hazards to be encountered at D&B/WFC work sites, assure personnel access to information on chemical hazards, and familiarize them with procedures for the safe handling of hazards in the workplace.

5.2 Hazard Determination

Hazard assessment of chemicals used by D&B/WFC are made by the suppliers and manufacturers of these chemicals and communicated to D&B/WFC via Material Safety Data Sheets.

5.3 Chemical Inventory List

A list of potentially hazardous materials will be included with the site-specific HASP or other applicable project documents and shall contain, at a minimum, the following:

- Product names
- Hazardous components
- Manufacturer's identification
- Location used

After the initial determination, the Hazard Communication inventory list will be updated annually. New chemicals shall be added to the list when received.

5.4 Labels

5.4.1 Incoming Products

Products arriving from chemical manufacturers and/or distributors shall be inspected by receiving personnel to assure that:

1. The labels and warnings are appropriate, legible, in English, and prominently displayed on each container.

2. The existing labels have not been removed or defaced.

The HSC or HSR must be notified if a container arrives without a label; the label is illegible; or the label does not identify the chemical, supply the name and address of the manufacturer or list hazard warnings.

This is to be completed before the product is used so that its contents may be assessed and marked appropriately.

5.4.2 Transfer Containers

When a hazardous chemical is transferred from its primary container to a new one, the transfer container must be adequately labeled.

5.5 Material Safety Data Sheets

Copies of material safety data sheets (MSDS) for all chemicals being used on each site shall be accessible to employees working at that site. Each MSDS shall be in English and will contain the following information:

1. Manufacturer's name, addresses and telephone number

2. Name and signature of sheet's preparer

3. The date of preparation or revision of the MSDS

4. Product identification using chemical, common, and trade names (must include the same name on the label)

5. Chemical Abstract Service (CAS) Number

6. Chemical formula

7. Chemical family

8. Hazardous ingredients of products as defined by OSHA according to toxicity, flammability, and reactivity. If the hazardous chemical has not been tested as a whole, the chemical and common name(s) of all ingredients which have been determined to be a health hazard, and which comprise 1% or greater of the composition shall be listed (except the chemicals identified as carcinogens shall be listed if the concentration is 0.1% or greater).

9. Physical data including vapor pressure, flash point, specific gravity, and boiling point.

10. Fire and explosion data including flammable limits in air, autoignition temperature, specific recommendations on the types of fire extinguisher(s) to be used and/or avoided, and special fire fighting procedures.

11. Health hazard information including the primary route(s) of exposure, established exposure limits (listed as the permissible exposure limit (PEL) or the threshold limit value (TLV)), potential adverse health effects of exposure, signs and symptoms of exposure, and medical conditions aggravated by exposure and whether the chemical is listed as a carcinogen by the National Toxicology Program (NTP) or the International Agency for Research on Cancer (IARC) or by OSHA.

12. Precautions for safe handling and use including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean up of spills and leaks.

13. Control measures including engineering controls, work practices and personal protective equipment.

14. Emergency and first aid procedures.

Requests for copies of MSDS by any employee will be honored within 72 hours.

5.6 Training

All D&B/WFC employees, who may be exposed to chemicals, shall be trained regarding the characteristics and safe handling of hazardous chemicals in the workplace at the time of initial assignment, periodically thereafter, prior to assignment of non-routine tasks, and whenever a new hazard is introduced into the workplace environment.

The following information shall be provided in the training course:

1. Requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200)
2. Location and availability of the D&B/WFC Hazard Communication Program
3. Details of the D&B/WFC Hazard Communication Program including:
    a. An explanation of the labeling system and how to read labels
    b. An explanation of the MSDS and how to obtain and use them to find the appropriate hazard information
    c. The location of toxic chemicals to which employees may be exposed
    d. The name(s) of toxic substances present in the work area including generic, chemical, common, and trade names
    e. The physical and chemical properties of toxic substances to which employees may be exposed
    f. Definition of terms (e.g. exposure, TLV, PEL, etc.)
    g. Short and long term health effects of exposure to the hazardous materials
    h. Symptoms of exposure
    i. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the workplace (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance, or odor of hazardous materials when released)
    j. Safe handling of hazardous materials

k. Emergency procedures to follow if exposed to hazardous materials

l. How to lessen or prevent exposure to hazardous chemicals through safe work practices and personal protective equipment (PPE).

5.7 Non-Routine Tasks

In the event that an employee may be required to perform tasks that are not part of normal duties the employee will be given information about hazards involved with such activities. This information shall include:

1. Specific chemical hazards
2. Protective measures the employee can take
3. Measures that D&B/WFC has taken to lessen the hazards including ventilation, respirators, presence of another employee, and emergency procedures.

5.8 Recordkeeping

The following records must be maintained:

1. A record of Hazard Communication Employee Training Program and attendance
2. The chemical inventory list
3. MSDSs locations

5.9 Informing Contractors and Subcontractors

Each contractor and subcontractor will be provided with the following information as part of their initial contract:

1. List of hazardous substances they may encounter while on the job
2. MSDS for each chemical on the list

Each contractor and subcontractor shall be informed of:

1. Hazardous chemicals to which they may be exposed

2. Measures that may be taken to lessen the possibility of exposure

3. First aid/emergency procedures

The contractor and subcontractor will sign a statement confirming that they have reviewed the above information.

Contractors and subcontractors should provide MSDS for any chemicals brought into a D&B/WFC site and should ensure that appropriate labels are on all containers. D&B/WFC employees will be informed of any potential hazards with which they might be expected to come into contact with.

5.10 Informing Visitors

Visitor access shall be restricted. All visitors are required to check in with the appropriate authority. Visitors should be provided with any necessary PPE and the following information:

1. Hazardous chemicals to which he/she may be exposed

2. Measures the visitor may take to lessen the possibility of exposure including the proper use of the PPE

3. D&B/WFC policies and procedures to be followed to reduce the risks

4. First aid/emergency procedures.

6.0 REFERENCES

1. OSHA 29 CFR 1910.1200
2. OSHA 29 CFR 1926.59

APPENDICES

Appendix A –Contractor Sign-Off Form

Project/Name:

Date

I, _____, as an authorized representative of _____ have received a copy of the following information from the D&B/WFC project representative:

1. List of hazardous substances that may be encountered while on the job
2. MSDS sheet for each chemical on the list.

The D&B/WFC project representative has informed me of:

1. Hazardous chemicals to which we may be exposed
2. Measures I may take to lessen the possibility of exposure
3 First aid/emergency procedures.

I will ensure that the other representatives from our company receive this information before beginning work on the project.

If we bring any chemicals onto the D&B/WFC project site, we will ensure MSDS are available on site and that the appropriate labels are on all containers. We will alert any D&B/WFC employees working with us of the potential hazards if there is a chance that they will come into contact with such hazards.

Name

Title

_____

Signature

Table of Contents

1.0 PURPOSE

The objective of these guidelines is to provide general reference information regarding the control and disposal of contaminated materials generated during site investigation activities.

2.0 SCOPE

Applies to all D&B/WFC work sites.

3.0 DEFINITIONS

Contaminated Materials - Contaminated materials are defined as any by-products of field operations that are known or suspected to be contaminated with hazardous substances. These by-products include materials such as decontamination solutions, disposable equipment and clothing, drilling debris, well-development fluids and spill-contaminated materials.

4.0 RESPONSIBILITIES

Health and Safety Coordinator (HSC) is responsible for revising these guidelines to include new OSHA updates. The HSC is also responsible for ensuring that proper training is available to D&B/WFC employees regarding proper disposal procedures and that a Site-Specific HASP incorporates these guidelines.

Health and Safety Representative (HSR) or his/her designee (such as Field Operations Manager) is responsible for the correct implementation of these procedures in the field.

5.0 GUIDELINES

Field investigation activities often result in the production or movement of contaminated material that must be properly managed to protect field personnel, the public and the environment. These guidelines address the proper management of this material.

5.1 General

As a general policy, it is wise to select site investigation methods that minimize the generation of contaminated material. Until sample analysis is complete, it must be assumed that all produced material suspected to be contaminated would always require containment. The Site-Specific HASP for a site investigation activities should include control procedures for contaminated material. It should address the type of contamination, estimated amounts that would be produced, containment equipment and procedures and storage or disposal methods.

5.2 Sources of Contaminated Material and Containment Methods

5.2.1 Decontamination Solutions

All decontamination solutions and rinses must be assumed to contain hazardous chemicals associated with the site, unless there is analytical or other data to the contrary. The solution volumes could vary from a few gallons to several hundred gallons in some cases.

The decontamination solutions are typically generated from:

- Personnel decontamination
- Sampling equipment decontamination
- Large equipment decontamination.

Depending upon site conditions, contamination type and site requirements, the decontamination solutions may be allowed to be drained back into the contaminated portion of the site. In some situations the decontamination solutions must be disposed off site. The Site-Specific HASP must include whether the fluids from personnel and equipment decontamination activities should be contained and disposed of, contained and left on the site for future disposal, or allowed to be drained back into the soil.

The DOT approved drums only should be used for the transportation of decontamination fluids.

5.2.2 Disposable Equipment and Clothing

Disposable equipment that could be contaminated during the site investigation typically includes protective suits, gloves, boots, broken sample containers, paper towels, and spent respirator cartridges. These items can be temporarily stored in plastic bags and transferred to 55-gallon drums (with lids) at the end of the day. These containers shall be secured at the end of each workday.

5.2.3 Drilling Fluids and Well Development Fluids

Drilling, well development and well evacuation fluids are generated during or as a result of groundwater monitoring, well installation and sampling activities. Since these fluids are potentially contaminated they are also required to be contained for eventual treatment or disposal.

The volumes of drilling, well development and well evacuation fluids depend on the well diameter and depth, groundwater characteristics, geologic formations, and drilling methods utilized. There are no simple mathematical formulas available to accurately predict these volumes. It is best to rely on the experience of reputable well drillers familiar with local conditions and the selected well installation techniques.

Drilling fluid (mud) is stored in a container commonly referred to as a mud pit (tub). This mud pit consists of a suction section from which drilling fluid is pumped to the drill pipe and back to the settling section of the mud pit. In the settling section, the well cuttings are allowed to settle. If the mud pit is lined to prevent leaks, it can also be used to contain possibly contaminated drilling fluids. Spent drilling fluids can then be pumped directly from the mud pit to 55-gallon drums for treatment and/or disposal. The sediments that accumulate in the settling section are transferred into drums or other similar containers.

If ground pits are used, they shall not extend into the natural water table. They should be lined with a bentonite-cement mixture followed by a layer of flexible impermeable material such as plastic

sheeting compatible with the wastes. Depending on site conditions and the size of the pit, it may be advantageous to excavate the entire pit for disposal and backfill the excavation with clean fill.

When the above ground tank or the inground pit is used, a reserve tank or pit should be located at the site as a backup system in the event of leaks, spills, and overflows. In addition, surface drainage shall be planned so that any leaks, spills, and overflows can be controlled within the immediate area of the drill site.

The containment procedure for well development fluids is similar to that for drilling fluids. The volume of contaminated fluid will be determined by the method of development. Bailing a new well usually generates less fluid volume than processes using backwashing. When bailing, the removed fluids can be directly placed in drums. For backwashing, a T-section can be fitted on the well casing to direct the overflow to the drums.

5.2.4 Soil Cuttings

Contaminated soil cuttings, generated while performing field investigation activities, typically consist of cuttings from borings, test pit excavations, and discarded soils from sampling activities. These soils should be contained in drums for further treatment or disposal.

5.2.5 Spill-Contaminated Materials

A spill is always possible when a site investigation involves opening and moving containers of liquids. Contaminated sorbents and soils resulting from spills must be containerized for disposal. Small quantities of spill-contaminated materials are typically contained in drums, while larger quantities can be placed in lined pits or other impermeable structures. In some cases onsite containment may not be feasible, in which case, the immediate transport to an approved disposal site will be required.

5.3 Disposal of Contaminated Materials

Actual disposal techniques for contaminated material are the same as those for any hazardous substance: incineration, landfill, treatment, etc. All involved parties must agree on determining who is responsible for disposal before the fieldwork starts. Without any previous agreement, the contractor must provide for the disposal of wastes resulting from field activities. Therefore, the contractor is responsible for subcontracting with reputable waste transporters and for assuring compliance with RCRA requirements whenever it is necessary to containerize and remove

hazardous wastes. To expedite the disposal process the following should be completed prior to field activities:

1. Identify authorized, permitted facilities for proper treatment, storage, and/or disposal of wastes
2. Obtain generator identification numbers
3. Prepare the required manifests.

Another consideration in selecting disposal methods for contaminated materials is whether the disposal can be incorporated into subsequent site cleanup activities. In this case, the contaminated material generated during the investigation activities can be stored at the site for future disposal with other contaminated site materials. If the contaminated material will be stored onsite, then containment suitable for long-term storage must be provided. Site conditions, such as surface drainage, security and soil type as well as meteorological conditions must be considered to design proper storage.

APPENDIX B

FIELD SIGN-OFF FORM

FIELD SIGN-OFF FORM

Each field team member shall sign this section after the site-specific training has been completed and before being permitted to work on-site.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with all of its provisions.

Project: PSC – Chemical Pollution Control, LLC of New York (CPC)

Name (Print)	Signature	Date