June 13, 2006

100% REMEDIAL DESIGN FOR REMEDIAL ELEMENTS I AND II

Liberty Industrial Finishing Superfund Site
55 Motor Avenue
Village of Farmingdale, Nassau County, New York

Prepared for

LIBERTY INDUSTRIAL FINISHING SITE QUALIFIED SETTLEMENT TRUST

Remedial Engineering, P.C.

Environmental Engineers

and ROUX ASSOCIATES, INC.

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DISCLOSURE STATEMENT

All professional engineering services rendered in preparation of this document have been performed for Roux Associates, Inc. by Remedial Engineering, P.C., a professional corporation qualified to perform such services in the state of New York.

The 100% Remedial Design (RD) has been prepared by Remedial Engineering, P.C. based on the Draft 95% RD and supporting documents that were prepared by Environmental Resources Management (ERM). Remedial Engineering, P.C. reviewed all key aspects of the Draft 95% RD and developed a working understanding of all relevant remedial investigative data supporting the 95% RD. All appropriate changes to address EPA comments on the Draft 95% RD have been incorporated in the 100% RD.

SECTION 01000

MEASUREMENT AND PAYMENT

1.01. GENERAL

A. This Measurement and Payment Section separates the Work of this Contract into measurable units for payment purposes, in identical units to those presented in the Bid Form of the Contract.

B. The Contractor shall be entirely responsible for performing all Work described in the Contract, whether or not specifically or fully described in this Measurement and Payment Section. The total Bid Price must include all Work described in the Contract whether or not such Work is explicitly described in this Measurement and Payment Section. Taxes shall be included in prices provided in the Bid Form.

C. Payment will not be made for unit price quantities that exceed the stated quantities in the Price Schedule, including any over-excavation or additional placement of fill materials beyond the lines and grades shown on the Drawings, unless additional quantities are approved in writing by the Engineer.

D. The number of in-place cubic yards of Site Media to be used for payment purposes will be based upon the Contractor's pre and post excavation surveys, provided that the limits of excavation shown on the Drawings or modified by the Engineer based on the results of post-excavation sampling and analysis, are not exceeded. Contractor's survey results and associated required documentation are subject to the approval of the Engineer.

1.02. UNIT PRICE SCHEDULE ITEMS

A. ITEM 1 - INSURANCE AND BONDING

This item will be measured as a complete unit (Lump Sum). The cost for this item shall include the provision of all insurance coverage and furnishing of performance and payment bonds required in Article 5 of the Standard General Conditions, as amended by the Supplementary Conditions.

A maximum of eighty (80) percent of this lump sum cost shall be paid prior to construction. The remaining twenty (20) percent of this lump sum cost shall be paid at the completion of remedial construction.

B. ITEM 2 - SITE PREPARATION

This item will be measured as a complete unit (Lump Sum). The cost for this item shall include the provision of all Work for Site Preparation, as described in the Contract and acceptably performed. The cost for this Item shall include the mobilization, installation and demobilization of all equipment, materials, temporary facilities, and labor necessary to begin remediation Work, and shall be limited to five percent (5%) of the total bid price.

The Work under this Item shall include:

1. Temporary potable and non-potable water, electricity, and telephone utilities required for the Work.

2. Decontamination trailers, pads, and personal hygiene facilities.

3. Sanitary facilities.

4. Staging, stockpiling and laydown areas.

5. Water storage tanks.

6. Dust suppression equipment.

7. Field trailers.

8. Site clean-up and Demobilization.

Eighty percent (80%) of the stated price for this Payment Item will be paid following installation of all of the items listed above at the Site, as determined by the Engineer. The remaining twenty percent (20%) will be paid upon completion of demobilization activities.

C. ITEM 3 - MISCELLANEOUS REQUIREMENTS

This item will consist of a Unit Price payment item, and shall include all Work to provide the miscellaneous requirements described below. Measurement and payment will be based on the number of months that services are provided, unless otherwise reduced or extended by the Engineer in the Notice of Award or in a formal Change Order.

This Item shall include the provision of all miscellaneous administrative and technical Work required in the Contract for the duration of the Project until Final Completion, including:

1. New York State-licensed surveyor and provision of all required survey documents.

2. Progress Drawings.

3. Record Drawings.

4. Schedules, and submittals not included in other Payment Items.

5. Site meetings.

6. Transport and off-Site disposal of Construction Debris, not otherwise included in Payment Item 12.

7. Transport and off-Site disposal of grubbed materials removed from on-Site soils not characterized as contaminated waste.

8. On-site management of construction wastewater. Off-site management options for construction wastewater will be addressed as contingency costs in the Bid Form.

9. Construction Approvals and Permits.

D. ITEM 4 - TEMPORARY FACILITIES

This Item will consist of a Unit Price payment item, and shall include all Work to properly operate and maintain the temporary Site facilities and services for the duration of the Project until Final Completion, as described in Section 01510 and elsewhere in the Contract. Measurement and payment will be based on the number of months that services are provided, unless otherwise reduced or extended by the Engineer in the Notice of Award or in a formal Change Order.

The Work under this Item shall include maintaining the following:

1. Temporary warning tape, fencing, signs, and miscellaneous Site access control.

2. Temporary utilities including water, electricity, telephone, and sanitary facilities.

3. Field office trailers.

4. Trash removal.

5. Site Security.

6. Temporary on-Site weigh scale.

7. Staging, stockpiling, and loading areas.

8. Water storage tanks

9. Dust suppression.

10. Decontamination Plan and implementation.

E. ITEM 5 – EROSION AND SEDIMENT CONTROL

This item will be measured as a complete unit (Lump Sum) and shall include all Work necessary to comply with State or Local permits for the installation and maintenance of erosion and sediment control best management practices.

The lump sum price for this item will be paid in monthly installments that correspond to the quantity of work completed during the month as determined by the Engineer.

F. ITEM 6 – IMPLEMENTATION OF THE HSCP

This item shall consist of a Unit Price payment item, and shall include all Work necessary to prepare and comply with the HSCP, including the provision of a Safety Representative at

the Site, and all Work in Levels D, C or B protection as directed by the Site Safety Officer in accordance with the HSCP and Section 01517. Measurement and payment will be based on the number of months that services are provided, unless otherwise reduced or extended by the Engineer in the Notice of Award or in a formal Change Order.

Measurement shall begin when Work activities begin in an established exclusion zone, and shall be considered completed when there is no longer an exclusion zone. All daily maintenance costs for health and safety are part of this Item.

G. ITEM 7 – CLEARING AND GRUBBING

This item will be measured as a complete unit (Lump Sum) and shall include all Work necessary for clearing and grubbing the Site to the limits determined by the Contractor, and approved by the Engineer, as necessary to remediate the Site to the limits shown on the Drawings. All cleared materials shall be chipped and stockpiled on-Site in a location proposed by the contractor and approved by the Engineer. All chipped materials may be utilized on-Site as mulch for restoration purposes in areas where there is minimal vegetation. All grubbed material shall be disposed off-site as construction and demolition debris (as part of Item 3), non-hazardous material (as part of Item 16) or hazardous material (as part of Item 17) with the same RCRA classification as the soil from which the material was removed.

Measurement and payment will be based on its cumulative percentage of completion.

H. ITEM 8 – EXCAVATION OF CONTAMINATED SOILS (SOILS ABOVE THE SITE SPECIFIC CLEAN-UP CRITERIA.)

This item shall consist of a Unit Price payment item, and shall include:

1. Excavation and segregation of contaminated soil, and on-site transport to applicable staging areas.

2. Mixing of soil prior to stabilization, if used.

3. Sampling and analysis of soil prior to disposal or initial stabilization, to characterize the soil as necessary.

Measurement and payment will be based on the number of <u>in-place</u> cubic yards of soil that are excavated.

I. ITEM 9 – EXCAVATION OF PROPOSED CLEAN OVERBURDEN AND CUT BACK SOILS.

This item shall consist of a Unit Price payment item, and shall include excavation of clean soil, and transport to temporary stockpiles, as necessary, and staging in windrows in accordance with the requirements of the SAMP.

Measurement and payment will be based on the number of <u>in-place</u> cubic yards of soil that are excavated.

J. ITEM 10 - STABILIZATION OF SITE MEDIA WASTE STREAMS (OPTIONAL)

This item consists of Unit Price payment items for each Site Media waste stream, identified by the Contractor that will be stabilized on-Site prior to disposal. In the Unit Price Schedule included as an attachment to the Bid Form, Contractor shall identify each Site Media waste stream to be stabilized.

In the Unit Price Schedule, stabilization of each Site Media waste stream processed by the Contractor will consist of a Unit Price payment item, and shall include:

1. Handling and processing of the Site Media waste stream (e.g., raking, screening, crushing) as necessary to properly stabilize the Site Media waste stream as described in the Contract Documents.

2. Stabilization of the Site Media waste stream to meet regulatory requirements, and requirements of disposal facilities.

3. Sampling and analytical requirements to document proper stabilization in accordance with the Contract Documents.

4. All additional handling, mixing and staging required, that is not included in other payment items.

During activities associated with stabilization of the Site soils, other potential waste streams may be developed and identified as separate waste streams for disposal purposes (e.g., grubbed material and/or screened or raked debris). The cost of all on-Site Work necessary to ensure that these additional waste streams pass the TCLP performance criteria for disposal approval in a RCRA Subtitle D facility must be included under one of the Site Media waste streams identified under Payment Item 9 in the Unit Price Schedule.

For example, if the Contractor elects to screen out miscellaneous debris which is located on top of or in the soil prior to stabilization, and has to wash the debris prior to disposal in a RCRA Subtitle D facility, all costs associated with raking and washing the debris should be included in the cost for soil stabilization identified under Payment Item 10.

Measurement and payment for each Site Media waste stream will be based on the number of <u>in-place</u> cubic yards of each waste stream that are excavated and stabilized at the Site.

K. ITEM 11 - LOADING OF WASTE STREAMS INTO TRANSPORT VEHICLES

This item shall consist of a Unit Price payment item, and shall include all Work necessary to load waste materials into transport vehicles prior to off-site disposal.

Measurement and payment will be based on the total number of <u>in-place</u> cubic yards of soil that are excavated.

L. ITEM 12 – REMEDIATION OF SUBSURFACE FEATURES

This item will be measured as a complete unit (Lump Sum) and shall include:

1. Identifying and locating existing subsurface features as shown on the Construction Drawings.

2. Removing all liquids and solid material from within existing subsurface features.

3. Identifying connecting piping and trace to any connecting subsurface features not previously identified.

4. Remediation of structures, including sediments in connecting pipelines and structures, and the envelope of soil surrounding the pipeline and structures. (Note: The quantity of Site Media excavated under this payment item shall not be included in the surveyed quantity of excavated soil included under Payment Item 8 - "Soil Excavation", of this Section.

5. Removal of all liquids and sediments from the excavated pipelines and structures.

6. All Work necessary to permanently plug any remaining pipelines.

Payment will be made for this item based on its cumulative percentage of completion.

M. ITEM 13 – SUBSURFACE FEATURE DEMOLITION

This item shall consist of a Unit Price payment item, and shall include:

1. Demolition of existing subsurface features as shown in the Contract Drawings.

2. All necessary segregation, decontamination, and staging of demolition debris.

3. Excavation and removal of out of service USTs, and characterization and excavation of surrounding soils.

4. Backfilling of subsurface feature excavation as determined by the Engineer, with imported approved fill material.

Measurement and payment will be based on the number of tons of demolition debris removed from the Site, as determined by empty and full weight tickets obtained at the disposal facility.

N. ITEM 14 - CONCRETE SLAB REMOVAL

This item shall consist of a Unit Price payment item, and shall include:

1. Demolition of concrete slabs as shown in the Contract Documents.

2. All necessary segregation and staging of concrete.

Measurement and payment will be based on the square foot of concrete slab demolished and stockpiled separately on site.

O. ITEM 15 - ASPHALT PAVEMENT REMOVAL

This item shall consist of a Unit Price payment item, and shall include:

1. Demolition of asphalt pavement (portions to be determined by Engineer).
2. All necessary segregation and staging of asphalt.

Measurement will be based on the square foot of asphalt pavement demolished and stockpiled separately on site.

P. ITEM 16 - WELL DECOMMISSIONING

This item shall consist of a Unit Price payment item, and shall include:

1. Abandonment and decommissioning of wells.
2. Disposal of debris generated by the Work.
3. Restoration of the area around each well.

Measurement and payment will be based on the number of linear feet of well abandoned at the Site.

Q. ITEM 17 - RCRA SUBTITLE D DISPOSAL OF SOLID WASTE MATERIALS

This item shall consist of a Unit Price payment item, and shall include:

1. The disposal of soil and solid materials from subsurface features, at a RCRA Subtitle D disposal facility.
2. The disposal of subsurface features debris at a RCRA Subtitle D disposal facility, if subsurface feature contents are disposed in this manner.
3. All sampling and profiling required by the disposal facilities.
4. Compliance with all disposal requirements identified in the Contract Documents.

Measurement and payment will be based on the number of tons of solid waste materials disposed at the disposal facility, as determined by empty and full weight tickets obtained at the disposal facility.

R. ITEM 18 - RCRA SUBTITLE C DISPOSAL OF SOLID WASTE HAZARDOUS WASTE MATERIALS

This item shall consist of a Unit Price payment item, and shall include:

1. The disposal of soil and solid materials from subsurface features, at a RCRA Subtitle C disposal facility.

2. The disposal of building subsurface features debris at a RCRA Subtitle C disposal facility, if building debris is disposed in this manner.

3. The disposal of asphalt pavement at a RCRA Subtitle C disposal facility, if pavement is disposed in this manner.

4. All sampling and profiling required by the disposal facilities.

5. Compliance with all disposal requirements identified in the Contract Documents.

Measurement and payment will be based on the number of tons of solid waste materials disposed at the disposal facility, as determined by empty and full weight tickets obtained at the disposal facility.

S. ITEM 19 - GRADING OF NATIVE SOIL

This item shall consist of a complete unit (Lump Sum), and shall include all miscellaneous grading following completion of contaminated soil removal Work. This grading consists of:

1. Transport of native soils from staging areas.

2. Cut and fill Work to achieve required subgrades and final grading as shown on the Contract Drawings.

3. 4:1 transition slopes at the edges of the excavations.

4. Compaction and compaction testing associated with this Work.

Payment will be made for this item based on its cumulative percentage of completion.

T. ITEM 20 - PROVISION AND PLACEMENT OF COMMON FILL

This item shall consist of a Unit Price payment item, and shall include:

1. The provision, stockpiling, placement, compaction, and compaction testing of pre-approved common fill which is required from off-site sources.

2. Contractor maintenance for a minimum of one year, or until the disturbed areas are considered to be permanently stabilized with vegetation, whichever is longer.

Measurement and payment will be based on the number of tons of common fill from off-Site sources installed by Contractor, as determined by weight tickets.

U. ITEM 21 - PROVISION AND PLACEMENT OF TOPSOIL

This item shall consist of a Unit Price payment item, and shall include:

1. The provision and placement of topsoil, which may be required from off-Site sources, as specified in Section 02920.

2. Testing and certifications required in the Specifications.

Measurement and payment will be based on the number of tons of topsoil from off-Site sources installed by Contractor, as determined by weight tickets.

V. ITEM 22 - SEEDING

This item shall consist of a Unit Price payment item, and shall include:

1. The provision and placement of fertilizer, lime, seed, mulch, and other supplements, as specified in Section 02920.

2. Testing and certifications required in the Specifications.

Measurement and payment will be based on the number of square feet of land that is seeded, as determined by a field survey and submitted as a Record Drawing. Areas to be seeded will be verified by Engineer prior to seeding operations. Measurement and payment will include only the areas of contaminated soil and sediment, and areas of required disturbance/grading (e.g., drainage channels, access roads) as determined by Engineer. Contractor will not receive payment for the restoration of other areas disturbed by its Work.

W. ITEM 23 - PLACEMENT OF EROSION CONTROL BLANKET FOR RESTORATION BASINS

This item shall consist of a Unit Price payment item, and shall include the provision and placement of erosion control blankets for new Basins A and B as described in the Specifications and shown on the Drawings.

Measurement and payment will be based on the actual area, in square feet, of erosion control blankets installed.

X. ITEM 24 - PLACEMENT OF NON-WOVEN GEOTEXTILE FOR RESTORATION BASINS

This item shall consist of a Unit Price payment item, and shall include the provision and placement of non-woven geotextiles for new Basins A and B as described in the Specifications and shown on the Drawings.

Measurement and payment will be based on the actual area, in square feet, of non-woven geotextiles installed.

Y. ITEM 25 – PREPARATION OF INITIAL SUBMITTALS

This item will be measured as a complete unit (Lump Sum) and shall consist of all work necessary to prepare, submit and obtain Engineer's and EPA approval of the following submittals required by the Contract Documents:

1. Stabilization Plan (Sections 02240 and 01300);

2. Work Plan (Section 01300); and

3. Initial Construction Schedule (Section 01300).

Payment will not be made until Engineer and EPA approve all three required submittals.

1.03 CONTINGENCY ITEMS

A. ITEM A - TEMPORARY CRUSHED STONE ACCESS ROADS

This item shall include:

1. Installation of all temporary access roads approved by Engineer in the field.

2. Maintenance of such roads until the roads are no longer required.

3. Removal of the roads when directed by Engineer, and appropriate disposal or reuse of road materials as described in the Specifications.

Measurement and payment will be based on the number of actual square feet of temporary roads installed.

B. ITEM B - PROVISION OF A TEMPORARY CONSTRUCTION WATER TREATMENT SYSTEM

This item consists of the provision of a temporary construction water treatment system (TCWTS). The cost for this item shall include the mobilization, installation and demobilization of all equipment, materials, temporary facilities, and labor necessary to provide a TWTS, functional for its intended purpose at the Site.

Measurement and payment will be based on a lump sum for mobilization, installation, decommissioning and demobilization. Contractor to provide a unit price for consumables e.g. filter bags, GAC and Clay vessel change-outs with unit pricing to include all labor misc. materials and disposal costs associated with this item.

C. ITEM C - STABILIZATION OF WASTE STREAMS TO MEET UNIVERSAL TREATMENT STANDARDS

The Contractor's Bid Form identifies each separate waste stream that will be processed by the Contractor for stabilization and disposal. For each waste stream processed by the Contractor, this allowance item shall represent any and all additional costs not included in Payment Item 10, for:

1. Stabilization of the waste stream to meet the proposed Universal Treatment Standards identified in the Specifications.

2. Sampling and analytical requirements to demonstrate compliance with the Universal Treatment Standards, to the satisfaction of Engineer and proposed disposal facilities.

3. All additional handling and staging required, that is not included in other Payment Items.

Measurement and payment for each waste stream will be based on the number of in-place cubic yards of excavated waste stream, that are stabilized to meet the Universal Treatment Standards.

D. ITEM D - TRANSPORTATION AND RECYCLING OF ASPHALT PAVEMENT

This item shall consist of:

1. The transportation and recycling of asphalt debris to an off-Site recycling facility.

2. All sampling and profiling required by the recycling facility.

3. Compliance with all transport requirements identified in the Contract Documents.

Measurement and payment will be based on Unit Pricing for the number of tons of asphalt transported to a recycling facility, as determined by empty and full weight tickets obtained at the disposal facility.

[If asphalt is recycled, and weighing of the asphalt at the recycling facility is not possible Engineer may allow measurement and payment to be based on empty and full weight tickets obtained from the on-Site scale.]

E. ITEM E - TRANSPORTATION AND DISPOSAL OF WASTEWATER AT A RCRA SUBTITLE C OR SUBTITLE D DISPOSAL FACILITY

This item shall consist of:

1. The transport and disposal of wastewater to an off-Site RCRA Subtitle C or Subtitle D disposal facility.

2. All sampling and profiling required by the disposal facility.

3. Compliance with all transport requirements identified in the Contract Documents.

Measurement and payment will be based on Unit Pricing for the number of gallons of water transported to the disposal facility.

(END OF SECTION)

SECTION 01005

DEFINITIONS

PART 1 – GENERAL

1.01 DESCRIPTION:

This Section contains definitions, used throughout the Specifications and Drawings, that are not defined in the General Conditions or Special Conditions. Also refer to Section 01090 for references.

1.02 DEFINITIONS:

Addenda – Written or graphic instruments issued prior to the opening of Bids, which clarify, correct or change the Contract Documents.

CERCLA – US EPA Superfund Comprehensive Environmental Response, Compensation, and Liability Act

Chemical Stabilization – Treatment of environmental media by chemical reduction and/or micro encapsulation, such that the leachability of hazardous constituents, as measured by the TCLP (EPA Test Method 1311), is reduced to performance standards required in the Contract Documents.

CLP – Contract Laboratory Program

Construction Debris – All non-contaminated solid debris generated during construction activities which is not defined as a Waste Material.

Construction Wastewaters – The term "construction wastewaters" includes: (1) leachate generated from waste piles, which requires collection; and (2) equipment and personnel decontamination wash water which requires collection.

Container – The term Container as used in these Contract Documents is defined as any trailer, roll-off or other appropriate container in which Waste Materials can be stored, or transported to the disposal facility.

Day – a calendar day unless expressly stated to be a working day.

Engineer – is defined as the design engineer for the Work

Order – The Unilateral Administrative Order issued by the EPA to the PRP Group pursuant to section 106(a) of CERCLA for the Liberty Finishing Industrial Site.

Owner – also referred to as the PRP Group

Performance Standards – Those cleanup standards, standards of control, and other substantive requirements, criteria or limitations that are used to determine whether the objectives of the ROD and the Order are being achieved.

Project – The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Project Coordinator – Representative from the PRP Group

Project Manager – person designated as the Engineering project manager

RCRA – Resource Conservation and Recovery Act

Reagent – All chemicals, water and other additives that are to be added to Site Media to successfully perform stabilization.

Record of Decision or "ROD" – the EPA Record of Decision relating to the Liberty Industrial Finishing Site

Request For Payment – Invoice submitted by Contractor requesting progress or final payments, which is to include such supporting documentation as is required by the Contract Documents.

Resident Engineer – person, designated on behalf of the PRP Group, to be the on-site engineer during the project.

Respirable Particulates – airborne particulates which are 10 microns or less in diameter.

Safety Representative – Contractor employee who must be present at the Site at all times while work is being conducted in the exclusion zone or contamination reduction zone. Engineer's SSO will communicate directly with Contractor's Safety Representative who shall then communicate all health and safety requirements to all Contractor's employees.

Site Media – Soil

Stabilization Mixture – Mixture of Site Media and stabilization reagent.

TSDF – Transport, Storage and Disposal Facility permitted under RCRA Subtitle C (hazardous waste), RCRA subtitle D (non-hazardous solid waste), and/or TSCA.

(END OF SECTION)

SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL:

1.01. PROJECT BACKGROUND:

A. The purpose of this Section is to summarize the Work to be performed at the Liberty Industrial Finishing Superfund Site in the Village of Farmingdale, Nassau County, New York, under the Project entitled "Liberty Industrial Finishing Site – Remedial Elements I and II". This Section is not all-inclusive and is intended to describe only the general performance requirements of the Work. The Contractor shall be entirely responsible to perform all Work described in these Contract Documents whether or not specifically or fully specified in this Specification Section.

B. Administrative Order:

1. The Drawings and Specifications have been prepared in accordance with the selected remedy described in the Record of Decision (ROD) for the Site (Included as Appendix A). The Consent Judgment and attached Scope of Work (SOW) provides the performance standards to be achieved by the work described herein (Included as Appendix B).

2. The Contractor shall be deemed to be in a contractual relationship with the PRP Group within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607 (b)(3).

C. The Site is being remediated under CERCLA (USEPA Superfund), therefore, all applicable requirements and exemptions promulgated under CERCLA apply to the Work of this Project.

D. Site soils contain chromium, cadmium, trichloroethene, cis-1,2 dichloroethene, and tetrachloroethene at concentrations, which exceed Site performance standards. Some of these soils, as delineated on the contract drawings may exhibit RCRA hazardous characteristics for chromium and cadmium.

E. Subsurface features and surrounding soils may also contain chromium, cadmium, trichloroethene, cis-1,2 dichloroethene, tetrachloroethene, polychlorinated biphenyl (PCBs), cyanide, benzo(a)pyrene, and dibenzo(a,h)anthracene at concentrations which may exceed Site performance standards.

1.02. SUMMARY OF WORK:

A. Several components of the Work have been described by performance specifications, to give the Contractor significant latitude in developing cost-effective means, methods, and techniques which will accomplish the goals of the Site remedy as described in the ROD, while being protective of the environment.

B. The Work to be performed in accordance with these Contract Documents shall consist of but not be limited to:

1. The provision of all temporary facilities, utilities and equipment required by the Contract Documents, or required to properly perform the Work.

2. Ancillary to the excavation activities, the pumping, storage, treatment, and discharge of Construction Wastewater shall be managed in accordance with the site State Pollution Discharge Elimination System (SPDES) surface water discharge criteria.

3. The excavation, loading, transport, and off-Site disposal of the following Site media:

   a. Excavation, stockpiling, characterization testing and transportation and disposal (off site) of soils above the site-specific performance standards.

   b. Excavation, stockpiling, confirmation testing, and backfill of cutback soils determined to be below the site performance standards.

   c. Excavation and removal of construction debris associated with the excavation of soils that exceed the site performance standards and demolition and removal or abandonment of some subsurface features including demolished concrete and asphalt.

4. Any necessary dewatering/solidification of soils necessary to obtain disposal approvals at TSDFs.

C. The Work shall also include:

1. All backfill materials required for the Project;

2. All necessary clearing and grubbing;

3. Any necessary temporary dewatering;

4. The erection, maintenance, and subsequent removal of specified soil erosion control measures;

5. Decontamination of all equipment in accordance with the requirements of the Specifications, and;

6. Final grading and seeding of the Site.

D. The Contractor shall be responsible for the implementation of the Contractor's Health and Safety Plan, as described in detail in Specification Section 01517 Health and Safety Plan Requirements and shall also comply with the requirements of the Site-specific Health and Safety Contingency Plan.

E. The Contractor shall construct decontamination pads for its use and the use of its subcontractors at the Site. The Contractor shall be responsible to collect, treat and

discharge, or dispose off-Site all decontamination wash waters generated on the Site as described in Section 01565 Decontamination Plan Requirements.

F. Contractor shall provide temporary storage tanks as specified in Section 01520 (Temporary Staging and Storage Requirements), subject to the approval of the Engineer, to store Construction Wastewater with capacity to accommodate a 25-year storm and minimize delays in its Work.

G. All materials, which are not otherwise indicated in the Contract Documents, or directed by Engineer, to be disposed of as RCRA non-hazardous, RCRA hazardous, or TSCA waste shall be considered Construction Debris, and shall be disposed of by Contractor in accordance with all applicable regulatory requirements, at an off-Site facility approved by the Owner/Engineer.

1.03. SEQUENCING OF WORK:

A. The Contractor shall prepare and submit Remedial Action Work Plan 40 days from Contractor Award

B. The Contractor shall have areas of the site cleared and grubbed to allow for sufficient space for necessary site improvements, mobilization of construction equipment, access to underlying site soils requiring excavation, and construction of soil stockpile areas. In accordance with the technical specifications, Contractor shall only clear and grub areas in which construction activities will take place within a reasonable time frame. Contractor shall <u>not</u> clear and grub the entire Site at one time.

C. The Contractors shall have the site surveyed with sufficient detail to perform the Work as detailed in these specifications and on the Contract Drawings.

D. The Contractor shall locate and investigate all subsurface features on site and perform all necessary remediation. Subsurface features that are not located within the boundaries of soil excavation can be abandoned in place in accordance with regulatory requirements for abandonment i.e. tanks filled with acceptable fill after the feature has been remediated and samples from beneath the feature show the soils are below the site performance standards.

E. The Contractor shall perform all excavations at locations shown on the Construction Drawings in the sequence provided below:

1. Remediation of Area 1

    a. The following events shall occur for each excavation cut shown on Drawings S-3 (excavation to 60 feet), S-4 (excavation to 55 feet), S-5 (excavation to 50 feet) and S-6 (excavation to 45 feet):

        i. Remove and stage potentially re-usable clean soil.

        ii. Test clean soil (By Engineer).

iii. Remove and stage impacted soil.

iv. Collect and analyze post-Excavation samples (By Engineer)

v. Test impacted soil.

vi. Transport impacted soil to appropriate TSDF.

b. Backfill and compaction to final elevations.

2. Remediation of Area 2

c. The following events shall occur for each excavation cut shown on Drawings S-3 (excavation to 60 feet), S-4 (excavation to 55 feet), S-5 (excavation to 50 feet) and S-6 (excavation to 45 feet):

i. Remove and stage potentially reusable clean soil.

ii. Test clean soil (By Engineer).

iii. Remove and stage impacted soil.

iv. Collect and analyze post-Excavation samples (By Engineer)

v. Test impacted soil.

vi. Transport impacted soil to appropriate TSDF.

d. Backfill and compaction to final elevations.

3. Remediation of Area 3

e. The following events shall occur for each excavation cut shown on Drawings S-3 (excavation to 60 feet), S-4 (excavation to 55 feet), S-5 (excavation to 50 feet) and S-6 (excavation to 45 feet):

i. Remove and stage potentially reusable clean soil.

ii. Test clean soil (By Engineer).

iii. Remove and stage impacted soil.

iv. Collect and analyze post-Excavation samples (By Engineer)

v. Test impacted soil.

vi. Transport impacted soil to appropriate TSDF.

f. Backfill and compaction to final elevations.

F. The Contractor shall complete miscellaneous Site restoration activities.

1.04. SPECIFIC REQUIREMENTS:

A. All soils that exceed the site performance standards shall be excavated and brought into one of the three staging area(s) shown on the Drawings depending upon the type of soil anticipated and delineated on the contract drawings (i.e. cut-back, above performance standard, above performance standard and RCRA characteristic).

B. The Contractor has the option of stabilizing soils as described in Section 02240 Chemical Stabilization of Soil for media that is confirmed RCRA characteristic.

C. The Contractor shall perform all excavation, testing and backfilling with remaining cut-back soils that are documented to be below the site performance standards. These soils shall be used to restore the site consistent with the final grading plan per the Construction Drawings.

D. During restoration activities, Contractor shall minimize the quantity of topsoil provided from off-Site sources. The soils used for site restoration after completion of remedial activities shall be seeded, if the soil is suitable to support vegetation. Contractor shall test the soil in accordance with the topsoil testing requirements in Section 02920 (Topsoil, Soil Supplements, Seeding and Mulching), to determine its suitability. If the subgrade soil in any area is not suitable to support vegetation, Engineer and Contractor shall determine the appropriate quantity of topsoil to place. No soils shall be brought on-site without prior approval by the Engineer.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01012

WORK BY OTHERS

PART 1 - GENERAL

1.01. DESCRIPTION:

A. This Section describes work on the Project being performed by others, and the requirements for coordinating the Contractor's Work with work under all other contracts and subcontracts, to minimize conflicts, delays and interruptions.

1.02. WORK BY OTHERS:

A. PRP Group:

1. The PRP Group will obtain and grant all access agreements for the Work. All other required approvals or access agreements shall be the responsibility of the Contractor to obtain.

2. Portions of the Site are surrounded by a chain-link fence. The gates of this entrance will be locked at all time during non-working hours. The provision by Contractor of guard service during non-working hours is at the discretion of the Contractor.

3. PRP Group will assist the Contractor with securing approval for disposal of Waste Materials at appropriate and properly permitted TSDFs, solely by providing information relative to previous sampling and analysis of Site media and Site use history.

4. PRP Group or its representative will sign all waste manifests required under federal, state, and local law.

5. PRP Group will coordinate repair of Motor Avenue throughout the project, as determined necessary by the Engineer. This road repair/maintenance Work shall be performed to ensure that the roads: remain in at least as good condition as prior to commencement of Site Work, are safe for local vehicular traffic, and do not disrupt normal traffic patterns

B. Engineer:

1. Health and Safety Contingency Plan Monitoring: A Site-specific Health and Safety Contingency Plan (HSCP), prepared by the Engineer, is included as a Contract Document. The Engineer will perform all environmental monitoring and enforce parts of this HSCP on Site as described in Section 01517.

2. Community Air Monitoring: Engineer will implement relevant portions of the Community Air Monitoring Plan (CAMP), provided as part of the SAMP, for air quality in the work areas and adjacent areas. If air monitoring reveals conditions that

exceed action levels detailed in the SAMP, Engineer shall implement an appropriate course of action as outlined in the SAMP.

3. Construction Wastewater Sampling: Sampling of Construction Wastewater will be performed by the Engineer. Refer to Section 01562.

4. All Confirmation Sampling: All confirmation sampling, including sidewall and bottom post-excavation confirmatory sampling and overburden and cutback soil sampling, will be performed by the Engineer. The Engineer will provide Contractor with the locations where Engineer's samples will be collected.

5. Sampling of on-Site Spills: Post excavation sampling and analysis of all on-Site spill areas will be conducted by the Engineer to verify that the spill event has been properly remediated. Refer to Section 01560.

6. Topsoil Sampling: Prior to delivering any topsoil material on-Site, Contractor shall identify the location(s) (in writing) of the source of topsoil material proposed for incorporation in the Work and whether the source has been approved. If requested by Engineer, Contractor shall make arrangements for the Engineer to collect a representative sample of each type and source of topsoil material. The Engineer will collect samples from each source and have each sample analyzed for full TAL/TCL parameters, including PCBs and pesticides. Engineer will obtain two week laboratory turnaround time on all topsoil samples, from the time of sample collection. No topsoil shall be brought on-Site until analytical results have been approved by Engineer.

7. Fill Material Sampling: As required by Section 02225, prior to delivering any fill material on-Site, Contractor shall identify the location(s) (in writing) of the source of each type of fill material proposed for incorporation in the Work and whether the source has been approved. Engineer will sample and analyze all sources of fill materials proposed for use in the Work. If requested by Engineer, Contractor shall make arrangements for the Engineer to collect a representative sample of each type and source of fill material. The Engineer will collect samples from each source and will have each sample analyzed for full TAL/TCL parameters, including PCBs and pesticides. Engineer will obtain two week laboratory turnaround time on all fill material samples, from the time of sample collection. No fill materials shall be brought on-Site until analytical results have been approved by Engineer.

8. Dense Graded Aggregate (DGA) Approval: Prior to delivering any DGA material on-Site, Contractor shall identify the location(s) (in writing) of the source of material proposed for incorporation in the Work and whether the source has been approved. If requested by Engineer, Contractor shall make arrangements for the Engineer to collect a representative sample of each type and source of material.

9. The Engineer may collect split samples of any samples collected by Contractor. In addition, the Engineer has the right to collect any additional stabilization confirmation or disposal approval samples that it deems appropriate. Engineer approval and concurrence will be required on any decisions made regarding the analytical results of

Contractor's sampling activities. Concurrence will be received from the Engineer within 48-72 hours from its receipt of analytical results and identification of the decision regarding the results. The Engineer will use the same laboratory turnaround time as used by the Contractor.

10. Engineer will verify whether Contractor's proposed TSDFs have current acceptable compliance status to accept CERCLA Waste Materials. Engineer will contact the appropriate Regional off-Site Contacts at EPA to make this determination.

11. Engineer will prepare and distribute minutes for pre-construction meeting and bi-weekly construction progress meetings in accordance with Specification Section 01200.

C. EPA:

1. EPA and/or EPA's authorized representatives may collect split samples of any samples collected by Engineer and/or Contractor. In addition, EPA has the right to collect any additional samples that it deems appropriate. The Engineer will obtain EPA's concurrence on any decisions made regarding the analytical results of EPA's sampling activities. Concurrence will be received from EPA within 48-72 hours from its receipt of analytical results and identification of the decision regarding the results. EPA will use the same laboratory turnaround time as used by the Engineer or Contractor.

2. If Contractor performs pre-stabilization testing of Site media, EPA concurrence is required on any decisions concerning the results of Site media TCLP testing performed prior to the start of remediation activities (i.e., prior to stabilization of Site media). Concurrence will be received from EPA within 48-72 hours from its receipt of PRP Group's representative analytical results and identification of the disposal decision regarding the results.

PART 2 - PRODUCTS

(Not applicable)

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01035
APPROVALS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01. DESCRIPTION OF REQUIREMENTS:

A. Requests for approvals and substitutions of equipment or materials shall conform to the requirements of the General Conditions and as hereinafter specified. Specific administrative and procedural minimum actions are specified in this section as extensions of provisions in the General Conditions.

1.02. SUBMITTALS:

A. In accordance with Specification Section 01300, the Contractor shall submit the following:

1. A list of materials and equipment suppliers and manufacturers who are to furnish items of materials or equipment. If the materials and equipment submitted are offered as substitutes to those specified in the Contract Documents, the Contractor shall advise the Engineer of the substitutions and comply with the remaining requirements of this section.

2. Any materials or types of construction for which the Contractor wishes to propose a substitute, shall be submitted as an initial shop drawing package to the Engineer. Submittal shall clearly indicate that a substitute item is being submitted for review and approval. Manufacturers' name, make and/or catalog number of both specified item and proposed substitute shall be identified in submittal.

3. Prior to submitting a formal request for substitution, Contractor shall submit information to the Engineer in sufficient detail for Engineer to establish additional fees that may be required to review proposed substitutions. Additional engineering fees will only be charged to the Contractor where design changes are indicated or an excessive review period is required.

4. Requests for all substitutions shall be accompanied by any and all information needed for the Engineer to make an evaluation, including performance data, test reports, samples, history of service, and other data as applicable.

   a. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Engineer to determine if the proposed substitution is equal.

   b. Requests for substitutions shall include full information, concerning differences in equipment and installation costs between specified item and proposed substitute. Fifty (50) percent of any savings in cost resulting from such substitutions shall be passed on to the Owner.

1.03. SUBSTITUTIONS:

A. All materials and equipment incorporated in the Work shall be new.

B. Whenever specific references are made in the Specifications to manufacturers or brand names, the intent is to establish a standard of type, quality and function of the required material or equipment. In all cases, the Specification requirements shall take precedence over the manufacturer's standard.

C. Whenever reference is made in the Specifications to any articles, devices, products, materials, fixtures, forms or types of construction by manufacturers' names, makes or catalog numbers, the products of such manufacturers shall be used. Requests for substitutions will be received and considered from the Contractor only, and not from manufacturers, suppliers, subcontractors or other parties.

D. Only those products originally specified and/or added by approved requests for substitutions may be used in the Work. Whenever requests for substitutions are approved, such approval is conditional upon strict conformance with all requirements of the Contract and further subject to the following:

1. Any item submitted for approval must be equal, in the sole opinion of the Engineer, to the item specified. It must be readily available in sufficient quantity to prevent delay of any Work, inspection or tests; it must be equal to the specified item in strength, functionality, durability, efficiency, serviceability, compatibility with existing systems, ease and cost of maintenance; it must be compatible with the design and not necessitate design modifications by the Engineer; its use must not impose additional work, or require changes in the work of any other contractor or subcontractor without the written agreement of such contractor or subcontractor.

2. A submission request represents that the contractor has investigated proposed product and determined that it meets or exceeds quality level of specified product and contractor will provide the same warranty as for the specified product.

3. The Owner and Engineer reserve the right to disapprove, for aesthetic reasons, any material or equipment on the basis of design considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required design.

E. Where the approval of a substitution requires revision, redesign or re-permitting of any part of the Work, all such revision, redesign, re-permitting and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Engineer.

F. In the event that the Engineer is required to provide additional engineering services, the cost for such additional services shall be charged to the Contractor, or said charges will be deducted from amounts payable to Contractor.

G. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor. Any delays arising out of consideration for an approval of a substitution shall be the sole responsibility of the Contractor, who shall arrange its operations to make up the time lost.

H. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract.

I. In all cases, the Engineer shall be the judge as to whether a proposed substitution is to be approved. The Contractor shall abide by Engineer's decision when proposed substitute items are judged to be unacceptable and shall in such instances, furnish the item specified or indicated. No substitute items shall be used in the Work without written approval of the Engineer.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01050
SURVEYS AND RECORD DRAWINGS

PART 1 - GENERAL

1.01. DESCRIPTION:

A. Existing grades are indicated on the Drawings and are based on aerial and ground surveys conducted during the remedial investigation. Existing grades indicated on the Drawings shall be considered as existing at the time of construction unless surveys conducted by Contractor, as required by this Section, indicate otherwise.

B. All horizontal locations surveyed shall be in U.S. feet relative to the New York State Plane Coordinate System, Long Island Zone, North American Datum of 1983 (NAD 83).

C. All elevations surveyed shall be in U.S. feet relative to the National Geodetic Vertical Datum of 1929 (NGVD 29). The NGVD Datum is also known as the U.S. Coast and Geodetic Survey (USC&G) Mean Sea Level Datum of 1929.29.

D. The Contractor shall employ a surveyor licensed in New York State, who shall lay out the location of all Work, and who shall perform all other surveying associated with the Work and specified herein. Surveyor shall comply with all requirements of Contractor's **site-specific HASP**, and all applicable provisions of 29 CFR 1904, 1910, and 1926, during the performance of their Work.

E. All property markers and survey monuments which may have to be disturbed during construction shall be properly tied in to fixed points before being disturbed, and properly reset by the Contractor upon completion of the Work.

F. The Contractor shall carefully preserve all property lines, survey monuments, bench marks, reference points and stakes, and in the case of disturbance or destruction thereof caused by its Work, Contractor shall be charged with the expense and damage resulting there from, and shall be responsible to correct any mistakes that may be caused by the unnecessary loss or disturbance of such property lines, survey monuments, bench marks, reference points and stakes.

G. Existing or new control points, property markers and monuments that will be or are destroyed during the normal course of construction shall be reestablished by the Contractor and all reference ties recorded therefore shall be furnished to, and checked by, the Engineer. All computations necessary to establish the exact position of the Work shall be made and preserved by the Contractor.

1.02. SUBMITTALS:

A. In accordance with Section 01300, the Contractor shall submit the following:

1. Name, address, qualifications and license of proposed surveyor, equipment calibration and inspection reports.

2. Initial Site survey showing location of all benchmarks and the proposed limits of excavation. Deliverable shall include a site contour map with 1 foot intervals.

3. Locations of health and safety work zones, as described in the Health and Safety Contingency Plan.

4. Pre-excavation survey (based on a 100-foot grid system) of all Site soils above the clean-up criteria and soils to be excavated. This survey must be submitted and approved by Engineer prior to commencement of soil remediation activities.

5. Post-excavation surveys of all disturbed soil areas after each excavation cut (shown respectively on Drawings S-3, S-4, S-5 and S-6).

6. Progress Drawings shall be kept up to date identifying the surveyed dimensions and location of all Work performed.

7. Post-excavation survey of all Site soils after backfilling activities have been completed for each major excavation area.

8. Record Drawings of all Work.

B. Seven copies of all survey results shall be submitted as well as one copy on compact disks (CDs) using AutoCad 2004 or later version, unless otherwise specified.

C. The Drawings have been prepared using AutoCad 2004. Copies of all Drawings on compact disk are available upon request to assist the Contractor in the preparation of the submittals identified above and all Record Drawings.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01. LAYOUT AND LEVELS:

A. The Contractor shall establish benchmarks in not less than three widely separated locations at the Site and shall maintain these benchmarks as the Work progresses. Field records and Record Drawings shall show the exact surveyed location and elevation of all Work in relation to the benchmarks, including, but not limited to:

1. The locations and elevations of all utilities identified or uncovered during performance of the Work.

2. Elevations and slopes of all subgrades and final grades of roadways, and drainage channels.

3. Initial and final limit of all soil excavations (including non-hazardous and hazardous excavations areas).

4. All post excavation confirmatory sample locations and elevations. Refer to Section 02200.

B. After clearing and grubbing, the Contractor shall perform an initial Site survey to establish and confirm the exact position/location (laterally and vertically) of all the Work shown on the Drawings. Any errors, or apparent discrepancies found in the Drawings with respect to existing Site conditions shall be called to the Engineer's attention for interpretation prior to proceeding with the Work as stated in the General Conditions. In areas where existing concrete and asphalt must be removed to access areas to be remediated, payment for soil excavation removal shall be based on grade elevation after concrete and pavement has been removed.

C. Contractor shall perform a pre-excavation survey of the Site to determine the pre-excavated soil surface elevations. Survey points shall be generally spaced on a 100-foot grid across the Site. In addition, top and bottom locations shall be surveyed for existing Basins 1, 2 and 3 as shown on the Technical Drawings as part of the pre-excavation survey. These same points shall be surveyed immediately following each excavation cut (shown respectively on Drawings S-3, S-4, S-5 and S-6) to verify the vertical limits of remediation have been achieved. Note, bottom elevations shall be confirmed at a minimum of 1 location per 5,000 square feet of exposed area after each excavation cut. In addition to the grid system, Contractor shall survey all horizontal limits of excavation and limits of proposed contaminated areas (non-hazardous and hazardous areas) after each excavation cut. All surveying information shall be used to provided surveyed volumes of soil removed after each excavation cut.

D. During performance of the Work, Contractor shall establish and maintain an excavation control system to provide verification that all soils are being excavated to the required depths shown on the Drawings. This system shall be subject to the approval of the Engineer and shall be described in the Work Plan to be submitted by the Contractor.

E. Prior to initiation of any Site remediation activities the limits of soil remediation shall be permanently staked in the field. The stakes shall be maintained for the duration of the Work until such time as Engineer indicates that they can be removed.

3.02. PROGRESS DRAWINGS:

A. The Contractor, at all times, shall maintain a set of Progress Drawings at the Site. The Progress Drawings shall be kept up to date identifying the surveyed dimensions and location of all Work performed.

B. As Work progresses, the Contractor shall keep a record of all deviations from the Drawings and Specifications (including deviations from details shown on the Drawings), and shall have them neatly and correctly entered in colored pencil on a paper print of Drawings on a weekly basis, and have prints available at the Site for inspection by the Engineer, the Owner, and other regulatory agencies.

C. The Owner, Engineer, and regulatory agencies may check all or any portion of the Work in the on-Site trailer and the Contractor shall afford all necessary assistance to the Engineer in carrying out such checks. All regulatory agency comments on the Progress Drawings will be coordinated through the Engineer. The Contractor shall immediately make corrections to the Work. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of its Work. Failure of the Engineer to check Contractor's Progress Drawings shall not relieve the Contractor of its responsibilities for maintaining the Progress Drawings and performing the surveys specified herein.

D. Contractor invoices for payment will not be processed unless the Progress Drawings are kept up-to-date and all surveys performed during that month have been received by Engineer and are reasonably accurate.

3.03. RECORD DRAWINGS:

A. Upon completion of all Work and before requesting final payment, Contractor shall complete mylar reproducibles of the Record Drawings showing all "as-built" changes to the Drawings. Two sets of paper prints shall be submitted to the Engineer for review and approval.

B. Contractor shall revise the Record Drawings in accordance with the Engineer's comments and resubmit two additional sets of paper prints of the revised Record Drawings for the Engineer's review and approval if requested by the Engineer.

C. Record Drawings shall include all survey drawings prepared in accordance with the requirements of paragraph 1.02.

D. Upon receipt of the Engineer's approval, the Contractor shall submit:

1. Record Drawings on CDs using AutoCAD version 14.0

2. One set of mylar reproducibles of every Drawing stamped "Record Drawings of Work", and signed indicating "Work was installed as shown" by an authorized representative of the Contractor.

3. Two sets of paper prints of the mylar reproducibles.

E. All Record Drawings showing final elevations and the locations and dimensions of Work shall be sealed and signed by a licensed surveyor employed by the Contractor.

F. The Engineer's checking and approval of Record Drawings will apply to content only. Contractor shall be responsible for the accuracy and completeness of its Work.

G. The Engineer will not approve Contractor's request for Final Payment until the Record Drawings are received and approved.

H. Shop Drawings will not be deemed acceptable as Record Drawings.

3.04. TOLERANCES:

A. Unless otherwise indicated on the Drawings, vertical coordinates shall be surveyed to the nearest 0.1 foot and horizontal coordinates shall be surveyed to the nearest 0.1 foot.

(END OF SECTION)

SECTION 01060
REGULATORY REQUIREMENTS AND APPROVALS

PART 1 - GENERAL

1.01. REGULATORY REQUIREMENTS:

A. The Contractor shall perform all Work in accordance with all applicable regulations promulgated under the following:

1. EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
2. EPA Resource Conservation and Recovery Act (RCRA).
3. EPA Land Disposal Restrictions (LDRs).
4. "Clean Water Act" (CWA).
5. US Department of Labor Occupational Safety and Health Administration (OSHA) regulations.
6. US Department of Transportation (USDOT) Hazardous Materials Transportation Act.
7. New York Air Quality Standards: 6 NYCRR Part 257.
8. New York State Pollution Discharge Elimination System: SPDES permit.
9. Regulations promulgated under the authority of the New York State Department of Environmental Conservation (NYSDEC) as well as all other applicable federal, state and local statutes and regulations.

1.02. CONSTRUCTION-RELATED APPROVALS:

A. Permits are not required under CERCLA for the Work. However, Contractor shall comply with the substantive requirements of all agencies and authorities, in lieu of obtaining any permits, and shall obtain all necessary approvals required for the Work.

B. Refer to Section 01012 for information regarding EPA approval of Contractor's submittals.

C. The Contractor shall obtain all approvals from each TSDF as applicable.

1.03. SUBMITTALS:

A. The Contractor shall obtain and adhere to all approvals, certifications, inspection reports, and similar documents required under federal, state and local regulations related to the

performance of the Work. In accordance with Section 01300, Contractor shall submit copies of all such approvals, certifications and other documents.

1.04. REGULATORY INFORMATION:

A. Copies of federal regulations pertaining to the Work may be purchased from:

Superintendent of Documents
US Government Printing Office
Washington, DC 20402

B. Copies of state environmental regulations are available from:

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01080
WARNING TAPES, SIGNS AND FENCING

PART 1 - GENERAL

1.01. DESCRIPTION:

A. The Contractor shall furnish and install temporary caution tapes, warning signs and fencing specified herein.

B. All Work shall comply with applicable OSHA, ASTM, and ANSI Standards, and all standards referenced herein.

1.02. SUBMITTALS:

A. In accordance with Section 01300, the Contractor shall submit the following:

1. Samples of each type of warning tape and warning sign.

2. List of warning signs to be provided including wording of sign, color of lettering and background, locations to be installed, and quantities.

3. Product data for temporary safety fencing.

PART 2 - PRODUCTS

2.01. GENERAL:

A. All lettering shall be carefully made so as to produce a clear legible sign. No lettering, symbol or markings containing the name of the manufacturer will be permitted to be placed on the signs.

B. All lettering and numbering on warning signs and tapes shall be in block style in size and spacing to suit the size of the sign or tape unless otherwise specified.

C. All colors shall be brilliant distinctive shades in accordance with ANSI Z53.1 "Safety Color Code for Marking Physical Hazards".

2.02. ABOVE GROUND CAUTION TAPES:

Aboveground caution tape shall be 3 inches wide, 4 mil polyethylene tape. Tape wording shall be "Caution - Do Not Enter".

2.03. WARNING AND SAFETY SIGNS:

A. Signs shall be medium-weight, 4 mils, and aluminum with a long lasting baked enamel finish. Signs shall be furnished complete with appropriate mounting holes. All holes shall be provided with suitable brass or stainless steel grommets.

B. Warning signs shall be seven (7) inches by ten (10) inches, "OSHA Regulation Signs" Style 20BE

C. As per OSHA regulations, warning signs shall be orange with black lettering, and shall have the wording: "Keep Out - Open Excavations", and "Unauthorized Personnel Keep Out".

D. Safety signs with a legend similar to "Caution - Trucks Entering" shall be provided, as required by NYSDOT, Nassau County, and the Town of Oyster Bay. Signs shall be provided in sizes, colors, and quantities required by these agencies. Contractor shall coordinate all requirements for safety signs directly with the appropriate agencies.

2.04. TEMPORARY FENCING:

A. Orange colored plastic (polyethylene or polyethylene-propylene) barrier fences shall be a minimum of four (4) feet tall and installed with steel fence posts. Installation shall be in accordance with OSHA requirements.

PART 3 - EXECUTION

3.02. INSTALLATION OF ABOVEGROUND CAUTION TAPE:

A. Aboveground caution tapes and temporary fencing shall be located around all exclusion zones, contamination reduction zones, and other hazards as directed by Engineer. The tape shall be placed so that words on the tape are upright and readable. The temporary fence shall be secure and capable of keeping unauthorized personnel from entering the restricted area.

B. The tape shall be supported by steel fence posts, wooden posts or trees.

3.03. SIGNS:

A. "Open Excavation" warning signs shall be located on the inner side of the existing chain link perimeter fence and all temporary fencing located at the Site perimeter, at a maximum spacing of 100 feet. Signs shall be installed at a height of five feet above grade.

B. "Unauthorized Personnel" warning signs shall be installed at all entrances to the Site.

C. Safety signs shall be provided, installed, and located as required by officials of NYSDOT, Nassau County, and the Town of Oyster Bay. Primary location of signs shall be along Motor Avenue. At a minimum, two signs shall be installed on Motor Avenue during the performance of the Work when any trucks (except pickup trucks) are entering or leaving the Site.

3.04. INSTALLATION OF TEMPORARY FENCING:

A. Contractor shall install orange plastic fence around all exclusion zones, contamination reduction zones, all staging areas, locations required by the HASP, or hazardous areas as required by Engineer, as may be necessary to control access to the Work areas.

B. Steel support posts shall be spaced at no more than eight (8) feet apart or on center.

(END OF SECTION)

SECTION 01090

REFERENCES

PART 1 - GENERAL

1.01. INDUSTRY STANDARDS:

A. Applicable standards of the construction industry have the same force and effect (and are made a part of Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith.

1. Referenced standards (referenced directly in Contract Documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to the Work.

2. Non-referenced standards are hereby defined to have no particular applicability to the Work, except as a general measurement of whether Work complies with standards recognized in the construction industry.

B. Contractor shall perform all Work in accordance with the latest revision of referenced industry standards.

C. Refer to Section 01005 for a partial list of acronyms used to describe agencies, regulations, standards, societies, and specific terms which may be used in the Contract Documents, and the respective meanings of these terms:

AASHTO	–	American Association of State Highway and Transportation Officials
ACI	–	American Concrete Institute
ANSI	–	American National Standards Institute
ASA	–	American Standards Association
ASCE.	–	American Society of Civil Engineers
ASP	–	Analytical Services Protocol
ASTM	–	American Society for Testing and Materials
BOCA	–	Building Officials and Code Administrators
CAMP	–	Community Air Monitoring Plan
CERCLA	–	Comprehensive Environmental Response, Compensation, and Liability Act

CQAPP	–	Construction Quality Assurance Project Plan
CWA	–	Clean Water Act
EPA	–	United States Environmental Protection Agency – Region II
FID	–	Flame Ionization Detector
HSCP	–	Health and Safety Contingency Plan
LDRs	–	Land Disposal Restrictions
mg/kg	–	milligrams per kilogram (parts per million)
mg/L	–	milligrams per liter (parts per million)
µg/kg	–	micrograms per kilogram (parts per billion)
µg/L	–	micrograms per liter (parts per billion)
MSDS	–	Material Safety Data Sheet
NBS	–	National Bureau of Standards
NEC	–	National Electric Code
NEMA	–	National Electrical Manufacturers Association
NFPA	–	National Fire Protection Association
NIOSH	–	National Institute for Occupational Safety and Health
NSF	–	National Sanitation Foundation
NYSDEC	–	New York State Department of Environmental Conservation
NYSDOH	–	New York State Department of Health
NYSDOT	–	New York State Department of Transportation
OSHA	–	Occupational Safety and Health Administration
PCBs	–	Polychlorinated Biphenyls
PID	–	Photoionization Detector
ppb	–	parts per billion
ppm	–	parts per million

RCRA	–	Resource Conservation and Recovery Act
ROD	–	Record of Decision
SAMP	–	Sampling and Analysis Monitoring Plan
SPDES	–	State Pollution Discharge Elimination System
TAL/TCL	–	Target Analyte List/Target Compound List
TCLP	–	Toxicity Characteristic Leaching Procedure
TSCA	–	Toxic Substances Control Act
UFPO	–	Underground Facilities Protection Organization
USCS	–	United Soil Classification System
UL	–	Underwriters Laboratory
USDOT	–	United States Department of Transportation
VOC	–	Volatile Organic Compound

1.02. DRAWING SYMBOLS:

A. Except as otherwise indicated, graphic symbols used on the Drawings are those symbols recognized in the construction industry for purposes indicated.

PART 2 – PRODUCTS

(Not Applicable)

PART 3 – EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01200
PROJECT MEETINGS

PART 1 – GENERAL

1.01. PRE-CONSTRUCTION MEETING:

A. Following award of the Contract, and prior to Contractor mobilizing to the Project Site, a pre-construction meeting will be held at a date, time, and place convenient to all parties.

B. Contractor shall attend the pre-construction meeting. At a minimum, Contractor's project manager, site superintendent and safety representative shall attend the meeting. In addition, if a subcontractor is used to provide chemical stabilization services, a representative of the stabilization subcontractor shall also attend the meeting.

C. Agenda:

1. Identify and discuss roles of all key project personnel.
2. Review Scope of Work.
3. Review work to be performed.
4. Review site health and safety plans
5. Review status of materials and equipment submittals and delivery schedules.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments and procedures, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.
8. Use of premises by Contractor.
9. Construction facilities.
10. Temporary utilities.
11. Security and housekeeping procedures.
12. Procedures for maintaining record documents.

D. Engineer shall record minutes and distribute copies within five days after the meeting to all participants, with two copies each to Contractor, Owner, and those affected by decisions made. Copies can be e-mailed to the Contractor, Owner and others as indicated by each party.

1.02. PROJECT PROGRESS MEETINGS:

A. Engineer shall conduct progress meetings held once every two weeks at the Site.

B. Contractor's project manager, site superintendent, and safety representative shall attend all meetings.

C. Contractor's chemical stabilization subcontractor (if used) shall also attend all meetings, until stabilization activities at the Site have been completed. If required by Engineer, a representative of any other subcontractor shall attend any requested progress meetings.

D. It is anticipated that in addition to the Owner, Engineer, and Contractor personnel, the progress meetings will be attended by representatives of EPA and NYSDEC.

E. Agenda:

1. Review minutes of previous meetings.
2. Review site health and safety items
3. Review of work progress.
4. Field observations, problems, and decisions.
5. Identification of problems impeding planned progress.
6. Review of submittals schedule and status of submittals.
7. Review of off-site fabrication and delivery schedules.
8. Maintenance of progress schedule.
9. Corrective measures to regain projected schedules.
10. Planned progress during succeeding work period.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Other business relating to Work.

F. Engineer shall record minutes and distribute copies within two days after meeting to participants, with two copies each to Contractor, Owner and those affected by decisions made. Copies can be e-mailed to the Contractor, Owner and others as indicated.

PART 2 – PRODUCTS

(Not Applicable)

PART 3 – EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01300
SUBMITTALS

PART 1 - GENERAL:

1.01. DESCRIPTION OF REQUIREMENTS:

The types of submittal requirements specified in this Section include Shop Drawings, product data, samples and miscellaneous Work-related submittals. Individual submittal requirements are specified in applicable Specification sections for each unit of Work.

A. Definitions: Work-related submittals of this Section are categorized for convenience as follows:

1. Shop Drawings include specially-prepared technical data for this Project, not in standard printed form for general application to several projects.

2. Product data includes standard printed information on materials, products and systems, and shall be submitted with Shop Drawings and in accordance with the procedures outlined below.

3. Samples include both fabricated and unfabricated physical examples of materials, products and units of Work, either for limited visual inspection or for more detailed testing and analysis.

4. Miscellaneous submittals related directly to the Work include a list of subcontractors, construction schedule, warranties, field reports, and a Work Plan.

B. Refer to the Contract General Conditions for additional information regarding submittal requirements. A minimum list of required submittals is presented in the Submittal Schedule provided at the end of this Specifications Section.

1.02. GENERAL SUBMITTAL REQUIREMENTS:

A. All submittals required for the Project shall be provided with seven (7) complete sets of submittal information, unless otherwise specified.

B. The Contractor shall review all copies of submittals for completeness and stamp the cover page of the submittal with contractors stamp that indicates products or materials submitted comply with the requirements specified in the contract documents. Contractors approval stamp shall indicate the name and initials of the reviewer and provide detailed description of any deviations from the specifications (if any). Contractor will coordinate preparation and processing of submittals with performance of the Work so that Work will not be delayed by submittals.

C. The Contractor shall provide a permanent marking on each submittal to identify the project, date, Contractor, specification section number and submittal name. Each submittal shall be

packaged appropriately for transmittal and handling. Submittals which are received from sources other than through Contractor's office will be returned by Engineer stamped "No Action".

D. Each submittal shall be complete in all respects, incorporating all information and data required for evaluation by the Engineer. Partial, incomplete, or illegible submissions will be returned to the Contractor without review, for re-submittal by Contractor.

1.03. SPECIFIC-CATEGORY SUBMITTAL REQUIREMENTS:

A. Shop Drawings:

Within ten (10) days after Notice of Award, the Contractor shall submit to the Engineer a preliminary schedule of Shop Drawing and Sample submittals, which will list each required submittal and times for submitting, reviewing, and processing.

1. The Contractor shall provide Shop Drawings, necessary for the execution of the Work. Deviations from the Drawings and Specifications shall be called to the attention of the Engineer at the time of the first submission of Shop Drawings and subsequent Shop Drawings for approval. The Engineer's review of any Shop Drawings or samples shall not release the Contractor from responsibility for such deviations.

2. If the submittal contains drawings larger than 11 inches by 17 inches, the Contractor shall supply one reproducible sepia or mylar of each drawing and five (5) prints of each drawing with each submittal package.

3. The Contractor shall respond to required submittals with complete information and accuracy to achieve required approvals within three (3) submissions. All costs to Engineer involved with subsequent submissions of Shop Drawings requiring approval will be back charged to the Contractor by deducting such costs from payments due for work completed. In the event an approved item is requested by the Contractor to be changed or substituted for, all involved costs in the review and approval process will likewise be back charged to the Contractor unless judged by the Engineer that the need for such deviation from the previously approved item is beyond the control of the Contractor.

4. Shop Drawings shall be submitted according to the following schedule:

   a. All Shop Drawings shall be submitted within sixty (60) days after Notice of Award is issued or earlier if required to prevent delay of the Work.

   b. The Engineer will as soon as possible, but in no case more than fifteen (15) working days after receipt in Engineer's office of the submittal of any Shop Drawings, return two copies to the Contractor.

   c. The Contractor shall then correct and resubmit the Shop Drawing, if required, in accordance with paragraphs 1.02 and 1.03. Each re-submittal shall include seven (7) sets of <u>complete</u> submittal information.

d. Contractor shall continue to resubmit Shop Drawings until Shop Drawing is returned marked "Approved", or “Approved as Noted”, with an additional notation by Engineer that re-submittals are not required. Refer to part 1.04 of this section

5. Contractor shall maintain copies of each Shop Drawing submittal including product data at the Site, available for reference by Engineer and others.

B. Product Data:

1. The Contractor shall collect required data into one submittal for each unit of Work or system, and mark each copy to show which choices and options are applicable to the Project and will be provided. Include manufacturer's standard printed recommendations for installation, application and use, compliance with standards, application of labels and seals, notation of field measurements, which have been checked, and special coordination requirements.

2. Contractor shall submit Material Safety Data Sheet (MSDS) and anticipated quantities of chemicals, fuels, oils, etc. to be for this project. Contractor shall understand all hazards and implement appropriate safety procedures.

C. Samples:

Samples required by the Specifications shall be provided in units identical with the final condition of proposed materials or products for the Work. Information shall be included with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.

D. Material and Equipment Suppliers and Manufacturers:

Within fourteen (14) days after Notice of Award, the Contractor shall submit to the Engineer a list of material and equipment suppliers and manufacturers for approval.

E. Construction Schedule:

1. A construction bar chart schedule shall be prepared by the Contractor and submitted to the Engineer for approval within ten (10) days after Notice of Award. Schedule shall be updated every month and submitted to Engineer for review and approval.

2. The construction bar chart schedule shall show concisely the key remedial activities, the manner in which the Work will be started and executed, the interrelationship of Work under the various trades, times upon which different phases of Work are to be started, methods and speed for performing the different phases, dates upon which certain subcontracts are dependent upon the other subcontracts, and critical quality control inspection milestones.

3. The schedule shall identify, at a minimum, the following key remedial activities:

a. Mobilization.

b. Site preparation.

c. Temporary facilities and water treatment equipment.

d. Remedial activities

e. Restoration activities

f. Soil Excavation.

g. Subsurface Feature Remediation.

h. Stabilization of site soils (if applicable.).

i. Transportation and disposal of each proposed waste stream.

j. Demobilization.

4. The Contractor shall prepare and submit a detailed sequence of all Work to be performed. The sequence of Work shall address specific means, methods and procedures for all tasks that will be employed by the Contractor, to perform its Work in a manner that will minimize the risk to properties adjoining the Site.

F. Subcontractors: (A list of intended subcontractors is required in the Bid)

1. After Contract Award, the Contractor may change Subcontractors, persons, or organizations proposed for the Work only with the Engineer's and the Owners written consent. Contractor shall submit qualifications of changed or additional Subcontractors at least 21 days prior to intended use of Subcontractor on Site.

G. Execution Work Plan (Work Plan):

The Contractor shall submit a Work Plan within twenty-one (21) days after Notice of Award. The Work Plan shall describe the manner by which the Contractor intends to comply with the following requirements. The Contractor will not be allowed to begin Work until the Work Plan is approved by Engineer. The Work Plan will be reviewed by both Engineer and EPA, as described in Section 01012.

1. Quality Control and Laboratory Testing

The quality of Work shall be the responsibility of the Contractor. The Contractor shall maintain an effective quality control program that complies with the Contract Documents and approved Work Plan. The Contractor shall furnish qualified personnel, appropriate facilities, instruments and testing devices necessary for the performance of the quality control system; these shall be adequate to cover all operations, including both on-Site and off-Site testing. Sufficient inspections and tests shall be performed on a continuous basis of all items of Work, including Work performed by Subcontractors. The Contractor’s Work Plan shall include the following:

A. A list of all testing laboratories, and the materials/media that each laboratory will test. The list shall include certification numbers, address, telephone number, and contact person for all laboratories Contractor intends to use for performance of the Work. **The laboratory to be used for analysis of the Stabilization Performance Testing samples (refer to Section 02240 (1.07)) must be approved by Engineer.**

B. A copy of each laboratory's Quality Assurance Project Plan, qualifications, previous certifications, Performance Evaluation results (if relevant), equipment lists, and personnel resumes.

C. For each laboratory, a list of the chemical and physical parameters, laboratory analytical methods, and laboratory detection limits as applicable, to be implemented during the Project.

2. Decontamination Plan

The Contractor's Decontamination Plan shall address the requirements of Section 01565, and shall include at a minimum the items listed below:

A. A description of the proposed equipment and methods to be used in the decontamination procedures including dusting, brushing, water use, power requirements, other cleaning activities, and solvents to be used.

B. A description and drawings (as applicable) showing construction details of the decontamination pads, wastewater containment area, spill prevention methods, storage containers, required storage volumes, and how decontamination wash waters will be transferred into the holding tank(s).

C. Intended procedures for transporting of equipment that will be used in remedial areas outside the fenced facility, back onto the facility without contaminating clean areas.

D. A description of procedures for the disposal of materials generated from decontamination activities.

3. Site Diagram

An adequate diagram of the Work Site with a layout showing existing Site conditions, and the location of access routes and roads, staging areas, decontamination pads, office trailers, and limits of clearing and grubbing. The diagram shall also show the Contamination Reduction Zones.

4. Staging and Storage Equipment

The Work Plan shall include:

a. Drawings showing construction details for all tanks, soil stockpiles, containers, and other equipment proposed for use in staging solid and liquid Waste Materials.

b. Drawings of the soil stockpiles shall identify sump volumes, and other information necessary to demonstrate compliance with the 25-year storm requirements discussed in Section 01520.

c. Drawings showing the proposed layout of the staging areas, including berms, truck access provisions, tank locations and other information necessary to demonstrate that the staging requirements described in Section 01520 will be met at all times during the Work.

d. Procedures for pumping and storage of storm water and wash water generated during the Work.

e. Any other requirements for proper staging and storage of site soils and other waste materials.

f. Identification of proposed quantities, sizes, and types of temporary storm water or wash water tanks to be used, including selection justification.

5. Excavation Activities

a. Specific operation plan details of excavation activities.

b. Methods for excavation of soil.

c. Methods for remediation of subsurface features.

d. Schedule by excavation area.

6. Soil Dewatering

The Work Plan shall include descriptions and figures (if necessary) for the following:

a. Methods and equipment to be used for the removal of surface or standing water. Refer to Section 02480.

7. Soil Erosion and Sedimentation Control

The Contractor shall identify all methods and devices, which it will use to minimize soil erosion during the Project, if these measures vary from the requirements of the Contract Documents, and provide the following:

a. Provisions for the control and prevention of surface runoff from the active Work areas.

b. Specific measures to be used during final seeding and restoration.

In order to minimize the impacts of storm events, storm water diversion measures shall be established before and during the Work (refer to Section 01560). The Contractor shall provide a description and sketches of its intended approach for diversion of storm water.

8. Traffic Plan

   This plan shall describe any traffic control requirements during Work on site and in the vicinity of Motor Avenue including:

   a. Any required flagmen;

   b. Times of day that Work and traffic measures will be required;

   c. Provisions for Work where equipment will be required to enter cross public roadways.

9. Dust Control

   a. Provisions for the control of fugitive dust emissions to the air. Refer to Sections 01560 and 01517.

10. Miscellaneous Requirements

    The following miscellaneous requirements shall also be addressed in Contractor's Work Plan:

    a. List and condition of equipment to be used on-Site.

    b. Procedures for handling materials that exceed site performance standards, materials that are RCRA characteristic and materials that are below the site performance standards.

    c. Methods and equipment to be used for compaction of all fill materials installed on the Site.

    d. Spill response Plan for petroleum and/or chemical spills

H. Daily Field Reports:

1. In accordance with the requirements of the Contract Documents, the Contractor shall furnish a daily report, which identifies at a minimum:

   a. The dates of commencement and completion of all aspects of the Work;

   b. All Work performed that day;

   c. The number of workers on-Site each day working for the Contractor and all Subcontractors, with further breakdowns by craft and employee names;

d. All major equipment items on-Site;

e. Weather conditions;

f. Quantities or payment items performed that day; and

g. Quantities of materials delivered and removed from the Site.

2. All daily reports shall be kept as a permanent record at the Site. One copy of the daily reports shall be submitted to the Engineer prior to the Contractor leaving the Site each day.

1.04. ACTION ON SUBMITTALS:

A. Engineer's Action:

Where action and return is required or requested, Engineer will review each submittal, mark with "Action", and return to Contractor. Where submittal must be held for coordination with other contracts, Contractor will be so advised without delay.

B. Final Unrestricted Release:

Work may proceed, provided it complies with Contract Documents, when submittal is returned with the following:

Marking: "Approved"

C. Restricted Release:

Minor corrections are noted and shall be made. **A re-submittal is only required if noted by Engineer on the Shop Drawings returned to the Contractor**. Work may proceed at Contractor's own risk, provided it complies with notations and corrections on submittal and with Contract Documents. Should re-submittal not be approved, Contractor shall perform all revisions to Work executed to bring Work into compliance with final approved shop drawing at no cost to Owner.

Marking: "Approved as Noted"

D. Returned for Revisions and Re-submittal:

Do not proceed with Work. Major corrections are noted. Revise submittal in accordance with notations thereon, and resubmit **complete** submittal without delay to for review. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the Work:

Marking: "Disapproved"

E. Rejected:

Based on the information submitted, the submission is not in conformance with the Contract Documents. The deviations from the Contract Documents are too numerous to list and a completely revised submission of the proposed equipment or a submission of other equipment is required.

or

Reproducible transparencies and resultant prints are not legible and will not be reviewed and a re-submittal is required. Partial or incomplete submittals will be rejected.

Marking: "Rejected"

F. Other Action:

Where submittal is returned for other reasons, with Engineer's explanation included, it will be marked as follows:

Marking: "No Action"

G. If a re-submittal is required, the Engineer will annotate the submittal as indicated, and return two (2) copies to the Contractor for appropriate action. If reproducible Shop Drawings are submitted, the Engineer will return one (1) set of marked prints and the marked reproducible transparencies to the Contractor.

H. Approval of a shop drawing by the Engineer will constitute approval of the subject matter for which the drawing was submitted and not for any other material, equipment or appurtenances shown.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

A. Submittal Schedule

Specification Section	Title	Submittal(s)
01050	Surveys and Record Drawings	1. Name, address, qualifications and license of proposed surveyor, equipment calibration and inspection reports. 2. Initial Site survey. 3. Location of health and safety zones. 4. Pre-excavation survey of all Site soils above the clean-up criteria and soils to be excavated. 5. Post-excavation survey of all soil areas after each excavation cut. 6. Progress Drawings. 7. Post-excavation survey after backfill. 8. Record Drawings of all Work.
01060	Regulatory Requirements and Approvals	1. Copies of all such approvals, certifications and other documents.
01080	Warning Tapes, Signs and Fencing	1. Samples of each type of warning tape and warning sign. 2. List of warning signs to be provided. 3. Product data for temporary fencing.
01300	Submittals	1. Equipment and Materials Suppliers and Manufacturers List. 2. Construction Schedules. 3. Work Sequence. 4. Subcontractor qualifications. 5. Execution Work Plan. 6. Daily Field Reports.
01400	Quality Control, Testing, and Inspection	1. List of QA/QC requirements to be submitted as part of the Execution Work Plan. 2. Records of all field inspections, tests, alignments and calibrations performed under Contractor's supervision. 3. All laboratory and other test/ inspection results and reports.

Specification Section	Title	Submittal(s)
01517	Health and Safety Requirements	1. Site-specific Contractor's Health and Safety Plan. 2. Description of additional health and safety measures than those identified in the HSCP, if identified. 3. Qualifications and experience of Contractor's Safety Representative. 4. Executed copies of Appendices A and B of HSCP. 5. Training and fit test certificates and/ or records of Contractor's employees. 6. A copy of each employee's medical records. 7. Reports of construction activities, which cause or threaten to cause a release of any materials from the Site, or any accidents, as described in Specification Section 01517.
01520	Temporary Staging and Storage Requirements	1. Information and drawings of all staging and storage systems as part of the Execution Work Plan. 2. Manufacturer's certifications that all tank systems have been constructed/ installed, as specified.
01550	Access Roads	1. Construction details regarding temporary access roads.
01562	Management and Treatment of Construction Wastewaters	1. Shop drawings of complete assembly, layout, and installation drawings for the temporary treatment system. 2. Shop drawings of manufacturer's literature for the components of the treatment system. 3. O&M manuals for all equipment comprising the temporary treatment system.
01565	Decontamination Plan and Requirements	1. A Decontamination Plan submitted as part of the Execution Work Plan. 2. Decontamination certificate for each construction and material transport vehicle leaving the Site.
01700	Project Closeout	1. Written certification that Contract Documents have been reviewed, Work has been inspected, and the Work has been completed in conformance with Contract Documents. 2. Release of lien for subcontractor and suppliers. 3. Final application for payment identifying total adjusted Contract Sum
02210	Clearing and Grubbing	1. Proposed limits of clearing and grubbing as part of the Execution Work Plan. 2. Management plan of potentially contaminated grubbed material.
02200	Excavation of Site Soil	a. All submittals regarding soil excavation as part of the Execution Work Plan.

Specification Section	Title	Submittal(s)
02210	Miscellaneous Earthwork	1. Product data for the grout used to permanently plug underground piping and abandon the monitoring wells. 2. Methods to be used for dewatering and removal of soil that may be contained within the subsurface features to be remediated as part of the Execution Work Plan.
02225	Fill Materials	1. Name of, and certification for, all proposed fill material sources. 2. Gradation testing results and certifications from suppliers. 3. Three (3) five-pound samples of all fill materials. 4. Results of all laboratory Proctor testing results, and all field compaction tests.
02240	Chemical Stabilization of Soil	1. Stabilization Plan. 2. All analytical testing results with a figure, which identifies the location and sample number of each sample, and any QA/QC results. 3. Daily stabilization log.
02270	Erosion Control	1. Routine inspection logs for conditions of temporary, Site security fencing and erosion controls.
02275	Geotextiles	1. Samples and manufacturer's product literature. 2. Written instructions for storage, handling, installation, and joining/ seaming of all geotextiles used.

Specification Section	Title	Submittal(s)
02280	Transportation and Disposal of Waste Materials	1. Product and calibration procedures for temporary Site weigh scale. 2. The following documents at least four (4) weeks prior to initiating any off-Site transport: a. List of transportation subcontractors. b. Detailed transport schedule. c. Letter from each transporter certifying that the transporter has the capacity to transport the offered volume of waste materials. d. Documentation that vehicles are properly permitted to transport waste materials and that the transporter is licensed by New York State, and all other states through which waste materials will be transported. e. A list of all TSDFs proposed for its Work, including alternates. f. Copies of all current permits for proposed TSDFs. g. For each TSDF, a description of all its waste characterization requirements. h. Written certification that each selected TSDF has the capacity to accept the volumes of waste materials offered for disposal. i. Proposed primary and contingency transportation routes. j. Contingency Plan/ Program for responding to off-Site spills. k. Shop drawings and samples of all types of vehicles liners to be used during the Work.
02830	Fencing	1. Shop Drawings. 2. Product Literature. 3. Manufacturer's printed installation instructions.
02920	Topsoil, Soil Supplements, Seeding and Mulching	1. Name and location of each proposed topsoil source. 2. All results for topsoil, certification that topsoil meets the requirements of Specification Section 02920. 3. Certification of seed mixture, purity, germinating value, and crop year identification. 4. Product data and application rates for all soil supplements, mulch, binders, or any other products proposed for the Work. 5. Hydro-seeding mixture and rate of application. 6. Samples of all seed mixtures.

(END OF SECTION)

SECTION 01400
QUALITY CONTROL, TESTING, AND INSPECTION

PART 1 - GENERAL

1.01. TESTING AND INSPECTION:

A. All materials, equipment and workmanship (if not otherwise designated by the Specifications) will be subject to inspection, examination and testing by the Engineer at any time during construction. Contractor shall afford reasonable access to Engineer and any agencies performing tests and inspections.

B. Required inspection and testing services are intended to assist in determination of probable compliance of the Work with requirements, but do not relieve Contractor of responsibility for the fulfillment of requirements of the Contract Documents. Specified inspections and tests are not intended to limit Contractor's quality control program.

C. All specified tests and inspections shall be performed by laboratories approved by the Engineer. The costs for all specified inspections and tests shall be borne by the Contractor at no additional cost to the Owner.

D. Contractor's test results shall be binding on both the Contractor and the Owner, and shall be considered irrefutable evidence of compliance or non-compliance with the Specification requirements unless supplementary testing by Engineer or EPA proves to the satisfaction of the Owner and Engineer that the Contractor's samples were not representative of actual conditions. Refer to Section 01012 for additional information regarding Engineer and EPA sampling during the Work.

E. The Contractor may conduct additional tests as it may require. Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Engineer and the Owner. Testing of this nature shall be conducted at the Contractor's expense.

F. Contractor shall conduct all testing and sampling in the presence of Engineer or Owner's Representative.

1.02. SAMPLING AND ANALYSIS OF SOLID SITE MEDIA:

A. Contractor shall be responsible for sampling and analysis of all solid Site media to demonstrate that the media meet the requirements of Contractor's offsite disposal facility(ies) identified in accordance with the requirements of Section 02280, and that the media also meet the chemical stabilization criteria presented in Section 02240 (if applicable).

B. Contractor shall retain the services of a laboratory for these purposes. The Contractor must obtain the Engineer and EPA's acceptance of the proposed testing laboratory prior to commencement of analytical activities. In addition, the laboratory shall be acceptable to

the offsite disposal facility(ies) and the state(s) in which the disposal facility(ies) are located.

C. QA/QC requirements for Contractor's sample collection and analytical activities are identified in Part 3 of this Section. Refer also to Section 02240 if soil stabilization is performed.

1.03. SUBMITTALS:

A. In accordance with the procedures and requirements set forth in Section 01300 and this Specification Section, the Contractor shall submit the following:

1. Refer to Section 01300 for a list of QA/QC requirements to be submitted as part of the Work Plan.

2. Records of all field inspections, tests, alignments and calibrations performed under the Contractor;s supervision.

3. All laboratory and other test/inspection results and reports.

1.04. WATERTIGHTNESS OF WORK:

A. All liquid-holding tanks and piping systems shall be tested for leakage by the Contractor before their use. This requirement also applies to any decontamination pads or Waste Piles, if lined. Prior to testing, all debris shall be removed and the structures shall be in a broom clean condition.

B. All liquid-holding equipment shall be filled with potable water to overflowing or such other level as directed by the Engineer for a period of not less than twenty-four (24) hours.

C. All equipment shall be examined for leakage, especially at joints. Leakage will be considered to be within allowable limits when there is no visible sign of leakage and the water surface does not drop during twenty-four (24) hours. If leakage is visible or evident, the defect shall be corrected by methods approved by the Engineer at no additional cost to the Owner and the testing repeated until the tank passes the leakage test.

D. Piping shall be hydrostatically tested with potable water by plugging the pipes and pressurizing the piping system to 100% of the intended working pressure. The piping system must hold the applied pressure for one hour. Any leaks shall be corrected by methods approved by the Engineer at no additional cost to the Owner and the testing repeated until the piping system passes the hydrostatic test.

1.05. FILL MATERIAL TESTING:

A. Requirements for testing of topsoil are identified in Section 02920.

B. Requirements for compaction testing of fill materials are identified in Section 02225.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01. SAMPLE BOTTLES AND EQUIPMENT

A. The Contractor's selected laboratory(ies) shall supply properly cleaned and prepared sample containers and analyte-free water, if necessary.

B. Certificates of analysis shall be provided for sample containers delivered in lots. The laboratory shall supply demonstrated analyte-free water in accordance with EPA CERCLA Quality Assurance requirements, along with the results of the water analyses.

3.02. DECONTAMINATION OF SAMPLING EQUIPMENT:

A. All sampling equipment shall be dedicated (i.e., used once and then discarded) or shall be decontaminated prior to each use as specified herein.

B. All sampling equipment shall be cleaned before each use by washing with solutions in the following order:

1. phosphate-free detergent wash;

2. tap water rinse;

3. nitric acid rinse;

4. tap water rinse;

5. final rinse with a volume of analyte-free deionized, distilled water equivalent to five times the amount of acid used in the previous step;

6. air dry;

7. wrap in aluminum foil until use.

The tap water may be obtained from any municipal water treatment system. The nitric acid shall be reagent-grade, diluted to 10 percent.

C. Sampling equipment shall be decontaminated on a decontamination pad and the decontamination liquids shall be poured on the decontamination pad and allowed to evaporate. Decontamination procedures shall be documented in the field logbook.

3.03. SAMPLE COLLECTION PROCEDURES:

A. Soil samples shall be collected with a stainless steel trowel.

B. Small rocks and vegetation shall be removed.

C. Samples collected for TCLP analysis shall be visually inspected to ensure that, to the extent practical, objects greater than 3/8" are not present in the sample. This sampling approach is consistent with the screening step in the TCLP test method and will ensure that the stabilization performance assessment is conducted on the native condition of the waste material.

D. Each sample shall be placed in a stainless steel bowl, homogenized, and placed in the sample container.

E. Composite samples shall be collected by placing discrete grab samples in a stainless steel bowl, mixing the grab samples together, and placing the composite sample in the sample container.

3.04. SAMPLE CUSTODY PROCEDURES:

A. Sample custody shall be maintained by the Contractor. The Contractor is responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory.

B. A self-adhesive sample label shall be affixed to each container prior to sample collection. The sample label shall contain the following information:

1. Laboratory name;
2. Sample ID number;
3. Sample location;
4. Sample matrix;
5. Date and time of sample collection;
6. Analytical parameters;
7. Any preservative added; and
8. Name of sampler.

3.05. RECORDING OF FIELD DATA:

A. Sampling information shall be recorded in a field-sampling logbook. Recorded information shall include:

1. Sample number;

2. Date and time the sample is collected;

3. Source of the sample;

4. Location of the sample;

5. Analyses required;

6. Any chemical preservative used;

7. Sample condition (color, odor, etc.);

8. Any decontamination procedures.

3.06. SAMPLE PREPARATION AND SHIPMENT:

A. Following collection, all samples shall be stored in an insulated cooler on ice at 4°C for shipment to the laboratory. Each cooler shall contain sufficient ice or ice packs to ensure that a 4°C temperature is maintained from the time of sample collection through the time of sample shipment. Coolers shall be packed in a manner to prevent damage to sample containers.

B. Field chain-of-custody records completed at the time of sample collection shall be placed inside the cooler for shipment to the laboratory and the cooler sealed with tape. Contractor shall then sign a custody seal and place the seal on the cooler in such a way that any tampering during shipment will be detected.

C. All samples shall be shipped to the laboratory within 48 hours of sample collection. All coolers shall be shipped by an overnight courier according to current USDOT regulations. As long as custody forms are sealed inside the sample cooler and the custody seals remain intact, it shall not be necessary for commercial carriers (i.e., overnight carriers) to sign off on the custody form. Upon receiving the samples, the sample custodian at the laboratory shall verify and record the temperature inside the cooler.

3.07. ANALYTICAL REQUIREMENTS

A. The analytical reporting requirements shall be a standard laboratory data reporting package, which shall include:

1. Laboratory sample identification;

2. Date sampled;
3. Date received by the laboratory;
4. Dates extracted and/or analyzed;
5. Specified analytes;
6. Detection/quantitation limits and appropriate units; and
7. Sample analytical results.

(END OF SECTION)

SECTION 01510
TEMPORARY FACILITIES

PART 1 - GENERAL

1.01. DESCRIPTION OF REQUIREMENTS:

A. Specific administrative and procedural requirements are specified in this section as extensions of other provisions in the Contract Documents. Nothing in this section is intended to limit the types and amounts of temporary work required, and no omission from this section will imply that such temporary activity is not required for successful completion of the Work and compliance with requirements of Contract Documents. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, support facilities, and security/protection provisions.

B. In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, Contractor shall comply with specific requirements indicated and with applicable local industry standards for construction work. Contractor shall obtain inspections and approvals as required.

C. All temporary Work shall comply with the applicable provisions of ANSI A10-Series standards on construction safety and NFPA Code 241 "Building Construction and Demolition Operations".

D. Contractor shall establish and initiate the use of all specified temporary facilities prior to commencement of Site remediation activities, unless otherwise specified herein or approved by Engineer. Temporary facilities, which are not required to be established prior to initiation of Site remediation activities, shall be established when reasonably required for proper performance of the Work as approved by the Engineer. Contractor shall terminate the use of, and remove from the Site, the facilities when no longer needed or when directed to do so by the Engineer.

E. Contractor shall install, operate, maintain and protect temporary facilities in a manner which will be safe, non-hazardous, sanitary, and protective of persons and property. Facilities shall be located where shown on the Drawings or as directed by the Engineer.

F. Contractor shall not post advertisement signs during the performance of its Work.

PARTS 2 - PRODUCTS

2.01. TEMPORARY UTILITY SERVICES:

A. Where possible and reasonable, Contractor shall connect to existing utilities for required services, locate, and relocate services to minimize interference with construction operations. Contractor shall pay for all utility connections and service during the Project.

B. Contractor shall be responsible for maintaining utility connections and for payment of all fees resulting from usage of all temporary utilities, including services used by the Owner, Engineer, and regulatory agencies.

2.02. TEMPORARY CONSTRUCTION FACILITIES:

The types of temporary construction facilities required may include, but not by way of limitation, dewatering equipment, electrical power distribution, lighting, water, sanitary services, telephones, hoisting facilities, and ladders. Contractor shall provide facilities reasonably required to perform construction operations properly and adequately.

A. Enclosure:

1. Provide temporary enclosures for the Work where reasonably required to ensure adequate workmanship and protection from weather and unsatisfactory ambient conditions, including enclosures where temporary heat is used.

B. Electrical Power:

1. Contractor shall provide all necessary electrical power necessary for the performance of the work. The Contractor shall comply and make all necessary arrangements with the local power utility to meter temporary service at Contractor's own cost and to pay all electric service charges.

2. Any other electrical power requirements shall be provided by the Contractor. Contractor shall provide a dedicated service entrance cabling, weatherproof, grounded, power distribution system sufficient to accommodate construction operations, field offices, use of power tools, electrical heating, and lighting. Provide overload protection. The installation shall comply with the National Electric Code (NEC), National Fire Protection Association (NFPA), and all other local applicable electrical and safety codes.

C. Lighting:

1. Provide sufficient temporary lighting to ensure proper workmanship by combined use of daylight, general lighting, and portable plug-in task lighting.

D. Temporary Heat:

1. The Contractor shall provide temporary heat when required to maintain temperatures within limits recommended by a manufacturer for the installation of its products or as ordered by the Engineer.

E. Access Provisions:

1. Provide roadways, personnel walkways, ladders, and similar temporary access elements as reasonably required to perform the Work and facilitate its inspection during execution. Comply with reasonable requests of governing authorities performing inspections.

F. Temporary Water:

1. The Contractor shall provide all potable and non-potable water necessary for the execution and testing of its Work. The Contractor shall comply and make all

necessary arrangements with the water utility to meter temporary service at the Contractor's own cost and to pay all service charges

2. The Contractor shall furnish and install, as required: all pipe, hoses, tanks, receptacles, equipment, and accessories necessary for the conveyance and application of water to the construction Work.

3. Contractor shall, at its expense, store used waters in an approved manner as specified in the Contract Documents.

G. Trash Disposal:

1. Contractor shall make arrangements to dispose of trash, garbage, etc. offsite on a daily basis, if necessary, in accordance with the Contract Documents.

2. Trash shall be disposed offsite on a regular basis, as necessary to ensure that Contractor's trash containers are not overflowing with trash at any time.

H. Communications:

1. Furnish, install, and maintain telephone, fax and e-mail communication capability in Contractor's and Engineers field offices.

2. In addition to the telephone requirements specified, Contractor shall provide a minimum of four (4) portable radios or walkie-talkies throughout the Project. Contractor shall also provide spare batteries and chargers for each radio. Two (2) radios shall be dedicated for use by the Engineer's Resident Project Representative (RPR) and Site Safety Officer (SSO).

2.03. DECONTAMINATION FACILITIES:

A. The Contractor shall erect and maintain temporary decontamination facilities at the Site in accordance with Section 01565 throughout the execution of its Work.

B. Contractor shall provide and maintain means for decontamination of personnel, which shall include:

1. Hot and cold running potable water.

2. One (1)-shower station.

3. Two (2)-hand-washing stations.

4. One (1)-portable eyewash station capable of providing a minimum 15 minutes of water.

5. Suitable supplies of detergents, towels, and other equipment.

C. The requirements identified herein are minimum requirements only. The actual decontamination facilities to be supplied by the Contractor shall be adequate for the Contractor's work force and shall comply with all applicable OSHA standards and requirements.

2.04. TEMPORARY SUPPORT FACILITIES:

A. The types of temporary support facilities required include, but not by way of limitation, field offices, storage sheds, fabrication sheds, sanitary facilities, drinking water, first aid facilities, private telephones, and similar miscellaneous general services as may be reasonably required for proficient performance of the Work. The Engineer shall designate or approve locations for temporary support facilities.

B. Sanitary Facilities:

1. The Contractor shall provide self-contained toilet (Port-O-Johns) units in quantity and type acceptable to governing authorities, adequate for all stages of construction for use by the Owner, Engineer's, and Contractor's personnel.

2. Sanitary facilities shall be maintained on a regular basis and when directed by the Engineer.

3. The Contractor shall provide separate facilities for male and female personnel when both sexes are working in any capacity at the Site.

C. Engineer's Field Office:

1. The Contractor shall provide and maintain a suitable all-year-round heated and air-conditioned office for the use of the Engineer, the Owner, and regulatory authorities. The office shall have two (2) locking or adequately padlocked exterior doors and a minimum of one operable window at each exterior wall. Four (4) keys shall be provided to Engineer. Safe and properly constructed metal or wooden stairways with handrails shall be provided at each access doorway. Two duplex convenience electrical outlets and cable internet service with wireless router and adequate lighting shall be provided for each work area.

2. Engineer's field office shall contain three separate work areas and shall be at least 300 square feet in area. One area of the office shall be for the use of regulatory agencies. The field office shall contain the following items in good condition:

a. Three (3) office desks with drawers.

b. Three (3) office swivel chairs.

c. Six (6) folding chairs.

d. One (1) five-foot drafting table.

e. One (1) draftsman's stool.

f. Two (2) four-drawer legal-sized file cabinets with lock and key.

g. One (1) printing calculator with tape.

h. Two (2) bookcases approximately three by five feet in size.

i. One (1) plain paper facsimile machine with its own separate telephone line number.

j. Two (2) touch-tone equivalent telephones with a minimum of 10 speed dial numbers, each equipped with a speakerphone. Each telephone shall have a separate telephone line number.

k. Two (2) portable Type ABC fire extinguishers, 10 lb. capacity.

l. One (1) electric water cooler/hot water dispenser and a maintained quantity of bottled water for drinking purposes. The Water cooler shall incorporate a small refrigerator or a separate small refrigerator shall be provided.

m. A rest room with hot and cold running water, flush toilet, and sink.

n. Print Rack.

o. Two (2) 36" x 24" Bulletin Boards.

p. One (1) First Aid Kit suitable for 5 people.

3. The Contractor shall provide, furnish, maintain, and pay all janitor services, electricity, phone, water, and wastewater/sanitary charges for the Engineer's field office.

4. One month after final acceptance of the Work or when ordered by the Engineer, whichever is sooner, the use of the field offices, together with the equipment and facilities furnished by the Contractor, shall revert to the Contractor who shall remove them and leave the Site in a condition satisfactory to the Owner and Engineer.

5. Contractor's Field Office:

   a. The Contractor shall provide and maintain a field office and telephones for use by its employees and subcontractors throughout the course of the Work.

   b. The Contractor's trailer shall be of sufficient size to provide a meeting area for all Project meetings. Area shall be supplied with a conference table and chairs sufficient for 16 individuals.

   c. Contractor's field office shall be furnished with a copy machine adequate for paper sizes up to 11 inches by 17 inches to be jointly used by Contractor, the Owner, and Engineer.

d. Contractor shall be responsible for any and all damages occurring to the property, which is kept in the field office. Such damages shall include any loss caused by, but not limited to, fire, theft, vandalism, or malicious mischief.

2.05. SECURITY/PROTECTION PROVISIONS:

A. The Contractor shall provide, but not by way of limitation, fire protection, barricades, warning signs/lights, building enclosure/lockup, environmental protection, and similar provisions intended to minimize property losses, personal injuries, and claims for damages at the Site.

B. Contractor is responsible to provide all security/protection services for its equipment, as Contractor deems necessary.

C. Contractor shall provide services to limit access onto the Site by pedestrians and all non-authorized personnel, which shall consist of the following:

1. Keeping gates locked at all times and providing authorized personnel only with copies of the lock keys.

2. Inspecting all Site perimeter fencing daily and repair fencing immediately if it becomes damaged.

3. Installing temporary fencing in all necessary areas to prevent access to the Work areas by unauthorized personnel.

D. Fire Extinguishers:

Provide types, sizes, and numbers of extinguishers at locations that would be reasonably effective in extinguishing fires during early stages by personnel at the Site.

1. Provide Type A, 10 lb. extinguishers at locations of low-potential for either electrical or grease-oil-flammable liquids fires.

2. Provide Type ABC, 10 lb. dry chemical extinguishers at all other locations.

3. Comply with recommendations of NFPA No. 10.

4. Refer to the Health and Safety Plan requirements in specification section 01517.

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01517
HEALTH AND SAFETY REQUIREMENTS

PART 1 - GENERAL

1.01. DESCRIPTION:

A. The Work areas at the Site contain chromium, cadmium, trichloroethene, cis-1,2-dichloroethene, tetrachloroethene, polychlorinated biphenyl (PCBs), cyanide, benzo(a)pyrene, and dibenzo(a,h)anthracene, and may contain other contaminants for which OSHA Permissible Exposure Limits (PELs) have been established. Therefore, the Work shall be performed in accordance with specific health and safety requirements. For the purpose of this Specification Section only, the term "Contractor's employees" refers to all employees of the Contractor and its Subcontractors who will work on the Site.

B. The Engineer has prepared a Health and Safety Contingency Plan (HSCP), attached as a Contract Document, to assist the Contractor, its employees and Subcontractors in the preparation of their own site-specific Health and Safety Plan (HASP). The Engineer's HSCP fulfills the requirements of 29 CFR 1904, 1910 and 1926 for the activities of the Engineer. The Contractor will be undertaking different activities and may implement additional health and safety measures in addition to those identified in the Engineer's HSCP, as the Contractor deems necessary.

C. The Contractor shall comply with all requirements of their **site-specific HASP**, and all applicable provisions of 29 CFR 1904, 1910 and 1926 during the performance of all Work.

D. The Engineer will be authorized by the Owner to issue orders stopping Work if the Engineer observes that the Contractor is violating the Engineer's HSCP, OSHA regulations, any other applicable regulations concerning safety, or is otherwise conducting Work in an unsafe manner. No part of the time lost due to any such stop orders shall be made the subject of a claim against the Owner or Engineer by the Contractor.

1.02. IMPLEMENTATION:

A. As described in the Engineer's HSCP, the Engineer will perform environmental (air) monitoring, including particulate monitoring. The Engineer will provide a full-time Site Safety Officer (SSO) who will be responsible for routine inspection of the Contractor's compliance with their HASP for the duration of the Project.

B. All guidelines and requirements of the Contractor's **site-specific HASP** (i.e., construction safety) shall be implemented and adhered to by the Contractor. The Engineer will not be responsible for supervision of the Contractor's compliance with these requirements.

C. The Contractor shall provide the services of a Safety Representative for the duration of the Project. The Safety Representative can be the Contractor's Site Superintendent. The Engineer's SSO will communicate directly with the Contractor's Safety Representative. The Contractor's Safety Representative shall then communicate all health and safety requirements to all Contractor's employees.

1.03. SUBMITTALS:

A. In accordance with Section 01300, the Contractor shall submit the following:

1. A **site-specific HASP** within 14 calendar days after award of the Contract.

2. If the Contractor implements any additional health and safety measures than those identified in the Engineer's HSCP, the Contractor shall submit a description of these additional measures. The submittal will be reviewed by the Engineer and the EPA, and must be approved by the Engineer before construction activities can begin.

3. Qualifications and experience of Contractor's Safety Representative.

4. Following award of the Contract and prior to an employee beginning work at the Site, executed copies of Appendices A and C to the Engineer's HSCP for all Contractor employees who will work in an exclusion zone or a contamination reduction zone.

5. Training and fit test certificates and/or records of the Contractor's employees prior to each employee beginning work at the Site.

6. A copy of each employee's medical records shall be on file in the Contractor's trailer prior to each employee being allowed to work in either the exclusion zone or contamination reduction zone.

7. The Contractor is responsible for ensuring that all employees are medically fit to perform the Work. For privacy reasons, the Engineer will not review the medical records, but will only verify that the medical records are on file at the Site with the Contractor.

8. Reports of construction activities, which cause or threaten to cause a release of any material from the Site, or any accidents, as described below.

1.04. HEALTH AND SAFETY CONTINGENCY PLAN:

A. The Contractor shall become familiar with the scope of Work described in these Contract Documents, the conditions of the Site, and the necessity for the safety of the Contractor's employees, its Subcontractors, and others during the performance of its Work. Specifically, the Contractor shall comply with all applicable safety laws and regulations including, but not limited to, those under federal and state occupational, safety, and health acts, and in particular the provisions of OSHA 29

CFR 1910.120. The Contractor shall comply with the more stringent of those safety programs and procedures.

B. The Contractor shall make the Engineer's HSCP available to all of its employees and Subcontractors. The Contractor shall require that all its employees read the HSCP, as verified by the Contractor's submittal of the Appendices at the end of the HSCP.

C. All Contractor employees who will enter an exclusion zone or a contamination reduction zone must have received training required by 29 CFR 1910. The health and safety training requirements apply only to those employees who will work in an exclusion zone or a contamination reduction zone.

1.05. GENERAL REQUIREMENTS

A. If the Engineer's air monitoring indicates that the established action levels identified in the Engineer's HSCP are exceeded at any time, the Contractor shall implement all necessary corrective action techniques (engineering controls) to reduce or eliminate potential chemical or respirable particulate exposures as required by the Engineer's HSCP. The Contractor shall take such action in consultation with the Engineer and SSO. The corrective action techniques to be used shall include, but not be limited to:

- applying water mist on excavation faces and haul roads;
- wetting equipment and buckets during excavation, stabilization and loading activities;
- using equipment which prevents the release of particulates;
- hauling materials in properly tarped or watertight containers;
- restricting vehicle speeds;
- reducing the number and/or size of excavations open at one time; and
- covering excavated areas and stockpiled materials as specified elsewhere.

1. When application of water is necessary, atomizing sprays or misting/fogging shall be employed to prevent overly wet conditions and conserve water. If necessary, dust and vapor control agents such as foam may be used subject to the approval of the Engineer.

2. All equipment and labor necessary to implement the corrective action techniques described above, shall be supplied by the Contractor at no additional cost to the Owner

3. While the selected engineering controls are being installed, Work will be stopped until such time as the controls are in place. Work will not be allowed to continue while engineering controls are being installed.

4. The measures described above are required to be implemented prior to upgrading the levels of personal protection identified in the Engineer's HSCP. Portions of the Work will be subject to very low particulate monitoring action levels, as described in the Engineer's HSCP. Although the Contractor is required to implement engineering controls prior to upgrading levels of protection, it is anticipated that Level C protection will be required for portions of the Work.

B. If any remediation activities cause or threaten to cause a release of any material from the Site, that, in the opinion of the Owner, Engineer, EPA's onsite representative, or Contractor, constitutes an emergency situation or may present an immediate threat to public health, welfare, or the environment, the Contractor shall take all appropriate action to prevent, abate, or minimize such release or threat of release.

1. The Contractor shall take such action in consultation with the Owner, Engineer, and EPA's onsite representative or other available authorized EPA personnel and in accordance with all applicable provisions of this Specification, the Engineer's HSCP, and the Contract Documents.

2. Within 15 days of the onset of such an event, a written report setting forth the events that occurred and the measures taken and to be taken in response thereto shall be submitted to the Engineer by the Contractor. Within 30 days of the conclusion of such an event, a report setting forth all actions taken in response thereto shall be submitted to the Engineer by the Contractor.

C. The Contractor shall take every precaution for the safety of its employees, Site personnel, and the public. The Contractor shall provide such equipment and facilities for first aid service to anyone who may be injured in the progress of the Work, and shall have standing arrangements for the removal and hospital treatment of any employees who may be injured or who may become ill.

D. The Contractor must report immediately to the Engineer and the Owner every accident to persons and shall furnish in writing full information, including testimony of witnesses, regarding any and all accidents.

PART 2 - PRODUCTS

2.01. HEALTH AND SAFETY EQUIPMENT:

A. The Contractor shall supply all health and safety equipment required for its employees and Subcontractors, or required to perform its Work.

B. The Contractor shall have Level C protective equipment available at the Site for all its employees who will enter an exclusion zone or a contaminant reduction zone at all times, as specified in the Engineer's HSCP.

C. The Contractor shall supply and maintain a minimum of two (2) sets of Level B equipment onsite at all times.

D. The Contractor shall provide and maintain the following equipment onsite at all times for contingency and/or emergency situations that may arise:

1. Gasoline powered centrifugal 3" suction pump with a minimum of 100 feet of suction and 500 feet of discharge hoses and connectors
2. Emergency electrical generator
3. Supply of reserve fuel (275-gallon portable tank with fuel transfer pump and 5-gallon safety cans for centrifugal pump and emergency generator)
4. Two-way radio or walkie-talkies (a minimum of two sets)
5. Floodlights
6. Tarpaulins
7. Flashlights
8. Hand shovels
9. Safety shower
10. Portable eye wash facility
11. First aid kits (appropriately sized for number of Contractor employees onsite)
12. Fire extinguishers
13. Two hand held sirens/alarms
14. Safety harness with lifeline
15. Safety fencing

E. The portable eye wash facility shall be provided with a supply of potable water sufficient for an eye wash duration of at least 15 minutes.

PART 3 - EXECUTION

3.01. IMPLEMENTATION OF THE ENGINEER'S HSCP:

A. The Contractor shall post in conspicuous locations (e.g., next to all trailer telephones) the Engineer's HSCP Emergency Contacts list and the map to the local hospital, as shown in the Engineer's HSCP.

B. A verbal discussion between the Engineer and the Contractor regarding the Engineer's HSCP shall be initiated prior to any field activities at the Site and daily prior to commencement of Work. This provision is not intended to create any rights in parties other than the Engineer and the Contractor.

C. The Contractor shall ensure that its employees use at least a Level D level of protection when performing all Work. Additional equipment, as needed, shall be used for levels of protection specified in the Engineer's HSCP.

D. The Contractor shall be responsible for guarding and protecting open excavations and other potentially hazardous locations in and adjacent to the Work areas in accordance with Section 01080 and all applicable OSHA requirements.

E. A substantial covering (e.g., steel road plates) shall be placed over any excavation, where it is reasonable to expect that vehicles will move over such covering.

(END OF SECTION)

SECTION 01520
TEMPORARY STAGING AND STORAGE REQUIREMENTS

PART 1 GENERAL

1.01. DESCRIPTION:

A. This Section describes the requirements for the staging and segregation of all solid and liquid wastes generated during performance of the Work. All solid materials generated on-Site shall be staged in waste piles. All staging and storage areas shall be designated for health and safety purposes as "Exclusion Zones" as defined in the HASP, and shall be maintained a minimum of 50 feet from the existing perimeter fence.

B. This Section describes, among other things, the requirements for staging solid Site media in lined waste piles. However, if the soil beneath a waste pile requires remediation, the waste pile does not have to be lined, and all requirements associated with the waste pile lining do not apply. All other requirements for waste piles (e.g. erosion controls, waste pile covering) shall be implemented as specified.

C. Lined, covered, non-leaking roll offs are an acceptable substitute for the waste pile requirements described herein for all solid Waste Materials. Contractor is responsible for unloading, reloading, corrective actions, and other remedial Work resulting from any leakage of rolloffs. The Engineer reserves the right to disallow subsequent staging in rolloffs if leakage occurs.

D. All Waste Materials staged on Site shall be transported and disposed of off-Site in accordance with Section 02280 within 90 days of excavation.

E. All staging and storage areas for solid Site media shall be sized by the Contractor as necessary to perform its Work. Suggested staging (and storage) areas are shown on the Drawings.

F. Waste piles shall have run-on and run-off control systems capable of preventing flow onto or off of the stockpiled material, from a minimum of a 25-year, 24-hour storm event. At the Site, this storm event is equivalent to 5.02 inches of rainfall in 24 hours.

G. During and following storm events, Contractor shall expeditiously manage all water collection systems installed as part of the waste piles in order to maintain the design capacity of the systems.

H. Contractor shall inspect all waste piles and storage tanks daily and following storms, to detect any deterioration, malfunction, leaks, or presence of liquids, and shall immediately correct any problems encountered to the satisfaction of the Engineer.

I. Any tank, rolloff, or lined waste pile that is leaking shall be immediately taken out of service, the waste removed if necessary to repair the leak, and any visible releases to the environment contained. The cause of the leak shall be determined and repaired, or the item permanently taken out of service. Any repairs must be inspected and approved by Engineer prior to the item being placed back in service.

J. All rolloffs, tanks, or waste piles used for storage of solid Hazardous Waste Materials, shall be labeled as "hazardous waste", and shall also be labeled to identify the contents and date accumulation begins.

K. At Project closeout, all waste residues, contaminated containment systems, and other equipment shall be decontaminated or disposed off-Site at an appropriate TSDF as specified in Section 02280.

1.02. SUBMITTALS:

A. Contractor shall submit as part of the Work Plan described in Section 01300, information and drawings of all staging and storage systems.

B. Manufacturer's certifications that all tank systems have been constructed/installed, as specified.

1.03. SEGREGATION OF WASTE STREAMS:

A. Contractor shall establish separate stockpile/staging areas for the following:

1. Proposed clean overburden and cutback soil confirmed to be below site performance standards,

2. Soil above the cleanup site performance standards that are not RCRA characteristic,

3. Soils that exceed site performance standards and exhibiting RCRA hazardous characteristics;

4. Subsurface features and other building debris;

5. Asphalt pavement;

6. Concrete;

7. Grubbed material; and

8. Chipped material.

1.04. STAGING OF SOLID WASTE MATERIALS:

A. Solid Waste Materials shall be staged in waste piles and meeting the following requirements:

1. Soil stockpiles maybe located on existing concrete slabs. Existing slab must be in good condition and capable of supporting the soil stockpiles and construction equipment.

2. Soil stockpiles shall be lined with geotextile, and a welded liner that is chemically resistant to the Waste Materials (refer to the HSCP), to prevent any migration of

wastes or liquids from the waste pile. The liner shall have a minimum thickness of 40 mils.

3. A water collection and removal that includes a sump, shall be installed directly above the liner. The collection system shall consist of a geocomposite drainage net or similar material approved by Engineer, and a low-point sump.

4. Liquids that accumulate on the liner, and in the sump, shall be removed and either treated on-Site in the temporary treatment system, or shall be disposed of to an off-Site RCRA-permitted TSDF, if so required by the Engineer.

5. Waste piles shall be covered with polyethylene sheeting at all times unless waste is being added to or removed from the pile.

6. Temporary safety fencing and silt fence shall be installed around all waste piles.

7. A weather shelter shall be installed for solid waste material stockpiles as shown on the Technical Drawings. The weather shelter shall be relocatable and engineered and shall be a clear span multi-layered structure constructed of aluminum frame.

B. Waste piles that are required to be lined shall be tested for water tightness prior to use as specified in Section 01400.

C. Once a waste pile has been sampled for disposal purposes, material shall not be added to the waste pile until the waste pile contents have been removed for disposal.

D. A waste pile that has been removed from service due to leaking may not be restored to service until the liner system is repaired, tested and has been certified by a Professional Engineer.

1.05. STAGING OF CONSTRUCTION WASTEWATER:

A. Contractor shall use appropriate controls and practices to prevent spills and overflows from tanks, including spill prevention controls and overfill prevention controls.

B. Once Engineer has collected a water sample from a storage tank, liquids shall not be added to the tank until the tank has been emptied.

1.06. STAGING OF PROPOSED CLEAN MATERIALS:

A. Soils that are excavated as proposed clean overburden or sidewall cut backs shall be stockpiled separately from soil that exceeds site performance standards.

B. Staging areas for soils below the site performance standards shall comply with the requirements of the Technical Drawings and be maintained in accordance with all requirements of this Section.

PART 2 - PRODUCTS

2.01. TEMPORARY STORAGE TANKS:

A. Construction Wastewater Tanks

1. The Contractor shall provide influent holding tanks and effluent holding tanks for use with the temporary Construction Wastewater Treatment System. Each holding tank shall have sufficient capacity to allow contractor to continue work in the excavation areas. If contractor elects to use tanks or containers greater than 8,800 gallons in capacity this units must be secondarily contained. Tank units shall not exceed a maximum capacity of 20,000 gallons unless otherwise approved by the Engineer. The tank shall be either a "frac" style or modular style.

2. If modular tanks are provided, each tank shall have a minimum liner thickness of 40 mils, constructed of a material that will be compatible with all chemicals to be stored in the tank.

3. Contractor shall procure and install storage tanks in quantities necessary to provide adequate separate capacity for:

   - Untreated Construction Wastewaters;
   - Untreated Construction Wastewaters which have or are undergoing sampling and analysis;
   - Treated Construction Wastewaters;
   - Treated Construction Wastewaters that have or are undergoing sampling and analysis.

No additional Construction Wastewater will be permitted to enter a storage tank once it has been sampled by Engineer.

B. Engineer will direct Contractor when temporary storage tanks are to be removed from the Site. All tanks shall be decontaminated as required by the tank manufacturer and as required in Sections 01562 and 01565, prior to return to manufacturer, or shall be disposed of in accordance with Section 02280.

C. All temporary storage tanks shall be located in areas approved by Engineer.

2.02. POLYETHYLENE SHEETING:

A. All polyethylene sheeting used for staging purposes shall be 20 mils thick, construction grade sheeting.

PART 3 - EXECUTION

3.01 SPILL RESPONSE MEASURES - SOLID WASTE MATERIALS:

A. Spills of solid Waste Materials shall be immediately cleaned up by the Contractor using appropriate tools and supplies. Any "clean" soil potentially contaminated by spills of solid Waste Materials during remediation activities shall be excavated and disposed of with other similar Site media as appropriate. Post excavation sampling and analysis of the excavated spill area will be conducted by Engineer to verify that the spill event has been properly remediated.

B. Any "clean" equipment, materials or facilities which are contaminated by a spill event shall be immediately cleaned, restored to previous existing conditions, and decontaminated by the Contractor in accordance with the Specifications, and in a manner acceptable to the Engineer.

C. If there is evidence of a leak of a waste pile liner system, the Contractor shall be immediately required to stop adding material to the pile, contain all leakage which has or is occurring, and take measures which will stop the leak.

D. If the leak cannot be stopped by other means, the Waste Material shall be removed from the pile and placed in a newly constructed waste pile.

E. A waste pile that has been removed from service may not be restored to service unless the liner system has been repaired and been certified by a Professional Engineer as meeting the requirements of the Specifications.

3.02. SPILL RESPONSE MEASURES - CONSTRUCTION WASTEWATERS:

A. If a spill of Construction Wastewater or other liquids of concern (e.g., gasoline or diesel fuel) occurs anywhere on-Site during transfer to a storage tank, flow to the tank shall be immediately stopped and the spill immediately contained. The source of the spill shall be identified and the transfer equipment shall be repaired, subject to the approval of the Engineer, prior to commencement of transfer activities.

B. In the event of a tank leak anywhere on Site, the source of the leak shall be identified immediately and repaired subject to the approval of the Engineer. If the leak cannot be repaired without removing the wastewater from the tank, the tank shall be immediately drained and removed from service. Prior to reuse, the tank shall be repaired subject to the approval of the Engineer.

C. All spills of Construction Wastewaters, including leakage of free liquids from transport vehicles, shall be immediately cleaned up and collected by the Contractor, if feasible, using appropriate tools and supplies.

D. All materials used for the cleanup of liquid spills (e.g., absorbent materials) shall be collected, stored, stabilized as necessary, and disposed of with similar Site media as appropriate.

E. All collected liquids resulting from spills shall be stored with Construction Wastewaters for subsequent testing, treatment, if necessary, and disposal as described in Section 01562.

F. Any soil or sediment contaminated by liquid spills during remediation activities shall be excavated, stabilized as necessary, and disposed of with the other similar Site media as appropriate. Any "clean" equipment, materials (e.g., concrete or asphalt paving), or facilities with impervious surfaces which are potentially contaminated by a liquid spill event shall be immediately cleaned up and decontaminated by the Contractor in accordance with the Specifications and in a manner acceptable to the Engineer.

(END OF SECTION)

SECTION 01550
ACCESS ROADS

PART 1- GENERAL

1.01. DESCRIPTION:

A. This Section describes the requirements for temporary access routes and access roads.

1.02. SUBMITTALS:

A. In accordance with Section 01300, Contractor shall submit the following:

1. Construction details regarding temporary access roads.

1.03. ACCESS ROADS IN SOIL REMEDIATION AREAS:

A. Temporary access routes shall be constructed as necessary throughout the Site, in order to provide stable access from the main facility gates to all Work areas.

B. Contractor shall provide necessary Site access routes by clearing and leveling the current Site topography only. If at any time during the Work, access becomes impassable, or results in unacceptable dust generation, access roads shall be constructed.

C. Access roads shall be constructed by rolling and compacting the sub grade to remove ruts and uneven areas. Mirafi 100X woven geotextile shall then be installed, followed by a six-inch layer of dense graded aggregate.

1.04. RESTORATION OF ACCESS ROAD AREAS:

A. Following Work, all temporary access routes and access road areas shall be restored. Stone used in the temporary access roads shall be removed, used as backfill, or disposed off-Site, based on testing by Engineer. Geotextile shall be disposed as RCRA non-hazardous Waste Material.

B. Contractor shall be responsible for all sampling and analyses necessary for disposal approval if stone cannot be placed as backfill based on analytical results of Engineer's samples consistent with the Confirmation Sampling and Analysis Plan.

PART 2- PRODUCTS

2.01. GEOTEXTILE:

A. Mirafi 100X woven geotextile for use in access roads is specified in Section 02275.

2.02. DENSE GRADED AGGREGATE

A. Dense graded aggregate is specified in Section 02225.

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01560
TEMPORARY CONTROLS

PART 1 - GENERAL

1.01. DESCRIPTION:

A. This Section describes temporary controls that shall be implemented during the Work. These measures include control of dust, erosion, sedimentation, noise, and pollution.

B. The Contractor shall provide environmental protection to ensure the retention of the environment in its natural state to the greatest possible extent during the Work. Environmental protection shall include consideration of air, water, and land protection, noise minimization, and management of trash and other pollutants. The Contractor shall comply with all applicable federal, state, and local laws, and the requirements specified herein.

C. The Engineer will notify the Contractor of any non-compliance with the provisions of this Section and the corrective actions to be taken. The Contractor shall, after receipt of such notice, immediately inform the Engineer of proposed corrective action and take such action as may be approved. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

D. The failure of the Engineer to notify the Contractor of any non-compliance with the foregoing regulations shall not relieve the Contractor of its liability or responsibility to comply with applicable regulations.

1.02. PROTECTION OF LAND RESOURCES:

A. Except in areas of the Site approved to be cleared, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without the approval of the Engineer. Where the possibility exists that trees may be defaced or damaged, the Contractor shall adequately protect such trees. Contractor shall prevent employees from trampling over, and vehicles from being driven through, wooded or grassed lands unless necessary for the performance of the Work, and approved by the Engineer.

B. All materials and equipment shall be stored in cleared spaces away from all trees and shrubs. Stone, earth, or other material that is displaced into uncleared areas shall be removed immediately.

C. Any trees or other landscape feature damaged by the Contractor's operations shall be restored or replaced as directed by the Engineer at the Contractor's expense.

D. If any fuel or Waste Material is released in unauthorized areas, the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated soil shall be excavated at Contractor's expense, disposed of as directed by the Engineer, and replaced with suitable fill material, compacted, finished with topsoil, and planted to reestablish vegetation.

E. In the event of a fuel spill, the Engineer will perform verification sampling to comply with NYSDEC cleanup standards for soil associated with fuel spills. Contractor shall be responsible for all cleanup Work necessary based on the sampling analytical results, as determined by Engineer, at no additional cost to the Owner.

1.03. PROTECTION OF WATER RESOURCES AND WETLANDS:

A. Contractor shall comply with the Discharge Limits for Construction Wastewaters (Section 01562).

B. Special measures shall be taken to prevent chemicals, fuels, oils, greases, bituminous materials, waste washings, herbicides and insecticides, and concrete materials and surface drainage from entering surface waters. Contractor shall place containment structures around and under motor fuel and chemical dispensing containers.

C. Any spillage or leakage of oil or other substances, no matter how small, must be immediately reported to the Engineer and cleaned up by the Contractor. The Engineer will determine the amount of cleanup necessary. Contractor shall be responsible for all remedial and disposal coats.

D. Water used in material processing, dust control, cleanup, and other wastewaters shall not be allowed to migrate offsite.

E. Contractor shall take special precautions and comply with all applicable regulations when working in or near wetland areas.

1.04. DUST CONTROL:

A. The Contractor shall maintain all excavations, embankments, stockpiles, access roads, and all other Work areas free from excessive dust that would cause a hazard or nuisance to others. Refer to Section 01517 and the HSCP for further requirements related to dust minimization and control.

1.05. EROSION AND SEDIMENTATION CONTROL:

A. The Contractor shall take all necessary measures to control erosion and sedimentation until Final Acceptance and the Site and adjacent areas are restored in accordance with the Contract Documents. Contractor shall comply with all requirements specified herein and as shown on the Drawings.

B. All silt fence and straw bales (and other storm water erosion control measures) shall be maintained by the Contractor throughout the duration of the Project until the Engineer determines that they are an obstruction to the Work, and at the time will direct Contractor to either remove or relocate them.

C. Soil stockpiles shall be re-covered daily.

D. Temporary diversion ditches and berms shall be created as necessary to prevent storm runoff from entering or exiting excavations, and to prevent storm water from running onto adjacent properties, with locations and methods subject to the approval of the Engineer.

E. Disturbed Work areas shall be graded to control erosion within acceptable limits. With the exception of clearing activities, the area that has been disturbed by Contractor shall be limited to two sub areas, unless approved by the Engineer. Contractor may initiate remediation activities in additional sub area while restoration activities are being performed in the previously excavated sub area.

F. Straw bales and/or silt fence shall be placed at locations up gradient of excavation areas to minimize water flow and soil from entering excavations, and down gradient of excavation areas to prevent soil in the excavations from migrating to other areas of the Site.

G. Soil erosion measures shall be installed as shown on the Technical Drawings.

H. The need for any additional erosion control measures will be determined by the Engineer during construction on an as-needed basis, and shall be implemented and maintained by the Contractor at no additional cost to the Owner. Inspection of temporary erosion control measures by the Contractor shall be frequent and repair or replacement shall be made promptly, as needed or directed by Engineer.

I. If Contractor's Work interferes with, or requires relocation of, any temporary erosion control devices, the Contractor shall make all required changes and relocations to the devices as needed or as directed by the Engineer.

J. The Contractor shall remove erosion control devices at the conclusion of the Work, or as directed by the Engineer.

1.06. NOISE CONTROL:

A. The Contractor shall conduct all operations for the execution of the Work in compliance with the applicable local regulations controlling maximum noise levels due to construction work, and shall take noise abatement measures necessary to comply with the local regulations. All Work shall be performed during daylight hours and will be subject to local noise regulations.

1.07. TRAFFIC CONTROL

A. Contractor shall establish temporary, secure crossing areas, gates, and/or fencing as necessary to safely and properly transport soil across the site.

B. Contractor shall provide flagmen and implement measures necessary to control traffic, to ensure the safety of public motorists and Site workers. These measures shall also be implemented, as necessary, when waste is being transported from the Site.

C. If Engineer believes that fugitive dust may impact vehicular traffic during any portion of the Work, Engineer will direct the Contractor to halt Work until dust controls are implemented. This determination will be made based on real-time air monitoring and wind direction.

D. Contractor shall install any and all measures (e.g., temporary barriers) necessary to guard open excavations so that the excavations do not pose an undue hazard to vehicular traffic.

1.08. SITE CLEANING

A. During progression of the Work, all Work areas shall be kept clean by Contractor, all rubbish shall be collected on a weekly basis, and all surplus materials and unneeded construction equipment shall be removed from the Site when no longer required for the Work.

B. Where Contractor's operations have allowed or caused material or debris to enter existing watercourses, ditches, drains, pipes or structures, such material or debris shall be entirely removed and disposed of during the progress of the Work.

C. Contractor shall place all Construction Debris, and rubbish (trash) into separate containers provided by Contractor, and shall be responsible for the disposal of container contents when full.

D. The Contractor shall restore or replace, when and as directed, any property damaged by its Work, equipment, or employees, to pre-existing conditions.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

(END OF SECTION)

SECTION 01562
MANAGEMENT AND TREATMENT OF CONSTRUCTION WASTEWATERS

PART 1. - GENERAL

1.01. SCOPE OF WORK:

A. Contractor shall make all reasonable efforts to minimize the quantity of Construction Wastewaters generated during performance of the Work. Storm water is not considered Construction Wastewater, and is therefore not subject to the requirements of this Section. Excavation dewatering of any kind will be considered Construction Wastewater. Requirements for collecting and storing Construction Wastewaters are defined in other Sections of the Specifications.

B. Contractor has the option of managing Construction Wastewaters by any of the following methods that Contractor believes to be the most cost-effective method for the Project:

1. Construction wastewater may be disposed of into the existing wastewater disposal basin, prior to remediation of the basin. Wastewater may be piped to the existing basin and allow to percolate into the soil.

2. Construction wastewater may be conveyed to the on-Site treatment plant (subject to available capacity and approval by the Nassau County Department of Public Works).

3. Construction Wastewaters may be used as part of the chemical stabilization process, should water be an ingredient in Contractor's stabilization reagent. This option is described in Section 02240.

4. Construction Wastewaters may be treated on-Site and discharged to the municipal storm water sewer system, located along Motor Avenue. It will be the Contractor's responsibilities to meet all applicable requirements for discharge to this municipal storm water system. These requirements may include but are not limited to obtaining a site SPDES permit and compliance with the discharge limits therein.

5. Construction Wastewaters may be disposed directly to an appropriate off-Site disposal facility, as described in Section 02280.

C. Contractor shall install all erosion control measures necessary to prevent any migration of decontamination wash waters into uncontaminated areas of the Site, or off-Site.

D. The remainder of this Section describes the requirements for management of Construction Wastewaters if on-Site treatment is selected by Contractor.

E. The Contractor shall provide all labor, equipment, tools, materials, and appurtenances necessary to procure, install, test, and operate a temporary treatment system for the treatment of Construction Wastewaters in order to meet the applicable discharge standards.

F. The Contractor shall be aware that should the temporary wastewater treatment system fail to treat the water to a level that satisfies the discharge standards, or should Contractor generate grossly contaminated volumes of wastewater, Engineer may direct Contractor to dispose of certain volumes of wastewater off-site. The scope of any off-site wastewater disposal is not covered under the Contract, and the price for such disposal would be negotiated at that time.

G. Contractor shall be responsible for the change out and replacement of wastewater treatment media as necessary to ensure the proper treatment capability of the system until the completion of Work. The Contractor shall be responsible for the proper handling and disposal of all residuals resulting from the treatment of Construction Wastewaters (e.g., bag filters, granular activated carbon (GAC) and/or clay/anthracite media).

H. The Contractor shall operate the temporary treatment system until all remedial Work is completed and all Construction Wastewaters have been properly treated and either discharged or disposed of off-Site. The Contractor shall not remove the temporary treatment system until directed by Engineer.

I. The Contractor shall be responsible for all costs associated with the cleaning, decontamination and return of rented equipment to the Manufacturer or Equipment Rental Company.

1.02. QUALITY ASSURANCE:

A. The equipment specified in this section is intended to be standard equipment of proven performance. The equipment shall be designed, constructed, and installed in accordance with the best practices of the trade.

B. It is the intent of this section that all components of the temporary treatment system be provided by one vendor who shall have the sole responsibility of selecting, matching, and assembling the components so that they function together as a system.

1.03 SUBMITTALS:

A. The Contractor shall provide the submittals listed in this paragraph for review and approval by the Engineer, in accordance with the requirements of Section 01300, “Submittals”.

B. Shop Drawings:

1. Complete assembly, layout, and installation drawings for the temporary treatment system, including piping, valving, and sample port diagrams, with clearly marked dimensions.

2. Manufacturer's literature for the components of the treatment system including equipment specifications and product data sheets.

C. O&M Manuals: The Contractor shall submit four (4) copies of standard operations and maintenance manuals for all of the equipment comprising the temporary treatment system. The manufacturer's standard O&M manuals should be sufficient, but must include the following:

1. Instructions for the safe and proper installation, start-up, operation, shut down, maintenance, and repair of the equipment.

2. The use of arrows, or the obliteration or removal of extraneous information, so that the manuals only pertain to the specific models of the equipment provided.

3. Copies of standard equipment warranties.

1.04 MANUFACTURER'S SPECIAL SERVICES:

A. The Contractor shall provide the services of a qualified Manufacturer's technical representative, as necessary, who shall:

1. Supervise and/or inspect the installation of the equipment furnished by the Manufacturer under this Section.

2. Assist in the start-up, commissioning, and operation of equipment.

3. Instruct the Contractor in the maintenance and operation of the equipment.

1.05. HEALTH AND SAFETY:

A. All on-Site personnel shall comply with the requirements of the Engineer's HACSP or Contractor prepared HASP and Section 01517.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA:

A. The temporary treatment system shall be designed to treat Construction Wastewaters subject to the discharge effluent standards.

2.02 TEMPORARY TREATMENT SYSTEM DESCRIPTION:

A. Contractor shall be responsible for selecting and providing equipment that will treat the Site contaminants anticipated to be present in Construction Wastewaters. At a minimum, the temporary treatment system shall be skid mounted and pre-piped to the greatest extent practicable and shall consist of the components, described below or a similar system approved by the Engineer:

   1. Influent holding/sedimentation tank.

   2. Bag filters to remove suspended solids and particulate metals;

   3. A GAC and clay/anthracite vessels to remove VOC's, oil and grease, and for additional particulate filtration.

   4. Effluent holding tanks

B. Contractor shall be aware that Construction Wastewater may not require treatment through all treatment components. The use of bypass piping shall be installed that allows wastewater to be processed only through the necessary components and minimize the usage of treatment component media.

2.03 ANCILLARY EQUIPMENT:

A. The Contractor shall furnish and install all temporary pumping, piping, sumps, tanks, controls, and other ancillary equipment to:

   1. Transfer Construction Wastewaters from the work areas or the sediment dewatering system to the influent holding tanks.

   2. Pump the Construction Wastewaters from the influent holding tanks through the temporary treatment system.

   3. Transfer the treated water to the effluent holding tanks for sampling and analysis.

   4. Transfer of treated water from effluent holding tanks to municipal stormwater system discharge/inlet point as directed by engineer.

B. Freeze Protection:

   The Contractor shall furnish and install all equipment and take all precautions necessary to prevent freezing of the influent and effluent holding tanks, and the temporary treatment system.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. The Contractor shall install the temporary treatment system in accordance with the written installation instructions supplied by the Manufacturer.

B. The Contractor shall install the temporary treatment system in the staging area shown on the Drawings or other location proposed by the contractor and approved by the engineer.

3.02 OPERATIONAL REQUIREMENTS:

A. Influent Holding:

1. Prior to treatment, the Engineer will perform sampling and analysis of the accumulated Construction Wastewater in the influent holding tank(s). Engineer will perform this sampling when the influent tank is full. The maximum allowable volume of each tank shall be 20,000 gallons unless otherwise approved by Engineer. If wastewater sampling and analysis performed by the Engineer indicates that all the discharge criteria listed in SPDES permit are satisfied, the Engineer will direct the Contractor to discharge the tank contents without treatment.

2. If any of the wastewater parameters exceed the discharge criteria listed in SPDES permit the Engineer will direct the Contractor to treat the wastewater and will discuss with Contractor the appropriate treatment components for that batch of wastewater.

3. During treatment of the last influent tank volume of a particular wastewater stream, the Contractor may begin collecting the next wastewater stream using a second, empty influent holding tank.

B. Treatment of Wastewater Streams:

1. Upon approval of the Engineer, the Contractor shall begin treating the wastewater stored in the influent holding tanks. Treatment of all wastewater shall be performed as a batch process. The treated wastewaters shall be stored in an effluent holding tank to permit sampling and analysis by Engineer prior to discharge.

C. Effluent Holding and Testing:

1. If the effluent sampling confirms that the treated water meets the discharge standards specified in the SPDES permit, then the Contractor shall discharge the contents of the tested holding tank to the onsite wastewater disposal basin or the municipal stormwater sewer.

2. If the effluent sampling and analysis indicates that one or more wastewater parameters exceed the discharge criteria listed in the SPDES permit, then the contents of the effluent holding tank shall be re-circulated through the treatment system a second time and stored for additional testing by Engineer prior to discharge, or disposed off-Site, at Engineer's option based on discussions with Contractor.

D. Discharge:

1. Treated Construction Wastewater which testing has shown meets all of the discharge criteria listed in the SPDES permit shall be discharged to waste water disposal basin or the municipal storm water sewer. Discharge shall not commence without the approval of Engineer.

3.03 STAFFING AND HOURS OF OPERATION:

A. The operation of the temporary pumping and treatment equipment shall be overseen by an on-site representative of the Contractor at all times when the equipment is operating. The equipment may be operated up to 24 hours per day, Monday through Friday, as deemed necessary by the Contractor. The temporary treatment system shall not be operated on weekends (Saturday and Sunday) unless approved in advance in writing by the Engineer (A minimum of 48 hours advance notice from the Contractor is required).

3.04 SAMPLING AND ANALYSIS:

A. The Contractor shall be responsible for the following sampling and analysis:

1. All sampling and analysis required for off-Site disposal approvals, including sampling of residuals and used equipment to be disposed.

2. Sampling and analysis of rented equipment that will be returned to the Manufacturer for reuse in order to verify proper decontamination.

B. The sampling and analysis that will be performed by the Engineer and EPA is described in Section 01012. The Engineer will coordinate with the Contractor and will request analytical results from the laboratory within a time frame that minimizes potential construction delays incurred by the Contractor.

3.05 DECONTAMINATION AND DISPOSAL:

A. All residuals resulting from treatment of Construction Wastewaters (e.g., spent filter bags, spent GAC, clay/anthracite filter media) shall be handled and properly disposed of by the Contractor. The Contractor shall be responsible for ensuring that these residuals are properly disposed of, including the removal of the spent media from the vessels provided by the Manufacturer.

B. The Contractor shall be responsible for all disposal approval sampling (waste characterization) required by the disposal facility for any treatment residuals and temporary treatment equipment and appurtenances to be disposed of.

C. All rented equipment to be returned to the Manufacturers or to be reused by the Contractor for other projects shall be decontaminated as required by each Manufacturer and as specified in Section 01565.

D. The Contractor shall be responsible for all costs associated with the return of rented equipment to the Manufacturer.

(END OF SECTION)

SECTION 01565
DECONTAMINATION PLAN AND REQUIREMENTS

PART 1 - GENERAL

1.01. DESCRIPTION:

A. The Work covered by this Section consists of the decontamination of equipment and personnel.

B. Decontamination wash waters may be contaminated with chromium, cadmium, trichloroethene, cis-1,2 dichloroethene, tetrachloroethene polychlorinated biphenyl (PCBs), cyanide, benzo(a)pyrene, and dibenzo(a,h)anthracene. Therefore, Contractor shall perform all decontamination in accordance with Section 01517 - "Health and Safety Plan and Requirements", the HSCP, and as specified herein.

C. If decontamination pads are located on contaminated soil that has not yet been remediated, the decontamination wash waters shall be allowed to run onto the non-remediated ground surface, and do not have to be collected. Contractor shall install all erosion control measures necessary to prevent any migration of decontamination wash waters into uncontaminated areas of the Site, or off-Site.

D. If decontamination pads are located on uncontaminated or remediated soil, all decontamination wash waters shall be collected. All decontamination wash waters, which require collection, shall be treated, prior to release.

E. Decontamination pads shall be sized by the Contractor as necessary to perform the Work, but shall be a minimum of 20 feet by 40 feet in area, with a one-foot high perimeter berm.

1.02. SUBMITTALS:

A. Decontamination Plan, meeting all the requirements of these Contract Documents, shall be submitted as part of Contractor's Work Plan, as described in Section 01300.

B. A decontamination certificate, signed by the Contractor, shall be submitted for each construction and material transport vehicle leaving the Site, stating that:

1. No soil or other material is adhering to the vehicle body or undercarriage.

2. The vehicle is not leaking or dripping liquids.

3. The contents of the vehicle are covered or completely enclosed so as not to permit potentially fugitive particulate matter to become airborne.

1.03. LEAKAGE, SPILLAGE, CONTAMINATION:

A. Any leakage, spillage, or contamination of soil or equipment caused by the decontamination activities of the Contractor, shall be cleaned up by the Contractor at its expense.

B. All soil contaminated by the Contractor by decontamination activities shall be excavated and disposed of in a manner acceptable to the Engineer and all governing regulatory agencies, at the Contractor's expense.

C. All existing materials or facilities (e.g., asphalt) other than soils contaminated by the Contractor shall be cleaned by the Contractor, to the approval of the Engineer.

1.04. WORK BY OTHERS:

A. Engineer will test collected decontamination wash waters as described in Section 01012.

PART 2 - PRODUCTS

2.01. EQUIPMENT/MATERIALS:

A. All decontamination equipment and materials necessary for the performance of the Work in accordance with these Specifications shall be supplied by the Contractor.

B. Requirements for all tanks used for storage of decontamination wash waters are described in Section 01520.

2.02. DECONTAMINATION PADS:

A. Temporary decontamination pads shall be constructed in accordance with the Technical Drawings.

B. Decontamination pads for equipment shall be impermeable, with a sloped floor and low-point sump to promote collection of decontamination wash waters, and splashguards that shall be a minimum of five feet high on the sides of the decontamination pads. Splashguards shall extend to the height necessary to contain all decontamination wash waters.

C. Decontamination pads shall be constructed as necessary to support equipment loads in a manner that shall not compromise the impermeability of the pad.

D. Decontamination pads shall be sized as necessary for the size of equipment that will be decontaminated.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. The Contractor shall minimize its use of wash waters used for decontamination purposes.

B. All decontamination wash waters that are required to be collected shall be collected and stored in accordance with Section 01520.

C. Contractor may have the option of either: 1) using collected wash waters for use in the chemical stabilization process (if this option is chosen) as described in Section 02240, 2) treating the wash water and discharging it to the municipal stormwater sewer as described in Section 01562, 3) discharging of untreated construction water into the existing onsite stormwater basin prior to remediation of the basin, or 4) disposing of the wash water to an off-Site TSDF as described in Section 02280.

D. All safety equipment and other equipment used during decontamination procedures shall be either decontaminated and salvaged, or contained and disposed of in accordance with applicable regulatory requirements.

E. Contamination reduction zones (CRZs) for equipment decontamination shall be established at the Site, in locations selected by the Contractor and approved by the Engineer. CRZs shall be used to completely decontaminate all machinery and equipment used by the Contractor.

F. Each CRZ shall include shovels, brushes, power washers, a steam jenny, detergent solutions, and provisions to collect decontamination wash waters.

3.02. DECONTAMINATION OF EQUIPMENT, TOOLS, AND FACILITIES:

A. All equipment used for excavation and other earthwork activities which comes in contact with potentially contaminated materials shall be decontaminated in accordance with the HSCP and the Specifications prior to:

   1. Crossing areas of the Site, which do not require remediation or have already been remediated:

   2. Handling stabilized Site media;

   3. clean fill materials; and before

   4. Leaving the Site.

B. The Contractor shall not allow equipment to leave the Site with water leaking or mud dripping or caked to the equipment. All equipment leaving the Site shall be dry except during rainy or snowy weather, or with Engineer's written consent for other exceptions.

C. Dry brushes shall be used to decontaminate trucks, trailers, and drill rigs. Trailers and trucks shall not be decontaminated using jet washers or steam jenny(ies), unless directed by the Engineer. Any dry decontamination must be performed in accordance with the activity cessation thresholds for dust, as specified in the HSCP.

D. Prior to equipment leaving the Site, the final decontamination of excavation equipment shall consist of using a powered or steam cleaning system (e.g., steam jenny) capable of effectively removing all soil, residues, and other debris adhering to equipment. Additives to the wash water shall be used when necessary and approved by Engineer to enhance decontamination to levels acceptable to Engineer.

E. Contractor shall erect decontamination facilities at location(s) selected by Contractor and approved by Engineer, to ensure heavy equipment is clean when leaving the Site.

3.03. PERSONNEL DECONTAMINATION:

A. Personnel shall be decontaminated in accordance with Section 01517 and the HSCP.

B. Employees of the Owner, Engineer, and regulatory agencies will utilize the personnel decontamination facilities provided by the Contractor.

(END OF SECTION)

SECTION 01600

MATERIALS

PART 1 - GENERAL

1.01. GENERAL

A. Furnish and Install:

1. Where the words "furnish", "provide", "supply", "replace" or "install" are used, whether singularly or in combination, they shall mean to furnish and install, unless specifically stated otherwise.

2. In the interest of brevity, the explicit direction "to furnish and install" has sometimes been omitted in specifying materials. Unless specifically noted otherwise, it shall be understood that all materials specified or shown on the Drawings shall be furnished and installed by the Contractor under the Contract as designated on the Drawings.

1.02. STORAGE OF MATERIALS:

A. All materials shall be delivered to the Site in original, unopened, undamaged containers, identified with manufacturer's labels.

B. Contractor shall store materials at the Site in accordance with the requirements of the General Conditions and as hereinafter specified.

C. All materials shall be stored in accordance with manufacturer's recommendations, and in conformity to applicable statutes, ordinances, regulations and rulings of the public authority having jurisdiction.

D. Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property, except where the Owner has obtained access agreements as described in Section 01012.

E. The Drawings identify potential staging areas where Contractor will be allowed to store materials and equipment. The Contractor’s shall include the final staging area as part of the submitted work plan, to be approved by the Engineer.

1.03. INSTALLATION OF MATERIALS:

A. Materials shall be installed in accordance with the requirements of the General Conditions, Specifications, and manufacturer's printed installation instructions.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01. CUTTING AND PATCHING:

A. When Work is being conducted at the site, Contractor shall not cut and patch pavement or concrete in a manner resulting in reduction of load-carrying capacity. Concrete and asphalt shall be cut in a neat manner subject to Engineer's approval.

B. Except as otherwise indicated or approved by Engineer, the Contractor shall provide materials for cutting and patching which will result in equal-or-better Work than work being cut and patched. Use materials identical with original materials where feasible.

C. Contractor shall provide adequate temporary support for work to be cut, to prevent failure. Provide adequate protection of other work during cutting and patching to prevent damage, and provide protection of the work from adverse weather exposure.

1. Where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.

2. Patch with seams, which are durable and as invisible as possible. Comply with specified tolerances for the Work. Where feasible, inspect and test patched areas to demonstrate integrity of Work.

3. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received specified surface preparation and prime and base coats.

(END OF SECTION)

SECTION 01700
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01. FINAL CLEANING:

A. Before Final Acceptance of the Work, the Contractor shall remove all rubbish and Construction Debris from and about the Site, and all temporary structures, fencing, construction signs, warning tapes, tools, materials, supplies and equipment which it or any of its Subcontractors may have used in the performance of the Work. Contractor shall broom clean paved surfaces and rake clean other surfaces of grounds to the satisfaction of the Engineer.

1.02. SITE RESTORATION:

A. Before Final Acceptance of the Work, all land resources and landscaping damaged or disturbed during the performance of the Work shall be restored to as-new condition satisfactory to Engineer.

B. Final condition of land resources and landscaping shall appear to be natural and not detract from the appearance of the Project. Refer to Section 01560 for additional information regarding Site restoration.

1.03. INSPECTIONS:

A. Prior to Final Acceptance of the Work, inspections shall be held in accordance with the requirements of the Contract Documents. The Contractor shall also provide all necessary documentation as required by the Contract Documents and comply with all their requirements.

1.04. CLOSEOUT PROCEDURES

A. Contractor shall submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work has been completed in conformance with Contract Documents and is ready for Engineer's review.

B. Contractor shall participate in Engineer’s review of completed work and address/ correct/ complete all noted deficiencies.

C. Contractor shall provide submittals to Owner and Engineer that are required by governing or other authorities.

D. Contractor shall submit release of lien for subcontractors and suppliers.

E. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01. PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction.

(END OF SECTION)

SECTION 02110
CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish all labor, services, materials, and equipment for clearing, grubbing, removing and disposing of all trees, brush, vegetation, stumps, fences, debris, and objectionable materials within the Site as necessary to perform the Work.

B. Clearing shall consist of the above-grade cutting, removal and disposal of all trees, bushes shrubs, and other vegetation.

C. Grubbing shall consist of the removal and disposal of all stumps, roots, logs, sticks and other perishable subgrade materials.

D. Contractor shall only clear and grub areas in which construction activities will take place within a reasonable time frame. Contractor shall not clear and grub the entire Site at one time.

E. The limits of areas to be cleared and grubbed shall be determined by the Contractor as necessary to perform the Work. These limits must be approved by the Engineer prior to any clearing and grubbing. Contractor shall not clear and grub beyond these limits and shall be responsible for any damage outside of these limits.

1.02 SUBMITTALS

A. As part of the Work Plan described in Section 01300, Contractor shall submit its proposed limits of clearing and grubbing.

B. A management plan of potentially contaminated grubbed material shall be included in the Contractor's work plan.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 CLEARING:

A. Contractor shall cut trees, stumps, and shrubs to be cleared, no more than six (6) inches above the ground surface for trees less than three (3) inches in diameter, and

no more than 12 inches above the ground surface for trees greater than three (3) inches in diameter.

3.02 GRUBBING AND STRIPPING:

A. Unless otherwise allowed by the Engineer, the Contractor shall remove stumps and roots to a depth necessary to perform the Work.

3.03 DISPOSAL:

A. All cleared and grubbed materials shall be chipped and stockpiled within 15 days after cutting, felling, or removal unless otherwise approved by Engineer.

B. Cleared Materials:

1. All cleared materials shall be chipped and stockpiled on-Site in a location proposed by the contractor and approved by the Engineer. All chipped materials may be utilized on-Site as mulch for restoration purposes in areas where there is minimal vegetation. Cleared materials shall not be transported off-Site for disposal.

C. Grubbed Materials:

1. All grubbed materials shall be stockpiled separately from other materials, in accordance with the Contract Documents, in a location designated by the Engineer.

2. Contractor shall dispose of grubbed material as debris, with the same RCRA classification as the soil from which the material was removed, in accordance with Specification Section 02280.

D. No cleared or grubbed material shall be buried on the Site, placed outside the boundaries of the Site, or burned.

E. Contractor shall dispose of elm trees, if applicable, in accordance with local laws to prevent spread of Dutch Elm disease.

(End of Section)

SECTION 02200
EXCAVATION OF SITE SOIL

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This Section describes the requirements for excavation of soil from areas detailed on the Technical Drawings. Refer to specific sequencing requirements described in Section 01010.

B. The soil excavation limits indicated on the Drawings are preliminary, and may be modified based on post-excavation confirmatory sampling performed by Engineer and described in Section 01012.

C. The Drawings do not show the location of utilities. Contractor shall contact the One Call Center at 1-800-272-4480 (or other utility approved third party locating service) prior to initiating excavations activities. Contractor shall stakeout, to the extent practicable, all on-Site utilities not identified after completion of the markout process. If unforeseen subsurface conditions are encountered during the Work, the Contractor shall notify Engineer and proceed as indicated in the General Conditions.

D. During progress of the Work, Contractor shall conduct its operations and maintain the area of its activities, so as to minimize the wind dispersal of contaminants. If air monitoring determines that it is necessary to use more effective dust control, based on the requirements of Section 01517 and the HSCP, Contractor shall furnish all equipment and material required to minimize airborne particulates, as directed by the Engineer.

E. The Contractor shall prevent storm water run-on and run-off near excavation areas. The storm water shall be diverted using appropriate storm water and erosion control methods as specified in Section 01560 and as shown on the Drawings.

F. Contractor has the option of performing ex-situ stabilization of soil. Refer to Section 02240. Contractor shall determine whether any debris and rocks must be removed from soil prior to chemical stabilization by screening or raking, or if the soil can be stabilized with the debris and rocks present.

1.02 SUBMITTALS:

A. All submittals regarding soil excavation Work are incorporated into the Work Plan requirements described in Section 01300.

B. Copy of documents verifying completion of underground utilities stakeouts completed for public and private underground utilities.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS:

A. All existing pipes, poles, wires, fences, curbing, property line markers, ground water monitoring wells and other structures, utilities or items in areas where excavation will take place, shall be left in place unless specifically indicated otherwise in the Contract Documents or approved in writing by the Engineer.

B. All structures, utilities, or items left in place shall be carefully supported and protected from damage by the Contractor. Any items damaged by Contractor shall be restored to original condition or replaced as approved by Engineer at no additional cost to the Owner

C. All existing pipes, poles, wires, or other structures or utilities which are to remain in service, but must be removed in order for Contractor to perform the Work in accordance with the requirements of the Contract Documents, shall be:

1. Permanently relocated as approved by Engineer, or

2. Temporarily relocated as approved by Engineer and then returned to the item's original position in an undamaged condition.

D. During progress of all Work activities, the Contractor shall conduct its operations and maintain Work areas so as to minimize risk, interference and obstruction to other Site personnel.

E. The Contractor shall be responsible at all times for carrying out all excavation operations in a safe and prudent manner so that unreasonable hazards to workers and the public are minimized. The Contractor shall observe all applicable local, state and/or federal requirements.

3.02 SOIL EXCAVATION:

A. All soil shall be excavated to the initial horizontal and vertical limits shown on the Drawings and identified in Section 01050. Contractor shall stake out limits of excavation based on the areas depicted on Drawings S-3, S-4, S-5 and S-6, which are based on excavation cuts greater than 60 feet, between 60 to 55 feet, between 55 to 50 feet and between 50 to 45 feet, respectively. Note, electronic CAD drawings of the design shall be provided shortly after the Contract has been awarded. Soil shall be excavated to the depths shown on the Drawings, or to the elevation of groundwater, whichever is shallower.

B. Soil excavation shall be performed in 5-foot vertical increments as detailed on the Technical Drawings. Cut back soils shall be removed as shown on the Technical Drawings or as necessary for excavation sidewall slope stability. If necessary, the excavation shall be extended horizontally and/or vertically as determined by Engineer, until post-excavation confirmatory sampling and analysis performed by Engineer reveal that all soil with constituents in excess of the Site performance standards has been removed.

C. Soils that exceed the site performance standards shall be excavated and immediately transferred into the staging area prepared by the Contractor and detailed within the Contractor's Work Plan, for staging and any necessary chemical stabilization as described in Section 02240.

D. Excavated soils that exhibit RCRA hazardous characteristics may be stabilized on site prior to transportation to the offsite TSDF.

E. In areas where asphalt and concrete overlay soil areas requiring remediation as shown on the Drawings, Contractor shall saw cut and remove the asphalt and concrete as needed to expose the affected soils.

F. Soil excavation shall be accomplished using power equipment such as an excavator or a backhoe.

G. Surveying shall be performed in accordance with Specification Section 01050 to maintain horizontal and vertical control of all excavations and remediation depths.

3.03 CONCRETE AND ASPHALT EXCAVATION

A. Contractor shall remove concrete and asphalt as needed to provide access to the affected soil and/or sub-surface feature.

B. If a portion of concrete or asphalt must be removed from a larger section, Contractor shall saw cut at the removal limit to create a neat final edge.

C. Concrete and asphalt that has been removed shall then be staged separately in accordance with Specification Section 01520 for off-Site disposal specified in Section 02280.

3.04 EXCAVATION OF MISCELLANEOUS BELOW-GRADE FEATURES

A. Contractor shall perform Work in such a manner as to eliminate the possibility of undermining or disturbing existing foundations or structures that are to be left in place.

B. Excavation by machinery shall be discontinued when excavation approaches pipes, wells, conduits, building foundations or other above or belowground structures or utilities. Contractor shall perform all excavation near such structures and utilities by the use of hand tools.

C. Contractor shall excavate test pits by machine, and continue by hand, if necessary when determination of exact location of pipes or other underground utilities, structures or items is necessary for performing Work properly.

D. All existing culverts shall be protected during the Work, unless the Drawings specifically identify culverts to be removed.

3.05 UNAUTHORIZED EXCAVATION:

A. When the excavation of an area is taken out beyond the limits indicated on the Drawings or identified by the Engineer, the Contractor shall backfill the additional excavation with approved common fill, topsoil and seed as necessary, at no additional cost to the Owner. Contractor shall receive no compensation for excavation, relocation, loading, transportation or disposal of soil for which the excavation was unauthorized.

3.06 SPILLS OF EXCAVATED SOILS:

A. All spills and any clean soil contaminated by spilled contaminated soil during remediation activities shall be cleaned up and the area restored to previous existing conditions by the Contractor in a manner acceptable to the Engineer at no additional cost to the Owner.

3.07 RESTORATION OF THE SITE:

A. Contractor shall backfill all disturbed areas to within six inches of the final grading plan with clean soils removed and staged on-site or common fill, as specified in Section 02225. Six (6) inches of topsoil shall then be installed, and all areas restored as specified.

(END OF SECTTION)

SECTION 02210
MISCELLANEOUS EARTHWORK

PART 1 - GENERAL

1.01. DESCRIPTION:

A. This Section describes the Work required to perform all miscellaneous earthwork shown on the Drawings but not specified elsewhere, including but not limited to:

1. Removal of the subsurface features, and subsurface piping.

2. Permanent plugging of any piping disconnected from removed subsurface features.

3. Removal of liquids and sediments from subsurface features.

1.02. SUBMITTALS:

A. Contractor shall submit, in accordance with Section 01300, product data for the grout used to permanently plug underground piping and abandon on-Site monitoring wells.

B. Methods to be used for dewatering and removal of sediments that may be contained within the subsurface features to be remediated shall be described in Contractor's Work Plan, specified in Section 01300.

PART 2 - PRODUCTS

(Not Applicable).

PART 3 - EXECUTION

3.01. SUB SURFACE FEATURE REMOVAL

A. Contractor shall excavate and remove all subsurface features located within areas of excavation as shown on the Drawings.

B. Soil and sediment present in subsurface features shall be sampled and characterized prior to removal. Information, if known, on the location, size and nature of contents for each subsurface feature is provided in Table 1 of the CQAPP.

C. Contractor shall maintain open excavations as required for Engineer to collect post-excavation confirmatory samples. Refer to Section 01012. Additional soil

excavation in the pipe trenches may be necessary based on the sample analytical results.

D. Any spills of sediment or debris into uncontaminated areas shall be cleaned up as directed by the Engineer.

E. Contractor shall erect any temporary sheeting and/or bracing that may be necessary for the safe entry of Contractor personnel into excavations to perform the Work. To the greatest extent practicable, Contractor shall utilize mechanical equipment to perform the Work.

F. Contractor shall be responsible for erecting warning tapes and fencing if the excavations are left open or unattended during the work of this contract.

G. Following the required removal Work, the Contractor shall backfill and restore the excavations in accordance with the Drawings and Specification Sections 02225 and 02920.

3.02. PROTECTION OF MONITORING WELLS:

A. Contractor shall protect all monitoring wells on the Site that are not to be abandoned. Particular attention shall be paid to those within the limits of construction and/or disturbance. The locations of these monitoring wells are shown on the Drawings.

B. The Contractor shall be responsible for the repair of all wells disturbed by the Work. Repairs shall be made and documented such that the well(s) similar to their original condition as approved by the Engineer at no additional cost to the Owner.

C. In the event a well is damaged by the Contractor such that it cannot be repaired, the Contractor shall be responsible for the installation of a replacement well equal in all respects to the previously undamaged well at a location selected by Engineer. Contractor shall also be responsible for abandoning the damaged well in place. All Work shall be performed at no additional cost to the Owner.

D. If, in the opinion of the Contractor, a well cannot be adequately protected from damage due to the performance of the Work, the Engineer shall be immediately informed. If the Engineer concurs, the well in question shall be abandoned in place.

3.03. ABANDONMENT OF WELLS

Wells shall be fully sealed in a manner to prevent contaminant migration through the borehole. Such sealing shall consist of the following:

1. Well shall be filled with cement bentonite grout. Grout shall be mixed until a smooth, homogenous mixture is achieved without lumps or dry clots.

2. Sealing by pressure injection with cement bentonite grout, using a tremie pipe or other method acceptable to the Engineer, shall extend the entire length of the boring to five feet below the ground surface or the proposed excavation level. The screened interval or open borehole portion of the well shall be sealed separately and tested to ensure its adequacy before sealing the remainder of the well. Contractor shall implement all measures necessary to prevent the migration of the grout into the surrounding geologic formation.

3. After grout has set for 24 hours, the upper three feet of the well casing shall be removed by saw cutting from an open excavation.

4. The excavation area shall be restored to a safe condition and shall be inspected periodically after sealing for settlement or other conditions which require remediation.

Contractor shall be responsible for any repairs, or adjustments needed after sealing, to ensure that the abandoned wells meet the above requirements, to the satisfaction of the Engineer.

(END OF SECTION)

SECTION 02225
FILL MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide, place and compact fill materials as shown as necessary to perform the remedial action, or as directed by the Engineer.

B. All fill materials obtained from off-Site sources shall be obtained from sources approved by the Engineer, EPA, NYSDEC, and Nassau County DOH.

C. The Contractor shall submit a representative sample of each type of fill material proposed to be provided, from each source. The samples will then be analyzed by the Engineer's laboratory for full TAL/TCL parameters, including PCBs and pesticides. All results must be approved by Engineer for each type of fill material. Refer to Section 01012.

1.02 SUBMITTALS

In accordance with Section 01300, the Contractor shall submit the following:

1. Name of, and certifications for, all proposed fill material sources.

2. Gradation testing results and certification from suppliers, that all fill materials to be supplied for use at the Site meet the requirements of this Specification, and that they are clean and free of contaminants. Certification must be received and approved prior to delivery of fill materials to the Site.

3. Three (3) five-pound samples of all fill materials.

4. Results of all laboratory Proctor testing results, and all field compaction tests.

PART 2 - PRODUCTS AND EXECUTION

2.01 PLACEMENT OF FILL MATERIALS

A. Compaction of fill material shall be discontinued when the temperature is below freezing long enough to create ice in the fill material or during weather that Engineer determines is too wet to achieve compaction requirements.

B. Contractor shall temporarily stage all fill materials and stockpiled materials in the stockpile/staging area identified by the contractor and approved by Engineer, and shall protect stockpiled materials as specified.

2.02 COMMON FILL

Products

A. Common fill from off-site sources shall be well-graded granular material from fine to coarse, conforming to a USCS classification of GM, GC and/or SW.

B. Native (on-Site) soils may be used as common fill subject to approval by the Engineer. On-site soils used as common fill are not subject to the gradation requirements.

C. Common fill shall be obtained from approved natural deposits. It shall be substantially free from loam and other organic matter, trash, debris, and other fine or harmful substances. Vegetation, masses of roots or individual roots more than 18 inches long or more than 1/2 inch in diameter shall not be permitted.

Execution

A. A representative sample of the fill material shall be tested in an independent laboratory, in accordance with ASTM D-1557, to determine maximum Proctor Density. This result shall be used to perform in-place density testing in the field.

B. Common fill shall be installed to meet the proposed grades as shown on the Technical Drawings. Grading shown on existing drawings are approximate and will be confirmed and revised, as necessary, during the performance of the remedial action prior to restoration of Areas 1, 2 and 3. The Contractor shall spread twelve-inch thick uniform layers of fill, moisten as necessary, and compact to 85% Standard Proctor Density.

C. In-place density testing shall be performed at a minimum of every 2,000 square yards per lift, by nuclear methods in accordance with ASTM D-2922. The Contractor shall thoroughly compact fill materials by means of suitable power-driven equipment.

D. Final grading shall be performed as indicated on the Technical Drawings, to the lines, and grades shown or as modified during placement of the off-Site fill materials to a tolerance of ±1/10 of a foot. The grading shown in the Technical Drawings is based upon current estimations of waste removal depths and areas. Final grading may be altered based on actual conditions encountered during remedial activities.

2.03 SELECT FILL

Products

A. Select fill, if used, shall consist of well-graded material conforming to the following gradation:

Sieve Size	Percent Passing by Weight
#8	100
#50	35-55
#100	20-40
#200	0-20

B. Select fill shall consist of natural, clean, hard and durable particles free from dirt, vegetation or other objectionable matter and free from an excess of soft, thin, elongated, laminated or disintegrated pieces. Select fill shall be free of chlorides, limestone and organic material.

C. Select fill material shall be placed in twelve-inch uniform lifts.

D. If select fill is placed in dry conditions, each lift shall be compacted by two passes using standard power compaction equipment.

E. If Contractor uses sand bags for surface water diversion purposes, the sand will be tested by Engineer following use, and shall be used as select fill if Engineer determines that the sand in uncontaminated.

F. If select fill is placed in wet conditions, each lift shall be carefully placed to prevent the fill from being suspended in the water.

2.05 DENSE GRADED AGGREGATGE (DGA)

A. DGA shall be used for the construction of temporary access roads, stabilized construction access points and temporary truck decontamination pads.

B. DGA shall conform to the following gradation requirements in accordance with ASTM D 2940:

Sieve Size	Percent Passing by Weight
2 in. (50 mm)	100
1-1/2 in. (37.5 mm)	95 to 100

Sieve Size	Percent Passing by Weight
3/4 in. (19.0 mm)	70 to 92
3/8 in. (9.5 mm	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (0.600 mm)	12 to 25
No. 200 (0.075 mm)	0 to 8

(END OF SECTION)

SECTION 02240

CHEMICAL STABILIZATION OF SOIL

PART 1 - GENERAL

1.01. DESCRIPTION

A. The Work covered by this Section consists of the chemical stabilization and testing of Site soils that exceed the site performance standards AND are RCRA characteristic with TCLP concentrations for cadmium or chromium (>1mg/l and/or >5mg/l respectively), and are therefore considered to be RCRA characteristic hazardous wastes when excavated.

B. The requirements of this Section shall be coordinated by the Contractor, with the requirements of Section 02280 "Transportation and Disposal of Waste Material", which describes the requirements for off-Site disposal of Waste Materials. Contractor has the option to chemically stabilize all Site Soils that exhibit RCRA characteristics as necessary, to obtain approval to dispose of the treated Site Media at off-Site RCRA Subtitle D (non-hazardous) TSDF(s) selected by Contractor.

C. The scope of Work described in this Section consists of the stabilization of Site Soils in order to meet the requirements identified on attached Table 1 and all requirements of Contractor's selected disposal facilities, provided that the total cadmium and chromium concentrations of the Site Soils are less than or equal to the maximum TCLP concentrations.

D. Contractor has the option to stabilize all Site soils excavated from areas on the Contract Drawings identified as RCRA characteristic (hazardous), or determined to be RCRA characteristic (hazardous) by confirmation sampling.

E. The Work shall include all labor, equipment, materials, and services necessary to stabilize the Site Soils.

F. Contractor shall submit a Stabilization Plan that shall be implemented during all stabilization Work.

G. All stabilization Work shall be performed ex situ.

H. Stabilization Work shall be performed in a central location, as determined in the Contractor's Work Plan and approved by the Engineer. At this central location, the Contractor will be required to install its stabilization process equipment, as well as RCRA-compatible staging areas for untreated and treated Site Media.

I. The possibility exists for Site Soils to be treated such that the Media 1) no longer exhibit RCRA hazardous characteristics, but 2) do <u>not</u> meet the disposal approval criteria of specific TSDFs selected by Contractor. Therefore, Site Soils may have

to be disposed at more than one TSDF if all Soils cannot be treated to satisfy the requirements of one TSDF.

1.02. QUALIFICATIONS

A. The superintendent of the Stabilization Services Provider (SSP) shall be knowledgeable and experienced in chemical stabilization. This experience shall include, but not necessarily be limited to: 1) ex situ stabilization equipment, 2) methods required to properly mix the stabilization reagent and Site Soil, 3) knowledge of construction equipment and material, and 4) routine quality assurance/ quality control testing.

1.03. WORK BY OTHERS

A. Engineer and EPA will have the right to collect split samples, and any additional samples, of Contractor's stabilization performance testing samples, as described in Section 01012.

B. EPA and Engineer will review the Contractor's Stabilization Plan. EPA and Engineer approval of the Stabilization Plan is required before Contractor will be allowed to commence stabilization activities at the Site.

1.04 SUBMITTALS

A. In accordance with Section 01300, the Contractor shall submit a Stabilization Plan within twenty-one (21) days of Contract Award, if onsite stabilization is to be performed. The Stabilization Plan shall be referenced in the Work Plan but be a separate document. The Stabilization Plan shall contain the following information, which must be consistent with 1) all applicable information presented in the SSP's pre-award Stabilization Process Testing Program Report, and 2) the pre-award independent stabilization testing results:

1. If the SSP is a subcontractor, qualifications and experience of the SSP, for a maximum of ten previous projects. For each project, include a general description, the quantity and type of environmental media that was treated, the type of stabilization reagent used, and the chemical contaminants and typical concentrations in the media.

2. Qualifications and experience of the SSP's Project Manager and superintendent.

3. For each type of Site Media to be stabilized, identify the following:

    a. The stabilization reagent, including MSDS sheets for all components of the reagent. If the reagent is proprietary, only the trade name and the type of reagent (e.g., pozzolonic) shall be provided with the MSDS sheets. If the agent is not proprietary, the ingredients and specific formulation of the ingredients shall be provided.

b. Estimated curing time to achieve required chemical stabilization.

c. Pre-conditioning requirements prior to stabilization.

d. The stabilization reagent/Soil ratio (i.e., formulation) at time of mixing. The ratio shall be identified in the same units that will be used for mixing determinations in the field (i.e., either weight or volume).

e. Percent bulking, by volume, of the original Media volume at time of curing.

f. The original Site Media density, and the density of the cured stabilization mixture.

4. Equipment description, which shall include:

   a. Detailed description of all stabilization equipment that will be used.

   b. Requirements and consumption rates of all utilities, including water and electricity as applicable.

   c. Equipment layout diagram, including storage locations for all reagent components.

   d. Proposed process flow diagram showing all streams, including consumption of reagent, Site Media and other information, as appropriate.

5. A detailed system performance testing procedure. System testing shall be conducted prior to Site Media stabilization by the Contractor, to assure the stabilization process system functions properly.

6. Procedure used to retreat cured material, if re-treatment is required. This information is of particular concern for stabilization reagents that are cement-based, since the cured material may have significantly different physical characteristics than the Site Media that was treated.

7. QA/QC procedures, which shall include at a minimum:

   a. The measures which will be implemented to gauge the quality of the stabilization Work in the field, including reagent quality, the proper ratio of reagent and Site Media, and the uniformity of the Stabilization Mixture.

   b. Sampling and testing procedures that will be implemented at the testing laboratories for performance testing of stabilized samples.

   c. In accordance with Section 01300, Contractor shall submit copies of all analytical testing results. Each submittal shall include a figure, which

identifies the location and sample number of each sample, and any QA/QC results.

d. Daily Stabilization Log:

A daily log shall be maintained by the Contractor, and submitted on a weekly basis, which documents all activities accomplished including, but not limited to:

(1) Quantity of Media that was stabilized, and the area of the Site where the Media was removed.

(2) Quantity, and types if applicable, of reagent used.

(3) Locations and sample numbers of stabilization performance testing samples collected.

(4) Any required re-treatment, including location of samples, and unacceptable sample analytical results.

1.05 PRE-STABILIZATION ANALYTICAL TESTING

A. The Contractor has the option of testing soil and/or sediment prior to performing stabilization of these Media, to determine whether these Media may meet the Stabilization Performance Criteria without being stabilized.

B. If Contractor elects to perform pre-stabilization testing, a minimum of one sample shall be collected from every 100 cubic yards of soil or sediment, and the samples analyzed at a minimum for TCLP cadmium and chromium. Contractor shall be responsible for having samples collected at a frequency, and analyzed for all parameters necessary to obtain disposal approvals at its selected TSDFs. Refer to Section 02280.

C. Media samples whose analytical results exceed the Performance Criterion for TCLP cadmium and chromium shall be stabilized. If the analytical results meet the Performance Criterion for cadmium (10 mg/kg) and chromium (143 mg/kg), then samples shall be analyzed for all other parameters on Table 1. If the Media exceeds any of the other TCLP Performance Criteria, the Media shall be stabilized.

D. If analytical results do not exceed any of the Performance Criteria, the Contractor may proceed with arrangements for the transport and disposal of the tested volume of Media (i.e., no greater than 100 cubic yards) subject to Engineer approval and EPA concurrence, including performing any additional analytical testing required by its selected TSDFs.

1.07 POST-STABILIZATION PERFORMANCE TESTING AND REQUIREMENTS

A. Following stabilization of each batch of Site Media, Contractor shall conduct stabilization performance testing to demonstrate that the Site Media has been treated to meet the applicable Performance Criteria identified in Table 1. A batch is defined as the volume of material being sampled, as identified below.

   In addition to the parameters identified in Table 1, the stabilized media must produce a physical consistency (e.g., bearing strength, compressive strength, and percent solids) acceptable to the Contractor's selected TSDF(s).

B. Performance testing shall be performed after the chemical stabilization curing time (as identified in the Stabilization Plan) has been achieved.

C. The following minimum sampling frequency shall apply for Site Media. All additional performance testing required by the Contractor's selected TSDFs shall also be performed by the Contractor:

   1. One sample shall be collected every 100 cubic yards, for the first 500 cubic yards of stabilization (i.e., the "initial stabilization phase").

   2. One sample shall be collected every 200 cubic yards, for the next 600 cubic yards of stabilization (i.e., the "beginning of full scale operation phase").

   3. One sample shall be collected every 1,000 cubic yards until stabilization has been completed for the soil, or for the sediment (i.e., the "full-scale operation phase").

D. All stabilization performance-testing samples shall be analyzed by Contractor in accordance with the Stabilization Plan. Analytical results shall meet all Performance Criteria identified in Table 1, at a minimum, and shall also meet any criteria applicable to stabilization, that may be required by the Contractor's selected TSDFs. Refer also to Section 02280.

F. If Performance Criteria are exceeded in three out of any six consecutive full-scale batches, the sampling frequency shall revert to the "beginning of full scale phase" frequency (i.e., one sample every 100 cubic yards). Batch sampling at this modified frequency shall occur until three consecutive batches meet all Performance Criteria, at which time sampling shall return to a frequency of one sample per 1,000 cubic yards.

G. If any sample exceeds the Performance Criteria, the entire batch shall be stabilized again. Sampling and stabilization of that batch shall continue until all Performance Criteria are met, at no additional cost to the Owner.

H. In the event that isolated volumes of Site Media cannot be stabilized to meet the Performance Criteria (i.e., the stabilized Site media is classified as RCRA characteristic) this material shall be disposed in an RCRA-permitted Subtitle C TSDF.

I. In the event that isolated volumes of Site Media can not be stabilized to meet specific stabilization-related criteria (e.g., compressive strength) required by its TSDF (i.e., the stabilized Site media is not classified as RCRA hazardous, but does not meet other TSDF specific disposal requirements) this material shall be disposed of either in a RCRA-permitted Subtitle C TSDF or one of the alternate Subtitle D TSDFs selected by Contractor that may have different disposal approval requirements, as approved by the Engineer.

J. The Owner will bear the additional cost for disposal at a RCRA Subtitle C TSDF only if Contractor can justify to the satisfaction of the Engineer that the material can not be effectively stabilized on-Site, and that the failure to successfully stabilize that batch of material is due to reasons beyond the Contractor's control.

K. Contractor will be required to meet any additional or more stringent disposal approval standards in effect at the time of performance of the Work in order to obtain disposal approval from its selected TSDFs and appropriate state regulatory agencies.

PART 2 - MATERIALS

2.01 STABILIZATION PROCESS EQUIPMENT

A. Contractor shall provide, install, and operate all stabilization process equipment required to perform the Work. The equipment shall include as necessary, but not be limited to, a mixing unit, reagent delivery/feed system, reagent storage, reagent blending, and any ancillary equipment required. The equipment shall not release any vapors or dust to the atmosphere.

B. The reagent mixing and feed system shall be capable of maintaining a constant addition rate, and achieving a uniform stabilization mixture, with the flexibility to alter the process rates as required.

2.02 REAGENT

A. A reagent mix shall be designed as necessary to meet the Performance Criteria described in this Section, and shall be provided in quantities sufficient to perform the Work. Reagent ingredients shall be managed, stored, and used in a manner that shall not cause deterioration to the environment at the Site.

2.03 WATER

A. Contractor shall secure its own supply of water, either from local utility or delivered from an offsite source. Water delivered from an off-site source shall be of potable quality.

B. Contractor may elect to use Construction Wastewaters generated at the Site, for water supply purposes during the stabilization process. Contractor shall be

responsible for any and all testing that Contractor deems necessary, to determine that the water quality will not interfere with the stabilization process.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Contractor shall not modify any stabilization equipment, techniques, reagent components or mix ratios without the prior written approval of the Engineer. Any modifications needed in the event that performance standards are not being met shall be provided at the Contractor's expense. Any required system rectification will not be a justification for a time extension of the Contract.

B. Contractor shall perform stabilization activities in accordance with all applicable OSHA requirements, Specification Section 01517, and the HASP.

C. On-Site treatment of RCRA characteristic material is exempt from permitting when performed in accordance with 6 NYCRR 373-1.1(d)(1)(ix). Contractor shall identify other applicable regulations and obtain the required RCRA permits or permit equivalents prior to performing stabilization Work.

3.02 SCREENING AND CONDITIONING OF SITE MEDIA

A. Miscellaneous debris may exist in surface soil at the Site, rocks, brick, broken concrete/asphalt, or other building material. Contractor shall determine whether this debris can be effectively stabilized with the soil, whether any pre-stabilization handling steps are required (e.g., crushing) and, whether the combined waste stream (debris and soil) can be approved for disposal by the TSDFs selected by the Contractor.

B. If Contractor elects to screen or rake this debris from the soil, all generated debris shall be managed as a separate waste stream and disposed off Site to a properly permitted TSDF. The intent of the Contract is that this debris also be treated on Site, to enable disposal to a RCRA Subtitle D TSDF.

C. Contractor shall perform all conditioning steps prior to stabilization of Site Media as Contractor deems necessary, and as identified in Contractor's Stabilization Plan.

3.03 STABILIZATION REQUIREMENTS

A. Site Media shall be excavated, staged within the staging area shown on the Drawings, and processed through the stabilization process equipment.

B. All Site Media shall be stabilized to render the Media RCRA non-hazardous material within 90 days of excavation, or shall be disposed of off-Site within 90 days of initial disturbance.

TABLE 1

MINIMUM STABILIZATION PERFORMANCE CRITERIA

Parameter	MINIMUM Performance Criteria TCLP	Proposed Universal Treatment Standard mg/L TCLP
Chemical Parameters (TCLP mg/l):		
antimony	11.50	1.15
arsenic	50.0	5.0
barium	210.0	21.0
beryllium	12.20	1.22
cadmium	1.1	0.11
chromium	6.0	0.60
lead	7.5	0.75
mercury	0.25	0.025
nickel	110.0	11.0
selenium	57.0	5.7
silver	1.4	0.14
thallium	2.0	0.20
vanadium (note 4)	16.0	1.6
zinc (note 4)	43.0	4.3
Physical Parameters:		
pH	2<pH <12.5 and satisfaction of TSDFs	
Free Liquids (by Paint Filter Test)	No Free Liquids	
Uniformity of Stabilization Mix	Uniform to Satisfaction of Engineer and TSDFs	

NOTES:

1. Table 1 presents minimum stabilization Performance Criteria only. Stabilization performance testing samples shall also meet all criteria applicable to stabilization, that may be required by the Contractor's selected TSDFs.

2. The Performance Criteria identified in the "Minimum Performance Criteria" Column of Table 1 were developed, in part, from the Performance Standards identified in 40 CFR Part 268.49 C(1)(c) treating to 10x the universal treatment standard.
3. Universal Treatment Standards are summarized from 40CFR268.48.
4. 40CFR 268.48 (footnote 5) indicates that vanadium and zinc are not underlying hazardous constituents in characteristic waste according to the definition at 40CFR268.2(i).

(END OF SECTION)

SECTION 02270
EROSION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section describes the temporary erosion control measures, which shall be installed during Site preparation and restoration activities.

B. Erosion control measures include silt fencing, straw bale dikes and sediment barriers installed during Site preparation activities and erosion control blankets installed during final regrading of the Site.

1.02 SUBMITTALS

A. Routine inspection logs for condition of temporary, site security fencing and erosion controls.

1.03 PERMITS

A. The Contractor shall procure all associated permits and approvals from authorities having jurisdiction pertaining to soil erosion control.

PART 2 - MATERIALS

2.01 GEOTEXTILES

A. All geotextiles are specified in Specification Section 02275.

PART 3 - EXECUTION

3.01 METHODS

A. Soil erosion control methods shall be as shown in the New York State Standards and Specifications for Erosion and Sediment Control.

B. General methods are shown on the Drawings, and described in Sections 02275.

(END OF SECTION)

SECTION 02275
GEOTEXTILES

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish all labor, equipment and materials necessary for installation of geotextiles for use in silt fences, erosion control, and reinforcement/protection of various parts of the Work, as specified herein and shown on the Drawings. Polyethylene sheeting for use in waste piles and stockpiles is specified in Section 01520.

1.02 QUALITY ASSURANCE:

A. Each roll of geotextile shall be labeled with the following information:

1. Manufacturer's name
2. Product identification
3. Lot number
4. Roll number
5. Roll dimensions

1.03 SUBMITTALS:

A. Prior to delivery of geotextiles to the Site, the Contractor shall submit the following:

1. Samples and manufacturer’s product literature for all geotextiles supplied for this Project.
2. Complete written instructions for storage, handling, installation, and joining/seaming of all geotextiles specified in this section.

PART 2 - PRODUCTS

2.01 WOVEN GEOTEXTILE FILTER FABRIC:

A. All filter fabrics used for silt fencing and construction of temporary roads and stabilized construction access points shall be Mirafi 100X woven geotextile or Engineer's-approved equal, and shall conform to the following properties:

Fabric Property	Average Roll Value	Test Method
Grab Tensile Strength (machine direction)	Min. 120 lbs.	ASTM D-4632
Mullen Burst Strength	Min. 280 psi	ASTM D-3786
Trapezoid Tear Strength	Min. 60 lbs.	ASTM D-4533
Permittivity	Min. 0.15 sec^{-1}	ASTM D-4491
Water Flow Rate	Max 12 gal/min./ft^2	ASTM D-4491
Permeability	Max 0.001 cm/sec	ASTM D-4491

2.02 NON-WOVEN GEOTEXTILE FABRIC

A. The non-woven geotextile fabric installed below the erosion control blankets for new Basins A and B and for the construction of the temporary truck decontamination pads shall be Mirafi 1120N non-woven geotextile or Engineer's approved equal. Geotextile shall conform to the following properties:

Fabric Property	Average Roll Value	Test Method
Weight	Min. 12 oz/yd^2	ASTM D-5261
Grab Tensile Strength	Min. 300 lbs.	ASTM D-4632
Grab Tensile Elongation	Min. 50%	ASTM D-4632
Puncture Strength	Min. 175 lbs.	ASTM D-4833
Mullen Burst Strength	Min. 600 psi	ASTM D-3786
Trapezoid Tear Strength	Min. 115 lbs.	ASTM D-4533
Water Permeability	Min. 0.27 cm/sec	ASTM D-4491
Water Flow Rate	Min. 65 gal/min./ft2	ASTM D-4491

2.03 EROSION CONTROL BLANKET

A. The erosion control blanket for new Basins A and B shall be model C125, as manufactured by North American Green, Evansville, Indiana, or Engineer's approved equal. The erosion control blanket will be constructed of 100% coconut fiber and has a functional longevity of 36 months. The erosion control blanket shall consist of a top and bottom UV-stabilized polypropylene net (3.0 lbs./1,000 sq. ft.), a middle UV-stabilized polypropylene net (20 lbs./1,000 sq. ft.), interwoven through

a middle blanket of coconut fiber (0.50 lbs./ sq. yd.). In addition, the geotextile shall meet the following properties:

Property	Average Roll Value	Test Method
Mass/Unit Area	Min. 8 oz./ sq. yd.	ASTM D-6475
Tensile Strength (Machine)	Min. 213.60 lb./ft.	ASTM D-5035
Elongation (Machine)	Min. 13.6%	ASTM D-5035
Tensile Strength (Transverse)	Min. 208.8 lb./ft.	ASTM D-5035
Elongation (Transverse)	Min. 25.50%	ASTM D-5035
Resiliency	Min. 82%	Erosion Control Technology Council Guidelines

PART 3 - EXECUTION

3.01 HANDLING AND INSTALLATION

A. The Contractor shall handle all geotextiles to ensure they are not damaged in any way. Geotextiles shall be placed to lines and grades shown on Drawings or directed by Engineer.

B. All geotextiles shall be provided in rolls wrapped with protective covering to protect from ultraviolet light, precipitation, dirt, puncture, cutting or any other damage. If any special handling of the geotextile is required, it shall be so marked on the top surface of the geotextile (e.g., "This Side Up").

C. Geotextiles shall not be exposed to precipitation prior to installation.

D. All geotextiles shall be installed in accordance with manufacturer's printed instructions.

E. Construction equipment shall not be allowed directly on the geotextile.

F. Contractor shall take precautions not to damage geotextile during installation of DGA. Contractor shall repair any damage that occurs in accordance with manufacturer’s instructions.

3.02 REPAIRS

A. Geotextiles will be rejected at any time if they are determined to be defective, to have deteriorated, or if they are damaged.

B. In the event that any damage occurs to the geotextiles at any time, the damaged portion shall either be repaired by methods approved by the Engineer or the geotextile replaced at no additional expense to the Owner.

C. Holes or tears in the geotextiles which are deemed repairable by the Engineer, shall be repaired as follows: A patch made from the same material shall be anchored in place with a minimum of 24 inches overlap in all directions. If necessary, sewing of the patch shall be performed using polymeric thread with chemical resistance properties equal to or exceeding those of the geotextile.

3.03 SEAMS AND OVERLAPS

A. Geotextiles shall be seamed and overlapped in accordance with manufacturer's instructions. No horizontal seams shall be allowed on side slopes (i.e., seams shall be along, not across, the slope), except as part of a patch.

B. All sewing of seams shall be performed using polymeric thread with chemical resistance properties equal to or exceeding those of the geotextile.

(END OF SECTION)

SECTION 02280
TRANSPORTATION AND DISPOSAL OF WASTE MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Work covered by this section consists of the characterization sampling, transportation, and off-Site disposal of all Waste Materials.

B. Demolition and construction debris generated at the Site during remediation activities, shall be sampled, characterized, and disposed of by Contractor at a Contractor selected, and Owner approved, off-Site construction and demolition debris facility. The remainder of this Specification Section does not address disposal of construction and demolition debris.

C. Miscellaneous construction debris may be encountered during the excavation of surface soil at the Site. If Contractor elects to screen or rake this debris from the soil, all generated debris shall be managed as a separate waste stream and disposed off-Site to a properly permitted facility.

D. The requirements of this Section shall be coordinated by Contractor very carefully, if necessary, with the requirements of Section 02240, which describes the required chemical stabilization requirements. The intent of this Contract is to provide the Contractor with the option to chemically stabilize all RCRA characteristic Site soils as necessary, to obtain approval to dispose the treated soils at off-Site RCRA Subtitle D (non-hazardous) TSDFs. Contractor's stabilization testing results (refer to Section 02240) shall also be used to demonstrate compliance with the testing requirements of the Contractor's selected TSDFs.

E. The Work shall include all labor, equipment, materials, and services necessary to properly characterize, profile, manifest, transport, and dispose of the following separate Waste Material streams:

1. Site soil and sediment,
2. Asphalt,
3. Concrete,
4. Screened and/or raked Site debris (refer to Section 02200),
5. Personal protective equipment and other miscellaneous debris, and,
6. Construction Wastewaters (if disposed off-Site [refer to Section 01562]).

F. Contractor shall attempt to recycle all waste asphalt generated by the Work. If the asphalt cannot be recycled, Contractor shall dispose of asphalt at an off-Site RCRA Subtitle D facility.

G. Contractor has the option of choosing the RCRA Subtitle C and Subtitle D TSDFs to be used for the Work subject to the approval of the Owner. Each proposed TSDF shall be currently and appropriately permitted to accept the Waste Materials to be disposed at the TSDF.

H. Contractor will not be required to use any specific TSDF, but shall have made arrangements for disposal at more than one facility to avoid potential delays.

I. Isolated volumes of Waste Material may not be treatable on Site, and may therefore require disposal as hazardous waste. Contractor shall propose at least one RCRA Subtitle C permitted TSDF. Contractor shall only dispose of Waste Material at an off-Site RCRA Subtitle C TSDF if Contractor has demonstrated to the satisfaction of Engineer that the Waste Material cannot be effectively treated on Site, and meets the criteria for a RCRA characteristic hazardous waste.

J. The Work includes obtaining and providing appropriate liners and covers as specified herein, as well as transport vehicles.

K. The Contractor shall be responsible for all scheduling and coordination of transportation subcontractors and TSDFs. All costs incurred by Contractor due to delays, downtime, and charges by other subcontractors resulting from the failure to properly schedule, coordinate, or perform the Work shall be the responsibility of the Contractor.

L. Contractor shall assume responsibility for all Waste Materials at time of loading into transport vehicles, and shall retain responsibility for all Waste Materials until receipt by Engineer of Certificates of Disposal.

1.02 WORK BY OTHERS

A. Engineer and EPA will have the right to collect split samples of Contractor's disposal characterization samples.

B. The Owner or Owner's Representative will sign all manifest forms and other bills of lading associated with transportation of the Waste Materials.

C. The Owner will verify that all TSDFs proposed by the Contractor currently have acceptable compliance status to accept CERCLA wastes.

1.03 SUBMITTALS

A. Product and calibration procedures for temporary Site weigh scale.

B. In accordance with Section 01300, the Contractor shall submit the following to the Engineer and the Owner at least four (4) weeks prior to initiating any off-Site transport.

1. List of transportation subcontractors to be used for all Waste Materials transport, including EPA ID Numbers for each transporter, if applicable.

2. A detailed schedule identifying the proposed daily transport schedule, including number of transport vehicles.

3. A letter from each transporter certifying that the transporter has the capacity to transport the offered volume of Waste Materials.

4. Documentation that vehicles are properly permitted to transport waste materials, and that the transporter is licensed by New York State, and all other states through which Waste Materials will be transported.

5. A list of all TSDFs proposed for its Work, including alternates, as discussed above. For each TSDF, the name, address, telephone number, and EPA ID Number shall be identified.

6. Copies of all current permits for proposed TSDFs.

7. For each TSDF, a description of all its waste characterization requirements, including sampling frequencies, analytical parameters, and approval limits for each parameter.

8. Written certification that each selected TSDF has the capacity to accept the volumes of Waste Materials offered for disposal.

9. Proposed primary and contingency transportation routes.

10. Contingency Plan/Program for responding to off-Site spills.

11. Shop drawings and samples of all types of vehicle liners to be used during the Work.

12. Shop drawings/certifications from all vehicle providers, stating that vehicles are in compliance with NYSDOT requirements for transport of hazardous wastes and meet the requirements of this specification.

13. Documentation that all individuals with responsibility for packaging, labeling, placarding, and transporting waste materials have been trained in accordance with the requirements in 49 CFR Part 172 Subpart H.

14. Qualifications and license of the subcontractor responsible for calibration and certification of the Site scale.

15. Documentation of all Site scale calibrations and certifications.

16. Copies of all profiles, sample and analytical results, and all other paperwork generated in performing the Work described herein, including disposal approval applications.

17. Tare and loaded weight tickets from the on-Site scale, for all transport vehicles prior to off-Site disposal.

18. Copies of all manifest forms or other bills of lading required under federal and state regulations, immediately following transport from the Site.

19. Copies of all manifest forms or other bills of lading following completion of the forms at the TSDFs, to document that the Waste Materials arrived at the TSDF. Contractor shall ensure that copies of all forms are distributed among regulatory agencies as required.

20. Tare and loaded weight tickets from TSDFs for all transport vehicles.

1.04 LICENSING AND PERMIT REQUIREMENTS

A. Contractor, or its transportation subcontractors if used, shall be permitted and licensed to transport Waste Materials in New York State and all localities and states through which they will transport the Waste Materials. All transporters shall be permitted in accordance with RCRA, USDOT, state and local requirements, and shall possess an EPA ID Number, if transporter will be transporting waste materials characterized as hazardous for disposal purposes.

B. Vehicles used for transportation of Waste Materials shall be permitted pursuant to all USDOT and EPA requirements, and the requirements of all states and localities through which the Waste Materials will be transported, and shall possess all required licenses and registration numbers.

C. Contractor shall comply with all federal requirements and the requirements of states and localities through which the Waste Materials will be transported.

D. All TSDFs shall be permitted, as applicable for the waste stream, under RCRA, TSCA, and/or by the State in which the TSDF is located.

E. Each TSDF shall have current acceptable status to receive CERCLA wastes.

1.05 WASTE PROFILING AND SAMPLING

A. Contractor shall be responsible to sample all Waste Materials at the frequencies required by the TSDF(s), and analyze all samples for the parameters required by the TSDF(s), in order to properly profile the Waste Materials and obtain disposal approvals.

B. Contractor shall complete and submit all profile forms and other information as required by the TSDF(s) in order to obtain disposal approvals.

C. At a minimum, characterization samples of stabilized Site Soil shall be collected at the following frequencies:

   1. One sample every 100 cubic yards, for the first 500 cubic yards of a waste stream.

   2. One sample every 200 cubic yards, for the next 600 cubic yards of a waste stream.

   3. One sample every 1,000 cubic yards, for the remaining volume of the waste stream.

   All other Waste Materials shall be sampled at a minimum frequency of every 500 cubic yards.

D. At a minimum, all characterization samples for disposal shall be analyzed for the following parameters:

   1. TCLP RCRA metals;

   2. pH;

E. Contractor shall ensure that all Waste Materials have been treated as necessary to comply with the requirements of the TSDF(s) prior to off-Site disposal, as described in more detail in Section 02240.

F. All liquids to be disposed of off-Site shall be sampled as required by the TSDF to obtain disposal approvals.

1.06 MANIFESTING, PLACARDING AND TRANSPORTATION REQUIREMENTS

A. The Contractor shall ensure that all transport vehicles do not exceed regulatory weight limits, and shall be responsible for all measures necessary to correct overweight vehicles. Contractor shall provide, install and utilize a Site scale for this purpose.

B. Due to the concentrations of total chromium and cadmium in the Waste Materials being transported off-Site, it is anticipated that the Waste Materials may meet the definition of a USDOT hazardous material, and that the Waste Material shipments shall be described as follows:

1. All Waste Materials shall be described for transportation purposes, and transported, in accordance with USDOT HM-181 regulations and transporter has a New York State Transporter Permit.

2. Contractor shall ensure that all vehicles are not leaking when the vehicles leave the Site.

3. Non-hazardous Waste Materials shall be manifested on "Bills of Lading Forms" provided by Contractor. Generator shall approve forms prior to shipment of Waste Materials. The Contractor shall provide and complete these forms for all Waste Material shipments, as necessary to comply with federal, state and local regulations and requirements.

4. The Owners Representative will sign all manifest forms as the generator. Contractor shall provide sufficient notice to the Owner so that a representative can be made available to sign manifest forms.

5. The Contractor shall provide and affix to each vehicle, placards required under USDOT regulations. All shipping documents, labeling, and placarding shall comply with USDOT HM-181 regulations.

6. Contractor shall obtain tare and loaded weight tickets from the TSDF(s) for all Waste Materials transported off the Site. Weight tickets from the TSDF will be the only basis for payment. Payment will not be made based on weight tickets obtained from the Site scale, or for vehicles for which Contractor has not obtained weight tickets.

1.07 RCRA SUBTITLE C AND TSCA DISPOSAL REQUIREMENTS

A. If Waste Materials require disposal at off-Site TSDFs permitted under RCRA Subtitle C and/or TSCA, all requirements of this Paragraph shall apply to the Work, in addition to all other requirements of this Section.

B. Contractor shall provide and complete Land Disposal Restriction Notification Forms with any shipments of hazardous Waste Materials. These forms will be signed by the Owner's representative.

C. All Waste Materials shall be manifested on Hazardous Waste Manifest Forms required under federal and state regulations. Waste Materials shall be described for transportation purposes, and transported, in accordance with USDOT HM-181 regulations.

D. Waste Materials that do not meet federal land disposal requirements (40 CFR Part 268) shall be treated as necessary by the selected TSDF prior to land disposal. Contractor shall bear all costs for sampling and profiling the Waste Materials, including all analyses to determine compliance with the Land Disposal Restrictions, required by the TSDF.

E. If treatment of Waste Materials is necessary to meet Land Disposal Restrictions (40 CFR Part 268), a Certificate of Destruction or other similar documentation shall be submitted, certifying that the Waste Material has been destroyed or treated to meet Land Disposal Restrictions in 40 CFR Part 268.

PART 2 - PRODUCTS

2.01 VEHICLE LINERS

A. Liners for vehicles shall be minimum 10-mil liners custom sized for the particular size and type vehicle and container being used.

B. Liners shall be selected by Contractor to be chemically compatible with the respective Waste Materials being transported.

C. Liners shall be provided with extra height so that the liner can be draped or tied over the materials in the vehicles, and so there will be a liner between the Waste Materials and the outermost cover.

2.02 TRANSPORT VEHICLES

A. All vehicles used to transport Waste Materials off the Site shall be designed, equipped, operated and maintained to prevent leakage, spillage, or airborne emissions during transport. Contractor may install additional liners, absorbents, or other contingency measures; however, the actual vehicles provided for transportation of Waste materials must be leak-proof.

2.03 TRUCK SCALE

A. Contractor shall provide and set up a temporary scale at the Site. The Site scale shall be provided with a ticket printer and digital weight indicator.

B. The temporary Site scale shall be appropriate for the Site's climate.

C. The temporary scale shall be placed in an on-Site location approved by the Engineer. The Contractor shall be responsible for the complete installation of the scale including all necessary supports and/or foundation.

D. The Site scale shall have sufficient capacity to measure all transport vehicles, and shall be designed and calibrated for the range of tare and full weights anticipated.

E. The Site scale shall be calibrated and certified by a licensed firm in accordance with all applicable standards and regulations. The scale shall meet the applicable requirements of the National Institute of Testing - Handbook 44 for commercial weighing.

F. The Contractor shall be responsible for all maintenance and operation of the Site scale. The scale shall be accurately calibrated and certified at the beginning of the Work and monthly thereafter by a licensed firm in accordance with NYSDOT and the manufacturer's requirements.

PART 3 - EXECUTION

3.01 LINING AND PROTECTION

A. The liners have been specified to minimize decontamination and provide an additional contingency against leakage. However, Contractor shall not rely on the specified 10-mil liner to provide leak-proof vehicles, and Contractor bears all risk regarding corrective measures due to vehicle leakage. The intent of the Contract Documents is that the leak-proof requirements for transport vehicles be obtained by provision of vehicles supplied. Any additional contingency measures such as placement of absorbent material in vehicles shall be provided as deemed necessary by the Contractor.

B. All vehicles shall be securely covered with a canvas tarp, unless the vehicle is equipped with a cover determined by the Engineer to be more secure than the tarp. The canvas tarp or other cover must be the outermost cover and must be waterproof.

3.02 ON-SITE DECONTAMINATION

A. Contractor shall verify that the exterior of all vehicles are visibly clean, prior to transport off the Site. If vehicles are not clean, Contractor shall decontaminate the vehicles in accordance with Section 01565.

3.03 TRANSPORTATION OF WASTE MATERIALS

1. Contractor shall be required to place truck signs prior to any off-Site transport, remove the signs after completion of off-Site transport, and coordinate with Town of Oyster Bay, Nassau County, and NYSDOT officials. At a minimum, two (2) signs shall be placed along Motor Avenue.

2. Prior to loading, any precipitation present in vehicles shall be drained in a manner acceptable to Engineer.

3. Any transport vehicles observed by the Engineer to be leaking, or to be a source of airborne dust, will be immediately rejected.

4. Contractor shall be responsible for all measures necessary to correct leaking transport vehicles, from the time of loading to the time of tipping at the TSDFs, at no additional cost to the Owner.

5. The Contractor shall ensure that all transport vehicles do not exceed regulatory weight limits, and shall be responsible for all measures necessary to correct overweight vehicles.

6. The contractor shall submit the proposed routes and highways that will be used by transport vehicles. These transport routes shall be submitted for approval. Use of interstate highways shall be maximized.

7. Waste Materials shall not be repackaged or handled between the Site and the TSDFs/facility(s).

3.04 OFF-SITE DECONTAMINATION

A. Following disposal of Waste Materials, each truck shall be decontaminated and sampled at the TSDF, in accordance with all applicable federal, state and TSDF requirements. All decontamination and sampling shall be performed by Contractor at no additional cost to the Owner.

3.05 OFF-SITE TRANSPORTATION SPILLS

A. In the event of an off-Site spill during transportation, the Contractor and/or its transportation subcontractor shall immediately take all necessary action to prevent, abate, or minimize the additional release or threat of release of any Waste Material.

B. The general response measures to be taken in the event of a spill incident during off-Site transport of Waste Materials are summarized below in sequential order:

    1. The transporters, who are trained in handling hazardous materials, shall secure the area, determine the extent of injuries if any, and implement emergency first aid if required.

    2. The transporter shall notify local authorities, fire, police, etc. and the transporter's headquarters.

    3. The transporter shall then immediately dispatch a spills response contractor to the scene of the incident.

    4. The response contractor hired by the transporter shall mobilize to the scene of the incident.

    5. The transporter shall notify all appropriate federal and state authorities (e.g., EPA, USDOT), and the Contractor.

    6. Contractor shall notify Nassau County officials and Engineer.

C. Off-Site spills of Waste Materials shall be collected, stored and disposed of with similar Site materials. Any "clean" materials potentially contaminated by an off-Site spill shall be excavated and disposed of with the excavated materials which caused the contamination, or shall be cleaned and restored to previous existing conditions by the transporter's response contractor, to the satisfaction of local authorities having jurisdiction, the Owner and the Engineer.

(END OF SECTION)

SECTION 02830
FENCING

PART 1 - GENERAL

1.01 DESCRIPTION

A. After mobilization to the Site, and prior to remedial Work, Contractor shall repair and/or replace all damaged portions of perimeter fencing surrounding the Site, and install new fencing as shown on the Drawings. Contractor shall maximize the re-use of existing fencing fabric and posts.

B. Fencing shall consist of a six (6) foot high chain link fence with 3 strands of barbed wire. Work shall be in accordance with the Contract Documents and as directed by the Engineer.

C. The Contractor shall furnish fencing, including top and bottom tension wires, posts, bracing, extension arms, fabric ties, truss rods, stretcher bars, and all required fittings and hardware. All fencing and gate components shall be galvanized.

D. The fence and gates are to be installed in accordance with the manufacturer's instructions. Gates and fence posts shall be installed in concrete a minimum of 36 inches deep.

E. Contractor shall take into account frozen ground, if applicable, and include all costs involved with Work during winter months.

F. Contractor shall take special precautions while performing Work in the vicinity of fenced areas, such as protection of the fence from heavy equipment and hand excavation methods.

G. Contractor shall be responsible for furnishing of all materials and the complete installation relating to the replacement and/or repair of damaged fence, gates, and other associated fencing components to as good condition, as determined by the Engineer. All installations and repairs shall be in accordance with manufacturer’s instructions, and shall be performed at no additional cost to the Owner.

1.02 SUBMITTALS

A. Contractor shall submit the following in accordance with Section 01300:

1. Shop Drawings.

2. Product literature.

3. Manufacturer's printed installation instructions.

PART 2 - PRODUCTS

2.01 FABRIC AND RELATED HARDWARE

A. The fabric shall be 6 feet high, 9 gauge steel wire, fabricated in a 2-inch diamond link continuous mesh without splices. Top and bottom selvages must be furnished without knuckling. Fabric shall be zinc-coated galvanized steel in accordance with ASTM A392.

B. The fabric shall be stretched taut so it meets final grade, and securely fastened to the outside of the posts. The fabric shall be cut and each span shall be attached independently at all terminal posts. Fastening to terminal posts shall be with stretcher bars and fabric bands spaced at maximum 15-inch intervals.

C. Fabric ties shall be No. 9 gauge round aluminum alloy wire. Hog rings, for attachment of fabric to tension wire, shall be No. 12 aluminum alloy.

D. Tension wire shall be galvanized No. 7 gauge and spring wire.

E. The tension wires shall be stretched between 4 to 6 inches from the edges of the fence fabric. The tension wire shall be securely attached to terminal and gate posts with brace bands. The fabric shall be secured to the tension wire with hog rings at intervals not to exceed 2 feet on center. The tension wires shall be installed prior to fence installation.

F. Fabric ties shall be uniformly spaced on line posts at the rate of 1 tie per foot of height of fabric and bracing at intervals not to exceed 2 feet. The fabric shall be fastened to the bottom tension wire with hog rings uniformly spaced at intervals not to exceed 2 feet.

G. Stretcher bars shall be 1/4 x 3/4-inch galvanized steel for attaching fabric to terminal posts. Stretcher bars shall be fastened to posts by means of 1/8 x 1-inch galvanized steel bands. Stretcher bars shall be one piece and equal to the full height of fabric.

H. Stretcher bars shall be threaded through the fabric and secured to all end, corner, pull and gateposts with metal bands uniformly spaced at intervals not to exceed 15 inches.

2.02 BARBED WIRE

A. Barbed wire shall be 3 strands of 12.5 gauge steel wire with 4-point barbs spaced 5 inches on center. The barbed wire must be zinc galvanized in accordance with ASTM A121.

B. Extension arms shall be hot-dipped galvanized malleable iron and/or pressed steel. Each arm shall support 3 strands of barbed wire with the uppermost strand 12 inches above the top of the fabric and 12 inches out from the fence line.

2.03 FRAMEWORK

A. Pipe and extruded shapes, line posts, terminal posts, corner posts, top rail, braces, gate posts, and gate frames shall be in-line galvanized, 5540 steel pipe or hot-dipped galvanized extruded shapes with a zinc coating averaging not less than 2.0 oz. per sq. ft., and no single coating shall show less than 1.8 oz. per sq. ft., of the size shown in the following table:

Application	Pipe Size (Outside diam.)	Square Tubing Size	H-Beam Size
Terminal Posts*	3"	2-½" x 2-½"	N/A
Line Posts	2-½"	N/A	1-5/8" x 1-7/8"
Top Rail	1-5/8"	N/A	N/A
Gate Posts	4"	N/A	N/A

* Terminal Posts include end, corner, angle and pull posts

B. Post tops shall be galvanized malleable iron and provide watertight closure for tubular posts.

C. Line posts shall be uniformly spaced at a maximum of 10 feet, set plumb and true to line. Line posts shall be driven to a minimum depth of 3 feet below final grade. Two galvanized steel drive anchors 1½" by 1½" x 1/8" x 2'6" shall be driven diagonally through galvanized steel fittings located approximately 3 inches below grade and attached to opposite sides of the post. The drive anchors shall be installed perpendicular to the fence line. Augured holes filled with concrete may be substituted for steel anchors.

D. Terminal posts shall be set plumb and true to line. Posts shall be set a minimum depth of 36 inches in concrete, in undisturbed or compacted soils. Postholes shall be a dug or drilled cylindrical hole fifteen (15) inches minimum diameter, or fifteen (15) inches diameter at the top tapered outwardly at the bottom to a 17-inch diameter. Concrete shall have a 28-day strength of 2500 psi. Terminal posts shall be spaced at a maximum of 200 feet, in addition to the end, corner, angle and pull posts.

2.04 BRACING

A. Bracing shall be installed at all end, pull and gate posts and in both tangents at corner posts. Braces shall be installed horizontally, midway between top of fabric and grade, extending to the next adjacent post. They shall be securely attached to both posts and be trussed back from the top adjacent post to the braced post with an adjustable truss rod. Bracing shall be installed prior to fabric installation.

B. Truss rods shall be 3/8-inch diameter galvanized steel rod with galvanized turn buckles for adjustment.

2.05 GATE(S)

A. Swing gate frames, where required, shall be hot-dipped galvanized Schedule 40 steel pipe, 1½ inches nominal diameter, or 2 inches square tubing weighing 2.72 pounds per foot. The gate frame joints shall be welded or be connected by use of special rigid connections. The gate fabric shall be the same as the fence fabric and shall be securely fastened to the frame on all sides. The vertical members shall extend 12 inches above the top horizontal rail and support 3 strands of barbed wire and furnished with post caps.

B. Gates shall be installed plumb, level and shall secure the full opening without interference. All hardware is to be adjusted for smooth operation and lubricated where necessary.

C. Gate posts shall be set plumb and true to line. Posts shall be as specified under paragraph 2.03-"Framework". Posts shall be set a minimum depth of 36 inches in concrete in undisturbed or compacted soils. Postholes shall be a dug or drilled cylindrical hole 15 inches minimum diameter, or 15 inches diameter at top tapered outwardly at the bottom to a 17-inch diameter. Concrete shall have a 28-day strength of 2500 psi.

2.06 CHAINS AND LOCKS

A. A chain and lock shall be installed on each gate. Chains shall be heavy duty and galvanized. Padlock shall also be heavy duty and key locking. These must be approved by Engineer prior to purchase. All locks shall be keyed to one master key. Four copies of the master key shall be given to the Owner upon completion of the Work.

PART 3 - EXECUTION

A. Install fencing in accordance with manufacturer's printed installation instructions.

(END OF SECTION)

SECTION 02920

TOPSOIL, SOIL SUPPLEMENTS, SEEDING AND MULCHING

PART 1 - GENERAL

1.01. DESCRIPTION:

A. During restoration activities at the site, Contractor shall minimize the quantity of topsoil provided from off-Site sources. Sub-grade soil remaining after remedial activities have been completed shall be seeded, if the soils are suitable to support vegetation as confirmed by testing described below. Contractor shall test the topsoil, in accordance with the topsoil testing requirements in this section, to determine its suitability. If the sub-grade soil in any area is not suitable to support vegetation, Engineer and Contractor shall determine the appropriate quantity of topsoil to place.

B. The Contractor shall furnish all labor, equipment, and materials necessary for placement of topsoil, soil supplements, seed and mulch to restore all areas disturbed during remediation activities to as-new conditions as specified herein and where shown on the Drawings.

C. Site restoration activities shall provide an established erosion resistant perennial vegetative cover of at least 80% of the disturbed area, on a per 10,000 square foot basis, before the Site is considered to be permanently stabilized with vegetation. The results of all Site restoration activities will be subject to the final approval of the Engineer and the Owner.

1.02. QUALITY ASSURANCE:

A. The Contractor shall notify the Engineer at least 48 hours in advance of all planned seeding operations and shall identify the specific materials to be used, their proposed location, and their application rate.

B. Permanent seeding operations shall be carried out between March 1 and June 1 or between August 1 and October 1, unless otherwise specifically permitted or required by the Engineer.

C. Topsoil, seed, soil supplements, and mulching shall meet all applicable requirements of the Cornell Cooperative Extension recommended guidelines.

D. Samples of Site sub-grade soils shall be collected and analyzed, to determine whether these soils can support vegetation. Samples shall be collected at a frequency of one per acre at locations determined by Engineer, and analyzed for gradation, pH, buffer pH, soluble salts, organic content, and fertilizer and liming requirements.

E. One soil sample from each topsoil source shall be collected, and analyzed by a qualified laboratory in accordance with Cornell Cooperative Extension recommendations. Samples shall be analyzed to determine the necessary fertilizer and liming requirements, and to demonstrate that all requirements have been achieved. Analysis shall include buffer pH.

F. Contractor shall identify the location(s) of proposed topsoil borrow sources. Engineer will collect a representative topsoil sample from each source. The Engineer will collect samples and analyze for full TAL/TCL parameters, including PCBs and pesticides. All results must be below background levels for Engineer to approve the topsoil. Refer to Section 01012.

1.03. SUBMITTALS:

A. In accordance with Section 01300, Contractor shall submit the following:

1. Name and location of each proposed topsoil source for approval by the Owner.

2. All test results for topsoil, certification that topsoil meets all the requirements of this section, and all topsoil analyses.

3. Certification of seed mixture, purity, germinating value, and crop year identification.

4. Product data and application rates for all soil supplements, mulch, binders, or any other products proposed for the Work.

5. Hydro-seeding mixture and rate of application.

6. Samples of all seed mixtures.

PART 2 - PRODUCTS

2.01. TOPSOIL

A. Topsoil shall be a loam, typical of locality. The mixture of sand, silt and clay particles in the topsoil shall be in approximately equal proportions. Topsoil shall not contain subsoil, slag, cinders, stones, glass, lumps of soil, sticks, roots, undesirable material, plant parts, trash, or any materials larger than 1 inch in diameter. All topsoil shall have a pH of 5.5 to 7.5, and shall have conductivity less than 1.0 mhos/cm.

B. Topsoil shall contain not less than two (2) percent and no more than ten (10) percent organic matter. Topsoil shall have had prior vegetative growth and shall contain no toxic materials, including acid or alkaline elements, harmful to vegetation growth.

2.02. SOIL SUPPLEMENTS:

A. Ground agricultural limestone shall be labeled indicating its calcium carbonate equivalent (CCE). Liming material shall meet the "fine-size" gradation criteria in the most recent Cornell Cooperative Extension guidelines.

B. Fertilizer shall conform to the requirements of the Cornell Cooperative Extension guidelines.

C. Dry formulations of N-P-K as indicated by soil tests, for seeded and sodded areas shall be used. Liquid formulations may be used in place of dry formulations for seeded or sodded areas, provided:

- A certified weigh bill, showing guaranteed analysis, accompanies each delivery to the project.
- A minimum of 15 minutes of agitation is provided in storage tanks and transport vehicles prior to loading or discharge.
- The liquid mixture application does not exceed a concentration of 200 gallons per 1,000 gallons of slurry.
- A chart is provided showing the gallons required to provide the equivalent dry fertilizer required per 1,000 square yards, or as otherwise indicated.

2.03. SEED

A. Seed species shall have 98% purity, minimum 85% germination, and maximum used seed of 0.15% unless Contractor can demonstrate to Engineers' satisfaction that the latest years crop does not meet these requirements. Seed used on site shall meet the following requirements:

Name	Proportion by Weight
Creeping Red Fescue	20%
Tall Fescue	60%
Perennial Rye	20%

B. All seed mixtures shall be of the latest year's crop and shall conform to New York State seed laws.

2.04. MULCH:

A. Mulch shall be Hydro-Blanket, as manufactured by Wood Recycling Inc., Peabody, MA or Engineer's approved equal. Mulch shall be applied at the rate of 3,000 lbs. per acre.

B. All chipped materials generated by clearing operations, as described in Section 02110 can be re-used for restoration purposes in areas where there is minimal vegetation.

PART 3 - EXECUTION

3.01. SOIL SUPPLEMENTS:

A. Limestone and fertilizer shall be applied at the rates determined by the specified soil testing.

B. Contractor shallow harrow or disc lime uniformly into the soil to a minimum depth of 2 inches.

C. Fertilizer shall be applied at the time of seeding.

3.02. TOPSOIL PLACEMENT:

A. Contractor shall prepare the subgrade by loosening to a depth of three (3) inches, and then place a layer of topsoil, up to six (6) inches in thickness spread evenly and compacted by means of a light pneumatic tired roller or similar equipment. The actual thickness of the topsoil layer shall be determined based on the ability of the subsoil to support vegetation. Stones, roots, branches and debris shall be removed from the topsoil and an evenly finished surface provided.

B. The final finished seedbed shall result in a furrow-like configuration parallel to slopes.

C. Topsoil shall not be placed in a frozen or muddy condition.

D. Final surface, prior to seeding, must be approved by the Engineer. Contractor shall rework topsoil layer until the Engineer's approval is obtained, at no additional cost to the Owner.

3.03. SEED APPLICATION:

A. The seed mixture shall be applied at a rate of 1.3 pounds per 1,000 square yards (215 lbs./acre) by hydro-seeding on a firm, moist seedbed.

B. Fertilization, seeding and 25 percent of the mulch shall be applied in one application. A second application shall be used to apply the remaining 75 percent of the required mulch.

C. Hydro-seeding shall not be performed during high winds or when the ground surface is too wet for working.

D. Any portions of seeded areas, which do not produce a uniform erosion resistant perennial vegetative cover, or are washed out shall be re-graded, re-fertilized and reseeded. All areas, which have been seeded, shall be watered and cared for by the Contractor until the disturbed areas are considered to be permanently stabilized with vegetation. The grassed areas shall be left in a condition acceptable to the Owner at the completion of the Contract.

3.04. GUARANTEE:

The Contractor shall guarantee all seeding for a period of one year from the completion date of the Contract. All necessary regrading, refertilizing and reseeding shall be made at the beginning of the first succeeding planting season.

PART 4 - MAINTENANCE

4.01. MAINTENANCE:

The Contractor shall perform the following maintenance for a minimum of one year or until the disturbed areas are considered to be permanently stabilized with vegetation, whichever is longer.

A. Irrigation: If soil moisture becomes deficient, the Contractor shall provide whatever temporary system is necessary to provide adequate watering to establish permanent vegetation.

B. Contractor shall protect newly seeded areas from erosion due to inclement weather. Any damage arising from the lack of erosion protection shall be repaired and reseeded at Contractor's own cost.

C. Repairs: The Contractor shall inspect all seed areas for failures and make necessary repairs, replacements and reseedings (within the planting season, if possible) as follows:

1. If the Engineer deems the restored area is inadequate for erosion control, the Contractor shall overseed, fertilize and mulch using half of the rates originally applied.

2. If restored area is over 60 percent damaged, the Contractor shall reestablish vegetation following original lime, fertilizer, seeding and mulching requirements.

3. Fertilization: A booster application of 200 pounds per acre of a 10-20-10 fertilizer shall be made if the grass deteriorates

(END OF SECTION)

June 13, 2006

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN FOR REMEDIAL ELEMENTS I AND II

Liberty Industrial Finishing Superfund Site
55 Motor Avenue
Village of Farmingdale, Nassau County, New York

Prepared for:

LIBERTY INDUSTRIAL FINISHING SITE QUALIFIED SETTLEMENT TRUST

Remedial Engineering, P.C.

Environmental Engineers

and ROUX ASSOCIATES, INC.

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1.0 INTRODUCTION

This Construction Quality Assurance Project Plan (CQAPP) has been developed as part of the Final Remedial Design for the Liberty Industrial Finishing Site, 55 Motor Avenue, Farmingdale, New York (the "Site"). The CQAPP has been prepared on behalf of the Liberty Industrial Finishing Site Qualified Settlement Trust (hereinafter referred to as the Potentially Responsible Parties or "PRP Group") in accordance with the Consent Judgment (Index No. 04-1308) and attached Statement of Work (SOW) entered in the United States District Court for the Eastern District of New York on August 27, 2004.

The Consent Judgment requires the submission of a final design submittal, which sets forth the engineering elements ("Remedial Design") to implement and construct the Remedial Action (RA) selected in the Record of Decision (ROD) (EPA, March 2002). As specified in the SOW and summarized in the Pre-Final Remedial Design (RD) (ERM, July 2005), the Final RD is comprised of:

- Final Design Drawings and Specifications for the RA; and
- Final RA Plans that include:
    - Construction Quality Assurance Project Plan (CQAPP);
    - Health and Safety Contingency Plan (HSCP);
    - Sampling, Analysis and Monitoring Plan (SAMP), which includes the Remedial Air Monitoring Plan (RAMP); and
    - Transportation and Disposal (T&D) Plan, which includes a Hazardous Material Transportation Security Plan (HMTSP).

The CQAPP, in conjunction with the other RA Plans, will be for use by the PRPs, Engineer, Contractor, EPA and its representatives and other regulatory personnel having jurisdiction. The list of individuals and their respective organization that need copies of the approved CQAPP and subsequent revisions, including all persons responsible for implementation, the QA managers, and representatives of all groups involved is provided in Appendix B. The project manager as defined in Section 3.1 will ensure that the appropriate project personnel have the most current approved version of the CQAPP. If updates to the CQAPP are required, the CQAPP will be

amended or revised accordingly and the dates on the cover page, approval page and footers of each page will be updated accordingly.

This CQAPP outlines the construction quality assurance procedures for Remedial Elements I and II (On-Site Soils and On-site Western Subsurface Features, respectively). Remedial Elements I and II are identified and discussed in greater detail in the Preliminary RD Report (ERM, October 2004).

The approximate limits of the on-Site soils and western subsurface features to be addressed as part of Remedial Elements I and II, respectively, are shown on the Technical Drawings.

As discussed in the Preliminary RD Report, the eastern subsurface features will be addressed in accordance with the March 26, 2002 Administrative Order on Consent (AOC) (Index No. CERCLA – 02-2002-2013).

1.1 Site Description

The Site is located in the Village of Farmingdale, Town of Oyster Bay, Nassau County, New York, approximately one-mile south of Bethpage State Park. The Site address is 55 Motor Avenue. The Site is approximately 30 acres in size and borders the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east, and Ellsworth Allen Park to the west.

Currently, approximately half the Site (i.e., the western portion) primarily consists of vacant land that abuts Ellsworth Allen Park with the exception of the current groundwater treatment system building. The other half of the Site (i.e., the eastern portion) contains several buildings, which are currently leased to a variety of tenants engaged in trucking, warehousing, automobile parts salvaging operations, and product distribution.

1.2 Site History

The Site is a former aircraft parts manufacturing and metal finishing facility that began its operation in the late 1930's. Since then, ownership of and operations at the Site have changed numerous times. A complete Site history can be found in the Preliminary RD Report.

1.3 Proposed Remedy

Based upon the results of the initial Site Remedial Investigation (Weston, January 1994), Continuing Remedial Investigation (CRI) (ERM, July 2000), the Feasibility Study (FS) (ERM, July 2000), public comments on ERM's CRI and FS Reports and the United States Environmental Protection Agency's (EPA's) Proposed Plan for the Site (EPA, July 2001) and other supporting documents, the EPA, in consultation with the New York State Department of Environmental Conservation (NYSDEC), has selected FS Alternative SL-3 for implementation at the Site to address environmental concerns for on-Site soils and subsurface features (Remedial Elements I and II, respectively). The components of Alternative SL-3 are summarized below and are discussed in greater detail in the Site's ROD and Preliminary RD Report.

- Excavation and off-Site disposal of all soils contaminated above groundwater protection levels (10 milligrams per kilogram [mg/kg] cadmium and 143 mg/kg chromium);
- Removal of contaminated aqueous and/or solid materials from three underground storage tanks (USTs) and fifty-six subsurface features, as well as the northern and eastern sanitary leaching fields, if warranted. (As documented in the Preliminary RD Report, only eighteen USTs and eighteen subsurface features will be addressed as part of Remedial Element II. The remaining USTs and subsurface features will be addressed as part of the March 26, 2002 AOC);
- Removal and off-Site disposal of any soil surrounding the subsurface features that exceed the following soil Performance Standards (i.e., ROD cleanup criteria):
  - Cadmium: 10 mg/kg
  - Chromium: 143 mg/kg;
  - Trichloroethene (TCE): 0.7 mg/kg;
  - Cis-1,2-dichloroethene (DCE): 0.25 mg/kg;
  - Tetrachloroethene (PCE): 1.4 mg/kg;
  - Polychlorinated biphenyls (PCBs) for soils between zero and 1 foot below ground surface (bgs): 1 mg/kg;
  - PCBs for soils below 1 foot bgs: 10 mg/kg;
  - Cyanide: 35 mg/kg;
  - Benzo[a]pyrene: 0.29 mg/kg; and
  - Dibenzo[a,h]anthracene: 0.29 mg/kg.

- Implementation of institutional controls to restrict the use of the Site to commercial/ industrial or, where applicable, to recreational uses.

1.4 Organization And Summary

This CQAPP outlines the approach to quality assurance during construction activities at the Site. The following sections present the plan to implement the RA for Remedial Elements I and II, a proposed methodology for performing the RA, quality assurance methods to verify the effectiveness of the RA, the lines of responsibility during the RA, a detail of construction oversight, and the submission of required documentation to the EPA.

The remainder of this report is organized into the following sections:

- Section 2.0: This Section contains a general plan for Contractor site mobilization, surveying, stockpiling of clean soil, soils exceeding the Performance Standards, and soils exhibiting Resource Conservation and Recovery Act (RCRA) hazardous characteristics. Section 2.0 also describes the transportation and disposal methods. Finally, the potential Contractor's project organization, as well as any quality control methods to be performed by the Contractor is included in this section.

- Section 3.0: This Section defines the scope of work for the Engineer performing the construction oversight, as well as describing the organization of oversight personnel. A team of individuals with specific responsibilities will provide construction oversight. Field personnel will include the Resident Project Representative, Site Safety Officer, and other field personnel subordinate to the Resident Engineer, as necessary to oversee and inspect the work.

- Section 4.0: The documentation and submittals reviews for the EPA review are defined in this section. The Engineer will coordinate the submittals and comments by the EPA with the Contractor.

- Section 5.0: A description of the roles of all regulatory agencies that have jurisdiction over the RA.

- Section 6.0: The Remedial Action Construction Schedule estimates the overall construction schedule and duration of each phase of the work with detailed task breakdown by area.

- Section 7.0: This section outlines the procedures that will be used for Contractor solicitation for bidding process, bid evaluation process, and the methods used for Contractor selection.

2.0 REMEDIAL CONSTRUCTION PLAN

The Remedial Construction Plan includes plans necessary for: preparation of the Site prior to the RA, installation of the necessary site improvements for implementation of the work plan, and the sequence of work to be performed in achieving the remedial goals and objectives. The sequence of work will detail a general approach for performing the excavation, remediation of subsurface features, stockpiling and sampling of excavated soils, transporting and disposing of impacted and RCRA characteristic soils, and site restoration. This sequence of work is not intended to limit the Contractor from their own means and methods for performing the work or developing innovative methods. The Contractor will be responsible for developing their own means and methods for performing the work, which will be submitted as a subsequent Remedial Action Work Plan (RAWP) subject to approval by the Engineer, the PRP Group, and the EPA.

2.1 Remedial Goals And Objectives

The objectives and goals for the RA include: the excavation and offsite disposal of all soils exceeding groundwater protection levels as summarized in Section 1.3; the removal of aqueous and/or solid materials from subsurface features and underground storage tanks (USTs) exceeding Site Performance Standards summarized in Section 1.3; and the removal of any soils surrounding the subsurface features that exceed Site Performance Standards summarized in Section 1.3.

2.2 Technical Drawings

The Technical Drawings have been prepared, reflecting the limits of excavation as determined by remedial investigations conducted at the Site. The Technical Drawings show the vertical and horizontal limits for soils (cadmium and chromium impacted) above the Performance Standards and soils exhibiting RCRA hazardous characteristics. The horizontal limits are shown on drawings that start at an elevation of greater than or equal to 60 feet above mean sea level (AMSL) and proceeding downward in 5-foot intervals to 45 feet AMSL. The excavation limits presented in the Technical Drawings are the initial vertical and horizontal limits of soil excavation. The final excavation limits will be based on post-excavation soil samples indicating the Performance Standards are met or the water table is encountered.

Water level data indicates that saturated conditions may be encountered at approximately 45 feet AMSL. Excavation to lower elevations will cease once the water table has been encountered.

Excavation below the 45-foot AMSL elevation is not expected but will depend upon seasonal fluctuations in the water table.

Clean overburden soils requiring removal for access to impacted areas or soils below and soils to be windrowed in the area of excavation for excavation sidewall stabilization are also identified on the Technical Drawings.

2.3 Construction Overview

The Contractor will perform excavation of Site soils at the locations shown on the Technical Drawings. The Site has been divided into three major areas as shown on the Technical Drawings:

1) Area 1: Northwest Disposal Area,

2) Area 2: Wastewater Disposal Basin, and

3) Area 3: Building B Basement Area.

Each area has been further divided into a number of sub-areas. The Contractor will identify each sub-area as shown on the Technical Drawings. Each sub-area will be cleared and grubbed of brush, trees, and other vegetation necessary to perform the soil excavation.

As necessary, the Contractor will install temporary haul roads to facilitate soil removal while maintaining the Site as dust free as possible. Prior to excavation of Site soils, the Contractor will have each sub-area surveyed and a survey map generated for preparation of progress drawings. The Contractor will identify and call to the attention of the Engineer any variation in the design drawings, regardless of impacts to the scope of work, prior to excavation of Site soils.

After approval of the initial Site survey by the Engineer, Site soils will be excavated downwards in 5-foot layers and to the horizontal limits shown on the Technical Drawings. In accordance with 29 CFR 1926 Subpart P, Appendices A and B, a maximum allowable slope of 1.5 foot horizontal to 1 foot vertical will be utilized for excavations less than 20 feet deep because Type C soils are present onsite. For excavations deeper than 20 feet (not expected to occur during the performance of Remedial Element I), a licensed professional engineer will design the required

side slopes. Excavated soils will be stockpiled separately in accordance with the following method:

- Overburden soils will be cut back to access impacted soils and provide slope stability. These soils will be presumed clean and will be removed and stockpiled separately from impacted soils for potential re-use as backfill material, pending confirmation sampling. Overburden soils from each sub-area will be windrowed separately from each other according to the location of removal. The windrowed overburden will then be sampled in accordance with the Sampling Analysis and Monitoring Plan (SAMP) to confirm the horizontal limits of excavation and subsequently used as backfill material. Windrowed soils that exhibit concentrations of constituents above the Performance Standards will be removed to the impacted soil stockpiling area. The location of origin of these soils will be noted for further excavation in that sub-area.

- Soil excavated from areas above the Performance Standards, but exhibiting non-hazardous characteristics, will be removed and stockpiled in designated locations. The impacted soils will be segregated into sufficient stockpiles according to the location of excavation. The stockpiled impacted soils will be sampled according to the SAMP and as required by the Treatment, Storage, and Disposal Facility (TSDF). If sampling results show a soil stockpile to exhibit hazardous characteristics, then the stockpile will be handled as RCRA characteristic hazardous waste and the location of removal noted for future excavation.

- Soils excavated from locations shown on the Technical Drawings as exhibiting RCRA hazardous characteristics will be stockpiled separately from other soils at a location approved by the Engineer. The Contractor may have the option of stabilizing these soils (*in situ* or *ex situ*) or to manage the soils as RCRA characteristic hazardous waste.

There are currently 36 subsurface features, including 18 USTs, located around the Site targeted for remediation as part of Remedial Element II. These features will be located and, as necessary, investigated for content and other attached piping and structures. Subsurface features that are located within the boundaries of the soil excavation for Remedial Element I will be removed as part of the soil excavation and demolished and disposed of as construction debris. Subsurface features that are outside the limits of the excavation areas for Remedial Element I, whose contents have not been characterized, will be sampled and characterized according to the subsurface features Performance Standards prior to remediation.

The PRP Group and the Contractor will comply with applicable Occupational Safety and Health Administration (OSHA) requirements during all phases of remedial construction.

2.4 Sequence Of Work

This section details the proposed sequence of work starting with the necessary temporary Site improvements, clearing and grubbing of areas requiring excavation, performing Site surveys, performing excavation of contaminated soils, remediation of subsurface features, transportation and disposal, storm water management, performing onsite stabilization of soils exhibiting RCRA hazardous characteristics (optional), and performing confirmatory sampling.

2.4.1 Temporary Site Improvements

Temporary Site improvements are discussed below.

Field Office

Office space for the Contractor and Engineer will be located at the Site. The office space will be equipped with electric, telephone, fax, cable internet service including wireless router, and potable water. Additional requirements for the Field Office are specified in the Technical Specifications.

Roadways

Due to the condition and expanse of the Site, temporary roadways will be required to facilitate truck and equipment access to each sub-area. Temporary access roads will be routed such that they will not interfere with the excavation of contaminated soils. The temporary roadways will be constructed by removing the top soil (~6") and installing non-woven geo-textile the full width (20 feet) of the proposed roadway followed by the placement and compaction of dense grade aggregate (DGA). Details concerning the construction of temporary roadways are shown on the Technical Drawings and are provided in the Technical Specifications.

Construction Zone Exit Pad

This will include the construction of entrance and exit pads from non-paved to paved areas to limit tracking of Site soils outside the contamination reduction zones. The construction zone exit pad will be constructed using DGA and will be a minimum of 8-inches thick. The construction zone exit pad will be constructed in accordance with the New York Standards and Specifications for Erosion and Sediment Control and as shown on the Technical Drawings and detailed in the

Technical Specifications. The number and location of construction zone exit pads will be determined by the Contractor and included in the Contractor's RAWP.

Decontamination Pad

The Contractor will be responsible for the construction of a truck and equipment decontamination pad. All construction equipment exiting the contamination reduction zone must first be decontaminated regardless if the equipment has come in contact with contaminated materials. Upon inspection, if transportation vehicles are determined by the Engineer to be impacted with soils from the exclusion zone, then such vehicles must undergo decontamination.

Soil Stockpile Areas

Soil staging areas will be constructed as shown on the Technical Drawings or in alternative configuration(s) as approved by the Engineer. The soil staging areas will be constructed to allow sufficient areas for multiple segregated piles or windrows of soils. Separate stockpile locations will be prepared for soils above the Performance Standards and soils exhibiting RCRA hazardous characteristic.

Storage areas for the impacted soils and soils exhibiting RCRA hazardous characteristics will be constructed on the existing concrete slabs, formerly used as building slabs, as shown on the drawings. Temporary storage bins may be constructed using concrete barriers (jersey barriers) as sidewalls. The storage area will be covered at all times to the extent practicable. The Contractor will have the alternative for building a structural cover, which can be provided for the stockpile of soils exhibiting RCRA hazardous characteristics to eliminate the need to maintain temporary polyethylene cover(s) and to minimize the effects of precipitation and subsequent management of storm water run-off.

Soil and Sediment Erosion Control

Soil erosion control measures will be installed around areas that have been cleared and grubbed, active excavations, and soil stockpiles. Soil and sediment erosion control methods will be as described in the New York Standards and Specifications for Erosion and Sediment Control. The erosion control methods will include silt fences, straw bales, temporary swales, and other best management practices.

2.4.2 Clearing and Grubbing

Portions of the Site are overgrown with brush and small trees. The Contractor will be responsible for clearing and removing all brush and trees that impact the sequence of work. The cleared vegetative material will be chipped/mulched and stockpiled onsite at a location approved by the Engineer. Vegetative material that contacts impacted soils will be stockpiled separately and sampled prior to offsite disposal. Clearing and grubbing will be performed in stages to limit the extent of bare areas requiring erosion control and/or dust suppression.

Soil erosion control methods will be employed at all areas that are cleared and grubbed or disturbed otherwise.

2.4.3 Site Surveys

After clearing of an area or sub-area, the Contractor will have the limits of excavation surveyed. The Contractor will employ a New York licensed surveyor to establish the limits of each excavation. Offsets of 15 and 20 feet from the rim of each excavation will be identified in the event the limits become distorted due to soil removal efforts.

The Surveyor will layout the limits of each excavation as shown on the Technical Drawings, delineating cut-lines for clean cutback soils, non-hazardous soils above Site Performance Standards and soils expected to be hazardous. The Contractor will also be responsible for surveying the actual excavated limits after post-excavation sample results have confirmed excavation has been performed to clean soil. The progress of excavation activities will be periodically surveyed and included in the Contractor's progress drawings.

The Surveyor will be employed at a sufficient time for redefining the excavation limits or limits of contamination, re-establishing offsets, and to develop as-built drawings.

2.4.4 Soil Excavation

The Site has been divided into three areas, with each area further divided into a number of sub-areas. Each sub-area is defined by the limits of proposed clean cut-back soil required to be removed to access impacted/ hazardous soils and to ensure slope stability.

For sub-areas with impacted soils present 60 feet AMSL, excavation will start at the center of each sub-area and will be advanced vertically to the approximate 60-foot AMSL elevation and horizontally to the limits of impact, as defined on the Technical Drawings and marked out by the surveyor. Once the anticipated limits of impacted soil are reached, as defined by the initial Site survey, the excavation/windrowing of eligible clean soil will be performed and the sidewalls will be cut back at a minimum of 1 foot vertical to 1.5 foot horizontal slope. Soils removed by the sidewall cutbacks from these excavations will be windrowed into stockpiles in proximity to the sub-area of origin as proposed clean backfill material. These soils will be sampled per the SAMP. The sampling of cutback soils will achieve two objectives: 1) serve as confirmation of the horizontal limits of excavation, and 2) provide verification needed for use as backfill material. If sampling of clean cutback soil indicates further impact of constituents above the Performance Standards in the horizontal direction, additional soils will be removed and windrowed from the sidewall of the sub-area of origin and sampled. This process will continue in each 5-foot elevation level until soils exhibit concentrations for constituents below the Performance Standards.

For sub-areas that require the removal of clean overburden at the above 60-foot elevation, excavation will be performed vertically to 60 feet AMSL and to the limits of excavation as shown on the drawings, including sidewall stabilization of 1 foot vertical to 1.5 foot horizontal. The proposed clean overburden and sidewall cutback soils will be windrowed into stockpiles as proposed clean backfill material, pending confirmation sampling, as previously described. Excavation in these sub areas will proceed in this method until the impacted layer is reached.

After excavation has been performed to the 60-foot AMSL elevation and soils are stockpiled as described above, the area will be re-surveyed to delineate cut-lines for the next excavation that will be conducted through the next 5-foot interval. Soils shown on the Technical Drawings as clean overburden and soil removed as excavation cutback soils will be stockpiled separately as proposed backfill, pending confirmation sampling. The proposed clean overburden and sidewall cutback soil stockpiles will be staged on 40-mil high density polyethylene liner to prevent contact with the staging area Site soils.

2.4.5 Subsurface Features

Eighteen subsurface features and eighteen USTs are present on the western portion of the Site and are included under the remaining activities for Remedial Element II.

Table 1 lists all known subsurface features associated with this CQAPP and their locations are shown on the Technical Drawings.

The remedial approach that was developed to address subsurface features and USTs is provided below:

1. Locate and uncover subsurface features and USTs and trace any connecting pipes.
2. Sample (aqueous and/or solid) from subsurface features and USTs for waste characterization and, if necessary, initial characterization (i.e., those not previously sampled).
3. Determine if subsurface features and USTs contain liquids or solids in excess of performance standards.
4. Remove liquid and solid contents with concentrations of constituents above the performance standards from subsurface features via vacuum or equivalent method.
5. Confirmation samples will be collected from remediated subsurface features to confirm cleanup.
6. Dispose subsurface feature and UST contents according to results of characterization sampling.
7. Access and clean USTs, if necessary, rendering UST vapor free and remove USTs identified. Removal of petroleum product will be performed in accordance with 6 NYCRR Part 611. After UST is removed, it will be recycled and/or disposed of in accordance with 6 NYCRR Part 611. Soil samples will be collected from the UST excavation sidewalls and excavation bottom and compared to the performance standards for verification of subsurface feature remediation.
8. Verify and document UST closure following removal through Nassau County Department of Health and NYSDEC.
9. Backfill UST excavations to grade following closure confirmation sampling.

2.4.6 Transportation And Disposal

Contaminated soils that are excavated based on the limits shown on the Contract Drawings, or determined to be above the Performance Standards and not a RCRA characteristic hazardous

waste based on the results of confirmatory sampling will be disposed at a RCRA Subtitle D permitted TSDF. Onsite soil that exhibits RCRA hazardous waste characteristics will be disposed of at an RCRA Subtitle C permitted TSDF, unless the Contractor opts to stabilize the soil onsite prior to offsite removal.

Upon award of the contract, the Contractor will submit information on each disposal facility for review and approval by the Engineer and the EPA. The Contractor will be responsible for coordinating the means and methods of transportation and disposal, as well as procuring all associated permits.

All soils exhibiting RCRA hazardous characteristics will be removed from the Site within 90 days of excavation and properly disposed of at a RCRA Subtitle C permitted TSDF, or stabilized onsite and disposed of at a RCRA Subtitle D permitted TSDF.

All soils containing concentrations of polychlorinated biphenyls (PCBs) at or greater than 50 parts per million will be removed from the Site within 90 days of excavation and properly disposed of at a TSDF that is permitted through the Toxic Substances Control Act (TSCA) and RCRA Subtitle C.

The Contractor will transport and dispose solid waste materials (e.g., subsurface features, USTs, used personal protective equipment) generated during the RA in accordance with applicable local, state and federal laws and regulations. The Contractor will dispose construction water generated from equipment and personnel decontamination, dewatering, and from waste pile runoff via the sanitary sewer or through the onsite groundwater treatment plant discharge.

2.4.7 Storm Water Management

Due to the size of the excavations, a chance exists for storm water to accumulate within excavations during performance of soil removal activities. Best management practices, as outlined in the New York Standards and Specifications for Erosion and Sediment Control, will be used to prevent the inflow of stormwater into such excavations. If necessary, excavations that fill with water may be pumped dry. If the sequence of work warrants, the Contractor will pump all water from the excavation into the existing wastewater disposal basin prior to the remediation

of this area. This water will be allowed to drain into the existing soils within the basin. Storm water management during excavation of soils within wastewater disposal basin will require the use of a frac tank with additional treatment prior to discharge.

Based on Site hydrogeology, groundwater mounding should only be a concern when excavating below 50 feet AMSL. Therefore, excavation below 50 feet AMSL will only be performed when the effects of groundwater mounding, if any is observed after a significant stormwater event, have dissipated. Best management practices to prevent the inflow of stormwater into excavations will also minimize the effects of groundwater mounding after a significant storm event.

The Contractor will be responsible for acquiring all permits related to excavation dewatering.

2.4.8 Onsite Soil Stabilization (Optional)

Onsite stabilization of soils with hazardous characteristics may be performed prior to offsite disposal. Soils shown on the Technical Drawings and any stockpiled soils with sample results exhibiting hazardous characteristics may be stabilized to meet certain performance criteria prior to its removal for land disposal at an offsite Subtitle D permitted TSDF: These performance criteria include, but are not limited to:

- Acceptable physical properties for materials handling;
- RCRA land ban treatment requirements for D007 (chromium) hazardous waste and D006 (cadmium) hazardous waste; and
- Chemical limits for land disposal of materials in a Subtitle D (or C at the discretion of the Contractor) permitted TSDF.

The Contractor will submit for approval, the stabilization method to be used, as well as the results of a treatability study documenting the feasibility of the solidification/stabilization method. The stabilization method will (at a minimum) determine the ability of solidification to meet Toxicity Characteristic Leaching Procedure (TCLP) requirements and determine the optimum ratio of solidification agent to soil. The Contractor will also perform any tests that may be required by the receiving TSDF.

2.4.9 Post-Excavation Confirmation Sampling

Post-excavation confirmation samples will be collected when the limits of soil removed in the vertical or horizontal direction have been reached and it is anticipated that soils with concentrations below the Site Performance Standards have been encountered.

Once the horizontal limits of soil removal, as shown on the drawings, are reached for each elevation, sufficient soils will be removed, for slope stability, from the excavation sidewalls. This cutback soil will be windrowed in proximity to the excavation and sampling will be performed to verify the horizontal limits of removal have been met and the soil is eligible to be reused as backfill material.

Post-excavation samples will only be collected from the sidewall and bottom of the excavation once the vertical limit of soil removal have been achieved, as shown the Technical Drawings. Bottom excavation samples will not be collected if the bottom of excavation elevation coincides with the elevation of groundwater. Soils below the elevation of groundwater will not be excavated or sampled and will be addressed in Remedial Element III (onsite and offsite groundwater) and are, as such, not part of this Remedial Design.

The SAMP provides additional details regarding post excavation sampling. The data collected during the course of the RA at the Site will be used to confirm that the various components of the RA have been properly implemented. Therefore, the data must be sufficiently accurate to determine whether Performance Standards have been achieved.

2.5 Construction Quality Assurance Objectives

The three quality assurance objectives for the construction of the Remedial Design are:

1. To ensure that all construction activities are implemented in accordance with the ROD, Order (and SOW), and Remedial Design, which includes the Technical Drawings, Specifications, CQAPP, SAMP, T&D Plan, and HSCP. These construction activities include, but are not limited to:
    - The use of appropriate construction practices, means, methods and techniques;
    - The use of materials of construction as required by the Technical Drawings and Specifications or as commonly accepted in the construction industry;

- The use of specified or approved testing methods to ensure that all earthwork activities are performed and/or installed as required by the Remedial Design;

- The use of specified or approved sampling and analytical methods and procedures, and quality assurance protocols as required by the Drawings, Specifications, and SAMP; and

- The preparation of documentation (as outlined in the CQAPP) to track and identify that all activities related to the construction of the Remedial Design are conducted in accordance with the Remedial Design Contract Documents.

2. To ensure that all Site activities are implemented safely, in accordance with the ROD, Order (and SOW), and Remedial Design documents (including the Drawings, Specifications, and project plans). These activities include but are not limited to:
   - The implementation of appropriate OSHA requirements during construction activities;

   - The implementation of all applicable federal and state requirements when personnel are working onsite in areas of potential exposure to the chemicals of concern; and

   - The execution of proper Site-specific health and safety measures to prevent the injury of individuals at or near the Site who are not directly involved with the construction activities being conducted.

3. To ensure that the constructed Remedial Design functions in accordance with the intent of the ROD, Order (and SOW), and the Remedial Design, and meets the performance standards established for the Site.

The following Contractor personnel will have specific duties regarding the quality assurance of the construction.

Project Director

The Contractor's project director is responsible for the overall direction of the implementation of the RA. The responsibilities of the Contractor's project director generally include administrative review and interaction with the Engineer. The Contractor's project director is also responsible for overseeing the construction activities, schedule, and budget maintenance.

Project Manager

The Contractor's project manager is responsible for general administration of the contract to carry out implementation of the RA, including providing technical guidance and resolution of technical issues, schedule and budget maintenance, and review of project deliverables. The

Contractor's project manager will supervise and direct the construction of the Remedial Design competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the construction in accordance with the Contract Documents. The Contractor's project manager will be responsible for the means, methods, techniques, sequences, and procedures of construction, except as otherwise specified in the Contract Documents, and is responsible for ensuring that the finished work complies accurately and completely with the Contract Documents.

Superintendent

The Contractor will have onsite, at all times during the RA, a competent superintendent. The Contractor's superintendent will not be replaced without written notice to and approval from the Engineer. The superintendent will be the Contractor's representative at the Site and will have authority to act on behalf of the Contractor. The Contractor's superintendent will act as directed by and under the supervision of the Contractor's project manager. The Contractor's superintendent will be the main contact between the Contractor and the Engineer's Resident Project Representative regarding all onsite work. The Contractor selected to perform the RA will determine the specific duties and responsibilities of the Contractor's superintendent.

The Contractor's superintendent may also be the Contractor's Site safety representative or another individual may be selected for the Site safety role.

Site Safety Representative

The Contractor will have on-Site, at all times during the RA, a Site Safety Representative (SSR). The SSR will principally be responsible for enforcing the Contractor's Health and Safety Plan (HASP) and ensuring the Contractor's compliance with the HSCP.

3.0 CONSTRUCTION OVERSIGHT

The implementation of the RA at the Site will require the PRP Group to select an Engineer to oversee the construction and perform inspection and certification services, as well as other Construction Quality Assurance Tasks. The Engineer will perform the construction oversight in accordance with the CQAPP and the General Conditions of the Specifications. The Engineer will have a number of people associated with these tasks.

The Engineer will oversee the construction and will ensure that all provisions of the construction Contract Documents (the "Contract" or the "Work") are enforced. The Engineer will have no authority to order additional work to be performed or to alter any term or condition of the Contract, including technical provisions, and will have no authority to waive or lessen any requirement of the Contract.

The Engineer will staff the project with the following staff members:

- Resident Project Representative (RPR) with overall responsibility for overseeing daily construction activities and daily logging of Contractor's work efforts;
- Site Safety Officer (SSO) with responsibility for ensuring that all work at the Site is performed in accordance with the HSCP; and
- Additional construction inspectors, technicians, and clerks, as needed.

The qualifications and specific roles and responsibilities of the personnel who will perform these construction oversight activities are set forth in the contract documents. In general, all onsite personnel will be properly trained in accordance with applicable federal, state and local health and safety regulations including 29 CFR 1910.120 and 29 CFR 1926. The Health and Safety Manager will ensure that all personnel working at the Site will be HAZWOPER-certified, and have obtained medical clearance to perform the Work at the Site. The Health and Safety Manager will keep the OSHA Certifications and medical clearance certifications onsite for the duration of the Project. In addition, the Health and Safety Manager will ensure that the Site Safety Officer is a "competent person" in accordance with 29 CFR 1926. The remainder of this section describes the construction oversight activities that will be implemented by the Engineer during the RA. These activities are:

- Observation, inspection, and certification of the Contractor's work;

- Implementation of the HSCP (including remedial air monitoring elements);
- Confirmatory sampling and monitoring as outlined in the SAMP;
- Preparation of documentation and record keeping, including measurement (of quantities), daily logging, and as-built drawings; and
- Perform independent quality assurance of the RA, including filed performance testing.

3.1 Project Organization And Responsibility

General project responsibilities, management structure, and roles for the Engineer and key personnel titles have been established based on previous approaches and experiences on similar projects. An overall project organization chart is provided in Figure 1.

The SOW requires that the CQAPP specify an Independent Quality Assurance Team (IQAT) to conduct the quality assurance program during the construction phase of the project. For the implementation of the RA, the IQAT will consist of the Engineer's Project Director (PD), Project Manager (PM), RPR, Quality Assurance Officer, Health and Safety Manager, SSO, technical review team, and members of the field and office support teams, as appropriate.

Project Director

The PD will oversee the PM and will be responsible for maintaining appropriate management controls at all responsibility levels of the project.

Project Manager

The PM will be responsible for general administration of the contract to implement the Remedial Action. The CQAPP related responsibilities of the PM include:

- Supervising field and office support staff;
- Interfacing with the Contractor's project director;
- Ensuring that all requirements of the SAMP are being followed in the field;
- Responding to technical questions from field and laboratory oversight personnel;
- Conducting periodic visits to the Site to observe progress and quality of the Contractor and Engineer's work;
- Supervising field and office support staff, including the RPR;

- Interfacing with the Contractor's project director;
- Ensuring that all requirements of the HSCP are being followed in the field;
- Overseeing coordination of construction contracts and the Site remediation contract requirements;
- Ensuring that the completed work of the Contractor conforms to the requirements of the Remedial Design Contract Documents;
- Disapproving or rejecting work of the Contractor that does not conform to the requirements of the Contract Documents or accepted construction practices;
- Interfacing with the Remedial Design project manager and project engineer to obtain clarifications regarding the intent of the Remedial Design documents;
- Issuing interpretations and clarifications of the Contract Documents and receiving and approving change orders as necessary;
- Reviewing shop drawings submitted by the Contractor and evaluating and determining acceptability of substitute materials proposed by the Contractor;
- Requiring special inspections or testing and reviewing all certificates of inspections or testing required by the Contract Documents or other rules or laws;
- Reviewing the Contractor's applications for payment and recommending payments to the Contractor;
- Reviewing the Contractor's final completion documents and performing final inspection to determine if the Contractor's work is complete and in accordance with the Contract Documents;
- Approving the preparation of the Record ("As-Built") Documents;
- Preparing the Remedial Action Completion Report; and
- Preparing monthly progress reports, reviewing the Engineer's invoices with the PRP Group, and budget tracking.

Resident Project Representative

- As required by the Order, the RPR will be the lead site representative provided by the Engineer to ensure that the Work is performed in accordance with the approved RA submittals. The RPR will be the main contact between the Engineer and the Contractor regarding all onsite Work and will act as directed by and under the supervision of the Engineer's PM. The RPR will be onsite when construction activities associated with the RA are being performed and will oversee daily construction activities. The duties and responsibilities of the RPR related to the CQAPP will include:

- Supervising the field support staff;
- Assuring that all field team members are familiar with the SAMP and HSCP, as appropriate;
- Overseeing sampling activities and ensuring that approved sampling and QA/QC methods and protocols are followed, and that pertinent sampling information is obtained, including the appropriate logging and documentation of these activities;
- Overseeing the proper collection, preservation, packaging, documentation and chain of custody samples until released to another party for transport to the analytical laboratory;
- Evaluating samples furnished at the Site by the Contractor;
- Assisting the PM in executing the responsibilities as outlined above;
- Performing all duties outlined in the General Conditions Section of the Specifications;
- Inspecting the Contractor's work to determine if the Work is proceeding in accordance with the requirements of the Contract Documents;
- Disapproving or rejecting the Contractor's work that does not conform to the requirements of the Contract Documents;
- Forwarding interpretations and clarifications of the Contract Documents from the Engineer to the Contractor;
- Maintaining orderly files of Contract Documents, meeting minutes, submittals and other construction correspondence;
- Maintaining a daily log and completing daily reports, which will include but may not be limited to the following information:
  - A summary of work performed by the Contractor each day;
  - Conditions at the Site;
  - Instructions given to the Contractor;
  - Field problems encountered and resolution;
  - All personnel onsite, including employees of the Contractor, subcontractor(s), and Engineer and visitors to the Site;
  - All equipment onsite and equipment used that day;
  - All materials or equipment delivered to the Site;
  - Preliminary (i.e., unverified) quantities of pay items placed;

  - Field tests performed and results;
  - Quality of the work, including identification of any materials or work that do not conform to the requirements of the Contract Documents;
  - References to surveys made that day, if any;
  - Unusual occurrences or accidents;
  - Events that have an impact on the performance of the Work;
  - Observation of Contractor's compliance with the HSCP;
  - The daily activities of each of the Engineer's own forces in terms of locations where the Contractor's Work was inspected, items of work inspected, results of such inspections, and similar data;
  - Results of follow-up inspections of previously reported deficiencies; and
  - Any other project-related events not identified above.
- Running Site construction progress meetings (once every two weeks) and preparing meeting minutes;
- Evaluating samples furnished at the Site by the Contractor;
- Advising the Engineer's PM if special inspections or testing are required and reviewing all certificates of inspections or testing required by the Contract Documents or other rules or laws;
- Reviewing Contractor's applications for payment with Contractor before forwarding to PM;
- Performing final inspection to determine if the Contractor's work is complete and in accordance with the Contract Documents;
- Interfacing with onsite regulatory personnel; and
- Assisting the PM in executing his responsibilities as outlined above.

The RPR will interface closely with the Engineer's PM and SSO, as well as onsite regulatory personnel and the Remedial Design support team, as appropriate.

Quality Assurance Officer

The Quality Assurance Officer reports to the PM and is responsible for the implementation of the SAMP. This individual is responsible for maintaining quality control on all aspects of the project

from sampling to report preparation. The Quality Assurance Officer also interfaces with the laboratory to address issues that may arise in the laboratory's performance of the specified methodologies pursuant to desired protocols. This individual will oversee the data validator who will be responsible for auditing and validating all analytical data generated during the RA as described herein.

Health and Safety Manager

The Health and Safety Manager is responsible for:

- Administering and tracking the Site employee's health monitoring program and other mandated OSHA record keeping (OSHA 200 and 101 Forms);
- Implementing the HSCP prepared for the RA;
- Providing industrial hygiene/OSHA/safety guidelines for all appropriate Site activities (e.g., selection, maintenance, use of protective gear; use of dangerous equipment, etc.)
- Developing procedures that facilitate project planning and implementation; and
- Conducting all required training programs.

Site Safety Officer

The Engineer's Site Safety Officer (SSO) will have the following duties:

- Ensuring the Engineer's field team members have completed the health and safety training required by the HSCP;
- Ensuring the Contractor's field team members have submitted documentation confirming the completion of the health and safety training required by the HSCP;
- Observing all construction activities to determine whether work at the Site is being conducted in accordance with the HSCP;
- Performing dust monitoring and be responsible for the Contractor's health and safety where the potential exposure to chemical hazards exists;
- Overseeing the performance of all Site perimeter air monitoring;
- Having the authority to stop work if Site conditions exceed allowable limits (as identified in the HSCP) and, as appropriate, will assume certain sampling responsibilities;
- Coordinating with the PRP Group's Project Coordinator, the Engineer's Health and Safety Manager (HSM), PM, and RPR, the Contractor's superintendent, and the emergency responder, as appropriate in the event problems arise;

- Coordinating with emergency response personnel; and
- Maintaining a daily log.

As described in the HSCP, the SSO will be a "Competent Person" who will have the specific duties outlined in 29 CFR 1926, and will oversee the performance of full-time environmental monitoring, including particulate monitoring. The SSO will be responsible for the Contractor's health and safety associated only with potential exposure to OSHA contaminants. All other guidelines and requirements of the HSCP and OSHA (i.e., construction safety) must be implemented and performed by the Contractor. The SSO will not be responsible for full-time supervision of the Contractor's compliance with these construction safety requirements, but will notify the Contractor's site superintendent, Engineer's PM and RPR, and the PRP Group's Project Coordinator if deficiencies are observed.

Technical Review Team

The individuals assigned to the technical review team will provide technical review and guidance associated with the construction of the Remedial Design and assist in maintaining quality control on all aspects of the project.

Field Support Team

The Engineer's field support team will consist of construction inspectors and field technicians as required by the RPR and SSO.

Office Support Team

The Engineer's office support team will consist of the project engineer, data validator, staff engineer(s), and word processing and drafting/CADD support, as required by the PM.

Laboratory Subcontractor(s)

The analytical laboratory subcontractor is responsible for supplying properly cleaned and prepared glassware and analyte-free water for field use, and for analysis of all samples collected during the implementation of the RA and for completion of chain-of-custody forms for all samples. The laboratory is also responsible for following analytical and quality control

procedures outlined in this SAMP and for interfacing with the data validator to ensure data meets the RA data quality objectives.

3.2 Observation And Inspection Of Contractor's Work

The Engineer is responsible for observing, inspecting, and documenting the work of the Contractor. In addition to the responsibilities stated for each member of the project oversight team, the Engineer's responsibilities include:

- Observing and inspecting the Contractor's work to determine if the work is proceeding in accordance with the requirements of the Remedial Design Contract Documents;
- Disapproving or rejecting work performed by the Contractor that does not conform to the requirements of the Contract Documents;
- Reviewing Shop Drawing submittals to ensure that materials and equipment to be provided by the Contractor meet the requirements of the Contract Documents and to determine acceptability of substitute materials proposed by the Contractor;
- Informing Contractor if special inspections or testing are required, overseeing the performance of special inspections or testing ordered by the PRP and reviewing all certificates of inspection or testing results required by the Contract Documents or other rules or laws;
- Observing Contractor's stabilization performance (if onsite stabilization is performed) and waste disposal characterization sampling and testing activities and ensuring that approved and/or specified methods are followed, and that all sampling and testing activities are logged and documented appropriately (refer to the SAMP);
- Overseeing the Contractor's coordination of offsite transportation and disposal of all Site media;
- Issuing interpretations and clarifications of the Contract Documents (including field orders);
- Recommending change orders (to the PRP Group) as necessary;
- Reviewing Contractor's applications for payment and recommending Contractor payment amounts to the Group;
- Performing inspections to determine if Contractor's work meets the requirements for substantial completion in accordance with the Contract Documents;
- Reviewing Contractor's final completion documents and performing final inspection to determine if, and ensure that, Contractor's work is complete and conforms to the requirements of the Contract Documents; and

- Serving as liaison for the PRP Group with authorized regulatory personnel on all matters, including but not limited to, progress of work, Contractor performance, regulatory sampling activity and/or disputes pertaining to the requirements of the Contract Documents and actual work.

The Engineer (except for its own activities and those of its subcontractors) will not have control of, and will not be responsible for, Contractor's construction means, methods, sequences, or safety precautions and programs in connection with the work, for the acts or omissions of the Contractor, or for the failure of the Contractor to carry out work in accordance with the Contract Documents. However, the Engineer will observe and review completion of the project by the Contractor, will require the Contractor to conform with the requirements of the Contractor's Contract Documents, and will report to the PRP Group any deviations by the Contractor, of which the Engineer becomes aware.

3.3 Implementation Of The Health And Safety Contingency Plan

The Site-specific HSCP conforms to the applicable OSHA and EPA requirements, including but not limited to, 29 CFR 1910.120, and was prepared to ensure the protection of persons at and in the vicinity of the Site during the construction of the Remedial Design.

An SSO will be onsite at all times during remedial activities involving potentially contaminated media, who will ensure that the HSCP is being followed by the Contractor and authorized onsite personnel. The SSO will oversee the performance of work by the Contractor when the potential exposure of onsite personnel to OSHA contaminants exists. The SSO will perform monitoring to ensure that: (1) exposures of onsite personnel to potential releases of contaminants generated by construction activities are minimized; and (2) airborne particulates containing Site related constituents are not released beyond the Site boundary as a result of work activities at the Site. Refer to the SAMP and HSCP for identification of specific responsibilities of the SSO.

The Contractor must adhere to all guidelines and requirements of the HSCP and all other authorized personnel onsite at all times. As described in the HSCP, the SSO will oversee the performance of full-time environmental monitoring, including particulate monitoring. The SSO will also monitor the Contractor's compliance with the their own Site-Specific HASP associated only with potential exposure to OSHA contaminants. All other guidelines and requirements of

the HSCP and OSHA (i.e., construction safety) must be implemented and performed by the Contractor. The SSO will not be responsible for full-time supervision of the Contractor's compliance with these construction safety requirements, but will notify the Contractor's Site superintendent, Engineer's PM and RPR, if deficiencies are observed.

The Engineer will be authorized by the PRP Group to issue orders stopping the work, if in the Engineer's opinion, the Contractor is violating the HSCP, their own Site-specific HASP, OSHA regulations, any other applicable regulations concerning safety, or is otherwise conducting work in an unsafe, unhealthy or environmentally unsound manner.

3.4 Confirmatory Sampling And Monitoring

Confirmatory Sampling and Monitoring is included in the SAMP. The SAMP addresses the sampling methods and analytical procedures to be used for confirmatory sampling of Site soil, and subsurface structures, as applicable, as well as quality assurance protocols to be followed for all sampling and analytical procedures.

The Engineer will perform all confirmatory sampling, monitoring and analytical work in accordance with the SAMP. The Engineer, on behalf of the PRP Group, will retain a laboratory to perform the required analytical work for all samples.

3.5 Preparation Of Documentation And Record Keeping

This section identifies the documentation that will be prepared and records that will be collected and maintained by the Engineer during implementation of the RA. The records will describe essential work elements such as methods of construction, daily activities and the quality and quantity of materials excavated or used and of the work performed. The specific types of records that the Engineer will prepare and/or maintain are:

- Daily logs (including safety logs);
- Submittal log;
- Material delivery records;
- Material shipment records;
- Survey records;

- Change orders;
- Accident reports;
- Punch list ; and
- Miscellaneous documents.

The work associated with the preparation and/or maintenance of these records and documents is described in the following sections. The final format of the record keeping system will be selected before construction activities are initiated. All records will be available onsite for review by EPA during implementation of the RA.

3.5.1 Daily Logs

The RPR, assisted by members of the field support team, will maintain a daily log that will include the following information:

- Conditions at the Site;
- All personnel onsite, including employees of Contractor, subcontractor(s), Engineer, and the EPA and other government agencies' representatives and regulatory oversight Contractors;
- Visitors to the Site;
- All equipment on Site and equipment used that day;
- All materials or equipment delivered to the Site;
- References to and documentation of surveys and field tests made that day, if any;
- Instructions given to the Contractor;
- Summary of work performed by Contractor each day, including progress of Site remediation activities (e.g., areas of excavation completed);
- Approximate quantities of pay items (e.g., volume of soil excavated, and transported);
- The daily activities of the Engineer's onsite personnel including identification of locations where the Contractor's work was inspected, items of work inspected, results of such inspections and similar data;
- Identification of any materials or work that does not conform to requirements of the Contract Documents;

- Unusual occurrences, accidents, and other events that have an impact on the performance of the work;
- Field problems encountered and resolution;
- Results of follow-up inspections of previously reported deficiencies; and
- Any other pertinent daily project-related events not identified above.

The SSO will maintain a separate daily site safety log for health and safety activities. The daily site safety log will include:

- Conditions at the Site;
- Topic and/or discussion items of Site safety tailgate meeting;
- Details of daily safety inspections;
- Work area and perimeter air monitoring data; and
- Personal protective equipment information.

The daily logs will be kept in the field office/trailer and no entries will be deleted. The RPR and SSO will keep their daily logs current and will sign and date each day's log, and initial each page. At the completion of the construction phase, the logs will be incorporated into the project files.

The Contractor will also be required to prepare a daily log to submit to the Engineer at the end of each day. The log will summarize the work completed each day and will identify the number of workers onsite working for the Contractor and each subcontractor (broken down by craft), and the major equipment items onsite. The Contractor's daily report will also identify dates of commencement and completion of all aspects of the Work, and will be maintained at the Site.

3.5.2 Submittal Log

The Engineer will have the responsibility for performing and coordinating the review of all submittals (e.g., work plans, Shop Drawings, etc.). The Engineer will receive, log, review, and distribute all Contractor submittals required by the Specifications. A submittal log will be established and maintained using a spreadsheet program such as Excel. All submittals will be assigned a tracking number based on the Specification reference. The submittal log will include

a description of the submittal and will identify the submittal review status, key milestone dates (e.g., received, reviewed, due and return dates), identification of the reviewer(s) and any appropriate comments/remarks. A current submittal log will be available for review at the Site and will also be distributed with the monthly progress report described in Section 4.4.

3.5.3 Material Delivery Records

The Contractor will be required to submit copies of material delivery records to the Engineer for all materials delivered to the Site. The Engineer will maintain a file of these records and, if the specifications require that the material to be used on the Project be certified by an outside testing laboratory prior to delivery, the Contractor will be required to submit this certification to the Engineer before the material is delivered to the Site. The Engineer will keep this information on file at the Site.

3.5.4 Material Shipment Records

Copies of all documents required for transport and disposal of materials off-Site will be maintained on file at the Site. These documents will include hazardous manifests and non-hazardous bills of ladings, and "Land Disposal Notification and Certification Forms" (LDR Forms) if necessary. The Engineer will compare the quantity of materials shipped off-Site to the quantities identified in the Contractor's applications for payment. Copies of each manifest or bill of lading and any LDR form will be will be available for review by EPA at the Site.

3.5.5 Survey Records

The contract documents require that the Contractor employ a New York licensed surveyor who will lay out the locations of all Work and who will perform all surveying required by the Contract Documents. Use of a licensed surveyor will ensure that the Contractor has conducted all Work items to the limits established on the Drawings. Surveys are also necessary to determine the quantity of Work performed by the Contractor, and to document the final location of all Work. Survey information will be used for payment purposes, and to prepare record drawings. The Contractor will also be required to provide a survey of the post-excavation locations so that limited excavation of areas with soils exceeding the Performance Standards can be conducted.

The performance of all surveys will be the responsibility of the Contractor. The Engineer will maintain copies of all surveys conducted during the project. The Contractor will be required to show all applicable survey information on the record drawings to be submitted at the end of the project.

3.5.6 Changes In Work

Written Amendments, Work Change Directives, or Change Orders may authorize addition, deletion or revision in the Contract Documents, Scope of Work, or an adjustment in the contract price or times. Management of such changes will be the responsibility of the Engineer. Change orders requested or proposed by the Contractor will be reviewed to determine if it is additional work that is not included in the Scope of Work of the Contract Documents. Changes in work will only be considered as a result of one of the following criteria:

- Differing Site condition;
- Error or omission in plans or specifications;
- Change instituted by regulatory agency or the PRP Group;
- Field emergency; and
- Other factors affecting time of completion not under control of Contractor.

The Engineer will provide recommendations on change order requests by the Contractor to the PRP Group. All change orders issued by the PRP Group will be consistent with the scope of the remedy selected in the ROD. In the event a proposed change order covers work that modifies the scope of the remedy selected in the ROD, it will also be subject to EPA approval prior to authorization by the PRP Group. Copies of each change order will be forwarded to the PRP Group and will be available for review by EPA upon request.

3.5.7 Accident Reports

EPA's on-Site representative will be immediately notified of any accidents at the Site. If the EPA, or EPA's designated representative, is not on-Site, the EPA will be notified by telephone.

Accident reports will be generated by the Engineer as soon as possible and no later than one week after an incident resulting in injury to humans or a release of contamination has occurred.

Accident reports will contain a description of the injury or release, the current status of the situation and the steps taken, or planned to be taken, in response to the accident.

Copies of each injury related accident report will be forwarded to the PRP Group and will be available on-Site for review by the EPA. Accident reports regarding releases of potentially contaminated materials will be prepared and distributed in accordance with the "Notification Requirements" sections of the HSCP.

3.5.8 Punch List

When the Work is considered ready for its intended use (approximate 95 percent of the Work has been completed), the project will be considered substantially complete, and the Engineer will develop a punch list. The punch list will be used to identify all deficiencies in work items that must be corrected or work items that must be completed before the project is complete and the final payment can be made to the Contractor.

The Contractor will be given a specific length of time to complete or correct the items. At the end of this period, the Engineer will inspect the work in general and the punch list items in particular. If all items are acceptable, the Engineer will approve final payment and closeout of the Contract. If there are still items that are deficient or outstanding, the Engineer will generate an updated punch list and the process repeated until all work items are completed in accordance with the Contract Documents. Copies of each punch list will be forwarded to the PRP Group and will be available on-Site for review by the EPA.

The Contract Documents will require that a certain percentage of the contract amount be withheld (retainage) until all items on the punch list have been completed to the approval of the Engineer, the PRP Group and the EPA.

3.5.9 Miscellaneous Documents

Copies of meeting minutes, shop drawings, submittals, applications for payment and other construction documents and correspondences will be maintained in orderly files on-Site.

3.6 Independent Quality Assurance Team

The IQAT will be formed to conduct the quality assurance program during the construction phase of the project. As previously mentioned, for the construction of the Remedial Design, the IQAT will consist of the PM, RPR, QAO, HSM, SSO, technical review team, and members of the field and office support teams as appropriate. Persons with specific quality assurance roles are the PM, RPR, and QAO. The roles for each of these members are outlined above in Section 3.1.

4.0 PREPARATION OF DOCUMENTATION FOR EPA

In addition to the documentation and records that will be prepared and/or collected and maintained by the Engineer during construction, the Order requires that certain construction related reports or documents be prepared and submitted to the EPA. These documents include:

- Written identification of all proposed Contractors for the RA;
- Written notification of any off-Site shipment of waste material to an out-of-state waste management facility;
- Progress reports;
- Notifications pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA); and
- A Remedial Action Completion Report.

4.1 Off-Site Shipment Of Wastes

The identity and location (State) of the disposal facilities that will receive materials from the Site will be determined following the award of the Contract. EPA will be provided with this information as soon as practicable after the award of the Contract and before any Site media are shipped off-Site.

In accordance with the Order, prior to any off-Site shipment of hazardous substances from the Site to an out-of-state waste management facility, written notification will be provided to the appropriate state environmental official in the receiving facility's state and to the EPA Remedial Project Manager of such shipment of hazardous substances.

The above referenced notification will be provided as soon as practicable after the award of the Contract, but in no case less than fourteen (14) days before the hazardous substances are actually shipped. This notification requirement does not apply to any off-Site shipments when the total volume of all such shipments does not exceed 10 cubic yards.

The following information will be included in the written notification, where available:

- The name and location of the facility to which the hazardous substances is to be shipped;
- The type and quantity of the hazardous substances to be shipped;

- The expected schedule for the shipment of the hazardous substances; and
- The method of transportation.

The state in which the planned receiving facility is located will be notified of major changes in the shipment plan, such as a decision to ship the waste material to another facility within the same state, or to a facility in another state, or of a significant change in volume or shipment schedule.

4.2 Remedial Action Health And Safety Contingency Plan

A remedial action HSCP has been prepared as a separate document and is included with this 100% Remedial Design submittal.

Specification Section 01517 (Health and Safety Plan and Requirements) requires that the Contractor comply with all substantive requirements of this HSCP and use the HSCP as a guide in preparing their own site specific health and safety plan.

4.3 Contractor's Submittals Requiring EPA Approval

As required by the SOW, within 40 days of the award of the RA contract, the Contractor will submit a RAWP that will be subject to review and comment by the EPA. In accordance with Specification Section 01300 (Submittals), the Contractor's RAWP will outline the approach for all Site media handling activities, and will include but not be limited to the following;

- Any "Requests for Modification of Approved Final RD Report", based on the Contractor's own construction methods,
- Modifications to the construction schedule approved in the Final Remedial Design,
- A Site management plan for remedial construction activities which includes a methodology for implementation of the RD and CQAPP, decontamination plans for construction equipment, and a schedule for implementation of the RA,
- Methods for excavation, handling, stabilization (optional), transportation, and disposal of excavated soils.

The RAWP will be forwarded to the EPA for review concurrent with the Engineer's review. The intent of the regulatory review is to ensure that the Work described in the RAWP complies with the intent of the Remedial Design. Any regulatory review comments pertaining to the

Contractor's implementation of the Remedial Design will be incorporated with the Engineer's comments on the RAWP and forwarded to the Contractor for incorporation into the final RAWP. In addition, any regulatory comments that do not pertain to the Remedial Design will be given due consideration by the Engineer and the PRP Group.

The Engineer will ensure that the Contractor's RAWP is submitted to the EPA for review in accordance with the schedule set forth in the final design submittal. This schedule, which will identify the major submittals required from the Contractor, will specify review and approval time frames for the PRP Group and the EPA, as appropriate, to avoid delays in the performance of the Work.

Upon receipt of comments from the regulatory agencies, the PRP Group and the Engineer will review the comments (with the regulatory agencies, if deemed necessary) and forward all substantive comments, as described above, to the Contractor for incorporation in the final RAWP. Regulatory comments that are not directly related to compliance with Remedial Design, or which change the requirements of the Contract Documents, will not be forwarded to the Contractor unless agreed to by the PRP Group.

4.4 Progress Reports

Written progress reports will be submitted monthly to the EPA. Progress reports will continue to be submitted on a monthly basis in the same format during construction activities until the EPA notifies the PRP Group otherwise.

4.5 Results Of Inspections

As required by the order, the results of all inspections performed will be reported to the PRP Group and to the EPA in the monthly progress reports.

4.6 Remedial Action Completion Report

Following completion of the RA and attainment of the Performance Standards, a Remedial Action Report (RAR) will be prepared and submitted to the EPA pursuant to Section XI of the SOW. The report will be submitted to the EPA for approval within 30 days of the EPA's determination that the RA is complete.

The purpose of the report is to document the activities that occurred to implement the RA selected for the Site. The RAR provides documentation that the RA has met its objectives (Performance Standards) as well as summary information for subsequent inclusion in the Superfund Site Close Out Report to be prepared by the EPA.

The elements that will be included in the RAR include:

- Introduction;
- Chronology;
- Performance standards and construction quality control;
- Construction activities;
- Final inspection;
- Certification that remedy is operational and functional; and
- Summary of Project costs

It is anticipated that the following appendices will also be incorporated into the RAR:

- Monthly progress reports;
- Minutes of project progress meetings;
- Key project memoranda;
- Results of sampling activities conducted during construction; and
- Record ("As-Built") drawings.

The RAR will be prepared in accordance with EPA Publication 9355.0-39FS - Remedial Action Report, Documentation for Operable Unit Completion. In the RAR, a registered professional engineer and a representative of the PRP Group will certify that the RA has been completed in full satisfaction of the requirements of the Order.

The RAR will include record drawings signed and stamped by a registered professional engineer. The record drawings will contain all recorded construction information, and will reflect changes to the final engineering Drawings and Specifications in order to respond to actual field conditions, or other modifications that were made during the remediation phase of the project.

The record drawings will show all applicable survey information generated during construction of the Remedial Design.

5.0 ROLE OF REGULATORY AGENCIES

The EPA and its representatives will have access to the Site at all times. It is anticipated that there will be an EPA representative on-Site during construction of the Remedial Design.

All authorized visitors to the Site must be thoroughly familiar with the HSCP prepared for construction of the Remedial Design and will have full responsibility for compliance with the HSCP. All authorized visitors will be required to sign a Site entry log as well as an acknowledgment that they have read the HSCP.

As described in the HSCP, the SSO will oversee the performance of full time environmental monitoring, including particulate monitoring. The SSO will be responsible for all authorized visitors' health and safety associated only with potential exposure to Site contaminants. All other guidelines and requirements of the HSCP, the NYSDEC, and OSHA (i.e., construction safety) are the responsibility of the visitor. The Engineer will not be responsible for full-time supervision of authorized visitors. The RPR and/or SSO will document any non-compliant incidents in the daily logs and will notify the Engineer's PM and RPR, and the PRP Group's Project Coordinator of any such incidents.

In addition, the EPA and/or its authorized representatives are allowed to take split or duplicate samples of any sample collected by the PRP Group. In addition, the Specifications indicate that the EPA has the right to take any additional samples that the EPA deems appropriate.

The Specifications (Section 01012) also indicate that EPA concurrence is required on any disposal decisions concerning the results of Site Media TCLP testing performed prior to the stabilization of the Site media.

6.0 REMEDIAL ACTION CONSTRUCTION SCHEDULE

The Contractor will be required to submit a construction schedule as part of the submittal package. A preliminary schedule is shown as Figures 2 to show the approximate duration of the project.

The number of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment will be set forth in the Agreement between the PRP Group and the selected Contractor.

7.0 METHOD OF CONTRACTOR SELECTION

- The selection of a Contractor for performing the RA will be based upon factors including, but not limited to:
- Satisfaction of pre-bid qualifications;
- Cost for performing the Work;
- Qualifications of the bidder;
- Past experience with similar projects (of similar cost and scope); and
- Specific means and methods for satisfactorily completing the project.

The Engineer or the PRP Group's Representative will initiate a bid solicitation to potential contractors interested and potentially qualified in participating in the bid processes for the RA. To satisfy pre-bid qualifications for performing the RA, bidders will be required to submit prior to the bid phase and supplement as appropriate as part of their bids the following;

- Written evidence of financial position;
- Number of years in business;
- Evidence of compliance with insurance and bonding requirements;
- Previous experience of a minimum of three similar (cost and scope) projects;
- Project references;
- Current commitments;
- License to perform work in the State of New York;
- Potential subcontractor that Contractor may use on the project;
- Exceptions to any draft subcontract agreement issued for Contractor review and comment prior to providing a bid;
- OSHA documentation including employee Hazardous Waste Operations and Emergency Response (HAZWOPER) certifications;
- Written information regarding Contractor's health and safety programs;
- Contractors Worker Compensation Experience Modification Rates (EMR) for the most recent 3 years;

- OSHA Total Recordable Incident Rate, data for the most recent 3 years, including current year;
- OSHA 200/300 Log (enclose copies of the past 3 years, including current year);
- OSHA Citations. If the Contractor has received any OSHA citations for the most recent 5 years, the Contractor will be required to enclose copies with corrective actions taken; and
- OSHA Competent Person responsible for health and safety program.

Once the prequalification process has been completed, the Engineer or the PRP Group's Representative will initiate the bid phase by completing the following:

- Issuing the contract documents to acceptable pre-qualified bidders;
- Conduct a Site walkthrough with the bidders to review existing site conditions;
- Issue any bid addenda necessary for clarification to the contract documents;
- Develop a bid tabulation summarizing Contractor's submitted bid information; and
- Provide a recommendation to the PRP Group for selection of the Contractor to perform the RA.

The PRP Group may conduct investigations such as the PRP Group deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications and financial ability of the bidders or bidder's subcontractors. The PRP Group reserves the right to reject any bid where an investigation of the available information does not satisfy the PRP Group that the bidder is qualified to the PRP Group's satisfaction, regardless of comparison of prices on the bid form.

In evaluating bids, the PRP Group will consider the qualifications of the bidders, whether or not the bids comply with the prescribed requirements, unit prices and other data as may be requested in the Bid Form. If the Agreement is to be awarded, it will be awarded to lowest responsible bidder whose evaluation by the PRP Group indicates to the PRP Group that the award will be in the best interests of the PRP Group. The PRP reserves the right to award the Contract to other than the lowest (cost) bidder.

The selection of all Contractors will be subject to approval by the EPA.

8.0 APPROVAL PAGE

June 13, 2006 Construction Quality Assurance Project Plan for Remedial Elements I and II

Liberty Industrial Finishing Superfund Site
Village of Farmingdale, Nassau County, New York

Prepared by:
Remedial Engineering, P.C.
209 Shafter Street
Islandia, New York 11749

Approvals:

Project Director — Date: 6/12/06

Project Manager — Date: 6/12/06

Quality Assurance Officer — Date: June 12, 2006

US Environmental Protection Agency — Date

Table 1. Western Subsurface Features And USTs, Remedial Element II, Liberty Industrial Finishing Superfund Site

Subsurface Features ID	Location	Type of Subsurface Feature	Matrix Present	Exhibits Concentration above ROD Cleanup levels
SF-28	Loading dock #4 on western side of Building I	Concrete, bell-shaped structure with an adjoining pipe traveling to the west	Solids/ Liquid	Yes
SF-29	North of Building K	Feature has not been located	Unknown	Unknown Because Location was Not Sampled
SF-30	North of Building K	Concrete and brick cylindrical-shaped structure with adjoining pipes traveling in the east and southwest directions	Solids	Yes
SF-31	Loading ramp, northwest portion of Building K	Concrete cone-shaped structure with no visible adjoining pipes		Yes
SF-32	East end of Building W	Not accessed	Unknown	Unknown Because Location was Not Sampled
SF-33	East end of Building W, west side of asphalt berm	Concrete rectangular-shaped structure with no solid bottom. An 8-inch diameter pipe was observed running east and west	Solids/ Liquid	Yes
SF-34	South of Building W in north central portion of former Building G	Not accessed	Unknown	Unknown Because Location was Not Sampled
SF-35	Southwest of Building W garage door	An apparent cylindrical concrete structure with an adjoining pipe traveling south	Liquid/ Sediment Unknown	Unknown Because Location was Not Sampled
SF-36	Northwest corner of Site	Square concrete structure with a hollow structure beneath. No pipes observed.	Not Sampled	Unknown Because Location was Not Sampled
SF-37	Northwest corner of Site	Square concrete structure with a hollow structure beneath. No pipes observed.	Not Sampled	Unknown Because Location was Not Sampled
SF-38	North-west corner of Site	Square concrete structure with a hollow structure beneath. No pipes observed.	Not Sampled	Unknown Because Location was Not Sampled
SF-39	West of Building A	Square concrete structure with a solid bottom. Piping connected to a well head from the east was observed.	Solids	Unknown Because Location was Not Sampled
SF-40	West of Building A	Square concrete structure with a solid bottom. Piping connected to a well head from the east was observed	Solids	Unknown Because Location was Not Sampled
SF-50	West end unnamed building, between Building A and H	Cinder block structure with rectangular steel lid. 8-inch pipe traveling east and west observed	Solids	Yes
SF-53	Former Building G	Not Located	Unknown	Unknown Because Location was Not Sampled

Subsurface Features ID	Location	Type of Subsurface Feature	Matrix Present	Exhibits Concentration above ROD Cleanup levels
SF-54	South of Building I	Cinder block structure with rectangular steel lid. 8-inch pipe traveling east and west observed	Solids	Unknown Because Location was Not Sampled
SF-56	North Side of Building I	North side of Building I	Unknown	Unknown Because Location was Not Sampled
SD-01	North side of Motor Avenue	Storm Drain	Solids/ Liquids	Unknown Because Location was Not Sampled
UST-1	Beneath Building D slab	Three USTs	Fuel Oil/ Water	Removed
UST-2	South Side of Building W	UST	Fuel Oil	No. Interim Closed-in-place
UST-3	East of Building M pad	UST	Fuel Oil/ Water	No Interim Closed-in-place
UST-4	East of Building M pad	UST	Fuel Oil/ Water	No Interim Closed-in-place
UST-5	East of Water Tower	UST	Fuel Oil/ Water	No Interim Closed-in-place
UST-6	East of Water Tower	UST	Fuel Oil/ Water	No Interim Closed-in-place
UST-7	East of Chimney at Building A	UST	Fuel Oil/ Water	Interim Closed-in-place (not completed)
UST-8	Concrete pad North of Former Disposal Basins	UST	Fuel Oil/ Water	No Interim Closed-in-place
UST-9	North of Water Shaft, adjacent to rail tracks	UST	Empty	Empty
UST-10	North of Building K	UST	Active	Active/In-use
UST-11	Under Building I	UST	Active	Active/In-use
UST-12	North of Acetone Building	UST	Active	Active/In-use
UST-13	North of Building A	UST	Water	Sampled 2000 CRI/Left in place
GPR-12	Northwest corner of Building S pad	Unknown/Possible UST	Unknown	Unknown Because Location was Not Sampled
GPR-04	North of Building C	UST	Unknown	Unknown Because Location was Not Sampled
GPR-NS	Northwest of Building N	Unknown/Possible UST	Unknown	Unknown Because Location was Not Sampled
UT-1A	Beneath Building D slab.	UST	Unknown	Unknown Because Location was Not Sampled
OD-1	West of Building F	UST	Unknown	Unknown Because Location was Not Sampled

Figure 1. Project Organization Chart, Remedial Elements I and II, Liberty Industrial Finishing Superfund Site

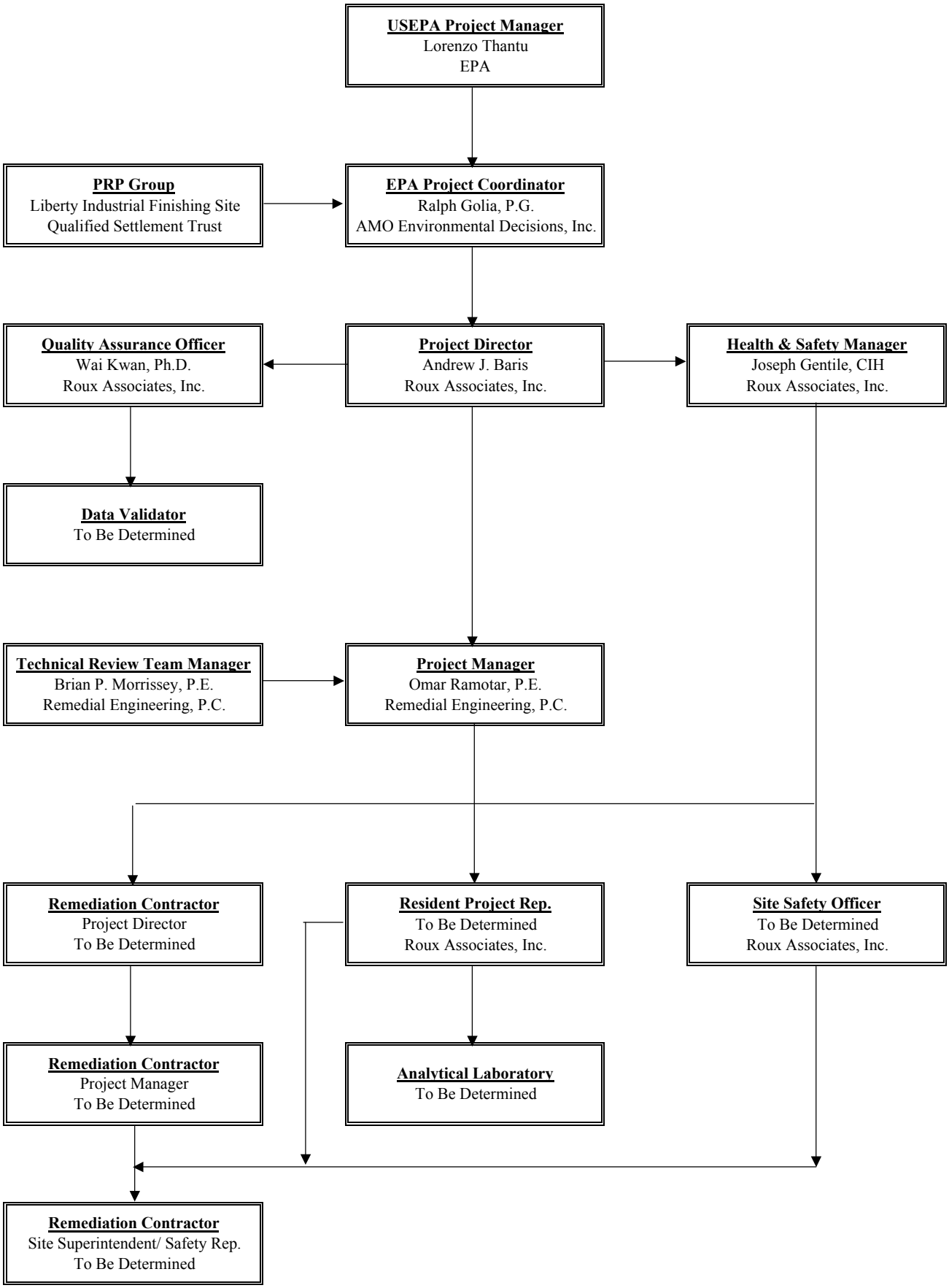
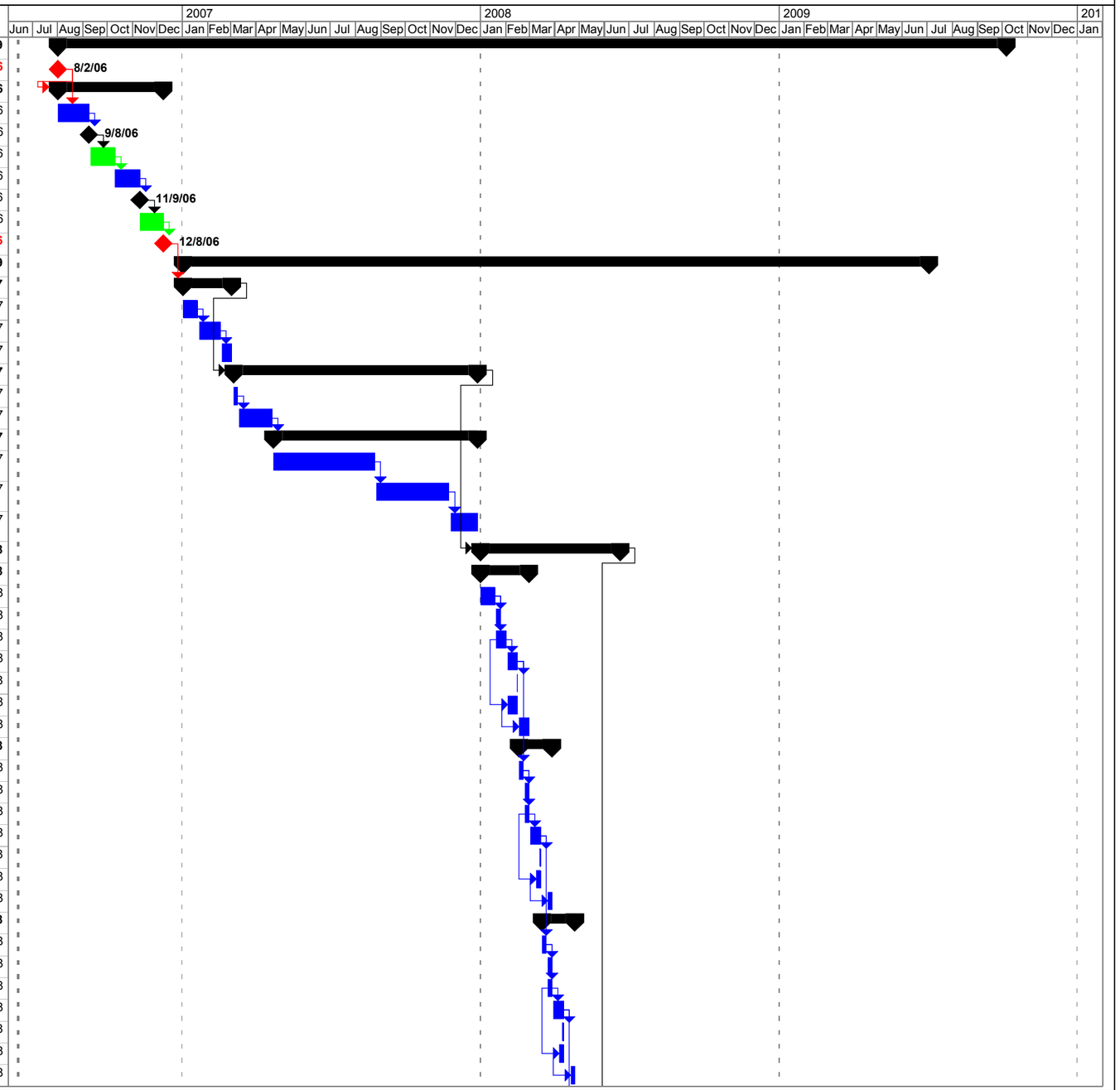


Figure 2. Remedial Action Schedule
Remedial Elements I and II (On-Site Soils and Subsurface Features)
Liberty Industrial Finishing Superfund Site

ID	Task Name	Duration	Start	Finish
1	**Remedial Elements I and II - Construction Related Activities**	**1162 days**	**Wed 8/2/06**	**Tue 10/6/09**
2	**Award of Contract (Awarded 40 days from Final Approval of 100% RD)**	**0 days**	**Wed 8/2/06**	**Wed 8/2/06**
3	**Remedial Action Work Plan (Submitted 40 days from Contractor Award)**	**129 days**	**Wed 8/2/06**	**Fri 12/8/06**
4	Prepare Draft RAWP (SMP, QAPP and HASP)	38 days	Wed 8/2/06	Fri 9/8/06
5	Submit Draft RAWP	0 days	Fri 9/8/06	Fri 9/8/06
6	EPA Review of Draft RAWP	30 days	Mon 9/11/06	Tue 10/10/06
7	Address EPA comments on Draft RAWP	30 days	Wed 10/11/06	Thu 11/9/06
8	Submit Final RAWP	0 days	Thu 11/9/06	Thu 11/9/06
9	EPA Review of Final RAWP	29 days	Fri 11/10/06	Fri 12/8/06
10	**EPA Approval of Final RAWP**	**0 days**	**Fri 12/8/06**	**Fri 12/8/06**
11	**Perform Remedial Action**	**914 days**	**Tue 1/2/07**	**Fri 7/3/09**
12	**Mobilize to Site**	**60 days**	**Tue 1/2/07**	**Fri 3/2/07**
13	Mobilization	18 days	Tue 1/2/07	Fri 1/19/07
14	Clear and Grub Site	26 days	Mon 1/22/07	Fri 2/16/07
15	Construct Staging Area	12 days	Mon 2/19/07	Fri 3/2/07
16	**Remediation of Subsurface Features**	**299 days**	**Mon 3/5/07**	**Fri 12/28/07**
17	Locate and Access Subsurface Features	5 days	Mon 3/5/07	Fri 3/9/07
18	Perform any Characterization Sampling	40 days	Mon 3/12/07	Fri 4/20/07
19	**Perform Remedial Activities**	**250 days**	**Mon 4/23/07**	**Fri 12/28/07**
20	Perform remedial activities at existing subsurface features, including confirmation sampling and restoration	124 days	Mon 4/23/07	Fri 8/24/07
21	Perform remedial activities at existing underground storage tanks, including confirmation sampling and restoration	89 days	Mon 8/27/07	Fri 11/23/07
22	Perform remedial activities at previously unknown subsurface features and storage tanks, including confirmation sampling and restoration	33 days	Mon 11/26/07	Fri 12/28/07
23	**Excavate and Stage Area 1**	**171 days**	**Wed 1/2/08**	**Fri 6/20/08**
24	**Excavate First Lift (FL) of Area 1 - (Grade to 60 ft.)**	**59 days**	**Wed 1/2/08**	**Fri 2/29/08**
25	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	17 days	Wed 1/2/08	Fri 1/18/08
26	Test Clean Soil (as described in SAMP)	5 days	Mon 1/21/08	Fri 1/25/08
27	Excavate & Stage FL to 60 ft.	12 days	Mon 1/21/08	Fri 2/1/08
28	Collect and Analyze Post-Excavation Bottom Samples & Review Results	12 days	Mon 2/4/08	Fri 2/15/08
29	Survey Location of Post-Excavation Samples	1 day	Fri 2/15/08	Fri 2/15/08
30	Test impacted Soils in 1000 cy increments	12 days	Mon 2/4/08	Fri 2/15/08
31	Transport Characterized Soils to TSDF	12 days	Mon 2/18/08	Fri 2/29/08
32	**Excavate Second Lift (2L) of Area 1 - (60 to 55 ft.)**	**40 days**	**Mon 2/18/08**	**Fri 3/28/08**
33	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 2/18/08	Fri 2/22/08
34	Test Clean Soil (as described in SAMP)	5 days	Mon 2/25/08	Fri 2/29/08
35	Excavate & Stage 2L to 55 ft.	5 days	Mon 2/25/08	Fri 2/29/08
36	Collect and Analyze Post-Excavation Bottom Samples & Review Results	12 days	Mon 3/3/08	Fri 3/14/08
37	Survey Location of Post-Excavation Samples	1 day	Fri 3/14/08	Fri 3/14/08
38	Test impacted Soils in 1000 cy increments	5 days	Mon 3/10/08	Fri 3/14/08
39	Transport Characterized Soils to TSDF	5 days	Mon 3/24/08	Fri 3/28/08
40	**Excavate Third Lift (3L) of Area 1 - (55 to 50 ft.)**	**40 days**	**Mon 3/17/08**	**Fri 4/25/08**
41	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 3/17/08	Fri 3/21/08
42	Test Clean Soil (as described in SAMP)	5 days	Mon 3/24/08	Fri 3/28/08
43	Excavate & Stage 3L to 50 ft.	5 days	Mon 3/24/08	Fri 3/28/08
44	Collect and Analyze Post-Excavation Bottom Samples & Review Results	12 days	Mon 3/31/08	Fri 4/11/08
45	Survey Location of Post-Excavation Samples	1 day	Fri 4/11/08	Fri 4/11/08
46	Test impacted Soils in 1000 cy increments	5 days	Mon 4/7/08	Fri 4/11/08
47	Transport Characterized Soils to TSDF	5 days	Mon 4/21/08	Fri 4/25/08

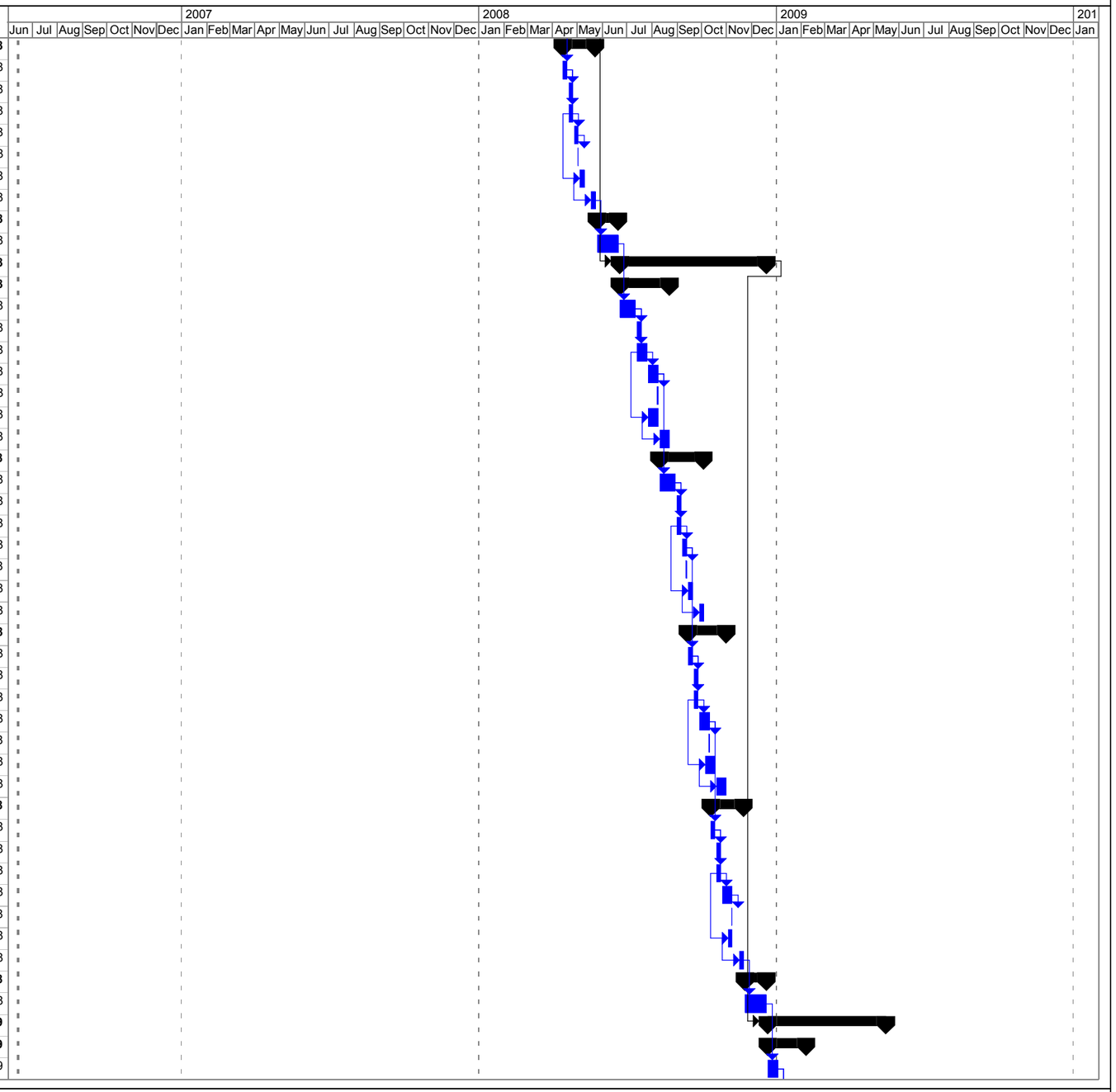


Project: Remedial Elements I and II
Date: 6/13/06

PRP Group Task | EPA Task | Milestone | Summary

Figure 2. Remedial Action Schedule
Remedial Elements I and II (On-Site Soils and Subsurface Features)
Liberty Industrial Finishing Superfund Site

ID	Task Name	Duration	Start	Finish
48	**Excavate Fourth Lift (4L) of Area 1 - (50 to 45 ft.)**	**40 days**	**Mon 4/14/08**	**Fri 5/23/08**
49	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 4/14/08	Fri 4/18/08
50	Test Clean Soil (as described in SAMP)	5 days	Mon 4/21/08	Fri 4/25/08
51	Excavate & Stage 4L to 45 ft.	5 days	Mon 4/21/08	Fri 4/25/08
52	Collect and Analyze Post-Excavation Bottom Samples & Review Results	5 days	Mon 4/28/08	Fri 5/2/08
53	Survey Location of Post-Excavation Samples	1 day	Fri 5/2/08	Fri 5/2/08
54	Test impacted Soils in 1000 cy increments	5 days	Mon 5/5/08	Fri 5/9/08
55	Transport Characterized Soils to TSDF	5 days	Mon 5/19/08	Fri 5/23/08
56	**Restoration**	**26 days**	**Mon 5/26/08**	**Fri 6/20/08**
57	Backfill and Compaction to Final Elevations	26 days	Mon 5/26/08	Fri 6/20/08
58	**Excavate and Stage Area 2**	**180 days**	**Mon 6/23/08**	**Fri 12/19/08**
59	**Excavate First Lift (FL) of Area 2 - (Grade to 60 ft.)**	**61 days**	**Mon 6/23/08**	**Fri 8/22/08**
60	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	19 days	Mon 6/23/08	Fri 7/11/08
61	Test Clean Soil (as described in SAMP)	5 days	Mon 7/14/08	Fri 7/18/08
62	Excavate & Stage FL to 60 ft.	12 days	Mon 7/14/08	Fri 7/25/08
63	Collect and Analyze Post-Excavation Bottom Samples & Review Results	12 days	Mon 7/28/08	Fri 8/8/08
64	Survey Location of Post-Excavation Samples	1 day	Fri 8/8/08	Fri 8/8/08
65	Test impacted Soils in 1000 cy increments	12 days	Mon 7/28/08	Fri 8/8/08
66	Transport Characterized Soils to TSDF	12 days	Mon 8/11/08	Fri 8/22/08
67	**Excavate Second Lift (2L) of Area 2 - (60 to 55 ft.)**	**54 days**	**Mon 8/11/08**	**Fri 10/3/08**
68	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	19 days	Mon 8/11/08	Fri 8/29/08
69	Test Clean Soil (as described in SAMP)	5 days	Mon 9/1/08	Fri 9/5/08
70	Excavate & Stage 2L to 55 ft.	5 days	Mon 9/1/08	Fri 9/5/08
71	Collect and Analyze Post-Excavation Bottom Samples & Review Results	5 days	Mon 9/8/08	Fri 9/12/08
72	Survey Location of Post-Excavation Samples	1 day	Fri 9/12/08	Fri 9/12/08
73	Test impacted Soils in 1000 cy increments	5 days	Mon 9/15/08	Fri 9/19/08
74	Transport Characterized Soils to TSDF	5 days	Mon 9/29/08	Fri 10/3/08
75	**Excavate Third Lift (3L) of Area 2 - (55 to 50 ft.)**	**47 days**	**Mon 9/15/08**	**Fri 10/31/08**
76	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 9/15/08	Fri 9/19/08
77	Test Clean Soil (as described in SAMP)	5 days	Mon 9/22/08	Fri 9/26/08
78	Excavate & Stage 3L to 50 ft.	5 days	Mon 9/22/08	Fri 9/26/08
79	Collect and Analyze Post-Excavation Bottom Samples & Review Results	12 days	Mon 9/29/08	Fri 10/10/08
80	Survey Location of Post-Excavation Samples	1 day	Fri 10/10/08	Fri 10/10/08
81	Test impacted Soils in 1000 cy increments	12 days	Mon 10/6/08	Fri 10/17/08
82	Transport Characterized Soils to TSDF	12 days	Mon 10/20/08	Fri 10/31/08
83	**Excavate Fourth Lift (4L) of Area 2 - (50 to 45 ft.)**	**40 days**	**Mon 10/13/08**	**Fri 11/21/08**
84	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 10/13/08	Fri 10/17/08
85	Test Clean Soil (as described in SAMP)	5 days	Mon 10/20/08	Fri 10/24/08
86	Excavate & Stage 4L to 45 ft.	5 days	Mon 10/20/08	Fri 10/24/08
87	Collect and Analyze Post-Excavation Bottom Samples & Review Results	12 days	Mon 10/27/08	Fri 11/7/08
88	Survey Location of Post-Excavation Samples	1 day	Fri 11/7/08	Fri 11/7/08
89	Test impacted Soils in 1000 cy increments	5 days	Mon 11/3/08	Fri 11/7/08
90	Transport Characterized Soils to TSDF	5 days	Mon 11/17/08	Fri 11/21/08
91	**Restoration**	**26 days**	**Mon 11/24/08**	**Fri 12/19/08**
92	Backfill and Compaction to Final Elevations	26 days	Mon 11/24/08	Fri 12/19/08
93	**Excavate and Stage Area 3**	**145 days**	**Mon 12/22/08**	**Fri 5/15/09**
94	**Excavate First Lift (FL) of Area 3 - (Grade to 60 ft.)**	**47 days**	**Mon 12/22/08**	**Fri 2/6/09**
95	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	12 days	Mon 12/22/08	Fri 1/2/09

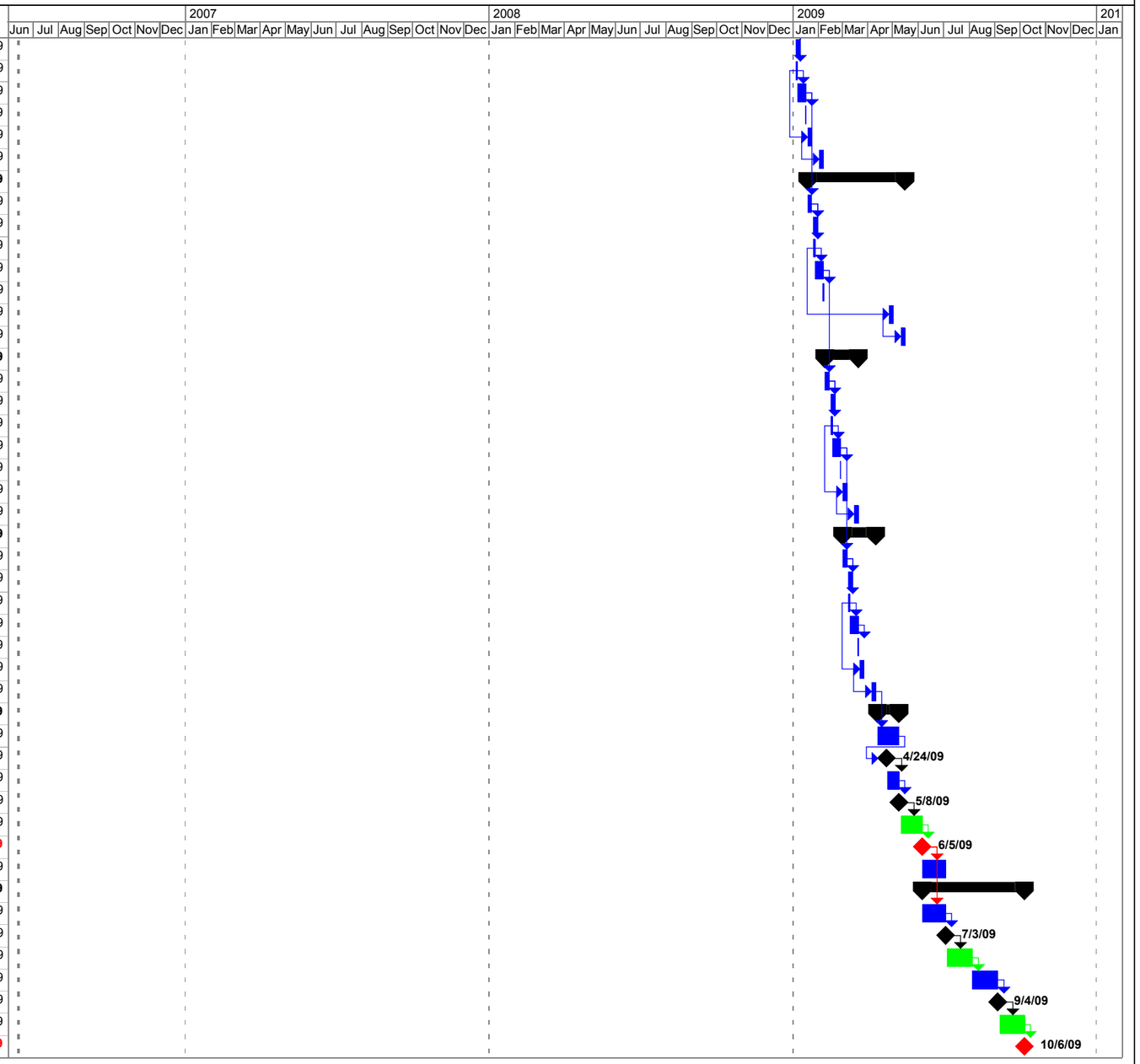


Project: Remedial Elements I and II
Date: 6/13/06

PRP Group Task | EPA Task | Milestone | Summary

Figure 2. Remedial Action Schedule
Remedial Elements I and II (On-Site Soils and Subsurface Features)
Liberty Industrial Finishing Superfund Site

ID	Task Name	Duration	Start	Finish
96	Test Clean Soil (as described in SAMP)	5 days	Mon 1/5/09	Fri 1/9/09
97	Excavate & Stage FL to 60 ft.	2 days	Mon 1/5/09	Tue 1/6/09
98	Collect and Analyze Post-Excavation Bottom Samples & Review Results	10 days	Wed 1/7/09	Fri 1/16/09
99	Survey Location of Post-Excavation Samples	1 day	Fri 1/16/09	Fri 1/16/09
100	Test impacted Soils in 1000 cy increments	5 days	Mon 1/19/09	Fri 1/23/09
101	Transport Characterized Soils to TSDF	5 days	Mon 2/2/09	Fri 2/6/09
102	**Excavate Second Lift (2L) of Area 3 - (60 to 55 ft.)**	**117 days**	**Mon 1/19/09**	**Fri 5/15/09**
103	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 1/19/09	Fri 1/23/09
104	Test Clean Soil (as described in SAMP)	5 days	Mon 1/26/09	Fri 1/30/09
105	Excavate & Stage 2L to 55 ft.	2 days	Mon 1/26/09	Tue 1/27/09
106	Collect and Analyze Post-Excavation Bottom Samples & Review Results	10 days	Wed 1/28/09	Fri 2/6/09
107	Survey Location of Post-Excavation Samples	1 day	Fri 2/6/09	Fri 2/6/09
108	Test impacted Soils in 1000 cy increments	5 days	Mon 4/27/09	Fri 5/1/09
109	Transport Characterized Soils to TSDF	5 days	Mon 5/11/09	Fri 5/15/09
110	**Excavate Third Lift (3L) of Area 3 - (55 to 50 ft.)**	**40 days**	**Mon 2/9/09**	**Fri 3/20/09**
111	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 2/9/09	Fri 2/13/09
112	Test Clean Soil (as described in SAMP)	5 days	Mon 2/16/09	Fri 2/20/09
113	Excavate & Stage 3L to 50 ft.	2 days	Mon 2/16/09	Tue 2/17/09
114	Collect and Analyze Post-Excavation Bottom Samples & Review Results	10 days	Wed 2/18/09	Fri 2/27/09
115	Survey Location of Post-Excavation Samples	1 day	Fri 2/27/09	Fri 2/27/09
116	Test impacted Soils in 1000 cy increments	5 days	Mon 3/2/09	Fri 3/6/09
117	Transport Characterized Soils to TSDF	5 days	Mon 3/16/09	Fri 3/20/09
118	**Excavate Fourth Lift (4L) of Area 3 - (50 to 45 ft.)**	**40 days**	**Mon 3/2/09**	**Fri 4/10/09**
119	Remove & Stage Clean Soil (Overburden and/ or Cutback Soils)	5 days	Mon 3/2/09	Fri 3/6/09
120	Test Clean Soil (as described in SAMP)	5 days	Mon 3/9/09	Fri 3/13/09
121	Excavate & Stage 4L to 45 ft.	2 days	Mon 3/9/09	Tue 3/10/09
122	Collect and Analyze Post-Excavation Bottom Samples & Review Results	10 days	Wed 3/11/09	Fri 3/20/09
123	Survey Location of Post-Excavation Samples	1 day	Fri 3/20/09	Fri 3/20/09
124	Test impacted Soils in 1000 cy increments	5 days	Mon 3/23/09	Fri 3/27/09
125	Transport Characterized Soils to TSDF	5 days	Mon 4/6/09	Fri 4/10/09
126	**Restoration**	**26 days**	**Mon 4/13/09**	**Fri 5/8/09**
127	Backfill and Compaction to Final Elevations	26 days	Mon 4/13/09	Fri 5/8/09
128	Pre-Final Inspection (Occurring 14 Days Prior to Construction Completion)	0 days	Fri 4/24/09	Fri 4/24/09
129	Complete Remaining Remedial Construction Activities	14 days	Sat 4/25/09	Fri 5/8/09
130	Final Inspection	0 days	Fri 5/8/09	Fri 5/8/09
131	Deliberation by EPA to Determine if Remedial Action is Complete	26 days	Mon 5/11/09	Fri 6/5/09
132	**Final Approval that Remedial Action is Complete by EPA**	**0 days**	**Fri 6/5/09**	**Fri 6/5/09**
133	Demobilization	28 days	Sat 6/6/09	Fri 7/3/09
134	**Remedial Action Report (Submitted 30 days after EPA Approval)**	**123 days**	**Sat 6/6/09**	**Tue 10/6/09**
135	Prepare Draft Remedial Action Report	28 days	Sat 6/6/09	Fri 7/3/09
136	Submit Draft Remedial Action Report	0 days	Fri 7/3/09	Fri 7/3/09
137	EPA Review of Draft Remedial Action Report	30 days	Mon 7/6/09	Tue 8/4/09
138	Address EPA comments on Draft Remedial Action Report	31 days	Wed 8/5/09	Fri 9/4/09
139	Submit Final Remedial Action Report	0 days	Fri 9/4/09	Fri 9/4/09
140	EPA Review of Final Remedial Action Report	30 days	Mon 9/7/09	Tue 10/6/09
141	**EPA Approval of Final Remedial Action Report**	**0 days**	**Tue 10/6/09**	**Tue 10/6/09**



Project: Remedial Elements I and II
Date: 6/13/06

PRP Group Task | EPA Task | Milestone | Summary

APPENDIX A

List of Acronyms

LIST OF ACRONYMS

CADD	Computer-Aided Design and Drafting
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CQAPP	Construction Quality Assurance Project Plan
EMR	Experience Modification Rates
EPA	U. S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IQAT	Independent Quality Assurance Team
kg	Kilograms
LDR	Land Disposal Restriction
mg	Milligrams
MSL	Mean Sea Level
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PRP	Potentially Responsible Parties
QA/QC	Quality Assurance/Quality Control
RA	Remedial Action
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act

ROD	Record of Decision
RPR	Resident Project Representative
SAMP	Sampling Analysis and Monitoring Plan
SOW	Statement of Work
SSO	Site Safety Officer
T&D	Transportation and Disposal
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
UST	Underground Storage Tank
VOC	Volatile Organic Compound

APPENDIX B

Distribution List

DISTRIBUTION LIST

Construction Quality Assurance Project Plan
for Remedial Elements I and II

Liberty Industrial Finishing Site
Village of Farmingdale, Nassau County, New York

Distribution List (For Implementation of CQAPP):

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Resident Project Representative – To Be Determined, Roux Associates, Inc.
Health and Safety Manager, Mr. Joseph Gentile, CIH, Roux Associates, Inc.
Site Safety Officer – To Be Determined, Roux Associates, Inc.
Analytical Laboratory Subcontractor – To Be Determined
Data Validator – To Be Determined
Contractor's Project Director – To Be Identified in Contractor's RAWP
Contractor's Project Manager – To Be Identified in Contractor's RAWP
Contractor's Superintendent – To Be Identified in Contractor's RAWP
Contractor's Safety Representative – To Be Identified in Contractor's RAWP

Distribution List (For Information Only):

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Laura Amend Babcock, Weston Solutions, Inc.
Gary Loesch, H2M
Ken Wenz, Dvirka & Bartilucci

'

June 13, 2006

HEALTH AND SAFETY CONTINGENCY PLAN FOR REMEDIAL ELEMENTS I AND II

Liberty Industrial Finishing Superfund Site
55 Motor Avenue
Village of Farmingdale, Nassau County, New York

Prepared for

LIBERTY INDUSTRIAL FINISHING SITE QUALIFIED SETTLEMENT TRUST

Remedial Engineering, P.C.

Environmental Engineers

and ROUX ASSOCIATES, INC.

209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

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H. Confined Space Entry Permit (CSEP)

CERTIFICATION OF COMMITMENT TO WORKER HEALTH AND SAFETY AND SITE SAFETY OFFICER'S AUTHORITY

Workers may be exposed to risks from hazardous conditions. It is the goal of this Health and Safety Contingency Plan (HSCP) to minimize the possibility of work-related injury or illness through aware and qualified supervision, health and safety training, medical monitoring, and the use of appropriate personal protective equipment (PPE).

This Site-specific HSCP applies to remediation workers at the Liberty Industrial Finishing Superfund Site where operations involve actual or potential exposure to safety or health hazards. This HSCP describes emergency response procedures and existing and potential physical/chemical hazards that have been identified. Subcontractors are retained as independent contractors and, as such, are responsible for ensuring the safety of their employees.

1.0 INTRODUCTION

This Health and Safety Contingency Plan (HSCP) has been developed as part of the Final Remedial Design for the Liberty Industrial Finishing Superfund Site, 55 Motor Avenue, Farmingdale, New York (the "Site"). The HSCP has been prepared on behalf of the Liberty Industrial Finishing Site Qualified Settlement Trust (hereinafter referred to as the Principle Responsible Parties or "PRP Group") in accordance with the Consent Judgment (Index No. 04-1308) and attached Statement of Work (SOW) entered in the United States District Court for the Eastern District of New York on August 27, 2004.

The Consent Judgment requires the submission of a final design submittal, which sets forth the engineering elements ("Remedial Design") to implement and construct the Remedial Action (RA) selected in the Record of Decision (ROD) (USEPA, March 2002). As specified in the SOW and summarized in the Pre-Final Remedial Design (RD) (ERM, July 2005), the Final RD is comprised of:

- Final Design Drawings and Specifications for the RA; and
- Final RA Plans that include:
  - Construction Quality Assurance Project Plan (CQAPP);
  - Health and Safety Contingency Plan (HSCP);
  - Sampling, Analysis and Monitoring Plan (SAMP), which includes the Remedial Air Monitoring Plan (RAMP); and
  - Transportation and Disposal (T&D) Plan, which includes a Hazardous Material Transportation Security Plan (HMTSP).

The HSCP, in conjunction with the other RA Plans, will be for use by the PRP Group, Engineer, Contractor, USEPA and its representatives and other regulatory personnel having jurisdiction. This HSCP establishes the procedures necessary to protect workers and the general public from potential hazards during implementation of Remedial Elements I and II (On-Site Soils and On-Site Western Subsurface Features, respectively). Remedial Elements I and II are identified and discussed in greater detail in the Preliminary RD Report (ERM, October 2004).

The approximate limits of the onsite soils and western subsurface features to be addressed as part of Remedial Elements I and II, respectively, are shown on the Technical Drawings.

As discussed in the Preliminary RD Report, the eastern subsurface features will be addressed in accordance with the March 26, 2002 Administrative Order on Consent (AOC) (Index No. CERCLA – 02-2002-2013).

1.1 Purpose

This document serves as the primary health and safety resource for the activities pertaining to the Site; therefore, workers prior to performing any investigative, sampling and remedial activities at the Site must review the HSCP. The contractors and subcontractors may review this document to determine the appropriate health and safety measures that are implemented when needed. Any individuals that will be visiting or performing work at this Site are required to comply with the applicable aspects of this HSCP.

In addition, the adoption and compliance of individual company procedures should be supplemented in a separate plan (if necessary) by each subcontractor. This HSCP has been prepared in conformance with Occupational Safety and Health Administration (OSHA) requirements, 29 CFR 1910.120 and 29 CFR 1926. The procedures in this plan have been developed based on current knowledge regarding the hazards that are known or anticipated for the operations to be conducted on-Site.

1.2 Site Hazards

Potential physical, chemical and biological hazards are discussed in the following subsections.

1.2.1 Physical Hazards

The planned remedial activities at the Site include, but are not limited to the following:

- Excavation of soil from designated areas of the Site and stockpiling as clean, non-hazardous (in excess of performance standards) and hazardous ([Resources Conservation and Recovery Act] RCRA characteristic);
- Appropriate grading and shoring of all excavations;
- Offsite disposal of hazardous soil and soil contaminated above the soil performance standards;

- Locating and uncovering subsurface features and underground storage tanks (USTs) located in the western portion of the Site and tracing any connected piping;

- Removal of contaminated aqueous and or solid materials from USTs, subsurface features (with associated piping) and the northern and eastern sanitary leaching fields using 1) vac truck, 2) a bucket mounted on a backhoe 3) pipe jets and/or 4) hand shovels or equivalent;

- Confined space entry procedures for USTs as well as fall protection may be required for specific removal tasks;

- Removal and offsite disposal of any soil surrounding USTs or subsurface features that exceed the ROD cleanup criteria; and

- Replacement of excavated soils with clean fill and Site regrading.

Potential physical hazards associated with the planned activities include injury from the operation of heavy equipment, confined space entry, excavation hazards, fire and explosion, vehicle traffic, fall hazards, and noise exposure. A list of physical safety concerns is provided as Table 1-1.

TABLE 1-1
PHYSICAL SAFETY CONCERNS

HAZARD	DESCRIPTION	LOCATION	PROCEDURES USED TO REDUCE HAZARD
Heavy equipment	Vehicles	Used throughout Site	Personnel maintain eye contact with operators, hard hats, safety shoes, hearing protection and safety glasses worn during equipment operation when required.
Existing underground utilities	Storm water, sewer, electrical, gas	Verify with area utilities	Verify number and location of utilities prior to Site operations. Locate prior to subsequent excavation activities. "One Call" will also be contacted and if available utility records will be viewed at the local

HAZARD	DESCRIPTION	LOCATION	PROCEDURES USED TO REDUCE HAZARD
			authorities. Prior to excavation, a geophysical survey will be conducted around exterior utilities to verify the area is free of subsurface works.
Power lines	Aboveground	On-Site and off-Site	Maintain at least 15 feet of total clearance from lines.
Confined space	Aboveground and subsurface	Potentially throughout Site	Confined space entry will be avoided, if possible. If confined space entry is required, a confined space entry permit will be prepared as described in the HSCP.
Excavation	Subsurface	Potentially throughout Site	Proper shorings, evacuation routes available, multi-gas meter, use proper PPE.
Accidental fires and explosions	Aboveground and subsurface	Potentially throughout Site	Emergency contacts posted, portable fire extinguishers available within 50 feet of every worker.
Vehicle traffic	Vehicles	Used throughout Site	Personnel maintain eye contact with operators and drivers. Wear highly visible or reflective vests.
Trips and falls	During Site activities	Potentially throughout Site	Identify slip/trip hazards, use safety cones and caution tape to flag these hazards.
Noise	During Site activities	Throughout Site	Hearing protectors with proper noise reduction rating. Signs posted to identify hearing protection needed.
Temperature extremes	Hot weather activities Cold weather activities	Throughout Site	Protection as designated by SSO.

1.2.2 Chemical Hazards

During previous investigations of the Site, soil samples were found to contain chromium, cadmium and volatile organic compounds (VOCs) (trichloroethene [TCE], cis-1,2-dichloroethene [cis-1,2-DCE], and tetrachloroethene [PCE]) in excess of performance standards. Several of the subsurface features were found to contain solid or aqueous material that exhibited certain semi-volatile organic compounds (SVOCs) (4,4'-DDT, benzo[a]pyrene,

dibenzo[a,h]anthracene), polychlorinated biphenyls (PCBs), and/or inorganic constituents (cyanide, arsenic, iron, lead, and zinc).

The above referenced constituents are subject to OSHA Permissible Exposure Limits (PELs) and Hazard Communication requirements. It is the worker's responsibility to read and understand the hazards as identified in Section 4.0 of this HSCP, and sign the form indicating that they received adequate answers to any questions prior to commencement of work activities. The exposure limits and physical properties of compounds of potential concern and other chemicals detected on the Site are provided as Table 1-2.

The potential routes of exposure are inhalation, dermal contact, and ingestion.

TABLE 1-2
EXPOSURE LIMITS AND PHYSICAL PROPERTIES OF COMPOUNDS OF POTENTIAL CONCERN

Compound	Exposure Limits	IDLH Level	Physical Description	Chemical Properties &	Physical Properties
VAPORS					
Acetone	PEL: 1000 ppm REL: 250 ppm	2500 ppm	Colorless liquid with a fragrant, mint-like odor.	MW: 58.1 BP: 133°F Sol: Miscible	FL.P.: 0°F UEL: 12.8% LEL: 2.5% I.P.: 9.69eV
Benzo(a)pyrene Dibenzo(a)pyrene Phenanthrene (Collectively known as coal tar pitch volatiles)	PEL: 0.2 mg/m^3 REL: 0.1 mg/m^3 Suspected carcinogen	80 mg/m^3	Black or dark brown amorphous residue.	MW: 252.3 BP: 923°F Sol: Slight	Varies
Benzo(b)fluoranthene	Avoid All Contact	NA	Colorless crystals	MW: 252.3 BP: 481°F Sol: None	NA
Benzene	PEL: 1 ppm REL: 0.1 ppm Carcinogen	500 ppm	Colorless to light-yellow liquid with an aromatic odor.	MW: 78.1 BP: 176°F Sol: 0.07%	FL.P.: 12°F UEL: 7.8% LEL: 1.2% I.P.: 9.24eV
Ethylbenzene	PEL: 100 ppm REL: 100 ppm Animal Carcinogen	800 ppm	Colorless liquid with an aromatic odor.	MW: 106.2 BP: 277°F Sol: 0.01%	FL.P.: 55°F UEL: 6.7% LEL: 0.8% I.P.: 8.76eV
Toluene	PEL: 200 ppm REL: 100 ppm TLV: 50 ppm	500 mg/m^3	Colorless liquid with a sweet, pungent, benzene-like odor.	MW: 92.1 BP: 232°F Sol: (74°F) 0.07%	FL.P.: 40°F UEL: 7.1% LEL: 1.1% I.P.: 8.82eV

Compound	Exposure Limits	IDLH Level	Physical Description	Chemical Properties &	Physical Properties
Tetrachloroethylene	PEL: 100 ppm REL: NA TLV: 25 ppm Animal carcinogen	150 ppm	Colorless liquid with a mild, chloroform-like odor.	MW: 165.8 BP: 250°F Sol: 0.02%	FL.P.: NA UEL: NA LEL: NA I.P.: 9.32eV
Trichloroethylene	PEL: 100 ppm REL: NA TLV: 50 ppm	1000 ppm	Colorless liquid (unless dyed blue) with a chloroform-like odor.	MW: 131.4 BP: 189°F Sol: (77°F) 0.1%	FL.P.: none UEL: 10.5% LEL: 8% I.P.: 9.45eV
1,2-Dichloroethene	PEL: 200 ppm REL: 200 ppm	1000 ppm	Colorless liquid with a slightly acrid, chloroform-like odor.	MW: 97.0 BP: 118-140°F Sol: 0.4%	FL.P.: 36-39°F UEL: 12.8% LEL: 5.6% I.P.: 9.65eV
Trans-1,3-Dichloropropene	PEL: NA REL: 1 ppm Animal carcinogen	NA	Colorless to straw-colored liquid with a sharp, sweet, irritating, chloroform-like odor.	MW: 111.0 BP: 226°F Sol: 0.2%	FL.P.: 77°F UEL: 14.5% LEL: 5.3% I.P.: NA
Vinyl Chloride	PEL: 1 ppm Carcinogen	NA	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations.	MW: 62.5 BP: 7°F Sol: (77°F) 0.1%	FL.P.: -77.8 °F (closed cup) UEL: 33.0% LEL: 3.6% I.P.: 9.99eV
Xylene (total)	PEL: 100 ppm REL: 100 ppm	900 ppm	Colorless, oily liquid with an aromatic odor.	MW: 106.2 BP: 282°F Sol: Slight	FL.P.: 81°F UEL: 7.0% LEL: 0.9% I.P.: 8.56eV

Compound	Exposure Limits	IDLH Level	Physical Description	Chemical Properties &	Physical Properties
Bis-(2-Ethylhexyl)phthalate	PEL: 5 mg/m^3 REL: 5 mg/m^3 Animal carcinogen	5000 mg/m^3	Colorless, oily liquid with a slight odor.	MW: 390.6 BP: 727°F Sol: (75°F) 0.00003%	FL.P.: 420°F UEL: Not Reported LEL: 0.3% I.P.: Not Reported
Dibenzo(a,h)anthracene	Suspected carcinogen	NA	White to light yellow crystalline solid	MW: 278.0 BP: 975.2°F Sol: None	NA
Fluoranthene	Carcinogen	NA	Solid	MW: 202.0 BP: 707°F Sol: Negligible	FL.P.: 388.4°F UEL: NA LEL: NA
Indeno(1,2,3-cd)pyrene	Carcinogen	NA	Solid	MW: 156.0 BP: 321.8 – 325.4°F Sol: Negligible	NA
PARTICULATES					
Beryllium	PEL: 0.002 mg/m^3 REL: 0.0005 mg/m^3 Carcinogen	4 mg/m^3	A hard, brittle, gray-white solid.	MW: 9.0 BP: 4532°F Sol: Insoluble	NA
Cadmium	PEL: NA REL: 0.005 mg/m^3 TLV: 0.002 mg/m^3 (compounds)	9 mg/m^3	Silver-white, blue-tinged lustrous, odorless solid.	MW: 112.4 BP: 1409°F Sol: Insoluble	NA
Chromium	PEL: 1 mg/m^3 REL: 0.5 mg/m^3	250 mg/m^3	Blue-white to steel-grey, lustrous, brittle, hard, odorless metal.	MW: 52 BP: 4788°F Sol: Insoluble	NA
Hexavalent Chromium	PEL: 5 ug/m^3 REL: 0.001 mg/m^3 Carcinogen	15 mg/m^3	Dark red odorless flakes or powder.	MW: 100 BP: 482°F Sol: 63%	NA

Compound	Exposure Limits	IDLH Level	Physical Description	Chemical Properties &	Physical Properties
Lead	PEL: 0.05 mg/m^3 REL: 0.05 mg/m^3 Animal carcinogen	100 mg/m^3	A heavy, ductile, soft, gray solid.	MW: 207.2 BP: 3164°F SOL: Insoluble	NA
4,4' DDT (DDT)	PEL: 1 mg/m^3 REL: 0.5 mg/m^3 Animal carcinogen	500 mg/m^3	Colorless crystals or off-white powder with a slight aromatic odor (pesticide).	MW: 354.5 BP: 230°F Sol: Insoluble	FL.P.: 162-172°F UEL: NA LEL: NA I.P.: NA
Aroclor 1260	PEL: 0.5 mg/m^3 TLV: 0.5 mg/m^3	5 mg/m^3	Colorless to pale yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.	MW: 326 (approx) BP: 689-734°F Sol: Insoluble	FL.P.: NA UEL: NA LEL: NA I.P.: NA

Notes: IDLH – Immediately Dangerous to Life & Health
PEL – OSHA Permissible Exposure Limit, based on 1992 Transitional limits in 29 CFR 1910.100
REL – NIOSH Recommended Exposure Limit, time-weighted average concentrations based on a 10-hour workday during a 40-hour workweek
TLV – ACGIH Threshold Limit Value (Listed only when it is more restrictive than the PEL or REL), as an 8-hour time-weighted average
ppm – parts per million
mg/m^3 – milligrams per cubic meter
NA – Not Available
MW – Molecular Weight
BP – Boiling Point
Sol – Solubility
UEL – Upper Explosive Limit
LEL – Lower Explosive Limit
°F – Degrees Fahrenheit
FL.P. – Flash Point
IP – Ionization Potential

1.2.3 Biological Hazards

No biological hazards are expected other than those associated with indigenous plants, insects, and vermin.

1.3 Levels of Protection

The activities described within the scope of this HSCP are expected to require Level D. The HSCP includes provisions for upgrading to Level C in the event that higher than expected vapor exposures are encountered. Each confined space has to be evaluated on a case-by-case basis and the level of protection is determined based on a review of the hazards and potential exposures. Since every effort will be made to ensure no atmospheric hazards exist at the time of confined space entry, it is anticipated that entries will be made in Level D with continuous air monitoring. In the event that conditions were to change the confined space activity will be stopped, the situation re-evaluated and the space further cleaned, ventilated, etc., until entry can continue.

1.4 Health and Safety Personnel

The control of Site hazards is dependent upon the degree to which management enforces compliance and employees cooperate with the specified health and safety requirements. Therefore, personnel at levels of the organization must recognize their individual responsibility to comply. Activities covered by the HSCP must be conducted in compliance with the HSCP and with applicable federal, state and local health and safety regulations including 29 CFR 1910.120 and 29 CFR 1926. Personnel covered by the HSCP who cannot or will not comply must be excluded from Site activities. Personnel visiting the Site must receive orientation and sign the Site Orientation Record provided in Appendix A.

During all on-Site activities related to remedial activities, at least one on-Site representative, who has current (Red Cross or equivalent) training and certification in basic first aid and cardiopulmonary resuscitation (CPR), will be present. This person should also have received training and information regarding blood borne pathogen control, including the required use of "universal precautions" and the availability of Hepatitis B vaccinations (HBV) during yearly physicals.

The following subsections briefly describe the health and safety personnel designations and general responsibilities that will be employed for the project.

1.4.1 Health and Safety Manager

The Health and Safety Manager (HSM) is Joseph Gentile. The HSM has final authority to resolve health and safety issues that are not resolved at the Site by the Site Safety Officer (SSO). This includes the modification of the HSCP as may be warranted by Site conditions. The HSM has the overall responsibility to make certain that the policies and procedures of this HSCP are implemented by the SSO.

1.4.2 Site Safety Officer

The SSO will be identified prior to the performance of the RA . The SSO or designee will be located on-Site at all times. The SSO will have the following responsibilities:

- Perform Site orientation training to remediation workers new to the Site;
- Conducting daily safety briefings and providing location specific hazard awareness training to any on-Site personnel and visitors to areas subject to remediation;
- Daily implementation of the HSCP. The HSCP provides the necessary health and safety procedures associated with the proposed subcontractor work activities;
- Conducting safety inspections and investigating any accidents, illnesses, and/or incidents related to sampling activities that occur on-Site;
- Confirm that personnel entering work areas are qualified in accordance with 29 CFR 1910.120 and are following the designated Level of Protection;
- Accompanying any New York State Department of Environmental Conservation (NYSDEC), United States Environmental Protection Agency (USEPA), OSHA or other governmental agency personnel visiting the Site in response to health and safety issues; and
- In consultation with the HSM, update and modify this HSCP as Site or environmental conditions change.

The SSO will be considered a "Competent Person" as defined by OSHA in 29 CFR 1926.20(b) – Accident Prevention Responsibilities. As such, the SSO is vested with the authority to stop Site operations (i.e., Stop Work Authority) if the SSO determines that an imminent health or safety hazard or other potentially dangerous situation exists. The SSO is to immediately notify the

Project Manager, Project Principal and the HSM of any Stop Work Orders issued. The SSO may also revoke the downrange authorization of any individual Site personnel for health and safety violations. The SSO will also be considered a competent person with regard to excavation safety, as defined by OSHA in 29 CFR 1926.650(b) – Excavation Safety.

1.4.3 Staff

Compliance and adherence to the health and safety procedures outlined in this HSCP is the responsibility of each individual employee. Therefore, each employee must become familiar with the health and safety requirements associated with their position and daily operations. Employees also have the responsibility to notify the appropriate management and/or health and safety representative of unsafe conditions and accidents/injuries immediately. When employees are issued respirators or any other PPE, they are responsible for making sure that the required items are used properly, cleaned as instructed, and maintained in good working order.

1.5 Provision for Updating HSCP

This document was prepared based upon the information available regarding the Site. Unanticipated situations may occur during the course of field activities at the Site that are not provided for in this HSCP. If changes occur, then it will be the responsibility of the SSO to notify the HSM of appropriate changes so that the HSM can modify the HSCP, as warranted, to reflect changing conditions or activities at the Site.

2.0 SITE DESCRIPTION

The Site Setting and description are provided below.

2.1 Site Setting

The Liberty Industrial Finishing Superfund Site is located in Nassau County, New York, approximately one mile south of Bethpage State Park in the Town of Oyster Bay. The Site is bordered by the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east, and Ellsworth Allen Park to the west. The surrounding area is primarily residential, with commercial establishments along nearby major roadways. The location of the property is shown in Figure 10-1.

The property may be divided into a western portion (generally unpaved and inactive) and an eastern portion (paved and limited activity). Former manufacturing operations in the western portion have ceased, and only the foundations of some of the former structures and industrial facilities remain visible. This portion of the property is secured by a fence line running along the northern, western, and southern property boundaries.

The property includes several large warehouses and the remains of past industrial operations, including foundations of former process buildings. Although many of the previous process buildings are no longer standing, the former water supply well vaults, fire-fighting water storage reservoir, storm water/waste water leaching chambers, and miscellaneous process area sumps and drains still remain on-Site. Many of the subsurface features located in the eastern portion of the Site, known as the Phase 1 Demolition area, are being addressed under AOC Index No. CERCLA – 02-2002-2013. The western portion of the Site was identified to contain the majority of impacted soil as well as numerous subsurface features and USTs. Three main areas in the western portion of the Site contain impacted soil including the northwest disposal area, the former wastewater disposal basin, and the Building B basement. The soils in these three areas and the material in and around the subsurface features and USTs in the western portion of the Site are the subject of this remedial action.

2.2 Site History

The Liberty Industrial Finishing Superfund Site is a National Priorities List (NPL) site under CERCLA commonly referred to as Superfund. Under the Superfund program, the Liberty Industrial Finishing Superfund Site has been subject to ongoing investigations and interim remedial actions.

The USEPA has been the lead regulatory agency providing oversight to a Remedial Investigation and Feasibility Study (RI/FS) for the Liberty Industrial Finishing Superfund Site. The RI/FS process led to a ROD in March 2002, which selected a number of preferred remedial actions to address particular contaminants of concern (COCs) in specific environmental media.

The Site occupies approximately 30 acres of property that housed the Former Liberty Industrial Finishing Corporation. An 8.7+ acre parcel occupying the eastern segment of the property is proposed for redevelopment. Based on historic information, the 8.7+ acre parcel contained four buildings (E, F, H and U). Subsurface features located in the eastern portion of the Site, known as the Phase 1 Demolition area, are being addressed under AOC Index No. CERCLA – 02-2002-2013.

3.0 SCOPE OF WORK

The areas of concern (AOC) at the Site include but are not limited to:

- The northwest disposal area;
- The wastewater disposal basin;
- Building B basement area;
- 18 subsurface features; and
- 18 USTs

The work activities to be performed at the AOCs include the following:

- Inspecting, assessing, and surveying;
- Clearing and grubbing;
- Soil excavation, windrowing, and stockpiling;
- Removing aqueous and solid materials in excess of performance standards from subsurface structures;
- Soil sampling;
- Loading & unloading of soil;
- Backfilling, compacting, and grading of soil; and
- Equipment decontamination.

Remedial activities must be performed in accordance with this HSCP and applicable regulatory programs, including such programs as personal protective equipment and respiratory protection.

4.0 HAZARD ASSESSMENT

The following hazard assessment applies to the activities within the specified scope of this HSCP. The following sections contain descriptions of hazards that may be present at the Site and must be communicated as part of the initial orientation of Site hazards to new Site workers.

4.1 Chemical Hazards

This chemical hazard assessment is based on Site-specific data obtained during previous investigations. Anticipated soil and/or subsurface water constituents include cadmium, chromium, cyanide, TCE, cis-1,2-DCE, PCE, benzo(a)pyrene, dibenzo(a,h)anthracene, and PCBs. Dusts and/or aerosols generated during remedial activities may contain these constituents.

4.1.1 Chemicals Subject To OSHA Hazard Communication

Hazardous chemicals brought on-Site such as solvents, reagents, decontamination solutions, or any other hazardous chemical must be accompanied by Material Safety Data Sheets (MSDS), meet container labeling requirements, and have any associated hazards communicated to employees through training and documentation as required by OSHA 29 CFR 1910.120. Copies of MSDSs for chemicals used on-Site, when available, will be available on-Site as part of the field project file.

4.1.2 Inorganics

Overexposure to metals has been associated with a variety of local and systemic health hazards, both acute and chronic in nature, with chronic effects being most significant. Direct contact with the dusts of some metal compounds can result in contact or allergic dermatitis. The main inorganics of concern at the Site are hexavalent chromium (aqueous), cadmium, chromium, arsenic, iron, lead, and zinc. The maximum detected concentrations are summarized below:

TABLE 4-1

SUMMARY OF MAXIMUM CONCENTRATIONS OF DETECTED INORGANICS

Parameter	Units	Matrix Maximum
Arsenic	mg/kg	**22.5**
Chromium	mg/kg	**1,380**
Hexavalent Chromium	mg/L	**223**
Cadmium	mg/kg	**158**
Iron	mg/kg	**376,000**
Lead	mg/kg	**4,280**
Zinc	mg/kg	**6,110**

The most significant route of exposure to metals is likely to be skin contact with impacted soils or water. Protective measures, such as the wearing of chemically resistant gloves, to minimize the potential for skin contact are addressed in Section 6.0 of this HSCP.

Inhalation of metal impacted soil resulting from dust generation is not anticipated to be a significant route of exposure to metals within the scope of this HSCP. Inhalation exposure to metals will be minimized by monitoring atmospheric dust and reducing the potential for dust generation by using water sprays when appropriate.

Incidental ingestion of metals may occur through hand-to-mouth contact. Incidental ingestion will be minimized by following appropriate personal hygiene habits including washing of hands and face when leaving potentially impacted areas and through enforcement of no smoking, drinking, food consumption or applying cosmetics onsite (see Section 7.0 for additional information).

4.1.3 Semi-Volatile Organic Compounds

Semi-volatile organic compounds (SVOCs) are expected to primarily include benzo(a)pyrene, dibenzo(a,h)anthracene, 4,4'-DDT, and PCBs. Continuous exposure to the vapors of benzo(a)pyrene, dibenzo(a,h)anthracene, 4,4'-DDT, and PCBs above their respective permissible exposure limits, as defined by OSHA, may adversely affect the biological functions of the respiratory system, reproductive system, bladder, and/or kidneys. In addition, the above referenced SVOCs have been designated as suspected human carcinogens by the American

Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute of Occupational Safety and Health (NIOSH). Continuous animal exposures above the applicable regulatory limits have been shown to elicit lung, kidney, and skin cancer as well as tumors of the pituitary gland and liver.

The vapor pressures of SVOCs are generally not high enough to generate significant quantities of airborne vapor. Site soil and aqueous data indicate that the minimum and maximum detected concentrations for the SVOCs are as follows:

TABLE 4-2

SUMMARY OF MAXIMUM AND MINIMUM CONCENTRATIONS OF DETECTED SVOCS

	PCOC* Present in Matrix:		Aqueous Matrix: (mg/L)		Solid Matrix: (ug/kg)	
Constituent:	**Solids**	**Aqueous**	**Minimum**	**Maximum**	**Minimum**	**Maximum**
Benzo(a) pyrene	Yes	Yes	0.1	41	28	160,000
Dibenzo (a,h) anthracene	Yes	Yes	1	7	22	26,000
Aroclor 1260	Yes	Yes	1.5	33	58	3,000
4,4 - DDT	Yes	Yes	0.32	14	4.5	5,000

* PCOC = principle contaminants of concern

The ROD provided a summary of the risk-based approach used to determine the potential chemical exposure hazards to construction workers. This evaluation was used as the basis for determining the initial level of protection and action levels for workers. Real-time air monitoring will be used in conjunction with the action levels to upgrade and downgrade levels of protection.

4.1.4 Volatile Organic Compounds

VOCs are expected to primarily include PCE, cis-1,2-DCE, and TCE. Continuous exposure to the vapors of PCE, cis-1,2-DCE and TCE above their respective permissible exposure limits, as defined by OSHA, may adversely affect the biological functions of the respiratory system, reproductive system, bladder, and/or kidneys. Site soil and aqueous data indicate that the minimum and maximum detected concentrations for the VOCs are as follows:

TABLE 4-3

SUMMARY OF MAXIMUM AND MINIMUM CONCENTRATIONS OF DETECTED VOCS

	PCOC Present in Matrix:		Aqueous Matrix: (mg/L)		Solid Matrix: (ug/kg)	
Constituent:	**Solids**	**Aqueous**	**Minimum**	**Maximum**	**Minimum**	**Maximum**
PCE	Yes	No	Not Applicable	Not Applicable	0.2	98
cis-1,2-DCE	Yes	Yes	0.8	0.8	0.3	12
TCE	Yes	Yes	2.0	2.0	0.5	440

4.2 Physical Hazards

A variety of physical hazards may be encountered during Site activities and are described in greater detail in the following sections.

4.2.1 General Physical Hazards

The job Site will be kept as clean, orderly and sanitary as possible. When water is used for dust control, care must be taken to avoid creating muddy or slippery conditions. If slippery conditions are unavoidable, barriers and warning signs will be used to warn of these dangers.

Loose clothing, jewelry, or other personal items will not be worn around equipment that could catch or entangle these items. Care must be taken to have an individual's hair pulled back and out of the way of equipment that could catch or entangle the hair. Sufficient space will be maintained around operating machinery to prevent accidental contact that may result from mechanical or human error.

Hard-hats must be worn to protect against bumps or falling objects. Safety glasses must be worn by all workers in all areas of the Site except the support zone. Goggles, face shields or other forms of eye protection must be worn when necessary to protect against chemicals or other hazards. Steel-toed safety shoes or boots are also required. The shoes must be chemically resistant or protected with appropriately selected boots/coverings where necessary. Unless otherwise specified, normal work clothes must be worn. Long sleeves and gloves are also required whenever necessary to protect against hazardous contact, cuts, abrasions or other possible skin hazards.

A daily tailgate safety meeting is conducted to provide information and training necessary to avoid accidental injury, including assuring that the Site is maintained in such a way that slip, trip and fall hazards are recognized and eliminated or controlled. Additionally, the use of standard OSHA Level D PPE is enforced at the Site.

4.2.2 Excavations

All provisions of the OSHA trenching and excavation standard (29 CFR 1926.650-652) and Trench and Excavation Safety and Health Guide (and CSE Program Supplement) must be followed during excavation activities. The estimated location of utility installations, such as gas, sewer, telephone, electric, water lines and other underground installations that may reasonably be expected to be encountered during excavation work, must be determined prior to opening an excavation.

Excavations in areas with degraded or potentially degraded atmospheres must be monitored for confined space hazards prior to entry. Excavations should not be entered if other means are available to perform the tasks that do not require entry. If entry into an excavation is required, entry will only be permitted if proper shoring or sloping has been utilized and the atmosphere within the space is monitored by a trained person to assure that oxygen concentrations exceed 19.5 percent and are less than 23 percent, combustible gas levels are less than 10 percent of the lower explosive limit (LEL), and that vapor levels are within applicable exposure (PEL and/or Threshold Limit Values [TLV]) limits. These parameters will be monitored using a combustible gas meter, photoionization detector (PID) and/or detector tubes.

A ladder or similar means of egress must be located in excavations greater than 4 feet in depth, so as to require no more than 25 feet of lateral travel for employees. No person should be allowed to enter an excavation greater than 5 feet in depth unless the following conditions have been met:

1) All excavated materials must be placed at least 2 feet from the edge of the excavation to prevent excess loading and to prevent staged materials from re-entering into the excavation;

2) Personnel must remain at least 2 feet away from the edge of the excavation at all times;

3) Upon completion of a test pit exploration, the excavation shall be backfilled and graded; and

4) Excavations should never be left open unless absolutely necessary, and then only with proper barricading and controls to prevent accidental injury.

The following safe work practices will be followed during excavations.

- The proximity of chemical, water, sewer and electrical lines will be identified by a facility representative prior to any subsurface activity beginning.
- While excavating, stay out of the reach of the backhoe arm's swing by standing at the end of the excavation, not near the sides (sides have the potential to cave in).

Maximum Allowable Slopes

Soil or Rock Type	**Maximum Allowable Slopes (H:V)[1] for Excavations Less Than 20 Feet Deep[3]**
Stable Rock	Vertical (90°)
Type A[2]	¾ : 1 (53°)
Type B	1 : 1 (45°)
Type C	1½ : 1 (34°)

OSHA (29 CFR 1926.652, Subpart P, Appendices A and B)

Notes:

[1] Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

[2] A short-term maximum allowable slope of 1/2H: 1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 meters) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 meters) in depth shall be 3/4H : 1V (53°).

[3] Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

If the SSO or a competent person determines that sloping or benching is inadequate to ensure the protection and safety of the workers in the excavation or trench, other forms of protective systems (i.e., trench shield [box]) may be utilized. The trench box can be either pre-manufactured or custom-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4).

4.2.3 Confined Space Entry

Confined spaces may be encountered during Site operations (i.e., utility survey, subsurface feature investigation, UST removal, etc.). If a confined space is encountered and entry is absolutely necessary, appropriate safety precautions must be taken in accordance with the safety and health program. Only confined space entry trained personnel will be allowed to perform such activities. Confined space entry will be accordance with the provisions detailed in Section 11.

4.2.4 Underground Utilities and Hazards

The identification of underground pipes, utilities and other underground hazards is critically important prior to all drilling, excavating, and other intrusive activities. In accordance with OSHA 29 CFR 1926.650, the estimated location of utility installations, such as gas, sewer, telephone, electric, water lines, and other underground installations that may reasonably be expected to be encountered during excavation work, must be determined prior to opening an excavation. The same requirements apply to drilling operations and the use of soil gas probes. Where public utilities may exist, the utility agencies or operators must be contacted directly or through a utility-sponsored service (e.g., One Call). Where other underground hazards may exist, reasonable attempts must be made to identify their locations as well. Failure to identify underground hazards can lead to fire, explosion, flooding, electrocution, or other life threatening accidents.

4.2.5 Overhead Utilities and Hazards

Overhead hazards can include low hanging structures that can cause injury due to bumping into them. Other overhead hazards include falling objects, suspended loads, swinging loads and rotating equipment. Hardhats must be worn by personnel in areas where these types of physical hazards may be encountered. Barriers or other methods must also be used to exclude personnel from these areas when appropriate.

Electrical wires are another significant overhead hazard. According to OSHA 29 CFR 1926.550, the minimum clearance that must be maintained from overhead electrical wires is 15 feet from an electrical source.

4.2.6 Pedestrian Traffic

The uncontrolled presence of pedestrians during Site activities is hazardous to both pedestrians and Site workers. Prior to the initiation of these activities, the location will be evaluated by the SSO to determine appropriate pedestrian barriers and restrictions. This includes walkways, parking lots, gates and doorways. Barriers, or at a minimum caution tape, will be used to identify the potential hazardous area and exclude pedestrian traffic. Exclusion of pedestrian traffic is intended to prevent injury to the pedestrians and eliminate distractions that could cause injury to personnel or other Site workers.

4.2.7 Vehicle Traffic

All vehicular traffic routes that could impact worker safety must be identified and changes communicated during the daily safety meeting. OSHA 29 CFR 1926.201 specifies that when signs, signals, or barricades do not provide adequate protection from highway or street traffic then flag persons shall be utilized. Flag persons will wear red or orange garments. Garments worn at night must be reflective. Provisions will be made for pedestrian and traffic control when appropriate as determined by the SSO.

4.2.8 Noise

Noise exposure can be affected by many factors including the number and types of noise sources (continuous versus intermittent or impact), and the proximity to noise intensifying structures such as walls or buildings that can cause the sound level to be increased. The operation of an excavator, backhoe or other mechanical equipment can be a source of significant noise exposure. In order to reduce the exposure to this noise, personnel working in areas of excessive noise must use hearing protectors (earplugs or earmuffs) consistent with an OSHA compliant Hearing Conservation Program. Noise compliance monitoring should be conducted in order to determine the necessary level of hearing protection. The hearing protection must have an adequate Noise Reduction Rating (NRR) for the associated noise exposure. Removal activities will continue to be conducted pursuant to all local, state, and federal laws and regulations regarding noise levels.

4.2.9 Heat and Cold Stress

Overexposure to temperature extremes can represent significant risks to personnel. Typical control measures designed to prevent heat stress include dressing properly, drinking plenty of water or electrolyte replacement fluids, and establishing an appropriate work/break regimen. Typical control measures designed to prevent cold stress also include dressing properly, and establishing an appropriate work/break regimen. The SSO will verify that the appropriate heat and cold stress control measures are implemented.

4.2.10 Fire and Explosion

There is the potential for combustible or flammable materials to be encountered during field activities. This includes situations where excessive organic vapors or free product are encountered. When this occurs, monitoring with a combustible gas indicator (CGI) is required to identify the potential for fire and explosion to occur.

In situations where flammable materials (gasoline, acetylene cylinders, hexane, methanol) are used on-site, the following precautions must be observed: keep flammable and combustible materials away from heat, sparks and open flames; do not smoke around flammable or combustible materials; keep all flammable and combustible liquids in approved and properly labeled safety containers; and segregate all flammable materials from other incompatible materials such as oxidizers.

4.2.11 Fire Protection

Site personnel, as applicable, must comply with the following fire prevention requirements:

- Fire Prevention, 29 CFR 1926.151: Electrical wiring and equipment for light, heat or power purposes are to be installed in compliance with the National Electrical Code. Portable battery-powered lighting equipment used in connection with the storage, handling, or use of flammable gases or liquids is to be the type approved for the hazardous location.

- Fire Extinguishers, 29 CFR 1926.150(c): Contractors are to make certain that at least one 10-pound capacity type ABC fire extinguisher is provided within 50 feet of each work area. Fire fighting equipment is to be periodically inspected and maintained in operating condition. Extinguishers subject to freezing are to be protected from freezing.

- Fuel Cans, 29 CFR 1926.351: Approved self-closing safety cans with flame arrest protection are to be used when dispensing small quantities of fuel.

4.2.12 Fall Protection

The most frequently cited serious violations of the fall protection provisions found in OSHA 29 CFR 1926, Subpart M are the following:

- Failure to protect workers from falls of 6 feet or more from unprotected sides or edges (e.g., floors and roofs);
- Failure to protect workers from falling into or through holes or openings in floors and walls; and
- Failure to provide guardrails on runways and ramps where workers are exposed to falls of 6 feet or more to a lower level.

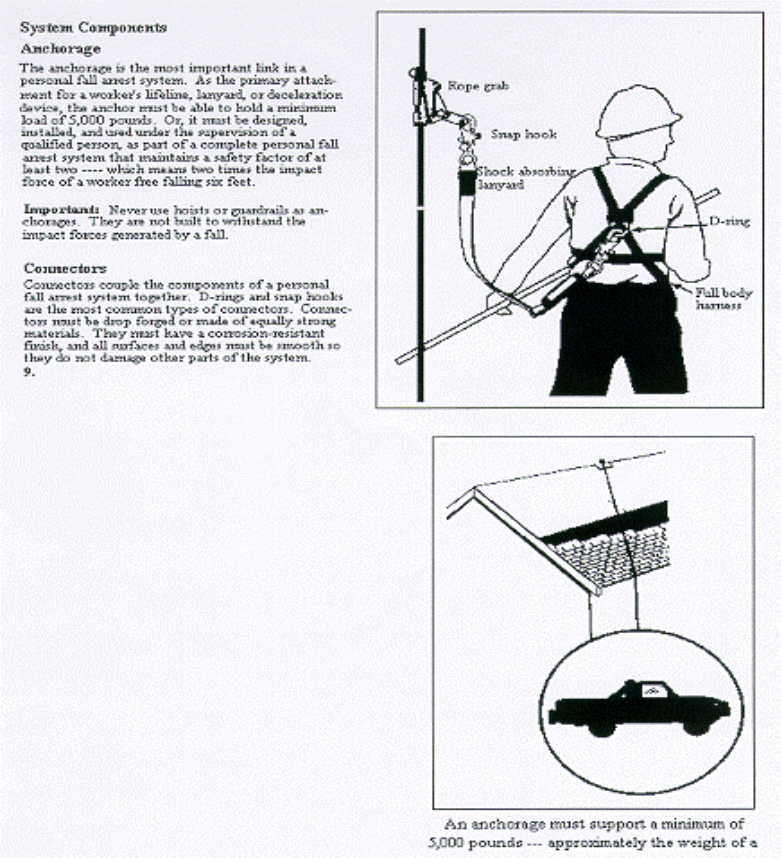
The SSO shall determine if the walking/working surfaces on which contract employees are to work has the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

Effective control measures that may be used to protect each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge, which is 6 feet (1.8 m) or more above a lower level, are as follows:

- Tie or restrain workers so they cannot reach the edge, thereby eliminating the fall hazard;
- Erect guardrail systems, warning lines, safety net systems, or personal fall arrest systems;
- Place covers over holes as soon as they are created if no work is being done at the hole;

The SSO must verify that each employee who might be exposed to fall hazards has been trained to recognize the hazards of falling and confirm that contractors have trained each employee in the procedures to be followed in order to minimize these hazards. The SSO will require contractors to show the latest fall protection training certification.

Fall protection requirements also apply to each employee at the edge of an excavation 6 feet (1.8 m) or more in depth. The employee shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier.



4.3 Biological Hazards

Potential biological hazards include poisonous plants, insects, or other animals that carry disease (e.g., Lyme disease, rabies) or venom (e.g., bees, snakes, spiders) and etiological agents potentially present in subsurface features associated with the sanitary waste disposal system.

4.3.1 Insects

Insects represent significant sources (vectors) of disease transmission. Precautions to avoid or minimize potential contact should be considered prior to all field activities. Disease or harmful effects can be transmitted through bites, stings, or through direct contact with insects or through ingestion of foods contaminated by certain insects. Examples of disease transmitted by insect bites include encephalitis and malaria from contaminated mosquitoes, Lyme disease and spotted fever from contaminated ticks. Stinging insects, such as bees and wasps, are prevalent throughout the country, particularly during the warmer months. The stings of these insects can be painful, and cause serious allergic reactions in some individuals.

4.3.2 Lyme Disease

Lyme disease is an infection caused by the bite of certain ticks, primarily deer, dog, and wood ticks. The symptoms of Lyme disease usually start out as a skin rash then progress to more serious symptoms. The more serious symptoms can include lesions, headaches, arthritis, and permanent damage to the neurological system. If detected early the disease can be treated successfully with antibiotics. The following steps are recommended for prevention of Lyme disease and other diseases transmitted by ticks:

- Beware of tall grass, bushes, woods and other areas where ticks may live;
- Wear sturdy shoes, long pants tucked into socks, and a shirt tucked into pants with a snug collar, and tight-fitting cuffs around the wrists. Insect/tick repellents may also be useful; and
- Carefully monitor for the presence of ticks. Carefully inspect clothes and skin when undressing. If a tick is attached to the skin, it should be removed with fine tipped tweezers. You should be alert for early symptoms over the next month or so. If you suspect that a tick has bitten you should contact a physician for medical advice.

4.3.3 Poisonous Plants

The possible presence of poisonous plants should be anticipated for field activities in wooded or heavily vegetated areas. Contact with poison ivy, poison oak, and poison sumac can result in an intense itching skin rash and characteristic blister-like lesions. Contact with these plants should be avoided.

4.3.4 Rats, Snakes, and Other Vermin

Certain animals, particularly those that feed on garbage and other wastes, can represent significant sources (vectors) of disease transmission. Precautions to avoid or minimize potential contact with (biting) animals (such as rats) or animal waste (such as pigeon droppings) should be considered prior to all field activities. Rats, snakes, and other wild animals can inflict painful bites. The bites can be poisonous (as in the case of some snakes), or disease causing (as in the case of rabid animals). Avoidance of these animals is the best protection.

4.3.5 Etiological Agents

Pathogens present in sanitary waste may represent a potential exposure risk to workers removing materials from subsurface features associated with the sanitary waste disposal system. Appropriate PPE will be used by workers dealing with these types of subsurface features.

5.0 AIR MONITORING

Air monitoring falls into three separate categories: direct reading/environmental monitoring, personal exposure monitoring, and perimeter air monitoring.

5.1 Site Monitoring Instruments

All air monitoring will be conducted with appropriate equipment to identify the contaminants of concern at the Site. The following instruments will be utilized, as necessary, to quantify the suspected materials at the Site:

- VOCs and SVOCs – PID, such as the Photovac MicroTip MP-100 or Thermo Environmental Instruments Model 580B OVM/Datalogger or Flame Ionization Detector (FID), such as the Photovac MicroFID or Thermo Environmental Instruments Model TVA 1000.
- Particulate or Heavy Metals - A digital dust indicator such as the MIE personal DataRam (PDR) will be used to measure particulate levels in air. The action limit will be 150 μ/m^3 (15 minute duration). Controlling total dust levels to less than nuisance dust levels will adequately control exposures to the metals contained within the soils.
- Combustible Gas Meter – O_2/LEL meter will be used to monitor potential flammable/combustible atmospheres.
- Specific Toxics – Sorbent tubes requiring subsequent laboratory analysis.

Direct reading instruments will be used continuously during the remedial activities. All instruments used during Site activities will be intrinsically safe for use in designated areas. Instruments will be calibrated prior to use and on an as-needed basis, thereafter consistent with the manufacturer's recommendations. Calibration information will be documented in the Daily Site Safety Log (Appendix B) or in the daily field notes.

Site monitoring will be conducted under the supervision of the SSO. On-Site readings will be recorded by the SSO in the Daily Site Safety Log (Appendix B) or in the daily field notes.

5.2 Site Monitoring Frequency

Site monitoring will be conducted to assess both the current conditions and changing status of airborne contaminant (particulate and VOC) concentrations. The following air monitoring schedule will be performed at the Site:

- Initial Background – Upon initial entry and prior to initiation of any Site activities, to identify Immediately Dangerous to Life and Health (IDLH) conditions, exposures above OSHA-PELs and Site-specific action levels.

- Daily Background – Prior to initiation of daily Site activities within the exclusion zone and at the conclusion of daily Site activities. Includes both upwind and downwind locations.

- Work Zone Monitoring – Environmental monitoring in the work zone will be performed during all intrusive Site activities. Air quality in the breathing zone will be monitored continuously for particulates and VOCs/SVOCs. Continuous monitoring for oxygen, LEL, carbon monoxide and hydrogen sulfide will be performed during all confined space entries. Monitoring results will be compared to action level criteria for upgrading PPE or implementing additional engineering controls or procedures in the Work Areas.

- Contaminant Migration – Degree of contaminant migration will be evaluated by monitoring the perimeter of the Work Area during intrusive activities. Continuous real-time air monitoring for particulates will be conducted at the Work Area perimeter. In addition, periodic monitoring for VOCs will be performed at the Work Area perimeter. Monitoring results will be compared to action level criteria for implementing additional engineering controls or procedures in the Work Areas.

Site monitoring will be conducted under the direction of the SSO and may be revised based on previous sampling results and current Site conditions. Site monitoring results will be documented in the Daily Site Safety Log (Appendix B) or in the daily field notes.

5.3 Environmental Monitoring

The environmental monitoring required for the Site will be conducted using the direct reading instruments as indicated in Table 5-1. Due to the variety of compounds of concern that may become airborne and require monitoring in the breathing zone, a combination of several monitoring instruments will be utilized. The data provided by these instruments could be used to determine the appropriate control actions and PPE requirements.

Equipment calibration must be performed in accordance with the manufacturer's instructions. Field checks using the appropriate reference standards must be made on-site at the minimum frequency of twice per shift (pre and post sampling). A daily log of all instrument readings, as well as all field reference checks and calibration information, must be maintained. The action limits established for work at the Site are summarized in Table 5-1.

5.3.1 Total Organic Compounds

A PID, equipped with an 10.6 eV lamp (minimum), calibrated with isobutylene, will be used to monitor the general area and the breathing zone of workers during intrusive activities to assess the potential presence of organic vapors, both volatile and semi-volatile. VOCs include TCE, cis-1,2-DCE, and PCE, and SVOCs are coal tar pitch volatiles, such as dibenzo(a,h)anthracene and benzo(a)pyrene. A FID, calibrated with a methane standard may also be used to monitor organics in the breathing zone.

Table 5-1
Action Limits for Work Activities Conducted at the
Liberty Industrial Finishing Superfund Site

Location/Activitiy	Contaminant	Action Limit	Respiratory Protection	Monitoring Equipment
Initial Site Work at all AOCs, Level D	VOCs, SVOCs,	Background - 5 ppm (15 minute duration) Greater than 5 ppm (15 minute duration)	Level D Wait for levels to decrease. Evaluate perimeter monitoring. Level C (Implement Action Level Response Measures from the RAMP (Sec. 1.3)	PID Sorbent Tube sampling for subsequent laboratory analysis
Removing contaminants via bucket and/or hand shovels	VOC's, SVOCs	Background - < 5 ppm (15 minute duration) Greater than 5 ppm (15 minute duration)	Level D Wait for levels to decrease. Initiate perimeter monitoring. Level C (Implement Action Level Response Measures from the RAMP (Sec. 1.3)	PID Sorbent Tube sampling for subsequent laboratory analysis
Excavation	Inorganic Mixture	Background - < 150 ug/m^3 >= 150 ug/m^3	Level D Initiate Engineering Controls	MIE DataRam or Personal Exposure Monitoring – MCE filter cassettes
Confined Space Entry (Combustible Gas Indicator Used)	Oxygen CO H_2S	19.5 % - 23% >=25 ppm Continuously >= 5 ppm	Acceptable Range Level B Level C	LEL meter or CGI CO sensor H_2S sensor

Personal monitoring should be performed over an entire workshift for 2 consecutive days.

(1) The OV cartridges used must meet the requirements of 29 CFR 1910.134. In order to prevent potential overexposure within the respirator facepiece, new OV cartridges will be installed at the beginning of the shift. Combination cartridges will be used in order to satisfy the protection requirements of VOCs as well as particulate matter.
(2) Full-facepiece respirators have an APR of 50 X TLV.

Changes to the action levels (for vapors or particulates) and use of any personal protective equipment are allowed according to the professional discretion of the Site Site Safety Officer based upon the nature of the field operations, observations, and their previous experience during other similar activities at other similar Sites.

References: American Conference of Governmental Industrial Hygienists, 1992-1993. Threshold Limit Values and Biological Exposure Indices for 1992-1993.
U.S. Department of Health and Human Services, 1990. NIOSH Pocket Guide to Chemical Hazards. June 1990.

As previously indicated, the ROD provided a summary of the risk based approach for the determination of potential hazards associated with chemical exposure to construction workers at the Site.

The initial level of PPE for this Site is Level D with use of appropriate dermal protection for hands. Real-time air monitoring will be conducted to make certain that no additional exposure develops from the inhalation route.

5.3.2 Metal Particulates

Based on previous investigation results, potential hexavalent chromium (aqueous), copper, chromium, arsenic, iron, lead, and zinc exposures exist. The highest detected concentrations of these metals are copper at 21,600 mg/kg and iron at 376,000 mg/kg. The most hazardous metals detected are arsenic, hexavalent chromium (aqueous), and lead. Because hexavalent chromium is found in the aqueous form, this constituent poses little, if any, inhalation risk, but it does present a potential skin contact or ingestion exposure. Particulate air monitoring will be achieved using a MIE personal DataRam (PDR), which measures respirable particulate via passive diffusion. An action level of 150 $\mu g/m^3$, consistent with NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4030 and the New York State Department of Health (NYSDOH) Community Air Monitoring Plan for fugitive dust will be protective for the metals content of the dust.

5.3.3 Combustible Gases

Monitoring for combustible gases/explosive atmospheres will be required with a CGI/LEL meter calibrated using an appropriate reference standard (methane or pentane, as applicable). Monitoring with a CGI will be required continuously during confined space entry activities. CGI monitoring will also be required when potential sources of explosive atmospheres or methane

generating sources are encountered, including biodegrading organic materials, released product or solvents, and situations where excessive organic vapors or free product are encountered. Monitoring shall be conducted with the CGI/LEL meter with the alarm set at 10% of the LEL.

In addition, the CGI meter must be equipped with a hydrogen sulfide (H_2S) sensor for wastewater monitoring, and a carbon monoxide (CO) sensor. The OSHA 10-minute peak for H_2S is 50 parts per million (ppm) per 8-hour shift, and the ACGIH 8-hour TLV is 10 ppm. The OSHA PEL for CO is 50 ppm, and the ACGIH TLV is 25 ppm.

5.3.4 Excavations/Confined Space Entry

Air monitoring for excavations and confined space entries must be conducted in accordance with the information provided below. Confined space entry may be required at the Site when access to the UST is necessary. If a confined space is encountered and entry is absolutely necessary, Site supervisory personnel must be notified to coordinate the entry. Only confined space entry trained personnel will be allowed to perform such activities. Confined space entries should be avoided whenever possible. Trenches (greater than 4 feet in depth) and other excavations will require air monitoring with both the PID and CGI/LEL meter. Monitoring of confined spaces must be conducted in the following order only:

- Oxygen (O_2 output)
- Explosive/combustible atmospheres (CGI/LEL meter)
- Other toxics (SVOCs/VOCs, H_2S-both CGI/LEL meter and a PID)

Confined space entry monitoring must be continuous during the entire entry. Action levels for confined space entry monitoring are provided on Table 5.1.

5.3.5 Carbon Monoxide

Air monitoring for CO will be conducted using a CO meter. Carbon monoxide monitoring will be conducted continuously during any confined space or excavation entry requiring the use of equipment powered by an internal combustion engine (generators, etc.) regardless of the fuel type.

If CO levels cannot be controlled with ventilation to below 15 ppm over an 8-hour day, Level B PPE will be required.

5.4 Documentation Monitoring

Documentation monitoring will be performed by the SSO during discrete Work tasks, as described below, to verify that the action levels which are measured by real-time particulate monitoring are appropriate to afford protection to on-Site workers during Work activities. Documentation samples will be collected by fitting three workers selected by the SSO with sampling pumps that draw air at a prescribed flow rate. Each pump will be suitably equipped so that only the respirable fraction of particulates is drawn into the pump. The pump will draw air across a filter cartridge, which will then removed and sent to a laboratory for analysis (Refer to Section 5.4.1). All documentation sampling equipment will be provided by the SSO.

Based on the total weight of each contaminant (i.e., respirable particulate) on the filter cartridge (as determined by the laboratory), the "estimated contaminant exposure" over a given period of time can be calculated for each worker, as follows:

(pump flow rate in liters/minute) (minutes sampled) = total sampled liters of air

Then:

(total mg of contaminant) = *actual contaminant exposure in mg/m^3*

(sampled liters of air) (1 m^3/1,000 liters)

Documentation samples will be collected by the SSO from three workers during the first ten days after initiating on-site activity. Following the initial ten days, documentation sampling will be reduced to once per month for the duration of the remedial activity. The documentation air sample results for total dust will be compared to the real time monitoring data collected with the dust monitors.

Documentation sampling will continue until it is established by the SSO that the results of the documentation monitoring program are consistent with the real-time particulate monitoring, and that workers are not experiencing unexpected exposures.

As deemed necessary or appropriate in his or her professional judgment, the SSO may elect to collect documentation samples more frequently or during other Work activities than identified above in order to take into account any variances in the nature of the Work conducted, weather conditions, soil concentrations, or actions to be taken in the event particulate levels are higher than anticipated.

5.4.1 Documentation Sampling and Analytical Methodologies

All documentation sampling methodologies (i.e., pump flow rates, calibration, sampling media and subsequent analysis) will be performed in accordance with NIOSH or OSHA methodologies, and the written instructions of the equipment manufacturer. The samples will be collected over a time frame that will not exceed NIOSH or OSHA guidelines, and will not restrict the flow of air through the filter cartridge. For example, if sample collection is calculated to be for eight hours based upon the assumed filter loading, and the worker will be in the work zone for 10 hours, then two five-hour samples will be collected at a higher sampling rate for appropriate loading or the sampling rate for one 10 hour sample may be reduced.

Each sample pump will be equipped with a 10 millimeter (mm) cyclone to ensure that only respirable particulates enter the pump. Sampling media shall be 37 mm MCE matched weight filters. The initial pump flow rate will be 1.7 liters per minute. The initial sample volume will be 800 liters. Both flow rate and sample volume may be adjusted based upon dust loading rates to the filter.

All samples will be submitted to an American Industrial Hygiene Association (AIHA) accredited laboratory for 24-hour verbal turnaround time, and analyzed for respirable particulates using NIOSH Method 0600, and for lead using NIOSH Method 7300. All analyses will be conducted using the lowest achievable detection limit for that NIOSH Method.

5.5 Perimeter Air Monitoring

Perimeter monitoring performed at the Site is discussed in detail in the SAMP and will be performed by the Engineer. Work Zone perimeter air monitoring should be performed during specified intrusive activities, such as excavation or sampling work of Site soils and subsurface features. The perimeter monitoring discussed in the SAMP provides a measure of protection for

the downwind community (i.e., offsite receptors including residences and businesses not directly involved in with the Site work activities). Perimeter air monitoring will incorporate meteorological monitoring, real-time contaminant migration monitoring, and applicable action level response measures.

6.0 PERSONAL PROTECTIVE EQUIPMENT

This section describes the levels of protection that will be required by on-Site personnel during Site activities.

6.1 Personal Use Factors And Equipment Limitations

Certain personal features of workers may jeopardize safety during equipment use. Protective or precautionary measures will be taken as necessary for the following personal features:

- Facial hair and long hair that passes between the face and the sealing surface of the respirator is prohibited because it interferes with respirator fit and wearer vision, whereby excessive contaminant penetration may occur. Long hair must be effectively contained within protective hair coverings.
- Eyeglasses with conventional temple pieces will interfere with the respirator-to-face seal of a full face-piece. A spectacle kit should be installed in the facemasks of workers requiring vision correction, providing a tight seal. Prescription eyeglasses worn on-site must meet ANSI Standard Z87.1. Contact lenses may trap contaminants and/or particulate between the lens and the eye, causing irritation. Wearing contact lenses with a respirator in a contaminated atmosphere is prohibited.
- Gum and chewing tobacco are prohibited during respirator use because they may cause the ingestion of contaminants and may compromise the respirator fit.

During equipment use, workers will be encouraged to report any perceived problems or difficulties to their supervisor(s). These malfunctions include, but are not limited to the following:

- Degradation of the protective ensemble;
- Perception of odors;
- Skin irritation;
- Unusual residues on PPE;
- Discomfort;
- Resistance to breathing;
- Fatigue due to respirator use;
- Interference with vision or communication;
- Restriction of movement; and

- Personal responses such as rapid pulse, nausea and chest pain.

If a supplied air respirator is being used, all hazards that might endanger the integrity of the airline should be removed from the working area prior to use. During use, other workers and vehicles should be excluded from the area.

6.2 Work Duration

In selecting PPE, the anticipated duration of the Work will be considered. Several factors may limit the Work length, including air supply, equipment effectiveness and temperature. The SSO will make all decisions regarding selection of PPE and Work duration.

6.2.1 Suit/Ensemble Permeation, Degradation, And Penetration

The possibility of chemical permeation, degradation, or penetration of protective ensembles during the Work may limit Work duration. No single clothing material is an effective barrier to all chemicals or all combinations of chemicals, and no material is an effective barrier to prolonged chemical exposure.

6.2.2 Ambient Temperature

The ambient temperature may have a major influence on Work duration as it affects both the worker and the protective integrity of the ensemble. Heat stress, which can occur even in relatively moderate temperatures, presents the greatest immediate danger to an ensemble-encapsulated worker. Hot and cold ambient temperatures also can effect:

- Valve operation on suits and/or respirators;
- The durability and flexibility of suit material;
- The integrity of suit fasteners;
- The breakthrough time and penetration rates of chemicals; and
- The concentration of airborne contaminants.

All of these factors may decrease the duration of protection provided by a given piece of clothing or respiratory equipment.

6.3 Personal Protective Equipment Storage And Maintenance

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Many equipment failures can be directly attributed to improper storage.

Different types and materials of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake. Protective clothing will be folded or hung in accordance with manufacturer's recommendations. Contaminated clothing for reuse will remain in the contamination reduction zone (CRZ).

Self-contained breathing apparatus (SCBA), supplied air respirators, and air-purifying respirators, if required, will be dismantled, washed and disinfected after each use. SCBAs will be stored in storage chests supplied by the manufacturer. Air-purifying respirators should be stored individually in their original cartons or carrying cases, or in heat-sealed or re-sealable plastic bags.

The technical aspects of PPE maintenance procedures vary by manufacturer and type of equipment. Manufacturers frequently restrict the sale of certain PPE parts only to individuals or groups who are specially trained, equipped and authorized by the manufacturer to purchase them.

6.4 Personal Protective Equipment Training and Proper Fitting

This section provides details regarding personal protective equipment training and procedures for proper fitting for respirators.

6.4.1 Personal Protective Equipment Training

Employees must be trained in the proper use of protective equipment prior to using any equipment at the Site. The purpose of the training will be to: (1) become familiar with the equipment in a non-hazardous situation; (2) instill confidence and awareness in the user of the limitations and capabilities of the equipment; (3) increase the operating and protective efficiency of PPE use; and (4) reduce maintenance expenses.

6.4.2 Respirator Fit Testing

The "fit" of the face piece-to-face seal of a respirator will be tested on each potential wearer to verify a tight seal. Every face piece does not necessarily fit every wearer. Certain features, such as scars, very prominent cheekbones, deep skin creases, dentures or missing teeth and the chewing of gum and tobacco may interfere with the respirator-to-face seal. Under conditions where these features may impede a good seal, a respirator must not be worn. Personnel who may wear a respirator will be qualitatively fit-tested with irritant smoke, iso-amyl acetate, or equivalent methods according to 29 CFR 1926.58, Appendix C, at least annually.

6.5 Personal Protective Equipment Donning And Doffing Procedures

The PPE program includes clearly defined donning and doffing procedures as indicated in the following sections.

6.5.1 Personal Protective Equipment Donning

A routine has been established for donning and evaluating all levels of protective clothing and equipment. If the clothing is too small, the likelihood of tearing the suit material and accelerating worker fatigue will increase. If the clothing is too large, the possibility of snagging the material and compromising the dexterity and coordination of the worker is increased. In either case, better fitting clothing will be provided.

6.5.2 Personal Protective Equipment Doffing

Exact procedures for removing PPE have been established and will be followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others. These procedures will be performed only after decontamination of the suited worker.

6.6 Personal Protective Equipment Inspection Procedures

An effective PPE inspection program features four different inspections:

- Inspection and operational testing of equipment received from the factory or distributor;
- Inspection of equipment as it is issued;
- Inspection before and after use or training and prior to maintenance; and

- Periodic inspection of stored equipment.

6.7 Personal Protective Equipment Program Evaluation

At a minimum, the PPE program is reviewed annually to evaluate the effectiveness of the following factors:

- The number of personnel-hours that are spent in various PPE ensembles;
- The degree to which the Site complies with the Hazardous Waste Operation Emergency Response (HAZWOPER) standards on PPE use, inspection, maintenance, and record keeping;
- Accident, injury, and illness statistics as well as recorded levels of exposure;
- The adequacy of operating procedures to guide the selection of PPE;
- The degree of coordination with comprehensive and Site-specific health and safety programs; and
- Recommendations for and results of program improvement and modification.

6.8 Levels of Protection

The following table specifies the initial level of protection required for each task. The table is arranged according to major project tasks. The personal protection requirements are based on the anticipated chemical and physical hazards, past uses of the Site, and potential exposure routes (i.e., inhalation, skin contact, and ingestion). Personnel will be required to upgrade levels of protection based on the air monitoring results. The SSO and Site supervisory personnel will determine the level of protection and will inform all other personnel.

TABLE 6-1
INITIAL LEVEL OF PROTECTIVE EQUIPMENT

Task	Initial Level of Protection
General Site work - **No contact hazards** (general pre-construction Site utility survey, contractor oversight, traffic/pedestrian control)	Level D
General Site work - **Contact hazards** (utility survey of the locations and elevations of any additional utilities uncovered during the performance of work, all intrusive activities, soil and aqueous material sampling, and all other tasks involving contact with soil or aqueous material)	Modified Level D
Excavation Activities – Equipment Operators (provided that the operators remain inside of the equipment). Operators would be required to don Level C PPE if required based on air monitoring results.	Level D

PPE will be donned as described below for the activities described in Table 6-1. Based on available analytical data and anticipated activities, it is assumed that most activities will require Level D or Modified Level D PPE with contingencies for Level C PPE. The initial level of protection for the tasks not included in Table 6-1 will be determined by the SSO in consultation with the HSM.

6.9 Level D Personal Protective Equipment

Level D PPE is defined as the following equipment, or equivalent:

- Hardhat;
- Work clothes;
- Steeled-toed work boots;
- Hearing protection (if necessary as discussed in Section 4.2.8);
- Eye protection; and
- Reflective orange vest if working on or near public roadways.

6.10 Modified Level D Personal Protective Equipment

Modified Level D is specified where there is a contact hazard but not an inhalation hazard. Modified Level D PPE is defined as the following, or equivalent:

- Hardhat;

- Chemical resistant coveralls* over work clothes;
- Steel-toed work boots;
- Chemically resistant gloves (with disposable inner latex or vinyl gloves with neoprene or butyl rubber outer gloves);
- Hearing protection (if necessary as discussed in Section 4.2.8); and
- Reflective orange vest if working on or near public roadways.

* If the potential exists for contact with liquids, personnel will be required to wear a coated chemical protective suit (e.g., Saranex).

6.11 Level C Personal Protective Equipment

Based on specific activities, air monitoring results and/or the presence of unanticipated volatile conditions, Level C respiratory protection may be required. Level C PPE is defined as the following, or equivalent:

- Hardhat;
- Tyvek coveralls* over work clothes;
- Steel-toed work boots with disposable boot covers;
- Chemically resistant gloves (with disposable inner latex or vinyl gloves with neoprene or butyl rubber outer gloves);
- Hearing protection (if necessary as defined in Section 4.2.8);
- Reflective orange vest if working on or near public roadways; and,
- Full-face air purifying respirator with combination High Efficiency Particulate (HEPA)/organic vapor cartridges.

* If the potential exists for contact with liquids, personnel will be required to wear a coated chemical protective suit (e.g., Saranex).

All personnel who will be required to wear air-purifying respirators must have been qualitatively or quantitatively fit-tested within the last year for the particular brand and size respirator he/she will be wearing on-site. Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the face seal. As a result, workers requiring corrective lenses must

use spectacle inserts designed for use with respirators. Each contract employee required to wear respirators must provide the SSO with proof of training, fit testing, and medical evaluations.

6.12 Level B Personal Protective Equipment

Significant engineering controls would be implemented should Level C PPE be required. No circumstances under which Level B PPE would be required are anticipated for this removal action.

7.0 SITE CONTROL

To minimize both exposure of unprotected personnel and the migration of potential contamination to areas outside of the specified work area by personnel or equipment, work areas along with personal protective equipment requirements will be clearly identified.

Work areas or zones will be established as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November 1985. This document recommends that the area surrounding each of the work areas be divided into three zones; the exclusion or "Hot" zone, CRZ, and the support zone, whenever possible and plausible.

7.1 Exclusion Zone

Control of pedestrian traffic is critical. Barriers providing adequate clearance from work activities (particularly excavation and tracing operations) will be required. Barriers will be established to prevent injury from moving vehicles and all workers will be reminded daily and must be aware of on-Site vehicular traffic.

If necessary, caution signs may be used in addition to physical barriers. Additionally, Site workers will be assigned the responsibility of maintaining Site control in order to prohibit non-Site personnel from approaching or entering work areas.

Due to the scattered locations of the activities covered within the scope of this HSCP, the actual zones are expected to change frequently in accordance with daily activities. Therefore, all exclusion zones are expected to be temporary and dynamic. Site personnel will be advised of the locations of temporary work zones as part of the routine Site safety meetings described in Section 9.0.

Each exclusion zone will consist of the active work areas where potential contaminant exposures exist. Therefore, the AOC listed in Section 3.0, Scope of Work, are the current exclusion zones present at the Site. It should be noted that exclusion zones encompass intrusive work activities that are believed to present a potential contaminant exposure exceeding the established regulatory limits. An appropriate radius will be established as the typical perimeter of the zone

in order to protect unprotected and untrained personnel from chemical or physical hazards that may occur as a result of Site operations. The perimeter of the zone will be marked with brightly colored hazard tape. All personnel entering these areas must wear the prescribed level of protective equipment, and must have received training for the specific hazards associated with the work conducted within the exclusion zone.

7.2 Contamination Reduction Zone

The CRZ will serve as a passageway between the exclusion and support zones. The actual length and/or location of the corridor will also be temporary or dynamic in accordance with the locations of the exclusion zones. The CRZ is where personnel will begin the sequential decontamination process when exiting the exclusion zone. To prevent cross contamination and for accountability purposes, all personnel must enter and leave the exclusion zone through the CRZ. A separate, heavy equipment decontamination zone has been established at the Site. Personnel performing the equipment decontamination procedures will be required to show the SSO proof of HAZWOPER training.

7.3 Support Zone

The support zone (SZ) will coincide with the project command post, and will consist of an area outside the exclusion zone and CRZ, where support vehicles and equipment will be staged. In addition, potable water and soap for hand washing will be available at the Site, along with containers for solid waste for use by on-Site personnel. The containers will be removed from the Site for proper disposal. Hazardous, or potentially hazardous, materials will be drummed, labeled, and stored with other drums of substances generated during this project for future disposal.

7.4 Other Site Control and Safety Measures

The following measures are designed to augment the specific health and safety guidelines provided in this plan for exclusion zone activities.

- The "buddy system" will be used by personnel performing intrusive activities. No one is to perform Site work alone. Each team member must be intimately familiar with the procedures for initiating an emergency response.

- Avoidance of contamination is of the utmost importance. Whenever possible, actively avoid contact with affected (or potentially affected) surfaces or materials. Walk around

(not through) puddles and discolored surfaces. Do not kneel on the ground or set equipment on the ground.

- Protect air-monitoring instruments from water by either using the instrument in the provided case or by wrapping the instrument in plastic if a case is not provided. If the instrument is wrapped in plastic, openings in the bag must be made for sample intake and exhaust.

- Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activities.

- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited except in the SZ after proper decontamination.

- Beards or other facial hair that interfere with respirator fit are prohibited for anyone who is required to wear a respirator.

- The use of alcohol or drugs is prohibited during the conduct of field operations. Working under the influence of prescription drugs or over-the-counter medication that may cause drowsiness or loss of alertness is also prohibited.

- All equipment must be decontaminated or properly disposed, as designated by the SSO, before leaving the Site.

- Safety equipment (i.e., PPE) specified in Section 6.0 will be required for all field personnel unless otherwise approved by the SSO.

7.5 Site Security

The SSO and Site supervisory personnel are responsible for identifying the presence of all employees on-site. A Site Entry/Exit Log (Appendix G) will be maintained for this purpose or the information will be kept in the SSO's field book.

Equipment left on-Site during off-hours must be locked, immobilized, and/or otherwise secured to prevent theft or unauthorized use or access.

8.0 DECONTAMINATION

Proper decontamination is required of all personnel and equipment before leaving the AOC designated as exclusion zones. All materials and equipment used for decontamination must be disposed of properly. Clothing, tools, buckets, brushes, and all other equipment that is affected must be secured in drums or other containers and labeled.

8.1 Personnel Decontamination Procedures

The following procedures have been established to provide Site personnel with minimum guidelines for proper decontamination. Personnel leaving the exclusion zone must follow these minimum procedures. The decontamination process shall take place at a reasonable distance from any area of potential contamination.

Designated stations will be established within the CRZ and will include at a minimum, washtubs, scrub brushes, detergent/water, and rinse water when appropriate for non-disposable equipment. Non-disposable equipment will be cleaned and staged for the next use. Wash stations shall consist of a potable water supply, hand soap, and clean towels. In most instances, employees will perform self-decontamination. In cases where further assistance is necessary, employees will be designated to work within the CRZ to assist employees with decontamination. Modifications of the decontamination procedures may be necessary as determined by the SSO. Decontamination solutions will be contained in 55-gallon drums, sampled, and disposed consistent with regulatory guidance and applicable regulations.

8.2 Decontamination Procedures for Prescribed Levels of Protection

The following decontamination procedures shall be implemented during Site activities for the appropriate level of protection.

8.3 Level D - Personal Protection Decontamination Procedure

Step 1 - Segregated Equipment Drop: Deposit contaminated equipment (e.g., tools, sampling devices, monitoring instruments) onto plastic drop cloths.

Step 2 - Boot, Outer Glove and Coverall Wash: Brush overboots (if used), outer gloves (if used) and coveralls (if used) free of residual materials. If necessary, wash with detergent/water solution, and rinse with water.

Step 3 - Boot, Outer Glove and Coverall Removal: Remove overboots (if used), outer gloves (if used), and coveralls (if used) in that order. Place disposable overboots, outer gloves, and coveralls into a container with a plastic liner. Stage non-disposable equipment for future use.

Step 4 - Inner Glove Wash and Removal: Wash and remove inner gloves (if used) and place in lined container.

Step 5 - Field Wash: Wash hands and face thoroughly.

8.4 Level C - Personal Protection Decontamination Procedure

Step 1 - Segregated Equipment Drop: Deposit contaminated equipment (e.g., tools, sampling devices, monitoring instruments) onto plastic drop cloths.

Step 2 - Outer Boot, Outer Glove and Outer Coverall Wash and Rinse: Brush overboots (if used), outer gloves (if used) and coveralls (if used) free of residual materials. If necessary, wash with detergent/water solution, and rinse with water.

Step 3 - Outer Boot and Outer Glove Removal: Remove overboots (if used) and outer gloves (if used) in that order. Place disposable overboots and outer gloves into a container with a plastic liner. Stage non-disposable equipment for future use.

Step 4 - Canister or Mask Change: If the worker leaves the exclusion zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, and joints taped worker returns to duty.

Step 5 – Boot and Outer Coverall Removal: Boots, chemical-resistant splash suit removed and deposited in separate containers lined with plastic.

Step 6 - Face Piece and Inner Glove Removal: Remove face piece. Remove inner glove. Avoid touching face with fingers. Deposit face piece on plastic sheet. Deposit inner gloves in container.

Step 7 - Field Wash: Wash hands and face thoroughly. Shower as soon as possible.

8.5 Equipment Decontamination

Measures should be taken to prevent potential contamination of sampling and monitoring equipment. Sampling devices may become impacted, but monitoring instruments, unless they are splashed, usually do not. Once affected, instruments are difficult to clean without damaging them. Any delicate instrument that cannot be easily decontaminated should be protected while it is being used. Protect air-monitoring instruments from water by either using the instrument in the provided case or by wrapping the instrument in plastic if a case is not provided. If the instrument is wrapped in plastic, openings in the bag must be made for sample intake and exhaust.

If solvents are used for decontamination of equipment, safety precautions specified on the manufacturer's warning label and MSDS must be observed (see Section 4.1.1 Chemicals Subject to OSHA Hazard Communication). Solvents or rinsate generated during the decontamination process will be drummed, labeled, and disposed of with other substances from the Site. Copies of MSDSs associated with decontamination solvents and detergents used on-Site are provided in the Field Trailer.

Wooden tools are difficult to decontaminate because they adsorb chemicals. Wooden hand tools will be kept on-Site for the project duration and handled only by protected workers. At the end of Site activities, wooden tools will be discarded if they cannot be decontaminated properly.

Fluids generated during decontamination activities will be collected and disposed properly, in accordance with all applicable regulations.

Shovels, sample trowels, and excavator buckets may require steam cleaning. Particular care must be given to those components in direct contact with contaminants. Personnel conducting

the decontamination must be adequately protected since mists and aerosols can be generated during the cleaning process.

PPE, as specified in Section 6.0, must be worn during steam cleaning and power washing activities. PPE requirements, air monitoring requirements, and associated action levels during all other decontamination activities will be determined by the SSO accordingly.

8.6 Decontamination Wastewater, PPE, And Sampling Equipment Disposal Procedures

The sampling activities will generate small quantities of decontamination wastewater, spent PPE, and expended disposable sampling equipment that will be contained in 55-gallon drums for offsite disposal. The drums will be sampled, characterized, and disposed within a reasonable time period after sampling has been completed, as defined below. Drums will be placed adjacent to the CRZ for ease in placing waste materials in the drums, and for subsequent transportation and offsite disposal. All drums will be secured at the end of each day by placing the lid on the drums, securing the ring back on the drums, and by tightening the drum bolts.

Drums containing spent PPE and disposable, sampling equipment will be assumed to be a hazardous waste, labeled with commercially available Department of Transportation (DOT) labels, and disposed at a permitted offsite facility. Waste characterization samples will be collected from the drums and analyzed prior to disposal. The PPE and sampling equipment drums as well as the drums containing decontamination wash water will remain on-Site until the waste characterization data is available and arrangements for disposal have been finalized.

Waste characterization samples of the decontamination wash water will be collected and shipped to a NYSDOH accredited laboratory for analysis. Accordingly, interim sampling and disposal of decontamination wash water will be performed throughout the duration of the field effort on an as needed basis, but at a minimum quarterly samples will be collected and analyzed. The drums containing decontamination wash water will be labeled indicating that the drums contain waste material that must be managed as “Hazardous” until classified otherwise in accordance with ongoing laboratory analysis. Drums containing decontamination liquids will be staged on appropriate spill-containment structures/systems. All spent PPE, disposable sampling equipment, and decontamination wash water drum labels will contain the following information:

- The name and address of the generator;
- The contents of the drum;
- Drum content classification (e.g., Hazardous, Non-Hazardous, PCBs or if classification analyses have not been received "Pending Analysis");
- Appropriate warnings relative to the material classification;
- The operation that generated the contents;
- The accumulation start date;
- The telephone number of the responsible contact; and
- Any other appropriate information relative to the drum's classification.

Following receipt of the analytical results of the drum characterization samples, the waste decontamination wash water will be profiled as "RCRA and/or Toxic Substances Control Act (TSCA) Hazardous" or "Non-Hazardous" and appropriate arrangements will be made for transportation and offsite disposal of the drums. The labels on the drums will then be changed to reflect the appropriate classification prior to shipment for offsite disposal. In addition, the waste characterization data will be used to complete the appropriate hazardous waste classification and waste manifest forms for the spent PPE and the disposable sampling equipment.

It is anticipated that the drums of waste to be generated through the sampling work to be performed will be removed from the Site for disposal within 45 days after the termination of field activities. All activities related to drum storage and/or transportation for offsite disposal will be coordinated by a Site representative with the USEPA or NYSDEC on-Site representative. Copies of all waste disposal manifests and other documentation (e.g., Certificates of Disposal) will be provided when they become available.

9.0 CRITERIA FOR INCLUSION IN HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE PROGRAM

Personnel who will be conducting fieldwork at a hazardous waste site or regularly conducting intrusive investigative activities are required to be in compliance with the personnel training and medical monitoring requirements of the HAZWOPER Program (29 CFR 1910.120).

Under no circumstances shall employees either engage in fieldwork at hazardous waste sites or conduct intrusive investigative activities without being in compliance with both the training and medical monitoring requirements identified below.

The general requirements of the HAZWOPER Program are provided below:

9.1 Medical Monitoring Requirements

The program participants must obtain baseline, annual, and exit physical examinations. The criteria for the program participants and the timing of such physical examinations are herein described.

9.1.1 Baseline Examination

The baseline examination for employees must be conducted prior to the first assignment involving fieldwork at a hazardous waste site or regular intrusive investigative activities. Although an exit examination from a previous employer may not be substituted for the baseline examination, a new employee's baseline examination may take place within the first three months of employment if the exit examination results from a previous employer are available. The costs for the medical monitoring will be covered by the subcontractor.

Should the subcontractor determine that the employee is likely to be involved in fieldwork at this hazardous waste Site or will regularly conduct intrusive investigations within the first two months of employment, the baseline examination should be scheduled immediately after the start of employment.

9.1.2 Annual Examinations

Personnel in the Medical Monitoring Program shall have a medical exam once every twelve months. Additional medical monitoring may be necessary depending on employee exposures to specific chemicals. Questions concerning applicability shall be discussed with the HSM.

9.1.3 Exit Examination

Site personnel who are included in the Medical Monitoring Program shall have an exit examination prior to their last day of employment.

9.2 Medical Monitoring and Personal Training Requirements

The OSHA has established requirements for a medical surveillance program designed to monitor and reduce health risks for employees who may potentially be exposed to hazardous materials. For the activities related to the sampling, this potential has been limited to on-Site activities. This program has been designed to provide baseline medical data for each employee involved in hazardous waste operations. Each employee must undergo testing, training, and a determination of his/her ability to wear personal protective equipment. The medical examinations must be administered prior to employment, annually, employment termination, and as warranted for chemicals that the employee may have been exposed. Employers shall provide these examinations to the employee without cost or loss of pay.

In accordance with 29 CFR 1910.120, medical surveillance records for 30 years of past employment will be maintained and made available to the employee.

9.3 Medical Monitoring

Due to potential exposure to hazardous materials, workers involved in intrusive on-Site sampling activities must participate in a medical monitoring program meeting specifications of 29 CFR Part 1910.120, HAZWOPER. The examining licensed physician is required to provide a written report to the employer of any medical condition that would place employees at increased risk of wearing a respirator or other personal protective equipment. A physician will specify respiratory protection clearance, or the user's ability to wear a respirator of any type for a work shift. Each subcontractor involved in sampling activities shall assume the responsibility of maintaining a medical surveillance program as well as maintaining Site personnel medical records as regulated

by 29 CFR 1910.20, Medical and Exposure Records. Evidence of medical certification will be provided for personnel, including subcontractors, who will be on-Site. This documentation will be in the custody of the SSO.

Three types of medical exams must be provided. Examination types are designated as baseline (B), annual (A), or exit (E). The examinations generally include at least the following:

- Completion of medical and work history (as well as completion of standardized forms as required by OSHA for work with asbestos, hazardous waste sites or other specific hazardous materials) (B, A, E).
- Physical examination evaluating the pulmonary, respiratory, circulatory and gastrointestinal systems (B, A, E).
- Chest x-ray (B, E).
- Height/weight (B, A, E).
- Blood pressure (B, A, E).
- Vision screening (B, A, E).
- Pulmonary function tests including forced vital capacity (FVC) and forced expiratory volume (FEV) (B, A, E).
- Baseline blood chemistry and urinalysis (B, E).
- Electrocardiogram (B, E).
- Audiometric testing (B, A, E).
- Additional tests as determined by the examining physician.

A medical examination program is required for those employees who wear or may wear respiratory protection as specified by 29 CFR 1910.134, Respiratory Protection and 29 CFR 1910.120, HAZWOPER. Disposable dust type respirators are included under these regulations, unless worn voluntarily. This program must determine an individual's ability to wear respiratory protection while performing designated duties. The applicable elements of 29 CFR 1910.134, Respiratory Protection, must be complied with and will be verified by the SSO. This verification includes review of the required written respiratory protection program regarding the selection, care, employee training requirements, use, and maintenance of respirators.

9.4 Training

Site personnel associated with remedial activities at the Site must participate in a health and safety training program that complies with OSHA 29 CFR 1910.120, HAZWOPER, prior to mobilization at the Site. This program instructs employees on the intent of the standard, health and safety principles/procedures, proper operation of monitoring instruments, use of personal protective equipment, decontamination, and Site specific emergency plans. Site personnel have an initial 40-hour training course. This course is supplemented by an annual 8-hour refresher course. Any chemical specific training that may be required will be based upon compliance with 29 CFR 1910.1200, Hazard Communication. Personnel responsible for supervision and on-Site management relative to Site operations receive an additional 8 hours of specialized training. Additional training is provided for those employees responsible for responding to Site emergencies.

A copy of this HSCP will also be made available to Site personnel for review. Employees will complete a Health and Safety Contingency Plan review form to verify they have reviewed this plan and a copy of the form is shown in Appendix A. Employees will also be required to fill out a field medical data sheet (Appendix E) prior to starting activities at the Site.

On-Site personnel involved with the sampling project will attend a pre-entry briefing on the chemical and physical hazards associated with the Site.

The initial health and safety briefing will consist of the following information:

- Names of personnel and alternates responsible for Site safety and health;
- Injury, illness, and other hazards present on the Site;
- Safe use of engineering controls and equipment on-Site;
- Work practices by which the employee can minimize risks from hazards;
- Selection, use, care, and maintenance of PPE;
- Site control procedures;
- Site decontamination procedures;
- Standard operation safety procedures; and

- Review of Emergency Response Plan.

Documentation of all training, fit testing, and medical monitoring certificates will be maintained in the field trailer in the custody of the SSO.

A daily tailgate meeting will be conducted prior to starting any intrusive activities. The topics covered will include a reminder of Site hazards, target activities for the day's work, potential changes in observed exposure levels, staff changes (e.g., due to illness) and responsibilities.

9.5 Subcontractors

Subcontractors will be required to provide specific written documentation (e.g., training certificates, medical clearance forms, or equivalent documentation) to the SSO prior to their performing any work on-Site. The Contractor Occupational Safety and Health Certification form is attached as Appendix C. Subcontractors will also be required to fill out a field medical data sheet (Appendix E) prior to starting activities at the Site. Depending on the specific work activities, contractors will have to communicate to the SSO the anticipated operations and the exposures associated with those operations prior to commencing work. After reviewing this information, the SSO will decide whether or not the HSCP needs to be revised. When and if the HSCP is revised, the contractor will be responsible for reviewing the information and requirements provided in the HSCP.

9.6 Health And Safety Audit

The activities described in this HSCP are subject to audit by a representative of the company's health and safety personnel. The audit is intended to verify compliance with this HSCP and corporate requirements and identify any errors or omissions within the HSCP that may require revision due to the HSCP's lack of effectiveness.

In addition to the possible need for a formal audit, daily safety and health inspections shall be conducted and documented by the SSO to determine if operations are being performed in accordance with the HSCP, applicable OSHA regulations, and contract requirements.

10.0 EMERGENCY ACTION PLAN

The following sections provide information vital to Site workers responding to on-Site emergencies.

10.1 General Requirements

An on-Site emergency may be the result of chemical exposures, chemical spills, and/or physical exposures, such as fire. In order to make certain that employees involved with Site activities are familiar with emergency procedures, an emergency action plan has been developed and implemented in accordance with 29 CFR 1910.120 (l) and 29 CFR 1910.38 (a). This plan will include, but is not limited to, the following:

- Pre-emergency planning;
- Reporting systems;
- Emergency evacuation procedures, routes, and Roster Point;
- Employee alarm systems; and
- Rescue and medical duties for those employees trained to perform them.

When more than 10 employees are working at the Site, the plan will be in writing and available for inspection and copying by employees, their representatives, OSHA personnel and other governmental agencies with relevant responsibilities. Otherwise, the plan will be communicated orally to the employees, in accordance with 29 CFR 1910.38 (a)(5)(iii).

Appropriate authorities, as indicated on Table 10-1, will be immediately notified of the nature and extent of the emergency. Emergency procedures, under direction from the SSO, will be initiated as indicated in Section 10.3. The SSO will notify and coordinate activities with regulatory representatives.

10.2 Pre-Emergency Planning

Pre-emergency planning is an integral part of any emergency response. Prior to the commencement of fieldwork, the project team will meet to discuss the project's health and safety requirements. Personnel roles, lines of authority and communication will be addressed, so that when the fieldwork begins, the field team will be familiar with their responsibilities.

10.3 Responsibilities

The SSO will be responsible for responding to all emergencies, and will:

- Notify appropriate authorities and/or health care facilities of the activities and hazards of Site operations. Table 10-1 provides emergency telephone numbers that will be posted within the support zone.

- Ensure the map (Figure 10-1) that details the most direct route to the nearest hospital and the list of emergency telephone numbers (Table 10-1) are posted on Site and in all of the Site's support vehicles. Both the route to the hospital and emergency contacts will also be posted in the SZ where sampling activities are being conducted. The SSO will require all drivers of support vehicles to become familiar with the emergency route and the travel time required at the beginning of project operations.

TABLE 10-1

LIST OF EMERGENCY TELEPHONE NUMBERS

Emergency Contacts	**Name**	**Telephone**
Health and Safety Manager	Joseph Gentile, CIH	(856) 423-8800
Site Safety Officer	To Be Determined	To Be Determined
Project Manager	Omar Ramotar	(631) 232-2600
Resident Project Representative	To Be Determined	To Be Determined
Site Superintendent	To Be Determined	To Be Determined
Hospital	New Island Hospital	(516) 520-2201 or 911
Police	Police Department	911
Fire	Fire Department	911
Poison Information System	NY Poison Information System	(800) 962-1253
Department of Health	NYSDOH	(518) 458-6310

National Response Center		(800) 424-8802
Center for Disease Control		(404) 488-4100
CHMTREC		(800) 424-9300
Emergency Response Team	To Be Submitted with Contractor's Remedial Action Work Plan	To Be Submitted with Contractor's Remedial Action Work Plan

Detailed directions from the Site to the primary hospital (New Island Hospital) are provided in Figure 10-1.

Because specific arrangements have been made in advance for an outside fully-trained emergency response team to respond to this Site, employees who may come to the incident first have had sufficient awareness training to recognize that an emergency response situation exists, and they have been instructed to call the designated outside emergency response team for assistance, in accordance with 29 CFR 1910.120 (p)(8)(iii)(A). The emergency response activities will be coordinated by the SSO.

10.4 First Aid

Workers shall be trained and available to provide first aid in situations where adequate response times cannot be met by outside medical personnel. In areas where work-related accidents resulting in suffocation, severe bleeding, or other immediately life-threatening injury or illness can be expected, a 3 to 4 minute response time is medically required (OSHA Interpretation Letter, 1993). In other circumstances, where immediately life-threatening injuries are not foreseen, OSHA has usually accepted a 15-minute response time (OSHA Interpretation Letter, 1993). The level of training for on-Site first-aid providers will be based on the workplace hazard assessment. At a minimum, personnel will be trained in basic first aid (e.g., the American Red Cross four-hour course, Table 10-3) and CPR. The hazards of the Site or its remoteness from advanced medical care may dictate a need for further training (OSHA Interpretation Letter,

1993). In this instance, medical procedures, such as CPR, bandaging, treating strokes, and splinting broken bones, will only be administered by employees meeting the training requirements.

At least one "industrial" first aid kit and stretcher shall be provided and maintained fully stocked at an easily accessible uncontaminated location. In addition, dry chemical fire extinguishers shall be provided at any Site location where flammable materials may present a fire risk.

Certified first aid responders will be present at the Site. They will have received a copy of the Blood Borne Pathogens Standard, OSHA 29 CFR 1910.1030, which describes the requirements regarding training, personal protective equipment, and post-exposure follow-up in the event of an exposure incident.

10.5 Decontamination Procedures for Emergency Incidents

Should an injured person have an excessive exposure to contaminated soils, ground water, or other materials, they will be decontaminated, if appropriate, and brought immediately to the hospital. The SSO will decide whether or not to decontaminate an affected employee, and the decision will be based upon the type and severity of the illness or injury and the nature of the contaminant. For some emergency victims, immediate decontamination may be an essential part of life-saving first aid. For others, decontamination may aggravate the injury or delay life-saving treatment. If decontamination does not interfere with essential treatment, it may be performed by any employee trained in the appropriate decontamination procedures, including respiratory protection and personal protective clothing.

While performing the decontamination procedures, the protective clothing of the affected employee will be washed, rinsed, and/or cut off. If decontamination cannot be performed, then the victim will be wrapped in blankets, plastic or rubber to reduce contamination of other personnel. Emergency and offsite personnel will be alerted to potential contamination, and they will be instructed in specific decontamination procedures if necessary. At least one person familiar with the incident will be sent along with the victim during emergency treatment.

10.6 Emergency Escape Procedures, Routes and Roster Point

Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees. In the event of an emergency, Site personnel shall be evacuated to a safe distance as identified by the SSO. A number of factors will go into the determination of a safe distance, they include:

- The toxicological properties of the substance;
- The physical state of the substance;
- The quantity and route of the release;
- The method of release;
- The vapor pressure of the substance;
- The vapor density relative to air;
- Wind speed and direction;
- Atmospheric stability;
- The height of the release;
- Air temperature and temperature change with altitude;
- Local topography;
- Fires; and
- Machinery failures.

Evacuation will proceed in an upwind direction if possible. The evacuation routes, safe distances, and places of refuge will depend on the location of the remedial activity. The SSO will address evacuation routes and the Roster Point in the daily Health and Safety meeting.

10.7 Accidents and Injuries

In the event of an accident or injury at the Site, appropriate emergency measures must be taken immediately to assist those who have been injured or exposed, and to protect others from hazards. The SSO shall be immediately notified and will respond according to the seriousness of the injury.

If the emergency involves personnel injuries, local emergency services will be contacted immediately. The SSO, or a person designated by the SSO, should be prepared to provide the following information:

- Exact location of the emergency;
- Phone number he/she is calling from;
- Type of injury(ies);
- How many persons have been injured; and
- What assistance or first aid is being given to the injured person(s).

Do NOT hang up unless told to do so. In most cases, the Emergency Management System (EMS) dispatcher will require the caller to stay on the phone.

When emergency services arrive, Site personnel shall immediately inform them of the details of the situation and what type of chemicals and hazards may be encountered on the Site. If available, MSDSs should be given to the responders.

If warranted by the severity of the incident, emergency response personnel may enter the exclusion zone dependent upon monitoring data. If appropriate, emergency personnel will exit the exclusion zone through the CRZ utilizing the same decontamination procedures as are applicable to remediation workers.

The SSO will observe and document any and all recognized symptoms of injury or illness. A reference of common symptoms is provided as Table 10-2.

Occupational injuries and illnesses will be documented by the SSO on the Roux Incident Reporting Form. Completed forms will be faxed immediately to the HSM for appropriate action.

TABLE 10-2
REFERENCE OF COMMON SYMPTOMS

Type of Injury of Exposure	Symptom
Chemical Exposure, Ingestion or Inhalation	Symptoms of chemical exposure, ingestion or inhalation may include one or more of the following: Abnormal pulse, Behavioral changes, Breathing difficulties or abnormal breathing, Changes in complexion or skin color, Convulsions, Coordination difficulties, Coughing, Dizziness or drowsiness, Drooling, Diarrhea, Fatigue and/or weakness, Irritation of eyes, nose, respiratory tract, skin, throat, mouth, or lips, Headache, Itching, Light-headedness, Nausea/vomiting, Skin irritation or rash, Sneezing, Sweating, Tearing, Tightness in the chest, or Unconsciousness.
Heat Stroke	Signs and symptoms of heat stroke are hot, red skin; very small pupils; and very high body temperatures-sometimes as high as 105 degrees F. If the victim was sweating from heavy work or exercise, his or her skin may be wet; otherwise, it will feel dry.

Heat Exhaustion	The usual signs and symptoms of heat exhaustion are cool, pale, and moist skin, heavy sweating; dilated pupils, headache, nausea; dizziness; and vomiting. Body temperature will be nearly normal.
Hypothermia	Signs and symptoms of hypothermia are: shivering; a decreased and sometimes irregular heart rate; a weak pulse; cool skins; decreased blood pressure; decreasing core temperature and slow, irregular breathing.
Frostbite	Signs and symptoms of frostbite area: a sensation of cold followed by numbness; tingling, stinging and aching may be felt initially. The skin may appear white, reddish-purple and finally black; blisters may also be present.

10.8 Spill Containment Program

Where hazardous substances may be released by spilling contaminated soil or other hazardous substances, such that employees may be exposed to these hazards, Hazardous Materials (HAZMAT) trained employees will perform the appropriate spill containment procedures. The spill containment procedures include the following:

- Diking;
- Ditching;
- Absorbents (e.g., vermiculite); and
- Neutralize.

TABLE 10-3
BASIC FIRST AID PROCEDURES

Chemical Exposure: Ingestion* or *Inhalation

1. Contact Emergency Services.
2. If possible move chemical hazards away from the area of the injured person or the injured person away from the area of chemical hazards and decontaminate.
3. If appropriate, remove personal protective equipment.
4. Await Emergency Services.

First Aid:

1. Be calm and quickly evaluate the emergency.
2. Contact Emergency Services.

3. Do not move the injured person unless necessary or instructed to do so.
4. If possible, move any physical and chemical hazards away from the area of the injured person.
5. Take care of the most serious injuries first - breathing must be restored, bleeding must be stopped, etc.
6. Cover injured person to keep warm and monitor for shock.

Heat Related Injuries: **Heat Stroke**

1. Contact Emergency Services.
2. Remove person from heat (hot) to cool location.
3. Lay the victim on their back.
4. Remove PPE and loosen up clothing.
5. Cool victim fast (i.e., immerse in cool bath, ice packs, wrap with wet sheets or towels).
6. Care for shock and monitor breathing.
7. Await Emergency Services.

Heat Related Injuries: **Heat Exhaustion**

1. Remove person from heat (hot) to cool location.
2. Lay the victim on their back with their feet up.
3. Remove PPE and loosen up clothing.
4. Cool victim (i.e., fanning, ice packs, wrap with wet sheets or towels).
5. Care for shock and monitor breathing.
6. If conscious and can tolerate it, provide a half-glass of water every 15 minutes.
7. Should see improvements within 30 minutes. (If not, contact Emergency Services).

Cold Related Injuries: **Hypothermia**

1. Contact Emergency Services.
2. Remove person from cold to warm location.
3. Remove any wet clothing.
4. Warm body slowly.
5. Care for shock and monitor breathing.
6. Await Emergency Services

Cold Related Injuries: **Frostbite**

1. Remove person from cold to warm location.
2. Remove PPE and clothing covering effected areas.
3. Place affected area in warm water to re-warm.
4. After re-warming, loosely bandage affected area.
5. Seek medical attention.

Employees performing these procedures are required to wear the proper protective clothing and equipment for the materials present, and to follow established standard operating procedures for spill control. Employees performing these procedures are required to wear the proper protective clothing and equipment for the materials present. Emergency use respirators, a SCBA with escape bottle, will be accessible at all times if determined to be appropriate for any chemicals brought on-site. While the first responders contain the spill, the SSO should notify the appropriate regulatory agencies and obtain additional outside assistance, if needed.

10.9 Communications

Telephones will be used as the primary offsite communication network. Telephone services will be made available on-Site by mobile phones during the sampling activities.

On-Site communications will be maintained via verbal communication and hand signals. Site communication systems will be set up by the SSO. When verbal communication is ineffective, the following hand signals will be used.

- Hand grips throat - Can't breathe!
- Grip partner's wrist - Evacuate area immediately!
- Hands on top of head - Need Assistance.
- Thumbs up - O.K., No problem.
- Thumbs down - No, Negative.

Since the communication system also serves as the employee alarm system, all emergency messages shall have priority over all non-emergency messages. The SSO shall assure that a test of the reliability and adequacy of non-supervised employee alarm systems is made every two months, in accordance with 29 CFR 1910.165(d)(2).

10.10 Site Access And Security

In an emergency, the SSO must know who is on the Site and must be able to control the entry of personnel into the exclusion zone areas to prevent additional injury and exposure. Therefore, access to Site activity areas will be limited to authorized personnel with appropriate training and medical surveillance, and wearing appropriate personal protective equipment. Such personnel

may include authorized Owner representatives, subcontractors, and regulatory personnel. All active areas will be monitored by the SSO to verify that unauthorized personnel do not enter.

Sign-in procedures will be implemented to make certain that only authorized personnel participate in exclusion zone activities. The SSO will coordinate this effort and maintain documentation accordingly. An Exclusion Zone Sign-In Sheet is presented as Appendix F and a Site Sign-In Sheet is presented as Appendix G.

10.11 Accident Prevention Plan

An accident prevention plan (APP) has been incorporated into this HSCP as indicated below and as referenced in the appropriate sections.

10.11.1 Safety Meetings

Safety meetings will be performed each week. Pre-entry briefings will also be performed prior to the initiation of any new activity.

10.11.2 Fire Prevention and Protection

A fire-fighting program will be followed throughout all phases of remedial activities. All fires, regardless of size or stage, will require the immediate notification of the local Fire Department. This program also provides for effective fire-fighting equipment (two 20 lb. ABC-rated extinguishers) to be available without delay and will be designed to effectively meet all incipient stage fires as they occur as required by 29 CFR 1926.151. Should the fire be past the initial or beginning stage and can no longer be controlled or extinguished by portable fire extinguishers, evacuation of the area will be implemented.

Firefighting equipment will be conspicuously located and readily accessible at all times and will be periodically inspected and be maintained in operating condition in accordance with 29 CFR 1920.150.

10.11.3 Site Housekeeping

Form and scrap lumber with protruding nails and all other debris will be kept clear from all work areas in accordance with 29 CFR 1926.25. Combustible scrap and debris will also be removed at

regular intervals. Containers will be provided for collection and separation of all refuse. Covers will be provided on containers used for flammable or harmful substances. Wastes will be disposed of at frequent intervals.

10.11.4 Mechanical Equipment Inspection

All vehicles in use will be checked at the beginning of each shift to verify that all parts, equipment, and accessories that affect safe operation are in proper operating condition and free from defects. All defects will be corrected before the vehicle is placed in service in accordance with 29 CFR 1926.601.

11.0 CONFINED SPACE ENTRY

Confined space means a space that: (1) is large enough and so configured that an employee can bodily enter and perform assigned work; and (2) has limited or restricted means or entry or exit (for example, tanks, vessels, silos, storage binds, hoppers, vaults, and pits are spaces that may have limited means of entry); and (3) is not designed for continuous employee occupancy. A permit-required confined space (permit space) means a confined space that has one or more of the following characteristics: (1) contains or has a potential to contain a hazardous atmosphere; (2) contains a material that has the potential for engulfing an entrant; (3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) contains any other recognized serious safety or health hazard.

Also as defined under 29 CFR 1926.21(6)(ii), a "confined or enclosed space" means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 feet in depth such as pits, tubs, vaults, and vessels. All confined spaces will be treated as permit confined spaces until monitoring and evaluation has indicated that it is appropriate to downgrade as designated by the Contractor's Health and Safety Officer (HSO).

For purposes of this plan, confined space and permit required confined space is used interchangeably. Entry into permit confined spaces pose potential health and safety risks due to: a flammable or explosive atmosphere, lack of oxygen to support life, toxic materials, or general safety hazards. The elements of a confined space entry plan have been developed based on 29 CFR 1910.146 – Confined Space Standards and guidance provided in USEPA's Standard Operating Safety Guides.

General Provisions

- The Contractor's HSO will be responsible for identifying and notifying the SSO of on-Site permit required and non-permit required confined spaces.

- If any activities by subcontractors require a confined space entry, it will be the responsibility of that subcontractor to appoint a responsible person who will coordinate and monitor the permit confined space entry (i.e., be the confined space attendant).

- The Contractor's HSO will be designated as the entry supervisor and has the responsibility to issue the Confined Space Entry Permit (CSEP) (Appendix H), to evaluate and monitor work performed within a confined space for possible hazards, and to determine the safety procedures, personal protective equipment and rescue equipment required.

- When possible, confined spaces should be identified with a posted sign, which reads: "Caution - Confined Space - Do Not Enter Unless Authorized".

- Only personnel trained and knowledgeable of the requirements of these Confined Space Entry procedures will be authorized to enter, attend, or supervise a confined space or be a confined space attendant.

- A CSEP (Appendix H) must be issued prior to performing any work within a confined space. The CSEP will become part of the permanent and official record of the Site.

- Natural ventilation shall be provided for the confined space prior to initial entry and for the duration of the CSEP. Positive/forced mechanical ventilation may be required to dissipate accumulated gases.

- If flammable liquids may be contained within the confined space, explosion proof equipment will be used. All equipment shall be positively grounded. Technically competent personnel trained in testing methods using an explosive gas detector will test the atmosphere within the confined space. If combustible gases are present, entry will not be allowed until the source has been isolated and the space flushed or purged so that the test indicates non-detectable or background concentrations.

- The contents of any confined space will, where necessary, be removed prior to entry. All sources of ignition will also be removed prior to entry.

- Hand tools used in confined spaces shall be in good repair, explosion proof and spark proof, and selected according to intended use. Where possible, pneumatic power tools will be used.

- Hand-held lights and other illumination utilized in permit required confined spaces shall be equipped with guards to prevent contact with the bulb and will be explosion-proof.

- Compressed gas cylinders, except cylinders used for self-contained breathing apparatus, shall not be taken into confined spaces. Gas hoses shall be removed from the space and the supply turned off at the cylinder valve when personnel exit from the confined space.

- If a permit required confined space requires respiratory equipment or where rescue may be difficult, safety belts, body harnesses, and lifelines will be used. The outside attendant will be provided with the same equipment as those working within the confined space.

- A ladder is required in all confined spaces deeper than the employee's shoulders. The ladder will be secured and not removed until all employees have exited the space.

- Technically competent personnel (entry supervisor) will use approved oxygen testing equipment to test the atmosphere within the permit required confined space to determine whether the air is respirable and contains sufficient oxygen to support normal consciousness. If the air is found to be oxygen deficient (less than 19.5 percent by volume), positive ventilation techniques, including fans and blowers, will be used to increase the oxygen content. No entry will be allowed until an oxygen concentration greater than or equal to 19.5 percent is achieved.

- When toxic or chemical materials that could result in injury by contact or inhalation by persons entering the confined space are detected or suspected, several actions will be taken by on-Site personnel. First, any piping that conveys hazardous materials to the confined space will be isolated. Second, the space will be emptied of the hazardous substance until safe limits are reached. Third, adequate ventilation equipment, as well as all other appropriate protective equipment for protection of the eyes, face, and arms will be provided if the work to be done in the confined space includes welding, burning, or heating, which may generate toxic fumes and gases. Finally, all employees entering a confined space that has contained corrosive materials will wear eye and other appropriate protective equipment to prevent possible contact with any remaining corrosive material.

- Where air-moving equipment is used to provide ventilation, chemicals will be removed from the vicinity to prevent introduction into the confined space.

- Vehicles will not be left running near confined space work or near air-moving equipment being used for confined space ventilation.

- Smoking, chewing or eating in confined spaces will be prohibited at all times.

- Any deviation from these confined space entry procedures requires the prior permission of the Contractor's HSO and SSO.

11.1 Procedure for Permit Required Confined Space Entry

A hazard evaluation will be conducted before any work in a confined space is started, to identify existing or potential work area hazards that have the potential to cause injuries, illness or property damage. Examples of work area, hazard control items include unguarded openings, high or low temperatures, poor illumination, sharp edges, steam, compressed gases and liquids, flammable or combustible materials, and mechanical or electrical exposures. When dealing with hazards that cannot be eliminated or controlled, adequate PPE will be used. The atmosphere of permit required confined space entry will be monitored for oxygen content, flammability, and toxic gases as indicated in Appendix H.

Prior to entry into a confined space, consideration will be given to how life support systems would function in the event of a power failure. For example, in the event of electrical failure, lights, warning systems, and other electrically powered devices would be inoperative. Site personnel will have an emergency plan of action that provides alternate illumination and a means of manual escape from the confined space. No life support systems, which are dependent on electrical power, will be utilized. The Contractor's HSO will have communicated alternate sources of light to all employees engaged in work in confined spaces.

Each employee entering a permit required confined space will wear a safety belt equipped with a life-line for evacuation purposes in case of an emergency. If the entry is through a top opening, the safety belt will be of the harness type that will suspend a person in an upright position. Emergency equipment such as life-lines, safety harnesses, fire extinguishers, breathing equipment and other devices appropriate to the situation will be ready and immediately available. All personnel engaged in the activity will be trained in the use of the life support system, rescue system, and emergency equipment. In keeping with the buddy system, at least one person, trained in first aid and respiration, will be immediately available outside the confined space to provide assistance if needed, utilizing a planned and immediately available communications means.

The Contractor's HSO will complete the Confined Space Entry Checklist prior to a confined space entry.

CONFINED SPACE ENTRY CHECKLIST

Task	Was Task performed? (If not – explain)
Evaluate the job to be done and identify the potential hazards before the confined space entry job is scheduled. Ensure all planned entry procedures (e.g. employee training) are consistent with the requirements of 29 CFR 1910 and 1926.	
Ensure that all process piping, mechanical and electrical equipment, etc., have been disconnected, purged, blanked-off or locked and tagged as necessary.	
If possible, ensure removal of any standing fluids that may produce toxic or air displacing gases, vapors, or dust.	
Initiate a Confined Space Entry Permit (CSEP).	
Ensure that any hot work (welding, burning, open flames, or spark producing operation) that is to be performed in the confined space is indicated on the CSEP.	
Ensure that the space is ventilated before starting work in the confined space and for the duration of the time that the work is to be performed in the space.	
Ensure that the personnel who enter the confined space and the confined space attendant are familiar with the contents and requirements of the confined space entry procedure.	
Ensure remote atmospheric testing of the confined space prior to employee entry and before validation/revalidation of a CSEP to ensure the following: • oxygen content between 19.5% and 23.0% • no concentration of combustible gases in the space. Sampling will be done throughout the confined space and specifically at the lowest point in the space. • the absence of other atmospheric contaminants, if the space has contained toxic, corrosive, or irritant material. • if remote testing is not possible, Level B personal protective equipment is required.	
Designate whether hot or cold work will be allowed	
Ensure that a copy of the CSEP is posted at the work Site	
Cancel the permit upon completion of the task.	

11.2 Confined Space Attendant

The Contractor's HSO will select a confined space attendant. While personnel are inside the confined space, the confined space attendant will monitor the activities and provide external assistance to those in the space. The attendant will have no other duties that may take his/her attention away from the work or require him/her to leave the vicinity of the confined space at any

time while personnel are in the space. The confined space attendant will maintain at least voice contact with all personnel in the confined space. Visual contact is preferred, if possible. The attendant will have the means available to contact rescue personnel in the event of an emergency. The attendant has the authority to command entrants to leave the confined space.

12.0 APPROVAL PAGE

The Approval Page must be attached and signed by the SSO, HSM, Project Manager and Project Director.

By their signature, the undersigned certify that this HSCP is approved and will be utilized by Roux Associates, Inc. personnel at the Liberty Industrial Finishing Superfund Site, Farmingdale, New York.

Site Safety Officer	Date
Joseph Gentile (on) — Health and Safety Manager	6/12/06 — Date
O. Rourke (WK) — Project Manager	6/12/06 — Date
Project Director	6/12/06 — Date



DIRECTIONS TO HOSPITAL

- From Site, make left onto Motor Avenue and proceed 0.2 miles.
- Make left onto Main Street.
- Cross railroad tracks and make first left onto Fulton Street (RT-109).
- Fulton Street becomes Hempstead Turnpike (RT-24).
- Proceed west on Hempstead Turnpike (RT-24) for approximately 1.2 miles.
- Hospital is located at 4295 Hempstead Turnpike to the west of RT-135.

Title:

HOSPITAL ROUTE MAP

HEALTH AND SAFETY CONTINGENCY PLAN
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
FARMINGDALE, NEW YORK

Prepared for: LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST
FARMINGDALE, NEW YORK

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 24MAY06	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	10-1
Project Mgr.: O.R.	Office: NY	
File No.: LIF0110318.CDR	Project No.: 141301Y	

\LIF1413\Y\LIF01Y\103\LIF0110318.CDR

APPENDIX A

Health and Safety Plan Review Record

HEALTH AND SAFETY PLAN REVIEW RECORD

I have read the Health and Safety Contingency Plan for the Liberty Industrial Finishing Superfund Site and have been briefed on the nature, level, and degree of exposure likely as a result of participation in this Project. I agree to conform to all the requirements of the Health and Safety Contingency Plan.

Employee Signature	
Please Print Name	Date
Employee Signature	
Please Print Name	Date

APPENDIX B

Daily Site Safety Log

DAILY SITE SAFETY LOG

Site: Liberty Industrial Finishing Superfund Site
Project: Remedial Elements I and II
Time on: ___ Time off: ___
Weather/Temperature: _____
Wind Direction: _____

Site Safety Talk: Yes_____ No____

Topics: _____
_____
_____
_____

Daily Safety Inspection:

Time:____Initials:_____Time:____Initials:_____

Comments:_____

Instrument Calibration:

Instrument	Time	Calibration Gas	Calibration Conc.	Actual Conc.
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____

Comments:_____

Personal Protective Equipment: Universal Equipment - hard hat, safety glasses and work boots.

Task 1:	Task 2:	Task 3:
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Date:_____

Air Monitoring:

Time/Location:	Inst:	Concentration Settings:	Inst:	Settings:

Comments (including upgrade, non-compliance, etc.):

_____

_____

_____

_____

SSO:_____Signature:_____Date:_____

APPENDIX C

Contractor Occupational Health and Safety Certification

CONTRACTOR OCCUPATIONAL HEALTH AND SAFETY CERTIFICATION

Project: Remedial Elements I and II for Liberty Industrial Finishing Superfund Site
Contractor: _____

1. Contractor certifies that the following personnel to be employed during on-site sampling activities have met the following requirements of the OSHA Hazardous Waste Operations Standard (29 CFR 1910.120) and other applicable OSHA standards. (Indicate date below.)

Contractor Personnel	Medical Examination	Training Certification	Respirator
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Contractor certifies that it has received a copy of the Health and Safety Contingency Plan and will ensure that its employees are informed and will comply with its requirements.

3. Contractor further certifies that has read and understands and will comply with all provisions of its contractual agreement with.

Signed: _____

Date: _____

APPENDIX D

Training Acknowledgement Form

TRAINING ACKNOWLEDGMENT FORM

NAME: _____
SOCIAL SECURITY NUMBER: _____
EMPLOYER: _____

I have completed the required training for work to be conducted at the Liberty Industrial Finishing Superfund Site, including the following topics:

a. Work Rules and Safety Requirements;
b. Personal Protection Equipment;
c. Potentially Hazardous Chemicals;
d. Emergency Equipment;
e. Reporting Injuries and Illnesses;
f. Emergency Procedures;
g. Job Assignments;
h. Personal Hygiene;
i. Medical Tests;
j. Motor Tests; and
k. Standard Operating Procedures.

I further confirm that a respirator fit test was conducted within the past year and that I have been issued a respirator of the same type.

Employee:

Signature:_____ Date:_____

I certify that this employee has received adequate safety training and understands the requirements of the Health and Safety Contingency Plan.

SSO:

Signature:_____ Date:_____

APPENDIX E

Field Medical Data Sheet

FIELD MEDICAL DATA SHEET

Name:_____ Phone:_____
Address:_____
Date of Birth:_____ Height:_____ Weight:_____
Allergies:_____
Particular sensitivities:_____
Do you wear contact lenses:__ Note*: Contact lenses are not permitted on-Site*
List exposures to hazardous chemicals, if any, and resultant illness or symptoms.

_____
_____
_____

List medications you presently use:_____

_____
_____

List any medical restrictions:_____

_____
_____

Special medical or incident response training:_____

_____
_____

Name, address and phone number of personal physician:

_____
_____
_____

Nearest Relative:_____ Phone:_____

_____ _____
Employee Signature Date

APPENDIX F

Exclusion Zone Sign-In Sheet

EXCLUSION ZONE SIGN-IN SHEET

Site: Liberty Industrial Finishing Superfund Site **Date:**_____

Employee	Company	Level of Protection	Time In	Time Out

APPENDIX G

Site Sign-In Sheet

SITE SIGN-IN SHEET

Site: Liberty Industrial Finishing Superfund Site **Date:**_____

Employee	Company	Time In	Time Out

APPENDIX H

Confined Space Entry Permit
(CSEP)

ROUX ASSOCIATES WORK PERMIT
AND LOCKOUT / TAGOUT

PERMIT TYPE: ■ Cold ■ Hot ■ Confined Space Entry ❑ Consultant ❑ Contractor

WORK LOCATION/SITE NUMBER	AREA OF WORK

DESCRIPTION OF WORK COVERED BY THIS PERMIT

DESCRIBE EQUIPMENT/MACHINERY/TOOLS USED	DATE / TIME FRAME of WORK	TIME ☐ AM ☐ PM

CONSULTANT/CONTRACTOR COMPANY NAME	NAME AND SIGNATURE OF INDIVIDUAL AUTHORIZING WORK	☐ VERBAL by:	TIME ☐ AM APPROVED ☐ PM

NUMBER OF PERSONNEL COVERED BY THIS PERMIT	DATE ISSUED	TIME ☐ AM ☐ PM	PERMIT NUMBER

WORK PERMIT DURATION IS ONE WORK DAY (DATE PERMIT ISSUED)

EMERGENCY PHONE NUMBERS: FIRE _____ POLICE _____ SHERIFF _____

HOSPITAL/MEDICAL EMERGENCY: _____ OTHER _____ Roux PM Notified? ☐ NA ☐ YES _____

PRIMARY CONTACT:	NAME	PHONE NUMBER

A. PREWORK CHECKLIST-JOBSITE INSPECTION REQUIRED	YES	NO	NA
1. JSA And/Or Detailed Work Procedures Reviewed/Available? List Procedure / Date _____			
2. Employees / Subcontractors Understand Site-Specific Safety Rules And Practices?			
3. Safety Procedures, Alarms, Equipment Safety Devices and Evacuation Routes Identified and Communicated To All Workers?			
4. Work Permit Requirements Including Work Limitations Have Been Communicated To and Are Understood By All Workers?			
5. Affected Personnel (e.g. Site Owner) Have Been Notified? If Yes, Name/Date _____			
6. Required Agencies Notified of Hot Work? If Yes, Name/Date _____			
7. Work Involves Interconnecting Areas? If Yes, Verbal Endorsement of Affected Received _____			
8. Job Site Inspected by Permit Issuer and Recipient?			
9. Sewers In Immediate Area Covered and Sealed?			
10. Precautions Taken To Prevent Leaks / Spills and Other Impacts to Workers/Environment?			
11. The Effect Of This Job On Neighboring Equipment, Third Party And/Or Public Considered and Addressed?			
12. Hazardous Materials Involved / MSDS Provided? ☐ Asbestos ☐ Acid/Caustic ☐ Lead / Paint ☐ H2S ☐ Hot Material ☐ Flammables ☐ Product _____ ☐ Other _____			
13. Subsurface Disturbance Required? If Yes, Check Box and List Potential Undergroud Items at site. ☐ Product lines ☐ Cathodic protection ☐ Sewer lines ☐ Electric lines ☐ Communication lines ☐ Water lines ☐ 3rd Party lines _____ ☐ Other _____			
SCP Checklist Completed and One Call Notification Made? If Yes, One Call Confirmation # _____			

	YES	NO	NA
14. Lockout/Tagout Procedures Reviewed With Authorized Personnel?			
15. Equipment Has Been ☐ Blinded ☐ Isolated ☐ Gas Freed ☐ Drained/Cleaned/Flushed ☐ Depressurized			
16. Work Site Warning Devices In Place (barricade warning signs, guarded walkways and work areas).			
17. Eyewash, Showers, Safety Blankets Identified?			
18. Area Cleared Of Flammable/Combustible Materials For Hot Work?			
19. Motorized Equipment / Vehicles Permitted?			
20. Personnel Involved With The Work Are Trained And Under-Stand The Hot Work And/Or Confined Space Entry Procedures?			
21. Fire Equipment Required On Site? ☐ Fire Hose and Nozzle ☐ Fire Watch ☐ Fire Extinguisher ☐ Fire Water Pressure ☐ Other _____			
22. Personal Protective Equipment Required (Check Box Or List) ☐ Hard Hat ☐ Safety Glasses ☐ Gloves (Type)_____ ☐ Life Vest ☐ Hearing Protection ☐ Air Purifying Respirator ☐ Goggles ☐ Safety Harness ☐ Supplied Air Respirator ☐ Face Shield ☐ Shoes / Boots ☐ Protective Clothing ☐ Lead PPE ☐ Asbestos PPE ☐ Welding PPE ☐ Other _____			
23. Gas Testing Equipment Used To Issue Permit			

Type of Equipment	Serial Number	Date Bump Tested	Equipment Owner

☐ Gas Testing Equipment has been calibrated and functioning properly
Calibration Documentation Form Is To Be Maintained In A Log With The Equipment

B. GAS TESTING REQUIRED ☐ YES ☐ NO **(RECORD GAS TESTING INFORMATION ON BACK)** **TESTER'S INITIALS:**

GAS TESTER'S NAME/COMPANY/SIGNATURE:

C. LOTO PROCEDURES DOCUMENTED: ☐ BELOW ☐ SEPARATE FORM

ENERGY SOURCES PRESENT — DEVICES TO BE LOCKED AND/OR TAGGED AND THEIR LOCATION

TYPE OF ENERGY	MAGNITUDE	DEVICE	LOCATION	LOCK #	TAG #	VERIFIED

TYPE: pressure, stored energy, cathodic protection, electricity, etc. MAGNITUDE: Examples: electricity - 220 volts AC; pressure - pounds per square inch (PSI); force - pounds (LBS)

LOCKOUT / TAGOUT AUTHORIZED EMPLOYEES _____ _____ _____ _____

D. CONFINED SPACE ENTRY REQUIRED: ☐ YES ☐ NO **IF YES - COMPLETE SECTION(S) ON BACK OF "CONFINED SPACE ENTRY" PAGE**

(CONTINUOUS AIR MONITORING REQUIRED FOR CONFINED SPACE ENTRY)

LIST OF AUTHORIZED ENTRANTS: (see back)

ACTIVE ENTRY SUPERVISOR:	RELIEVED BY:	TIME ☐ AM ☐ PM	ACTIVE ENTRY STANDBY:	RELIEVED BY:	TIME ☐ AM ☐ PM

RESCUE/EMERGENCY SERVICES REQUIRED: ☐ YES ☐ NO IF YES, TYPE OF RESCUE ☐ OFF-SITE SERVICE ☐ ON-SITE NON-ENTRY ☐ ON-SITE ENTRY ☐ EMERGENCY SERVICES

EMERGENCY RESUE PROVIDED BY:			INITIATE EMERGENCY RESUE BY:
_____ (NAME OF SERVICE)	_____ (NAME OF CONTACT)	_____ (TELEPHONE NUMBER)	_____

ON-SITE RESCUE EQUIPMENT REQUIRED: ☐ SCBA ☐ CPR/FIRST AID KITS ☐ RESCUE BASKET ☐ MECHANICAL RETRIEVAL DEVICE ☐ WRITTEN RESCUE PLAN ☐ LIFELINE ☐ FULL BODY HARNESS ☐ ENTRANT/STANDBY COMMUNICATION _____

E. OTHER COMMENTS, SPECIAL PRECAUTIONS, ETC.

F. SIGNATURES

ISSUER NAME AND SIGNATURE	TIME ☐ AM ☐ PM	RECIPIENT NAME AND SIGNATURE	TIME ☐ AM ☐ PM

RECIPIENT RELIEF NAME AND SIGNATURE TIME ☐ AM ☐ PM

G. POSTWORK / JOB STATUS ☐ **JOINT INSPECTION** **PERMIT REQUIRED NEXT DAY** ☐ **YES** ☐ **NO**

AREA/EQUIPMENT SECURED AND CLEANED? ☐ YES ☐ NO COMMENTS: WORK COMPLETED ☐ YES ☐ NO COMMENTS:

INSPECTED BY (NAME AND SIGNATURE)	TIME ☐ AM ☐ PM	RECIPIENT NAME AND SIGNATURE	TIME ☐ AM ☐ PM

PERMIT REVIEWER'S NAME	PERMIT REVIEWER'S SIGNATURE	DATE	TIME ☐ AM ☐ PM

PROMINENTLY DISPLAY PERMIT AT JOBSITE

June 13, 2006

SAMPLING ANALYSIS AND MONITORING PLAN FOR REMEDIAL ELEMENTS I AND II

Liberty Industrial Finishing Superfund Site
55 Motor Avenue
Village of Farmingdale, Nassau County, New York

Prepared for

LIBERTY INDUSTRIAL FINISHING SITE QUALIFIED SETTLEMENT TRUST

Remedial Engineering, P.C.

Environmental Engineers

and ROUX ASSOCIATES, INC.

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1.0 INTRODUCTION

This Sampling Analysis and Monitoring Plan (SAMP) has been developed as part of the Final Remedial Design for the Liberty Industrial Finishing Superfund Site, 55 Motor Avenue, Farmingdale, New York (the "Site"). The SAMP has been prepared on behalf of the Liberty Industrial Finishing Site Qualified Settlement Trust (hereinafter referred to as the Potentially Responsible Parties or "PRP Group") in accordance with the Consent Judgment (Index No. 04-1308) and attached Statement of Work (SOW) entered in the United States District Court for the Eastern District of New York on August 27, 2004.

The Consent Judgment requires the submission of a final design submittal, which sets forth the engineering elements ("Remedial Design") to implement and construct the Remedial Action (RA) selected in the Record of Decision (ROD) (EPA, March 2002). As specified in the SOW and summarized in the Pre-Final Remedial Design (RD) (ERM, July 2005), the Final RD is comprised of:

- Final Design Drawings and Specifications for the RA; and
- Final RA Plans that include:
  - Construction Quality Assurance Project Plan (CQAPP);
  - Health and Safety Contingency Plan (HSCP);
  - Sampling, Analysis and Monitoring Plan (SAMP), which includes the Remedial Air Monitoring Plan (RAMP); and
  - Transportation and Disposal (T&D) Plan, which includes a Hazardous Material Transportation Security Plan (HMTSP).

The SAMP, in conjunction with the other RA Plans, will be for use by the PRP Group, Engineer, Contractor, EPA and its representatives and other regulatory personnel having jurisdiction.

This SAMP incorporates the confirmation sampling and analysis and remedial air monitoring plans for Remedial Elements I and II (On-Site Soils and On-Site Western Subsurface Features, respectively). Remedial Elements I and II are identified and discussed in greater detail in the Preliminary RD Report (ERM, October 2004).

The approximate limits of the on-Site soils and western subsurface features to be addressed as part of Remedial Elements I and II, respectively, are shown on the Technical Drawings.

As discussed in the Preliminary RD Report, the eastern subsurface features will be addressed in accordance with the March 26, 2002 Administrative Order on Consent (AOC) (Index No. CERCLA – 02-2002-2013).

1.1 Site Description

The Site is located in the Village of Farmingdale, Town of Oyster Bay, Nassau County, New York, approximately one mile south of Bethpage State Park. The Site address is 55 Motor Avenue. The Site is approximately 30 acres in size and borders the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east, and Ellsworth Allen Park to the west.

Currently, approximately half the Site (i.e., the western portion) primarily consists of vacant land that abuts Ellsworth Allen Park with the exception of the current groundwater treatment system building. The other half of the Site (i.e., the eastern portion) contains several buildings, which are currently leased to a variety of tenants engaged in trucking, warehousing, automobile parts salvaging operations, and product distribution.

1.2 Site History

The Site is a former aircraft parts manufacturing and metal finishing facility that began its operation in the late 1930's. Since then, ownership of and operations at the Site have changed numerous times. A complete Site history can be found in the Preliminary RD Report.

1.3 Proposed Remedy

Based upon the results of the initial Site Remedial Investigation (Weston, January 1994), Continuing Remedial Investigation (CRI) (ERM, July 2000), the Feasibility Study (FS) (ERM, July 2000), public comments on ERM's CRI and FS Reports and the United States Environmental Protection Agency's (EPA's) Proposed Plan for the Site (EPA, July 2001), and other supporting documents, the EPA, in consultation with the New York State Department of Environmental Conservation (NYSDEC), has selected FS Alternative SL-3 for implementation at the Site to address environmental concerns for on-Site soils and subsurface features (Remedial

Elements I and II, respectively). The components of Alternative SL-3 are summarized below and are discussed in greater detail in the Site's ROD and Preliminary RD Report.

- Excavation and off-Site disposal of all soils contaminated above groundwater protection levels (10 milligrams per kilogram [mg/kg] cadmium and 143 mg/kg chromium);
- Removal of contaminated aqueous and/or solid materials from three underground storage tanks (USTs) and fifty-six subsurface features, as well as the northern and eastern sanitary leaching fields, if warranted. (As documented in the Preliminary RD Report, only eighteen USTs and eighteen subsurface features will be addressed as part of Remedial Element II. The remaining USTs and subsurface features will be addressed as part of the March 26, 2002 AOC);
- Removal and off-Site disposal of any soil surrounding the subsurface features that exceed the following soil Performance Standards (i.e., ROD cleanup criteria):
  - Cadmium (Cd): 10 mg/kg
  - Chromium (Cr): 143 mg/kg;
  - Trichloroethene (TCE): 0.7 mg/kg;
  - Cis-1,2-dichloroethene (DCE): 0.25 mg/kg;
  - Tetrachloroethene (PCE): 1.4 mg/kg;
  - Polychlorinated biphenyls (PCBs) for soils between zero and 1 foot below ground surface (bgs): 1 mg/kg;
  - PCBs for soils below 1 foot bgs: 10 mg/kg;
  - Cyanide: 35 mg/kg;
  - Benzo[a]pyrene: 0.29 mg/kg; and
  - Dibenzo[a,h]anthracene: 0.29 mg/kg.
- Implementation of institutional controls to restrict the use of the Site to commercial/ industrial or, where applicable, to recreational uses.

These Performance Standards are also provided in Table 1 for Remedial Elements I and II.

1.4 Organization And Summary

This SAMP outlines the approach to the various activities that may require collection of samples of environmental media (air, soil and/or water) during the course of the construction of the Remedial Actions for Remedial Elements I (On-Site Soil) and Remedial Element II (Western Subsurface Features) for the purpose of characterization and/or monitoring.

The samples for characterization will be used to:

1. Confirm that soil exceeding the respective Performance Standards have been adequately removed from the Site;

2. Pre-qualify the use of any stabilization agent the Contractor may use to render that portion of soil that exhibits the characteristics of hazardous waste into non-hazardous for the purpose of off-Site disposal;

3. Ensure that soil being removed from the Site comply with all applicable landfill disposal approval requirements and are properly characterized for disposal purposes;

4. Verify the quality of any imported soil/fill used for restoration;

5. Evaluate (as needed) the quality of any construction wastewater; and

6. Address unintended on-Site spills that may occur during the course of construction.

The samples collected for monitoring will be used to measure the concentration of airborne particulates at the Site boundaries to ensure protection of the adjacent community located in the downwind direction.

This SAMP has been organized into four sections as described below.

Following this Introduction Section, Section 2.0 describes the sampling and analytical activities that will be performed on-Site during the implementation of the Remedial Design. These sampling and analytical activities include:

- Pre-qualify stabilization agent and process(es) (optional)
- Confirmation sampling of soil;
- Disposal characterization (pre or post excavation);
- Construction wastewater sampling (optional); and,
- Imported backfill material sampling.

Section 3.0 describes monitoring activities that will be performed during implementation of the Remedial Design. These monitoring activities include air monitoring at the Site perimeter (work zone monitoring is provided in the HSCP).

Section 4.0 describes the report on sampling and monitoring activities, which will be prepared after implementation of the Remedial Design has been completed.

2.0 SAMPLING AND ANALYSIS PROCEDURES

The general sampling, analytical, and quality assurance /quality control (QA/QC) procedures and protocols used during performance of the Remedial Action will be similar to those used during the Remedial Investigation and the Remedial Design Pre-Design Studies for the Site.

General sampling procedures will also comply with the CQAPP and HSCP, which are also part of the Remedial Design.

All sampling, analytical, and QA/QC procedures will be performed as described herein and in accordance with the Quality Assurance Project Plan (QAPP) included as Appendix A to this SAMP.

In accordance with the Consent Judgment (Section IX), EPA and/or its authorized representatives are allowed to take split, duplicate and/or additional samples that EPA deems appropriate.

2.1 Pre-Qualification Testing Of Stabilization Agent And Process(es)

Based on the existing data, a certain volume of soil targeted for removal exhibits the characteristic of a hazardous waste based on leaching of Cd in excess of regulatory standards. If this soil is removed from the Site, it will be subject to disposal in a Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste disposal facility. Alternatively, the Contractor may elect to stabilize this soil prior to its removal from the Site to remove the hazardous characteristic, rendering the soil non-hazardous and eligible for disposal in a RCRA Subtitle D facility. Hence, the Remedial Design provides for the option of on-Site stabilization of soil that exhibits the characteristic of hazardous waste via the results of the toxicity characteristic leaching procedure (TCLP) test.

Stabilization is the process of chemically reducing the hazardous potential of a waste by converting the contaminants into less soluble, mobile, or toxic forms. This is accomplished by adding a chemical agent to the waste material. Stabilization is a proven technology for a number of contaminants, particularly inorganic constituents.

Following EPA conditional approval of the Final Design, the PRP Group will solicit bids from prospective Contractors for construction of the Remedial Design, including the option of stabilizing any portion of Site soil that may exhibit a hazardous characteristic based on TCLP testing. (Note, based on existing data, soil/sediment in subsurface features is not expected to exhibit a hazardous characteristic.) As part of the response to the bid, the prospective Contractors will be required to identify their proposed stabilization agent and the stabilization process (i.e., *in situ* or *ex situ*).

The prospective Contractors will be required to provide a material safety data sheet (MSDS) for the proposed stabilization agent, performance test data and descriptions of projects where the agent was used for similar contaminants (e.g., inorganics). Prior to construction, the selected Contractor will prepare a Field Work Plan which, among other things, identifies the manner in which any stabilization agent will be delivered and mixed with the soil media prior to disposal approval sampling (see Section 2.3).

Pursuant to 6 NYCRR 373-1.1(d)(1)(ix), on-Site stabilization of RCRA hazardous waste is exempt from permitting when performed in the same RCRA compatible container used to accumulate and store the hazardous waste, and the treatment or placement of the hazardous waste is not considered land disposal per 6 NYCRR 370.2(b). The prospective Contractors will be responsible for identifying other applicable regulations and obtaining the required RCRA permits or permit equivalencies prior to performing on-Site stabilization.

2.2 Confirmation Soil Sampling

The majority of the sampling activities to be performed during construction of the remedy will consist of collecting and analyzing soil samples after Site soil has been excavated to the limits shown on the Technical Drawings. The purpose of this sampling and analysis is to confirm that all soils and sediments exceeding the Performance Standards have been removed, which indicates further excavations are not warranted.

Confirmation sampling of soil and/or sediment in the following areas are addressed in this SAMP:

- Soil (clean overburden and perimeter cutback areas) that is moved to access, step-back and/or bench the areas of excavation identified in the Technical Drawings;
- Soil at certain locations on-Site that is tested to confirm that cadmium levels do not exceed its Performance Standard and thus do not warrant remediation;
- Soil collected from the sidewalls and base of the lowest target elevation of each excavation area (i.e., post-excavation samples); and
- Soil/sediment in the base of any subsurface feature (i.e., post-excavation samples).

The results of the confirmation samples from the clean overburden and perimeter cutback soils will also be used to determine the suitability of the material for on-Site reuse as backfill. Waste characterization samples will be collected in accordance with Section 2.2.1.

As specified in the ROD (page 39), the soil cleanup levels (i.e., the Performance Standards) represent allowable concentrations in soils that would be protective of human health under future commercial/industrial or recreational uses of the Site, and would maintain the drinking-water quality of the underlying groundwater aquifers. Therefore, samples of soil that would remain, or are regraded to restore the excavated areas will be collected to confirm that the Performance Standards have been met.

The subsurface features are summarized in Table 2 and Drawing S-8. As the subsurface features are exposed during the soil remedial activities, those not previously characterized will be sampled by the Engineer in accordance with the procedures outlined in the Subsurface Features Removal Action Work Plan, (24 September 2003) as approved by EPA via letter (3 March 2004). The results of the characterization will be used to determine whether the contents (aqueous and/or solid) need to be removed.

2.2.1 Remedial Element I (On-Site Soils) Sample Collection and Analysis Procedures

The Remedial Design anticipates excavation of soil from three general areas of the Site. There are various target excavation areas within each zone. Excavations are expected to occur in successive five-foot lifts with excavated soil either directly loaded into trucks for off-Site

transport and disposal (T&D) or moved to designated on-Site stockpile prior to loading for off-Site T&D. The Contractor will have the option of direct loading for T&D or stockpiling-loading for T&D, provided that the excavated soil is characterized for waste disposal (see Section 2.3) prior to its removal off-Site.

Each successive five-foot interval will be excavated in five-foot sections until an approximate elevation of 45 feet above mean sea level (AMSL) is reached or groundwater is encountered. Soil that needs to be moved to access impacted soil, and/or cut back to maintain a proper and safe slope to provide a platform from which to operate equipment, will be addressed in each successive five-foot lift. The Contractor will remove soil for access or cut back at each interval and place it in windrows (i.e., rows of soil created by digging or cutting back soil and placing it in the general vicinity of a target excavation area). The width of each cut back will be determined based on the lowest target elevation interval within an area to ensure the entire excavation has an adequate slope when the base elevation is reached. The Contractor will be directed to create separate windrows of each vertical lift of potentially clean soil. The windrow length will be determined in the field depending on the location of the area being excavated. The windrow height will not exceed eight feet.

The windrowed piles created by cutting back soil from each side of the excavated area will be addressed as separate sampling areas as described in "Methods for Evaluating the Attainment of Cleanup Standards" Volume 1, Soils and Solid Media, EPA, February 1989. Confirmation soil samples will be collected in a simple systematic sampling pattern (systematic sampling), which distributes sample locations uniformly across the windrowed segment not to exceed 500 cubic yards (CY). The collection and analysis procedures will be consistent with the following steps:

- Based on the height, width and length of the windrow, mark, with field flags or equivalent, 100 CY portions, noting the excavation zone, sub-area, elevation lift and, if appropriate, side of the excavation on the flag;
- Collect confirmation soil samples at equidistant points from the side and center of the windrow within each 100 CY segment. Confirmation soil samples will be collected using hand trowels with samples collected at a depth of at least one foot into the windrow.
- Log the samples in the field, place directly into laboratory-supplied jars, and store on ice for shipment to an approved laboratory;

- Specify required turnaround time and method of delivering results (e.g., faxed or emailed to the Engineer) based on duration of excavation activities in area;
- If the confirmation soil sample results exceed Performance Standards, collect waste characterization soil samples for disposal approval (if necessary) and remove via direct load or to on-site stockpile location for subsequent T&D, and extend (horizontally) the cut back from the particular elevation interval another two feet;
- Survey the final base limits of the excavation (and horizontal limits at the defined edge of the remediation area) to document the location and extent of the excavation work;
- If confirmation soil sample results indicate Performance Standards are met, grade the windrowed soil in the area of the excavation for restoration.

When the lowest target elevation is reached at each excavation, post-excavation soil samples will need to be collected *in situ* since no further cut back of potentially clean soil will be required. A composite post-excavation soil sample will be obtained from the sidewall every 100 feet or at least one per sidewall if less than 100 feet in length. The post-excavation samples will be collected from the approximate mid-elevation of each sidewall. Accordingly, the dimensions of the excavation, for the purposes of calculating the number of sidewall samples to be collected, will be based upon the mid-elevation of each sidewall. If the final elevation interval is above the ground water level (i.e., above 45 feet AMSL), one post-excavation soil sample will also be collected from the 0 to 1 foot depth in the base of the excavation at each intersection along a 100 feet by 100 feet grid. (A minimum of one post-excavation soil sample will be collected from the base of the excavation in each target area.). The post-excavation soil samples will be compared to the Performance Standards for Cd and Cr. As stated in the 30% Remedial Design, if the base elevation is coincident with the zone of saturation (i.e., ground water, elevation of 45 feet AMSL), no post-excavation soil sample will be collected.

Table 3 summarizes the anticipated confirmation sidewall and post-excavation bottom samples for each five-foot elevation interval in the target excavation areas. This table is intended to provide an estimate of the number of samples anticipated during the course of the project. The actual number of confirmation soil samples may be modified based on the final volume of soil removed from the Site and/or the Contractor's construction approach, though in no event will the frequency of confirmation sampling fall below one per 500 CY.

2.2.1.1 Pre-Remediation Confirmation Samples

Three pre-remediation soil samples contain Cd concentrations that slightly exceeded the Performance Standard of 10 mg/kg for Cd. The locations of the three sampling locations and their respective Cd concentrations are:

- D-13 containing 21.5 mg/kg of Cd;
- SB-25 containing 20.2 mg/kg of Cd; and
- TP-12 containing 12 mg/kg of Cd.

To verify the soils in the vicinity of these borings exceed the Performance Standard for Cd, a confirmation sample will be collected from the same location and depth interval. Note, the soil in the vicinity of these sampling locations will not be excavated unless the results from the confirmation samples exceed the Performance Standard for Cd.

2.2.2 Remedial Element II (Subsurface Features) Sample Collection and Analysis Procedures

There are 36 subsurface features identified in the western portion of the Site. Eighteen of these subsurface features are some form of underground concrete structure that is either solid or open to the environment. The other 18 subsurface features are known or suspected USTs. A listing of these subsurface features and USTs is provided in Table 2.

Based on the existing information, 13 of the 18 western subsurface features have not been characterized. Hence, as they are uncovered by the Contractor, they will be accessed and the liquid and/or solid contents sampled for characterization pursuant to the methodology set forth in "Removal Action Work Plan-Subsurface Features" 24 September 2003, approved by EPA via letter dated 3 March 2004.

Of the 18 identified USTs in the western portion of the Site, one (UST-1) is reportedly removed while another eight (UST-2 through UST-9) underwent interim closure during a prior removal action. These USTs do not need to be characterized prior to their removal by the Contractor. Of the remaining USTs, three are designated as active (UST-10, UST-11 and UST-12), one with water (UST-13), and five are unknown or suspected USTs that, if present, will be accessed and characterized by the Engineer prior to their removal by the Contractor. The characterization will

conform to the procedures set forth in "Removal Action Work Plan-Subsurface Features" 24 September 2003, approved by EPA via letter dated 3 March 2004.

In accordance with the ROD, "USTs and other subsurface features would be remediated through the removal of the aqueous and/or solid materials from the USTs and the subsurface features, via application of readily available technologies (such as liquid and sludge removal by vacuum suction)" (ROD page 44). The SOW called for the RD to identify methods to be used by the Contractor to "…remove aqueous and/or solid materials from the subsurface features and the USTs…" (SOW page 7), as well as to develop plans for remediation of the northern sanitary leaching field, if warranted based on the sample results. (The eastern sanitary leaching field is being handled as part of the eastern features removal action.)

Post-excavation soil/sediment samples will be collected from the base of porous (e.g., containing openings to the environment) subsurface features that are subject to remediation (i.e., those whose liquid or solid contents exhibits constituents above the Performance Standards). A single post-excavation sample from the base (0 to 1 foot) of the subsurface feature will be collected for analysis of the remedial goal constituents. If a subsurface feature is found to be a solid structure (i.e., not open to the environment), it will be cleaned and no post-excavation sample would be warranted.

USTs will be emptied, vented, cleaned and removed in accordance with 6 NYCRR Part 613, Handling and Storage of Petroleum. A single post-excavation sample will be collected from each sidewall and bottom of the pit following the UST removal. Additional post-excavation samples will be collected if warranted based upon the excavation dimensions. The sample will be analyzed for the specified Performance Standards.

2.3. Off-Site Disposal Sampling

Soil and sediment that exceeds the respective performance standards will be removed from the Site for disposal in a RCRA Subtitle C or D facility. Soil that exhibits the characteristic of hazardous waste, which is removed from the Site, will be transported and disposed at a RCRA Subtitle C facility. Additional sampling of this soil will be performed to ensure compliance with disposal restriction requirements set forth by regulations promulgated under RCRA. Soil and

sediment that exceeds the Performance Standards and does not exhibit the characteristic of hazardous waste will be removed from the Site, transported, and disposed in a RCRA Subtitle D facility. The Contractor may opt to stabilize (see Section 2.1) soil that exhibits the hazardous characteristic prior to its removal off-Site, thereby enabling all soil and sediment that is removed from the Site to be disposed in a RCRA Subtitle D facility.

If the Contractor elects to relocate excavated soil or sediment to designated on-Site stockpiles, the sampling for disposal approval will occur once the materials are placed in the stockpile. Alternatively, if the Contractor elects to directly load the soil/sediment into transport containers/vehicles for off-Site transport and disposal, disposal approval sampling may occur *in situ* prior to excavation and loading.

2.3.1 Proposed Sampling Approach

Soil and sediment to be removed from the Site for off-Site disposal will be subject to PCB and TCLP testing at a frequency of a minimum of one sample per 1000 CY. The disposal facility may also impose additional testing parameters and/or alternate sampling frequency consistent with their permit requirements. For soil and sediment that exhibit the characteristic of hazardous waste and is transported off-Site, additional sampling will be performed to ensure compliance with disposal restriction requirements set forth by regulations promulgated under RCRA.

Soil will be tested for disposal approval in place, if the Contractor elects to direct load, or following its placement in designated stockpile locations for subsequent loading. If the Contractor elects to stabilize soil that exhibits the characteristic of hazardous waste (*in* or *ex situ*), sampling will be done following the addition/mixing of an approved stabilization agent to eliminate the hazardous characteristic. The Contractor will be required to identify all disposal approval sampling and analysis requirements as identified in Specification Section 01400.

2.4 Construction Water Sampling

Construction water will have to be handled in the course of removing both soil and sediment. The term “Construction water” includes:

- Water generated from the mechanical dewatering of sediments;
- Leachate generated from waste piles that requires collection;

- Any equipment and personnel decontamination wash water that requires collection; and,
- Any liquids generated from dewatering of on-Site excavation activities.

2.4.1 Management of Construction Water

Contractor requirements for the management, treatment and disposal of construction water are described in Specification Section 01562.

The Contractor will be encouraged to use construction water as part of the stabilization process if they elect to stabilize any Site media. All other construction water will be collected and either conveyed to another, nearby on-Site location (with or without filtration) or, if contained, subsequently tested to determine the appropriate disposal point as described below.

Construction water resulting from the management of storm water during soil and sediment removal will not be sampled if managed within the confines of the Site (i.e., pumped from one location to another using simple sand filtration). Construction water that need to be containerized for treatment or off-Site disposal (i.e., runoff from waste piles and/or any dewatering fluids) will be sampled and, depending on analytical results, will either be:

- Directly discharged on-Site;
- Treated on-Site and discharged on-Site or to the sanitary sewer (subject to authorization from the Nassau County Department of Public Works [NCDPW], which will be obtained prior to the performance of the RA); or
- Conveyed to the on-Site treatment plant (subject to available capacity and approval by the NCDPW).

2.4.2 Proposed Approach

Storm water that is managed on-Site by diverting to an adjacent location will simply undergo sand filtration to minimize the suspension and migration of particulates. Storm water handled in this manner will not be subject to containerization or testing.

Construction water generated will be placed into on-Site containers. Suspended solids will be allowed to settle and then the liquids will be tested for target compound list (TCL) and target analyte list (TAL) constituents. Based on the results, the liquids will either be discharged via: 1) on-Site discharge if liquids meet ground water standards; 2) discharge to the sanitary sewer if

liquids meet use standards (and comply with flow/volume limits); or 3) conveyed to the on-Site treatment plant prior to discharge.

Any construction water sample collection, handling, analysis and equipment decontamination will be performed in accordance with the appropriate methodologies described in the QAPP. Any water samples will be collected directly into laboratory supplied containers.

2.5. Off-Site Restoration Material Sampling

All materials brought on Site by the Contractor for Site restoration purposes (e.g., backfill materials and topsoil) will be subject to testing by the Engineer as described in this Section and the Technical Specifications.

2.5.1 Fill Materials

The Contractor will be responsible for supplying documentation that any imported fill material meets the criteria set forth in Specification Section 02225. Additionally, the Contractor shall provide the Engineer samples of imported fill for verification testing. Any independent testing of imported fill material by the Engineer will be done in accordance with the QAPP.

2.5.2 Topsoil

The Contractor will be responsible for supplying documentation that any imported topsoil meets the criteria set forth in Specification Section 02920. Additionally, the Contractor shall provide the Engineer samples of topsoil for verification testing. Any independent testing of imported topsoil by the Engineer will be done in accordance with the QAPP.

2.6 On-Site Spills

For the purposes of the Remedial Design, an on-Site "spill" is defined as an unintentional release of potentially contaminated solid or liquid media (including non-stabilized or stabilized soil and/or sediments as well as construction water or other liquids of concern such as gasoline or diesel fuel) in an area of the Site that does not require remediation or which has already been remediated. Unintentional releases of potentially contaminated Site media in areas of the Site that require remediation but have not yet been remediated are not considered "spills" for the purposes of the Remedial Design.

In the event of a spill, the Specifications require that the Contractor immediately clean up the spill using appropriate tools and supplies to be stored on Site. Any "clean" soil or sediment potentially contaminated by spills of Site media (either solid or liquid) during remediation activities will be excavated as deemed appropriate by the Engineer and disposed of separately. Post-excavation sampling and analysis of the excavated spill area will be conducted by the Engineer to verify that the spill event has been properly remediated.

If the volume of the spill requires reporting, the regulatory agencies will be notified by calling the National Response Center at (800) 424-8802 and the NYSDEC regional office at (631) 444-0320.

2.6.1 Site Media Spills

One grab sample (from the zero to one inch level) will be collected from the center of the area potentially contaminated by the spill. The sample will be analyzed for Cd and Cr (as surrogates for other Performance Standards). Sample collection and analytical procedures will be as described in the QAPP. If the analytical results of the sample exceed the Performance Standards for these two constituents, the area of the spill will be excavated one foot in all directions and then re-sampled and re-analyzed for Cd and Cr. This process will be repeated until the analytical results of the sample are less than the Cd and Cr remedial goal.

2.6.2 Fuel Spills

In the event of an on-Site fuel spill, the Contractor will immediately clean up all visible evidence of the spill (as deemed appropriate by the Engineer) using appropriate tools and supplies to be stored on-Site. Any "clean" soil potentially contaminated by the spill will also be excavated and properly disposed of.

After clean up of the spill has been completed to the satisfaction of the Engineer, the Engineer will perform verification sampling to comply with guidelines developed to fulfill requirements under 6 NYCRR Part 613, Handling and Storage of Petroleum.

3.0 REMEDIAL AIR MONITORING PLAN

The RAMP defines a systematic approach to monitor ambient air quality during the remedial activities to ensure that on-Site activities do not result in an exceedance of established action levels at the Site/work perimeter. The RAMP will protect the community located downwind of the work (i.e., off-Site receptors including residences and businesses not directly involved with the Site work activities). The protection of Site personnel from potential airborne contaminants is discussed in the Site HSCP.

The air monitoring protocol that will be followed will be the New York State Department of Health (NYSDOH) generic Community Air Monitoring Plan (CAMP). The CAMP is included as Appendix B.

3.1 Meteorological Monitoring

During Site activities, the wind direction, precipitation and temperature will be monitored continuously with a general meteorological monitoring station and recorded with a data logger. The general meteorological monitoring station will be maintained at a fixed location where the terrain is relatively flat, there are no obstructions such as buildings or trees, and the location is representative and proximate to the work zones. The meteorological monitoring station standard package will include at a minimum the following:

- Wind speed;
- Wind direction;
- Ambient air temperature;
- Relative humidity;
- Barometric pressure;
- Precipitation;
- Data logger;
- Tripod and mast;
- Cables and mounts; and
- A software installation and equipment set-up disk.

3.2 Real-Time Air Monitoring

Continuous real-time air monitoring will be conducted at the perimeter of each of the work zones for total particulates and volatile organic compounds (VOCs) for the duration of intrusive remedial activities. Perimeter monitoring locations will be located at the downwind perimeter of the work zone (exclusion zone) based on the prevailing wind direction. An additional monitoring station will be located at the upwind perimeter of the work zone as discussed below. Air quality at the upwind work zone perimeter(s) is considered representative of ambient air quality.

Perimeter air monitoring using direct reading equipment will be performed for total particulate and VOC concentrations. During the mobilization phase of a particular project task or activity, the Contractor's Safety Representative, in conjunction with the Engineer, will determine the perimeter locations to where the real-time monitoring devices will be located. The Site Safety Officer (SSO) will check the meteorological station at mid-day of work activities or at a major weather change to confirm that the perimeter stations are properly located in determining the appropriate instrumentation.

All monitoring instruments will meet the established requirements set forth by the Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), National Institute of Occupational Safety & Health (NIOSH), and state agencies where applicable. Direct reading instrumentation will be calibrated daily per manufacturer's instructions. Cylinders of the appropriate calibration gas will be maintained at the Site and replenished by the Contractor.

<u>Dust Monitoring</u>

Perimeter dust monitoring will be performed using a DATARAM by MIE, Inc. or similar device selected by the Health and Safety Manager (HSM). The same device will be used for both real-time and documentation perimeter air monitoring. Dust monitors will be equipped with an on-board alarm set point and a 90 dB alarm, which will be activated if the total particulate concentration exceeds the established action level of 150 micrograms per cubic meter ($\mu g/m^3$).

Dust monitors will be set up at the upwind and downwind perimeters of the work zone to continuously monitor particulate concentrations. If the downwind particulate level is 100 $\mu g/m^3$ greater than background (upwind perimeter) for a 15-minute period, or if airborne dust is observed leaving the work area, then the appropriate action level response measures described in Table 4 must be employed.

Volatile Organic Compound Monitoring

Perimeter VOC monitoring will be performed using a Thermo Environmental 580B photoionization detector (PID) with 10.6 eV lamp, MiniRae 2000 with 10.6 eV lamp, flame ionization detector (FID) or similar device selected by the HSM. Background VOC concentrations will be measured prior to initiating work activities. Upon initiation of intrusive remedial activities, VOC concentrations will be monitored at the downwind work zone perimeter(s) on a continuous basis. During wet weather conditions, the monitoring frequency will be reduced to prevent damage to the equipment resulting from exposure to moisture. In these instances, a daily background measurement will be taken and subsequent measurements will be taken every 2 hours. The monitor will be capable of calculating 15 minute running average concentrations, which will be compared to the established action level of 5 parts per million (ppm) above background.

3.2.1 Real-Time Action Level Response Measures

The Contractor shall be responsible for implementing effective particulate control measures during all work activities, as necessary to comply with the requirements of this Section. Control measures include but are not limited to:

- The use of water to control dust during construction operations, the grading of roads, or the clearing of land;
- Covering of material stockpiles and other surfaces that may give rise to airborne dust;
- Decontamination and covering of all transport vehicles to prevent dust emissions during transport; and
- Maintenance of access and permanent roadways.

In the event that the action levels of the various contaminants are exceeded, the steps that will be taken are outlined in Table 4.

3.3 Documentation Monitoring

In order to establish background concentrations at the Site perimeter, documentation monitoring will be conducted each day for three days (one eight-hour sample per day at one upwind and two downwind locations) during the Contractor's mobilization activities.

After completion of the Contractor's mobilization activities, documentation air sampling for total particulates will be conducted on a monthly basis for the duration of the project. Monthly documentation air sample results for total dust will be compared to the real-time monitoring data.

The OSHA permissible exposure limits (PELs) will be used to evaluate actual and worst case Cd and Cr levels that might be present on dust particulates. Provided the actual (documentation) levels are below the real-time respirable particulate action level, the real-time particulate monitoring will continue to be the surrogate for evaluating potential Cd and Cr dust levels during the RA.

The results of documentation sampling will be used as necessary to modify the perimeter/supplemental real-time air monitoring action levels. The HSM will determine any necessary adjustments to the real-time particulate monitoring action levels described above. Any modifications to monitoring action levels will be subject to the approval of the EPA.

3.3.1 Documentation Sampling and Analytical Methodologies

All documentation of sampling methodologies (i.e., pump flow rates, calibration, sampling media and subsequent analysis) will be performed in accordance with NIOSH or OSHA requirements, and the written instructions of the equipment manufacturer. The samples will be collected over a time frame that will not exceed NIOSH or OSHA guidelines, and will not restrict the flow of air through the filter cartridge. For example, if sample collection is calculated to be for eight hours based upon the assumed filter loading, and the sample will be collected over a 12 hour work day, then two six-hour samples will be collected at a higher sampling rate for appropriate loading or the sampling rate for one 12 hour sample may be reduced.

The MIE DATARAM will be utilized as a documentation sampling pump. Sampling media will be a 37 millimeter (mm) mixed cellulose ester (MCE) matched weight filter that will be utilized

to determine total particulates. The 37 mm MCE matched weight filter is typically pre-assembled with two membrane filters supported by a cellulose pad. The top filter collects the contaminant during sampling and the bottom filter acts as a "control." The sampling media requires no weighing or conditioning by the user. Instead, each filter is weighed individually after sampling is completed, and the difference in weight between the two filters corresponds to the weight of the particulates collected. The initial pump flow rate will be 1.7 liters per minute. The initial sample volume will be 800 liters. Both flow rate and sample volume may be adjusted based upon dust loading rates to the filter.

All samples will be submitted to an American Industrial Hygiene Association (AIHA) accredited laboratory for 24-hour verbal turnaround time, and analyzed for total particulates using NIOSH Method 0500. All analyses will be conducted using the lowest achievable detection limit for that NIOSH Method.

The documentation sample results will be used by the HSM to determine whether the monitoring objectives for total settled particulates are being achieved.

4.0 REPORT ON SAMPLING AND MONITORING ACTIVITIES

A Remedial Action Report (RAR) will be prepared and submitted to the EPA pursuant to the Pre Final Inspections, Remedial Action Reports, Notice of Construction Completion section of the SOW. The RAR will be submitted to the EPA for approval within 30 days after the pre-certification inspection.

The results of any RA sampling and monitoring activities not previously incorporated in documents submitted to the EPA will be incorporated into a section or appendix of the RAR. The RAR will contain a description of the sampling activities that were conducted during the performance of the RA, tabulated summaries of the confirmatory and characterization sampling data, and all appropriate chain of custody forms and laboratory data packages.

Table 1. Summary of Performance Standards for Remedial Elements I and II Remedial Elements I and II, Liberty Industrial Finishing Superfund Site

Chemical/Constituent	Performance Standards, mg/kg (ppm)	
	Soil[1,2] (Remedial Element I)	Subsurface Features[2] (Remedial Element II)
Trichloroethene	0.7	0.7
1,2-Dichloroethene	0.25	0.25
Tetrachloroethene	1.4	1.4
PCBs (0 to 1 ft)	1	Not Applicable
PCBs (below 1 ft)	10	10
Benzo(a)pyrene	Not Applicable	0.29
Dibenzo(a,h)anthracene	Not Applicable	0.29
Cyanide	Not Applicable	35
Chromium	143	143
Cadmium	10	10

Note:

1. Limits of remediation shown on the Technical Drawings were based on chromium and cadmium levels in accordance with the Record of Decision.
2. All clean overburden or cutback soils reused on-Site must meet Performance Standards highlighted above for Remedial Elements I and II.

Table 2. Summary Information for Western Subsurface Features and USTs Remedial Element II, Liberty Industrial Finishing Superfund Site

Subsurface Features ID	Location	Type of Subsurface Feature	Matrix Present	Exhibits Concentration above ROD Cleanup levels
SF-28	Loading dock #4 on western side of Building I	Concrete, bell shaped structure with an adjoining pipe traveling to the west	Solids/ Liquid	Yes
SF-29	North of Building K	Feature has not been located	Unknown	Not Sampled
SF-30	North of Building K	Concrete and brick cylindrical shaped structure with adjoining pipes traveling in the east and south-west directions	Solids	Yes
SF-31	Loading ramp, northwest portion of Building K	Concrete cone shaped structure with no visible adjoining pipes		Yes
SF-32	East end of Building W	Feature has not been accessed	Unknown	Not Sampled
SF-33	East end of Building W, west side of asphalt berm	Concrete rectangular shaped structure with no solid bottom. An 8-inch diameter pipe was observed running east and west	Solids/ Liquid	Yes
SF-34	South of Building W in north central portion of former Building G	Not accessed	Unknown	Not Sampled
SF-35	Southwest of Building W garage door.	An apparent cylindrical concrete structure with an adjoining pipe traveling south	Liquid/ Sediment Unknown	Not Sampled
SF-36	North-west corner of Site	Square concrete structure with a hollow structure beneath. No pipes observed	Unknown	Not Sampled
SF-37	North-west corner of Site	Square concrete structure with a hollow structure beneath. No pipes observed	Unknown	Not Sampled
SF-38	North-west corner of Site	Square concrete structure with a hollow structure beneath. No pipes observed	Unknown	Not Sampled
SF-39	West of Building A	Square concrete structure with a solid bottom. Piping connecting to a well head from the east was observed	Solids	Not Sampled
SF-40	West of Building A	Square concrete structure with a solid bottom. Piping connecting to a well head from the east was observed	Solids	Not Sampled
SF-50	West end unnamed building, between Building A and H	Cinder block structure with rectangular steel lid. 8-inch pipe traveling east and west observed	Solids	Yes
SF-53	Former Building G	Not Located	Unknown	Not Sampled

Subsurface Features ID	Location	Type of Subsurface Feature	Matrix Present	Exhibits Concentration above ROD Cleanup levels
SF-54	South of Building I	Cinder block structure with rectangular steel lid. 8-inch pipe traveling east and west observed	Solids	Not Sampled
SF-56	North Side of Building I	North side of Building I	Unknown	Not Sampled
SD-01	North side of Motor Avenue	Storm Drain	Solids/ Liquids	Not Sampled
UST-1	Beneath Building D slab.	Three USTs	Fuel Oil/ Water	Not applicable, UST Previously Removed
UST-2	South Side of Building W	UST	Fuel Oil	No. (Note, UST was previously closed-in-place)
UST-3	East of Building M pad	UST	Fuel Oil/ Water	No. (Note, UST was previously closed-in-place)
UST-4	East of Building M pad	UST	Fuel Oil/ Water	No. (Note, UST was previously closed-in-place)
UST-5	East of Water Tower	UST	Fuel Oil/ Water	No. (Note, UST was previously closed-in-place)
UST-6	East of Water Tower	UST	Fuel Oil/ Water	No. (Note, UST was previously closed-in-place)
UST-7	East of Chimney at Building A	UST	Fuel Oil/ Water	No. (Note, UST was partially closed-in-place)
UST-8	Concrete pad North of Former Disposal Basins	UST	Fuel Oil/ Water	No. (Note, UST was previously closed-in-place)
UST-9	North of Water Shaft, adjacent to rail tracks	UST	Empty	Empty
UST-10	North of Building K	UST	Active	Active/In-use
UST-11	Under Building I	UST	Active	Active/In-use
UST-12	North of Acetone Building	UST	Active	Active/In-use
UST-13	North of Building A	UST	Water	Sampled 2000 CRI/ Left in place
GPR-12	Northwest corner of Building S pad	Unknown/Possible UST	Unknown	Not Sampled
GPR-04	North of Building C	UST	Unknown	Not Sampled
GPR-NS	Northwest of Building N	Unknown/Possible UST	Unknown	Not Sampled
UT-1A	Beneath Building D slab.	UST	Unknown	Not Sampled
OD-1	West of Building F	UST	Unknown	Not Sampled

Table 3. Summary of Excavation Volume and Confirmation Samples for Remedial Element I
Liberty Industrial Finishing Superfund Site, Farmingdale, New York

Main Area Designation	Subarea Designation[1]	Hazardous Soil (Cubic Yard)	Non-Hazardous Soil (Cubic Yard)	Clean Overburden Volume (Cubic Yard)	Cutback Volume (Cubic Yard)	Total Excavation Volume (Cubic Yard)	Number of Confirmation Samples Based on Potentially Clean Overburden Volume[2]	Number of Confirmation Samples Based on Potentially Clean Cutback Volume[2]	Number of Sidewall Post-Excavation Samples[2]	Number of Bottom Post-Excavation Samples[3]
Excavation Cut Lines: > 60 feet elevation										
1 A	Not Applicable	0	0	862	259	1,121	9	3	Not Applicable	Not Applicable
1 B	Not Applicable	0	0	521	209	730	6	3	Not Applicable	Not Applicable
1 C	Not Applicable	0	655	0	244	899	Not Applicable	Not Applicable	4	1
1 D	Not Applicable	0	3,921	0	628	4,549	Not Applicable	Not Applicable	7	2
1 E	1 E - 60 - a	0	89	0	110	199	Not Applicable	Not Applicable	4	1
1 E	1 E - 60 - b	0	89	0	110	199	Not Applicable	Not Applicable	4	1
1 F	Not Applicable	89	0	175	160	423	2	2	Not Applicable	Not Applicable
1 G	1 G - 60 - a	0	286	2,631	705	4,070	27	7	Not Applicable	1
1 G	1 G - 60 - b	0	89							
1 G	1 G - 60 - c	358	0							
2 A	2 A - 60 - a	0	3,478	1,798	1,443	7,370	18	15	Not Applicable	2
2 A	2 A - 60 - b	0	600							
2 A	2 A - 60 - c	0	28							
2 A	2 A - 60 - d	0	22							
2 B	Not Applicable	0	617	0	191	808	Not Applicable	Not Applicable	4	1
2 C	Not Applicable	0	0	521	209	730	6	3	Not Applicable	Not Applicable
2 D	Not Applicable	0	0	264	160	423	3	2	Not Applicable	Not Applicable
2 E	Not Applicable	0	0	264	160	423	3	2	Not Applicable	Not Applicable
3 A	3 A - 60 - a	0	211	1,094	388	1,804	11	3	Not Applicable	1
3 A	3 A - 60 - b	89	0							
3 A	3 A - 60 - c	22	0							
3 B	Not Applicable	89	0	0	110	199	Not Applicable	Not Applicable	4	1
3 C	Not Applicable	0	0	264	160	423	3	2	Not Applicable	Not Applicable
3 D	Not Applicable	0	89	0	110	199	Not Applicable	Not Applicable	4	1
3 E	Not Applicable	0	89	237	198	525	3	2	Not Applicable	1
3 F	Not Applicable	0	89	512	245	847	6	3	Not Applicable	1
Excavation Cut Lines: 55 - 60 feet elevation										
1 A	Not Applicable	0	74	360	142	576	4	2	Not Applicable	Not Applicable
1 B	Not Applicable	0	0	220	107	327	3	2	Not Applicable	Not Applicable
1 F	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
1 G	1 G - 55 - a	0	564	841	436	2,110	9	5	Not Applicable	1
1 G	1 G - 55 - b	0	195							
1 G	1 G - 55 - c	0	74							
2 A	2 A - 55 - a	0	681	4,232	944	6,308	43	10	Not Applicable	1
2 A	2 A - 55 - b	0	303							
2 A	2 A - 55 - c	0	74							
2 A	2 A - 55 - d	74	0							
2 A	2 A - 55 - e	0	0							
2 A	2 A - 55 - f	0	0							
2 C	Not Applicable	0	0	220	107	327	3	2	Not Applicable	Not Applicable
Excavation Cut Lines: 55 - 60 feet elevation (Continued from Previous Page)										
2 D	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
2 E	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
3 A	Not Applicable	147	0	558	206	912	6	3	Not Applicable	Not Applicable
3 C	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
3 E	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
3 F	Not Applicable	0	0	220	107	327	3	2	Not Applicable	Not Applicable

Table 3. Summary of Excavation Volume and Confirmation Samples for Remedial Element I
Liberty Industrial Finishing Superfund Site, Farmingdale, New York

Main Area Designation	Subarea Designation[1]	Hazardous Soil (Cubic Yard)	Non-Hazardous Soil (Cubic Yard)	Clean Overburden Volume (Cubic Yard)	Cutback Volume (Cubic Yard)	Total Excavation Volume (Cubic Yard)	Number of Confirmation Samples Based on Potentially Clean Overburden Volume[2]	Number of Confirmation Samples Based on Potentially Clean Cutback Volume[2]	Number of Sidewall Post-Excavation Samples[2]	Number of Bottom Post-Excavation Samples[3]
Excavation Cut Lines: 50 - 55 feet elevation										
1 A	Not Applicable	0	74	146	107	327	2	2	Not Applicable	Not Applicable
1 B	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
1 G	1 G - 50 - a	0	452	0	349	949	Not Applicable	Not Applicable	4	1
1 G	1 G - 50 - b	74	0						4	1
1 G	1 G - 50 - c	74	0						4	1
2 A	2 A - 50 - a	0	0	721	770	4,960	8	8	Not Applicable	Not Applicable
2 A	2 A - 50 - b	0	74							
2 A	2 A - 50 - c	0	74							
2 A	2 A - 50 - d	0	3,247							
2 A	2 A - 50 - e	74	0							
2 C	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
3 A	Not Applicable	0	148	217	170	535	3	1	Not Applicable	1
3 F	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	1
Excavation Cut Lines: 45 - 50 feet elevation										
1 A	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	Not Applicable
2 A	2 A - 45 - a	0	74	18	630	1,554	Not Applicable	Not Applicable	4	Not Applicable
2 A	2 A - 45 - b	0	74						4	Not Applicable
2 A	2 A - 45 - c	0	142						4	Not Applicable
2 A	2 A - 45 - d	0	197						4	Not Applicable
2 A	2 A - 45 - e	0	270						4	Not Applicable
2 A	2 A - 45 - f	74	0							
2 A	2 A - 45 - g	0	74						4	Not Applicable
3 A	Not Applicable	0	74	0	73	147	Not Applicable	Not Applicable	4	Not Applicable
		1,164	**17,959**	**15,512**	**10,134**	**44,769**	**166**	**78**	**107**	**28**

NOTES:

1. Subarea designations are unique to each lift (i.e., 1G-55-a should not be interpreted as the subarea underneath 1G-60-a). Refer to the Technical Drawings for locations of each subarea.
2. In general, sidewall confirmation samples will be collected at a frequency of 1 sample for every 100 cubic yards of potentially clean overburden and cutback soils removed. When the lowest target elevation is reached at each excavation, confirmation soil samples will need to be collected in situ since no further cut back of potentially clean soil will be required. Hence, once the final elevation depth is reached in each excavation area, a post-excavation soil sample will be obtained from the sidewall every 100 feet or at least one per sidewall if less than 100 feet in length.
3. If the final elevation interval is above the ground water level (i.e., above 45 ft. msl) one confirmation soil sample will also be collected from the 0 to 1 ft depth in the base of the excavation at each intersection along a 100 ft. by 100 ft grid. (A minimum of one sample will be collected from the base of the excavation in each target area.). If the base elevation is coincident with the zone of saturation (i.e., ground water, elevation of 45 ft. msl) no confirmation soil sample will be collected.

Table 4. Summary of Remedial Air Monitoring Action Levels and Response Actions Remedial Elements I and II, Liberty Industrial Finishing Superfund Site

Chemical	Action Level	Response Actions
Organics	PID reads 5 ppm above background for the 15-minute average.	Stop work and workers leave immediate area. Continue with monitoring. After allowing vapors to dissipate, if readings are less than 5 ppm above background, resume work with continued monitoring.
	PID reads in excess of 5 ppm above background but less than 25 ppm above background.	Stop work and workers leave immediate area. Notify Project Manager and Project Health and Safety Manager. Identify the source of vapors, corrective actions to abate emissions and continue monitoring. If the total organic compound level 200 feet downwind of the exclusion zone or half the distance to the nearest receptor is less than 5 ppm over background for the 15-minute average work activities may resume.
	PID reads above 25 ppm	Shutdown all work activities. Contact Project Manager and Project Health and Safety Manager. Maintain records of all instantaneous and 15-minute readings in form available for review by the Regulators. All personnel will be fit tested with proper respirator if upgrade to Level C is required.
Dust	Downwind dust monitor reads 100 $\mu g/m^3$ greater than the upwind dust monitor or visible dust is observed leaving the work area.	Employ appropriate dust suppression techniques. Work may continue as long as the downwind dust monitor does not exceed more than 150 $\mu g/m^3$ above the upwind dust monitor and visible dust is not observed to be leaving the work area.
	If after implementing dust suppression techniques, the downwind dust monitor exceeds more than 150 $\mu g/m^3$ above the upwind dust monitor	Stop work. Contact Project Manager and Project Health and Safety Manager. Maintain records of all readings in form available for review by the Regulators. Resume work if the dust suppression techniques are successful in reducing the downwind concentration to within 150 $\mu g/m^3$ of the upwind concentration and there is no visible dust migration

APPENDIX A

Quality Assurance Project Plan

June 13, 2006

QUALITY ASSURANCE PROJECT PLAN FOR REMEDIAL ELEMENTS I AND II

Liberty Industrial Finishing Superfund Site
55 Motor Avenue
Village of Farmingdale, Nassau County, New York

Prepared for:

LIBERTY INDUSTRIAL FINISHING SITE QUALIFIED SETTLEMENT TRUST

Remedial Engineering, P.C.

Environmental Engineers

and ROUX ASSOCIATES, INC.

209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

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GLOSSARY OF TERMS

Accuracy	A measure of the closeness of an individual measurement or the average of a number of measurements to the true value. Accuracy is influenced by a combination of random error (precision) and systematic error (bias) components, which are due to sampling and analytical operations. EPA recommends that this term not be used and that precision and bias be used to convey the information usually associated with accuracy.
ACO	Administrative Consent Order
Analyte	The chemical compound or element for which a sample is analyzed.
ARARs	Applicable or Relevant and Appropriate Requirements.
ASTM	American Society of Testing and Materials. An organization which develops and publishes standard methods of analysis and standards for materials and procedures.
Background	A level of hazardous substances that approximates the level that would be present in the medium of concern if the source of contamination under analysis did not exist.
Bias	The systematic or persistent distortion of a measurement process which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value). Bias can result from improper data collection, poorly calibrated analytical or sampling equipment, or limitations or errors in analytical methods and techniques.
Bioaccumulation	The tendency of a hazardous substance to be taken up and accumulated in the tissue of organisms, either directly or through consumption of food containing the hazardous substance. Bioaccumulation typically results in increasing concentrations of hazardous substances in tissues of organisms higher up in the food chain.
Blank	A sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage, or analysis. The blank is subjected to the same analytical or measurement process as other samples to establish a zero baseline value and is sometimes used to adjust or correct routine analytical results.
Calibration	Comparison of a measurement standard, instrument, or item with a standard or instrument of higher accuracy to detect and quantify inaccuracies ad to report or eliminate those inaccuracies by adjustments.
Calibration Standard	Standards prepared by successive dilution of a standard solution covering the full concentration range required and expected to be seen in the samples, for the organic and inorganic analytical method. The calibration standard must be prepared using the same type of acid or solvent used to prepare samples for analysis.

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.
Chain of Custody	An unbroken trail of accountability that ensures the physical security of samples, data, and records.
CLP	EPA's Contract Laboratory Program. Refers to laboratory specifications, analytical methods, and QA/QC protocols required for Superfund and related activities.
Co-located Samples	Independent samples collected in such a manner that they are equally representative of the parameter(s) of interest at a given point in space and time.
Comparability	The expression of information in units and terms consistent with reporting conventions; the collection of data by equivalent means; or the generation of data by the same analytical method. Aqueous samples will be reported as µg/l, solid samples will be reported in units of µg/kg for organics and mg/kg for inorganics, dry weight, and air samples will be reported in ppbv or $\mu g/m^3$.
Completeness	The percentage of valid data obtained relative to that which would be expected under normal conditions. Data are judged valid if they meet the stated precision and accuracy goals.
Composite Sample	Non-discrete samples composed of one or more individual samples taken at different locations at a site. Composite samples are representative of the average concentrations of contaminants across a large area.
Control Sample	A QC sample introduced into a data collection process to monitor the performance of the system.
Cooperative Agreement	A form of assistance provided by a Federal agency in which a substantial interaction is anticipated between the Federal agency and the assistance recipient (e.g., State, Tribal, Commonwealth, or local government or other) during performance of the contemplated activity.
CQAPP	The Construction Quality Assurance Project Plan, developed as part of the Remedial Design for Remedial Elements I and II.
CRDL	Contract Required Detection List
Data Validation	Confirmation through examination and provision of objective evidence that requirements for a specific intended use have been met. The process of examining the analytical data to determine conformance to user needs.
Data Verification	Confirmation through examination and provision of objective evidence that predefined requirements for a specific intended use have been met. The process of examining the result of a given activity to verify conformance to stated requirements for that activity.

Definitive Data	Data that are documented as appropriate for rigorous uses that require both hazardous substance identification and concentration. Definitive data are often used to quantify the types and leases of hazardous substances. *Guidance for Performing Site Inspections under CERCLA, Interim Final, p.99; Guidance for Data Usability in Site Assessment Draft, pp. 13 and 14.*
DL	Detection Limit – the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.
Duplicate Sample	Two separate samples taken from the same source by the same person at essentially the same time and under the same conditions that are placed into separate containers for independent analysis. Duplicate samples are intended to assess the effectiveness of equipment decontamination, the precision of sampling efforts, the impacts of ambient environmental conditions on sensitive analyses (e.g., volatile organics analysis [VOA]), and the potential for contaminants attributable to reagents or decontamination fluids. Identifying such potential sources of error is essential to the success of the sampling program and the validity of the environmental data. Each QC sample is described below. At a minimum, each set of ten or fewer field samples will include a trip blank, a duplicate and one sample collected in a sufficient volume to allow the laboratory to perform a matrix spike.
DQOs	Data Quality Objectives – Qualitative and quantitative statements (derived from the DQO process) that clarify the objectives of studies, technical processes and quality assurance programs, define the appropriate type, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.
Equipment Blank	Also called the equipment rinsate. A sample of analyte-free reagent taken after completion of decontamination and prior to sampling at the next sample location. It is used to check field decontamination procedures to ensure that analytes from one sample location have not contaminated a sample from the next location.
EPA	United States Environmental Protection Agency
False Positive Decision Error	The erroneous decision that the null hypothesis is correct.
False Negative Decision Error	The erroneous decision that the null hypothesis is incorrect
Field Blank	A blank used to provide information about contaminants that may be introduced during sample collection, storage, and transport. A clean sample, carried to the sampling site, exposed to sampling conditions, and returned to the laboratory and treated as an environmental sample.

Field Duplicate	An independent sample collected from the same location or source as close as possible to the same point in space and time. Duplicates are stored in separate containers and analyzed separately for the purpose of documenting the precision of the sampling process. (Laboratory variability will also be introduced in the samples' results.)
GC	Gas Chromatography – An analytical technique used to analyze environmental matrices for organic contaminants.
GC/MS	Gas Chromatography/Mass Spectrometry - This is a gas chromatography analyzer combined with a mass spectrometer detector. The mass spectrometer uses the difference in mass-to charge ratio (m/e) of ionized atoms or molecules to separate them from each other and to quantify their concentrations.
Grab Samples	Discrete samples that are representative of a specific area and a specific time. Useful in identifying "hot spots" of contamination at a site.
Hazardous Substances	CERCLA hazardous substances, pollutants, and contaminants, as defined in CERCLA Sections 101(14) and 101(33).
Holding Time	The period a sample may be stored prior to its required analysis. Although exceeding the holding time does not necessarily negate the veracity of analytical results, it causes the qualifying or "flagging" of the data for not meeting all of the specified acceptance criteria.
Interference	An element, compound, or other matrix effect present in a sample, which interferes with detection of a target analyte leading to inaccurate concentration results for the target analyte.
LQAP	Laboratory Quality Assurance Plan
Matrix	The substrate containing the analyte of interest – examples are soil, water, sediments, and air. Also called medium or media.
Matrix Duplicate	A duplicate field sample used to document the precision of sampling and homogeneity of a given sample matrix. (Sample as field duplicate.)
Matrix Spike (MS)	A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. Spiked samples are used, for example, to determine the effect on a method's recovery efficiency.
Matrix Spike Duplicate (MSD)	A split sample, both portions of which are spiked with identical concentrations of target analytes, for the purpose of determining the bias and precision of a method in a particular sample matrix.
Maximum Contaminant Level (MCL)	Maximum concentration of a contaminant allowed in drinking water systems by the National Primary Drinking Water Regulations; 40 CFR 141.11 (inorganic chemicals) and 141.12 (organic chemicals).

Method blank	A clean sample processed simultaneously with and under the same conditions as samples containing an analyte of interest through all the steps of the analytical procedure.
Method Detection Limit (MDL)	The minimum concentration of an analyte that can be measured and reported with 99% confidence. It is determined by analysis of samples with known concentrations at various dilutions. This limit is matrix-specific (e.g., soils vs. waters).
MSL	Mean Sea Level
Municipality	An urban political unit with corporate status and usually powers of self-government.
NYSDEC	New York State Department of Environmental Conservation
Null Hypothesis	Presumed or baseline condition. In the case of environmental investigations, generally either is contaminated or that the site is clean.
Ppb	Parts Per Billion; for soil samples equivalent to µg/kg (micrograms per kilogram); for aqueous samples equivalent to µg/l (micrograms per liter).
Ppm	Parts Per Million; for soil samples equivalent to mg/kg (milligrams per kilogram); for aqueous samples equivalent to mg/l (milligrams per liter).
PRAP	Proposed Remedial Action Plan
Precision	A measure of the agreement among individual measurements of the sample property under prescribed similar conditions. Precision is generally reported as Relative Standard Deviation (RSD) or Relative Percent Difference (RPD). Relative standard deviation is used when three or more measurements are available and is calculated as: $$RSD = \frac{\text{Standard Deviation}}{\text{Arithmetic Mean}} \times 100$$ Relative percent difference is used for duplicate measurements and is calculated as: $$RPD = \frac{\text{Value 1 - Value 2}}{\text{Arithmetic Mean}} \times 100$$
Priority Pollutants	List of inorganic and organic analytes commonly tested for in the National Pollution Discharge Elimination System (NPDES) program.
QA	All means taken in the field and inside the laboratory to make certain that all procedures and protocols use the same calibration and standardization procedures for reporting results; also, a program which integrates the quality planning, quality assessment, and quality improvements activities within an organization.

QAPP	Quality Assurance Project Plan – A formal document describing in comprehensive detail the necessary QA, QC, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria.
QC	Quality Control – The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality.
QL	Quantitation Limit – The level above which quantitative results may be obtained with a specified degree of confidence.
RA	Remedial Action – Action performed to implement the Remedial Design.
RCRA	The Resource Conservation and Recovery Act of 1976, as amended.
Release	Any spilling, leaking, pumping, pouring, emitting, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discharging or barrels, containers, and other receptacles containing any hazardous substance or pollutant or contaminant). CERCLA 101 (22)
Representativeness	A measure of the degree to which the measured results accurately reflect the medium being sampled. It is a qualitative parameter that is addressed through the design of the sampling program in terms of sample location, number of samples, and the actual material collected as a "sample" of the whole.
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAMP	Sampling Analysis and Monitoring Plan (SAMP). Site and event specific plan detailing sampling rationale, protocols, and analyses planned per sample type. A part of the QAPP.
Sample Delivery Group	A Sample Delivery Group (SDG) is defined as being either a Case of environmental field samples received for analysis, each twenty (20) environmental field samples within a Case received for analysis, or each fourteen (14) calendar day period which environmental field samples in a Case are received for analysis, whichever is most frequent.
Screening Data	Data that are appropriate for applications that only require determination of gross contamination areas and/or for site characterization decisions that do not require quantitative data. Screening data are often used to specify which areas to sample to collect definitive data. *Guidance for Performing Site Inspections Under CERCLA, Interim Final, pp. 99 and 100; Guidance for Data Usability in Site Assessment, Draft p. 15.*
SF	Subsurface Feature

SOP	Standard Operating Procedure – A written document that details the method for an operation, analysis or action with thoroughly prescribed techniques and steps, and that is officially approved as the method for performing certain routine or repetitive tasks.
Source Area	An area of contamination from which substances may have migrated to other media. Several source areas can be located within a site.
Spike	A known quantity of a chemical that is added to a sample for the purpose of determining (1) the concentration of an analyte by the method of standard additions, or (2) analytical recovery efficiency, based on sample matrix effects and analytical methodology. Also called analytical spike.
Split Samples	Two or more representative portions taken from one sample in the field or in the laboratory and analyzed by different analysts or laboratories. Split samples are used to duplicate the measurement of the variable(s) of interest.
Standard Addition	The practice of adding a known amount of an analyte to a sample immediately prior to analysis and used to evaluate interferences.
Standard Curve	A plot of concentrations of known analyte standards versus the instrument response to the analyte.
Surrogate	A pure substance with properties that mimic the analyte of interest. It is unlikely to be found in environmental samples and is added to them to establish that the analytical method has been performed properly.
SVOA	Semivolatile Organic Analysis or Analyte.
SVOC	Semivolatile Organic Compound. BNA; extractable organic compound.
SW-846	EPA "Test Methods for Evaluating Solid Waste," 1986 (Third Edition), plus Updates, a publication describing standard methods of analysis, sampling techniques, and QA/QC procedures.
Trip Blank	A clean sample of matrix that is carried to the sampling site and transported to the laboratory for analysis without having been exposed to sampling procedures.
VOA	Volatile Organic Analysis or Analyte.
VOC	Volatile Organic Compound.

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) was prepared as an appendix to the Sampling and Analysis Management Plan (SAMP) for Remedial Elements I and II at the former Liberty Industrial Finishing Superfund Site ("Site"), located in Farmingdale, New York. This QAPP is intended to set forth guidelines for the generation of reliable data by measurement activities, such that data generated are scientifically valid, defensible, comparable and of known precision and accuracy.

This QAPP contains a detailed discussion of the quality assurance (QA) and quality control (QC) protocols to be utilized by the Engineer, laboratory personnel, Contractor, and other subcontractors. In addition, this QAPP provides guidelines and procedures for field and laboratory personnel for collection and analysis of waste characterization and confirmatory soil samples to be collected as part of the Remedial Action (RA) for Remedial Elements I and II.

The SAMP outlines the procedure to be followed for collection of aqueous/solid characterization samples, confirmation soils samples, soil samples following removal of subsurface features, and ambient air samples. The QAPP describes the measures that will be taken to verify that data generated by field activities undertaken as part of the RA are of sufficient quality to meet the data quality objectives. The QAPP elements present the organization, objectives, functional activities and specific QA/QC activities associated with the sampling and analyses performed during the RA.

The QAPP describes the specific protocols that will be followed for sampling, chain of custody, and laboratory and field analysis. All QA/QC procedures will be developed and implemented in accordance with applicable professional technical standards, and United States Environmental Protection Agency (EPA) requirements. The SAMP elements are prepared in accordance with the applicable guidance documents including "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (EPA QA/R-5) and the "Guidance for the Data Quality Objectives Process" (EPA/G-4).

This QAPP contains a detailed discussion of the quality assurance protocols to be used by the Engineer and laboratory personnel, as well as a description of the field sampling activities and the project organization and responsibilities.

All fieldwork will be performed in accordance with the Site-specific Health and Safety Contingency Plan (HSCP), and the Scope of Work detailed in the Final Remedial Design for Remedial Elements I and II.

1.1 Data Quality Objectives

Data Quality Objectives (DQO) are described in the following subsections.

1.1.1 Data Use Objectives

The SAMP details the sampling that will be performed during the RA. This sampling will yield the necessary data to drive the RA to completion. The typical data use objectives for Remedial Elements I and II are:

- Soil characterization of proposed backfill material;
- Confirm the removal of soils above the clean-up criteria;
- Waste characterization of soils above the clean-up criteria;
- Waste characterization of soils exhibiting Resource Conservation and Recovery Act (RCRA) hazardous characteristics;
- Characterization of aqueous/solid materials contained in subsurface features for disposal;
- Confirm that the removal of the contents in subsurface features was effective in removing potential Site constituents;
- Confirm that soil adjacent to the subsurface features does not exceed specified Performance Standard;
- Measurement of the concentrations of airborne particulate at the Site boundaries to ensure protection of the adjacent community in the downwind direction; and
- Measurement of the concentration of airborne particulate in the work zone to ensure worker protection.

1.1.2 Overall Data Quality Objectives

DQOs are quantitative and qualitative statements specifying the quality of the environmental data necessary to support the decision-making process to guide the remedial action for Remedial Elements I and II. DQOs define the total uncertainty in the data that is acceptable for each activity. This uncertainty includes both sampling error and analytical error. Ideally, the prospect of zero uncertainty is the objective; however, the very processes by which data are collected in the field and analyzed in the laboratory contribute to the uncertainty of the data. It is the overall objective to keep the total uncertainty to a minimal level such that it will not hinder the intended use of the data.

The parameters that will be used to specify data quality requirements and to evaluate the analytical system performance for all analytical samples are precision, accuracy, representativeness, completeness and comparability (PARCC). These terms are defined as:

- Precision - a measure of the reproducibility of measurements under a given set of conditions.
- Accuracy - a measure of the bias that exists in a measurement system.
- Representativeness - the degree to which sample data accurately and precisely represent selected characteristics.
- Completeness - a measure of the amount of the valid data obtained from the measurement system compared to the amount that is required.
- Comparability - a measure of confidence with which one data set can be compared with another.

1.1.3 Field Investigation Data Quality Objectives

In order to permit calculation of precision and accuracy for the soil, sediment, ground water, and air samples, blind field duplicate, field blanks and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected, analyzed, and evaluated. All sampling, analytical, and QA/QC procedures will be performed as described in accordance with this QAPP.

Through the submission of field QC samples, the distinction can be made between laboratory problems, sampling technique considerations, sample matrix effects, and laboratory artifacts. To

assure soil, sediment, ground water, and air sample representativeness, all sample collection will be performed in strict accordance with the procedures set forth in this QAPP.

Precision will be calculated as RPD if there are only two analytical points and percent relative standard deviation (% RSD) if there are more than two analytical points. Blind field duplicate and MS/MSD sample analyses will provide the means to assess precision. The submission of field QC samples will provide a check with respect to accuracy and will monitor chemicals that may be introduced during sampling, preservation, handling, shipping and/or the analytical process. In the event that the blanks are contaminated and/or poor precision is obtained, the associated data will be appropriately qualified.

Representativeness will be assured through the implementation of the structured and coherent design of which this QAPP is a part. The Remedial Design for Remedial Elements I and II has been designed so that the appropriate numbers of samples of each matrix and of each location of interest are obtained for analysis.

Ideally, 100% completeness is the goal. However, it must be recognized that unforeseen issues may result in the generation of some data that may not be acceptable for use. Therefore, a completeness target of 90%, as determined by the total number of usable data points versus the total number of data points measured, will be the realistic goal of this program. Sample data that is not acceptable for use will be re-collected for the parameters that were not usable from the original analyses.

Comparability is defined as the extent to which data from one data set can be compared to similar data sets. Comparability between data sets is often questionable due to issues such as different analytical methods used or inter-laboratory differences. In order that the data generated as part of this project remain comparable to any previously generated data or data to be generated in the future, currently published analytical methods have been identified for the analysis of the collected samples. These methods will be performed by an analytical laboratory with a demonstrated proficiency in the analysis of similar samples by the referenced methods. In addition, samples will be collected using documented procedures to ensure consistency of effort and reproducibility if necessary.

1.1.4 Laboratory Data Quality Objectives

The analytical laboratory will demonstrate analytical precision and accuracy by the analysis of various QC samples (i.e., laboratory duplicates, spike samples, matrix spike duplicates and laboratory control samples). Table 1 presents parameters and typical reporting levels (actual reporting levels will be determined upon selection of the analytical laboratory), Table 2 presents sample preservation, holding times and container requirements, and a table summarizing the data quality objectives that will be generated upon selection of the analytical laboratory. This table should present the relevant precision and accuracy criteria. Precision, as well as instrument stability, will also be demonstrated by comparison of calibration response factors from the initial calibration to that of the continuing calibrations. Laboratory accuracy will be evaluated by the addition of surrogate and matrix spike compounds, and will be presented as percent recovery (%R). Precision will be presented as RPD, % RSD, or percent difference (%D), whichever is appropriate for the number and type of QC samples analyzed. Laboratory blanks can also be used to demonstrate the accuracy of the analyses and possible effects from laboratory artifact contamination.

2.0 PROJECT ORGANIZATION AND RESPONSIBILTY

While all personnel involved in the sampling of Site media and in the generation of data are a part of the overall project management and quality assurance program, certain members of the Project Team have specifically designated responsibilities. Project Team members with specific management and quality assurance roles during the RA are the Project Director (PD), the Project Manager (PM), the Resident Project Representative (RPR), and the Quality Assurance Officer (QAO). In the following sections, the roles and responsibilities of key personnel are identified.

2.1 Project Director

The PD will oversee the PM and be responsible for maintaining appropriate management controls at all responsibility levels of the project

2.2 Project Manager

The PM will report to the PD and will oversee the QAO, RPR, field investigation staff, and any subcontractors. The PM will also be responsible for all technical aspects of the project. This includes scheduling, communicating to the client, technical development and review of all field activities, subcontracting, and the overall quality of the project and project deliverables.

2.3 Quality Assurance Officer

The QAO will have overall responsibility for QA/QC review of all analytical data generated during the field investigation.

The QAO role is independent of the project team members that are responsible for generating project data and/or information. In addition, the QAO is the individual responsible for maintaining the official, approved QAPP.

2.4 Resident Project Representative

The RPR will report to the PM. The RPR will be responsible for the day-to-day management and coordination of field staff and subcontractors.

3.0 SAMPLING AND ANALYSIS

The purpose of the sampling is to determine the presence and concentration of constituents in the Site media. The objective of the sampling effort is to collect and analyze samples that are representative of the media under investigation. The methods and equipment used for collecting environmental matrices of concern will vary with the associated physical and chemical properties of each media designated for sampling.

The overall sampling program for the RA provides a proposed sampling network for each remedial element. The following section define the analysis to be performed for the samples associated with Remedial Elements I and II and defined in the SAMP.

3.1 Soil Sample Collection and Analysis Procedure

The following subsection defines the sampling regime for the RA addressing Remedial Element I (soils). The soil sampling shall be performed in accordance with the CQAPP and SAMP, and analyzed as defined in this QAPP. The constituents and associated Performance Standards associated with soils are:

- Cadmium ..... 10 mg/kg
- Chromium ..... 143 mg/kg
- Trichloroethene ..... 0.7 mg/kg
- Cis-1,2-dichloroethene ..... 0.25 mg/kg
- Tetrachloroethene ..... 1.4 mg/kg
- PCB (0-1 ft below ground surface [bgs]) 1 mg/kg
- PCB (> 1 ft bgs) ..... 10 mg/kg

3.1.1 Confirmation Sampling

Confirmation sampling will be performed on soils moved from the excavation and windrowed and from excavation sidewalls and bottoms. Windrowed soils are soils removed as cutback soils, defined in the CQAPP and SAMP, as soils that need to be moved to access impacted soil and/or cutback to maintain a proper and safe slope to provide a platform from which to operate equipment. Cutback soils are presumed to be clean and will be windrowed as described in the CQAPP and SAMP. Excavation sidewall and bottom samples are to be performed when no

remaining cutback soils require moving. Confirmation samples will be collected from the windrowed stockpile at a frequency stated in the SAMP.

In addition, three pre-remediation sampling locations, which slightly exceeded the performance standard of 10 mg/kg for cadmium, will be sampled in the field (pre-excavation) to confirm that the soils in the vicinity of these borings are in exceedance of the 10 mg/kg standard identified for the Site. Note, the soil in the vicinity of these sampling locations will not be excavated unless the results exceed the Site-specific performance standard for cadmium.

Analysis of soil samples will be by laboratory analysis through EPA SW-846 methods. All methods follow "Test Methods for Evaluation Solid Waste," EPA SW-846, Third Edition, September 1986, with revisions. The analysis performed for soils excavated under Remedial Element II will include volatile organic compound (VOC) analysis in accordance with EPA SW-846 Method 8260B for the following three (3) project specific compounds: cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. Polychlorinated biphenyl (PCB) analysis will be in accordance with EPA SW-846 Method 8082, and metals analysis will be in accordance with EPA SW-846 Method 6010B for the following two (2) project specific compounds: cadmium and chromium.

3.1.2 Disposal Approval Sampling (Soils)

Disposal approval sampling will be performed on all Site soils prior to being removed from the Site. Soils designated for off-Site disposal are to be stockpiled as described in the CQAPP. Soils to be removed from the Site will generally fall into two categories: 1) soils above the Performance Standard, and 2) soils exhibiting RCRA hazardous characteristic. At a minimum, the following analyses will be performed for soils to be transported off-Site as part of Remedial Element II: Toxicity Characteristic Leaching Procedure (TCLP) VOC analysis prepared in accordance with EPA Method 1311 and analyzed in accordance with EPA SW-846 Method 8260B, TCLP semi-volatile organic compound (SVOC) analysis prepared in accordance with EPA Method 1311 and analyzed in accordance with EPA SW-846 Method 8270C, and TCLP metals analysis prepared in accordance with EPA Method 1311 and analyzed in accordance with EPA SW-846 Method 6010B and 7470.

Sampling in addition to the sampling required as part of this RA may be required by the chosen disposal facility.

3.1.3 Construction Water Sampling

Construction water resulting from the management of storm water, during soil and sediment removal, will not be sampled if managed within the confines of the Site (i.e., pumped from one location to another using simple sand filtration). Construction water that needs to be containerized for treatment or off-Site disposal (i.e., runoff from stockpiles and/or any dewatering fluids) will be sampled and, depending on analytical results, construction waters will either be:

- Directly discharged on-Site;
- Treated on-site and discharged on-site or to the sanitary sewer (subject to authorization); or
- Conveyed to the on-Site treatment plant (subject to available capacity and approval).

3.1.4 Remedial Air Monitoring

Documentation monitoring will be performed during the RA for Remedial Element I and II to verify that the action levels which are measured by real-time particulate monitoring and VOC monitoring are appropriate to afford protection to on-site workers during Work activities. Documentation sampling will be performed as described in the HSCP for Remedial Elements I and II. The documentation air sample results for total dust will be compared to the real time monitoring data collected with the dust monitors. Monitoring equipment capable of measuring total VOC concentrations (photoionization detector [PID]) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights of approximately 4 to 5 feet above land surface (i.e., the breathing zone). The audible alarm on the PID will be set at 5 parts per million (ppm). Monitoring equipment will be MiniRAE 2000 portable VOC monitors, or similar equipment.

All documentation sampling methodologies (i.e., pump flow rates, calibration, sampling media and subsequent analysis) will be performed in accordance with National Institute of Occupational Safety & Health (NIOSH) or Occupational Safety and Health Administration

(OSHA) methodologies, and the written instructions of the equipment manufacturer. The samples will be collected over a time frame that will not exceed NIOSH or OSHA guidelines.

All samples will be submitted to an American Industrial Hygiene Association (AIHA) accredited laboratory for 24-hour verbal turnaround time, and analyzed for repairable particulates using NIOSH Method 0600, and for lead using NIOSH Method 7300. All analyses will be conducted using the lowest achievable detection limit for that NIOSH method.

3.2 Subsurface Feature Sample Collection and Analysis Procedure

The following subsection defines the sampling regime for the RA addressing Remedial Element II (subsurface features). Sampling shall be performed in accordance with the CQAPP and SAMP, and analyzed as defined in this QAPP. The constituents and associated performance standards associated with subsurface features are:

- Cadmium ..... 10 mg/kg
- Chromium ..... 143 mg/kg
- Trichloroethene ..... 0.7 mg/kg
- Cis-1,2-dichloroethene ..... 0.25 mg/kg
- Tetrachloroethene ..... 1.4 mg/kg
- PCB (0-1 ft bgs) ..... 1 mg/kg
- Cyanide ..... 35 mg/kg
- Benzo(a)pyrene ..... 0.29 mg/kg
- Dibenzo(a,h)anthracene ..... 0.29 mg/kg

3.2.1 Characterization Sampling

There are 36 subsurface features identified in the western portion of the Site. Eighteen of these subsurface features are some form of underground concrete structure that is either solid or open to the environment. The remaining eighteen features are known or suspected underground storage tanks (USTs). A listing of these subsurface features and USTs is provided as Table 2 in the SAMP.

Based on the existing information, 13 of the 18 subsurface features have not been characterized. These subsurface features will be accessed and the liquid and/or solid contents sampled for characterization.

Of the 18 identified USTs, three are designated as active (UST-10, UST-11 and UST-12), one with water (UST-13), and five are unknown or suspected USTs that, if present, will be accessed and characterized.

The sample analysis to be performed for characterization included Target Compound List (TCL) VOC analysis in accordance with EPA SW-846 Method 8260B, TCL SVOC analysis in accordance with EPA SW-846 Method 8270C, PCB analysis in accordance with EPA SW-846 Method 8082, and Target Analyte List (TAL) inorganics analysis in accordance with EPA SW-846 Methods 6010B, 7470, and 9012B.

3.2.2 Confirmation Sampling

Subsurface features that had previously been characterized will be remediated and confirmation soil/sediment samples will be collected from the base of porous (e.g., containing openings to the environment) subsurface features that are subject to remediation (i.e., those whose liquid or solid contents exhibits constituents above the performance standards). A single sample from the base (0 to 1 foot) of the subsurface feature will be collected for analysis of the remedial goal constituents. If a subsurface feature is found to be a solid structure (i.e., not open to the environment), it will be cleaned and no confirmation sample would be warranted. Confirmation samples will be collected and analyzed for the following: VOC analysis in accordance with EPA SW-846 Method 8260B with the following three (3) project specific compounds: cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene, SVOC analysis in accordance with EPA SW-846 Method 8270C with the following two (2) project specific compounds: benzo(a)pyrene and dibenzo(a,h)anthracene, PCB analysis in accordance with EPA SW-846 Method 8082, and metals analysis in accordance with EPA SW-846 Methods 6010B and 9012B with the following three (3) project specific inorganic analytes: cadmium, chromium, and cyanide.

4.0 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field quality assurance and quality control procedures are discussed in the following subsections of the QAPP.

4.1 Equipment Maintenance

A maintenance, calibration, and operation program will be implemented to ensure that routine calibration and maintenance is performed on all field instruments. The program administration will be by the RPR and the field team members. Instrument maintenance, calibration and equipment operation will follow the procedures outlined in the manufacturer's Operation and Field Manuals accompanying the respective instruments.

4.2 Equipment Calibration

Team members will be familiar with the field operation, calibration, and maintenance of the field equipment, and will perform the prescribed field operating procedures as outlined in the operations and maintenance manuals provided by the equipment manufacturers.

Field personnel will maintain written records of field instrument calibrations and QA/QC checks in the field logbooks. Calibration information recorded in the field logbooks shall include:

- Instrument manufacturer, model number and serial number;
- A description of the specific calibration procedures;
- Calibration results; and
- Instrument deviations from acceptable calibration criteria.

In the event of field equipment failure, the RPR will be contacted immediately and, in a timely manner, will be responsible for acquiring replacement equipment or facilitating repairs on the malfunctioning equipment. The repaired and/or replacement equipment will be calibrated prior to being placed back into service.

4.3 Equipment Decontamination

In order to minimize the potential for cross-contamination, all excavation and sampling equipment will be properly decontaminated prior to and after each use.

4.3.1 General Procedures

All heavy equipment will be decontaminated in a designated clean area. Sampling equipment and probes will be decontaminated in an area covered by plastic near the sampling location. A temporary decontamination pad will be constructed that will be approximately 20 feet wide and 40 feet long. Two four-foot wide crane mats will be constructed by using four 12 x 12 timbers which will be bolted together and placed in the center of the decontamination pad The pad will be covered when not in use with a 6 mil thick polyethylene sheet. All solvents and wash water used in the decontamination process and all disposable sampling equipment will be properly disposed.

Extraneous contamination and cross-contamination will be controlled by wrapping the sampling equipment with aluminum foil when not in use and changing and disposing of the sampler's gloves between samples. Decontamination of sampling equipment will be kept to a minimum in the field, and wherever possible, dedicated sampling equipment will be used. Personnel directly involved in equipment decontamination will wear appropriate protective equipment.

4.3.2 Non Aqueous Sampling Equipment

All non-aqueous sampling equipment (e.g., trowels, split-spoons, bowls, bailers) will be decontaminated before each use as follows:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination;
- Generous tap water rinse; and
- Distilled and deionized (American Standard for Testing of Materials [ASTM]) Type II) water rinse.

4.3.3 Aqueous Sampling Equipment

When possible, disposable bailers will be used during the fluid sampling. In the event that field decontamination is required, decontamination procedures will be as follows:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination;
- Generous tap water rinse;
- Distilled water rinse; and

- Air dry.

The decontamination procedure will be performed on all sampling equipment regardless of the suspected classification of the media sampled.

4.4 Quality Assurance/Quality Control Sampling

Specific guidance regarding the collection of field and laboratory QA/QC samples is presented separately below.

4.4.1 Field QA/QC Samples

A discussion on field QA/QC samples is provided in the following subsections of the QAPP.

4.4.1.1 Trip Blanks

The trip blank will be used to determine if any cross-contamination occurs between aqueous samples during shipment. Trip blanks will be supplied by the analytical laboratory as aliquots of distilled, deionized water that will be sealed in a sample bottle prior to initiation of each day of fieldwork. Glass vials (40 milliliters) with Teflon®-lined lids will be used for trip blanks. The sealed trip blank bottles will be placed in a cooler with the empty sample bottles and will be shipped to the Site by the laboratory personnel. If multiple coolers are necessary to store and transport aqueous VOC samples, then each cooler must contain an individual trip blank. Trip blanks are analyzed for VOCs only by EPA SW-846 Method 8260B.

4.4.1.2 Field Blanks

Field blanks (FB) will be collected to evaluate the cleanliness of the sampling equipment, sample bottles and the potential for cross-contamination of samples due to handling of equipment, sample bottles and contaminants present in the air. Field blanks will collected at a frequency of one per decontamination event for each type of sampling equipment, and each media being sampled at a minimum of one per equipment type and/or media per day.

Field blanks will be collected prior to the occurrence of any analytical field sampling event by pouring deionized or distilled water over a particular piece of sampling equipment and into a sample container. The analytical laboratory will provide field blank water and sample jars with

preservatives for the collection of all field blanks. Field Blanks will be preserved in the same manner as the aqueous samples. Glass jars will be used for organic blanks. The field blanks will accompany field personnel to the sampling location. The field blanks will be analyzed for the same analytes as the environmental samples being collected that day and will be shipped with the samples taken.

Field blanks will be taken in accordance with the procedure described below:

- Decontaminate sampler using the procedures specified in the QAPP;
- Pour distilled/deionized water over the sampling equipment and collect the rinsate water in the appropriate sample bottles;
- The sample will be immediately placed in a sample cooler and maintained at a temperature of 4°C until receipt by the laboratory; and
- Fill out sample log, labels and chain of custody (COC) forms, and record in field notebook.

4.4.1.3 Temperature Blanks

The temperature blank will be used to determine the temperature of the samples within the cooler upon arrival at the analytical laboratory. A laboratory-supplied temperature blank will be an aliquot of distilled, deionized water that will be sealed in a sample bottle. The sealed temperature blank bottles will be placed in a cooler with the empty sample bottles and will be shipped to the site by the laboratory personnel. If multiple coolers are necessary to store and transport samples, then each cooler must contain an individual temperature blank.

4.4.2 Laboratory QA/QC

Laboratory QA/QC samples provide checks on the laboratory sampling and measurement equipment and aid in determining the quality of data in regard to laboratory accuracy and precision. A discussion on laboratory QA/QC samples is provided below.

4.4.2.1 Blind Field Duplicate Samples

Blind field duplicate (DUP) samples will be collected and analyzed to check laboratory reproducibility of analytical data. Blind field duplicate samples are collected at a frequency of at least 5% (one out of every 20 samples) of the total number of samples collected to evaluate the

precision and reproducibility of the analytical methods. The blind field duplicate sample will be submitted to the analytical laboratory as a normal sample, but it will have a fictitious sample identification and fictitious time of sample collection. The blind field duplicate will be cross-referenced to document which actual sample it is a blind field duplicate of in the field notes.

4.4.2.2 Matrix Spike/Matrix Spike Duplicate

Additional environmental sample volume will be collected for use as MS/MSD samples at a frequency of at least 5% (one out of every 20 samples) of the total number of samples collected to evaluate the precision and reproducibility of the analytical methods. To ensure the laboratory has sufficient volume for MS/MSD analysis, triple sample volume must be submitted for aqueous organic extractable and volatile samples once per every 20 samples in a sample delivery group (SDG).

4.5 Field Records

Proper management and documentation of field activities is essential to ensure that all necessary work is conducted in accordance with the Remedial Design, the SAMP, and the QAPP in an efficient and high quality manner. Field management procedures include following proper COC procedures to track a sample from collection through analysis, noting when and how samples are split (if necessary), making regular and complete entries in the field logbook, and the consistent use and completion of field management forms. Field management forms and field logbook will be used to document all field activities, as this documentation will support that the samples were collected and handled properly, making the resultant data complete, comparable and defensible. Field logbook procedures and field management forms are identified in the following sections.

Upon project completion, the PM will be responsible for the compilation and archiving of the following project records for a minimum of seven (7) years. To the extent practical, all records will be stored using electronic media (saved to duplicate Compact Disks) using Microsoft applications.

These files may include, but are not necessarily limited to:

- Field data;
- Sampling collection and handling records;

- Field notebooks;
- COC forms;
- Analytical raw data and QC sample records;
- Instrument calibration data;
- Waste characterization and disposal documentation; and
- Interim and final reports.

Requests for access to the archived data that are received after approval of the final report are to be directed in writing to the Engineer.

4.5.1 Field Logbook

The sample team will keep a weatherproof field notebook. Field notebooks are intended to provide sufficient data and observations to enable reviewing parties to reconstruct the sampling events. The field notebook entries should be factual, detailed, and objective. All entries are to be signed and dated. All members of the field investigation team are to use this notebook, which will be kept as a permanent record. The field notebook will be filled out at the location of sample collection immediately after sampling. It will contain sample descriptions including: sample number, sample collection time, sample location, sample description, sampling method used, daily weather conditions, field measurements, name of sampler, and other Site-specific observations. The field notebook will contain any deviations from protocol and why, visitor's names, community contacts made during sampling, geologic and other Site-specific information that may be noteworthy.

4.5.2 Field Management Forms

In addition to maintenance of a field logbook, the use of field management forms will supplement field logbook entries for all field activities associated with this project. Field management forms provide a regular format to record the relevant information for a particular field activity. Use of these forms will ensure that the field team consistently and completely records all pertinent data relative to a particular field activity on a regular basis. All forms, sample labels, custody seals and other sample documents will be filled out completely.

A list of forms and the associated activities for which each form could be potentially be completed is presented below.

Form	Activity
Daily Field Report	Every day of field activity
Daily Instrument Calibration Log	Every day a field instrument is used
Laboratory Sample Bottle Request	All field sampling efforts
Chain of Custody Form	All field sampling efforts

4.6 Sample Preparation And Custody

All samples will be secured inside an ice-packed cooler for shipment to the laboratory for analytical testing. Chain of custody forms will be filled out, as the samples are taken and all entries on the COC will be verified before finalizing the forms with the sampler's signature. One copy of the COC will remain in the cooler with the samples and one copy will be kept with the sampler as documentation of the samples shipped. An example COC is included as Appendix B. Additional details for sample preparation and shipment are provided below.

4.6.1 Sample Identification

In order to provide for proper identification in the field, and proper tracking in the laboratory, all samples must be labeled in a clear and consistent fashion using the procedures and protocols described below and within the following subsections.

- Sample labels will be waterproof and have a pre-assigned, unique number that is indelible.
- Field personnel must maintain a field book. This notebook must be water resistant with sequentially numbered pages. Field activities will be sequentially recorded in the field book.
- The field book, along with the COC form, must contain sufficient information to allow reconstruction of the sample collection and handling procedure at a later time.
- Each sample will have a corresponding notebook entry which includes:
  - Sample ID number;
  - Sample location and number;
  - Date and time;

- Analysis for which sample was collected;
- Additional comments as necessary; and
- Sampler's name.

- Each sample must have a corresponding entry on a COC manifest.
- The manifest entry for sampling at any one well is to be completed before sampling is initiated at any other well by the same sampling team.
- In cases where the samples leave the immediate control of the sampling team (i.e., shipment via common carrier) the shipping container must be sealed.

In the case of QC samples, such as field blanks and blind field duplicate samples, six digits will follow FB and DUP respectively to represent the date (e.g., FB070105 would represent a field blank collected on 1 July 2005). For matrix spike/matrix spike duplicate samples, MS/MSD will be added following the applicable sample identification.

4.6.2 Sample Containers

The analytical laboratory will provide all sample containers. These containers will be chosen and labeled based on EPA guidance from the document, Specifications and Guidance for Contaminant-Free Sample Containers, Publication 9240.0-05A, December 1992. The field blanks will be utilized to determine whether sample container contamination has affected the analysis. If contaminant levels are above the thresholds given in Publication 9240.0-05A, additional testing will be performed to determine if the contamination is coming from the sampling equipment or sample containers.

- If glass bottles are used, extra glass bottles will be obtained from the laboratory to allow for accidental breakage that may occur.
- If sample preservation is specified, the necessary preservatives will be placed in the sample bottles by the laboratory.
- The sample bottles will be handled carefully so that any preservatives are not inadvertently spilled.

A summary description of the sample containers to be utilized during the RA can be found in Table 2.

4.6.3 Sample Preservation

Soil samples collected during the RA for Remedial Elements I and II will be preserved by cooling to 4°C and maintained at this temperature until time of analysis. A summary of the sample preservation to be utilized during the RA can be found in Table 2.

- Immediately after the samples are collected, they will be placed in a cooler with "freezer-pacs" in order to maintain sample integrity. All sample bottles will be filled to capacity. If necessary to meet a maximum recommended holding time, the samples will be shipped by overnight courier to the laboratory.

- The shipping container used will be designed to prevent breakage, spills and contamination of the samples. Tight packing material is to be provided around each sample container and any void around the "freezer-pacs." The container will be securely sealed, clearly labeled, and accompanied by a COC record. Separate shipping containers should be used for "clean" samples and samples suspected of being heavily contaminated. During winter months, care should be taken to prevent samples from freezing. Sample bottles will not be placed directly on "freezer-pacs."

4.6.4 Sample Holding Time

- When possible, samples will be shipped the same day they are obtained to the analytical laboratory. All samples will be shipped within 24 hours of collection.

- The samples must be stored at or near 4ºC and analyzed within specified holding times.

The analytical laboratory will be a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, and conform to meeting specifications for documentation, data reduction and reporting. The laboratory will follow all method specifications pertaining to sample holding times contained in the New York State Department of Environmental Conservation (NYSDEC) Analytical Service Protocol (ASP) (revised 2000) and/or as prescribed by the specific analytical method.

A summary of the sample holding times to be utilized for Remedial Elements I and II can be found in Table 2.

4.6.5 Sample Custody

The primary objective of the sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. All field sampling personnel will adhere

to proper sample custody procedures outlined in this QAPP. Possession of the samples must be traceable from the time each sample is collected until it is analyzed at the laboratory.

Field personnel will maintain custody of samples collected during this investigation until transferred to the laboratory. All field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory. COC records will be completed at the time of sample collection and will accompany the samples inside the shipping container for shipment to the selected laboratory.

The COC record will be signed by each individual who has the samples in their possession. If a delivery company is used for transfer of the samples to the lab, the courier's manifest papers will be appended to the COC, and the courier's signature will not appear. Preparation of the COC record is as follows:

- For every sample, the COC record will be initiated in the field by the person collecting the sample. Every sample will be assigned a unique identification number that is entered on the COC record.
- The record will be completed in the field to indicate project title, sampling team, etc.
- If the person collecting the sample does not transport the samples to the laboratory or deliver the sample containers for shipment, the first block for Relinquished By _____, Received By _____ will be completed in the field.
- The person transporting the samples to the laboratory or delivering them for shipment will sign the record form as Relinquished By _____.
- If the samples are shipped to the laboratory by commercial carrier, the original COC record will be sealed in a watertight container and placed in the shipping container, which will be sealed prior to being given to the carrier. The carbonless copy of the COC record will be maintained in the field file.
- If the samples are directly transported to the laboratory, the COC will be kept in possession of the person delivering the samples.
- For samples shipped by commercial carrier, the waybill will serve as an extension of the COC record between the final field custodian and the laboratory.
- Upon receipt in the laboratory, the Sample Custodian or designated representative will open the shipping containers, compare the contents with the COC record, and sign and date the record. Any discrepancies will be noted on the COC record.

- If discrepancies occur, the samples in question will be segregated from normal sample storage and the field personnel immediately notified.
- COC records will be maintained with the field records for a specific project, becoming part of the data package.

In general, the following procedures will be followed upon sample receipt. The laboratory will not accept samples collected by project personnel for analysis without a correctly prepared COC record. The first steps in the laboratory receipt of samples are completing the COC records and project sample log-in form. The laboratory Sample Custodian, or designee, will note that the shipment is accepted and notify the Laboratory Manager or the designated representative of the incoming samples.

Upon sample receipt, the laboratory Sample Custodian, or designee, will:

- Examine all samples and determine if proper temperature has been maintained during shipment. If samples have been damaged during shipment, the remaining samples will be carefully examined to determine whether they were affected. Any samples affected will also be considered damaged. It will be noted on the COC record that specific samples were damaged and that the samples were removed from the sampling program. Field personnel will be notified as soon as possible that samples were damaged and that they must be resampled, or the testing program changed, and provide an explanation of the cause of damage.
- Compare samples received against those listed on the COC record.
- Verify that sample holding times have not been exceeded.
- Sign and date the COC record and attach the waybill to the COC record.
- Denote the samples in the laboratory sample log-in book which contains the following information:
  - Project identification number.
  - Sample numbers.
  - Type of samples.
  - Date received in laboratory.
  - Record of the verified time of sample receipt (VTSR).

- Date put into storage after analysis is completed.
- Date of disposal.

The last two items will be added to the log when the action is taken.

- Notify the Laboratory Manager of sample arrival.
- Place the completed COC records in the project file.

The VTSR is the time of sample receipt at the laboratory. The date and time the samples are logged in by the Sample Custodian or designee will agree with the date and time recorded by the person relinquishing the samples.

A typical COC can be found as Appendix B.

4.6.6 Sample Packaging and Shipping

Sample bottles and samples will either be delivered/picked up at the Site daily by the analytical laboratory, or delivered/shipped via overnight courier. Once the samples have been collected, proper procedures for packaging and shipping will be followed as described below.

Packaging

Prior to shipment, samples will be packaged in accordance with current United States Department of Transportation (USDOT) regulations. As the collected samples may be potentially contaminated, transport by motor vehicle will be covered by the "Materials of Trade" exception, listed in 49 CFR Part 173.6. The packaging will be leak tight for liquid samples and sift proof for solids. All packaging will be securely closed, secured against movement, and protected against damage. All necessary government and commercial carrier shipping papers will be filled out. Dangerous goods paperwork will be typed, as overnight carriers may not accept handwritten paperwork. Any personnel shipping dangerous goods will have the appropriate DOT training requirements. The procedure below should be followed regardless of transport method:

- Samples will be transported in metal ice chests or sturdy plastic coolers (cardboard or Styrofoam containers are unacceptable). Air samples will be transported in their original cardboard packing, if applicable, or similar materials.
- Remove previously used labels, tape and postage from cooler.

- Ship filled sample bottles in same cooler in which empty bottles were received.
- Affix a return address label to the cooler.
- Check that all sample bottles are tightly capped.
- Check that all bottle labels are complete.
- Be sure COC forms are complete.
- Wrap sample bottles in bubble pack and place in cooler.
- Pack bottles with extra bubble pack, vermiculite, or Styrofoam "peanuts." Be sure to pack the trip blank, if one is being submitted with the samples.
- Keep samples refrigerated in cooler with bagged ice or frozen cold packs. Do not use ice for packing material; melting will cause bottle contact and possible breakage.
- Separate and retain the sampler's copy of COC and keep with field notes.
- Tape paperwork (i.e., COC, manifest, return address) in zipper bag to inside cooler lid.
- Close cooler and apply signed and dated custody seal in such a way that the seal must be broken to open cooler.
- Securely close cooler lid with packing or duct tape. Be sure to tape latches and drain plugs in closed position.

Shipping

Samples should arrive at the laboratory as soon as possible following sample collection to ensure that the holding times are not exceeded. When possible, samples are to be hand delivered the same day as sampling. When same day delivery is not feasible, samples may be sent via overnight courier. When using a commercial carrier, follow the steps below.

- Securely package samples and complete paperwork.
- Weigh coolers for air transport.
- Complete air bill for commercial carrier (air bills can be partially completed in office prior to sampling to avoid omissions in field). If necessary, insure packages.
- Keep customer copy of air bill with field notes and COC form.
- When coolers have been released to transporter, call receiving laboratory and give information regarding sampler's names and method of arrival.

- Call the laboratory on the day following shipment to be sure all samples arrived intact. If bottles are broken, locations can be determined from COC and resampled.

4.7 Analytical Laboratory

The data collected during the course of the RA activities will be used to determine the presence and concentration of certain analytes in soil, sediment, ambient air samples, or construction water. All samples collected during the RA will be submitted to a NYSDOH ELAP-certified laboratory meeting specifications for documentation, data reduction and reporting. The selection of subcontractor laboratory(s) will be completed by the Engineer after approval of the remedial design for Remedial Elements I and II. The Engineer will be responsible for preparing laboratory bid package and issuing to potential qualified (NYSDOH ELAP-certified) laboratories.

Upon selection of the subcontractor laboratory, the required laboratory documentation will be submitted by the Engineer to the USEPA for review and approval. As a minimum, the following subcontractor laboratory documentation will be provided to the EPA: the Laboratory Quality Assurance Plan (LQAP), Standard Operating Procedures (SOPs), and copies of recent laboratory certification for each analysis to be performed for this project. The Engineer will not collect field samples for analysis by the subcontractor laboratory until such time that the EPA issues the Engineer written approval of the subcontractor laboratory documentation, procedures, and analysis techniques.

4.8 Analytical Test Parameters

The sample specific analyses have been detailed in Section 3 and summarized in Table 2.

4.9 Instrument Calibration

The frequency of laboratory instrument calibration and associated procedures for the specific analytical methods to be followed by the selected laboratory are specified in the individual EPA analytical method procedures. The selected laboratory's calibration schedule will adhere to all analytical method specifications.

4.10 Data Management and Reporting Plan

Data management and reporting plan requirements are discussed in the following subsections of the QAPP.

4.10.1 Data Use and Management Objectives

The typical data use objectives for the RA for Remedial Elements I and II are:

- Performing confirmation of removal of impacted soils and sediment.
- Ascertaining if there is a threat to public health or the environment.
- Determining treatment and disposal options.

The primary objective of proper data management is to verify and document that all work is conducted in accordance with the Remedial Design and this QAPP in an efficient and high quality manner, thereby maximizing the confidence in the data in terms of PARCC. Data management procedures not only include field and laboratory documentation, but also include how the information is handled after the conclusion of field investigation and laboratory analyses are completed. Data handling procedures include project file management, reporting, usability analysis (review and validation), and use of consistent formats for the final presentation of the data.

Documents developed for this RA will be maintained under the control of the Project Manager. Readily available word processing software (e.g., Microsoft Word) will be used to prepare project reports. Laboratory data will be received in both paper (hardcopy) and electronic format by the project team. Electronic files will be imported into an electronic spreadsheet software application (Microsoft Excel) for tabulation and summary. No specialized hardware/software is anticipated during the course of this project.

4.10.1.1 Project File Specifications

All project information will be kept in a central Project File maintained by the Engineer. The Project File will be assigned a unique project number that will be clearly displayed on all project file folders (including electronic files). Electronic files will be maintained in a similarly organized Project File located on the Engineer's Central Network system that is backed up on a

weekly basis. Both hard copy and electronic Project Files will contain, at a minimum, copies or originals of the following key project information:

- All correspondences including letters, transmittals, telephone logs, memoranda, and emails;
- Meeting notes; and
- Technical information such as analytical data; field survey results, field notes, field logbooks and field management forms;
- Project Calculations;
- Subcontractor agreements/contracts, and insurance certificates;
- Project-specific health and safety information/records;
- Access agreements;
- Project document output review/approval documentation; and
- Reports: Monthly Progress, Interim Technical and Draft/Final Technical.

4.10.1.2 Reporting

Field and laboratory data reporting requirements are discussed below.

Field Data

Field data will be recorded and reported by field personnel using appropriate field data documentation materials such as the field logbook, field management forms and COC forms.

Good field management procedures include following proper COC procedures to track a sample from collection through analysis, noting when and how samples are split (if necessary), making regular and complete entries in the field logbook, and the consistent use and completion of field management forms. Proper completion of these forms and the field logbook are necessary to support the consequent actions that may result from the sample analysis. This documentation will support that the samples were collected and handled properly, making the resultant data complete, comparable and defensible.

Laboratory Data

The analytical results of all samples collected, as part of the RA, will be reported following NYSDEC ASP 2000 specifications. All laboratory analytical data will be reported as NYSDEC Category B deliverables. The Category B data deliverables include all backup QA/QC documentation necessary to facilitate a complete validation of the data. In addition, the Analytical Services Tracking System (ANSETS) summary datasheet and NYSDEC "Sample Preparation and Analysis Summary" forms will be completed and included with each data package. The sample tracking forms are specified and supplied by the 2000 NYSDEC ASP.

The laboratory will also transmit the analytical data in an electronic format to minimize the chances of transposition errors in summarizing the data. The data will be transmitted in an electronic data deliverable (EDD) in GISKEY (most recent version) format and a portable document format (PDF) copy of each ASP deliverable.

4.10.2 Data Review

All field and laboratory data will be reviewed, validated and qualified as necessary to assess data usability by direct comparison to the specified data quality objectives and/or procedures set forth in this QAPP. Information that can be obtained includes comparison of results obtained from samples taken at the same location, and the identification of missing data points. Examination of the data at the end of the process allows for the assessment of data quality with respect to PARCC.

The following paragraphs offer an overview of the anticipated validation process for the Site.

4.10.3 Field Data Validation Protocol

Field data generated will primarily consist of air monitoring and soil sample screening, and will be validated by review of the project documentation to check that all forms specified in the SAMP and this QAPP have been completely and correctly filled out, and that documentation exists for the specified instrument calibrations. This documentation will be considered sufficient to provide that proper procedures have been followed during the field investigation.

4.10.4 Laboratory Data Validation Protocol

Data validation is the assessment of data quality with respect to method specifications and technical performance of the analytical laboratory. Analytical data packages will be examined to ensure that all specified lab components are included, all QA/QC specifications were performed or met, and the data use restrictions are well defined.

Summary documentation regarding QA/QC results will be completed by the laboratory using NYSDEC ASP forms and will be submitted with the raw analytical data packages (NYSDEC ASP Category B deliverables) for all soil and sediment QC samples.

Data validation will be performed to assess and document analytical data quality in accordance with the project data quality objectives. The data review will evaluate data for its quality and usability. This process will qualify results so that the end user of the analytical results can make decisions with consideration of the potential accuracy and precision of the data. For example, the results are acceptable as presented, qualified as estimated and flagged with a "J," or rejected and flagged with an "R."

The data will be evaluated according to the protocols and QC requirements of the ASP, the National Functional Guidelines for Organic Data Review (October 1999), the National Functional Guidelines for Inorganic Data Review (July 2002), the EPA Region II Data Review SOP Number HW-24, Revision 1, June 1999: Validating Volatile Organic Compounds by SW 846 Method 8260B, the EPA Region II Data Review SOP Number HW 22, Revision 2, June 2001: Validating Semivolatile Organic Compounds by SW-846 Method 8270C, the EPA Region II Data Review SOP Number HW-23B, Revision 1.0, May 2002: Validating PCB Compounds by SW-846 Method 8082, the EPA Region II Data Review SOP Number HW 2, Revision 11, January 1992: Evaluation of Metals Data for the Contract Laboratory Program (CLP), the EPA Region II Data Review SOP Number HW 7, Revision 3, March 1993: TCLP Data Validation, and the reviewer's professional judgment.

The order in which the aforementioned guidance documents and/or criteria are listed does not imply a hierarchy of reliance on a particular document for validation. Guidance documents

and/or criteria will be used, relying on the most comprehensive reference sources to perform the most complete validation possible.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual obligations and specific 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.

During the review process, it will be determined whether sufficient back-up data and QA/QC results are available so the reviewer may conclusively determine the quality of data support laboratory submittals for sample results. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewers will develop a QA/QC data validation report for each SDG.

For the organic parameter analyses, the following items or criteria will be reviewed:

- Quantitation, detection limits;
- Holding times;
- Gas chromatogram/ mass spectrometer (GC/MS) tuning and performance;
- Initial and continuing calibration data;
- Procedural method blank data;
- Field and trip blank data;
- Field duplicate results;
- Internal standard areas, and retention times;
- Surrogate compound recoveries;
- MS/MSD recoveries;
- Data system printouts;
- Chromatograms and mass spectra;
- Qualitative and quantitative compound identification; and
- Case narrative and deliverables compliance.

For the inorganic parameter analyses, the following items or criteria will be reviewed:

- Holding times;
- Calibrations;
- Laboratory and field blanks;
- Inductively coupled plasma (ICP) interference check sample analysis;
- Contract Required Detection Limit (CRDL) standard analysis;
- Matrix spike analysis;
- Lab and field duplicate sample analysis;
- Laboratory control sample (LCS) results;
- ICP serial dilution analysis;
- Detection limits; and
- Case narrative and deliverable specifications.

Once the subcontractor laboratory has been selected, the laboratory-specific LQAP, SOPs, and data validation procedures that further define the project's data validation process will be submitted to the EPA for review and approval.

4.10.5 Data Presentation Formats

Project data will be presented in consistent formats for all letters, Monthly Progress Reports, Interim Technical Reports, and Draft/Final Technical Reports. Specific formats will be tailored to best fit the needs of the data being presented but general specifications are described below.

As requested in the EPA's comments, the "ANSETS Data Requirement" form will be utilized for any non-CLP analytical data and will be submitted to EPA at the conclusion of this project. Appendix A shows a template of this blank form.

Prior to presenting the data in a publicly available format (e.g., reports, tabular and/or graphic displays, etc.), a data quality assessment will be conducted, as described in Guidance for Data Quality Assessment: Practical Methods for Data Analysis, EPA QA/G-9, July 2000. The data quality assessment will consist of EPA's typical 5-step process, including:

- Review of the sampling design;
- Conduct the preliminary data review;
- Select statistical tests (as needed);
- Verify assumptions; and
- Draw conclusions form the data.

Once the data has been reviewed and assessed, they will be presented in formats described in Sections 4.10.1.2 of the QAPP (e.g., Progress Reports, Interim Technical Reports, Draft/Final Technical Reports, etc.). The reports will discuss the quality assurance/quality control requirements and whether these requirements were achieved. The discussion of QA/QC requirements will include a summary of each of the following topics:

- Project Variability – project analytical and overall variability assessed through inspection of field and laboratory duplicates;
- Sample Bias – assessed through inspection of performance evaluation samples and laboratory blanks;
- Sample Representativeness – assessed for each parameter and concentration level using the analysis audits conducted throughout the sampling and analysis program;
- Data Completeness – assessed by determining the percentage of valid measurements that were collected for each analytical parameter and concentration level; and,
- Data Limitations and Actions – in the event that it is determined that the data do not meet the DQOs, the PM, in consultation with the PD and the QAO, will determine the course of corrective actions that shall be undertaken and documented in the project reports. Typical corrective actions may include, but are not limited to: (1) a system audit for the analyte in question, (2) determination of matrix interference, (3) reconstruction of acceptable limits with statements explaining the results of the action/rationale taken, and (4) rejection of data and exclusion from reports with appropriate explanation.

4.10.6 Data Records

The data record will generally include one or more of the following:

- Unique sample or field measurement code;
- Sampling or field measurement location and sample or measurement type;
- Sampling or field measurement raw data;
- Laboratory analysis ID number;

- Property or component measured; and
- Result of analysis (e.g., concentration).

4.10.6.1 Tabular Displays

The following data will generally be presented in tabular displays:

- Unsorted (raw) data;
- Results for each medium or for each constituent monitored;
- Data reduction for statistical analysis;
- Sorting of data by potential stratification factors (e.g., location, soil layer/depth, topography); and
- Summary data.

4.10.6.2 Graphical Displays

The following data will be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs):

- Sample locations and sampling grid;
- Boundaries of sampling area;
- Areas where additional data are necessary;
- Constituent concentrations at each sample location;
- Geographical extent of impacts;
- Constituent concentration levels, averages, minima and maxima;
- Changes in concentration in relation to distance from the source, time, depth or other parameters;
- Features affecting intramedia transport; and
- Potential receptors.

4.11 Performance Audits

Field and laboratory audits will be performed periodically as discussed below.

4.11.1 Field Audits

During field activities, the QAO will verify that the sampling program is being properly implemented and to detect and define problems so that corrective action can be taken. All findings will be documented and provided to the PM and RPR.

4.11.2 Laboratory Audits

The NYSDOH ELAP certified laboratory using the NYSDEC ASP that has satisfactorily completed performance audits and performance evaluation samples will be used for all sample analysis. The results of the most recent performance audits and performance evaluations will be made available upon request.

4.11.3 Corrective Actions

The NYSDOH ELAP certified laboratory utilized for this project will meet the specifications for corrective action protocols typical for performing contract laboratory services. Laboratory corrective action may include instrumentation maintenance, methods modification, cross contamination/carry over issues, sample tracking practices, laboratory information management (LIMs), etc.

Prior to mobilization for the field investigation, a meeting may be scheduled among representatives of the Engineer and the laboratory to discuss general corrective action approach and establish procedures to ensure good and timely communications among all parties during the investigation. New procedures will be put into effect as appropriate.

TABLE 1
PARAMETER LIST AND REPORTING LEVELS

Volatile Target Compound List

Compound	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (µg/kg) [2]
Chloromethane	74-87-3	1	1
Bromomethane	74-83-9	1	1
Vinyl chloride	75-01-4	1	1
Chloroethane	75-00-3	1	1
Methylene chloride	75-09-2	2	2
Acetone	67-64-1	5	5
Carbon disulfide	75-15-0	1	1
1,1-Dichloroethene	75-35-4	1	1
1,1-Dichloroethane	75-34-3	1	1
cis-1,2-Dichloroethene [3]	156-59-2	1	1
trans-1,2-Dichloroethene	156-60-5	1	1
Chloroform	67-66-3	1	1
1,2-Dichloroethane	107-06-2	1	1
2-Butanone	78-93-3	5	5
Bromochloromethane	74-97-5	1	1
1,1,1-Trichloroethane	71-55-6	1	1
Carbon Tetrachloride	56-23-5	1	1
Bromodichloromethane	75-27-4	1	1
1,2-Dichloropropane	78-87-5	1	1
cis-1,3-Dichloropropene	10061-01-5	1	1
Trichloroethene [3]	79-01-6	1	1
Dibromochloromethane	124-48-1	1	1
1,1,2-Trichloroethane	79-00-5	1	1
Benzene	71-43-2	1	1
trans-1,3-Dichloropropene	10061-02-6	1	1
Bromoform	75-25-2	1	1
4-Methyl-2-pentanone	108-10-1	5	5
2-Hexanone	591-78-6	5	5
Tetrachloroethene [3]	127-18-4	1	1
1,1,2,2-Tetrachloroethane	79-34-5	1	1
1,2-Dibromoethane	106-93-4	1	1
Toluene	108-88-3	1	1
Chlorobenzene	108-90-7	1	1
Ethylbenzene	100-41-4	1	1

TABLE 1 (continued)
PARAMETER LIST AND REPORTING LEVELS

Volatile Target Compound List (Continued)

Compound	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (µg/kg) [2]
Styrene	100-42-5	1	1
Xylenes (total)	1330-20-7	1	1
1,3-Dichlorobenzene	541-73-1	1	1
1,4-Dichlorobenzene	106-46-7	1	1
1,2-Dichlorobenzene	95-50-1	1	1
1,2-Dibromo-3-chloropropane	96-12-8	1	1
1,2,4-Trichlorobenzene	120-82-1	2	2

Notes:
1. Chemical Abstracts Service (CAS) Registry Number
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory. Soil reporting limits will vary depending on percent moisture.
3. Project specific compounds. Only these compounds are reported for confirmatory samples. Additional compound may be added if characterization warrants.

Semivolatile Target Compound List

Compound	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (µg/kg) [2]
Phenol	108-95-2	5	330
bis-(2-Chloroethyl)ether	111-44-4	5	330
2-Chlorophenol	95-57-8	5	330
2-Methylphenol	95-48-7	5	330
2,2'-oxybis(1-Chloropropane)	108-60-1	5	330
4-Methylphenol	106-44-5	5	330
N-nitroso-di-n-propylamine	621-64-7	5	330
Hexachloroethane	67-72-1	5	330
Nitrobenzene	98-95-3	5	330
Isophorone	78-59-1	5	330
2-Nitrophenol	88-75-5	5	330
2,4-Dimethylphenol	105-67-9	5	330
bis-(2-Chloroethoxy)methane	111-91-1	5	330
2,4-Dichlorophenol	120-83-2	5	330
Naphthalene	91-20-3	5	330

TABLE 1 (continued)
PARAMETER LIST AND REPORTING LEVELS

Semivolatile Target Compound List (Continued)

Compound	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (µg/kg) [2]
4-Chloroaniline	106-47-8	5	330
Hexachlorobutadiene	87-68-3	5	330
4-Chloro-3-methylphenol	59-50-7	5	330
2-Methylnaphthalene	91-57-6	5	330
Hexachlorocyclopentadiene	77-47-4	5	330
2,4,6-Trichlorophenol	88-06-2	5	330
2,4,5-Trichlorophenol	95-95-4	20	670
2-Chloronaphthalene	91-58-7	5	330
2-Nitroaniline	88-74-4	20	670
Dimethylphthalate	131-11-3	5	330
Acenaphthylene	208-96-8	5	330
2,6-Dinitrotoluene	606-20-2	5	330
3-Nitroaniline	99-09-2	20	670
Acenaphthene	83-32-9	5	330
2,4-Dinitrophenol	51-28-5	20	670
4-Nitrophenol	100-02-7	20	670
Dibenzofuran	132-64-9	5	330
2,4-Dinitrotoluene	121-14-2	5	330
Diethylphthalate	84-66-2	5	330
4-Chlorophenyl-phenylether	7005-72-3	5	330
Fluorene	86-73-7	5	330
4-Nitroaniline	100-01-6	20	670
4,6-Dinitro-2-methylphenol	534-52-1	20	670
N-Nitrosodiphenylamine	86-30-6	5	330
4-Bromophenyl-phenylether	101-55-3	5	330
Hexachlorobenzene	118-74-1	5	330
Pentachlorophenol	87-86-5	20	670
Phenanthrene	85-01-8	5	330
Anthracene	120-12-7	5	330
Di-n-butylphthalate	84-74-2	5	330
Fluoranthene	206-44-0	5	330
Pyrene	129-00-0	5	330
Butylbenzylphthalate	85-68-7	5	330
3,3'-Dichlorobenzidine	91-94-1	5	330

TABLE 1 (continued)
PARAMETER LIST AND REPORTING LEVELS

Semivolatile Target Compound List (Continued)

Compound	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (µg/kg) [2]
Benzo(a)anthracene	56-55-3	5	330
Chrysene	218-01-9	5	330
bis-(2-Ethylhexyl)phthalate	117-81-7	5	330
Di-n-octylphthalate	117-84-0	5	330
Benzo(b)fluoranthene	205-99-2	5	330
Benzo(k)fluoranthene	207-08-9	5	330
Benzo(a)pyrene [3]	50-32-8	5	330
Indeno(1,2,3-cd)pyrene	193-39-5	5	330
Dibenzo(a,h)anthracene [3]	53-70-3	5	330
Benzo(g,h,i)perylene	191-24-2	5	330

Notes:
1. Chemical Abstracts Service (CAS) Registry Number
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory. Soil reporting limits will vary depending on percent moisture.
3. Project specific compounds. Only these compounds are reported for confirmatory samples. Additional compound may be added if characterization warrants.

Polychlorinated Biphenyl Compound List

Compound	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (µg/kg) [2]
Aroclor-1016	12674-11-2	1.0	16.6
Aroclor-1221	11104-28-2	1.0	16.6
Aroclor-1232	11141-16-5	1.0	16.6
Aroclor-1242	53469-21-9	1.0	16.6
Aroclor-1248	12672-29-6	1.0	16.6
Aroclor-1254	11097-69-1	1.0	33.3
Aroclor-1260	11096-82-5	1.0	33.3

Notes:
1. Chemical Abstracts Service (CAS) Registry Number.
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory. Soil reporting limits will vary depending on percent moisture.

TABLE 1 (continued)
PARAMETER LIST AND REPORTING LEVELS

Inorganic Target Analyte List

Analyte	CAS Number [1]	Reporting Levels Water (µg/l) [2]	Reporting Levels Solid (mg/kg) [2]
Aluminum	7429-90-5	200	20
Antimony	7440-36-0	60	1.0
Arsenic	7440-38-2	10	1.0
Barium	7440-39-3	200	20
Beryllium	7440-41-7	5	0.5
Cadmium [3]	7440-43-9	5	0.5
Calcium	7440-70-2	5000	500
Chromium [3]	7440-47-3	10	1.0
Cobalt	7440-48-4	50	5.0
Copper	7440-50-8	25	2.5
Iron	7439-89-6	100	10
Lead	7439-92-1	3	1.0
Magnesium	7439-95-4	5000	500
Manganese	7439-96-5	15	1.5
Mercury	7439-97-6	0.2	0.040
Nickel	7440-02-0	40	4.0
Potassium	7440-09-7	5000	500
Selenium	7782-49-2	5	1.0
Silver	7440-22-4	10	1.0
Sodium	7440-23-5	5000	500
Thallium	7440-28-0	10	1.0
Vanadium	7440-62-2	50	5.0
Zinc	7440-66-6	20	2.0
Cyanide [3]	57-12-5	10	1000

Notes:
1. Chemical Abstracts Service (CAS) Registry Number.
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory. Soil reporting limits will vary depending on percent moisture.
3. Project specific compounds. Only these compounds are reported for confirmatory samples. Additional compound may be added if characterization warrants.

TABLE 1 (continued)
PARAMETER LIST AND REPORTING LEVELS

Toxicity Characteristic Leaching Procedure (TCLP)
Volatile Compound List

Compound	CAS Number [1]	Reporting Level (mg/l)[2]	Method Detection Limit (mg/l) [2]
Benzene	71-43-2	0.0050	0.0005
2-Butanone (MEK)	78-93-3	0.0100	0.0016
Carbon tetrachloride	56-23-5	0.0050	0.0006
Chlorobenzene	108-90-7	0.0050	0.0005
Chloroform	67-66-3	0.0050	0.0006
1,4-Dichlorobenzene	106-46-7	0.0050	0.0004
1,2-Dichloroethane	107-06-2	0.0050	0.0006
1,1-Dichloroethene	75-35-4	0.0050	0.0008
Tetrachloroethene	127-18-4	0.0050	0.0004
Trichloroethene	79-01-6	0.0050	0.0008
Vinyl chloride	75-01-4	0.0050	0.0006

Notes:
1. Chemical Abstracts Service (CAS) Registry Number.
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory.

TCLP Semivolatile Compound List

Compound	CAS Number [1]	Reporting Level (mg/l) [2]	Method Detection Limit (mg/l) [2]
2-Methylphenol	95-48-7	0.010	0.0009
3&4-Methylphenol [3]	108-39-4/106-44-5	0.010	0.0016
Pentachlorophenol	87-86-5	0.050	0.0016
2,4,5-Trichlorophenol	95-95-4	0.050	0.0015
2,4,6-Trichlorophenol	88-06-2	0.010	0.0018
1,4-Dichlorobenzene	106-46-7	0.010	0.0009
2,4-Dinitrotoluene	121-14-2	0.010	0.0010
Hexachlorobenzene	118-74-1	0.010	0.0007
Hexachlorobutadiene	87-68-3	0.010	0.0011
Hexachloroethane	67-72-1	0.010	0.0009
Nitrobenzene	98-95-3	0.010	0.0005
Pyridine	110-86-1	0.020	0.0030

Notes:
1. Chemical Abstracts Service (CAS) Registry Number.
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory.
3. Compounds co-elute.

TABLE 1 (continued)
PARAMETER LIST AND REPORTING LEVELS

TCLP Metals Analyte List

Analyte	CAS Number [1]	Reporting Level (mg/l) [2]	Method Detection Limit (mg/l) [2]
Arsenic	7440-38-2	0.040	0.0039
Barium	7440-39-3	0.0050	0.0007
Cadmium	7440-43-9	0.0100	0.0011
Chromium	7440-47-3	0.010	0.0013
Lead	7439-92-1	0.010	0.0030
Mercury	7439-97-6	0.0002	0.00009
Selenium	7782-49-2	0.030	0.0050
Silver	7440-22-4	0.006	0.0011

Notes:
1. Chemical Abstracts Service (CAS) Registry Number.
2. Typical Reporting Levels. Will be finalized upon selection of the laboratory.

TABLE 2
ANALYTICAL METHODS, PRESERVATIVES, HOLDING TIMES AND CONTAINERS

Aqueous Samples

Analytical Parameter	Analytical Method - Reference	Sample Preservation	Holding Time [1]	Container [2]
TCL VOCs	USEPA SW-846 Method 8260B	Cool, 4°C, pH<2 (HCl)	14 days	3 – 40 ml glass Teflon-lined cap
TCL SVOCs	USEPA SW-846 Method 8270C	Cool, 4°C	14 days/ 40 days	1 – 1000 ml (1 Liter) amber glass
TCL PCBs	USEPA SW-846 Method 8082	Cool, 4°C	14 days/ 40 days	2 – 1000 ml (1 Liter) amber glass
TAL Inorganics	USEPA SW-846 Method 6010B, 7470A, 9012B	Cool, 4°C, Metals: pH<2 (HNO_3) Cyanide: pH>12 (NaOH)	All metals (except mercury) 180 days, mercury 26 days, cyanide 12 days	1 – 500 ml plastic bottle for metals 1 – 500 ml plastic bottle for cyanide
TCLP Metals and nonvolatile organics	Sample Preparation: USEPA SW-846 Method SW-1311 Sample analysis: 8260B, 8270C, 6010B & 7470A	Cool, 4°C	VOCs 7 days/NA/7 days, SVOCs 5 days/7 days/ 40 days Metals (except mercury) 180 days/NA/180 days, Mercury 5 days/NA/28 days	1 – 1000 ml (1 Liter) amber glass 1 – 60 ml amber glass, Teflon-lined cap
Reactivity to Sulfide and Cyanide	USEPA SW-846 Methods 9034 and 9014 respectively	Cool, 4°C	Not Regulated (14 days holding time is suggested)	1 – 300 ml amber glass
Corrosivity	USEPA SW-846 Method 9045C	Cool, 4°C	Not Regulated	1 – 300 ml amber glass
Flammability (Ignitibility)	USEPA SW-846 Method 1010	Cool, 4°C	26 days	1 – 300 ml amber glass

Notes:
1. VOC holding times are days after collection until analysis; SVOC holding times are days after collection until extraction / days from extraction to analysis; Inorganics holding times are days after collection until analysis. TCLP holding times are days after collection until leaching/days from leaching until extraction (if required)/days from extraction until analysis.
2. Typical. Will be specified by the selected laboratory.

TABLE 2 (continued)
ANALYTICAL METHODS, PRESERVATIVES, HOLDING TIMES AND CONTAINERS

Soil Samples

Analytical Parameter	Analytical Method - Reference	Sample Preservation	Holding Time [1]	Container [2,3]
TCL VOCs	USEPA SW-846 Method 8260B	Cool, 4°C	14 days	1 – 2 oz. glass jar
TCL SVOCs	USEPA SW-846 Method 8270C	Cool, 4°C	14 days/ 40 days	1 – 8 oz. glass jar
TCL PCBs	USEPA SW-846 Method 8082	Cool, 4°C	14 days/ 40 days	1 – 8 oz. glass jar
TAL Inorganics	USEPA SW-846 Method 6010B, 7470A, 9012B	Cool, 4°C	All metals (except mercury) 180 days, mercury 26 days, cyanide 12 days	1 – 8 oz. glass jar
TCLP Metals and nonvolatile organics	Sample Preparation: USEPA SW-846, Method SW-1311 Sample analysis: 8260B, 6010B	Cool, 4°C	VOCs 14 days/NA/14 days, Metals (except mercury) 14 days/NA/180 days Mercury 5 days/NA/28 days	1 – 8 oz. glass jar
Reactivity to Sulfide and Cyanide	USEPA SW-846 Methods 9034 and 9014 respectively	Cool, 4°C	Not Regulated (14 days holding time is suggested)	1 – 300 ml amber glass
Corrosivity	USEPA SW-846 Method 9045C	Cool, 4°C	Not Regulated	1 – 300 ml amber glass
Flammability (Ignitibility)	USEPA SW-846 Method 1010	Cool, 4°C	26 days	1 – 300 ml amber glass

Notes:
1. VOC holding times are days after collection until analysis; SVOC holding times are days after collection until extraction / days from extraction to analysis; Inorganics holding times are days after collection until analysis; TCLP holding times are days after collection until leaching/days from leaching until extraction (if required)/days from extraction until analysis.
2. Typical. Will be specified by the selected laboratory.
3. SVOCs, PCBs, inorganics, and metals may be collected into the same sample container.

APPENDIX A

ANSET Form

NON-CLP SUPERFUND ANALYTICAL SERVICES TRACKING FORM

Reference No. _____
(Assigned by Region)

Region_____ CERCLIS ID _____
Sampling Period _____ to _____

A separate form should be completed for each sample group, which is defined as a group of samples that are associated with a unique site, field team, sampling period, and laboratory (if applicable). The number of samples contained in each sample group is determined by the EPA site manager.

1. Site Name, city, state: _____

2. Type of activity (check all that apply): [ ]Preliminary Assessment [ ]SSI [ ]LSI
[ ]RI/FS [ ]Remedial Design [ ]Remedial Action [ ]Operation/Maintenance [ ]NPL Delisting
[ ]Removal Site Eval. [ ]Removal Action [ ]Oil Response [ ]UST Response
[ ]PRP Oversight [ ]Other specify _____

3a. Analytical facility/equipment used (check all that apply): {} = Facility Code included for use in question 5b
[ ]Fixed laboratory {L} [ ]Fieldable equipment {F} [ ]Temporary on-site laboratory {T}
[ ]Mobile laboratory {M} [ ]Portable equipment {P} [ ]Other {O}, specify _____
3b. Laboratory name (if applicable)_____ City, state _____
Subcontractor laboratory (if applicable) _____

4a. Funding lead: [ ]Superfund [ ]Other Federal Agency, specify _____
[ ]PRP [ ]State, specify_____ [ ]Other, specify affiliation _____
4b. Field Contract (Superfund lead only): [ ]TAT [ ]ERCS [ ]FIT [ ]ARCS [ ]TES
[ ]ESAT [ ]Other, specify _____
Contractor Company_____

5a. Total number of samples analyzed_____
5b. Specific Analysis Information (use additional pages if necessary to identify all analyses):

Analysis Type (e.g.,VOAs, Metals, PCBs)	Facility Code (see 3a)	Matrix	#Samples	Sample Preparation Source & Method # (if none, answer 5c)		Analysis Source & Method # (if none, answer 5c)	

#Samples = #Sampling Points + #Field QC Samples

5c. If non-standard methods were used, list below and specify if performance data are available for the matrices, analytes, and detection limits used. (Y = yes, N = No, D = Don't Know)

Non-standard sample preparation/cleanup techniques:	Matrices	Analytes	Detection Limits
_____	_____	_____	
_____	_____	_____	

Non-standard analytical methods:

_____	_____	_____	_____
_____	_____	_____	_____

SAMPLE

NON-CLP SUPERFUND ANALYTICAL SERVICES TRACKING FORM

6. Reasons for selecting non-CLP analytical services for these samples (check all that apply):
[ ]Proximity to site [ ]Direct interaction with lab [ ]Unique parameter analysis [ ]Cost savings
[ ]Product control [ ]Ease of acquiring services [ ]Less paperwork [ ]Method flexibility
[ ]Quick turnaround [ ]Select locations for further analysis
[ ]Other, specify _____

7. Are the environmental data from this sampling event stored electronically and available to EPA personnel?
[ ]No [ ]Don't Know [ ] yes, contained on: [ ]PC [ ]Mainframe (including minicomputers)

8. For laboratory analyses, what was the turnaround time?_____days Was it met? [ ]Yes [ ]No [ ]Don't Know

9a. Document(s) where sampling, analytical, and QC requirements are defined (check all that apply):
[ ]QAPjP [ ]SAP [ ]FOP/TDD/TID [ ]Other, specify _____
9b. Document(s) approved by: [ ]ESD [ ]WMD [ ]Other, specify affiliation _____
9c. For each analytical facility/equipment used, please indicate whether the QA/QC requirements were defined in the above documents (Def) and whether compliance was adequate to meet the intended purpose (Met).

	Fixed lab		Mobile lab		On-Site lab		Fieldable		Portable		Other	
	Def	Met	Def	Met	Def	Met	Def	Met	Def	Met	Def	Met
Analytical Method(s)												
Sample preservation & handling												
Sample chain-of-custody												
Sample holding times							xx	xx	xx	xx		
Detection/quantitation limits												
Equipment maintenance/calibration												
Documentation												
Frequency & type of QC samples												

Y = yes N = no R = data not reviewed for this criterion (only applicable for Met column)

10. Was the laboratory audited as part of the Superfund Program by:
[ ]EPA or EPA Contractor [ ]PRP [ ]Not Audited [ ]Don't Know
Comments: _____

11a. Were data reviewed for technical limitations? [ ]Yes [ ]No (go to 12)
11b. Reviewed by: [ ]ESD/ESAT [ ]User [ ]Other, specify affiliation _____
11c. Extent of data review: [ ]Full review of_____% of the data
[ ]Partial review of _____% of the data
11d. Review criteria used: [ ]CLP National Functional Guidelines
[ ]QA/QC Guidance for Removal Activities (ERT Guidance)
[ ]Other, specify_____

12. Where the quality and quantity of data sufficient to meet the intended purpose?
[ ]Yes [ ]No (explain below) [ ]Don't Know (explain below)
Reason: _____
_____

Completed by:_____ _____
Name and Affiliation Date

SAMPLE

APPENDIX B

Sample Chain of Custody Form

ROUX CHAIN OF CUSTODY

№ 10509 Y

ROUX ASSOCIATES, INC.
Environmental Consulting & Management
209 SHAFTER STREET
ISLANDIA, NEW YORK 11749-5074
(631) 232-2600 FAX: (631) 232-9898

ANALYSES

PAGE OF

PROJECT NAME | PROJECT NUMBER

PROJECT LOCATION

PROJECT MANAGER | SAMPLER(S)

SAMPLE DESIGNATION / LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX						TOTAL BOTTLES	NOTES

RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N

DELIVERY METHOD

ANALYTICAL LABORATORY

COMMENTS

CHAINOF.CDR 12AUG98

APPENDIX B

NYSDOH Generic Community Air Monitoring Plan

APPENDIX 1A

New York State Department of Health
Generic Community Air Monitoring Plan

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 volatile organic compounds (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 NYSDEC/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. 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.

- 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.

- 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.

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

All 15-minute readings must be recorded and be available for State (DEC and DOH) 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.

- 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.

- 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.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 13, 2005

TRANSPORTATION AND DISPOSAL PLAN FOR REMEDIAL ELEMENTS I AND II

Liberty Industrial Finishing Superfund Site
55 Motor Avenue
Village of Farmingdale, Nassau County, New York

Prepared for:

LIBERTY INDUSTRIAL FINISHING SITE QUALIFIED SETTLEMENT TRUST

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A-1 Transportation and Disposal Routes to Major Roadways from Site

1.0 INTRODUCTION

This Transportation and Disposal Plan (T&D Plan) has been developed as part of the Final Remedial Design for the Liberty Industrial Finishing Site, 55 Motor Avenue, Farmingdale, New York (the "Site"). The T&D Plan has been prepared on behalf of the Liberty Industrial Finishing Site Qualified Settlement Trust (hereinafter referred to as the Potentially Responsible Parties or "PRP Group") in accordance with the Consent Judgment (Index No. 04-1308) and attached Statement of Work (SOW) entered in the United States District Court for the Eastern District of New York on August 27, 2004.

The Consent Judgment requires the submission of a final design submittal, which sets forth the engineering elements ("Remedial Design") to implement and construct the Remedial Action (RA) selected in the Record of Decision (ROD) (USEPA, March 2002). As specified in the SOW and summarized in the Pre-Final Remedial Design (RD) (ERM, July 2005), the Final RD is comprised of:

- Final Design Drawings and Specifications for the RA; and
- Final RA Plans that include:
  - Construction Quality Assurance Project Plan (CQAPP);
  - Health and Safety Contingency Plan (HSCP);
  - Sampling, Analysis and Monitoring Plan (SAMP), which includes the Remedial Air Monitoring Plan (RAMP); and
  - Transportation and Disposal (T&D) Plan, which includes a Hazardous Material Transportation Security Plan (HMTSP).

The T&D Plan, in conjunction with the other RA Plans, will be for use by the PRPs, Engineer, Contractor, EPA and its representatives and other regulatory personnel having jurisdiction. The Engineer and/or Contractor will perform the activities described in this T&D Plan during construction of the RA.

This T&D Plan outlines the key elements of how soil, subsurface feature contents and construction wastewaters (collectively referred to herein as waste materials) will be removed from the Site and transported to, and disposed of at, an appropriate facility for Remedial Elements I and II (On-Site Soils and On-site Western Subsurface Features, respectively).

Remedial Elements I and II are identified and discussed in greater detail in the Preliminary RD Report (ERM, October 2004).

The approximate limits of the on-Site soils and western subsurface features to be addressed as part of Remedial Elements I and II, respectively, are shown on the Technical Drawings.

As discussed in the Preliminary RD Report, the eastern subsurface features will be addressed in accordance with the March 26, 2002 Administrative Order on Consent (AOC) (Index No. CERCLA – 02-2002-2013).

1.1 Site Description

The Site is located in the Village of Farmingdale, Town of Oyster Bay, Nassau County, New York, approximately one-mile south of Bethpage State Park. The Site address is 55 Motor Avenue. The Site is approximately 30 acres in size and borders the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east, and Ellsworth Allen Park to the west.

Currently, approximately half the Site (i.e., the western portion) primarily consists of vacant land that abuts Ellsworth Allen Park with the exception of the current groundwater treatment system building. The other half of the Site (i.e., the eastern portion) contains several buildings, which are currently leased to a variety of tenants engaged in trucking, warehousing, automobile parts salvaging operations, and product distribution.

1.2 Site History

The Site is a former aircraft parts manufacturing and metal finishing facility that began its operation in the late 1930's. Since then, ownership of and operations at the Site have changed numerous times. A complete Site history can be found in the Preliminary RD Report.

1.3 Proposed Remedy

- Based upon the results of the initial Site Remedial Investigation (Weston, January 1994), Continuing Remedial Investigation (CRI) (ERM, July 2000), the Feasibility Study (FS) (ERM, July 2000), public comments on ERM's CRI and FS Reports and the United States Environmental Protection Agency's (USEPA's) Proposed Plan for the Site (USEPA, July 2001) and other supporting documents, the USEPA, in consultation with the New York State Department of Environmental Conservation (NYSDEC), has selected

FS Alternative SL-3 for implementation at the Site to address environmental concerns for on-Site soils and subsurface features (Remedial Elements I and II, respectively). The components of Alternative SL-3 are summarized below and are discussed in greater detail in the Site's ROD and Preliminary RD Report.

- Excavation and off-Site disposal of all soils contaminated above groundwater protection levels (10 milligrams per kilogram [mg/kg] cadmium and 143 mg/kg chromium);

- Removal of contaminated aqueous and/or solid materials from three underground storage tanks (USTs) and fifty-six subsurface features, as well as the northern and eastern sanitary leaching fields, if warranted. (As documented in the Preliminary RD Report, only eighteen USTs and eighteen subsurface features will be addressed as part of Remedial Element II. The remaining USTs and subsurface features will be addressed as part of the March 26, 2002 AOC);

- Removal and off-Site disposal of any soil surrounding the subsurface features that exceed the following soil Performance Standards (i.e., ROD cleanup criteria):
  - cadmium: 10 mg/kg
  - chromium: 143 mg/kg;
  - trichloroethene (TCE): 0.7 mg/kg;
  - cis-1,2-dichloroethene (DCE): 0.25 mg/kg;
  - tetrachloroethene (PCE): 1.4 mg/kg;
  - polychlorinated biphenyls (PCBs) for soils between zero and 1 foot below ground surface (bgs): 1 mg/kg;
  - PCBs for soils below 1 foot bgs: 10 mg/kg;
  - cyanide: 35 mg/kg;
  - benzo[a]pyrene: 0.29 mg/kg; and
  - dibenzo[a,h]anthracene: 0.29 mg/kg.
- Implementation of institutional controls to restrict the use of the Site to commercial/ industrial or, where applicable, to recreational uses.

1.4 Organization And Summary

This T&D Plan outlines the approach for the loading, transporting and disposing of all waste materials shipped off-Site. These waste materials will be generated from the implementation of Remedial Elements I (On-Site Soil) and Remedial Element II (On-Site Western Subsurface Features).

The remainder of this report is organized into the following sections:

- Section 2.0: provides an overview of the transportation and disposal plan;

- Section 3.0: discusses Site access and egress procedures;
- Section 4.0: discusses waste loading procedures;
- Section 5.0: discusses waste transport procedures;
- Section 6.0: provides details of the HMTSP; and
- Section 7.0: discusses procedures for addressing off-Site spills.

2.0 OVERVIEW OF TRANSPORTATION & DISPOSAL PLAN

The purpose of this T&D Plan is to establish waste management procedures that will be employed during performance of remedial activities at the Site. The waste management procedures are intended to ensure proper on-Site loading, on-Site/ off-Site transport and disposal of waste materials generated during performance of remedial activities. The elements of the T&D Plan will also ensure compliance with the Resource Conservation and Recovery Act (RCRA) and Section 300.440 of the National Contingency Plan (NCP).

The scope of work to be performed at the Site for Remedial Elements I and II is discussed in the CQAPP included as part of the Final RD. The CQAPP provides details related to the removal of soils and subsurface feature contents in excess of Performance Standards, as well as the management of construction wastewaters generated during the performance of the RA. The T&D Plan will provide specific details for: Site access/ egress procedures; waste loading procedures; waste transport procedures (including primary routes of travel for vehicles leaving the Site with waste materials); the hazardous material transportation security plan; and procedures to address off-Site spills.

3.0 SITE ACCESS/ EGRESS PROCEDURES

All transport vehicles will primarily access the Site through a paved driveway located on Motor Avenue between former Site Buildings A and L as shown in the Technical Drawings. An alternate access point along Motor Avenue, as shown in the Technical Drawings, will be utilized if the proposed remedial excavation in Area 3 causes access problems at the Site's main entrance/ exit point. All efforts will be made to utilize any available space on-Site to avoid a build-up of transport vehicles along Motor Avenue.

Trucks entering the Site will stop inside the entrance gate for inspection by the Contractor and Engineer's personnel. Trucks will be inspected for caked on soils and debris. If the truck is not clean, as determined by the Contractor or Engineer, it will be rejected and not allowed to enter the Site until such time the vehicle is cleaned by the transport subcontractor to the satisfaction of the Engineer. After inspection and certification that the truck is clean, it will proceed to the on-Site scale where its' tare-weight will be logged. The transport vehicle will then be directed to the designated staging areas for loading.

To minimize disturbance of surface soils, on-Site transport vehicles will be directed to stay on the paved portions of the Site or on temporary construction access roads. The Contractor will be responsible for notifying all transport vehicle drivers as to what roadways and traffic patterns exist on-Site. The purpose of defining these routes is to keep transport vehicles from coming into direct contact with soil and other waste materials to be removed from the Site. Hence, decontamination of transport vehicles leaving the Site will be minimized. It should be noted that the Contractor will develop and provide the on-Site travel routes in the Contractor's Remedial Action Work Plan (RAWP) prior to mobilizing to the Site and initiating Site preparation activities.

Transport vehicles will leave the Site through the main entrance/ exit along Motor Avenue, or the secondary access point, if necessary. Prior to leaving the Site, each vehicle will be inspected at the construction zone exit pad, which will be constructed near the main entrance/ exit access point and will be identified in the Contractor's RAWP. At a minimum, no transport vehicle will be permitted to leave the Site without the Engineer's approval if the following is observed:

- Caked on soils and/ or debris on the tires or under carriage of the transport vehicle;

- Transport vehicle is leaking;
- Transport vehicle is not lined properly (6-mil polyethylene liner minimum); and
- Transport vehicle is not covered properly (i.e., waterproof canvas tarp).

If necessary, corrective measures will be employed at the on-Site decontamination pad based on the observed conditions of the transport vehicle. The on-Site decontamination pad will also be constructed near the main entrance/ exit access point and will be identified in the Contractor's RAWP.

Prior to exiting the Site, loaded transport vehicles will be weighed at the on-Site scale and properly manifested. Copies of all transport documentation shall be provided to the Engineer in accordance with the requirements specified in Specification Section 02280 (Transportation and Disposal of Waste Materials).

The Contractor will be responsible for properly maintaining (keeping clear from soil and debris) all on-Site roadways (permanent or temporary), construction zone exit pads, and decontamination pads.

4.0 WASTE LOADING PROCEDURES

Wastes generated during the remedial activities will include soils and subsurface feature contents containing constituents in excess of Performance Standards (as well as potentially exhibiting RCRA hazardous characteristics) and construction wastewaters shipped off-Site as non-hazardous or hazardous waste.

Transport vehicles will be loaded with non-hazardous and hazardous waste materials designated for off-Site transport and disposal based on the results of waste characterization sampling performed in accordance with the SAMP. The transport vehicles will, to the extent practicable, be kept in the clean zone for all loading operations (i.e., direct load, load from stockpile or pumpout from subsurface features or temporary on-Site storage tanks). Loading will be performed with a dedicated piece of equipment in the loading (exclusion or stockpile area) zone. Transport vehicles will be prohibited from entering the areas of excavation unless specifically authorized to do so by the Engineer, to minimize the potential for tracking impacted soils onto on-Site roadways or off-Site.

After loading, trucks will follow the on-Site traffic patterns back to the construction zone exit pad. All vehicles exiting the Site will use the construction zone exit pad where the aforementioned inspections will occur.

Transport vehicles for soil will be staged in clean zones near the excavation areas or stockpiles awaiting loading of removed materials. The designated areas for the clean zones will be developed by the Contractor and identified in the Contractor's RAWP. Loading will be done with a backhoe or front-end loader.

Removal of the aqueous wastes and sediments from subsurface features and USTs and construction wastewaters will be performed with a vacuum truck or equivalent pumpout method. Disposal trucks will be loaded adjacent to the subsurface features, USTs or temporary on-Site storage tanks. Vacuum trucks will be inspected in-bound and out-bound as described above. Vacuum trucks will also be required to be inspected and certified clean prior to leaving the Site.

5.0 WASTE TRANSPORT PROCEDURES

This section of the T&D Plan discusses waste transport procedures. In accordance with the requirements in 49 CFR Part 172 Subpart H, only individuals who have received training will perform packaging, labeling, placarding, and transporting of waste materials. Documentation of completion of such training will be maintained and be available upon request by USEPA and its representatives or other regulatory personnel having jurisdiction.

As previously discussed, all transport vehicles will primarily leave the Site through the main gate located along Motor Avenue. Prior to exiting the Site, each transport vehicle will be inspected and cleaned and/ or maintained, if necessary. In addition, each vehicle's operator will provide the Engineer with proper and complete documentation confirming that the transport company, specified vehicle and operator have the appropriate licenses, permits, training and insurance certificates necessary to transport the waste materials off-Site. In accordance with United States Department of Transportation (USDOT) HM-181 regulations, only carrier(s) possessing a New York State Transporter Permit will be permitted to transport hazardous materials.

The Engineer will approve all waste transporters subcontracted by the Contractor. As part of the approval process, the Contractor will provide all transporter information and necessary documentation in the Contractor's RAWP. This documentation will include all the necessary paperwork for each state that the wastes will pass through before arriving at its final destination. A waste profile sheet will be completed and submitted to the disposal facility for approval and scheduling of off-Site disposal as required.

Shipment of all waste materials will be documented either on bill of lading forms for non-hazardous waste or hazardous waste manifest forms, as appropriate. All shipping documents, labeling, and placarding will comply with USDOT HM-181 regulations. Contractor will ensure the safe handling, transport and cradle-to-grave disposal of generated wastes. All waste will be properly classified in accordance with USEPA definitions and USDOT requirements.

Waste soil and applicable construction wastewaters with USEPA-defined hazardous levels of lead and chromium will be designated as D008 and D009. Shipping papers will include the Uniform Hazardous Waste Manifest (USEPA Form 8700-22) with the applicable Emergency

Response Guide (#171, Class 9) attached to the manifest. The waste will be described on the manifest as follows for hazardous soil and construction wastewater, respectively:

Hazardous Soil

- Waste, Environmentally Hazardous Substances; and
- Solid, n.o.s., (lead and chromium), 9, UN3077, PG III

Hazardous Construction Wastewater

- Waste, Environmentally Hazardous Substances; and
- Liquid, n.o.s., (lead and chromium), 9, UN3082, PG III

As required by USDOT regulations, placards will be placed in accordance with 49 CFR 172.560 (Class 9) on each side and on each end of the silt-proof, closed vehicle container.

The waste materials will not be repackaged or handled between the Site and the Transport, Storage, and Disposal Facility(s) (TSDFs). Tare and gross weight tickets will be obtained from the TSDF(s) for each truck of waste shipped from the Site. Disposal records will be submitted to the Engineer daily and copies maintained on-Site by the Contractor for the duration of the remedial activities.

The directions for available transport vehicle (truck) travel routes from the Site to/from major roadways located to the north, south, east and west are provided in Figure A-1. These routes identify the roadways near the Site that transport vehicles may use to access major arteries that will enable them to move off Long Island to the selected disposal location. The Contractor will have the option of using any of these travel routes after confirming that the particular road rating can accommodate the transport vehicle. The Contractor will provide complete travel routes from the Site to all TSDFs in the Contractor's RAWP.

6.0 HAZARDOUS MATERIAL TRANSPORTATION SECURITY PLAN

In accordance with 49 CFR Part 172 Subpart I, generators and shippers of hazardous materials in quantities that require placarding are required to develop and adhere to a HMTSP. The purpose of the HMTSP is to evaluate potential security risks associated with transporting hazardous materials and appropriate measures to address the assessed risks. The following elements of the HMTSP are discussed below: risk assessment, personnel security, Site security and en route security.

6.1 Risk Assessment

The elements of the risk assessment performed are discussed in the following sections of the HMTSP and include:

- Identification of hazardous materials;
- Storage and shipment procedures for hazardous materials;
- Description of Site security measures;
- Description of Site personnel security measures;
- Characterization of existing en route security risks; and
- Conclusions.

6.1.1 Identification of Hazardous Materials

The hazardous materials that potentially may be encountered at the Site includes excavated soil, subsurface feature contents and construction wastewaters containing concentrations of total chromium and cadmium that exhibit RCRA hazardous characteristics. If improperly managed or disposed, the chromium and cadmium contaminated materials could contaminate soil and groundwater. However, the chromium and cadmium contaminated materials are not acutely toxic nor are they pyrophoric, reactive, flammable, or explosive. Furthermore, the hazardous materials contain no biological or infectious agents. If any material is characterized as hazardous based on the sampling performed in accordance with the SAMP, the material will be managed, transported, and disposed consistent with applicable RCRA and USDOT requirements.

6.1.2 Storage and Shipment Procedures for Hazardous Materials

During the performance of the RA, all excavated soil will be temporarily staged and stored on-Site in accordance with Specification Section 01520 (Temporary Staging and Storage Requirements). All waste materials encountered during the remediation of subsurface features will be managed in accordance with Specification Section 02210 (Miscellaneous Earthwork). All construction wastewaters will be temporarily stored on-Site and managed in accordance with Specification Section 01562 (Management and Treatment of Construction Wastewaters). The excavated soil, subsurface feature contents and construction wastewaters will be sampled in-situ and/or ex-situ in accordance with the SAMP for waste characterization purposes.

If the excavated soil or subsurface feature contents have been characterized as hazardous material, they will be shipped off-Site within a period of less than 90 days of excavation and/ or removal. If the construction wastewaters are characterized as hazardous waste, the water will be shipped off-Site within 120 days of generation. Note; construction wastewaters will only be sampled on a quarterly basis in accordance with the SAMP.

All hazardous materials will be shipped off-Site in accordance with the procedures identified in Section 5.0.

6.1.3 Description of Site Security Measures

The Site is located in the Village of Farmingdale, Town of Oyster Bay, Nassau County, New York, approximately one-mile south of Bethpage State Park. The Site address is 55 Motor Avenue. The Site is approximately 30 acres in size and borders the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east, and Ellsworth Allen Park to the west. Around the perimeter of the entire Site, fencing is currently installed. Prior to mobilizing to the Site, the existing fencing will be inspected and repaired, as necessary.

During the performance of the RA, only authorized personnel will be permitted to enter the Site. Entrance to the Site is only through controlled ingress point(s).

6.1.4 Description of Personnel Security Measures

Only authorized personnel will be permitted to enter the Site during the performance of the RA. Furthermore, in accordance with the requirements in 49 CFR Part 172 Subpart H, only individuals who have received training will perform packaging, labeling, placarding, and transporting of waste materials. Documentation of completion of such training will be maintained and be available upon request by USEPA and its representatives or other regulatory personnel having jurisdiction.

In addition, these individual will be permitted to work on-Site only after the following has been confirmed by the Contractor:

- Previous employment references.
- United States citizenship or otherwise are legitimately residing in the country.
- Security background checks, including criminal records.

6.1.5 Characterization of En Route Security Risks

The Contractor will be responsible for transporting all hazardous materials. The proposed transportation routes for disposal of hazardous materials from the Site to an approved RCRA facility will be provided in the Contractor's RAWP. Although the Contractor will select the transportation routes, every effort will be made to minimize movement of hazardous materials though any major metropolitan areas or near significant public landmarks or attractions. It should be noted; transportation routes from the Site to major highways are identified in Figure A-1.

All hazardous materials will be shipped to the approved RCRA facility via trucks or railcars. The Contractor will receive written confirmation of each shipment of hazardous materials to the RCRA facility.

6.1.6 Conclusions

Based on the nature and quantity of hazardous materials anticipated to be generated and managed at the Site, proposed on-Site management methods, proposed shipment preparation and accountability methods, and the proposed shipping routes and destinations, the shipment of

hazardous materials from the Site during the performance of the RA presents a low transportation security risk.

Nature of the Hazardous Materials

It is unlikely that the hazardous materials generated during the RA would or could be used as a weapon or other destructive implement. It is not acutely toxic, contains no biological agents, nor is it pyrophoric, reactive, flammable, or explosive. If intentionally released, the materials would not cause immediate or substantial human health or environmental endangerment. The hazardous materials threat results from long term exposure or releases that are not timely remediated. Any soil and/or construction wastewaters that are accidentally released could be remediated promptly. As such, the hazardous characteristics of any excavated soil are not those that can result in immediate and violent events (such as an explosive article).

On-Site Management, Shipment, and Accountability Methods

Any hazardous materials shipped off-Site is subject to federally mandated pre-transportation, recordkeeping and reporting, and manifesting requirements, in addition to USDOT's hazardous materials transportation requirements. Although the RCRA generator, transporter, and TSDF requirements were not originally designed to control for modern-day security risks, the regimented nature of hazardous waste transportation provides some protection against modern-day security risks. The heightened level of accountability, record keeping, and chain of custody management substantially reduces the risk that (1) any of the materials could end up in the wrong hands; or (2) if custody was breached, the Contractor or its carriers would not be able to alert law enforcement authorities.

During the performance of the RA, only authorized personnel will be permitted to enter the Site. Note, due to the manner in which excavated material will be stored and shipped off-Site, it seems highly unlikely that theft of the hazardous materials will be a concern.

In addition to the physical and organizational security measures, access to the hazardous materials will be limited to the Contractor and other authorized personnel that have received background checks and training in storage, intra-facility movement, and shipping preparation.

This training will serve as an added security protection because the employees will be able to continually monitor and evaluate whether there is anything unusual about these events.

Shipping Routes and Destinations

As part of the Contractor's RAWP, final transportation routes for the shipment of hazardous waste will be identified once an approved disposal facility is selected. Most shipment activities are subject to RCRA manifest requirements and each entity in the transportation chain is registered with the USEPA. Although not expressly designed for security purposes, the USEPA record keeping and registration requirements provide an added layer of protection against theft.

Mitigation

The best and most practical means for the Contractor to minimize security risks associated with the transportation of hazardous materials is to develop and implement a HMTSP that (1) confirms management's commitment to hazardous materials security; (2) focuses primarily on personnel hiring and training requirements, and compliance with applicable USDOT and RCRA hazardous waste requirements; and (3) relies on existing Contractor protocols and procedures regarding handling, access, and transportation of hazardous materials. Given the relatively low security risk of the Site's hazardous materials that may be generated during the performance of the RA, both in terms of hazardous characteristics and means of transport, a more detailed security risk assessment is unwarranted.

6.2 Personnel Security

All personnel involved in handling, storing, and preparing hazardous materials for transportation will receive training appropriate for their job description (e.g., employees involved in loading hazardous materials into transportation vehicles or containers must have RCRA training). All personnel will receive HMTSP training and routine refresher training thereafter. All new employees will be trained according to their job functions within 90 days of employment. In addition, the Contractor will have performed the following for all of its' proposed personnel:

- Checked past employment references.
- Confirmed that all personnel are either United States citizens, or have legitimate residency and/or immigration status.

- Recovered keys, passwords, and any other company access information from employees upon termination of employment status.

Employment training records, inquiries, and records related to hazardous materials transport compliance will be maintained consistent with state and federal employment and privacy laws.

6.3 Site Security

The Site is currently fenced along the entire perimeter of the property. Prior to the performance of the RA, the perimeter fence will be inspected and repaired, if necessary. All Site ingress and egress points will be controlled during the performance of the RA. All Contractor personnel will be informed to notify the Engineer of suspicious activities in or around the Site.

Only authorized personnel will be granted access to the Site. Unauthorized persons will be removed from the Site immediately and, if appropriate, reported to the proper authorities. The Contractor will also report to the Engineer and/or appropriate law enforcement authorities any missing or unaccounted for hazardous materials and any significant security breaches.

The efficacy of Site security will be reviewed/confirmed routinely.

6.4 En Route Security

To ensure the safe and secure transport of hazardous materials from the Site to the receiving facilities, hazardous materials shippers will be required to provide documentation indicating compliance with the new USDOT hazardous materials transportation security regulations (i.e., 49 CFR Part 172 Subpart I). The documentation will be used to verify that the hazardous materials shipper has conducted a security risk assessment and developed a HMTSP. The hazardous materials shipper's HMTSP will outline measures to insure en route security and should include background checks on employees, route selection that minimizes en route stops and hazardous materials exposure to communities or populated areas, a system to track the shipment of hazardous materials, driver training on USDOT shipping regulations, and emergency response actions.

In addition to the above, the following measures may be implemented to insure en route security:

- Identify the hazardous materials shipper's security officer/manager and maintain that individual's contact information in the files maintained by the Contractor.

- Meet with the hazardous materials shipper's security officer/manager and build a working relationship on transportation security issues, including the exchange of relevant details about each other's HMTSP.

- Require the hazardous materials shipper to update the Contractor of modifications to the hazardous materials shipper's HMTSP (e.g., changes in transportation routes).

7.0 OFF-SITE SPILL PROCEDURES

In the event of an off-Site spill during transportation, the Contractor and/or the transportation carrier must immediately take all necessary action to prevent, abate, or minimize the additional release or threat of release of any waste materials. Although specific procedures for addressing off-Site spills will be provided in the Contractor's RAWP, general response measures to be taken by the Contractor and/or the transporter in the event of a spill incident during off-Site transport of waste materials are summarized below in sequential order:

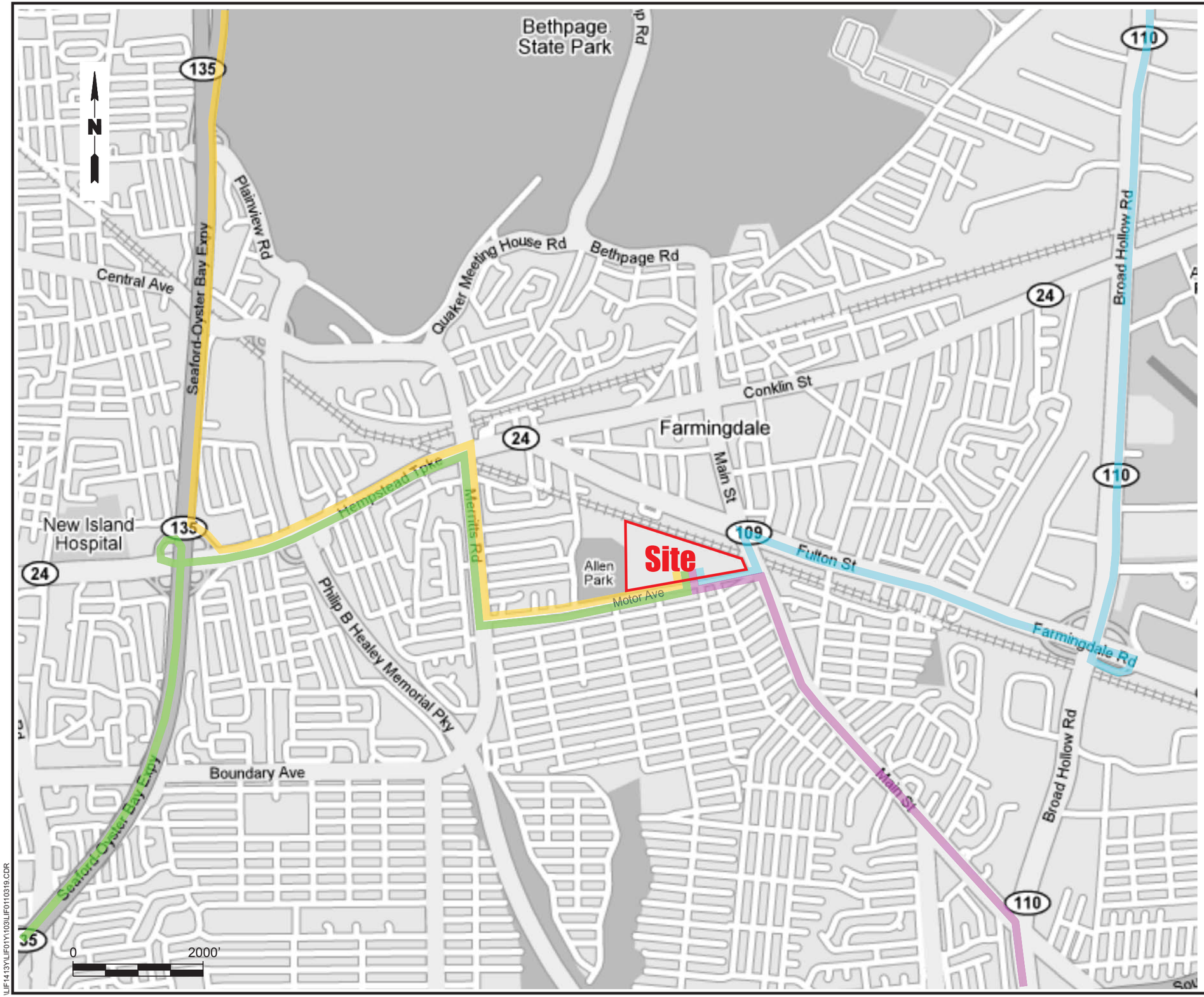
1. The transporter will secure the area and determine the extent of injuries if any, and implement emergency first aid if required.

2. The transporter will notify local authorities, fire, police, etc. and the transporter's headquarters.

3. The transporter or the transporter's headquarters will immediately dispatch a spills response contractor to mobilize to the scene of the incident.

4. The transporter will notify all appropriate federal and state authorities (e.g., EPA, USDOT), the Contractor, Nassau County, and Engineer.

Off-Site spills of waste materials will be collected, stored, and disposed of with similar Site materials. Any "clean" materials potentially contaminated by an off-Site spill will be excavated and disposed of with the hazardous materials that caused the contamination, or will be cleaned and restored to previous existing conditions by the transporter's response contractor, to the satisfaction of local authorities having jurisdiction, the Owner and the Engineer.



Directions from the Site to Major Roadways

Locations Northwest
Exit the site by making a right onto Motor Avenue heading west. Continue on Motor Avenue to Merritts Road. Turn right onto Merritts Road heading north. Make first left onto Hempstead Turnpike (Route-24) West. Continue west on Route-24 approximately 1-mile to the Seaford-Oyster Bay Expressway (Route-135) North. Take Route-135 N approximately 5-miles to the Long Island Expressway (Route-495) East/West.

Locations Southwest
Exit the site by making a right onto Motor Avenue heading west. Continue on Motor Avenue to Merritts Road. Turn right onto Merritts Road heading north. Make first left onto Hempstead Turnpike (Route-24) west. Continue west on Route-24 approximately 1-mile to the Seaford-Oyster Bay Expressway (Route-135) South. Take Route-135 S approximately 3-miles to Sunrise Highway (Route-27) East/West.

Locations Northeast
Exit the site by making a left onto Motor Avenue heading east. Continue on Motor Avenue to Main Street. Turn left onto Main Street heading north. Cross over railroad tracks and make first right onto Fulton Avenue (Route-109) East. Continue east on Route-109 approximately 1-2-miles to Route-110 North. Take Route-110 N approximately 5-miles the Long Island Expressway (Route-495) East/West.

Locations Southeast
Exit the site by making a left onto Motor Avenue heading east. Continue on Motor Avenue to Main Street. Turn right onto Main Street heading south. Continue south on Main Street approximately 1-2-miles. Make slight right onto Route-110 South. Continue south on Route-110 approximately 2-miles to Sunrise Highway (Route-27) East/West.

Title:

TRANSPORTATION AND DISPOSAL ROUTES

TRANSPORTATION AND DISPOSAL PLAN
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
FARMINGDALE, NEW YORK

Prepared for: LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST
FARMINGDALE, NEW YORK

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 23MAY06	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	A-1
Project Mgr.: O.R.	Office: NY	
File No.: LIF0110319.CDR	Project No.: 141301Y	

\LIF1413Y\LIF01Y103\LIF0110319.CDR

LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE

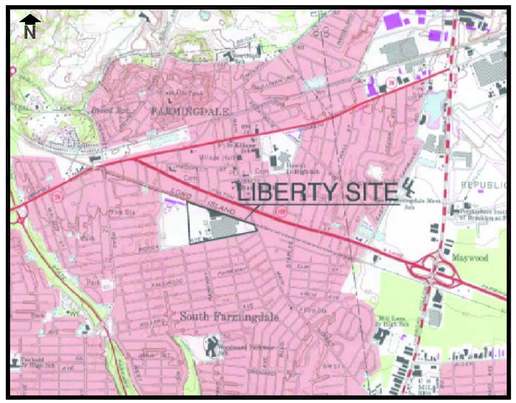
100% REMEDIAL DESIGN FOR REMEDIAL ELEMENTS I & II

VILLAGE OF FARMINGDALE, NASSAU COUNTY, NEW YORK

PREPARED FOR

LIBERTY INDISTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

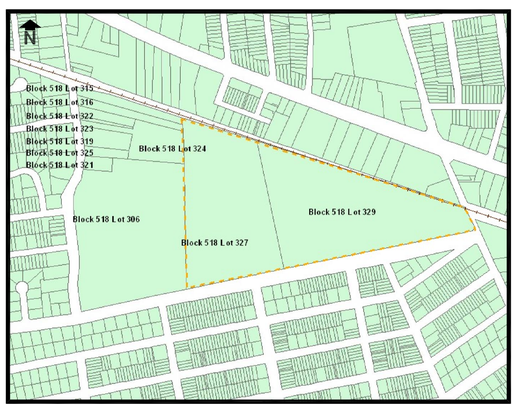
SITE LOCATION MAP



SOURCE MAP: U.S.G.S. AMITYVILLE QUADRANGLE, NY, 1969 PHOTOREVISED 1979

4000 0 2000 4000
SCALE OF FEET

SITE VICINITY MAP



SOURCE MAP: NASSAU COUNTY GIS

500 0 500 1000
SCALE OF FEET

DRAWING INDEX

C-1 COVER SHEET
S-1 SITE MAP WITH ADJOINING PROPERTY BOUNDARIES
S-2 AERIAL SITE MAP
S-3 EXCAVATION CUT LINES >60 FT. ELEVATION
S-4 EXCAVATION CUT LINES 55-60 FT. ELEVATION
S-5 EXCAVATION CUT LINES 50-55 FT. ELEVATION
S-6 EXCAVATION CUT LINES 45-50 FT. ELEVATION
S-7 EXISTING SITE
S-8 SUBSURFACE FEATURES AND UNDERGROUND STORAGE TANKS
S-9 FINAL GRADING PLAN
S-10 EROSION AND SEDIMENT CONTROL PLAN
S-11 EROSION AND SEDIMENT CONTROL DETAILS AND NOTES
S-12 MISCELLANEOUS DETAILS

PREPARED BY

REMEDIAL ENGINEERING, P.C.

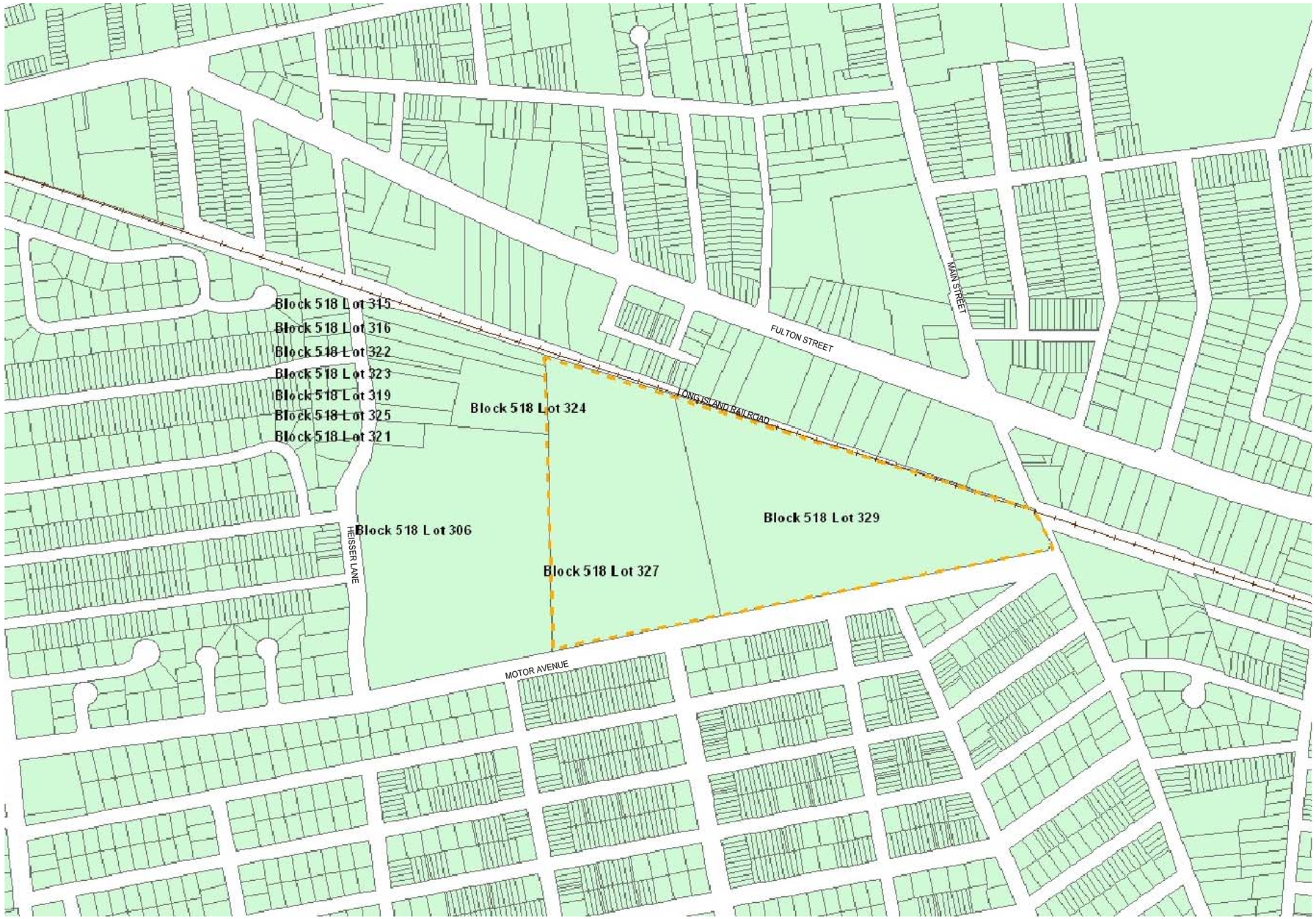
IN ASSOCIATION WITH ROUX ASSOCIATES, INC.

ROUX

209 SHAFTER STREET
ISLANDIA, NEW YORK 11749

JUNE 2006

Plot Scale: 1:1 Date: 24MAY06 File Name: N:\PROJECTS\LIF1431\LIF0119\103\LIF0110313.DWG



LEGEND

SITE BOUNDARY

PROPERTY LINE

SOURCE

NASSAU COUNTY GIS

60' 0 60'

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110301
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
SITE MAP WITH ADJOINING PROPERTY BOUNDARIES

DRAWING NO.
S-1
DRAWING 1 OF 12

Plot Scale: 1:1 Date: 24MAY06 File Name: N:\PROJECTS\LIF1411Y\LIF01Y\103\LIF0110301.DWG



SOURCE
NASSAU COUNTY GIS

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110302
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

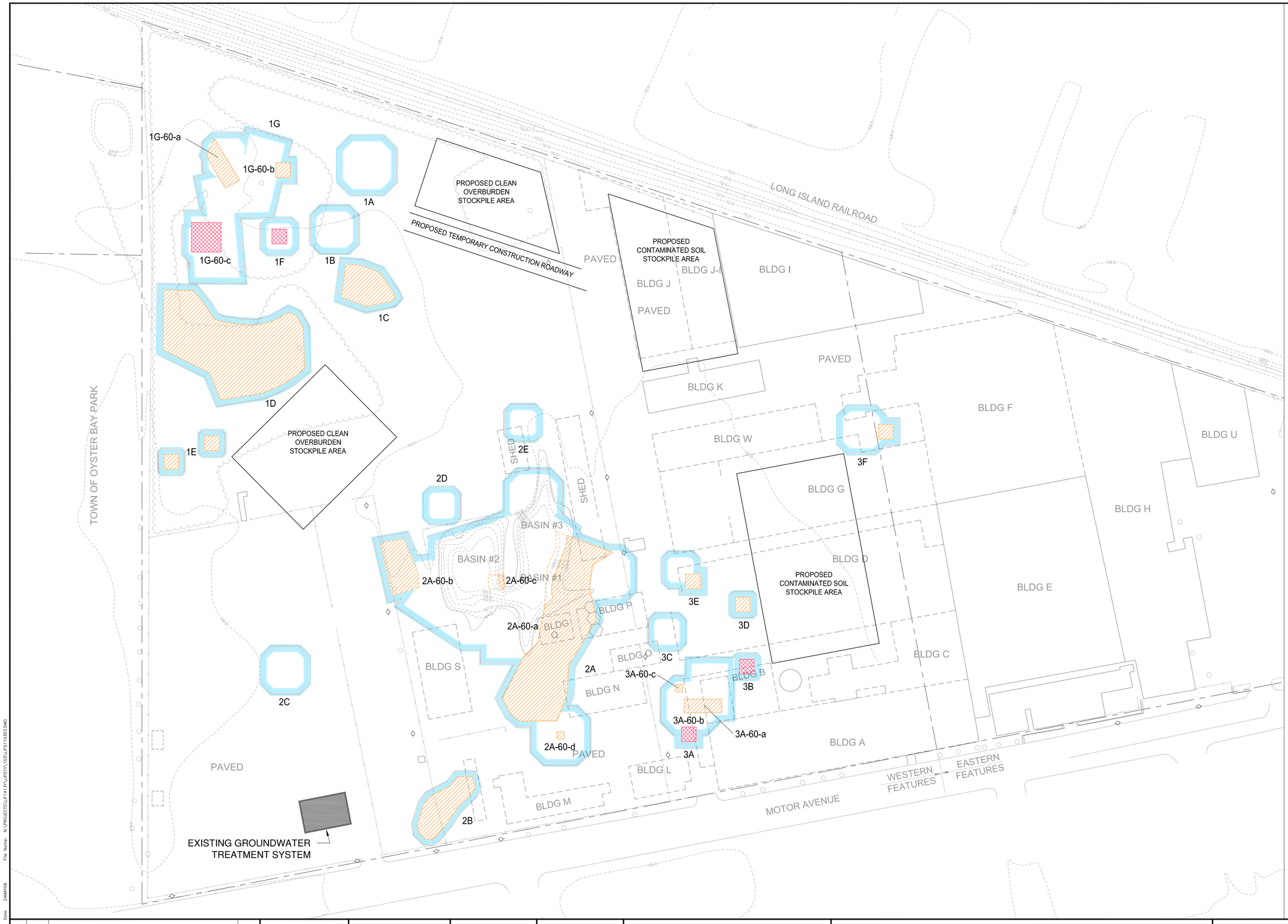
PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
SITE MAP WITH ADJOINING PROPERTY BOUNDARIES

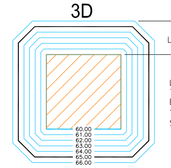
DRAWING NO.
S-2
DRAWING 2 OF 12

Plot Scale: 1:1
Date: 24MAY06
File Name: N:\PROJECTS\LIF1413Y\LIF01Y\03\LIF0110302.DWG



LEGEND

- SITE BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING (EXISTING SLAB REMAINS)
- EXISTING CONTOUR
- HAZARDOUS MATERIAL
- NON-HAZARDOUS MATERIAL (ABOVE PERFORMANCE STANDARD)
- CLEAN OVERBURDEN (TO BE CONFIRMED BY SAMPLING)
- 65 FOOT EXCAVATION CONTOUR
- ACTIVE EXCAVATION CONTOURS (SEE NOTE 1)
- UTILITY POLE
- TREE
- TREE LINE
- FENCE



LIMITS OF CUTBACK SOILS (TYP.)

LOCATION AND DESIGNATION OF TYPICAL REMEDIATION AREA WITH EXCAVATION CONTOURS SHOWN ON A 1:5 TO 1 SLOPE (ELEVATIONS NOT SHOWN ON DRAWING FOR CLARITY)

NOTES:

1. EXCAVATION CONTOURS BETWEEN 66 AND 60 FEET ARE BASED ON A 1.5 TO 1 SLOPE. ELEVATIONS NOT SHOWN FOR CLARITY.
2. AREA 1 IS COMPOSED OF EXCAVATION AREAS 1A THROUGH 1G.
3. AREA 2 IS COMPOSED OF EXCAVATION AREAS 2A THROUGH 2E.
4. AREA 3 IS COMPOSED OF EXCAVATION AREAS 3A THROUGH 3F.

SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

60' 0 60'

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110303
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

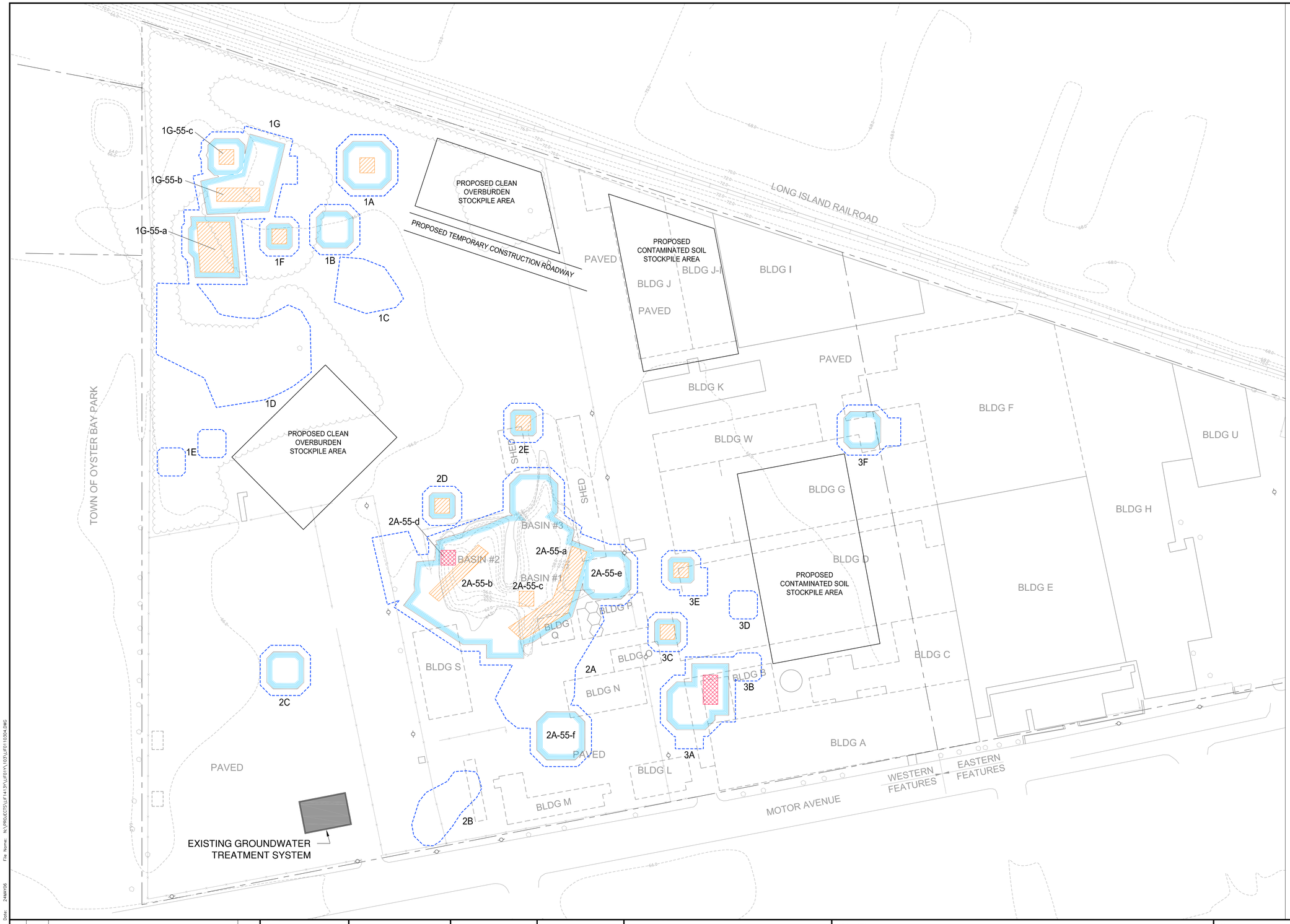
PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
EXCAVATION CUT LINES
>60 FT. ELEVATION

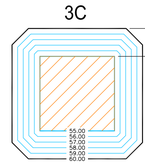
DRAWING NO.
S-3
DRAWING 3 OF 12

Plot Scale: 1:1
Date: 24MAY06
File Name: N:\PROJECTS\LIF1413Y\LIF0Y\103\LIF0110303.DWG



LEGEND

- SITE BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING (EXISTING SLAB REMAINS)
- EXISTING CONTOUR
- HAZARDOUS MATERIAL
- NON-HAZARDOUS MATERIAL (ABOVE PERFORMANCE STANDARD)
- CLEAN OVERBURDEN (TO BE CONFIRMED BY SAMPLING)
- 60 FOOT EXCAVATION CONTOUR
- ACTIVE EXCAVATION CONTOURS (SEE NOTE 1)
- ANTICIPATED LATERAL LIMITS OF EXCAVATION AT GRADE (SEE NOTES 2, 3 AND 4)
- UTILITY POLE
- TREE
- TREE LINE
- FENCE



LIMITS OF CUTBACK SOILS (TYP.)

LOCATION AND DESIGNATION OF TYPICAL REMEDIATION AREA WITH EXCAVATION CONTOURS SHOWN ON A 1:5 TO 1 SLOPE (ELEVATIONS NOT SHOWN ON DRAWING FOR CLARITY)

NOTES:

1. EXCAVATION CONTOURS BETWEEN 60 AND 55 FEET ARE BASED ON A 1.5 TO 1 SLOPE. ELEVATIONS NOT SHOWN FOR CLARITY.
2. AREA 1 IS COMPOSED OF EXCAVATION AREAS 1A THROUGH 1G.
3. AREA 2 IS COMPOSED OF EXCAVATION AREAS 2A THROUGH 2E.
4. AREA 3 IS COMPOSED OF EXCAVATION AREAS 3A THROUGH 3F.

SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

60' 0 60'

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110304
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

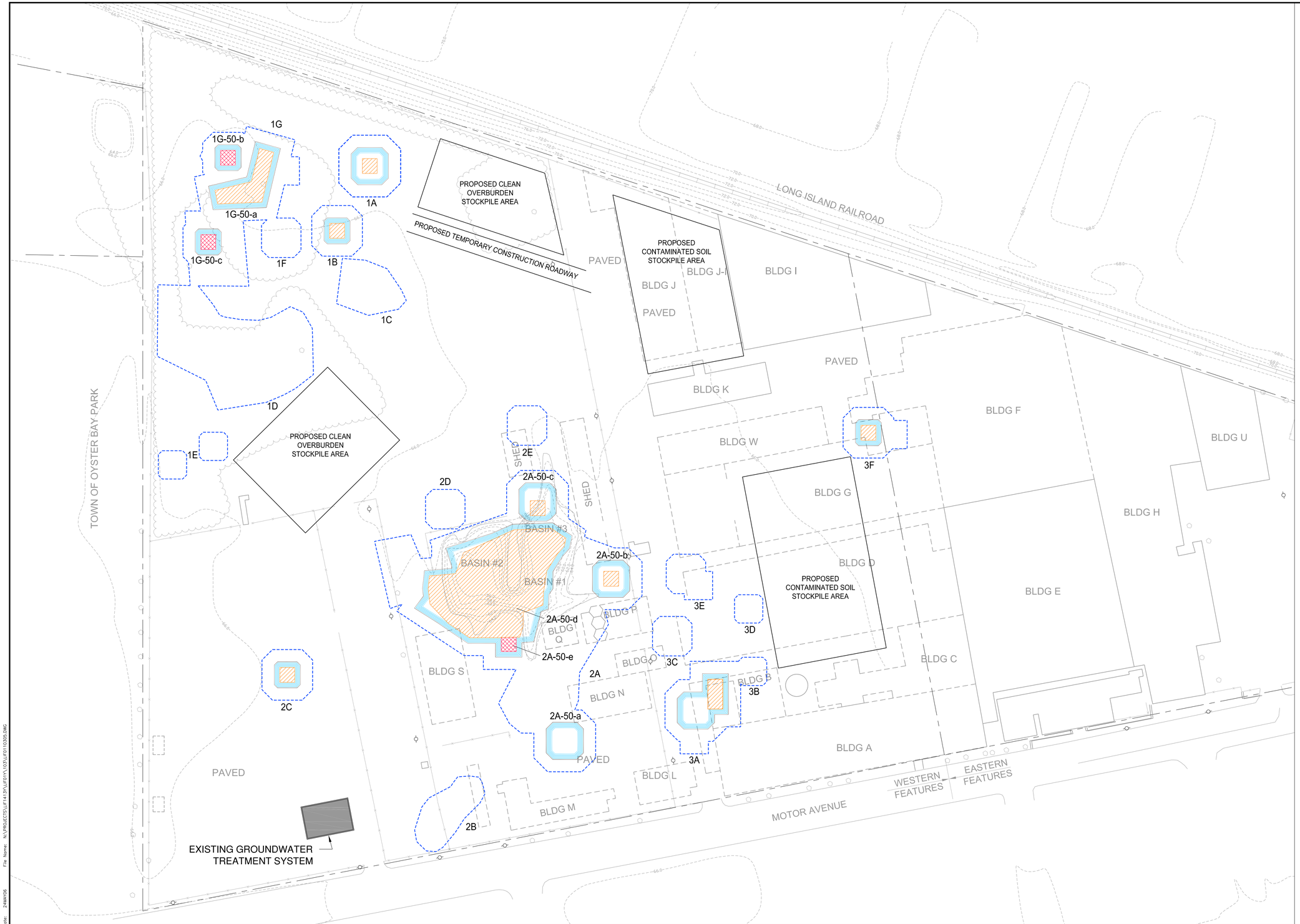
PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
EXCAVATION CUT LINES
55-60 FT. ELEVATION

DRAWING NO.
S-4
DRAWING 4 OF 12

Plot Scale: 1:1
Date: 24MAY06
File Name: N:\PROJECTS\LIF1413Y\LIF01Y\103\LIF0110304.DWG



NOTES:

1. EXCAVATION CONTOURS BETWEEN 55 AND 50 FEET ARE BASED ON A 1.5 TO 1 SLOPE. ELEVATIONS NOT SHOWN FOR CLARITY.
2. AREA 1 IS COMPOSED OF EXCAVATION AREAS 1A THROUGH 1G.
3. AREA 2 IS COMPOSED OF EXCAVATION AREAS 2A THROUGH 2E.
4. AREA 3 IS COMPOSED OF EXCAVATION AREAS 3A THROUGH 3F.

SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

Plot Scale: 1:1
Date: 24MAY06
File Name: N:\PROJECTS\LIF1413\LIF01Y\103\LIF0110305.DWG

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110305
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

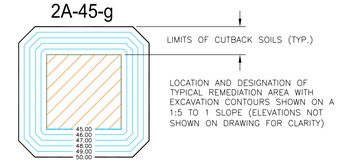
TITLE:
EXCAVATION CUT LINES
50-55 FT. ELEVATION

DRAWING NO.
S-5
DRAWING
5 OF 12



LEGEND

- SITE BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING (EXISTING SLAB REMAINS)
- EXISTING CONTOUR
- HAZARDOUS MATERIAL
- NON-HAZARDOUS MATERIAL (ABOVE PERFORMANCE STANDARD)
- CLEAN OVERBURDEN (TO BE CONFIRMED BY SAMPLING)
- 50 FOOT EXCAVATION CONTOUR
- ACTIVE EXCAVATION CONTOURS (SEE NOTE 1)
- ANTICIPATED LATERAL LIMITS OF EXCAVATION AT GRADE (SEE NOTES 2, 3 AND 4)
- UTILITY POLE
- TREE
- TREE LINE
- FENCE



NOTES:

1. EXCAVATION CONTOURS BETWEEN 50 AND 45 FEET ARE BASED ON A 1.5 TO 1 SLOPE. ELEVATIONS NOT SHOWN FOR CLARITY.
2. AREA 1 IS COMPOSED OF EXCAVATION AREAS 1A THROUGH 1G.
3. AREA 2 IS COMPOSED OF EXCAVATION AREAS 2A THROUGH 2E.
4. AREA 3 IS COMPOSED OF EXCAVATION AREAS 3A THROUGH 3F.

SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

60' 0 60'

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110306
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
EXCAVATION CUT LINES
45-50 FT. ELEVATION

DRAWING NO.
S-6
DRAWING 6 OF 12

Plot Scale: 1:1
Date: 24MAY06
File Name: N:\PROJECTS\LIF1413Y\LIF01103\LIF0110306.DWG



LEGEND

- SITE BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING (EXISTING SLAB REMAINS)
- EXISTING CONTOUR
- UTILITY POLE
- TREE LINE
- FENCE
- MW-1 LOCATION AND DESIGNATION OF EXISTING MONITORING WELL
- TREE

NOTES

1. BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.
2. HORIZONTAL LOCATIONS AND COORDINATES ARE IN U.S. FEET RELATIVE TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, LONG ISLAND ZONE, NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. ELEVATIONS ARE IN U.S. FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29). THE NGVD DATUM IS ALSO KNOWN AS THE U.S. COAST AND GEODETIC SURVEY (USC&G) MEAN SEA LEVEL DATUM OF 1929.29
4. ALL PROPERTY BOUNDARIES SHOWN ARE APPROXIMATE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE PRESENCE OR ABSENCE OF UTILITIES, INCLUDING, BUT NOT LIMITED TO, THE PERFORMANCE OF UTILITIES MARKOUTS AND THE COMPLETION OF TEST PITS, AS NECESSARY. THE LOCATIONS OF ALL UTILITIES ENCOUNTERED BY THE CONTRACTOR DURING PERFORMANCE OF THE WORK SHALL BE SHOWN ON THE AS-BUILT DRAWINGS PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOLLOWING THE COMPLETION OF THE WORK.

60' 0 60'

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: O.R.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110307
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE: EXISTING SITE

DRAWING NO. **S-7**
DRAWING 7 OF 12

Plot Scale: 1:1
Date: 09JUN2006
File Name: N:\PROJECTS\LIF1413Y\F01Y\103\LIF0110307.DWG



SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

NOTES

1. THE FOLLOWING SUBSURFACE FEATURES WERE ACCESSED BUT NOT SAMPLED: SD-1, SF-31, SF-35, SF-39, SF-40, SF-54 AND SF-56.
2. DETAILED INFORMATION, IF KNOWN, FOR EACH SUBSURFACE FEATURE AND UST REGARDING THEIR RESPECTIVE LOCATION, NATURE OF CONTENTS AND SAMPLING STATUS IS PROVIDED IN SPECIFICATION SECTION 02210 (MISCELLANEOUS EARTHWORK).

NO.	DATE	REVISION DESCRIPTION	INT.

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PROJECT ENGINEER: O.R.
DESIGNED BY: O.R.
DRAWN BY: O.R.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110308
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
SUBSURFACE FEATURES AND UNDERGROUND STORAGE TANKS

DRAWING NO.
S-8
DRAWING 8 OF 12

Plot Scale: 1:1
Date: 08/JUN/06
File Name: N:\PROJECTS\LIF1413Y\LIF0Y1103\LIF0110308.DWG



LEGEND

- SITE BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING (EXISTING SLAB REMAINS)
- EXISTING CONTOUR
- FINAL CONTOUR
- UTILITY POLE
- TREE
- TREE LINE
- FENCE
- LOCATION AND DESIGNATION OF REMEDIATION AREAS (e.g. 3D)

NOTES

1. STABILIZE SLOPES OF BASIN IN ACCORDANCE WITH DETAIL 3 ON DRAWING S-11.
2. FINAL GRADING SHALL BE CONFIRMED AND MODIFIED AS NECESSARY, BASED ON FINAL EXCAVATION LIMITS FOR AREAS 1, 2 AND 3, ANTICIPATED EXCAVATION LIMITS SHOWN ON DRAWINGS S-3, S-4, S-5 AND S-6. EXCAVATION FOR AREAS 1 AND 2 SHALL BE GRADED AS FUTURE STORMWATER BASINS.
3. ALL PROPOSED EXCAVATION AREAS OUTSIDE THE LIMITS OF NEW BASINS A AND B SHALL BE BACKFILLED TO PRE-CONSTRUCTION GRADE ELEVATIONS WITH ON-SITE SOURCE OF REUSABLE FILL. APPROVED OFF-SITE SOURCES OF FILL SHALL BE USED IF ADDITIONAL MATERIAL IS REQUIRED.

SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

60' 0 60'

NO.	DATE	REVISION DESCRIPTION	INT.

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DESIGNED BY: O.R.
DRAWN BY: O.R.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110309
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

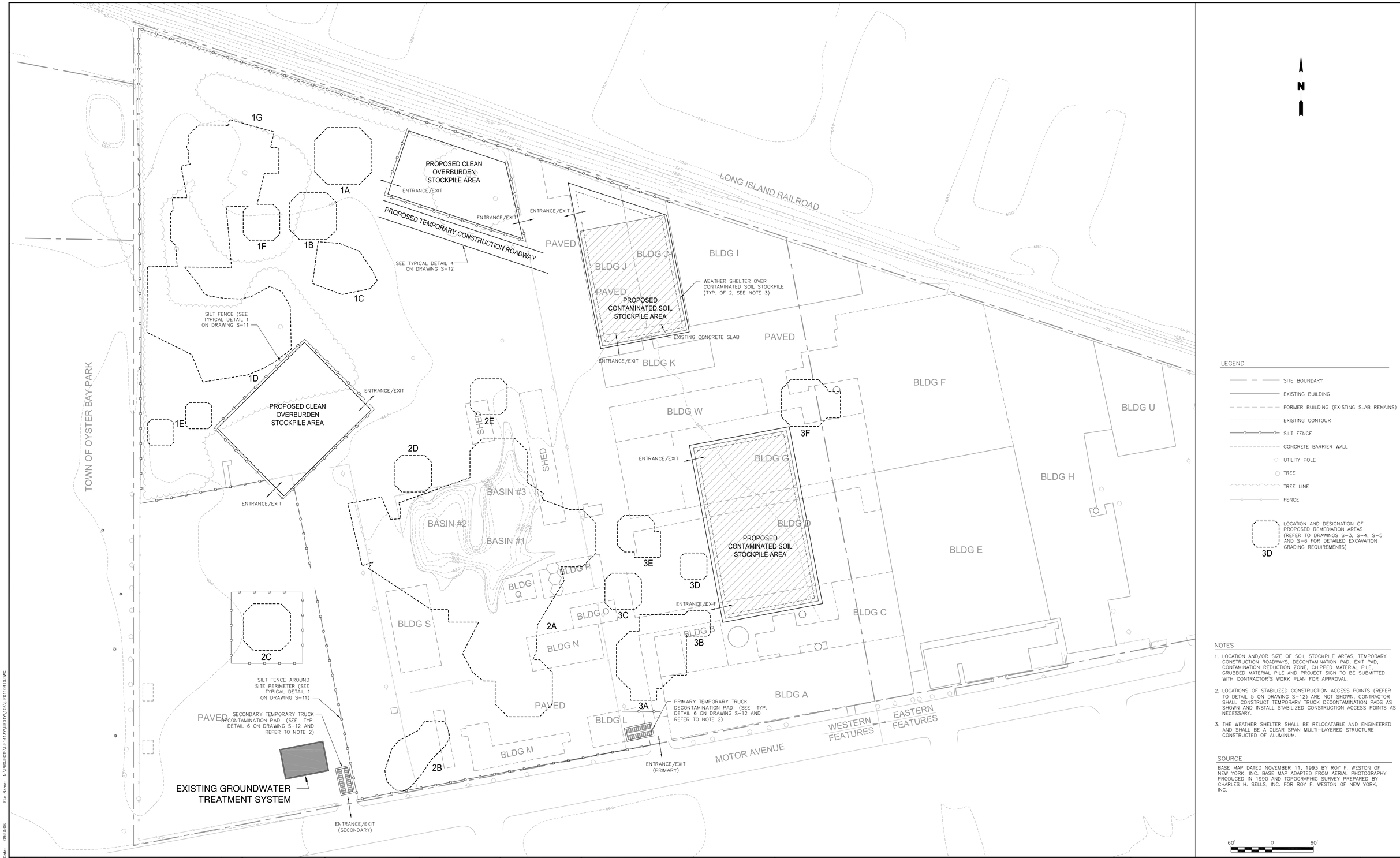
PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE: FINAL GRADING PLAN

DRAWING NO. S-9
DRAWING 9 OF 12

File Name: N:\PROJECTS\LIF141.5*\LIF0110309.DWG
Date: 09/24/06
Plot Scale: 1:1



NOTES

1. LOCATION AND/OR SIZE OF SOIL STOCKPILE AREAS, TEMPORARY CONSTRUCTION ROADWAYS, DECONTAMINATION PAD, EXIT PAD, CONTAMINATION REDUCTION ZONE, CHIPPED MATERIAL PILE, GRUBBED MATERIAL PILE AND PROJECT SIGN TO BE SUBMITTED WITH CONTRACTOR'S WORK PLAN FOR APPROVAL.
2. LOCATIONS OF STABILIZED CONSTRUCTION ACCESS POINTS (REFER TO DETAIL 5 ON DRAWING S-12) ARE NOT SHOWN. CONTRACTOR SHALL CONSTRUCT TEMPORARY TRUCK DECONTAMINATION PADS AS SHOWN AND INSTALL STABILIZED CONSTRUCTION ACCESS POINTS AS NECESSARY.
3. THE WEATHER SHELTER SHALL BE RELOCATABLE AND ENGINEERED AND SHALL BE A CLEAR SPAN MULTI-LAYERED STRUCTURE CONSTRUCTED OF ALUMINUM.

SOURCE

BASE MAP DATED NOVEMBER 11, 1993 BY ROY F. WESTON OF NEW YORK, INC. BASE MAP ADAPTED FROM AERIAL PHOTOGRAPHY PRODUCED IN 1990 AND TOPOGRAPHIC SURVEY PREPARED BY CHARLES H. SELLS, INC. FOR ROY F. WESTON OF NEW YORK, INC.

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PROJECT NO. 141301Y
FILE NO. LIF0110310
SCALE: AS SHOWN
DATE: JUN. 2006

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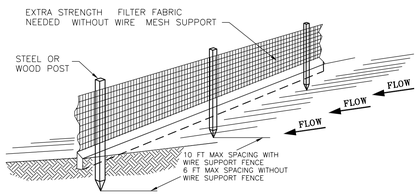
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REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

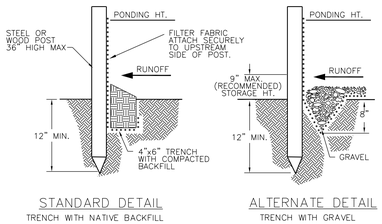
PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE:
EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO. **S-10**
DRAWING 10 OF 12

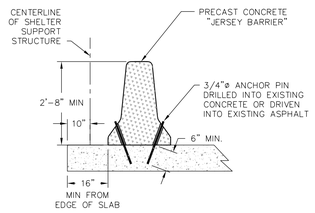
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Date: 09JUN06
File Name: N:\PROJECTS\LIF1413Y\LF01Y\100\LIF0110310.DWG

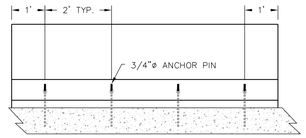




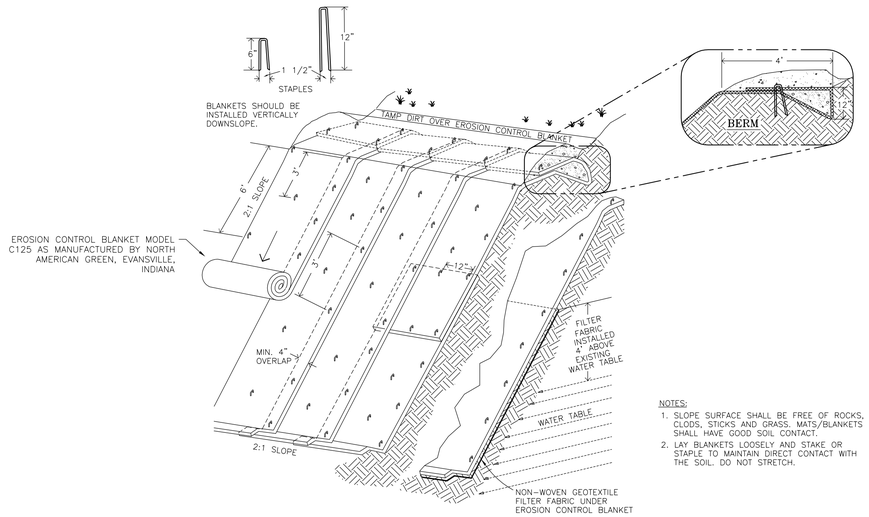
NOTES:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

1 SILT FENCE DETAIL
SCALE: NOT TO SCALE



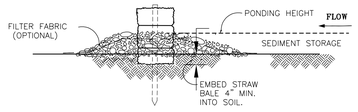


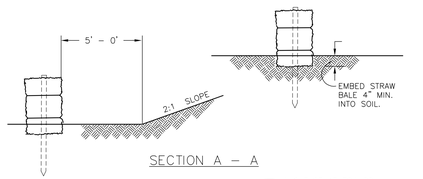
2 JERSEY BARRIER DETAIL
SCALE: NOT TO SCALE



NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

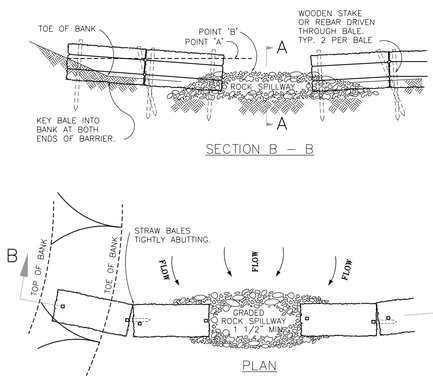
3 EROSION CONTROL BLANKET DETAIL
SCALE: NOT TO SCALE





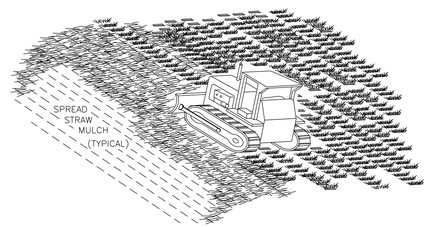
NOTES:
1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING. USE STRAW, ROCKS, OR FILTER FABRIC TO FILL GAPS BETWEEN THE BALES AND TAMP THE BACKFILL MATERIAL TO PREVENT EROSION OR FLOW AROUND BALES.

4 STRAW BALE DIKE DETAIL
SCALE: NOT TO SCALE



NOTES:
1. PLACE BALES PERPENDICULAR TO FLOW.
2. EMBED THE BALE 4" INTO THE SOIL AND "KEY" THE END BALES INTO THE CHANNEL BANKS.
3. BALES PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW, ROCKS OR FILTER FABRIC TO FILL ANY GAPS BETWEEN BALES AND TAMP BACKFILL MATERIALS TO PREVENT EROSION OR FLOW AROUND THE BALES.
4. POINT "A" SHALL BE HIGHER THAN POINT "B".
5. SPILLWAY SHALL NOT EXCEED 24".

5 SEMI-PERVIOUS STRAW BALE SEDIMENT BARRIER DETAIL
SCALE: NOT TO SCALE



NOTES:
1. ROUGHEN SLOPE WITH BULLDOZER
2. BROADCAST SEED AND FERTILIZER.
3. SPREAD STRAW MULCH 3" THICK. (2 1/2 TONS PER ACRE)
4. PUNCH STRAW MULCH INTO SLOPE BY RUNNING BULLDOZER UP AND AND DOWN SLOPE.

6 STRAW ANCHORING DETAIL
SCALE: NOT TO SCALE

Plot Scale: 1:1
Date: 30MAY06
File Name: N:\PROJECTS\LIF141.3Y\LIF01\163\LIF0110311.DWG

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CHECKED BY: C.J.M.

PROJECT NO. 141301Y
FILE NO. LIF0110311
SCALE: AS SHOWN
DATE: JUNE 2006

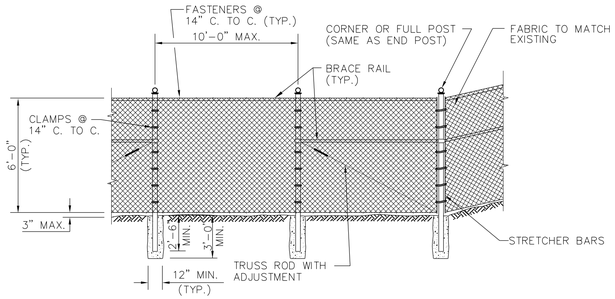
REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

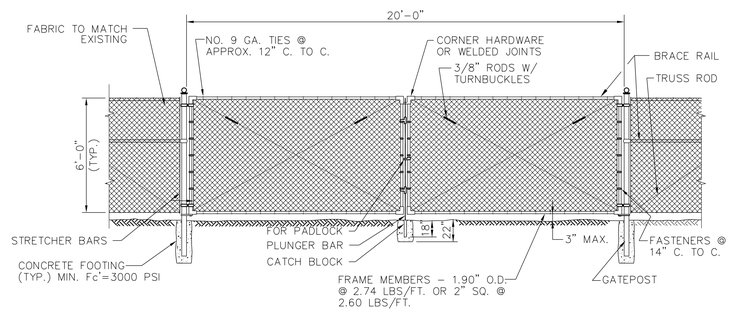
TITLE:
EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

DRAWING NO.
S-11
DRAWING 11 OF 12



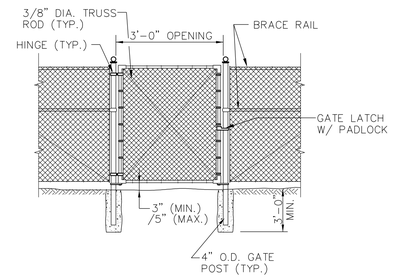
1 TYPICAL FENCE DETAIL

SCALE: NOT TO SCALE



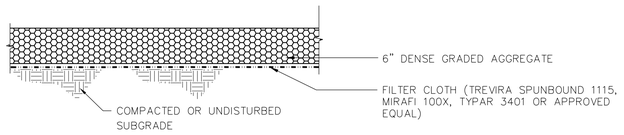
2 TYPICAL VEHICLE SWING GATE DETAIL

SCALE: NOT TO SCALE



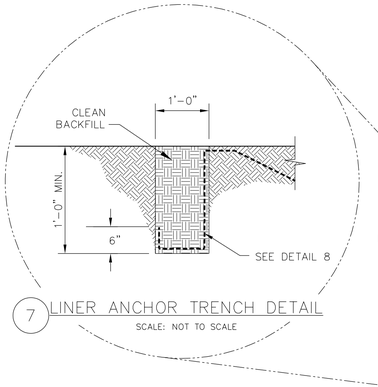
3 TYPICAL PERSONNEL GATE DETAIL

SCALE: NOT TO SCALE



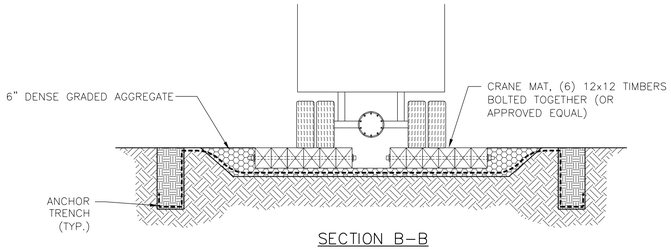
4 TEMPORARY ROAD DETAIL

SCALE: NOT TO SCALE

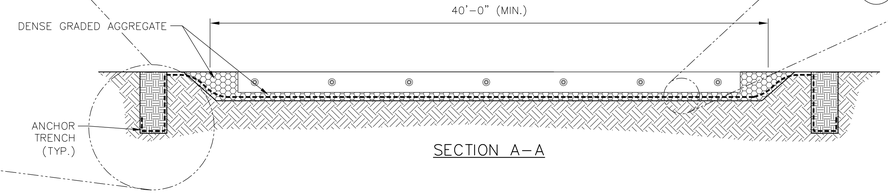


7 LINER ANCHOR TRENCH DETAIL

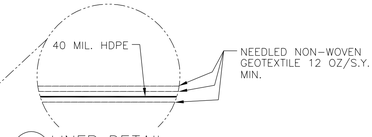
SCALE: NOT TO SCALE



SECTION B-B



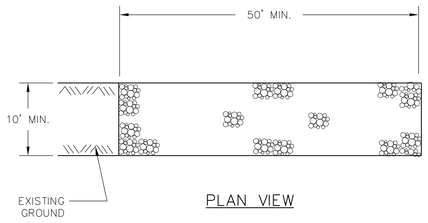
SECTION A-A



8 LINER DETAIL

SCALE: NOT TO SCALE

PROFILE

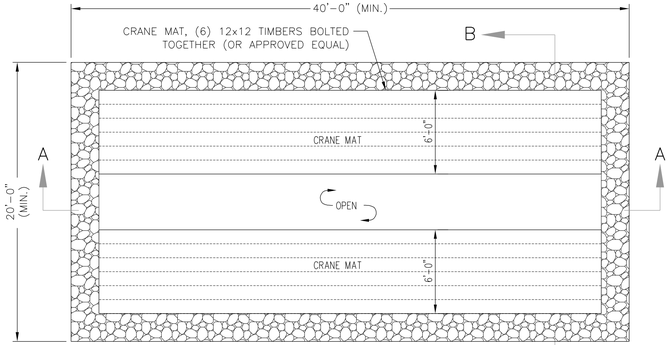


PLAN VIEW

5 STABILIZED CONSTRUCTION ACCESS DETAIL

SCALE: NOT TO SCALE

* THIS CONSTRUCTION ENTRANCE DETAIL SHALL ONLY BE USED IF NEEDED. TEMPORARY DECONTAMINATION PADS WILL BE USED AT THE INGRESS/EGRESS POINT FOR CLEANING ALL EXITING VEHICLES AND EQUIPMENT



PLAN VIEW

6 TEMPORARY DECONTAMINATION PAD DETAIL

SCALE: NOT TO SCALE

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DRAWN BY: G.M.
CHECKED BY: B.P.M.

PROJECT NO. 141301Y
FILE NO. LIF0110312
SCALE: AS SHOWN
DATE: JUN. 2006

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232-2600

PROJECT NAME:
LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE
REMEDIAL ELEMENTS I & II
VILLAGE OF FARMINGDALE, NASSAU COUNTY, NY

PROJECT FOR:
LIBERTY INDUSTRIAL FINISHING SITE
QUALIFIED SETTLEMENT TRUST

TITLE: MISCELLANEOUS DETAILS

DRAWING NO. **S-12**
DRAWING 12 OF 12

Plot Scale: 1:1 Date: 01JUN06 File Name: N:\PROJECTS\LIF1413P\LIF01Y\103\LIF0110312.DWG

APPENDIX A

Record of Decision

United States Environmental Protection Agency
Region II
New York, New York
March 28, 2002

RECORD OF DECISION
DECISION SUMMARY

LIBERTY INDUSTRIAL FINISHING SUPERFUND SITE

FARMINGDALE, NASSAU COUNTY, NEW YORK

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ATTACHMENTS

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APPENDIX III. TABLES
APPENDIX IV. ADMINISTRATIVE RECORD INDEX
APPENDIX V. STATE LETTER OF CONCURRENCE
APPENDIX VI. LIST OF POTENTIALLY RESPONSIBLE PARTIES
APPENDIX VII. RESPONSIVENESS SUMMARY

SITE NAME, LOCATION AND DESCRIPTION

The Liberty Industrial Finishing site (the Site) is located approximately one mile south of Bethpage State Park in the Town of Oyster Bay, Village of Farmingdale, Nassau County, New York (see **Figure 1**). The Site includes approximately 30 acres of property known as 55 Motor Avenue and is designated on the Nassau County Tax Map as Lots 327, 328 and 329 of Block 518, Section 48. The property is bordered by the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east and a small county park, Ellsworth Allen Park, to the west. The northwest corner of the Site abuts property owned by the South Farmingdale Water District which operates two deep public water supply wells at this location which is sidegradient of the Site. The surrounding area is primarily residential with several commercial establishments on the major roads. Approximately ten schools, both primary and secondary, are located within 1.5 miles of the Site. **Figure 2**, which was developed based on historical records, depicts former process facilities as well as potential contaminant source areas at the Site.

Currently, approximately half the Site property (the western portion, Lot 327) consists of primarily vacant land that abuts the park. The other half of the Site (the eastern portion, Lots 328 and 329) contains approximately ten buildings which are leased to a variety of tenants engaged in light industrial activities, such as trucking, warehousing, automobile parts salvaging operations, and product distribution.

The Site terrain is generally flat with numerous areas of standing water after heavy rainfall. There are no streams or drainage ditches on the Site property; however, there are private storm drains located throughout the property. Nassau County storm drains are located along Motor Avenue and Roberts Street, which ultimately drain into the headwaters of Massapequa Creek. This creek passes through the Massapequa Preserve and ultimately discharges into South Oyster Bay on the southern coast of Long Island.

The Site is situated on the glacial outwash plain of Long Island. The uppermost aquifer, the Upper Glacial, is estimated to be 85 feet thick beneath the Site. The depth to the water table is generally approximately 21 feet below ground surface (bgs), although the Site groundwater table fluctuates between 15 and 21 feet bgs. The saturated portion of the Upper Glacial aquifer, with a thickness of 64 feet, begins at the water table and extends down to 85 feet bgs. The Upper Glacial aquifer is underlain by the Magothy aquifer which is approximately 700 feet thick in the vicinity of the Site. Groundwater aquifers underlying the Site are classified as Class GA pursuant to 6 New York Codes, Rules and Regulations Parts 700-705 (6 NYCRR Parts 700-705, effective

September 1991). The Class GA standards apply to any groundwater, surface water body, aquifer or water course from which water is regularly taken for drink or which has been classified for present or future public beneficial use or source for domestic purposes. Similarly, the groundwater aquifers are classified as Class IIA by the U.S. Environmental Protection Agency (EPA) in that the aquifers are current or potential sources of drinking water.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site is a former aircraft parts manufacturing and metal finishing facility that began its operation in the late 1930's. Kirkham Engineering and Manufacturing Company purchased a portion of the Site property in 1937. In 1940, Kirkham changed its name to Liberty Aircraft Products Corp. and purchased the remainder of the 30-acre parcel. From 1940 to 1944, the federal government utilized the Site as a defense plant to develop and maintain production of materials needed for World War II. Materials used in Site operations included volatile organic compounds (VOCs) such as cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE); inorganic compounds containing cadmium, chromium, and cyanide; as well as other materials such as caustics and acids. Throughout most of the period of industrial operation, wastes containing these materials were discharged untreated into below-grade sumps, underground leaching chambers, and unlined, in-ground wastewater disposal basins.

Ownership of and operations at the Liberty site changed numerous times from 1957 until 1986.

In 1957, the Site was sold by Liberty Aircraft and was converted into an industrial park subject to a 25-year lease of the Site to the successor of Liberty Aircraft. Aircraft parts manufacturing was discontinued and a variety of other operations were conducted by tenants at the Site over the years, including metal plating and finishing operations, fiberglass product manufacturing, furniture manufacturing, and warehousing. Metal-plating operations were discontinued at the Site in 1978.

In 1978, the New York State Department of Environmental Conservation (NYSDEC) instituted an enforcement action under State law against Liberty Industrial Finishing Corporation, the last company to conduct plating operations at the Site. Liberty Industrial Finishing Corporation entered into an agreement with NYSDEC for cleanup of the Site. Limited cleanup activities were

conducted which consisted of the partial removal of soils from two Former Wastewater Disposal Basins.

In April 1984, the then owner of the Site, Four J's Company, among others, were brought into the State enforcement proceedings by Liberty Industrial Finishing and entered into an Order on Consent with NYSDEC to conduct a remedial investigation and feasibility study (RI/FS) under State law. An RI report was submitted to NYSDEC in November 1985; however, this report was not approved by NYSDEC. In March 1987, NYSDEC entered into a second Order on Consent with 55 Motor Avenue Company, who had assumed Four J's obligations under the first NYSDEC order, for an interim action involving the removal of contaminated soils from the Former Wastewater Disposal Basins. In July/August 1987, approximately 4,000 tons of metals-contaminated soils from the Sludge Drying Bed and Former Wastewater Disposal Basins were excavated and disposed of off-Site.

On June 10, 1986, the Liberty site was placed on the National Priorities List of federal hazardous substance sites. In May 1990, EPA assumed the role of lead agency for the Site from NYSDEC.

In September 1990, EPA utilized its contractor, Roy F. Weston, Inc. to conduct the RI/FS at the Liberty site. Field work was conducted from November 1991 to July 1992 and included various contaminant source and contaminant migration investigations and an ecological investigation. The initial RI report was completed in January 1994. This initial RI report defined much of the contamination at the Site, such as in soils on the western portion of the property, and in the Upper Glacial (shallow) aquifer. However, because the Magothy (lower) aquifer, the Massapequa Creek, and the majority of the soils and subsurface features consisting of vaults, drains, pipes, underground leaching chambers, underground storage tanks, and the northern and eastern sanitary leaching fields on the eastern portion of the property were not fully characterized during the initial RI, EPA determined the need to conduct a supplemental RI/FS for these areas.

Due to repeated instances of excavation and other disturbances, in March 1992, EPA issued an Administrative Order to the current Site owners under Sections 104(e) and 106(a) of CERCLA. Under this order, the property owners were required to refrain from excavating, disposing of, moving, or constructing upon soils at the Site and to refrain from taking any other actions, including disposal activities, that might interfere with EPA's investigation or remediation of the Site.

Based on the results of the initial RI report, EPA conducted a Removal Site Evaluation at the Liberty Site during late 1993 and early 1994, and subsequently determined that several localized areas of the Site posed an immediate risk to trespassers who may come in contact with these areas. These included electrical transformer areas contaminated with polychlorinated biphenyls (PCBs), wastes contained in underground storage tanks, and drums located at the Site. On August 30, 1994, EPA entered into an administrative order on consent (Removal AOC) to nine potentially responsible parties (PRPs) for performance of a time-critical removal action to remove immediate hazards posed primarily by PCBs and transport them to appropriate facilities for treatment and disposal. On August 30, 1994, EPA also issued a unilateral administrative order to six other PRPs directing them to coordinate with the Removal AOC respondents and to participate in the performance of the work required by the administrative order on consent or, in lieu thereof, to pay for their share of that work. Pursuant to the Removal AOC, the removal action began in late 1994 and all field work was completed in the Fall of 1995. This action eliminated the current-use risks associated with the Site. EPA also took steps to restrict access to areas of concern by installing fencing, repairing existing fencing, and posting warning signs.

After EPA released the initial RI report, the Agency had extensive discussions with the community, local officials, and PRPs on future land use and preliminary remedial alternatives for the western Site soils. A stakeholders group representing these parties was established and a mediator was brought in to facilitate the discussions. The mediation process officially began in October 1995 and initially consisted of private meetings and telephone conversations with various stakeholders, which were followed by seven joint sessions among all the stakeholders (the first session occurred on November 21, 1995). However, a consensus about the future land use could not be reached by the community, local officials and the PRPs. EPA ultimately decided, in April 1996, that for the purposes of identifying appropriate remedial alternatives, the reasonably anticipated future land use would be commercial/industrial primarily because the Site was zoned for industrial use from the 1920's until the mid-1980's and has been used for light industrial activities since that time.

In October 1996, EPA completed and released to the public a draft initial FS report which evaluated cleanup alternatives for addressing the contaminated soils on the western portion of the Liberty site. In accordance with the Agency's decision and

rationale regarding the reasonably anticipated future land use provided above, remedial alternatives presented in this draft initial FS report were developed for future commercial/industrial land use. Based on a supplemental soil sampling investigation that was conducted in January 1997, EPA revised the draft initial FS report.

In July 1997, EPA released an initial FS report and Proposed Plan for the remediation of the contaminated soils on the western portion of the Site to the public for comment. A public meeting and a public availability session were held in August 1997 and September 1997, respectively. Many commentors objected to EPA's commercial/industrial land use determination and also expressed concern about the lack of progress in addressing contaminated groundwater. In October 1997, after evaluation of the public comments received on the July 1997 Proposed Plan, EPA announced its decision to postpone the selection of a remedy for the soils on the western portion of the Liberty site to allow time for the Agency to assess further the impact of the soil remedy on the scope and duration of the future groundwater remedy.

On January 24, 1997, EPA issued an administrative order on consent to five PRPs for performance of the supplemental RI/FS (RI/FS AOC), to further characterize Site soils, Site groundwater and Massapequa Creek. Field work for the supplemental RI/FS was conducted from May 1997 to January 2000.

At the September 1997 public availability session, EPA also announced that it would move forward with an action to prevent the significantly contaminated portion of the groundwater contaminant plume (containing both VOCs and metals) from continuing to migrate from the Site until the future long-term comprehensive groundwater remedy was implemented. On March 31, 1998, the EPA selected an interim groundwater action to be performed as a non-time-critical removal action under CERCLA. On August 3, 1998, EPA issued a unilateral administrative order (Removal UAO) to all of the PRPs other than the two federal PRPs directing them to implement the interim groundwater action. The interim groundwater action, which addresses the groundwater plume known to originate at the Site, is being implemented by Coltec Industries with the cooperation of the two federal agency PRPs. Pilot testing of various innovative technologies for the interim groundwater action (similar to those of EPA's selected groundwater remedial alternative, discussed herein) began in December 1998 and was completed in May 1999. Construction of the full-scale interim groundwater treatment system began in November 1999. Treatment for VOCs was initiated in

January 2000, while treatment for metals was initiated in August 2000. However, various operational problems of significant nature that persisted for close to two years prevented the interim groundwater treatment system from continuous operation and effective treatment of groundwater contamination. As a result, in January 2002, EPA directed the PRPs to begin the process of converting the on-Site system into a conventional pump and treat system.

Additional information subsequently became available to EPA regarding the future use of the Site. On June 10, 1999, the Town of Oyster Bay released a study entitled "Preliminary Assessment of Utilizing the Western Portions of the Liberty Industrial Finishing Site for Parkland (May 7,1998)" which indicated a potential recreational use for the far western portion of the property. And, as discussed below, between July 2001 and March 2002, the Town took significant steps to acquire title to all or most of the western portion of the Site property for the purpose of expanding the adjacent Ellsworth Allen park and utilizing the property for recreational purposes. In December 2000, EPA was advised by the Town of Oyster Bay and by the owners of the Liberty site property, that the property owners had made application to the Town of Oyster Bay for a "special use permit" to permit the redevelopment of the easternmost ten acres of the Liberty site. The proposed project includes a supermarket and fueling facility/convenience store, uses that would be consistent with the anticipated commercial/industrial land use for the Site.

On March 27, 2002, EPA issued an administrative order on consent (Index number CERCLA-02-2002-2013) (the Features AOC) to four respondents who currently own and operate the real property included within the Site. The Features AOC requires those respondents to, among other things, i) investigate and remediate below-grade sumps, vaults, drains, pipes, underground leaching chambers, underground storage tanks and other features located on the eastern portion of the Site, as well as to investigate and, if necessary, to remediate the northern and eastern sanitary leaching fields which are also located on the eastern portion of the Site and to the extent that those features or leaching fields lie within the approximately ten acres that are planned by the Site owners for demolition in preparation of the Supermarket/fueling facility development; and ii) remediate by excavation and off-Site disposal an approximately 500 cubic yard mound of contaminated soils and other materials currently located on the western parcel of the Site near to the eastern parcel boundary. This ROD also selects all of

the work required by the Features AOC, but subject to its satisfactory completion pursuant to the Features AOC.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

As documented in the previous section, EPA had significant interaction with the community to discuss various reports proposed, proposed remedial efforts, and land use issues. The significant level of community input continued during the public comment period for the comprehensive remedy.

Upon completion of the supplemental investigations, EPA released supplemental RI/FS reports and the Proposed Plan to the public on April 10, 2001 and July 23, 2001, respectively. The July 2001 Proposed Plan, the supplemental RI/FS reports, and all other documents and information upon which the selected remedy is based were made available to the public in the administrative record file at the EPA Records Center in Region II, located at 290 Broadway, 20th Floor, New York, and also at the information repository established and maintained at the Farmingdale Public Library, located at 116 Merritt Road, Farmingdale, New York. The notice of the public meeting and availability of the above-referenced documents appeared in two newspapers, Newsday and the Farmingdale Observer on July 23, 2001 and July 27, 2001, respectively. These notices also announced a public comment period on the July 2001 Proposed Plan and supporting documentation from July 23, 2001 through August 22, 2001. The notice, as well as the July 2001 Proposed Plan, were also mailed to close to 700 interested parties on the Site mailing list. A press release announcing the public meeting and comment period was issued on August 1, 2001. On August 9, 2001, EPA held a public meeting at the Farmingdale Public Library to discuss remedial alternatives, to present EPA's preferred remedial alternatives, and to provide an opportunity for the interested parties to present comments and questions to EPA.

Per the public's request at the August 9, 2001 public meeting, EPA extended the public comment period by 30 additional days to September 21, 2001 and scheduled a separate public availability session for September 13, 2001. The notice of the public availability session and extension of the public comment period to September 21, 2001 appeared in the Farmingdale Observer and Massapequa Observer on August 24, 2001, August 31, 2001, and September 7, 2001, and in Newsday on August 28, 2001. The notice was also mailed to all interested parties on the Site mailing list. A press release announcing the same was issued on August 22, 2001.

However, because EPA's Region II office was closed due to the terrorist attacks on the World Trade Center (WTC), the September 13, 2001 public availability session was postponed. Also, because some public comments sent by regular mail were likely not received due to the closing of the postal facility in lower Manhattan, EPA further extended the public comment period to January 25, 2002 and rescheduled the public availability session for January 9, 2002. The notice of the public availability session and the public comment period extension appeared in the Farmingdale Observer and Massapequa Observer on December 14, 2001, December 21, 2001, and January 4, 2002, and in Newsday on December 12, 2001. The notice was also mailed to parties on the Site mailing list. EPA held the public availability session at the Farmingdale Public Library, to provide additional information and another opportunity to respond to comments and questions community members had regarding the proposed remedial alternatives.

Numerous comments were received on the supplemental RI/FS reports and the July 2001 Proposed Plan at the public meeting and the public availability session and throughout the public comment period. Comments and concerns raised by interested parties including members of the public relate to the use of innovative technologies for the comprehensive groundwater remedy; the discharge of treated groundwater; the extent of the Massapequa Creek remedy; human health and risk assessment issues; enforcement-related issues; however, the majority of comments received related to the preferred soil remedy. While there was a general sentiment among the commentors at the public meeting and the public availability session that EPA's preferred remedy was much improved relative to the preferred remedy described in the 1997 Proposed Plan, there was extreme dissatisfaction with preferred soil remedy, particularly with the component of the preferred remedy that would leave nearly 50,000 cubic yards of contaminated soils at the Site covered by an impermeable cap.

EPA received more than 400 letters, electronically and in writing, as well as verbal comments requesting that EPA change the proposed alternative for soil remediation from Alternative SL-2 (which would involve excavation and off-Site disposal of approximately 25,600 cubic yards of contaminated soils and capping of other lesser contaminated soils) to SL-3 (which would involve excavation and off-Site disposal of all contaminated soils that could potentially impact groundwater). Concerns were expressed over the long-term effectiveness of the 8.75-acre capping component of Alternative SL-2, with commentors asserting that the proposed cap would ultimately fail because effective cap maintenance, required to ensure the

integrity of the cap and remedy, could not be guaranteed. The commentors insisted that Alternative SL-3 should be selected because it is a permanent remedy that minimizes the potential threat to the sole source aquifer underlying the Site which serves as the drinking water supply for 44,000 people, and because it is more reliable than Alternative SL-2 in protecting human health and the environment. EPA also received oral and written comments from the elected representatives of the community unanimously requesting that EPA select Alternative SL-3 for many of the same reasons cited by the community members. During the comment period. EPA also became aware that the Town of Oyster Bay (Town) had taken significant steps towards formalizing plans to acquire nearly all of the western portion of the Site, including the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town also requested that EPA select Alternative SL-3, because they felt Alternative SL-2 would be incompatible with the recreational uses planned for the property proposed for acquisition. Further discussions and written information provided by the Town resulted in EPA's determination that SL-2 would interfere with the Town's ability to use the park over the short and long term. This information caused EPA to re-evaluate Alternatives SL-2 and SL-3 against the criteria listed in the NCP which EPA uses to evaluate remedies including: permanence and long-term effectiveness. Based upon this re-evaluation and the evaluation criterion of "community acceptance," EPA determined that Alternative SL-3 should be the selected remedy contingent upon the Town's acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does not complete the acquisition process within a time frame of approximately 6 to 8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy. In the event that Alternative SL-2 becomes the selected remedy, EPA will provide written notice to all stakeholders on the EPA mailing list for the Site.

Responses to the comments received at the public meeting and during the public comment period are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

The remedy selected in this ROD represents a long-term comprehensive remedy to address the on-Site soil contamination, the

on-Site and off-Site groundwater contamination, and localized contamination in pond sediments in Massapequa Creek downstream of the Site. The primary objective of the selected remedy is to reduce contaminant levels in affected media, including soils, groundwater, and pond sediments, to levels that are protective of human health and the environment.

The selected remedy will complement cleanup actions that have been and continue to be conducted under the removal program (described above): the 1994-95 time-critical PCB removal action that eliminated the current-use risks associated with the Site; the ongoing non-time-critical removal action (interim groundwater treatment system) that is treating the contaminated groundwater underlying the Site property; and the non-time-critical removal action to address the contaminated features, the 500 cubic yard mound of contaminated soils and the sanitary leaching fields.

SUMMARY OF SITE CHARACTERISTICS

The objective of the supplemental RI was to augment the initial RI data in order to more completely delineate the nature and extent of contamination at and emanating from the Site. In addition, an evaluation was also performed which established Site-specific cleanup concentrations in soils that would be protective of groundwater and would also be protective of human health for the most reasonably anticipated future uses of the Site property (commercial/industrial for the eastern portion and commercial/industrial or recreational for the western portion). Field work for the supplemental RI/FS was conducted by five of the Site PRPs pursuant to the RI/FS AOC, under EPA oversight, from May 1997 to January 2000. The supplemental RI/FS reports were issued in April 2001.

The results of the supplemental RI are summarized below by contaminated media, namely, soil, groundwater, and Massapequa Creek sediments. To assess the significance of the detected contaminants, a comparison was made in the supplemental RI report to applicable or relevant and appropriate federal and State environmental and public health requirements, and Site background conditions.

On-Site Soil Contamination

The initial RI and the supplemental RI confirmed several significant on-property source areas including the former

Wastewater Disposal Basins, the former Building B Basement area, the former Building B Ramp Pile, and the Northwest Disposal Area (see **Figure 2**).

The supplemental RI on-Site source investigation included the following field and analytical activities:

- ❑ geophysical investigation,
- ❑ soil gas survey,
- ❑ subsurface feature inspection and sampling,
- ❑ underground storage tank (UST) investigation,
- ❑ county storm drain sampling,
- ❑ soil screening and sampling conducted as part of a groundwater screening program, and
- ❑ comprehensive soil sampling program.

Geophysical Investigation

A geophysical investigation, using ground-penetrating radar (GPR) methods, was conducted at twelve (12) areas across the Site (see **Figure 3**). The objective of the GPR investigation was to further define and delineate suspected structures associated with leaching fields in specific portions of the Site, to identify the location of a possible basement structure beneath the floor slab of former Building D, and to verify the existence of suspected USTs at five on-Site locations. The results of the GPR surveys were used to locate soil and groundwater screening borings to further investigate these features.

Soil Gas Survey

A soil gas survey was conducted at the eastern paved portion (approximately 4 acres) of the Liberty property and along the south side of Motor Avenue to evaluate potential source areas for VOCs in subsurface soils or shallow groundwater (see **Figure 4**). The soil gas results from the eastern portion of the Site were used to optimize the location of soil and groundwater screening boring locations. The objective of collecting soil gas samples from the south side of Motor Avenue was to evaluate the presence of VOCs in shallow soils downgradient and off-property from the former

Wastewater Disposal Basins. A total of 78 soil gas samples were collected from the 42 borings and field-screened for total VOCs. Twenty-one percent of the screening samples were selected for off-property confirmatory laboratory analyses. Overall, the distribution of soil gas concentrations did not infer the presence of any significant VOC concentrations in soil and groundwater beneath the easternmost 4-acre portion of the Site.

Subsurface Feature Inspection and Sampling

A subsurface feature investigation and sampling program was undertaken in order to identify, describe, and determine the content of various sumps, vaults, drains, or other on-Site subsurface containment features that were located on the eastern portion but not sampled during the initial RI field program. In addition, the purpose of the sampling program was to provide an indication as to whether any of these features represents continuing sources to on-Site soil or groundwater contamination. **Table 1** and **Figures 5 and 6** summarize the locations of the 56 features that were considered during the CRI activities.

Of the 56 suspected or existing subsurface features (28 exterior and 28 interior) that were investigated, four subsurface features (SF-29, SF-44, SF-51, and SF-56) could not be located, but the remaining 52 subsurface features were inspected, described, accessed, and/or sampled. Of the 52 subsurface features, 30 were sampled for solids, aqueous material, or both. Of the 16 features that were found to contain aqueous material, 15 were sampled for aqueous analysis. Of the 33 features that were found to contain solids, 26 were sampled for solid analysis. The 15 aqueous samples and 26 solid samples were analyzed for VOCs, semivolatile volatile organic compounds (SVOCs), pesticides and PCBs, metals, and cyanide. In addition, 13 solid samples were analyzed to determine whether they are hazardous waste per the Toxicity Leachate Characteristics Procedure (TCLP), as regulated by the Resource Conservation and Recovery Act (RCRA). Sampling results indicated that the features do not represent significant sources of contamination (e.g., VOCs and metals) to on-Site soils or groundwater. However, the results did identify two SVOCs, namely, benzo[a]pyrene and dibenzo[a,h]anthracene, in concentrations as high as 0.041 milligrams/liter (mg/l) and 0.007 mg/l, respectively, in several of the subsurface features. These SVOCs do not present a potential threat to groundwater due to their limited mobility and low concentrations within the concrete subsurface features but would present a risk to future Site construction workers who may come in contact with these substances

(as further discussed in detail in ***Human Health Risk Assessment section,*** below). TCLP analytical results indicate that none of the samples tested were RCRA hazardous by characteristic.

The volumes of the accumulated soil and aqueous materials (which is believed to be primarily derived from surface drainage) within the inspected subsurface features were estimated as follows: roughly half of the features did not contain any significant materials, and the average size of each feature is on the order of two feet in diameter, with solids having accumulated to an average thickness of two feet and aqueous having accumulated to an average thickness of half a foot. Therefore, a conservative estimate of solid and aqueous materials present would amount to about 6 cubic yards and 40 cubic feet, respectively.

With the exception of the subsurface features in Buildings H and W, the identified features do not appear to be connected to one another over large distances. In addition, the features are not being actively used for any recognizable or intentional purpose by the current tenants. In general, the majority of the inspected subsurface features are self-contained sumps, chambers, or small holes in the ground, some of which have accumulated mud, leaves and surface runoff through time. Many of the pipes that were occasionally observed in these features are now blocked by debris. The few features that are connected (e.g., in Building H), appear to be linked by 8-inch to 12-inch diameter pipes with an estimated total length of 2,000 feet. Assuming that all the pipes are clogged with solids, the resulting additional volume in the pipes would amount to about 18.5 cubic yards.

As discussed above in **SITE HISTORY AND ENFORCEMENT ACTIVITIES** Section, EPA previously issued the Features AOC to four respondents who currently own and operate the Site which requires that they investigate and, as necessary remediate, the subsurface features on the approximately ten-acre portion of the eastern part of the Site property which will be the subject of demolition activities in preparation for commercial redevelopment of the Site. This ROD addresses the investigation and remediation of all of the Features. However, selection of the remediation of the features is subject to prior performance pursuant to the Features AOC.

Underground Storage Tank (UST) Investigation

An UST investigation was conducted to evaluate the suspected locations of five tanks (See **Figures 5 and 6**), which were inferred by Roy F. Weston, Inc. during the initial RI to potentially exist

based on their appearance on a fire insurance map, to determine if the tanks also received Site-related liquids such as waste solvents or PCB-bearing waste oils. Of the five suspected locations, four were investigated during the geophysical ground-penetrating radar (GPR) survey which indicated the presence of tank structures at three of the four investigated locations, north of Building C, between Buildings H and U, and north of Building A; the GPR survey did not indicate any evidence of a buried tank structure in a suspected area east of the former Building S pad. Due to safety considerations and inaccessibility, only UT-13, north of Building A, was sampled; one liquid sample was analyzed for RCRA hazardous waste characteristics for organics and metals, and pesticides and PCBs.

The analytical results did not indicate any significant concern for VOC or metal contamination; in addition, no pesticides and PCBs were detected. The TCLP analytical results indicate that the sample tested was not RCRA hazardous by characteristic. Fifteen soil samples were taken adjacent to the fifth suspected UST location north of the Wastewater Disposal Basins which showed limited VOC detections, all below NYSDEC soil guidance values (NYSDEC Technical and Administrative Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels, Revision 4/95). However, as part of the selected remedy, a more complete investigation of the three tanks (a UST north of Building C, a UST between Buildings H and U, and the aforementioned fifth suspected UST inferred to be located north of the Wastewater Disposal Basins that was not investigated via GPR survey), including sampling and analysis of any contents, would be conducted as part of the comprehensive soil remedy to determine if any remediation is necessary.

As discussed in the previous subsection "Subsurface Feature Inspection and Sampling," EPA previously issued the Features AOC to four respondents who currently own and operate the Site which requires that they investigate and, as necessary remediate, these three underground storage tanks. And, as discussed in the previous subsection, this ROD addresses the investigation and remediation of the underground storage tanks, but subject to its satisfactory completion pursuant to the Features AOC.

County Storm Drain Sampling

Historic plans indicated that the on-Site storm drainage system was connected to the county storm sewer system (one former connection existed from the former Wastewater Disposal Basins and one former

connection existed at the eastern portion of the Site). The county storm sewer discharges into the headwaters of Massapequa Creek near Spielman and Roberts Street. Soil/sludge materials present within five manholes accessing Nassau County storm sewer drains along the north side of Motor Avenue (See **Figures 5 and 6**) were sampled for Site-related constituents (VOCs, cadmium, chromium, or cyanide). Site-related VOCs (i.e., cis-1,2-DCE, TCE, and PCE) were not detected in any of the five samples. Cadmium and chromium were detected in concentrations which were all below their respective Site-specific soil cleanup levels.

Soil Screening and Sampling Conducted as Part of a Groundwater Screening Program

A soil screening and sampling program was implemented to evaluate the potential presence of dense nonaqueous phase liquid (DNAPL)[1] in the subsurface across the entire Site property and to acquire primarily supplemental VOC and metals soil data from locations surrounding suspected source areas. In all, 21 on-Site soil screening borings were completed (see **Figure 7**) and 28 soil samples were analyzed for VOCs, SVOCs, pesticides and PCBs, metals, and cyanide. In addition, four soil samples were collected from the suspected former Building D Basement area and the eastern portion of the Site for RCRA hazardous waste characteristics for organics and metals. Results from a DNAPL-screening test conducted, using a dye, concluded that the presence of DNAPL in on-Site soils is unlikely. Concentrations detected for VOCs, SVOCs, PCBs, and pesticides were below their respective TAGM values. Although cadmium and chromium were not detected above their respective Site-specific groundwater protection cleanup levels developed for the Site (details for the development of cadmium and chromium cleanup levels are provided below) in the subsurface soil samples (i.e., below 1 foot bgs), they were frequently detected at concentrations above their groundwater protection cleanup levels in surface soils and in soils sampled from the former Wastewater Disposal Basins

[1] Dense nonaqueous phase liquid (DNAPL) is a chemical (or mixture of chemicals) that is a liquid in its pure form, which does not readily mix with water but does slowly sink and dissolve in water. Generally, when present in the subsurface, DNAPLs slowly release vapor and dissolved phase contaminants, resulting in a zone of contaminant vapors above the water table and a plume of dissolved contaminants below the water table. DNAPLs, in general, are very difficult to remediate.

area. The TCLP analytical results indicate that the four soil samples tested were not RCRA hazardous by characteristics.

Comprehensive Soil Sampling Program

The comprehensive soil sampling program was conducted in the western portion and part of eastern portion of the Site to further delineate the horizontal and vertical extent of concentrations of cadmium, chromium, and VOCs. This effort was also conducted to derive Site-specific concentrations of cadmium and chromium that would be protective of the underlying groundwater aquifers using the Synthetic Precipitation Leachate Procedure (SPLP) methodology. Using a grid layout approach, 92 soil borings were completed to 20 feet bgs with samples collected at five-foot intervals, beginning with the collection of a surficial sample. The locations of the on-Site grid layout soil borings in Areas A through E are shown in **Figure 8**. Based on the analytical results for cadmium and chromium (total soil concentrations) and their corresponding SPLP extraction leachate from 18 samples collected from the four SPLP soil borings, 10 mg/kg cadmium and 143 mg/kg chromium were developed as Site-specific soil clean-up levels. (For comparison purpose, the NYSDEC TAGM values for cadmium and chromium are 10 mg/kg and 50 mg/kg, respectively.) Based on NYSDEC's Technical and Administrative Memorandum (TAGM), the following soil cleanup objectives were adopted for VOC contaminants: 0.7 mg/kg of TCE, 0.25 mg/kg of cis-1,2-DCE, and 1.4 mg/kg of PCE.

Thirty-four VOC soil samples were collected from Areas A, B, C, and the northern portion of Area D (excluding the former Wastewater Disposal Basins). Site-related VOCs were detected in only two soil samples (0.19 mg/kg and 0.13 mg/kg TCE), both within the Northwest Disposal Area and both below the TAGM value. Of the 42 VOC soil samples collected from the remainder of Area D (including the former Wastewater Disposal Basins), VOCs were detected in only five soil samples from locations near the former Wastewater Disposal Basins and at the northwest corner of former Building N. Two samples were above the TCE TAGM (0.7 mg/kg) with the highest concentration of 1.17 mg/kg; no other VOC TAGM values were exceeded. Of the 60 VOC soil samples collected from Area E, only one VOC, TCE, exceeded its TAGM value. TCE was detected in soil samples collected in the vicinity of the former Building B Basement area. The detected TCE concentrations ranged from 0.072 mg/kg to 5.09 mg/kg. Fifteen VOC confirmatory soil samples were collected from the former Building B Ramp Pile; none showed any Site-related VOC concentrations above respective TAGM values.

Three hundred and forty soil samples were collected from Areas A through E and analyzed for metals. The results indicate that the former Wastewater Disposal Basins, the former Building B Basement area, the Northwest Disposal Area, and the former Building B Ramp Pile are significant on-property source areas with cadmium and chromium concentrations well in excess of their respective soil cleanup levels; outside these source areas, cadmium and chromium were also detected, in scattered locations, in concentrations above their respective soil cleanup levels. In general, based on the supplemental soil sampling data for VOCs and metals, many of the locations where VOCs were detected in excess of their respective Site-specific soil cleanup levels are co-located with soils that also have cadmium and chromium concentrations above their respective soil cleanup levels.

Samples were also collected for RCRA TCLP characteristics analysis from the various source areas across the Site. Results indicated that samples collected from the Northwest Disposal Area, the former Building B Basement area, and the former Building B Ramp Pile tested positive for RCRA hazardous waste characteristics, due to metals contamination.

The supplemental RI results relating to on-property soils indicate that the majority, or approximately 95%, of the soil contamination is situated on the western portion of the Site (e.g., the former Wastewater Disposal Basins, the former Building B Ramp Pile, and the Northwest Disposal Area); the balance of the soil contamination is situated on the eastern portion of the Site (e.g., the Building B Basement area and the Building G floor drain).

The total volume of Site soils, based on above soil cleanup levels, that would require remediation was estimated at 73,100 cubic yards. In addition, due to the co-location of metal and VOC contaminants of concern, EPA believes that if the contaminated soils are remediated to 10 mg/kg cadmium and 143 mg/kg chromium soils cleanup levels, then the VOC contaminants in soils, estimated at approximately 500 cubic yards, will also be adequately addressed. The bulk of the contamination is located in four discrete areas: the Former Wastewater Disposal Basins (11,400 cubic yards), the Northwest Disposal Area (32,000 cubic yards), the Building B Basement (3,500 cubic yards), and the former Building B Ramp Pile (500 cubic yards); of these soils, the volume of RCRA hazardous soils was estimated to be 16,000 cubic yards. All 16,000 cubic yards of RCRA hazardous soils will be excavated for off-Site disposal and treatment at a RCRA Subtitle C facility. The remaining 25,700 cubic yards of soils represent low-level soil

contamination that are scattered and present throughout seven acres of soils that abut the four discrete source areas.

The results from the soil gas survey and soil borings completed on the easternmost 4-acre portion of the Site by Main Street indicate it is free of any soil contamination above the soil cleanup levels and, therefore, would qualify for a partial Site delisting from the National Priorities List. Similarly, with the exception of land included in the Northwest Disposal Area, the Site property bordering Ellsworth Allen Park does not appear to have been impacted by Site-related disposal activities.

Groundwater Contamination

An extensive groundwater investigation was conducted to evaluate the nature and extent of contamination in both the Upper Glacial aquifer and the Magothy aquifer. Initially, a groundwater screening program was conducted to evaluate groundwater and to optimize locations for permanent monitoring wells to be installed in the Upper Glacial and Magothy aquifers. A total of 17 on-property (see **Figure 9**) and 34 off-property (see **Figure 10**) groundwater screening borings were completed, from which 38 screening samples and 113 screening samples, respectively, were collected for analyses of VOCs, cadmium, and chromium. Based on the groundwater screening results, 7 on-property and 31 off-property monitoring wells were installed to augment the existing monitoring well network, which consisted of 26 initial RI monitoring wells (11 on-property and 15 off-property). Therefore, there are currently 16 on-property monitoring wells completed in the Upper Glacial aquifer and 2 on-property monitoring wells completed in the Magothy aquifer (see **Figure 11**). In addition, there are currently 26 off-property monitoring wells completed in the Upper Glacial aquifer and 20 off-property monitoring wells completed in the Magothy aquifer (see **Figure 11**). In all, three rounds of new and existing monitoring well sampling were conducted. The first sampling round included 9 on-property wells and 29 off-property wells, the second sampling round included 10 on-property wells and 33 off-property wells (including the Farmingdale High School irrigation well), and the third sampling round included 1 on-property well and 14 off-property wells.

Sampling results indicate that two distinct plumes exist beneath the property. These plumes have been designated as Plume A and Plume B. Plume A originates on the western portion of the Liberty property, while Plume B apparently originates primarily upgradient of the Site, east of Plume A. Plume A is characterized by TCE

concentrations (including degradation products such as cis-1,2-DCE) coming mainly from the former Building B Basement area and the former Wastewater Disposal Basins and extending south-southwest (generally west of Woodward Parkway). There is no significant PCE concentration in Plume A. Plume A is also characterized by chromium and cadmium contamination. Plume B is characterized by PCE concentrations (including degradation products) and extends across the Site toward the south-southwest (generally east of Woodward Parkway). PCE contamination was highest approximately 300 feet north of the Liberty property with a concentration of 1,100 micrograms/liter (µg/l) which indicates that the primary source of Plume B contamination is upgradient of the Liberty property. Unlike Plume A, Plume B is not characterized by chromium and cadmium contamination. Both Plumes A and B were delineated as relatively narrow in shape, which is typical of plumes in sandy aquifers similar to the Upper Glacial aquifer. The on-property and off-property extent of contamination in Plume A has been delineated while further investigation of Plume B and its source(s) is being conducted by EPA.

In Plume A, the cadmium and chromium contamination exists throughout the Upper Glacial aquifer under the Liberty property (maximum detected concentrations of 262 µg/l cadmium and 156 µg/l chromium) and to a lesser extent in the the upper portion of the Magothy aquifer (maximum detected concentration of 10 µg/l chromium - cadmium was not detected). The Safe Drinking Water Act Maximum Contaminant Levels (MCLs) for cadmium and chromium are 5 µg/l and 50 µg/l, respectively. Inorganic contamination in the off-property groundwater is almost entirely limited to the Upper Glacial aquifer (maximum detected concentrations of 135 µg/l of cadmium and 553 µg/l of chromium); chromium was detected at a concentration of 63.5 µg/l in one sample collected from a monitoring well located near the intersection of Fallwood Parkway and Kent Street and screened in the upper portion of the Magothy aquifer. The inorganic contaminant plume appears to extend approximately a mile beyond the Site property just to the north of the Southern State Parkway.

Plume A sampling data for groundwater beneath the Liberty property indicated that VOC contamination is limited to the upper portion of the Upper Glacial aquifer (maximum detected concentrations of 1,500 µg/l of TCE, 810 µg/l of cis-1,2-DCE, and 2 µg/l of PCE); the MCL for TCE, cis-1,2-DCE and PCE is 5 µg/l. VOC sampling data for off-property groundwater revealed that Site-related VOC contamination is present throughout the Upper Glacial aquifer (maximum detected concentrations of 160 µg/l of TCE, 48 µg/l of cis-1,2-DCE, and 7

µg/l of PCE) and into the upper portion of the Magothy aquifer (maximum detected concentrations of 490 µg/l of TCE, 24 µg/l of cis-1,2-DCE, and 3 µg/l of PCE) between Fallwood Parkway and the Woodward Parkway Elementary School; samples collected from the upper portion of the Magothy aquifer downgradient of the school, however, did not exceed drinking water standards. The VOC contaminant plume within the Upper Glacial aquifer also appears to extend approximately a mile beyond the Site property just to the north of the Southern State Parkway.

The depth to the water table is approximately 21 feet bgs, although the Site groundwater table fluctuates between 15 feet bgs and 21 feet bgs. Based on six rounds of groundwater elevations (or depth-to-groundwater table measurements), groundwater flow within the Upper Glacial aquifer was determined to be predominantly horizontal and in the south-southwesterly direction; the horizontal flow velocity in the Upper Glacial aquifer was estimated to be about 1.6 feet/day. The direction of the horizontal component of groundwater flow within the Magothy aquifer is also in the south-southwesterly direction, with a slight south-southeasterly component north of the Farmingdale High School; the horizontal flow velocity in the Magothy aquifer was estimated to be about 0.17 feet/day.

A numerical groundwater fate and transport model, using the United States Geological Survey (USGS) MODFLOW/MT3D model, was also conducted to simulate groundwater flow and transport in the vicinity and downgradient of the Site. The model domain included the Farmingdale and Bethpage area to the north and the Massapequa and Wantagh regions to the south of the Site. In addition, the USGS MODPATH code was used to assess flow paths and travel times between the Site and areas of groundwater discharge. The model was calibrated against observed head data obtained during the supplemental RI activities and against well data contained in the Nassau County Department of Public Works database (e.g., observation wells, supply wells, pumping information). During the calibration process, the flow model input parameters (i.e., literature-based values for hydraulic conductivity, recharge, etc.) were adjusted to produce a model calibrated to average, observed groundwater elevation data. Sensitivity analyses for the main model parameters were performed. The time-versus-concentration plots for cadmium, chromium, and TCE for the 1940-2010 period, generated by the fate and transport model, show that the concentrations of these contaminants peaked during the 1950's and 1960's and have decreased or remained stable since that time.

Through a collaborative effort with the Massapequa and South Farmingdale Water Districts, six sentinel monitoring wells were installed upgradient of the water districts' drinking water supply well fields to serve as an early warning system should contamination migrate close to the well fields. The water districts' periodic monitoring of these sentinel wells has not detected any Site-related contamination.

Massapequa Creek and Preserve

The initial RI revealed that the Liberty groundwater contaminant plume within the Upper Glacial aquifer discharges into Massapequa Creek north of Pond A. The County storm sewer system, to which the on-Site storm drainage system is connected, also discharges into the headwaters of Massapequa Creek. **Figure 12** shows several detention ponds along the Massapequa Creek corridor. From north to south, these ponds are referred to as Pond A (north of the Southern State Parkway), Pond 1, Pond 2, Pond 3, Pond 4 (also referred to as Massapequa Reservoir and located south of Sunrise Highway), and Pond 5 (also referred to as Massapequa Lake, located north of Merrick Road and approximately 4.5 miles south of the Site). These ponds were constructed to control localized flooding and silting of the streambed. The conceptual model of Site contamination based upon the RI indicates that these ponds serve as detention basins for runoff and associated sediments entering the creek from the watershed. Pond A, being located farthest upstream and closest to the Liberty Site, therefore has the greatest potential to be affected by contaminated groundwater discharge from the Liberty Site. This information indicated the need to expand the limited investigation of the Massapequa Creek that was initially conducted during the initial RI.

The objective of the supplemental RI was to further define the extent of groundwater discharge, and to evaluate potential ecological effects in an ecological risk assessment. The supplemental RI included the following activities:

- surface water sampling,
- stream and pond sediment sampling,
- sediment toxicity (bioassay) testing,
- fish sampling, and
- benthic macroinvertebrate surveys.

Figure 12 shows the ecological sampling locations in the Massapequa Creek and ponds that were investigated. Mill Pond, located in Bellmore approximately four miles west of the Massapequa Preserve, was utilized as a reference pond with which to compare results of the supplemental RI. Analytical results from the supplemental RI were screened in order to determine potential ecological risks from groundwater requiring further evaluation in the risk assessment. Exceeding screening benchmarks does not necessarily indicate the need for cleanup, or even the presence of actual risks, but indicate the need for further Site-specific evaluation of potential ecological risks in order to form the basis of informed risk management decisions. Results of the supplemental RI indicated that several chemicals present in groundwater discharging from the Site were also present in surface water and sediment at levels exceeding ecologically-based screening benchmarks. The highest frequency and magnitude of these values were noted in Pond A.

Surface Water Sampling

Surface water samples were collected from 13 locations within the Massapequa Creek system and analyzed for VOCs and cadmium, chromium and lead. The samples were collected between the eastern branch headwaters of Massapequa Creek and just south of Pond 2. Results indicated only trace concentrations of VOCs in the surface water samples, none above the NYSDEC chronic ambient water quality standards (AWQS). The major VOC constituent detected was methyl-tertiary butyl ether (MTBE), a common anti-knock gasoline additive, which is non-Site-related and was likely introduced into the Massapequa Creek by stormwater runoff from the adjacent highways and urban development. TCE in excess of 1 µg/l was only detected north of Pond A. Cadmium was detected above the NYSDEC chronic AWQS between Pond A and Pond 1 and above the NYSDEC acute AWQS upstream of Pond A; cadmium concentrations to the south of Pond 1 were either nondectable or below the AWQS. Total chromium concentrations were below the NYSDEC AWQS throughout the study area. Hexavalent chromium concentrations exceeded the AWQC only north of Pond A. These results are compatible with overall characteristics of shallow groundwater discharge into the Massapequa Creek.

Stream and Pond Sediment Sampling

Five rounds of stream sediment and pond sediment sampling were conducted, though not all locations were sampled in each round.

During the first round, 15 stream or pond sediment samples were collected from locations within the Massapequa Creek and ponds, between the headwaters of the Massapequa Creek and just south of Pond 2. During the second round, 11 pond sediment samples were collected from two locations in Pond A, three locations in and near Pond 1, three locations in Pond 2, and three locations in Pond 3. During the third round, 14 pond sediment samples were collected from one location from Pond A, one location from Pond 1, one location from Pond 2, two locations from Pond 3, three locations from Pond 4 (Massapequa Reservoir), and three locations from Pond 5 (Massapequa Lake), and one location from reference pond (Mill Pond). During the fourth round, 8 sediment samples were collected from Pond A, Pond 1, Pond 2, Pond 3 (two locations), Pond 4, Pond 5, and Mill Pond. During the fifth round, 11 pond sediment samples were collected from Pond A.

Sediment samples collected during rounds 1 and 2 were analyzed for VOCs and metals. Samples collected during rounds 3, 4, and 5 were analyzed for metals only, in particular, cadmium, chromium and lead. Only trace concentrations of the Site-related VOCs, TCE (0.6 to 1.0 µg/kg) and 1,1,1-TCA (0.5 to 2.2 microgram/kilogram (µg/kg)), which is a degradation product of TCE, were detected. Metal concentrations in stream sediments were lower (by about two orders of magnitude) than the metals concentrations in pond sediments. The metals data were compared to NYSDEC guidance values used to screen contaminated sediments for possible adverse ecological impacts. Cadmium concentrations which exceeded the NYSDEC Severe Effect Level (SEL) sediment screening guideline (9 mg/kg) in all ponds except the reference pond (Mill Pond), were highest in Pond A and Pond 1. Chromium concentrations also exceeded the NYSDEC SEL sediment screening guideline (110 mg/kg) in all ponds except the reference pond; chromium concentrations were highest in Pond A, Pond 1, and Pond 4. Lead concentrations also exceeded the NYSDEC SEL sediment screening guideline (110 mg/kg) in all ponds except the reference pond; lead concentrations were highest in Pond A, Pond 1, and Pond 5. Lead is considered non-Site-related as it is believed to have been introduced into the Massapequa Creek via urban runoff.

As the NYSDEC SELs are generic guidance criteria, they suggest the possibility for adverse ecological impacts. In such situations, Site-specific information (e.g., sediment toxicity analyses, fish tissue analyses, and macroinvertebrate analyses) is usually relied upon to provide additional information regarding the potential for ecological effects to result from exposure to contamination present in the system.

Sediment Toxicity (Bioassay) Testing

Sediment toxicity testing was performed to evaluate whether the metals concentrations in sediments have any effect on the survival of acclimated test organisms. Two rounds of sediment toxicity tests were conducted; the first round was conducted on sediments from all six Massapequa Creek ponds and the second round was conducted on sediments from only Pond A where the highest cadmium, chromium, and lead concentrations of 248 mg/kg, 839 mg/kg, and 1,160 mg/kg, respectively, were detected. The sediment toxicity tests were conducted on two standard benthic invertebrate test organisms (*Hyalella azteca and Chironomus tentans*) by exposing them to Site sediments. Pond sediments with cadmium concentrations of at least 99.9 ppm and chromium concentrations of at least 457 ppm caused a significant reduction in survival of *Hyalella azteca* and a significant reduction in growth of *Chironomus tentans* compared to the control sediments.

Fish Sampling

Fish tissue sampling was performed to determine metals concentrations in fish tissue, or bioaccumulation, for use in the human and ecological risk assessments. Fish samples (carp and sportfish) were collected from five ponds (Pond A and Pond 2 through Pond 5) and the reference location. Both carcass and fillet analyses were performed for lead, chromium, and cadmium. Fish tissue analytical data indicate that the concentrations of chromium, cadmium, and lead were higher in fish collected from Pond A compared to the downstream ponds. This difference was most pronounced for lead in carp, as might be expected considering the niche of these species. The carp is a bottom feeder with a limited forage range, while sportfish (e.g., bluegill and pumpkinseed) are more mobile and tend to feed in the water column. In Pond A, the decreasing order of relative concentration above the reference sample was lead, chromium and cadmium. In Pond A whole fish sample for carp, lead, chromium, and cadmium were detected at 6.8 mg/kg, 4.0 mg/kg, and 1.0 mg/kg, respectively. For comparison, in reference Mill Pond whole fish sample for carp, lead, chromium, and cadmium were detected at 1.0 mg/kg, 0.42 mg/kg, and 0.025 mg/kg, respectively.

Benthic Macroinvertebrate Surveys

The objective of the benthic macroinvertebrate survey was to evaluate the abundance and diversity of the macroinvertebrate community in the ponds along Massapequa Creek. The composition of

this community can be a useful indicator for the degree of overall impacts to the ecological habitat. Twelve sediment samples for macroinvertebrate analyses were collected from ponds along Massapequa Creek. Results from the macroinvertebrate study indicate that the benthic macroinvertebrate populations at all locations, including the reference location, were impoverished, of low diversity, and consisted largely of bloodworms, a few midges, and leaches. This is attributed to the introduction of contaminants into the locations from urban runoff. However, Pond A was found to have the lowest diversity and the least evenness of all ponds. The Mill Pond reference location also had very low number of total specimens, richness, diversity and evenness.

Additional details on the Site-specific sediment toxicity analyses, fish tissue analyses, and macroinvertebrate analyses as to their risk implications are described under "Summary of Site Risks" below.

SUMMARY OF SITE RISKS

A Human Health Risk Assessment Update (HHRA) (and HHRA Addendum) and Ecological Risk Assessment Update (ERA) were conducted to estimate the human and ecological risks associated with current and future Site conditions. A baseline risk assessment estimates the human health and ecological risk which could result from the contamination at the Site, if no remedial action were taken. As described above, during the comment period, EPA became aware, after the HHRA had already been prepared, that the Town of Oyster Bay had taken significant steps towards formalizing plans to acquire nearly all of the western portion of the Site for recreational development. The Town advised EPA that its planned recreational uses might include, among other uses, walking/nature trail and sensory gardens, a picnic area, cabins, and campgrounds for Boy Scout outings. Based on this information, EPA re-evaluated in the HHRA Addendum potential cancer risks and noncancer hazards associated with these potential future uses of the western portion of the Site.

Human Health Risk Assessment

A four-step process is utilized for assessing Site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification--identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence,

and concentration. Exposure Assessment--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed. Toxicity Assessment--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). Risk Characterization--summarizes and combines results of the exposure and toxicity assessments to provide a quantitative assessment of Site-related risks.

Current Federal guidelines for acceptable exposures are an individual lifetime excess carcinogenic risk to a reasonably maximally exposed individual in the range of 10-4 to 10-6 (e.g., a one-in-ten-thousand to a one-in-a-million excess cancer risk or likelihood of an additional incidence of cancer) and a Hazard Index (HI) (which reflects noncarcinogenic effects for a human receptor) equal to 1.0. An HI greater than 1.0 indicates a potential for noncarcinogenic health effects.

For purposes of the HHRA, the following potential exposure areas were considered: western portion of the Site, eastern portion of the Site, off-property residential areas (includes Ellsworth Allen Park and Woodward Parkway School), and the Massapequa Preserve.

Hazard Identification

During data evaluation, relevant Site information is compiled and analyzed, in order to select contaminants of concern (COCs). For the Liberty site, several inorganic chemicals and organic compounds meeting appropriate QA/QC requirements were selected as COCs because of the potential hazard they pose to human health and the environment. Selection of COCs that would be representative of Site risks for specific environmental media was made for the following potential exposure areas:

- western portion of the property (surface soil, surface/subsurface soil, on-property Upper Glacial groundwater, and on-property Magothy groundwater),
- eastern portion of the property (solid waste, aqueous waste, and surface/subsurface soil),
- off-property residential areas (subsurface soil, off-property Upper Glacial groundwater and off-property Magothy groundwater), and

- Massapequa Preserve (surface water, sediment, and fish tissue).

The most frequently selected COCs include cadmium, chromium, and TCE. **Table 2** summarizes the COCs and medium-specific exposure point concentrations for the COCs detected in various media within the aforementioned four potential exposure areas.

Exposure Assessment

Exposure point concentrations were calculated from sample data sets (e.g., soil and sediment) to represent the reasonable maximum exposure (RME) to various current and hypothetical future individuals on and around the Liberty site. **Table 3** provides a limited conceptual Site model of potential exposures for the Liberty site. This table focuses on those exposure pathways associated with unacceptable levels of risk. A complete conceptual Site model can be found in Table 1 of the HHRA. Based on current and future land uses, groundwater uses and surface water uses, the HHRA evaluated potential health effects for the following exposure pathways for current and/or future Site use scenarios for each of the four potential exposure areas.

- Western Portion of the Property

  Current Trespassers - ingestion of, dermal contact with, and inhalation of surface soil; inhalation of surface/subsurface soil; and inhalation of vapors from Upper Glacial groundwater by a trespasser.

  Future Commercial/Industrial Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; inhalation of vapors from Upper Glacial groundwater; inhalation of vapors from Magothy groundwater; and ingestion of Magothy groundwater.

  Future Construction Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; inhalation of vapors from Upper Glacial groundwater; inhalation of vapors from Magothy groundwater; and ingestion of Magothy groundwater.

  Future Recreational Users - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; inhalation of vapors from Upper Glacial groundwater;

inhalation of vapors from Magothy groundwater; and ingestion of Magothy groundwater (ingestion of, and dermal contact with, soils were re-evaluated in the HHRA Addendum).

- Eastern Portion of the Property

  Current Trespassers - inhalation of solid waste and aqueous waste.

  Current Commercial/Industrial Workers - inhalation of solid waste.

  Future Commercial/Industrial Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; and inhalation of solid waste and aqueous waste.

  Future Construction Workers - ingestion of, dermal contact with, and inhalation of surface/subsurface soil; ingestion of, dermal contact with, and inhalation of solid waste; and dermal contact with and inhalation of aqueous waste.

- Off-property Residential Areas

  Current Off-property Residents - inhalation of Upper Glacial groundwater.

  Current Off-property School Children - inhalation of Upper Glacial groundwater.

  Current Off-property School Employees - inhalation of Upper Glacial groundwater.

  Future Off-property Residents - ingestion of, dermal contact with, and inhalation of Magothy groundwater.

  Future Off-property Recreational Users - ingestion and inhalation of Upper Glacial groundwater; and ingestion of, dermal contact with, and inhalation of subsurface soils.

- Massapequa Preserve

Current Swimmers - ingestion of and dermal contact with surface water; and ingestion of and dermal contact with sediment.

Current Fishers - ingestion of fish tissue.

Many of the sample locations were biased, i.e., they were selected due to the presence of elevated levels of contaminants. Therefore, the values calculated on those data sets are a conservative estimate of the RME. In addition to the calculation of exposure point concentrations (**Table 2**), several Site-specific assumptions regarding future land-use scenarios and exposure pathways, e.g., inhalation, ingestion, and dermal contact, were made. Assumptions were based on Site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of Site-specific data.

Toxicity Assessment

Standard dose conversion factors, oral and inhalation reference doses, and oral and inhalation cancer slope factors were used to estimate the noncarcinogenic and carcinogenic hazards associated with Site contaminants. **Tables 4 and 5** provide the cancer and noncancer toxicity data, respectively, for the COCs based on information in the Integrated Risk Information System (IRIS), the 1997 Health Effects Assessment Summary Tables, and EPA's National Center for Environmental Assessment Superfund Technical Support Team. The risk estimators used in this assessment are accepted by the scientific community as representing reasonable projections of the hazards associated with exposure to the various COCs.

At this time, cancer slope factors and Reference Doses are not available for the dermal route of exposure. Thus, the dermal slope factors used in the assessment have been extrapolated from oral values using appropriate adjustment factors based on data on the chemical's absorption. Adjustments in the oral cancer slope factors and Reference Doses are listed in Tables 5 and 6 of the July 2000 Final Baseline Human Health Risk Assessment report.

A number of chemicals lack adequate toxicity information to quantify the potential risks and hazards associated with exposure. A list of the chemicals not quantitatively evaluated are also provided in the July 2000 Final Baseline Human Health Risk Assessment report. Lack of data to quantify risks and hazards for these chemicals may potentially underestimate the risks and hazards at the Site.

Risk Characterization

The Risk Characterization summarizes the risks and hazards for chemical contaminants through various routes of exposure.

For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

Risk = CDI x SF

where: risk = a unitless probability (e.g., 2×10^{-5}) of an individual's developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$.

These risks are probabilities that usually are expressed in scientific notation (e.g., $1x10^{-6}$). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of Site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for Site-related exposures is 10^{-4} to 10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., life-time) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ<1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemical(s) of concern that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI<1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are

unlikely. An HI > 1 indicates that Site-related exposures may present a risk to human health.

The HQ is calculated as follows:

Noncancer HQ = CDI/RfD

where: CDI = Chronic daily intake
RfD = reference dose.

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

The risks presented in **Tables 6 and 7** summarize the cancer risks from exposure to those chemicals with risks greater than 1 in 1,000,000 and the noncancer hazards from exposure to those chemicals with Hazard Index greater than 1, respectively.

For the western portion, in the HHRA, the only receptor whose noncarcinogenic hazard exceeds EPA's benchmark value of an HI of 1 is the commercial/industrial worker, exposed to contaminants in the Upper Glacial groundwater and evaluated under a future use scenario, with an HI of 8.9. This exposure currently does not occur, since groundwater is not used as a drinking water source at the Site. The primary contributors to this HI are cadmium (HQ of 7.5) and chromium (HQ of 1.4). None of the cancer risks estimated for the western portion exceed EPA's target risk range. As discussed below (see Human Health Risk Assessment Addendum - Western Parcel), the HHRA Addendum determined that there is an unacceptable noncancer risk to certain recreational users.

For the eastern portion, the receptor whose cumulative risk exceeds one-in-a-million excess cancer risk is the future construction worker (1×10^{-3}), which is greater than the upper boundary of the acceptable cancer risk range. For the future construction worker, the primary contributing medium and route is dermal exposure to aqueous waste, with benzo(a)pyrene and dibenzo(a,h)anthracene as the primary contributors to the cumulative risk. Dermal protection during handling of aqueous wastes would significantly reduce potential exposure and risks for this receptor. The only receptor whose cumulative hazard index exceeds 1.0 is the future construction worker (31). The primary contributor to the hazard index is dermal exposure to aqueous wastes, with chromium (HQ of 1.5) and a PCB (Aroclor 1260 with an HQ of 31) being the primary contaminants of concern.

For the off-property residential areas, the receptors whose cumulative cancer risks exceed EPA's target cancer risk are current and future off-property residents. The current off-property resident's cumulative cancer risk from exposure to the Upper Glacial groundwater is 1.9×10^{-3}, which is driven by vinyl chloride and 1,1-DCE (two degradation products of TCE). The evaluation of noncarcinogenic effects shows that the hazards to the off-Site child resident are 95 (HI values for cadmium of 35, for chromium of 8.7, and for manganese of 50), and the off-Site adult resident are 26 (HI values of 8.4 for cadmium, 6.1 for chromium, and 11 for manganese). Under a future use scenario, the risks to the child and adult residents from exposure to the Magothy groundwater are 4.5×10^{-4}, with vinyl chloride and 1,1-DCE as the most significant contributors to the risk. The noncarcinogenic hazards to the off-Site residents using the Magothy groundwater are 6.8 for the child resident, with chromium (HQ of 1.7) and manganese (HQ of 3.2) as the primary chemicals of concern. The HI for the adult resident is less than EPA's acceptable level. It is noted, however, that these scenarios are hypothetical as the groundwater in the vicinity of the Site is not used for public drinking water supply.

For the Massapequa Preserve, all carcinogenic risks estimated for surface water, sediment, and fish tissue are within EPA's acceptable risk range for all populations. Noncarcinogenic HI values for surface water and fish tissue for all populations and for adults exposed to sediment are less than EPA's benchmark of an HI value of 1. The HI value for children exposed to sediment slightly exceeds the benchmark (HI of 1.1), although no HQ values for an individual chemical exceeds 1.

Finally, several locations were identified as potential areas of concern for chromium. Dermal exposure to chromium may result in allergic responses in certain sensitive individuals, which is called "contact dermatitis." The areas of concern are the western portion surface samples in the northwest disposal area and the southern portion of the disposal basins; the western portion subsurface soil in and near the disposal basins, northwest disposal area and the ramp excavation pile on the Building N foundation (or former Building B Ramp Pile); and the eastern portion subsurface soil in the Building B basement. Potential effects from exposure to chromium in these areas can be managed and reduced by following the appropriate measures as outlined in the health and safety plan, including wearing gloves and other personal protection equipment and limiting exposure to the contaminated materials.

Human Health Risk Assessment Addendum - Western Parcel

In the HHRA Addendum, a four-step process similar to that of the HHRA was utilized for assessing Site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization. The HHRA Addendum re-evaluated potential cancer risks and noncancer hazards associated with the Town of Oyster Bay's planned future recreational uses of the western portion of the Site, as described above, for the following receptors: adults (over the age of 18 years), adolescents (age of 6 - 18 years), and children (under the age of 6 years).

For an adult recreational user, the cancer risk is within the acceptable range of 10^{-6} to 10^{-4}, while the noncancer risk, from exposure via incidental ingestion and dermal contact, is within EPA's acceptable level of an HI of less than or equal to 1.

For an adolescent recreational user, the cancer risk is within the acceptable range. The noncancer risk slightly exceeds the acceptable level of an HI of 1. When this occurs, the next level of evaluation requires that the HI for each target organ should be calculated to see if the HI for any target organ exceeds the acceptable level. The HI for each target organ is below the benchmark value of 1. This indicates that adverse health effects are not expected for the adolescent as a result of possible exposure to Site-related contaminants.

For a child recreational user, the cancer risk is within the acceptable range. However, the noncancer risk exceeds the benchmark value of 1 (HI of 8.6). The significant contributors to this value are cadmium (HQ of 4.0) and hexavalent chromium (HQ of 1.4). These hazard quotients indicate the potential for noncancer health effects if no remediation occurs. Additional details are provided in an EPA document entitled, "March 25, 2002 Liberty Industrial Finishing Site Human Health Risk Assessment Addendum - Western Parcel," which is provided in **APPENDIX I** to this ROD.

Ecological Risk Assessment

The purpose of the Ecological Risk Assessment Update (ERA), which was conducted as part of the supplemental RI, was to identify and estimate the potential ecological impacts associated with the exposure of fish and wildlife to Site-related contamination within the Massapequa Preserve. Specifically, the ERA focused on the potential impacts of the COCs found in sediments and surface waters

of the Massapequa Preserve, downstream of the zone of influence of a groundwater plume that originates at the Site, to terrestrial and aquatic ecological receptors.

A four-step process is utilized for assessing Site-related ecological risks for a reasonable maximum exposure scenario:

- *Problem Formulation* - a qualitative evaluation of contaminant release, migration, and fate; identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study.

- *Exposure Assessment* - a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations.

- *Ecological Effects Assessment* - literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors.

- *Risk Characterization* - measurement or estimation of both current and future adverse effects.

Surface water and sediment of the Massapequa Preserve were analyzed for both inorganic and organic chemicals, and fish tissues were analyzed for cadmium, chromium, and lead. The COCs were identified by comparing contaminant concentrations in surface water and sediment with the ecologically-based screening benchmarks. Detection of cadmium, chromium, and lead (which is believed to have been introduced into the Massapequa Creek via urban runoff) in most of the Massapequa Creek Pond sediment samples at concentrations above their respective NYSDEC SELs suggested the possibility of adverse effects. Therefore, as explained above, sediment toxicity testing (bioassays) and fish tissue analyses were conducted to further assess the potential effects.

Sediment toxicity testing was performed to evaluate whether the metals concentrations in sediments have any effect on the survival of acclimated test organisms. These tests are bioassays conducted in a laboratory where certain organisms are exposed to contaminated sediment samples and monitored. Two rounds of sediment toxicity tests were conducted; the first round was conducted on sediments from all six Massapequa Creek ponds and the second round was conducted on sediments from only Pond A where

the highest cadmium, chromium, and lead concentrations of 248 mg/kg, 839 mg/kg, and 1,160 mg/kg, respectively, were detected. The sediment toxicity tests were conducted on two standard benthic invertebrate test organisms (*Hyalella azteca* and *Chironomus tentans*) by exposing them to Site sediments. The bioassay results indicated toxicity to the test organisms from exposure to the sediment samples from Pond A. Pond sediments with cadmium concentrations of at least 99.9 ppm and chromium concentrations of at least 457 ppm caused a significant reduction in survival of *Hyalella azteca* and a significant reduction in growth of *Chironomus tentans* compared to the control sediments.

Fish tissue sampling was performed to determine metals concentrations in fish tissue for use in the human and ecological risk assessments. Fish samples were collected from five pond locations in Massapequa Preserve (Pond A and Pond 2 through Pond 5) and from the reference location. Both carcass and fillet analyses were performed for lead, chromium, and cadmium. Comparison of the fish tissue data with literature-based toxicological body burden data indicated that fish are potentially at risk in Pond A. The highest body burdens of chromium and lead were reported in fish collected from Pond A. Comparison of the fish tissue data with literature-based toxicological body burden data indicated that fish are potentially at risk from the contaminated sediments in Pond A. The highest concentrations of cadmium were found in fish from Pond A and Pond 5. The highest concentrations of chromium and lead were found in fish from Pond A. In Pond A, the whole fish sample for carp contained lead, chromium, and cadmium at 6.8 mg/kg, 4.0 mg/kg, and 1.0 mg/kg, respectively.

The objective of the benthic macroinvertebrate survey was to evaluate the abundance and diversity of the macroinvertebrate community in the ponds along Massapequa Creek. Twelve sediment samples for macroinvertebrate analyses were collected from ponds along Massapequa Creek. As explained above, results from the macroinvertebrate study indicate that the benthic macroinvertebrate populations at all locations, including the reference location, were impoverished, of low diversity, and consisted largely of bloodworms, a few midges, and leaches. This is attributed to the introduction of contaminants into the locations from urban runoff. Pond A was found to have the lowest diversity and the least evenness. However, the Mill Pond reference location also had very low number of total specimens, richness, diversity and evenness.

Based on the weight-of-evidence from the cumulative Massapequa Creek investigatory results as described above, it was concluded that Pond A poses potential risks to ecological receptors that include benthic invertebrates and fish.

Discussion of Uncertainties in Risk Assessment

The procedure and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis;
- environmental parameter measurement;
- fate and transport modeling;
- exposure parameter estimation; and,
- toxicological data.

Uncertainty in environmental sampling arises, in part, from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the contaminants of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the contaminants of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the baseline human health risk assessment provides upper-bound estimates of the risks to populations near the Site, and it is highly unlikely to underestimate actual risks related to the Site.

Specifically, several aspects of risk estimation contribute uncertainty to the projected risks. EPA recommends that the arithmetic average concentration of the data be used for evaluating long-term exposure and that, because of the uncertainty associated

with estimating the true average concentration at a Site, the 95% upper confidence limit (UCL) on the arithmetic average be used as the exposure point concentration. The 95% UCL provides reasonable confidence that the true average will not be underestimated. Exposure point concentrations were calculated from soil sample data sets to represent the reasonable maximum exposure (RME) to various current and hypothetical future populations on and around the Liberty site property. Many of the soil and sediment sample locations were biased, i.e., they were selected due to the presence of elevated levels of contamination. Therefore, the UCL values calculated on those data sets are a conservative estimate of the RME. In fact, the true UCL values on the actual distributions of chemicals of concern in soil are less than the values calculated from the analytical data. Uncertainty associated with sample laboratory analysis and data evaluation is considered low as a result of a rigorous quality assurance program which included data validation of each sample result.

In addition to the calculation of exposure point concentrations, several Site-specific assumptions regarding future land use scenarios, intake parameters, and exposure pathways are a part of the exposure assessment stage of a baseline risk assessment. Assumptions were based on Site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of Site-specific data. However, there remains some uncertainty in the prediction of future use scenarios and their associated intake parameters and exposure pathways. The exposure pathways selected for current scenarios were based on the Site conceptual model and related supplemental RI data. The uncertainty associated with the selected pathways for these scenarios is low because Site conditions support the conceptual model.

Standard dose conversion factors, risk slope factors, and reference doses are used to estimate the carcinogenic and noncarcinogenic hazards associated with Site contaminants. The risk estimators used in this assessment are generally accepted by the scientific community as representing reasonable projections of the hazards associated with exposure to the various chemicals of potential concern.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the July 2000 Final Baseline Human Health Risk Assessment report.

Based on the results of the supplemental RI/FS and the baseline risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected remedy, may present a current or potential threat to human health and the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), NYSDEC's recommended soil cleanup objectives, Site-specific risk-based levels, and the most reasonably anticipated future land use for the Site, i.e., commercial/industrial for the eastern portion and commercial/industrial or recreational for the western portion. The RAOs which were developed for soil, sediment, and groundwater are designed, in part, to mitigate the health threat posed by ingestion, dermal contact, or inhalation of vapors and particulates where these soils are contacted or disturbed or where groundwater may be contacted. The RAOs are also intended to mitigate the health threat posed by the ingestion of groundwater and are designed to prevent further leaching of contaminants from the soil to the groundwater.

The following remedial action objectives were established for the Site:

On-Site Soils

- Prevent the direct exposure of receptors to Site-related contaminants through inhalation, direct contact or ingestion, or mitigate soil contaminant concentrations to a level that will not pose unacceptable risks to human health and the environment,

- Reduce the concentration or mobility of soil contaminants to a level which will prevent further degradation of groundwater.

- Remove all RCRA hazardous waste from the Site.

- Remove any structural impediments that might interfere with pre-design sampling and implementation of soil, subsurface feature, and groundwater remediation.

On-Site Subsurface Features (on Eastern Portion of the Site) and Underground Storage Tanks

- removal of contaminated aqueous and/or solid materials from subsurface features and underground storage tanks.

On-Site and Off-Site Groundwater

- Prevent or minimize ingestion, dermal contact and inhalation of inorganic- and organic-contaminated groundwater that are above State and Federal maximum contaminant levels (MCLs).

- Restore groundwater quality to levels which meet State and Federal MCLs.

Massapequa Creek Pond A Sediments

- prevent adverse effects to ecological receptors within the Massapequa Creek and associated ponds caused by exposure to Site-related contaminants.

In order to meet these objectives, preliminary remedial goals, or PRGs, were developed during the supplemental FS for various contaminants of concern. In developing the final soil cleanup numbers presented below, consideration was given to risks posed by the contaminants under reasonably anticipated future uses of the Site, protection of the underlying sole-source aquifer, and the NYSDEC TAGMs.

Based on the information provided in the supplemental RI report and the HHRA, soil cleanup levels of 10 mg/kg cadmium and 143 mg/kg chromium were developed for the Site. The NYSDEC's soil cleanup objectives, as specified in the TAGM, were adopted as the soil cleanup levels for TCE, cis-1,2-DCE, and PCE, respectively: 0.7 mg/kg, 0.25 mg/kg, and 1.4 mg/kg. These soil cleanup levels represent allowable concentrations in soils that would be protective of human health under future commercial/industrial or recreational uses of the Site. These soil cleanup levels would also maintain the drinking-water quality of the underlying groundwater aquifers. Due to the spatial and vertical location of contaminants of concern, EPA believes that if the contaminated soils are remediated to the cadmium and chromium cleanup levels, then the VOC contaminants in soils will also be adequately addressed.

For the purpose of determining whether the subsurface features and the underground storage tanks have been adequately remediated, the following PRGs will be used: 10 mg/kg cadmium; 143 mg/kg chromium; 0.7 mg/kg TCE; 0.25 mg/kg cis-1,2-DCE; 1.4 mg/kg PCE; 1 mg/kg PCBs for soils between zero and 1 foot bgs and 10 mg/kg PCBs for soils below 1 foot bgs; 35 mg/kg cyanide; 0.29 mg/kg benzo[a]pyrene; and 0.29 mg/kg dibenzo[a,h]anthracene. (The PRGs, 10 mg/kg PCBs, 35 mg/kg cyanide, 0.29 mg/kg benzo[a]pyrene, and 0.29 mg/kg dibenzo[a,h]anthracene, are preliminary remediation goals for commercial-industrial risk-based screening concentrations and were developed by EPA Region IX.)

Groundwater cleanup levels for cadmium, chromium, TCE, cis-1,2-DCE, and PCE are State and Federal MCLs, i.e., cadmium = 5 µg/l, chromium = 50 µg/l, TCE = 5 µg/l, cis-1,2-DCE = 5 µg/l, and PCE = 5 µg/l. Due to the distribution of contaminants that were detected in the groundwater, EPA believes that if the contaminated on-Site and off-Site groundwater is remediated to these State and Federal drinking water standards, then all other inorganic and organic contaminants in the groundwater will also be adequately addressed.

Sediment cleanup levels of 50 mg/kg cadmium and 260 mg/kg chromium were developed for remediation of Pond A sediments.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to reduce permanently and significantly the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a Site. CERCLA §121(d), 42 U.S.C. §9621(d), further mandates that a remedial action attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under Federal and State laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Based on the information contained in the supplemental RI/FS reports and the HHRA and the ERA, the Proposed Plan evaluates, in detail, three remedial alternatives for Site soil contamination, three remedial alternatives for groundwater contamination, and two

remedial alternatives for sediment contamination within Pond A. The soil, groundwater, and sediment alternatives for the Site are presented below. Institutional controls in the form of deed restrictions are also required for all soil and groundwater remedial alternatives.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to negotiate with the PRPs, design the remedial action or procure contracts for design and construction.

The alternatives discussed below may vary in title and description from those identified in the FS report. In addition, in conformance with its July 2000 guidance document entitled, "Guide to Developing and Documenting Cost Estimates During the Feasibility Study," EPA recalculated the costs of the FS remedial alternatives utilizing a discount rate of 7%, assumed a 20-year time frame (except for a 50-year time frame for cap maintenance under Alternative SL-2), and included a category encompassing periodic costs which might be incurred during the long-term operation and maintenance of each alternative.

The remedial alternatives are:

Soil Remedial Alternatives

The cleanup levels for Site soils presented under the discussion entitled, "Remedial Action Objectives," above, would require remediation of approximately 73,100 cubic yards of soil. The bulk of the contamination, including 16,000 cubic yards of soils that are hazardous wastes under RCRA, is located in four discrete areas: the Former Wastewater Disposal Basins (11,400 cubic yards), the Northwest Disposal Area (32,000 cubic yards), the Building B Basement (3,500 cubic yards), and the former Building B Ramp Pile (500 cubic yards), with the remaining 25,700 cubic yards of low-level contaminated soils scattered and present throughout abutting seven acres of soils.

Of particular concern at the Liberty site is contamination in the subsurface soil that may come in contact with the groundwater. Unlike conditions at other sites where subsurface contamination is subject to leaching primarily from infiltrating precipitation, at the Liberty site, there exists a significant volume of contaminated soils that are in contact with the groundwater, as the groundwater table can fluctuate from 15 to 21 feet bgs. In addition to the three soil remedial alternatives described below, two other

alternatives were considered in the supplemental FS report but were not carried through the detailed comparative analysis in the Proposed Plan.

One alternative involving the contaminated soils at depth of 15 to 21 feet included excavating the contaminated soils and replacing this material with clean fill, redepositing the excavated soils above the clean fill and installing a cap. This alternative was eliminated from the detailed consideration in the Proposed Plan because it would not comply with New York Environmental Conservation Law §27-0704 (Long Island Landfill Law) which is an applicable or relevant and appropriate requirement (ARAR) for the Site. This law prohibits the creation of new landfills on Long Island in an effort to protect the sole source aquifer which is the primary source of drinking water for Long Island residents.

Another alternative involved excavation and stabilization of contaminated soils and redeposition of the stabilized material on the Site property. This alternative was also eliminated from detailed consideration in the Proposed Plan because it also would not comply with the Long Island Landfill Law. In addition, this alternative would require time to perform treatability studies, remedial design and the actual treatment of inorganically- and organically-contaminated soils; it would be technically difficult to stabilize some soils given the nature of the highest levels of contamination found at the Site; and it would likely not be widely accepted by the public.

Alternative SL-1: No Action

Capital Cost:	N/A
Total Operation and Maintenance Cost:	N/A
Present Worth Cost:	N/A
Construction Time:	N/A

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the soil contamination at the Site.

Because this alternative would result in contaminants remaining on Site, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative SL-2: Excavation and Off-Site Disposal of Contaminated Soils Near the Water Table and Capping of Other Contaminated Soils

Capital Cost:	$7,863,000
Total Operation and Maintenance (O&M) Cost:	$1,077,000
Present Worth Cost*:	$8,940,000
Construction Time:	1 year

* The present worth costs for Alternative SL-2 are calculated using a discount rate of 7 percent, a 50-year time interval, and annual, as well as periodic, O&M expenses.

Alternative SL-2 would involve the excavation and off-Site disposal of approximately 25,600 cubic yards of contaminated soils at depths of approximately 15 to 21 feet bgs and corresponding overlying soils (above 15 feet bgs) that exceed cadmium and chromium cleanup levels, as well as other Site soils, which would be characterized as RCRA hazardous waste. The excavation, which would need to be conducted when the water table is low, would occur primarily in the area of the Former Wastewater Disposal Basins. The excavated soils would undergo a soil contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the excavated soil would be transported to an off-Site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste. Soils that were not contaminated above Site-specific cleanup levels would be left at the Site. Subsequent to excavation, clean fill would be placed in the excavated areas to restore the Site to the original grade. For cost-estimating purposes, it is assumed that 16,000 cubic yards of the excavated soils would be sent to a RCRA Subtitle C facility.

This alternative would also include capping the remaining areas of the Site (approximately 8.75 acres in total) where concentrations exceed cadmium and chromium cleanup levels. The cap would be either an asphalt cover system or engineered structure, such as a building. If asphalt were used, it would be designed and constructed to include a 5-inch thick bituminous stabilized base overlain by a geotextile fabric and a 2-inch bituminous concrete wearing course with a permeability on the order of 5×10^{-8} cm/sec. The geotextile fabric would prevent surface cracks from spreading, reduce the potential for infiltration through cracks that may occur between maintenance activities, and further reduce the overall permeability of the asphalt cover system. **Figure 13** shows a conceptual diagram of the work to be performed under Alternative

SL-2. As part of the engineering evaluation and design for Alternative SL-2, various cover system designs would be tested to ensure that the objective of reducing surface permeability to 5 x 10^{-8} cm/sec can be achieved. Because the cap is susceptible to weathering and cracking, a maintenance and inspection program would be required to ensure the long-term integrity of the cap. The maintenance and inspection program will consist of visual inspections of the asphalt cap, performed on a quarterly basis. In addition, a comprehensive groundwater monitoring program would be implemented to evaluate the effectiveness of the cap system.

In addition, contaminated USTs and other subsurface features would be remediated through the removal of the aqueous and/or solid materials from the USTs and the subsurface features, via application of readily available technologies (such as liquid and sludge removal by vacuum suction). Related to the UST/features investigation and remediation, sampling and analysis at the northern and eastern sanitary leaching fields would be performed and contaminated soils, sediments, sludges, liquids and/or other forms of Waste associated therewith would be removed and disposed of off Site. As discussed above, under "**SUMMARY OF SITE CHARACTERISTICS**" ("Subsurface Feature Inspection" and "Sampling and Underground Storage Tank (UST) Investigation"), a portion of the UST/subsurface feature and sanitary leaching field activities which are described in this paragraph and a portion of the activities relating to remediation of the Former Building B Ramp Pile, are the subject of an administrative order on consent previously issued by EPA. These activities are included in the selected soil alternatives subject to satisfactory completion pursuant to that administrative order.

This alternative would leave contaminants at the Site and would not allow for unrestricted land use. Therefore, institutional controls (e.g., deed restrictions to limit the future use of the Site to recreational (western portion only) or commercial/industrial uses) to limit demolition or construction at the Site until the subsurface features have been remediated; and a prohibition on Site activities that would damage the cap. In addition, because this alternative would result in soil contamination remaining at the Site, CERCLA would require that the Site be reviewed at least once every five years to ensure that it remains protective of human health and the environment.

Alternative SL-3: Excavation and Off-Site Disposal of All Contaminated Soils

Capital Cost:	$12,862,000
Total Operation and Maintenance Cost:	$ 230,000
Present Worth Cost*:	$13,092,000
Construction Time:	1 ½ years

* The present worth costs for Alternative SL-3 and for groundwater alternatives and sediment alternatives, discussed below, are calculated using a discount rate of 7 percent, a 20-year time interval, and annual, as well as periodic, O&M expenses.

Alternative SL-3 would involve excavation and off-Site disposal of approximately 73,100 cubic yards of contaminated soils that exceed cadmium and chromium cleanup levels. The excavated soils would undergo a soil contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the excavated soil would be transported to an off-Site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste. Subsequent to excavation, clean fill would be placed in the excavated areas to restore the Site to the original grade. **Figure 14** shows a conceptual diagram of the work to be performed under Alternative SL-3. The USTs/subsurface features/northern and eastern sanitary leaching fields investigation and remediation provisions described under Alternative SL-2 would also pertain to Alternative SL-3. Also, the institutional controls described under Alternative SL-2 would apply to Alternative SL-3 except that there would be no need for the control relating to the prohibition of activities that might damage the integrity of the cap.

Under this alternative, CERCLA's five-year review would also be required to ensure that the remedial action remains protective of human health and the environment.

Groundwater Remedial Alternatives

As noted above, the interim groundwater remedy selected in March 1998 called for the treatment of the contaminated groundwater leaving the Liberty property. However, during the design of the interim groundwater remedy, it was learned that the principal source for Plume B is apparently upgradient of the property, and EPA decided that it was necessary to further evaluate this plume. EPA recently completed the fieldwork for this effort. Because it

has been shown that effective treatment of Plume A will involve treating Plume B, EPA has determined that Plume B should be addressed as part of any Liberty comprehensive groundwater remedial action. A comprehensive groundwater remedy for the Liberty site would thus address contamination from both plumes. EPA is attempting to identify the location of the source of the Plume B contamination and will evaluate options for remediating the source once identified.

The contaminated groundwater at the Site will be remediated to federal and New York State drinking water and groundwater standards.

Alternative GW-1: No Action

Capital Cost:	$ 180,000
Total Operation and Maintenance Cost:	$1,080,000
Present Worth Cost:	$1,260,000
Construction Time:	Immediately

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the off-property groundwater contamination. However, this alternative does include the implementation of a groundwater monitoring program, which would include installation of eight shallow and eight deep monitoring wells. Quarterly sampling, analyses, and water level measurements from new as well as selected existing on-Site and off-Site monitoring wells would be performed to assess contaminant migration and the long-term effectiveness of this no-action alternative. Under this alternative, the interim groundwater action would cease operation after the three-year period (September 2003) authorized under the non-time critical removal action.

Because this alternative would result in contaminants remaining in the groundwater plume above drinking water standards, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions might be implemented to remove or treat the groundwater contamination.

Alternative GW-2: In-Well Groundwater Treatment with Continuation of the On-property Interim Groundwater Action

Capital Cost*:	$5,030,000
Total Operation and Maintenance Cost*:	$9,999,000
Present Worth Cost*:	$15,029,000
Construction Time:	1 year

* Includes the following costs for Plume B treatment system, employing the same innovative technologies: capital cost of $813,000, total 20-year operation and maintenance cost of $1,821,000, and present worth cost of $2,634,000.

Alternative GW-2 would involve the use of two innovative technologies to remove VOCs and metal contaminants in the groundwater below ground. The first treatment component would involve in-well vapor stripping which is also known as groundwater circulation well (GCW) technology. In such a system, air is pumped into a well causing groundwater in the vicinity of the well to circulate around and through the well, while at the same time causing volatile contaminants to volatilize or be bubbled out of the groundwater. The volatile contaminants would be captured by an above-ground vapor-phase granular activated carbon unit.

As air stripping is not an effective means of removing metals, removal of soluble metal contaminants would be accomplished through a second treatment component which would incorporate a chelating medium which is an organic medium that captures metals. Once the metal contaminants have been removed, the clean groundwater would be pumped back into the aquifers. The chelating materials would be periodically regenerated to remove the captured metals; the resulting metals-contaminated waste would be disposed of at an off-Site EPA-approved hazardous waste facility.

Because the off-property component of the plume in the Magothy aquifer is limited to VOCs (i.e., only VOCs in the upper portion of the Magothy aquifer as compared to VOCs and metals in the Upper Glacial aquifer), it would only require a GCW system for VOC removal; the off-property component of the plume in the Upper Glacial aquifer would, however, require a GCW system coupled with a metals-removal technology component. The optimal location for the off-property GCW treatment system would be between Woodward Parkway and the headwaters of the Massapequa Creek (i.e., east of Woodward Parkway Elementary School near where the elevated Site-related VOC concentrations have been detected). And, the optimal location for the off-property GCW treatment system coupled with a

metals-removal technology component would be in the vicinity of monitoring well cluster MW-9, where the elevated Site-related metal concentrations have been detected. Three GCWs without a metals-removal technology component would be installed approximately 180 feet deep in the Magothy aquifer and three GCWs with a metals-removal technology component would be installed approximately 60 feet deep in the Upper Glacial aquifer. The total circulation rate of these six GCWs would be approximately 375 gallons per minute (gpm).

Because the hydrogeochemical characteristics of the Magothy aquifer are distinct from those of the Upper Glacial aquifer, pilot testing of the GCW treatment component, discussed above, would need to be conducted as part of the design effort to evaluate its effectiveness and feasibility in the Magothy aquifer.

Alternative GW-2 would also involve the continuation of the interim groundwater action with respect to the significantly-contaminated portion of the groundwater plume beneath the Site property within the Upper Glacial aquifer. The interim groundwater action employs innovative technologies identical to those described above. A total of three GCW systems have been installed approximately 90 feet deep into the bottom of the Upper Glacial aquifer, downgradient of the Former Wastewater Disposal Basins on the Site property and parallel to Motor Avenue. The three GCW systems are designed to handle a combined, average flow of 210 gpm. Plume B would also be addressed by installation and long-term operation of five GCW systems in the north-central portion of the Liberty property, within the Upper Glacial aquifer perpendicular to the direction of groundwater flow, to treat VOCs. The configuration of the Plume B treatment system as well as the cost estimates would be further refined upon EPA's review of the recently completed field investigation.

Alternative GW-2 would also include an enhanced monitoring program to document and monitor the leading edge of the off-property groundwater contaminant plume where concentrations are near nondetectable levels or drinking water standards and, therefore, would render the application of any active groundwater remedial alternative economically infeasible. Under this alternative, a Site-specific groundwater fate and transport model would also be performed to assess the effectiveness of natural attenuation in the leading edge of the plume in conjunction with groundwater remediation.

In addition, institutional controls (e.g., deed restrictions to prohibit installation or use of groundwater wells for human consumption purposes) would need to be implemented.

Alternative GW-3: Groundwater Extraction and Treatment with Continuation of Interim Groundwater Action

Capital Cost*:	$ 5,200,000
Total Operation and Maintenance Cost*:	$12,424,000
Present Worth Cost*:	$17,624,000
Construction Time:	1 ½ years

* Includes the following costs for Plume B treatment system, employing the same conventional pump-and-treat technologies: capital cost of $509,000, total 20-year operation and maintenance cost of $1,814,000, and present worth cost of $2,323,000.

Alternative GW-3 would consist of a conventional groundwater pumping and treatment system. The off-property contaminated groundwater would be extracted from both aquifers and pumped to an above-ground treatment system. Inorganic contaminants such as metals would be treated through ion exchange, precipitation with coagulation, and filtration. Organic contaminants would be treated through air stripping coupled to liquid and vapor phase carbon. Treatability studies would be performed to determine the optimum operating parameters for the groundwater treatment system. Residual waste from the treatment process such as sludges from the metals-treatment stage would be disposed of off Site in accordance with all applicable or relevant and appropriate federal and State disposal requirements (e.g., RCRA Land Disposal Requirements (LDRs)); spent carbon used to remove organic contaminants would be handled similarly or regenerated.

Treated groundwater would be either reinjected into aquifers or discharged to the Massapequa Creek. Alternative GW-3 would also involve the continuation of performance of the interim groundwater action; however, it would continue as conventional pumping and treatment as described under the foregoing paragraph. The Plume B treatment system would be conventional pump and treat.

Due to significantly greater potential short-term and long-term impacts associated with construction of an off-property conventional pump-and-treat system, as compared to Alternative GW-2, the off-Site contaminated groundwater would be pumped back to the Liberty site for treatment at an on-property groundwater

treatment system. One of the two extraction well clusters would be optimally located near the Woodward Parkway Elementary School (between Woodward Parkway and the headwaters of the Massapequa Creek) and the other near the Massapequa Creek, near present monitoring well cluster MW-9. The extraction well cluster near the Woodward Parkway Elementary School would be installed approximately 180 feet deep in the Upper Glacial aquifer and the extraction well cluster near the present monitoring well cluster MW-9, to the northwest of the Farmingdale High School, would be installed approximately 60 feet deep in the Magothy aquifer. The total pumping rate of these four groundwater extraction wells would be approximately 250 gpm. An aquifer pumping test to evaluate the hydrogeological characteristics of the Magothy aquifer would need to be conducted as part of the design.

For cost-estimating purposes, it was assumed that the extracted groundwater would be treated to meet drinking water standards required for aquifer reinjection. Approximately eight reinjection wells would be necessary. However, a detailed evaluation of groundwater reinjection would need to be conducted as part of the design effort.

The enhanced monitoring program provisions described under Alternative GW-2 would be carried out under Alternative GW-3.

In addition, the institutional controls and CERCLA five-year review required under Alternative GW-2 would also be required for Alternative GW-3.

Sediment Remedial Alternatives

As previously noted, based on the weight of evidence from the cumulative Massapequa Creek investigation, the remediation of Site-related contamination within the Massapequa Creek ponds will be limited to Pond A. Sediment cleanup levels of 50 mg/kg cadmium and 260 mg/kg chromium were developed for remediation of Pond A sediments. These remedial goals were established in recognition of the Site conceptual model, which indicates that if the groundwater contamination is addressed, the primary source of sediment and surface water contamination within the Massapequa Creek system will also be addressed. Moreover, removal of sediments within Pond A, the farthest upstream pond, where adverse ecological effects are greatest, would remove the primary source of contaminated sediments entering the creek below the Site, and its lower ponds.

Alternative SD-1: No Action

Capital Cost:	$	N/A
Total Operation and Maintenance Cost:	$	283,000
Present Worth Cost:	$	283,000
Construction Time:		Immediately

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the sediment contamination within the Massapequa Creek ponds. However, this alternative does include the implementation of a Pond A sediment and surface water monitoring program. Quarterly sampling and analyses from Pond A sediment and surface water would be performed to assess the continued potential impact from the Site groundwater contaminant.

Because this alternative would result in Site-related contaminants remaining in Pond A, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions might be implemented to remove or treat the Massapequa Creek pond sediments.

Alternative SD-2: Excavation or Vacuum Extraction and Off-Site Disposal of Contaminated Sediments from Pond A

Capital Cost:	$2,989,000
Total Operation and Maintenance Cost:	$ 384,000
Present Worth Cost:	$3,373,000
Construction Time:	1 year

Alternative SD-2 would involve the removal of contaminated sediments from Pond A by either excavation or vacuum extraction. If the sediments were removed by excavation, the pond would be dewatered and then excavated to a desired average depth of 1.5 feet, or a depth sufficient to collect the impacted fine-grained sediments, using conventional earth moving equipment. The underlying coarse sandy and gravelly sediments were found to be not impacted and, therefore, would not be removed. The surface water drained from the pond and stormwater would be diverted temporarily to a detention basin or Massapequa Creek. Sediment erosion control measures, such as the installation of interception trenches, silt fences, and temporary dams would be taken to prevent the downstream dispersion of suspended sediments. If sediment were to be removed by the vacuum extraction method, draining of the pond or the

temporary diversion of surface water and stormwater would not be necessary.

Removal of sediments, with a moisture content of 67%, to a depth of 1.5 feet throughout Pond A (138,000 square feet or 3.2 acres) would generate approximately 2,600 cubic yards of impacted sediments. These sediments would be staged adjacent to the pond and dewatered using a combination of passive draining and active filtration. The excess porewater would be returned to the pond. It is estimated that the volume of dewatered sediment would be approximately 1,300 cubic yards (or about 50% of the wet volume). The substrate of the ponds and any impacted wetlands would be restored. The dewatered sediments (i.e., the filter cake consisting of compressed sediment) would undergo a sediment contamination profile analysis (including total waste and TCLP analyses). Depending on these results, the sediment residue would be transported to an off-Site RCRA Subtitle D landfill for disposal as a nonhazardous waste, or to a RCRA Subtitle C landfill for disposal as a hazardous waste.

To ensure that Pond A remedy, as described above, is protective of the entire Massapequa Creek and Preserve, including the five lower ponds, the remedy will be integrated with an enhanced monitoring program for the remainder of the lower ponds that will consist of periodic surface water and sediment sampling and bioassays. It is expected that this program will further support its determination that only Pond A requires remediation, and demonstrate that removal of the contaminant source in Pond A will have a beneficial effect on downstream pond sediment quality.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA §121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 Code of Federal Regulations (CFR) §300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection

and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable (legally enforceable), or relevant and appropriate (requirements that pertain to situations sufficiently similar to those encountered at a Superfund site such that their use is well suited to the site) requirements of Federal and State environmental statutes and requirements or provide grounds for invoking a waiver.

The following "primary balancing" criteria are used to make comparisons and to identify the major trade-offs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume via treatment* refers to a remedial technology's expected ability to reduce the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants at the site.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation periods until cleanup goals are achieved.

6. *Implementability* refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. *Cost* includes estimated capital and operation and maintenance costs, and the present worth costs.

The following "modifying" criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. *State acceptance* indicates whether, based on its review of the FS and the Proposed Plan, the State supports, opposes, and/or

has identified any reservations with the preferred alternative.

9. *Community acceptance* refers to the public's general response to the alternatives described in the Proposed Plan and the FS report. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

A comparative analysis of the remedial alternatives based upon the evaluation criteria noted above follows.

Soil Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative SL-1 would provide no protection of human health and the environment, as it would not address the remedial action objectives for the Liberty site. The contaminants identified in the soils would continue to migrate via all of the routes identified in the supplemental RI.

Alternative SL-3 would provide the greatest degree of overall protection because all 73,100 cubic yards of soils contaminated above groundwater protection soil cleanup levels would be permanently removed from the Site and disposed of at an off-Site EPA-approved hazardous waste facility (some of the soils may need to be treated to satisfy LDR requirements). Alternative SL-2 may not be protective if the western portion of the Site were used for unrestricted recreational use as proposed by the Town of Oyster Bay because such use would call into question the continued reliability of the cap, and SL-2 would otherwise be less protective than Alternative SL-3 in a commercial/industrial (and recreational for the extreme western portion of the Site) because under Alternative SL-2 some soil contamination above the cleanup levels would remain untreated beneath the cap. Alternative SL-2 would also require monitoring and institutional controls to ensure the integrity of the cap.

- Compliance with ARARs

This criterion is not applicable to the "no-action" alternative, Alternatives SL-1.

Alternatives SL-2 and SL-3 would comply with all ARARs, including the Long Island Landfill Law, RCRA standards for owners and operators of hazardous waste treatment, storage and disposal

facilities, RCRA LDRs, and the Department of Transportation manifest standards for transporters of hazardous waste, during the implementation of all on-Site excavation and off-Site disposal activities.

- Long-Term Effectiveness and Permanence

Alternative SL-1 would not provide any long-term effectiveness and permanence since it would not involve any measures for containing, controlling or eliminating any of the Site soil contaminants, or reducing the potential for exposure to these contaminants.

Alternative SL-3 would provide the greatest degree of long-term effectiveness and permanence, as it would result in removal and off-Site disposal of 73,000 cubic yards of contaminated soils from the Site. Alternative SL-2 would not achieve long term effectiveness and permanence if the western portion of the Site were used for unrestricted recreational use as proposed by the Town of Oyster Bay because such use would call into question the continued reliability of the cap. If the western portion of the Site were to be used for commercial/industrial (and recreational for the extreme western portion), then Alternative SL-2 would still be less effective over the long term because a smaller volume of contaminated soils (25,600 cubic yards) would be removed from the Site. A maintenance and inspection program would be required for Alternative SL-2 to ensure long-term effectiveness of the caps.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative SL-1 would not provide any reduction in toxicity, mobility, or volume through treatment, as no action would be taken to address toxicity, mobility, or volume.

Although Alternatives SL-2 and SL-3 do not employ any treatment technology, both of these alternatives employ an off-Site disposal component that would result in reduction in toxicity, mobility, and volume of contamination at the Site. Alternative SL-3 would provide greater reduction than Alternative SL-2, as Alternative SL-3 would result in the off-Site disposal of 73,100 cubic yards of contaminated soils versus Alternative SL-2's 25,600 cubic yards of contaminated soils. Under both Alternatives SL-2 and SL-3, some of the soils may need to be treated to satisfy LDR requirements at an EPA-approved hazardous waste facility thereby reducing the toxicity and mobility of these contaminated materials at those locations.

- Short-Term Effectiveness

Alternative SL-1 would not include any construction and, therefore, would not present risk or adverse short-term impacts to the community, workers, or the environment as a result of its implementation; however, it would not provide any protection against principal Site threats.

Both Alternatives SL-2 and SL-3 would involve varying degrees of excavating, moving, placing, and regrading of contaminated soils. Therefore, both of these alternatives would present some potential risks to on-Site workers through dermal contact and inhalation from remedial activities. The potential for any adverse short-term impacts associated, however, would be mitigated by utilizing appropriate conventional controls (e.g., dust suppression, mufflers, personal protection equipment, etc.). Both alternatives would also have potential impacts on the surrounding community as each of these alternatives involves the transport of contaminated soils from the Site. The potential short-term risks would be greater for Alternative SL-3 because this alternative involves the transport of a much greater volume of contaminated soils.

- Implementability

Alternative SL-1 can be readily implemented, as it would not include any physical remedial measures to address the soil contamination at the Site.

Alternatives SL-2 and SL-3 would be easily and equally implementable because both use conventional excavation and disposal technologies with proven reliability. Construction of the cap system specified in Alternative SL-2 can be accomplished using proven technologies; equipment, services and materials for this work would be readily available.

- Cost

The estimated capital, total operation and maintenance (O&M), and present-worth costs for each of Alternatives SL-1 through SL-3 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
SL-1	$0	$0	$0
SL-2	$7,863,000	$1,077,000	$8,940,000
SL-3	$12,862,000	$230,000	$13,092,000

As indicated by the cost estimates, Alternative SL-1 has no associated cost, as it is a no-action alternative. Of the two action alternatives, Alternative SL-2 is less expensive than Alternative SL-3. The high cost associated with Alternative SL-3 is due to the excavation and off-Site disposal of 73,100 cubic yards of contaminated soils as opposed to excavation and off-Site disposal of 25,600 cubic yards of contaminated soils under Alternative SL-2.

Alternative SL-2 could be implemented at an estimated cost of $8,940,000, while the cost of implementing Alternative SL-3 is estimated at $13,092,000. Thus, Alternative SL-2 could be implemented for $4,152,000 less than Alternative SL-3, or 68% of the cost of Alternative SL-3. While this is a significant cost difference, it is much less than the cost differential estimated by EPA at the time of issuance of the Proposed Plan.

- State Acceptance

The NYSDEC concurs with the **selected remedy, Excavation and Off-Site Disposal of 73,100 Cubic Yards of Site Soils (SL-3), with Excavation and Off-Site Disposal of 25,600 Cubic Yards of Site Soils, Followed by Placement of an Impermeable Cap over 8.75 Acres of Low-level Contaminated Soils (SL-2), as Contingent Remedy if the Town of Oyster Bay does not acquire all or most of the Western portion of the Site that would otherwise be under the cap for recreational uses, and institutional controls).** A letter of concurrence is attached as **Appendix V.**

- Community Acceptance

Community acceptance of the selected remedy for soil was assessed during the public comment period. Comments were expressed at the August 9, 2001 public meeting and the January 9, 2002 public availability session, and written comments were received during the public comment period. Members of the community and their elected representatives overwhelmingly disfavored Alternative SL-2 and supported Alternative SL-3, and requested EPA to change the proposed alternatives for soil remediation from Alternative SL-2 to

Alternative SL-3. The commentors expressed their concern over the long-term effectiveness and durability of the 8.75-acre capping component of the selected soil remedy. Specific responses to public comments are addressed in the Responsiveness Summary, which is attached as **Appendix V.**

Groundwater Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative GW-1 would provide no protection of human health and the environment, as it would not address the remedial action objectives for the Liberty site. Groundwater contamination identified in the significantly-contaminated off-property portions of Plumes A and B would not be addressed, while the on-property portions of these plumes would only be addressed for the three-year period authorized under the non-time-critical removal action.

Alternative GW-3 would be the more protective of the two action alternatives in permanently removing VOCs and metals from the Upper Glacial Aquifer, and VOCs from the Magothy aquifer. Alternatives GW-2 may not be as protective, because its associated innovative treatment technologies proved to be problematic in implementation of the interim groundwater action, as many operational difficulties were experienced. Both of these alternatives would limit the migration of groundwater contaminants further downgradient, because the groundwater circulation wells being converted to extraction wells associated with Alternative GW-2 and the extraction wells associated with Alternative GW-3 would be designed to have overlapping capture zones and would provide effective capture of the groundwater contaminant plume.

- Compliance with ARARs

Both Alternatives GW-2 and GW-3 would comply with all ARARs, such as the RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities, the Clean Air Act (e.g., ambient air quality standards), and the Department of Transportation manifest standards for transporters of hazardous waste. However, it needs to be noted that Alternative GW-3 involves a conventional groundwater extraction and treatment which has been widely used with proven reliability, whereas Alternative GW-2 involves innovative technologies that may present operational difficulties based on experience with the interim groundwater. Alternative GW-3 would also need to comply with the drinking water standards for aquifer reinjection or limitations for discharge to

Massapequa Creek. In addition, Alternatives GW-2 and GW-3 would comply with, if necessary, federal and NYSDEC regulations related to wetlands evaluation/protection and floodplain evaluation/controls.

- Long-Term Effectiveness and Permanence

Alternative GW-1 would not provide any long-term effectiveness and permanence, as it would not address the remedial action objectives for the Liberty site.

Alternatives GW-3 would provide a higher degree of long-term effectiveness and permanence than Alternative GW-2 through the removal of VOCs and metals from the Upper Glacial aquifer and VOCs from the Magothy aquifer. Alternatives GW-2 may not provide as high a long-term effectiveness and permanence as would Alternative GW-3, because its associated innovative treatment technologies proved to be problematic in implementation of the interim groundwater action, as many operational difficulties were experienced.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative GW-1 would not provide any reduction in toxicity, mobility, or volume through treatment, as no action would be taken under this alternative.

Alternatives GW-3 would provide a higher reduction in toxicity, mobility, and volume through treatment than Alternative GW-2, through the permanent removal of VOCs and metals from the Upper Glacial aquifer and VOCs from the Magothy aquifer. Alternatives GW-2 may not provide as high a reduction in toxicity, mobility, and volume through treatment as would Alternative GW-3, because its associated innovative treatment technologies proved to be problematic in implementation of the interim groundwater action, as many operational difficulties were experienced.

- Short-Term Effectiveness

Alternative GW-1 would not include any construction measures and, therefore, would not present any risk or adverse short-term impacts to the community, workers, or the environment as a result of its implementation; however, it would not provide any protection against the threats posed by the contaminated groundwater.

Alternatives GW-2 and GW-3 would pose minimal potential adverse risks to to the community, workers, and the environment over the short term. Potential risks for these alternatives would be those typically associated with construction activity, and an appropriate health and safety program would be established to minimize any such risks. Alternative GW-3 would entail greater intrusive activities (e.g., additional trenching/piping activities to connect the extraction wells to the off-property groundwater treatment system) than Alternative GW-2 in the construction of their respective off-property groundwater treatment systems. The potential for any adverse short-term impacts associated with the construction activities, however, would be addressed by utilizing appropriate conventional and engineering controls (e.g., dust suppression, mufflers, personal protection equipment, etc.).

- Implementability

Alternative GW-1 would be the most readily implementable as it is a no-action alternative, followed in order by Alternatives GW-2 and GW-3.

Of the two action groundwater remedial alternatives, Alternative GW-2 would be the more readily implementable, as Alternative GW-2 would employ the same innovative technologies that are being used successfully for the interim groundwater action. Although Alternative GW-3 would involve conventional groundwater extraction and treatment which has been widely used with proven reliability, it would be more difficult to construct than Alternative GW-2 because of the size of the treatment plant and the amount of piping necessary to accommodate the high groundwater pumping rate. In addition, Alternative GW-3 would necessitate acquiring public or private property (between Woodward Parkway and the headwaters of the Massapequa Creek) to site the treatment system.

- Cost

The estimated capital, total O&M, and present-worth costs for each of Alternatives GW-1 through GW-3 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
GW-1	$180,000	$1,080,000	$1,260,000
GW-2	$5,030,000 [1]	$9,999,000 [1]	$15,029,000 [1]
GW-3	$5,200,000 [2]	$12,424,000 [2]	$17,624,000 [2]

[1] Includes the following costs for Plume B treatment system, employing the same innovative technologies: capital cost of $813,000, total 20-year operation and maintenance cost of $1,821,000, and present worth cost of $2,634,000.

[2] Includes the following costs for Plume B treatment system, employing the same conventional pump-and-treat technologies: capital cost of $509,000, total 20-year operation and maintenance cost of $1,814,000, and present worth cost of $2,323,000.

As indicated by the cost estimates, there is a significant cost increase between Alternative GW-1, the no-action alternative, and the other action alternatives, GW-2 and GW-3. Of the two action alternatives, Alternative GW-3 is more expensive than Alternative GW-2, due to the added O&M costs associated with a conventional groundwater extraction and treatment system.

- State Acceptance

As stated above, the NYSDEC concurs with the selected remedy, **Conventional Pump and Treat with Continuation of the On-property Interim Groundwater Action (GW-3) by Conventional Pumping and Treatment and Institutional Controls.** A letter of concurrence is attached as **Appendix V.**

- Community Acceptance

Community acceptance of the selected remedy for groundwater was assessed during the public comment period. The community generally supports Alternative GW-3. Specific responses to public comments are addressed in the Responsiveness Summary, which is attached as **Appendix V.**

Sediment Remedial Alternatives

- Overall Protection of Human Health and the Environment

Alternative SD-1 would provide no protection of ecological receptors, as it would not meet the remedial action objectives for the Liberty site; the contaminants identified in Pond A sediments would continue to pose a threat to ecological resources in this ecosystem. Alternative SD-2 would be fully protective of human health and the environment via permanent removal of 2,600 cubic yards of contaminated sediments in Pond A and the enhanced monitoring program for the remainder of the lower ponds.

- Compliance with ARARs

This criterion is not applicable to the "no-action" alternative, Alternative SD-1.

Alternative SD-2 would comply with all ARARs, including the NYSDEC surface water quality standards. In addition, due to associated off-property construction activities, Alternative SD-2 would comply with, if necessary, federal and NYSDEC regulations related to wetlands evaluation/protection and floodplain evaluation/controls. Alternative SD-2 would also comply with the Department of Transportation manifest standards for transporters of hazardous waste and the RCRA standards for owners and operators of hazardous waste treatment, storage and disposal facilities

- Long-Term Effectiveness and Permanence

Alternative SD-1 would not provide any long-term, effective or permanent measures for containing, controlling or eliminating any of the contaminated sediments within Pond A, or reducing the potential for exposure to these contaminants. Alternative SD-2 would be effective in protecting ecological resources over the long term in that it would result in the permanent removal of 2,600 cubic yards of contaminated sediments from Pond A.

- Reduction in Toxicity, Mobility, or Volume Through Treatment

Because Alternative SD-1 is the "no-action" alternative, it would not result in any reduction in the toxicity, mobility, or volume of contaminants present in the impacted ecosystems. Alternative SD-2 would substantially reduce the volume, toxicity, and mobility of contaminants present in Pond A sediments, as a result of removal, and off-Site transport and disposal of 2,600 cubic yards of contaminated sediments.

- Short-Term Effectiveness

Alternative SD-1 would not include any construction measures and, therefore, would not present potential risks or adverse short-term impacts to Site workers or the environment as a result of its implementation. Alternative SD-2 would present some potential risks to workers through dermal contact and inhalation from remedial activities. The potential for any adverse short-term impacts to Site workers, however, would be readily mitigated by using personal protection equipment and following appropriate health and safety procedures. Alternative SD-2 would also present

short-term impacts to wetlands, flora, and fauna. Sediment erosion control measures, such as the installation of interception trenches, silt fences, and temporary dams would be taken to prevent the downstream dispersion of suspended sediments. Following the implementation of Alternative SD-2, wetlands restoration would be required.

- Implementability

Alternative SD-1 can be readily implemented, as it would not include any physical remedial measures to address the Pond A sediments. Although Alternative SD-2 would use conventional excavation or vacuum extraction technologies which have proven reliability, it would be less readily implementable than Alternative SD-1, as Alternative SD-2 may require the resolution of issues that could arise from coordinating and consulting with State and local regulatory agencies (e.g., NYSDEC Bureau of Fisheries and Wildlife, Nassau County Department of Recreation and Parks, and Nassau County Department of Public Works). These issues would likely include delineation and restoration of sensitive or ecologically valuable wetlands.

- Cost

The estimated capital, total O&M, and present-worth costs for Alternatives SD-1 and SD-2 are as follows:

Alternative	Capital Cost	Total O&M Cost	Present Worth Cost
SD-1	N/A	$283,000	$283,000
SD-2	$2,989,000	$384,000	$3,373,000

The costs associated with Alternative SD-1 are for a Pond A sediment and surface water monitoring program whereas the costs for Alternative SD-2 are for removal of contaminated sediments from Pond A.

- State Acceptance

As stated above, NYSDEC concurs with the selected remedy, **Excavation and Off-Site Disposal of 2,600 Cubic Yards of Contaminated Pond a Sediments (SD-2) with an enhanced monitoring program for the remainder of the lower ponds.** A letter of concurrence is attached as **Appendix V.**

- Community Acceptance

Community acceptance of the selected remedy for Pond A sediment was assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary, which is attached as **Appendix V.**

PRINCIPAL THREAT WASTES

There are no source materials that meet the definition of principal threat wastes at the Site.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, NYSDEC and EPA have determined that Alternative GW-3 (Conventional Pump and Treat with Continuation of the On-property Interim Groundwater Action by Conventional Pumping and Treatment and Institutional Controls), to address the on-property and off-property groundwater contamination, Alternative SD-2 (Excavation and Off-Site Disposal of 2,600 Cubic Yards of Contaminated Pond A Sediments with an enhanced monitoring program for the Remainder of the Lower Ponds), to address Massapequa Creek sediments, and Alternative SL-3 (Excavation and Off-Site Disposal of 73,100 Cubic Yards of Site Soils, investigation and remediation of USTs, features and sanitary leaching fields and institutional controls) to address the Site soils and features, are the appropriate remedies, best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9).

The selected groundwater remedy Alternative GW-3, while somewhat more costly than Alternative GW-2, is expected to be more easily implementable, more effective over the long-term, and is favored by the community and the State. Unlike Alternative GW-2, Alternative GW-3 utilizes well demonstrated treatment technologies; as noted above, during the implementation of the non-time-critical groundwater removal action, the innovative treatment technologies specified in Alternative GW-2 proved to be problematic, as many operational difficulties were experienced. Alternative GW-1 (No

Action) would not be protective of human health and the environment, since it would not actively address the potential human health and ecological risks posed by the contaminated media.

Alternative SD-2 eliminates all potential adverse effects to ecological receptors within the Massapequa Creek from exposure to Site-related contaminants, Alternative SD-1, the no-action alternative, would not address these risks.

Alternative SL-1 would not be protective of human health nor the groundwater resource, since it would not address contaminated features or the contaminants in the soils that continue to serve as a source of groundwater contamination. Alternative SL-3, as well as Alternative SL-2 (if constructed and maintained properly) would both be protective of human health and the groundwater resource. Alternative SL-2 would provide this protection at less cost than Alternative SL-3, however Alternative SL-3 provides a greater degree of long-term effectiveness and permanence. Alternative SL-3 garnered overwhelming support from the community, while the community was opposed to Alternative SL-2.

The Proposed Plan identified Alternative SL-2 as the Preferred Remedy for addressing the soil contamination at the Site. However, during the comment period the Town of Oyster Bay indicated that it had taken significant steps towards formalizing plans to acquire the western portion of the Site, including nearly all of the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town indicated that the recreational uses planned for the property would include walking/nature trail and sensory gardens, a picnic area, cabins and campgrounds for Boy Scout outings. The development of the property would be phased in over a period of 10 years or more. This would result in disruption of significant portions of the property for trenching (utilities and irrigation), digging (for the planting of trees and shrubbery) and excavation (for the building of rest room facilities, cabins, trails, etc.). The cap component of Alternative SL-2 would be incompatible with Town's proposed use of the park over the short and long term. The Town's proposed use of the park might also compromise monitoring and maintenance the cap, thereby compromising the long-term effectiveness of the remedy. This information resulted in a re-evaluation of Alternative SL-2 and SL-3 against the criteria listed in the NCP, and other program goals. Alternative SL-3 is the selected soil remedy contingent upon the Town's acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does

not complete the acquisition process within a time frame of approximately 6-8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy.

Description of the Selected Remedy

The major components of the selected remedy include:

① Groundwater (Alternative GW-3):

- continued operation of the ongoing interim groundwater treatment system that is being converted to a conventional pump-and-treat system to address the groundwater underlying the Site property contaminated by previous operations at the Site,

- continuation of interim groundwater action by construction and operation of a conventional pump-and-treat system (Ion Exchange, Precipitation with Coagulation, Filtration, Air Stripping and Granular Activated Carbon with Two Groundwater Extraction Wells) to address groundwater underlying the Site property which is believed to have been contaminated by an upgradient source,

- construction and operation of a conventional 250-gpm pump-and-treat system (Ion Exchange, Precipitation with Coagulation, Filtration, Air Stripping and Granular Activated Carbon with Four Groundwater Extraction Wells) to treat off-property groundwater contamination,

- construction of all groundwater treatment systems on the Liberty property,

- restoration of the aquifer through reduction of contaminant levels to State and Federal MCLs (e.g., 5 µg/l for cadmium, 50 µg/l for chromium, and 5 µg/l for TCE, cis-1,2-DCE, and PCE),

- discharge of treated groundwater to Massapequa Creek surface water or reinjection of treated groundwater into the aquifer,

- implementation of a groundwater monitoring program, and

- institutional controls to prohibit installation or use of groundwater wells for human consumption.

② Massapequa Preserve (Alternative SD-2):

- excavation and off-Site disposal of approximately 2,600 cubic yards of contaminated sediments within Pond A of nearby Massapequa Creek and Preserve, and

- implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve to demonstrate that the removal of Pond A sediments is protective of the downstream ecosystem from contaminants associated with the Liberty site.

③ Soils (Alternative SL-3):

- excavation and off-Site disposal of all soils contaminated above groundwater protection levels (10 mg/kg cadmium and 143 mg/kg chromium), estimated at 73,100 cubic yards,

- removal of contaminated aqueous and/or solid materials from three underground storage tanks and fifty-six subsurface features, as well as from the northern and eastern sanitary leaching fields, if warranted (it is expected that one underground storage tank, approximately thirty-eight subsurface features, the entire eastern sanitary leaching field, and a small portion of the northern sanitary leaching field will be addressed separately pursuant to the Features AOC),

- Removal and off-Site disposal of any soil surrounding the subsurface features that exceed 10 mg/kg cadmium, 143 mg/kg chromium, 0.7 mg/kg TCE, 0.25 mg/kg cis-1,2-DCE, 1.4 mg/kg PCE, ; 1 mg/kg PCBs for soils between zero and 1 foot bgs and 10 mg/kg PCBs for soils below 1 foot bgs, 35 mg/kg cyanide, 0.29 mg/kg benzo[a]pyrene, or 0.29 mg/kg dibenzo[a,h]anthracene, and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses.

The major components of the contingent remedy for soils (Alternative SL-2) include:

- excavation and off-Site disposal of approximately 25,600 cubic yards of soils including: (1) contaminated soils that would be rendered TCLP hazardous, (2) soils in the groundwater table fluctuation zone (approximately 15-21 ft bgs) above the groundwater protection soil cleanup levels of 10 mg/kg cadmium and 143 mg/kg chromium, and (3) any soil above the groundwater protection soil cleanup levels that is excavated to access the soils in (1) and (2),

- placement of an impermeable cap (with a surface permeability of 5 x 10^{-8} cm/sec or less) or engineered structure, such as a building, over 8.75 acres of low-level contaminated soils with a requirement to maintain the integrity of the cap,

- removal of contaminated features and associated soils, as described above, in the selected remedy, and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational and an institutional control to prevent activities that could compromise the integrity of the cap.

Note that many of the specific details provided in this section are provided for conceptual purposes and cost estimating purposes; these details may change somewhat during the remedial design and construction process.

Summary of Estimated Remedy Costs

The estimated capital cost for the selected remedy is $21,052,000. The total present worth cost is $34,090,000. The total present worth is the sum of capital cost, periodic costs and the present-worth cost of O&M, which are based on a 7% discount rate and a project life of 20 years, for GW-3, SD-2, and SL-3. A detailed breakdown of the costs of the selected remedy are provided in **Tables 8, 9, and 10.** If the contingency soil remedy Alternative SL-2 is implemented the total capital cost and present worth cost would be $18,833,000 and $29,938,000, respectively; the project life for Alternative SL-2 was assumed to be 50 years. A detailed

breakdown of the costs of the contingent remedy (Alternative SL-2) is provided in **Tables 11.**

These engineering cost estimates are expected to be within +50 to -30 percent of the actual project cost, and are based upon the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of the Selected Remedy

Based upon the human health and ecological risk assessments, NYSDEC and EPA have determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected alternative or one of the other active measures considered, present a current or potential threat to public health or the environment.

Specifically, it has been concluded that: (1) construction workers would be at risk via exposure to aqueous waste in the subsurface features, (2) there are potential cross-media impacts to groundwater, (3) there is a potential health risk associated with future use of the contaminated groundwater as a potable water source, and (4) there is a potential risk to ecological receptors from exposure to Pond A sediments.

The selected alternative will remove the contaminants in features that present a risk to construction workers, remove contaminants in soils that are continuing to serve as a source of contamination to groundwater, extract and treat contaminated groundwater in the sole-source aquifer system so that the groundwater can be restored to its best beneficial use, and remove contaminated sediments from Pond A such the sediments no longer presents a risk to ecological receptors. Potential for short-term human health or ecological risks that could occur while the features, soils and pond sediments are being excavated and transported, can be minimized with fencing, controls on fugitive dusts, maintenance of temporary covers; institutional controls will prevent utilization of contaminated groundwater at the Site until such time as the groundwater is restored. The selected remedy will be cost-effective, and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy will also meet the statutory preference for the use of treatment as a principal element. Finally, the selected remedy will provide overall protection of

human health and the environment due to contaminants at the Site.

These actions will restore the Site such that it can be utilized in the future in accordance with the reasonably-anticipated future land use. Under the selected remedy, it is anticipated that it will require approximately one year to complete the design of the source control remedy, and one and a half years to implement the remedy (this time frame would also apply to the contingent remedy). With regard to groundwater, it is anticipated that it will take approximately 2 years to complete the design of the comprehensive system and approximately one and a half years to construct the groundwater collection system. Groundwater cleanup standards are not expected to be achieved for 20 years. The Pond A sediment excavation is expected to be initiated within 2 years and take approximately one year to complete. The property is currently zoned for commercial and light industrial use, though the Town is expected to acquire the western 15 acres of the Site for parkland use. Plans are currently before the Town Board for a supermarket and refueling facility on the easternmost 10 acres. The five remaining acres are also expected to be used for commercial purposes. The aforementioned uses of the property are not expected to change. It is also anticipated that the future use of the groundwater below the Site will not be a drinking water source, although the aquifer does serve as a sole-source aquifer, and there are several public water supply wells downgradient of the Site.

STATUTORY DETERMINATIONS

As previously noted, CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under Federal and State laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4). For the reasons discussed below, EPA has determined that the selected remedy meets the requirements of CERCLA §121, 42 U.S.C. §9621.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. The groundwater extraction and treatment component of the remedy will be effective in achieving protection of human health and the environment over the long term, by restoring groundwater quality to levels which meet State and Federal MCLs. The excavation and off-Site disposal of approximately 2,600 cubic yards of contaminated sediments from Pond A will result in the removal of a significant volume of Site-related contamination from this ecosystem, thereby eliminating any potential adverse effects to ecological receptors within the Massapequa Creek from exposure to these contaminants. The soil remediation component of the selected remedy, that is the excavation and off-Site disposal of approximately 73,000 cubic yards of soil with contaminant levels above the groundwater protection cleanup numbers, will eliminate the cross media impacts to the groundwater, thereby expediting the groundwater restoration and protecting human health and the environment over the long term; in addition the removal of contaminants in the Site features on the eastern portion of the Site will eliminate the future risk posed to construction workers. This remedy also requires the implementation of institutional controls to prevent residential use of the property. Although SL-3 provides a greater level of protectiveness, the contingency remedy for soils would also be protective of human health and the environment. However, because the contingency remedy only requires the excavation and off-Site disposal of 25,600 cubic yards of the most highly contaminated on-Site soils, and requires that a cap be placed over an area of approximately 8.75 acres of low-level contaminated soils, it will rely on an engineered cap and institutional controls to maintain the integrity of the cap to protect human health. The implementation of the remedy, or contingency remedy, will not pose any unacceptable short term risks.

Compliance with ARARs

The National Contingency Plan, Section 300.430 (f)(ii)(B) requires that the selected remedy attain federal and State ARARs. The remedy will comply with the following action-, chemical- and location-specific ARARs identified for the Site and will be demonstrated through monitoring, as appropriate.

Action-Specific ARARs:

- 40 CFR Part 50, National Ambient Air Quality Standards

- 40 CFR Part 61 - National Emissions Standards for Hazardous Air Pollutants

- 40 CFR Part 254.25 - Excavation and Fugitive Dust Emissions

- 49 CFR 173 - Off-Site Transportation of Radioactive Materials

- 40 CFR Parts 260-268 - RCRA Standards for Handling, Transportation and Disposal of Hazardous Waste, including Land Disposal Restrictions

- 6 NYCRR Part 200.6 - Ambient Air Quality Standards

- 6 NYCRR Part 257, Air Quality Standards

- 6 NYCRR Part 212, Air Emission Standards

- 6 NYCRR Parts 370-373 - New York State Standards for Handling, Transportation and Disposal of Hazardous Waste

Chemical-Specific ARARs:

- 40 CFR Part 141 - Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs)

- 6 NYCRR Part 703 - New York Water Quality Standards

- 10 NYCRR Part 5 - New York State Sanitary Code for Drinking Water

Location-Specific ARARs:

- National Historic Preservation Act

- Executive Order 11990 - Protection of Wetlands

- Executive Order 11988 - Floodplain Management

- New York Environmental Conservation Law §27-0704 - Long Island Landfill Law

To-Be-Considered:

- Air Guide I - NYSDEC Control of Toxic Ambient Air Contaminants

- NYSDEC TAGMs 4003 - Hazardous Soil Cleanup Levels
- New York Guidelines for Soil Erosion and Sediment Control

Cost-Effectiveness

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital costs, O&M costs and periodic costs have been estimated and used to develop present worth costs. In the present-worth cost analysis, annual costs were calculated for 20 years for the selected remedy (GW-3, SD-2, and SL-3) (for contingent soil remedy SL-2, 50-year time frame was used) using a seven percent discount rate, with 2002 as the base year.

The selected remedy for groundwater GW-3, while somewhat more costly than GW-2, provides greater overall effectiveness compared to costs than GW-2 because it utilizes well demonstrated treatment technologies; as noted above during the implementation of the non-time critical groundwater removal action, the innovative treatment technologies specified in GW-2 proved to be problematic, as many operational difficulties were experienced.

The selected remedy for Massapequa Creek sediments will eliminate all potential adverse effects to ecological receptors within the Massapequa Creek from exposure to Site-related contaminants, the no -action alternative does not address these risks and therefore is not cost-effective.

While the selected remedy for soil Alternative SL-3 will be more costly than Alternative SL-2, it is a permanent remedy that will be compatible with the Town's plans for utilizing the western portion of the property for passive and active parkland. Therefore, its costs are proportional to its overall effectiveness. The contingency remedy Alternative SL-2 would only be implemented if the Town does not acquire the western portion of the Site for parkland. Under this situation, the contingency remedy could be compatible with existing zoning and uses of the property at a lower cost than Alternative SL-3.

The selected comprehensive remedy for the Site will achieve the goals of the response actions and is cost-effective because it will provide the best overall effectiveness in proportion to its cost. For a detailed breakdown of costs associated with the selected remedy, please see **Tables 8, 9, and 10.**

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy meets the statutory requirement to utilize permanent solutions and treatment technologies to the maximum extent practicable. The selected groundwater remedy Alternative GW-3, while somewhat more costly than Alternative GW-2, is expected to be more easily implementable, more effective over the long-term, and favored by the community and the State. The alternative treatment technologies specified in Alternative GW-2 proved to be problematic during the non-time-critical removal action. The selected remedy for Massapequa Creek sediments satisfies all of the nine criteria to a greater extent than the no-action alternative. The selected soil remedy, Alternative SL-3, is more protective and permanent over the long term than Alternative SL-2; it provides a greater degree of reduction of toxicity, mobility and volume of contaminants at the Site than Alternative SL-2. Alternative SL-3 is also widely acceptable to the public and compatible with the planned long-term uses of the property. The selection of Alternative SL-3, however, is contingent upon the completion of the Town's acquisition of the property for parkland. If the Town does not acquire the property, then Alternative SL-2 will be implemented as the contingency soil remedy. While Alternative SL-2 is not as permanent a soil remedy as Alternative SL-3, and does not have wide public support, it would still be protective of human health and the environment at less cost than Alternative SL-3.

The selected comprehensive remedy represents the most appropriate solution to contamination at or from the Site in the soil, groundwater, and Massapequa Preserve sediment because it provides the best balance of trade-offs among the alternatives with respect to the nine evaluation criteria.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied by the selected remedy. The selected remedy for groundwater would meet the statutory preference for the use of treatment as a principal element. The selected sediment remedy will also meet the statutory preference for the use of treatment as a principal element, to the degree that treatment would be required prior to disposal at an off-Site EPA-approved hazardous waste facility. The selected remedy for soil would meet the statutory preference for the use of treatment as a principal element, to the degree that treatment would be required prior to

disposal at an off-Site EPA-approved hazardous waste facility, as will the contingency remedy for soil. There are no principal threat wastes present at the Site.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted at five-year intervals starting after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Selected Remedy is different from the Preferred Alternative outlined in the July 2001 Proposed Plan in two important aspects discussed below.

The Proposed Plan identified Alternative GW-2 as the Preferred Alternative. This alternative relied on innovative technologies for groundwater remediation. However, because the interim groundwater treatment system, which also employed the innovative technologies, was experiencing operational difficulties, that prevented the system from continuous operation and effective treatment of groundwater contamination, it was determined that traditional pump and treat technologies should be employed to capture and treat the groundwater contamination. In January 2002 steps to convert the on-Site system into a conventional pump and treat system were initiated. Subsequently, at the January 2002 availability session, the public was informed that Alternative GW-2 was being replaced with Alternative GW-3 as the Agency's preferred groundwater remedy. The selected groundwater remedy Alternative GW-3, while somewhat more costly than Alternative GW-2, is expected to be more easily implementable, more effective over the long-term, and is favored by the community and the State.

The Proposed Plan identified Alternative SL-2 as the Preferred Remedy for addressing the soil contamination at the Site. During the comment period, in letters to EPA and at the public meetings, the community expressed very strong support in favor of Alternative SL-3 and against Alternative SL-2. Also, based in part upon comments received during the public comment period, EPA re-evaluated the cost of the soil alternatives and determined that the

difference in cost between SL-3 and SL-2 had narrowed substantially from what had been assumed for the Proposed Plan. Moreover, during the comment period the Town of Oyster Bay (Town) publicly announced significant steps towards formalizing plans to acquire the western portion of the site, including nearly all of the area that would be capped under Alternative SL-2, for the purposes of expanding Ellsworth Allen Park. The Town indicated that the recreational uses planned for the property would include walking/nature trail and sensory gardens, a picnic area, cabins and campgrounds for Boy Scout outings. The development of the property would be phased in over a period of 10 years or more. This would result in disruption of significant portions of the property for trenching (utilities and irrigation), digging (for the planting of trees and shrubbery) and excavation (for the building of rest room facilities, cabins, trails, etc.). The cap component of Alternative SL-2 would be incompatible with Town's proposed use of the park over the short and long term. The Town's proposed use of the park might also compromise monitoring and maintenance the cap, thereby compromising the long-term effectiveness of the remedy. This information resulted in a re-evaluation of Alternative SL-2 and SL-3 against the criteria listed in the NCP, and other program goals. Alternative SL-3 is the selected soil remedy contingent upon the Town's acquisition of the property for recreational use. Alternative SL-3 would allow the Town to use the publicly owned property as a park without limitation. However, if the Town does not complete the acquisition process within a time frame of approximately 6-8 months, or satisfactorily demonstrate to EPA that they will acquire the property for such purposes within a reasonable time frame, then EPA will implement Alternative SL-2 as a contingency remedy.

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Liberty Industrial Finishing Superfund Site
Village of Farmingdale, Town of Oyster Bay, Nassau County, New York

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the selection by the U.S. Environmental Protection Agency (EPA) of the remedial action for the Liberty Industrial Finishing site (the Site) in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601 et seq. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300. An administrative record for the Site, established pursuant to the NCP, 40 CFR §300.800, contains the documents that form the basis for EPA's selection of the remedial action (see Appendix III).

The New York State Department of Environmental Conservation (NYSDEC) has been consulted on the planned remedial action in accordance with CERCLA §121(f), 42 U.S.C. §9621(f), and it concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy represents the comprehensive remedial action for the Site. It addresses: the soil contamination present primarily on the western half of the property in the Wastewater Disposal Basins, the Building B Basement, and the Northwest Disposal Area; numerous contaminated subsurface features present on the eastern portion of the property; the on-property and off-

property groundwater contamination; and localized contamination in pond sediments in nearby Massapequa Creek. The ROD also includes a contingent remedy for soils, described below, to be implemented if the Town of Oyster Bay does not acquire the western portion of the property for park land use.

The Selected Remedy will restore groundwater to its best beneficial use, a source of drinking water, through active remediation of the aquifer and elimination of contaminants in soils that continue to contaminate the groundwater. The removal of contaminants in Site features will eliminate the future risk posed to construction workers. Remediation of contaminated sediments from Pond A will eliminate any potential adverse effects to ecological receptors within the Massapequa Creek from exposure to these contaminants.

The major components of the Selected Remedy include:

Soils:

- excavation and off-Site disposal of all soils contaminated above groundwater protection levels, estimated at 73,100 cubic yards,

- removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features (structures), and

- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses.

Groundwater:

- continued operation of the ongoing interim groundwater treatment system that is being converted to a conventional pump-and-treat system to address the groundwater underlying the Site property contaminated by previous operations at the Site,

- continuation of the interim groundwater action by construction and operation of a conventional pump-and-treat system to address groundwater underlying the Site property which is believed to have been contaminated by an upgradient source,

- construction and operation of a conventional pump-and-

treat system to treat off-property groundwater contamination,

- implementation of a groundwater monitoring program, and
- institutional controls to prohibit installation or use of groundwater wells for human consumption.

Massapequa Preserve:

- excavation and off-Site disposal of approximately 2,600 cubic yards of contaminated sediments within Pond A of the Massapequa Preserve, and
- implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve.

The Town of Oyster Bay is in the process of acquiring the western portion of the Site for the purpose of expanding Ellsworth Allen Park. If the Town does not complete the acquisition of the western half of the property within a time frame of approximately 6-8 months, or otherwise satisfactorily demonstrate to EPA that it will acquire the property for such purposes within a reasonable time frame, the following contingency remedy for soils will be implemented:

- excavation and off-Site disposal of approximately 25,600 cubic yards of soils contaminated above Site-specific cleanup levels,
- placement of an impermeable cap over 8.75 acres of low-level contaminated soils with a requirement to maintain the integrity of the cap,
- removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features (structures),and
- institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses and institutional controls to prevent activities that could compromise the integrity of the cap.

In addition to the contingent remedy, it should be noted that approximately two-thirds of the features specified in the selected soil remedy and contingent soil remedy are expected to

be addressed separately pursuant to an Administrative Order on Consent issued to the Site property owners on March 27, 2002. If the property owners fail to implement this work, then all of the Site features will be addressed as part of the Selected Remedy.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121, 42 U.S.C. §9621: (1) it is protective of human health and the environment; (2) it achieves a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains the legally applicable or relevant and appropriate requirements (ARARs) under Federal and State laws; (3) it is cost-effective; (4) it utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable; and (5) it satisfies the statutory preference for remedies that employ treatment to reduce the toxicity, mobility, or volume of the hazardous substances, pollutants or contaminants at the Site.

A five-year review of the remedial action pursuant to CERCLA §121(c), 42 U.S.C. §9621(c), will be necessary to ensure that the remedial action remains protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

Chemicals of concern and their respective concentrations (see ROD, pages 10 - 25);

Baseline risk represented by the chemicals of concern (see ROD, pages 25 - 38);

Cleanup levels established for chemicals of concern and the basis for these levels (see ROD, pages 38 - 40);

Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD, pages 44, 48, and 51); and

Key factors that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see ROD, pages 65 - 71).

William J. Muszynski

Jane M. Kenny
Regional Administrator
EPA-Region 2

3/28/02
Date

APPENDIX B

Consent Judgment

D/F

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

ORIGINAL

FILED
IN CLERK'S OFFICE
U.S. DISTRICT COURT, E.D.N.Y.
★ AUG 31 2004 ★
BROOKLYN OFFICE

- X

UNITED STATES OF AMERICA,

Plaintiff,

- against -

Civil Action
No. CV-04-1308

(Garaufis, J.)
(Levy, M.J.)

COLTEC INDUSTRIES, INC.;
GOODRICH CORPORATION;
55 MOTOR AVENUE LLC;
CUBBIES PROPERTIES, INC.;
JEFRY ROSMARIN;
J. JAY TANENBAUM;
JAN BURMAN;
JEROME LAZARUS;
LIBERTY ASSOCIATES;
WILLIAM HELLER;
KOCH-GLITSCH, LP;
BEAZEREAST, INC.,

Defendants.

- X

CONSENT JUDGMENT

MOVANT'S COUNSEL IS DIRECTED
TO SERVE A COPY OF THIS ORDER
ON ALL PARTIES UPON RECEIPT

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I. BACKGROUND

A. The United States of America ("United States"), on behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §§ 9606, 9607.

B. The United States in its complaint seeks, *inter alia*: (1) reimbursement of costs incurred and to be incurred by EPA and the Department of Justice for response actions at the Liberty Industrial Finishing Superfund Site (the "Site") in the Village of Farmingdale, Town of Oyster Bay, Nassau County, New York, together with accrued interest; and (2) performance of studies and response work by the defendants at the Site consistent with the National Contingency Plan, 40 C.F.R. Part 300 (as amended) ("NCP").

C. In accordance with the NCP and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), EPA notified the State of New York (the "State") on September 23, 2002 of negotiations with potentially responsible parties regarding the implementation of the remedial design and remedial action for the Site, and EPA has provided the State with an opportunity to participate in such negotiations and be a party to this Consent Judgment.

D. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the U.S. Department of the Interior ("DOI") and the National Oceanic and Atmospheric Administration ("NOAA") on September 23, 2002 of negotiations with potentially responsible parties regarding the release of hazardous substances that may have resulted in injury to the natural resources under Federal trusteeship and encouraged the trustees to participate in the negotiation of this Consent Judgment.

E. The defendants that have entered into this Consent Judgment ("Settling Defendants") do not admit any liability to the Plaintiff arising out of the transactions or occurrences alleged in the complaint, nor do they acknowledge that the release or threatened release of hazardous substances at or from the Site constitutes an imminent or substantial endangerment to the public health or welfare or the environment. The Settling Federal Agencies do not admit any liability arising out of the transactions or occurrences alleged in any claim asserted by the Settling Defendants.

F. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Site on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on June 10, 1986, 51 Fed. Reg. 21054 (1986).

G. In response to a release or a substantial threat of a release of hazardous substances at or from the Site, in November, 1991, EPA commenced a Remedial Investigation and Feasibility Study ("RI/FS") for the Site pursuant to 40 C.F.R. § 300.430, and in January 1997 a group consisting of some of the Settling Defendants (the "CRI/FS Respondents") commenced a "continued RI/FS" for the Site pursuant to 40 C.F.R. § 300.430.

H. The CRI/FS Respondents completed a Remedial Investigation ("RI") Report on July 20, 2000, and the CRI/FS Respondents completed a Feasibility Study ("FS") Report on July 26, 2000.

I. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FS and of the proposed plan for remedial action on July 23, 2001, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which the Regional Administrator based the selection of the response action.

J. The decision by EPA on the remedial action to be implemented at the Site is embodied in a final Record of Decision ("ROD"), executed on March 28, 2002, on which the State has given its concurrence. The ROD includes EPA's explanation for any significant differences between the final plan and the proposed plan as well as a responsiveness summary to the public comments. Notice of the final plan was published on October 17, 2002 in accordance with Section 117(b) of CERCLA.

K. Based on the information presently available to EPA, EPA believes that the Work (as defined below) will be properly and promptly conducted by the Settling Work Defendants if conducted in accordance with the requirements of this Consent Judgment.

L. The remedial action selected in the ROD addresses, among other things, soil contamination at the Site. For purposes of this Consent Judgment, EPA has determined that the Town of Oyster Bay has acquired, or will, within a reasonable time frame, acquire the western part of the 30-acre portion of the Site for parkland purposes and that the applicable remedial action with respect to soils at the Site thus is the alternative denominated as SL-3 in the ROD.

M. The Settling Work Defendants have established the Liberty Industrial Finishing Site Trust Account to receive certain settlement and other payments with respect to the Site from certain of the Settling Defendants, the Settling Federal Agencies, and third parties. Payments to the Liberty Industrial Finishing Site Trust Account shall only be used to fund the Work, the Features Tasks and/or to pay Future Response Costs.

N. Solely for the purposes of Section 113(j) of CERCLA, the Remedial Action selected by the ROD and the Work to be performed by the Settling Work Defendants shall constitute a response action taken or ordered by the President.

O. The Parties recognize, and the Court by entering this Consent Judgment finds, that this Consent Judgment has been negotiated by the Parties in good faith and implementation of this Consent Judgment will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this Consent Judgment is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over the Settling Defendants. Solely for the purposes of this Consent Judgment and the underlying complaint, Settling Defendants waive all objections and defenses

that they may have to jurisdiction of the Court or to venue in this District and all defenses based on statute of limitations. Settling Defendants shall not challenge the terms of this Consent Judgment or this Court's jurisdiction to enter and enforce this Consent Judgment.

III. PARTIES BOUND

2. This Consent Judgment applies to and is binding upon the United States and upon Settling Defendants and their heirs, successors and assigns. Any change in ownership or corporate status of a Settling Defendant including, but not limited to, any transfer of assets or real or personal property, shall in no way alter such Settling Defendant's responsibilities under this Consent Judgment.

3. Settling Work Defendants shall provide a copy of this Consent Judgment to each contractor hired to perform the Work required by this Consent Judgment and to each person representing any Settling Work Defendant with respect to the Site or the Work and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Consent Judgment. Settling Work Defendants or their contractors shall provide written notice of the Consent Judgment to all subcontractors hired to perform any portion of the Work required by this Consent Judgment. Settling Work Defendants shall nonetheless be responsible for ensuring that their contractors and subcontractors perform the Work contemplated herein in accordance with this Consent Judgment. With regard to the activities undertaken pursuant to this Consent Judgment, each contractor and subcontractor shall be deemed to be in a contractual relationship with the Settling Work Defendants within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

IV. DEFINITIONS

4. Unless otherwise expressly provided herein, terms used in this Consent Judgment which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Judgment, the following definitions shall apply:

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.*

"Consent Judgment" shall mean this Consent Judgment and all appendices attached hereto (listed in Section XXIX). In the event of conflict between this Consent Judgment and any appendix, this Consent Judgment shall control.

"Day" shall mean a calendar day unless expressly stated to be a working day. "Working day" shall mean a day other than a Saturday, Sunday, or Federal holiday. In computing any period of time under this Consent Judgment, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.

"Effective Date" shall be the effective date of this Consent Judgment as provided in Paragraph 112.

"EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

"Features AOC" shall mean the administrative order on consent (Index number CERCLA-02-2002-2013) issued by EPA on March 27, 2002, pursuant to Section 106(a) of CERCLA, to 55 Motor Avenue Company; Cubbies Properties, Inc.; Jefry Rosmarin; and J. Jay Tanenbaum, current owners and operators of real property included within the Site, requiring the investigation and remediation of certain storage tanks, subsurface features, sanitary leaching fields and an approximately 500 cubic yard mound of contaminated soils located at such real property.

"Features Tasks" shall mean any or all of the work and other obligations required to be performed by the respondents under the Features AOC.

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Consent Judgment, verifying the Work, or otherwise implementing, overseeing, or enforcing this Consent Judgment, including, but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Sections VII, IX (including, but not limited to, the cost of attorney time and any monies paid to secure access and/or to secure or implement institutional controls including, but not limited to, the amount of just compensation), XV, and Paragraph 92 of Section XXI. Future Response Costs shall also include all Interim Response Costs.

"Interim Groundwater Tasks" shall mean any or all of the work and other obligations required to be performed by the respondents under the Interim Groundwater UAO.

"Interim Groundwater UAO" shall mean the unilateral administrative order (Index number II CERCLA-98-0208) issued by EPA on August 3, 1998, pursuant to Section 106(a) of CERCLA, to certain of the Settling Defendants, requiring the remediation of groundwater underlying the 30-acre portion of the Site.

"Interim Response Costs" shall mean all costs, including direct and indirect costs, (a) paid by the United States in connection with the Site between March 10, 2002 (as to payroll costs) or March 19, 2002 (as to all other costs) and the Effective Date, or (b) incurred prior to the Effective Date but paid after that date.

"Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Operation and Maintenance" or "O & M" shall mean all activities required to maintain the effectiveness of the Remedial Action as required under the Operation and Maintenance Plan approved or developed by EPA pursuant to this Consent Judgment.

"Owner Settling Defendants" shall mean the Settling Defendants listed in Appendix E.

"Paragraph" shall mean a portion of this Consent Judgment identified by an arabic numeral or an upper case letter.

"Parties" shall mean the United States and the Settling Defendants.

"Performance Standards" shall mean the cleanup standards and other measures of achievement of the goals of the Remedial Action, set forth in the Section of the ROD entitled "Remedial Action Objectives," the "Compliance with ARARs" subsection of the "Selected Remedy" section of the ROD, and Section II of the Statement of Work ("SOW"), as defined below.

"Plaintiff" shall mean the United States.

"Plume B" shall mean those hazardous substances and/or pollutants and contaminants, including tetrachloroethylene, released and threatened to be released into groundwater, from a source or sources located entirely or primarily about one-quarter mile north of the 30-acre portion of the Site, and also includes all areas of groundwater where hazardous substances and/or pollutants or contaminants released from that source or sources come to be located, the extent of which, as of 1999, is depicted generally on the map attached as Appendix H, but Plume B does not include that portion of the groundwater plume originating north of the Site which is commingled with hazardous substances and/or pollutants and contaminants released at or from the 30-acre portion of the Site.

"Prospective Purchaser Agreement" shall mean the Agreement and Covenant Not to Sue, Index Number CERCLA-02-2002-2019, entered into by EPA and the Town of Oyster Bay which became effective on June 10, 2003.

"RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901 *et seq.* (also known as the Resource Conservation and Recovery Act).

"Record of Decision" or "ROD" shall mean the EPA Record of Decision relating to the Site signed on March 28, 2002, by the Regional Administrator, EPA Region II, or his/her delegate, and all attachments thereto. The ROD (excluding appendices) is attached as Appendix A.

"Remedial Action" shall mean those activities, including Operation and Maintenance, to be undertaken by the Settling Work Defendants to implement the ROD, in accordance with the SOW and the final Remedial Design and Remedial Action Work Plans and other plans approved by EPA.

"Remedial Action Work Plan" shall mean the work plan or work plans developed pursuant to Section X of the SOW and approved by EPA, and any amendments thereto.

"Remedial Design" shall mean those activities to be undertaken by the Settling Work Defendants to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design Work Plan.

"Remedial Design Work Plan" shall mean the work plan developed pursuant to Sections VI and VII of the SOW and approved by EPA, and any amendments thereto.

"Section" shall mean a portion of this Consent Judgment identified by a Roman numeral.

"Settling Defendants" shall mean those Parties identified in Appendices D (Non-Owner Settling Defendants) and E (Owner Settling Defendants) but shall not include the Settling Federal Agencies.

"Settling Federal Agencies" shall mean those departments, agencies, and instrumentalities of the United States identified in Appendix F, which are resolving any claims which have been or could be asserted against them with regard to this Site as provided in this Consent Judgment.

"Settling Work Defendants" shall mean those Parties identified in Appendices D (Non-Owner Settling Defendants) and E (Owner Settling Defendants) other than BeazerEast, Inc. and Koch-Glitsch, LP.

"Site" shall mean the Liberty Industrial Finishing Superfund Site, located in the unincorporated Village of Farmingdale, Town of Oyster Bay, Nassau County, New York, encompassing an area approximately 30 acres in size, which is located at 55 Motor Avenue and designated on the Nassau County tax map as Lots 327 and 329 of Block 518, Section 48, depicted generally on the map attached as Appendix C, as well as those areas where hazardous substances and/or pollutants and contaminants released at or from the 30-acre area have come to be located, but, for purposes of this Consent Judgment, the Site does not include Plume B.

"State" shall mean the State of New York.

"Statement of Work" or "SOW" shall mean the statement of work for implementation of the Remedial Design, Remedial Action, and Operation and Maintenance at the Site, as set forth in Appendix B of this Consent Judgment and any modifications made in accordance with this Consent Judgment.

"Supervising Contractor" shall mean the principal contractor retained by the Settling Work Defendants to supervise and direct the implementation of the Work under this Consent Judgment.

"United States" shall mean the United States of America, including all of its departments, agencies, and instrumentalities, which includes without limitation EPA, the Settling Federal Agencies and any federal natural resource trustee.

"Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

"Work" shall mean all activities Settling Work Defendants are required to perform under this Consent Judgment, except those required by Section XXV (Retention of Records).

V. GENERAL PROVISIONS

5. Objectives of the Parties. The objectives of the Parties in entering into this Consent Judgment are to protect public health or welfare or the environment at the Site by the design and implementation of response actions at the Site by the Settling Work Defendants, to reimburse response costs of the Plaintiff, and to resolve the claims of Plaintiff against Settling Defendants and the claims of the Settling Defendants which have been or could have been

asserted against the United States with regard to this Site as provided in this Consent Judgment and to resolve the contribution claims among the Settling Defendants and Settling Federal Agencies.

6. Commitments by Settling Defendants and Settling Federal Agencies.

a. Settling Work Defendants shall finance and perform the Work in accordance with this Consent Judgment, the ROD, and all work plans and other plans, standards, specifications, and schedules set forth herein or developed by Settling Work Defendants and approved by EPA pursuant to this Consent Judgment. Settling Work Defendants shall also reimburse the United States for Future Response Costs as provided in this Consent Judgment. Settling Federal Agencies shall pay a share of the costs of the Work, the Features Tasks, and Future Response Costs through periodic contributions to the Liberty Industrial Finishing Site Trust Account, as provided pursuant to Paragraph 58.b of this Consent Judgment.

b. BeazerEast, Inc. and Koch-Glitsch, LP. BeazerEast, Inc. and Koch-Glitsch, LP are jointly and severally obligated to make the payment required of them under Paragraph 60 of this Consent Judgment.

7. Joint and Several Liability. The obligations of Settling Work Defendants to finance and perform the Work and to pay amounts owed to the United States under this Consent Judgment are joint and several. In the event of the insolvency or other failure of any one or more Settling Work Defendants to implement the requirements of this Consent Judgment, the remaining Settling Work Defendants shall fully comply with all such requirements.

8. Compliance With Applicable Law. All activities undertaken by Settling Work Defendants pursuant to this Consent Judgment shall be performed in accordance with the requirements of all applicable federal and state laws and regulations. Settling Work Defendants must also comply with all applicable or relevant and appropriate requirements of all Federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to this Consent Judgment, if approved by EPA, shall be considered to be consistent with the NCP.

9. Permits.

a. As provided in Section 121(e) of CERCLA and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or state permit or approval, Settling Work Defendants shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. The Settling Work Defendants may seek relief under the provisions of Section XVIII (Force Majeure) of this Consent Judgment for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit required for the Work.

c. This Consent Judgment is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

10. Notice to Successors-in-Title.

a. With respect to any property owned or controlled by the Owner Settling Defendants that is located within the Site, within 15 days after the entry of this Consent Judgment, the Owner Settling Defendants shall submit to EPA for review and approval a notice to be filed with the Registry of Deeds, Nassau County, State of New York, which shall provide notice to all successors-in-title that the property is part of the Site, that EPA selected a remedy for the Site on March 28, 2002, and that potentially responsible parties have entered into a Consent Judgment requiring implementation of the remedy. Such notice shall identify the United States District Court in which the Consent Judgment was filed, the name and civil action number of this case, and the date the Consent Judgment was entered by the Court. The Owner Settling Defendants shall record the notice within 10 days of EPA's approval of the notice. The Owner Settling Defendants shall provide EPA with a certified copy of the recorded notice within 10 days of recording such notice.

b. At least 30 days prior to the conveyance of any interest in property located within the Site including, but not limited to, fee interests, leasehold interests, and mortgage interests, the Owner Settling Defendant(s) conveying the interest shall give the grantee written notice of (i) this Consent Judgment, (ii) any instrument by which an interest in real property has been conveyed that confers a right of access to the Site (hereinafter referred to as "access easements") pursuant to Section IX (Access and Institutional Controls), and (iii) any instrument by which an interest in real property has been conveyed that confers a right to enforce restrictions on the use of such property (hereinafter referred to as "restrictive easements") pursuant to Section IX (Access and Institutional Controls). At least 30 days prior to such conveyance, the Owner Settling Defendant(s) conveying the interest shall also give written notice to EPA of the proposed conveyance, including the name and address of the grantee, and the date on which notice of the Consent Judgment, access easements, and/or restrictive easements was given to the grantee.

c. In the event of any such conveyance, the Owner Settling Defendants' obligations under this Consent Judgment, including, but not limited to, their obligation to provide or secure access and institutional controls, as well as to abide by such institutional controls, pursuant to Section IX (Access and Institutional Controls) of this Consent Judgment, shall continue to be met by the Owner Settling Defendants. In no event shall the conveyance release or otherwise affect the liability of the Owner Settling Defendants to comply with all provisions of this Consent Judgment, absent the prior written consent of EPA. If the United States approves, the grantee may perform some or all of the Work under this Consent Judgment.

11. Dismissal of Pending Claims. Within thirty (30) days following the Effective Date, the United States and the Settling Defendants who are parties to the action captioned 55 Motor Avenue Co., et al. v. Liberty Industrial Finishing Corp., et al., Civil Action No. CV-91-0968, which is pending in the United States District Court for the Eastern District of New York, shall submit to the Court for approval a stipulation (1) dismissing the action with prejudice, with the exception of Coltec's cross-claim against Liberty Aero, Inc. and any cross-claims or counterclaims against Grumman Corporation, (2) preserving for all parties claims relating to any

issue that is excepted from Plaintiff's covenant not to sue or take administrative action pursuant to paragraphs 88, 89 and 91 of this Consent Judgment, and (3) with each party bearing its own costs, expenses and attorneys' fees.

VI. PERFORMANCE OF THE WORK BY SETTLING WORK DEFENDANTS

12. Selection of Supervising Contractor.

a. All aspects of the Work to be performed by Settling Work Defendants pursuant to Sections VI (Performance of the Work by Settling Work Defendants), VII (Remedy Review), VIII (Quality Assurance, Sampling and Data Analysis), and XV (Emergency Response) of this Consent Judgment shall be under the direction and supervision of the Supervising Contractor, the selection of which shall be subject to disapproval by EPA. Settling Work Defendants' Supervising Contractor, as well as all other contractors and subcontractors who engage in the "practice of engineering" at the Site on behalf of Settling Work Defendants, as the "practice of engineering" is defined at Section 7201 of the New York State Education Law, must comply with all applicable New York State legal requirements regarding the practice of professional engineering within the State of New York, including, but not limited to, all applicable requirements of the New York State Education Law and Articles 15 and 15-A of the Business Corporation Law. Within 15 days after the lodging of this Consent Judgment, Settling Work Defendants shall notify EPA in writing of the name, title, and qualifications of any contractor proposed to be the Supervising Contractor. With respect to any contractor proposed to be Supervising Contractor, Settling Work Defendants shall demonstrate that the proposed contractor has a quality system that complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's Quality Management Plan (QMP). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA. EPA will issue a notice of disapproval or an authorization to proceed. If at any time thereafter, Settling Work Defendants propose to change a Supervising Contractor, Settling Work Defendants shall give such notice to EPA and must obtain an authorization to proceed from EPA before the new Supervising Contractor performs, directs, or supervises any Work under this Consent Judgment.

b. If EPA disapproves a proposed Supervising Contractor, EPA will notify Settling Work Defendants in writing. Settling Work Defendants shall submit to EPA a list of contractors, including the qualifications of each contractor, that would be acceptable to them within 30 days of receipt of EPA's disapproval of the contractor previously proposed. EPA will provide written notice of the names of any contractor(s) that it disapproves and an authorization to proceed with respect to any of the other contractors. Settling Work Defendants may select any contractor from that list that is not disapproved and shall notify EPA of the name of the contractor selected within 21 days of EPA's authorization to proceed.

c. If EPA fails to provide written notice of its authorization to proceed or disapproval as provided in this Paragraph and this failure prevents the Settling Work Defendants from meeting one or more deadlines in a plan approved by the EPA pursuant to this Consent

Judgment, Settling Work Defendants may seek relief under the provisions of Section XVIII (Force Majeure) hereof.

13. Remedial Design/Remedial Action.

Settling Work Defendants shall fully implement and comply with the SOW. The Work to be performed by Settling Work Defendants pursuant to this Consent Judgment shall, at a minimum, achieve the Performance Standards and all other requirements of, and be performed in a manner consistent with, the ROD and this Consent Judgment.

14. Continued Implementation of Work.

Settling Work Defendants shall continue to implement the various components of the Remedial Action and O&M until the Performance Standards are achieved and for so long thereafter as is otherwise required under this Consent Judgment.

15. Modification of the SOW or Related Work Plans.

a. If EPA determines that modification to the work specified in the SOW and/or in work plans developed pursuant to the SOW is necessary to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, EPA may require that such modification be incorporated in the SOW and/or such work plans, provided, however, that a modification may only be required pursuant to this Paragraph to the extent that it is consistent with the scope of the remedy selected in the ROD.

b. For the purposes of this Paragraph 15 and Paragraphs 52 and 53 only, the "scope of the remedy selected in the ROD," in summary, is:

(I) as to soils: (A) excavation and off-Site disposal of all soils contaminated above the soil Performance Standards; (B) subsequent to excavation of such soils, placement of clean fill in the excavated areas; (C) removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features at the Site; and (D) implementation of institutional controls to restrict the use of the Site to commercial/industrial uses or, where applicable, to recreational uses;

(II) as to groundwater: (A) continued operation of the groundwater treatment system installed pursuant to the Interim Groundwater UAO, to address the groundwater underlying the 30-acre portion of the Site, other than Plume B, in order to reduce contaminant levels so as to achieve Performance Standards and restore the aquifer; (B) construction and operation of a conventional pump-and-treat system to treat groundwater contamination downgradient of the 30-acre portion of the Site, other than Plume B, in order to reduce contaminant levels so as to achieve Performance Standards and restore the aquifer; (C) discharge of treated groundwater to Massapequa Creek surface water or reinjection of treated groundwater into the aquifer; (D) implementation of a groundwater monitoring program; and (E) implementation of institutional controls to prohibit installation or use of groundwater wells for human consumption of the well water or any other purpose which would or could result in human contact with groundwater; and

(III) as to the Massapequa Preserve: (A) removal by excavation or vacuum extraction and off-Site disposal of sediments contaminated above Performance

Standards within Pond A of the Massapequa Preserve; and (B) implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve.

c. If Settling Work Defendants object to any modification determined by EPA to be necessary pursuant to this Paragraph, they may seek dispute resolution pursuant to Section XIX (Dispute Resolution), Paragraph 71 (record review). The SOW and/or related work plans shall be modified in accordance with final resolution of the dispute.

d. Settling Work Defendants shall implement any work required by any modifications incorporated in the SOW and/or in work plans developed pursuant to the SOW in accordance with this Paragraph.

e. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as otherwise provided in this Consent Judgment.

16. Settling Work Defendants acknowledge and agree that nothing in this Consent Judgment or the Remedial Design or Remedial Action Work Plans constitutes a warranty or representation of any kind by Plaintiff that compliance with the work requirements set forth in the SOW and the Work Plans will achieve the Performance Standards.

17. a. Settling Work Defendants shall, prior to any off-Site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator of such shipment of Waste Material. However, this notification requirement shall not apply to any off-Site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

(1) The Settling Work Defendants shall include in the written notification the following information, where available: (1) the name and location of the facility to which the Waste Material is to be shipped; (2) the type and quantity of the Waste Material to be shipped; (3) the expected schedule for the shipment of the Waste Material; and (4) the method of transportation. The Settling Work Defendants shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

(2) The identity of the receiving facility and state will be determined by the Settling Work Defendants following the award of the contract for Remedial Action construction. The Settling Work Defendants shall provide the information required by Paragraph 17.a as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Settling Work Defendants shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3) and 40 C.F.R. 300.440. Settling Work Defendants shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulations cited in the preceding sentence.

VII. REMEDY REVIEW

18. Periodic Review. Settling Work Defendants shall conduct any studies and investigations as requested by EPA, in order to permit EPA to conduct reviews, at least every five years, of whether the Remedial Action is protective of human health and the environment, as required by Section 121(c) of CERCLA and any applicable regulations.

19. EPA Selection of Further Response Actions. If EPA determines, at any time, that the Remedial Action is not protective of human health and the environment, EPA may select further response actions for the Site in accordance with the requirements of CERCLA and the NCP.

20. Opportunity To Comment. Settling Work Defendants and, if required by Sections 113(k)(2) or 117 of CERCLA, the public, will be provided with an opportunity to comment on any further response actions proposed by EPA as a result of the review conducted pursuant to Section 121(c) of CERCLA and to submit written comments for the record during the comment period.

21. Settling Work Defendants' Obligation To Perform Further Response Actions. If EPA selects further response actions for the Site, the Settling Work Defendants shall undertake such further response actions to the extent that the reopener conditions in Paragraph 88 or Paragraph 89 (United States' reservations of liability based on unknown conditions or new information) are satisfied. Settling Work Defendants may invoke the procedures set forth in Section XIX (Dispute Resolution) to dispute (1) EPA's determination that the reopener conditions of Paragraph 88 or Paragraph 89 of Section XXI (Covenants by Plaintiff) are satisfied, (2) EPA's determination that the Remedial Action is not protective of human health and the environment, or (3) EPA's selection of the further response actions. Disputes pertaining to the whether the Remedial Action is protective or to EPA's selection of further response actions shall be resolved pursuant to Paragraph 71 (record review).

22. Submissions of Plans. If Settling Work Defendants are required to perform the further response actions pursuant to Paragraph 21, they shall submit a plan for such work to EPA for approval in accordance with the procedures set forth in Section VI (Performance of the Work by Settling Work Defendants) and shall implement the plan approved by EPA in accordance with the provisions of this Consent Judgment.

VIII. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

23. Settling Work Defendants shall use quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance and monitoring samples in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R5)" (EPA/240/B-01/003, March 2001) "Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998), and subsequent amendments to such guidelines upon notification by EPA to Settling Work Defendants of such amendment. Amended guidelines shall apply only to procedures conducted after such notification. Prior to the commencement of any monitoring project under this Consent Judgment, Settling Work Defendants shall submit to EPA for approval, after a reasonable opportunity for review and comment by the State, a Quality Assurance Project Plan ("QAPP") that is consistent with the SOW, the NCP and applicable

guidance documents. If relevant to the proceeding, the Parties agree that validated sampling data generated in accordance with the QAPP(s) and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this Consent Judgment. Settling Work Defendants shall ensure that EPA and State personnel and their authorized representatives are allowed access at reasonable times to all laboratories utilized by Settling Work Defendants in implementing this Consent Judgment. In addition, Settling Work Defendants shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring. Settling Work Defendants shall ensure that the laboratories they utilize for the analysis of samples taken pursuant to this Consent Judgment perform all analyses according to accepted EPA methods. Accepted EPA methods consist of those methods which are documented in the "Contract Lab Program Statement of Work for Inorganic Analysis" (Revision No. 11, 1992) and the "Contract Lab Program Statement of Work for Organic Analysis," (Revision No. 9, 1994), and any amendments made thereto during the course of the implementation of this Consent Judgment; however, upon approval by EPA, after opportunity for review and comment by the State, the Settling Work Defendants may use other analytical methods which are as stringent as or more stringent than the CLP- approved methods. Settling Work Defendants shall ensure that all laboratories they use for analysis of samples taken pursuant to this Consent Judgment participate in an EPA or EPA-equivalent QA/QC program. Settling Work Defendants shall only use laboratories that have a documented Quality System which complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2)," (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program (NELAP) as meeting the Quality System requirements. Settling Work Defendants shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Consent Judgment will be conducted in accordance with the procedures set forth in the QAPP approved by EPA.

24. Upon request, the Settling Work Defendants shall allow split or duplicate samples to be taken by EPA or its authorized representatives. Settling Work Defendants shall notify EPA not less than 28 days in advance of any sample collection activity unless shorter notice is agreed to by EPA. In addition, EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow the Settling Work Defendants to take split or duplicate samples of any samples it takes as part of its oversight of the Settling Work Defendants' implementation of the Work.

25. Settling Work Defendants shall submit to each of EPA and the State five copies of the results of all sampling and/or tests or other data obtained or generated by or on behalf of Settling Work Defendants with respect to the Site and/or the implementation of this Consent Judgment unless EPA agrees otherwise.

26. Notwithstanding any provision of this Consent Judgment, the United States hereby retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA and any other applicable statutes or regulations.

IX. ACCESS AND INSTITUTIONAL CONTROLS

27. To the extent that the Site, or any other property where access and/or land/water use restrictions are needed to implement this Consent Judgment, is owned or controlled by any of the Settling Defendants, such Settling Defendants shall:

a. commencing on the date of lodging of this Consent Judgment, provide the United States and its representatives, including EPA and its contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Consent Judgment including, but not limited to, the following activities:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to the United States;

(3) Conducting investigations relating to contamination at or near the Site;

(4) Obtaining samples;

(5) Assessing the need for, planning, or implementing additional response actions at or near the Site;

(6) Assessing implementation of quality assurance and quality control practices as defined in the approved Quality Assurance Project Plans;

(7) Implementing the Work pursuant to the conditions set forth in Paragraph 92 of this Consent Judgment;

(8) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Settling Defendants or their agents, consistent with Section XXIV (Access to Information);

(9) Assessing Settling Work Defendants' compliance with this Consent Judgment; and

(10) Determining whether the Site or other property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, by or pursuant to this Consent Judgment;

b. commencing on the date of lodging of this Consent Judgment, refrain from using the Site, or such other property, in any manner that would interfere with or adversely affect the implementation, integrity, or protectiveness of the remedial measures to be performed pursuant to this Consent Judgment. Such restrictions include, but are not limited to: (i) the prohibition of any use of the Site for residential purposes, and (ii) the prohibition of the installation or use of groundwater wells at the Site for purposes of human consumption of the well water or for any other purpose which would or could result in human contact with groundwater; and

c. execute and record in the Registry of Deeds, Nassau County, State of New York, an easement, running with the land, that (i) grants a right of access for the purpose of conducting any activity related to this Consent Judgment including, but not limited to, those activities listed in Paragraph 27.a of this Consent Judgment, and (ii) grants the right to enforce the land/water use restrictions listed in Paragraph 27.b of this Consent Judgment, or other restrictions that EPA determines are necessary to implement, ensure non-interference with, or ensure the protectiveness of the remedial measures to be performed pursuant to this Consent Judgment. Such Settling Defendants shall grant the access rights and the rights to enforce the land/water use restrictions to one or more of the following persons as determined by EPA: (i) the United States, on behalf of EPA, and its representatives, (ii) the State and its representatives, (iii) the other Settling Defendants and their representatives, and/or (iv) other appropriate grantees. Such Settling Defendants shall, within 45 days of entry of this Consent Judgment, submit to EPA for review and approval with respect to such property:

(1) A draft easement, in substantially the form attached hereto as Appendix G, that is enforceable under the laws of the State of New York, and

(2) a current title insurance commitment or some other evidence of title acceptable to EPA, which shows title to the land described in the easement to be free and clear of all prior liens and encumbrances (except when those liens or encumbrances are approved by EPA or when, despite best efforts, Settling Defendants are unable to obtain release or subordination of such prior liens or encumbrances).

Within 15 days of EPA's approval and acceptance of the easement and the title evidence, such Settling Defendants shall update the title search and, if it is determined that nothing has occurred since the effective date of the commitment to affect the title adversely, record the easement with the Registry of Deeds, Nassau County, State of New York. Within 30 days of recording the easement, such Settling Defendants shall provide EPA with a final title insurance policy, or other final evidence of title acceptable to EPA, and a certified copy of the original recorded easement showing the clerk's recording stamps. If the easement is to be conveyed to the United States, the easement and title evidence (including final title evidence) shall be prepared in accordance with the U.S. Department of Justice Title Standards 2001, and approval of the sufficiency of title must be obtained as required by 40 U.S.C. § 255.

28. If the Site, or any other property where access and/or land/water use restrictions are needed to implement this Consent Judgment, is owned or controlled by persons other than any of the Settling Defendants, Settling Work Defendants shall, if EPA so requests, use best efforts to secure from such persons:

a. an agreement to provide access thereto for Settling Work Defendants, as well as for the United States on behalf of EPA, and the State, as well as their representatives (including contractors), for the purpose of conducting any activity related to this Consent Judgment including, but not limited to, those activities listed in Paragraph 27.a of this Consent Judgment;

b. an agreement, enforceable by the Settling Work Defendants and the United States, to refrain from using the Site, or such other property, in any manner that would interfere with or adversely affect the implementation, integrity, or protectiveness of the remedial

measures to be performed pursuant to this Consent Judgment. Such restrictions include, but are not limited to those restrictions listed in Paragraph 27.b of this Consent Judgment; and

c. the execution and recordation in the Registry of Deeds, Nassau County, State of New York, of an easement, running with the land, that (i) grants a right of access for the purpose of conducting any activity related to this Consent Judgment including, but not limited to, those activities listed in Paragraph 27.a of this Consent Judgment, and (ii) grants the right to enforce the land/water use restrictions listed in Paragraph 27.b of this Consent Judgment, or other restrictions that EPA determines are necessary to implement, ensure non-interference with, or ensure the protectiveness of the remedial measures to be performed pursuant to this Consent Judgment. The access rights and/or rights to enforce land/water use restrictions shall be granted to one or more of the following persons, as determined by EPA: (i) the United States, on behalf of EPA, and its representatives, (ii) the State and its representatives, (iii) the Settling Work Defendants and their representatives, and/or (iv) other appropriate grantees. Within 45 days of EPA's request, Settling Work Defendants shall submit to EPA for review and approval with respect to such property:

(1) A draft easement, in substantially the form attached hereto as Appendix G, that is enforceable under the laws of the State of New York, and

(2) a current title insurance commitment, or some other evidence of title acceptable to EPA, which shows title to the land described in the easement to be free and clear of all prior liens and encumbrances (except when those liens or encumbrances are approved by EPA or when, despite best efforts, Settling Work Defendants are unable to obtain release or subordination of such prior liens or encumbrances)

Within 15 days of EPA's approval and acceptance of the easement and the title evidence, Settling Work Defendants shall update the title search and, if it is determined that nothing has occurred since the effective date of the commitment to affect the title adversely, the easement shall be recorded with the Registry of Deeds, Nassau County, State of New York . Within 30 days of the recording of the easement, Settling Work Defendants shall provide EPA with a final title insurance policy, or other final evidence of title acceptable to EPA, and a certified copy of the original recorded easement showing the clerk's recording stamps. If easement is to be conveyed to the United States, the easement and title evidence (including final title evidence) shall be prepared in accordance with the U.S. Department of Justice Title Standards 2001, and approval of the sufficiency of title must be obtained as required by 40 U.S.C. § 255.

29. For purposes of Paragraphs 27 and 28 of this Consent Judgment, "best efforts" includes the payment of reasonable sums of money in consideration of access, access easements, land/water use restrictions, restrictive easements, and/or an agreement to release or subordinate a prior lien or encumbrance except that "best efforts" shall not require the payment of money to the Town of Oyster Bay in connection with portions of the Site owned by the Town. If (a) any access or land/water use restriction agreements required by Paragraphs 28.a or 28.b of this Consent Judgment are not obtained within 45 days of the date of entry of this Consent Judgment, (b) or any access easements or restrictive easements required by Paragraph 28.c of this Consent Judgment are not submitted to EPA in draft form within 45 days of EPA's request therefor, or (c) Settling Defendants are unable to obtain an agreement pursuant to Paragraph 27.c.(2) or

Paragraph 28.c.(2) from the holder of a prior lien or encumbrance to release or subordinate such lien or encumbrance to the easement being created pursuant to this Consent Judgment within 45 days of the date of entry of this Consent Judgment, the Settling Defendants subject to Paragraph 27, or Settling Work Defendants, as the case may be, shall promptly notify the United States in writing, and shall include in that notification a summary of the steps that such Settling Defendants have taken to attempt to comply with Paragraph 27 or 28 of this Consent Judgment. The United States may, as it deems appropriate, assist such Settling Defendants in obtaining access or land/water use restrictions, either in the form of contractual agreements or in the form of easements running with the land, or in obtaining the release or subordination of a prior lien or encumbrance. Such Settling Defendants shall reimburse the United States in accordance with the procedures in Section XVI (Payments for Response Costs), for all costs incurred, direct or indirect, by the United States in obtaining such access, land/water use restrictions, and/or the release/subordination of prior liens or encumbrances including, but not limited to, the cost of attorney time and the amount of monetary consideration paid or just compensation.

30. If EPA determines that land/water use restrictions in the form of state or local laws, regulations, ordinances or other governmental controls are needed to implement the remedy selected in the ROD, ensure the integrity and protectiveness thereof, or ensure non-interference therewith, Settling Defendants shall cooperate with EPA's efforts to secure such governmental controls.

31. Notwithstanding any provision of this Consent Judgment, the United States retains all of its access authorities and rights, as well as all of its rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA and any other applicable statute or regulations.

X. REPORTING REQUIREMENTS

32. In addition to any other requirement of this Consent Judgment, Settling Work Defendants shall submit to EPA and the State written monthly progress reports that: (a) describe the actions which have been taken toward achieving compliance with this Consent Judgment during the previous month; (b) include a summary of all results of sampling and tests and all other data received or generated by Settling Work Defendants or their contractors or agents in the previous month; (c) identify all work plans, plans and other deliverables required by this Consent Judgment completed and submitted during the previous month; (d) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next six weeks and provide other information relating to the progress of construction, including, but not limited to, critical path diagrams, Gantt charts and Pert charts; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (f) include any modifications to the work plans or other schedules that Settling Work Defendants have proposed to EPA or that have been approved by EPA; and (g) describe all activities undertaken in support of EPA's Community Relations Plan for the Site during the previous month and those to be undertaken in the next six weeks. Settling Work Defendants shall submit these progress reports to EPA and the State by the tenth day of every month following the lodging of this Consent Judgment until EPA notifies the Settling Work Defendants pursuant to Paragraph 53.b of Section XIV (Certification

of Completion). If requested by EPA, Settling Work Defendants shall also provide briefings for EPA to discuss the progress of the Work.

33. The Settling Work Defendants shall notify EPA of any change in the schedule described in a monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than seven days prior to the performance of the activity.

34. Upon the occurrence of any event during performance of the Work that Settling Work Defendants are required to report pursuant to Section 103 of CERCLA or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), Settling Work Defendants shall within 24 hours of the onset of such event orally notify the EPA Project Coordinator or the Alternate EPA Project Coordinator (in the event of the unavailability of the EPA Project Coordinator), or, in the event that neither the EPA Project Coordinator or Alternate EPA Project Coordinator is available, the Chief of the New York Remediation Branch of the Emergency and Remedial Response Division, EPA Region II. These reporting requirements are in addition to the reporting required by CERCLA Section 103 or EPCRA Section 304.

35. Within 20 days of the onset of such an event, Settling Work Defendants shall furnish to EPA a written report, signed by the Settling Work Defendants' Project Coordinator, setting forth the events which occurred and the measures taken, and to be taken, in response thereto. Within 30 days of the conclusion of such an event, Settling Work Defendants shall submit a report setting forth all actions taken in response thereto.

36. Settling Work Defendants shall submit to EPA five copies of all plans, reports, and data required by the SOW, the Remedial Design Work Plan, the Remedial Action Work Plan, or any other approved plans, in accordance with the schedules set forth in such plans. Settling Work Defendants shall simultaneously submit five copies of all such plans, reports and data to the State. Upon request by EPA, Settling Work Defendants shall also submit in electronic form all portions of any report or other deliverable Settling Work Defendants are required to submit pursuant to the provisions of this Consent Judgment.

37. All reports and other documents submitted by Settling Work Defendants to EPA (other than the monthly progress reports referred to above) which purport to document Settling Work Defendants' compliance with the terms of this Consent Judgment shall be signed by an authorized representative of the Settling Work Defendants.

XI. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

38. After review of any plan, report or other item which is required to be submitted for approval pursuant to this Consent Judgment, EPA, after reasonable opportunity for review and comment by the State, shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that the Settling Work Defendants modify the submission; or (e) any combination of the above. However, EPA shall not modify a submission without first providing Settling Work Defendants at least one notice of deficiency and an opportunity to cure within 14 days, except where to do so would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects and

the deficiencies in the submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

39. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Paragraph 38.a, b, or c, Settling Work Defendants shall proceed to take any action required by the plan, report, or other item, as approved or modified by EPA subject only to their right to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) with respect to the modifications or conditions made by EPA. In the event that EPA modifies the submission to cure the deficiencies pursuant to Paragraph 38.c and the submission has a material defect, EPA retains its right to seek stipulated penalties, as provided in Section XX (Stipulated Penalties).

40. Resubmission of Plans.

a. Upon receipt of a notice of disapproval pursuant to Paragraph 38.d, Settling Work Defendants shall, within 14 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other item for approval. Any stipulated penalties applicable to the submission, as provided in Section XX, shall accrue during the 14-day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in Paragraphs 41 and 42.

b. Notwithstanding the receipt of a notice of disapproval pursuant to Paragraph 38.d, Settling Work Defendants shall proceed, at the direction of EPA, to take any action required by any non-deficient portion of the submission. Implementation of any non-deficient portion of a submission shall not relieve Settling Work Defendants of any liability for stipulated penalties under Section XX (Stipulated Penalties).

41. In the event that a resubmitted plan, report or other item, or portion thereof, is disapproved by EPA, EPA may again require the Settling Work Defendants to correct the deficiencies, in accordance with the preceding Paragraphs. EPA also retains the right to modify or develop the plan, report or other item. Settling Work Defendants shall implement any such plan, report, or item as modified or developed by EPA, subject only to their right to invoke the procedures set forth in Section XIX (Dispute Resolution).

42. If upon resubmission, a plan, report, or item is disapproved or modified by EPA due to a material defect, Settling Work Defendants shall be deemed to have failed to submit such plan, report, or item timely and adequately unless the Settling Work Defendants invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution) and EPA's action is overturned pursuant to that Section. The provisions of Section XIX (Dispute Resolution) and Section XX (Stipulated Penalties) shall govern the implementation of the Work and accrual and payment of any stipulated penalties during Dispute Resolution. If EPA's disapproval or modification is upheld, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section XX.

43. All plans, reports, and other items required to be submitted to EPA under this Consent Judgment shall, upon approval or modification by EPA, be enforceable under this Consent Judgment. In the event EPA approves or modifies a portion of a plan, report, or other

item required to be submitted to EPA under this Consent Judgment, the approved or modified portion shall be enforceable under this Consent Judgment.

XII. PROJECT COORDINATORS

44. Within 20 days of lodging this Consent Judgment, Settling Work Defendants and EPA will notify each other, in writing, of the name, address and telephone number of their respective designated Project Coordinators and Alternate Project Coordinators. If a Project Coordinator or Alternate Project Coordinator initially designated is changed, the identity of the successor will be given to the other Parties at least 5 working days before the changes occur, unless impracticable, but in no event later than the actual day the change is made. The Settling Work Defendants' Project Coordinator shall be subject to disapproval by EPA and shall have the technical expertise sufficient to adequately oversee all aspects of the Work. The Settling Work Defendants' Project Coordinator shall not be an attorney for any of the Settling Work Defendants in this matter. He or she may assign other representatives, including other contractors, to serve as a Site representative for oversight of performance of daily operations during remedial activities.

45. EPA may designate other representatives, including, but not limited to, EPA and State employees, and federal and State contractors and consultants, to observe and monitor the progress of any activity undertaken pursuant to this Consent Judgment. EPA's Project Coordinator and Alternate Project Coordinator shall have the authority lawfully vested in a Remedial Project Manager (RPM) and an On-Scene Coordinator (OSC) by the NCP, 40 C.F.R. Part 300. In addition, EPA's Project Coordinator or Alternate Project Coordinator shall have authority, consistent with the NCP, to halt any Work required by this Consent Judgment and to take any necessary response action when s/he determines that conditions at the Site constitute an emergency situation or may present an immediate threat to public health or welfare or the environment due to release or threatened release of Waste Material.

46. Settling Work Defendants' Project Coordinator shall be available to meet with EPA, at EPA's request.

XIII. ASSURANCE OF ABILITY TO COMPLETE WORK

47. Within 30 days of entry of this Consent Judgment, Settling Work Defendants shall establish and maintain financial security in the amount of $31,767,000 in one or more of the following forms:

a. A surety bond guaranteeing performance of the Work;

b. One or more irrevocable letters of credit equaling the total estimated cost of the Work;

c. A trust fund established to fund the Work at the Site substantially meeting the requirements of a trust fund described at 40 C.F.R. Sections 264.145 and 264.151(a)(1);

d. A guarantee to perform the Work by one or more parent corporations or subsidiaries, or by one or more unrelated corporations that have a substantial business relationship with at least one of the Settling Work Defendants and that satisfies the requirements of 40 C.F.R. Section 264.143(f); or

e. A demonstration that one or more of the Settling Work Defendants satisfy the requirements of 40 C.F.R. Section 264.143(f). For these purposes, (i) references in 40 C.F.R. Section 264.143(f) to "the sum of the current closure and post closure cost estimates and the current plugging and abandonment cost estimates" shall mean the amount of financial security required to be established and maintained pursuant to this Section, and (ii) the demonstration by one or more of such Settling Work Defendants may be made by submission to EPA of current financial statements certified by the independent certified public accountant(s) for the relevant Settling Work Defendant(s), together with a written explanation of how the provisions of this subparagraph have been satisfied.

48. If the Settling Work Defendants seek to demonstrate the ability to complete the Work through a guarantee by a third party pursuant to Paragraph 47.d of this Consent Judgment, Settling Work Defendants shall demonstrate that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f) applied in accordance with Paragraph 47.e. If Settling Work Defendants seek to demonstrate their ability to complete the Work by means of the financial test or the corporate guarantee pursuant to Paragraph 47.d or 47.e, they shall resubmit sworn statements conveying the information required by 40 C.F.R. Part 264.143(f) annually, on the anniversary of the Effective Date. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section are inadequate, Settling Work Defendants shall, within 30 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 47 of this Consent Judgment. Settling Work Defendants' inability to demonstrate financial ability to complete the Work shall not excuse performance of any activities required under this Consent Judgment.

49. If Settling Work Defendants can show that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 47 above after entry of this Consent Judgment, Settling Work Defendants may, on any anniversary date of entry of this Consent Judgment, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining work to be performed. Settling Work Defendants shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security upon approval by EPA. In the event of a dispute, Settling Work Defendants may reduce the amount of the security in accordance with the final administrative or judicial decision resolving the dispute.

50. Settling Work Defendants may change the form of financial assurance provided under this Section at any time, upon notice to and approval by EPA, provided that the new form of assurance meets the requirements of this Section. In the event of a dispute, Settling Work Defendants may change the form of the financial assurance only in accordance with the final administrative or judicial decision resolving the dispute.

51. EPA will cause to be discharged and released of record, the lien perfected by EPA in July 1996 pursuant to Section 107(l) of CERCLA, 42 U.S.C. 9607(l), on the real property situated within the Site and owned by Owner Settling Defendants, if EPA has been requested to do so in a writing signed on behalf of Coltec Industries, Inc. on the basis that Owner Settling Defendants have provided to Coltec Industries, Inc. satisfactory assurances of the ability of the Owner Settling Defendants to satisfy their financial obligations with respect to this Consent

Judgment as provided by separate agreement between Owner Settling Defendants and Coltec Industries, Inc.

XIV. CERTIFICATION OF COMPLETION

52. Completion of the Remedial Action.

a. Within 90 days after Settling Work Defendants conclude that the Remedial Action has been fully performed and the Performance Standards have been attained, Settling Work Defendants shall schedule and conduct a pre-certification inspection to be attended by Settling Work Defendants and EPA. If, after the pre-certification inspection, the Settling Work Defendants still believe that the Remedial Action has been fully performed and the Performance Standards have been attained, they shall submit a written report requesting certification to EPA for approval, with a copy to the State, pursuant to Section XI (EPA Approval of Plans and Other Submissions) within 30 days of the inspection. In the report, a registered professional engineer and the Settling Work Defendants' Project Coordinator shall state that the Remedial Action has been completed in full satisfaction of the requirements of this Consent Judgment. The written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Settling Work Defendant or the Settling Work Defendants' Project Coordinator:

> To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If, after completion of the pre-certification inspection and receipt and review of the written report, EPA, after reasonable opportunity to review and comment by the State, determines that the Remedial Action or any portion thereof has not been completed in accordance with this Consent Judgment or that the Performance Standards have not been achieved, EPA will notify Settling Work Defendants in writing of the activities that must be undertaken by Settling Work Defendants pursuant to this Consent Judgment to complete the Remedial Action and achieve the Performance Standards, provided, however, that EPA may only require Settling Work Defendants to perform such activities pursuant to this Paragraph to the extent that such activities are consistent with the "scope of the remedy selected in the ROD," as that term is defined in Paragraph 15.b. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Judgment or require the Settling Work Defendants to submit a schedule to EPA for approval pursuant to Section XI (EPA Approval of Plans and Other Submissions). Settling Work Defendants shall perform all activities described in the notice in accordance with the specifications and schedules established pursuant to this Paragraph, subject to their right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent report requesting Certification of Completion and after a reasonable opportunity for review and comment by the State, that the Remedial Action has been performed in accordance with this Consent Judgment

and that the Performance Standards have been achieved, EPA will so certify in writing to Settling Work Defendants. This certification shall constitute the Certification of Completion of the Remedial Action for purposes of this Consent Judgment, including, but not limited to, Section XXI (Covenants by Plaintiff). Certification of Completion of the Remedial Action shall not affect Settling Work Defendants' obligations under this Consent Judgment.

53. Completion of the Work.

a. Within 90 days after Settling Work Defendants conclude that all phases of the Work have been fully performed, Settling Work Defendants shall schedule and conduct a pre-certification inspection to be attended by Settling Work Defendants and EPA. If, after the pre-certification inspection, the Settling Work Defendants still believe that the Work has been fully performed, Settling Work Defendants shall submit a written report by a registered professional engineer stating that the Work has been completed in full satisfaction of the requirements of this Consent Judgment. The report shall contain the following statement, signed by a responsible corporate official of a Settling Work Defendant or the Settling Work Defendants' Project Coordinator:

> To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If, after review of the written report, EPA, after reasonable opportunity to review and comment by the State, determines that any portion of the Work has not been completed in accordance with this Consent Judgment, EPA will notify Settling Work Defendants in writing of the activities that must be undertaken by Settling Work Defendants pursuant to this Consent Judgment to complete the Work, provided, however, that EPA may only require Settling Work Defendants to perform such activities pursuant to this Paragraph to the extent that such activities are consistent with the "scope of the remedy selected in the ROD," as that term is defined in Paragraph 15.b. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Judgment or require the Settling Work Defendants to submit a schedule to EPA for approval pursuant to Section XI (EPA Approval of Plans and Other Submissions). Settling Work Defendants shall perform all activities described in the notice in accordance with the specifications and schedules established therein, subject to their right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent request for Certification of Completion by Settling Work Defendants and after a reasonable opportunity for review and comment by the State, that the Work has been performed in accordance with this Consent Judgment, EPA will so notify the Settling Work Defendants in writing.

XV. EMERGENCY RESPONSE

54. In the event of any action or occurrence during the performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the

environment, Settling Work Defendants shall, subject to Paragraph 55, immediately take all appropriate action to prevent, abate, or minimize such release or threat of release, and shall immediately notify the EPA's Project Coordinator, or, if the Project Coordinator is unavailable, EPA's Alternate Project Coordinator. If neither of these persons is available, the Settling Work Defendants shall notify the Chief of the Response and Prevention Branch of the Emergency and Remedial Response Division of EPA, Region II, at (732) 321-6656, or, if such person or his/her delegee is unavailable, the EPA Region II Emergency 24-hour Hot Line at (732) 548-8730. Settling Work Defendants shall take such actions in consultation with EPA's Project Coordinator or other available authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plans, the Contingency Plans, and any other applicable plans or documents developed pursuant to the SOW. In the event that Settling Work Defendants fail to take appropriate response action as required by this Section, and EPA takes such action instead, Settling Work Defendants shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVI (Payments for Response Costs).

55. Nothing in the preceding Paragraph or in this Consent Judgment shall be deemed to limit any authority of the United States a) to take all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or b) to direct or order such action, or seek an order from the Court, to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, subject to Section XXI (Covenants by Plaintiff).

XVI. PAYMENTS FOR RESPONSE COSTS

56. Payments for Future Response Costs.

a. Settling Work Defendants shall pay to EPA all Future Response Costs not inconsistent with the NCP, provided, however, that if EPA receives payments in excess of $1,000,000 from the Town of Oyster Bay pursuant to Paragraph 18 of the Prospective Purchaser Agreement, then the amount of Future Response Costs required to be paid by Settling Work Defendants under this Paragraph 56.a shall be reduced by forty percent (40%) of the amount, if any, in excess of $1,000,000 paid to EPA under Paragraph 18 of the Prospective Purchaser Agreement. On a periodic basis the United States will send Settling Work Defendants billings for such costs. The billings will be accompanied by a printout of cost data in EPA's financial management system and, to the extent applicable, in DOJ's financial management system. Settling Work Defendants shall make all payments within 45 days of Settling Work Defendants' receipt of each bill requiring payment, except as otherwise provided in Paragraph 57. Notwithstanding the foregoing, Settling Work Defendants shall not be obligated to make payment for Future Response Costs until the amounts payable to EPA pursuant to Paragraph 18 of the Prospective Purchaser Agreement have been determined by EPA. To the extent that Future Response Costs are not yet due, the United States may, in lieu of a billing, periodically send to the Settling Work Defendants a cost summary accompanied by a printout of cost data in EPA's financial management system and, to the extent applicable, in DOJ's financial management system setting forth the amount of Future Response Costs that were paid in that period, followed by a billing once the amounts payable to EPA pursuant to Paragraph 18 of the Prospective Purchaser Agreement have been determined by EPA. Settling Work Defendants

shall pay Interest on Future Response Costs from the earlier of the date of the billing or the date that the cost summary is sent to Settling Work Defendants, until the date of their payment. Settling Work Defendants shall make all payments under this Paragraph via electronic funds transfer ("EFT"). Payment shall be remitted via EFT to Mellon Bank, Pittsburgh, Pennsylvania, and Settling Work Defendants shall provide the following information to their bank:

- Amount of payment
- Title of Mellon Bank account to receive the payment: **EPA**
- Account code for Mellon Bank account receiving the payment: **9108544**
- Mellon Bank ABA Routing Number: **043000261**
- Name of paying Settling Work Defendants
- Case number: **[INSERT INFORMATION]**
- Site/spill identifier: **02T3**

b. At the time of payment, Settling Work Defendants shall send notice that payment has been made to the United States in accordance with Section XXVI (Notices and Submissions) and to the Comptroller, Financial Management Branch, U.S. Environmental Protection Agency, Region II, 290 Broadway, New York, NY 10007-1866.

c. The total amount to be paid by Setting Work Defendants pursuant to Subparagraph 56.a shall be deposited in the Liberty Industrial Finishing Site Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

57. Settling Work Defendants may contest payment of any Future Response Costs under Paragraph 56 if they determine that the United States has made a mathematical error or if they allege that a cost item that is included represents costs that are inconsistent with the NCP. Such objection shall be made in writing within 30 days of receipt of the bill or the cost summary provided pursuant to Paragraph 56.a, whichever is earlier, must be sent to the United States pursuant to Section XXVI (Notices and Submissions), and shall initiate the Dispute Resolution procedures in Section XIX (Dispute Resolution). Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection to costs that are the subject of a bill, the Settling Work Defendants shall, within the 45-day period referred to in Paragraph 56.a, pay all uncontested Future Response Costs to the United States in the manner described in Paragraph 56. Simultaneously, the Settling Work Defendants shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of New York and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. The Settling Work Defendants shall send to the United States, as provided in Section XXVI (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. In the case of a dispute

concerning a bill for Future Response Costs, if the United States prevails in the dispute, then within 14 days of the resolution of the dispute, the Settling Work Defendants shall pay the sums due (with accrued interest) to the United States in the manner described in Paragraph 56. In the case of a dispute concerning a cost summary sent under Paragraph 56 in lieu of a bill, if the United States prevails in the dispute, the Settling Work Defendants shall, within 45 days of receipt of a bill for those costs, pay the sums due (with accrued interest) to the United States as described in Paragraph 56. If the Settling Work Defendants prevail concerning any aspect of the contested costs, the Settling Work Defendants shall pay that portion of the costs (plus associated accrued interest) for which they did not prevail to the United States in the manner described in Paragraph 56; Settling Work Defendants shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIX (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding the Settling Work Defendants' obligation to reimburse the United States for its Future Response Costs.

58. Payments by Settling Federal Agencies.

a. Settling Federal Agencies shall pay a share of the costs of the Work, the Features Tasks, and Future Response Costs through periodic contributions to the Liberty Industrial Finishing Site Trust Account, as provided pursuant to Paragraph 58.b of this Consent Judgment.

b. The Settling Federal Agencies shall pay:

(I) 50% of the Net funding for the Work and the Features Tasks, to the extent that such costs are consistent with the NCP and this Consent Judgment; and

(II) 50% of the amount of Net Future Response Costs.

For purposes of this Paragraph 58.b, the term "Net" means the actual amounts paid by Settling Work Defendants for the Work and the Features Tasks (including the expenses of the Settling Work Defendants' Project Coordinator and retained consultants), and Future Response Costs, less amounts received by the Liberty Industrial Finishing Site Account from or on account of: (A) the Owner Settling Defendants or any other Settling Defendant (other than Coltec Industries, Inc. or Goodrich Corporation), (B) Liberty Aero Corporation, or (C) other persons, if any, who may settle with or otherwise pay to Settling Defendants and Settling Federal Agencies for the Work, the Features Tasks, or for Future Response Costs on account of claims against them for potential responsibility for the Site pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

The Settling Federal Agencies shall make periodic payments into the Liberty Industrial Finishing Site Trust Account, in accordance with the following:

(i) As soon as reasonably practicable after the Effective Date, the United States, on behalf of the Settling Federal Agencies, will pay $250,000, by deposit into the Liberty Industrial Finishing Site Trust Account.

(ii) Thereafter, and after the initial $250,000 deposited pursuant to subparagraph 58.b.(i) has been applied toward the Settling Federal Agencies' share of "Qualifying Expenditures," the United States, on behalf of the Settling Federal Agencies, will

initiate the process to pay, by deposit into the Liberty Industrial Finishing Site Trust Account, the appropriate Settling Federal Agencies' share of Qualifying Expenditures for the preceding semi-annual period. For purposes of this Paragraph 58.b, the term "Qualifying Expenditures" means those expenditures that have been made for performance of Work and Features Tasks (including the expenses of the Settling Work Defendants' Project Coordinator and retained consultants), to the extent that such expenditures are consistent with the NCP, or for reimbursement of Future Response Costs pursuant to Paragraph 56 of this Consent Judgment, and provided that such costs have actually been disbursed for such purposes. Settling Federal Agencies will make best efforts (A) to review and, if appropriate, approve such expenditures as Qualifying Expenditures within sixty (60) days of receipt of documentation, as set forth in subparagraph 58.b(iii), enabling Federal Agencies to make such determination; and (B) to deposit such amount into the Liberty Industrial Finishing Site Trust Account as soon as reasonably practicable.

(iii) On a semi-annual basis, the Settling Work Defendants' Project Coordinator shall provide to the Settling Federal Agencies a claim for payment. For the covered period, the claim for payment shall include (A) an invoice for the costs of performance of the Work and the Features Tasks, (B) an invoice for the expenses of the Settling Work Defendants' Project Coordinator and consultants selected and retained by the Settling Work Defendants to advise and assist their Project Coordinator in carrying out the Work and the Features Tasks, (C) copies of the Liberty Industrial Finishing Site Trust Account statements, (D) sufficient documentation to allow verification of the accuracy of the costs and expenses claimed, (E) confirmation from the Settling Work Defendants that such costs and expenses have actually been disbursed, and (F) a statement by the Project Coordinator, the Settling Work Defendants, and the entity(ies) performing the Work and the Features Tasks that such costs and expenses were properly incurred in connection with work performed in compliance with the terms of this Consent Judgment or the Features AOC, and are consistent with the NCP.

59. The Parties to this Consent Judgment recognize and acknowledge that the payment obligations of the Settling Federal Agencies under this Consent Judgment can only be paid from appropriated funds legally available for such purpose. Nothing in this Consent Judgment shall be interpreted or construed as a commitment or requirement that any Settling Federal Agency obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.

60. Payments by BeazerEast, Inc. and Koch-Glitsch, LP. BeazerEast, Inc. and Koch-Glitsch, LP, jointly and severally, shall, within thirty days of the Effective Date of this Consent Judgment, deposit $1,254,000 into the Liberty Industrial Finishing Site Trust Account, to be used solely to help fund performance of the Work and/or payment of Future Response Costs.

XVII. INDEMNIFICATION AND INSURANCE

61. Settling Work Defendants' Indemnification of the United States

a. The United States does not assume any liability by entering into this agreement or by virtue of any designation of Settling Work Defendants as EPA's authorized representatives under Section 104(e) of CERCLA. Settling Work Defendants shall indemnify, save and hold harmless the United States (with the exception of the Settling Federal Agencies) and its officials, agents, employees, contractors, subcontractors, or representatives for or from

any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Settling Work Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Judgment, including, but not limited to, any claims arising from any designation of Settling Work Defendants as EPA's authorized representatives under Section 104(e) of CERCLA. Further, the Settling Work Defendants agree to pay the United States (with the exception of the Settling Federal Agencies) all costs it incurs including, but not limited to, attorneys fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of Settling Work Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Judgment. The United States shall not be held out as a party to any contract entered into by or on behalf of Settling Work Defendants in carrying out activities pursuant to this Consent Judgment. Neither the Settling Work Defendants nor any such contractor shall be considered an agent of the United States.

b. The United States shall give Settling Work Defendants notice of any claim for which the United States plans to seek indemnification pursuant to Paragraph 61, and shall consult with Settling Work Defendants prior to settling such claim.

62. Settling Work Defendants waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Work Defendants and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Settling Work Defendants shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Work Defendants and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

63. No later than 15 days before commencing any on-site Work, Settling Work Defendants shall secure, and shall maintain until the first anniversary of EPA's Certification of Completion of the Remedial Action pursuant to Subparagraph 52.b of Section XIV (Certification of Completion) comprehensive general liability insurance with limits of ten million dollars, combined single limit, and automobile liability insurance with limits of ten million dollars, combined single limit, naming the United States as an additional insured. In addition, for the duration of this Consent Judgment, Settling Work Defendants shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Settling Work Defendants in furtherance of this Consent Judgment. Prior to commencement of the Work under this Consent Judgment, Settling Work Defendants shall provide to EPA certificates of such insurance and a copy of each insurance policy. Settling Work Defendants shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If Settling Work Defendants demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or

insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Settling Work Defendants need provide only that portion of the insurance described above which is not maintained by the contractor or subcontractor.

XVIII. FORCE MAJEURE

64. "Force majeure," for purposes of this Consent Judgment, is defined as any event arising from causes beyond the control of the Settling Work Defendants, of any entity controlled by Settling Work Defendants, or of Settling Work Defendants' contractors, that delays or prevents the performance of any obligation under this Consent Judgment despite Settling Work Defendants' best efforts to fulfill the obligation. The requirement that the Settling Work Defendants exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any potential force majeure event (1) as it is occurring and (2) following the potential force majeure event, such that the delay is minimized to the greatest extent possible. "Force Majeure" does not include financial inability to complete the Work or a failure to attain the Performance Standards or failure to make payments described in Section XVI (Payments for Response Costs).

65. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Judgment, whether or not caused by a force majeure event, the Settling Work Defendants shall notify orally EPA's Project Coordinator or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Chief of the New York Remediation Branch, Emergency and Remedial Response Division, EPA Region II, within 48 hours of when Settling Work Defendants first knew that the event might cause a delay. Within 5 days thereafter, Settling Work Defendants shall provide in writing to EPA an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Settling Work Defendants' rationale for attributing such delay to a force majeure event if they intend to assert such a claim; and a statement as to whether, in the opinion of the Settling Work Defendants, such event may cause or contribute to an endangerment to public health, welfare or the environment. The Settling Work Defendants shall include with any notice all available documentation supporting their claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Settling Work Defendants from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. Settling Work Defendants shall be deemed to know of any circumstance of which Settling Work Defendants, any entity controlled by Settling Work Defendants, or Settling Work Defendants' contractors knew or should have known.

66. If EPA agrees that the delay or anticipated delay is attributable to a force majeure event, the time for performance of the obligations under this Consent Judgment that are affected by the force majeure event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify the Settling Work Defendants in writing of its decision. If EPA

agrees that the delay is attributable to a force majeure event, EPA will notify the Settling Work Defendants in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure event.

67. If the Settling Work Defendants elect to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution), they shall do so no later than 15 days after receipt of EPA's notice. In any such proceeding, Settling Work Defendants shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Settling Work Defendants complied with the requirements of Paragraphs 64 and 65, above. If Settling Work Defendants carry this burden, the delay at issue shall be deemed not to be a violation by Settling Work Defendants of the affected obligation of this Consent Judgment identified to EPA and the Court.

XIX. DISPUTE RESOLUTION

68. Unless otherwise expressly provided for in this Consent Judgment, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Judgment. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of the Settling Defendants that have not been disputed in accordance with this Section.

69. Any dispute which arises under or with respect to this Consent Judgment shall in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations shall not exceed 20 days from the time the dispute arises, unless it is modified by written agreement of the parties to the dispute. The dispute shall be considered to have arisen when one party sends the other parties a written Notice of Dispute.

70. Statements of Position.

a. In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within 14 days after the conclusion of the informal negotiation period, Settling Work Defendants invoke the formal dispute resolution procedures of this Section by serving on the United States a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting documentation relied upon by the Settling Work Defendants. The Statement of Position shall specify the Settling Work Defendants' position as to whether formal dispute resolution should proceed under Paragraph 71 or Paragraph 72.

b. Within 14 days after receipt of Settling Work Defendants' Statement of Position, EPA will serve on Settling Work Defendants its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 71 or 72. Within 14 days after receipt of EPA's Statement of Position, Settling Work Defendants may submit a Reply.

c. If there is disagreement between EPA and the Settling Work Defendants as to whether dispute resolution should proceed under Paragraph 71 or 72, the parties to the dispute shall follow the procedures set forth in the paragraph determined by EPA to be applicable. However, if the Settling Work Defendants ultimately appeal to the Court to resolve the dispute, the Court shall determine which paragraph is applicable in accordance with the standards of applicability set forth in Paragraphs 71 and 72.

71. Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation: (1) the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this Consent Judgment; and (2) the adequacy of the performance of response actions taken pursuant to this Consent Judgment. Nothing in this Consent Judgment shall be construed to allow any dispute by Settling Work Defendants regarding the validity of the ROD's provisions.

a. An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, EPA may allow submission of supplemental statements of position by the parties to the dispute.

b. The Director of the Emergency and Remedial Response Division ("ERRD"), EPA Region II, will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 71.a. This decision shall be binding upon the Settling Work Defendants, subject only to the right to seek judicial review pursuant to Paragraph 71.c and d.

c. Any administrative decision made by EPA pursuant to Paragraph 71.b. shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by the Settling Work Defendants with the Court and served on all Parties within 10 days of receipt of EPA's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Judgment. The United States may file a response to Settling Work Defendants' motion.

d. In proceedings on any dispute governed by this Paragraph, Settling Work Defendants shall have the burden of demonstrating that the decision of the ERRD Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to Paragraph 71.a.

72. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Paragraph.

a. Following receipt of Settling Work Defendants' Statement of Position submitted pursuant to Paragraph 70, the ERRD Director, EPA Region II, will issue a final decision resolving the dispute. The ERRD Director's decision shall be binding on the Settling

Work Defendants unless, within 10 days of receipt of the decision, the Settling Work Defendants file with the Court and serve on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Consent Judgment. The United States may file a response to Settling Work Defendants' motion.

b. Notwithstanding Paragraph N of Section I (Background) of this Consent Judgment, judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

73. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone or affect in any way any obligation of the Settling Work Defendants under this Consent Judgment, not directly in dispute, unless EPA or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph 82. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Consent Judgment. In the event that the Settling Work Defendants do not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XX (Stipulated Penalties).

XX. STIPULATED PENALTIES

74. Settling Defendants shall be liable for stipulated penalties in the amounts set forth in Paragraphs 75 and 76 to the United States for failure to comply with the requirements of this Consent Judgment which are specified below and which are applicable to them under the terms of this Consent Judgment, unless excused under Section XVIII (Force Majeure). "Compliance" by Settling Work Defendants shall include completion of the activities under this Consent Judgment or any work plan or other plan approved under this Consent Judgment identified below in accordance with all applicable requirements of law, this Consent Judgment, and any plans or other documents approved by EPA pursuant to this Consent Judgment and within the specified time schedules established by and approved under this Consent Judgment.

75. Stipulated Penalty Amounts.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Subparagraph 75.b:

Penalty Per Violation Per Day	Period of Noncompliance
$ 2,000	1st through 14th day
$ 4,000	15th through 30th day
$ 8,000	31st day and beyond

b. Compliance Milestones.

(1) submission and, if necessary, revision and resubmission of any plan, report, or other deliverable required by Section VI (Performance of the Work by

Settling Work Defendants) or by the SOW or by any plan which is prepared pursuant to Section VI or the SOW and approved by EPA;

(2) any deadline imposed by Section VI (Performance of the Work by Settling Work Defendants) or by the SOW or by any plan which is prepared pursuant to Section VI or the SOW and approved by EPA;

(3) obligations imposed by Section XV (Emergency Response);

(4) obligations imposed by Section IX (Access and Institutional Controls);

(5) performance of the Remedial Design in accordance with the ROD, the approved Remedial Design Work Plan, and this Consent Judgment;

(6) implementation of the Remedial Action in accordance with the ROD, the approved Remedial Design Reports and approved Remedial Action Work Plan, the approved O&M Plan and O&M Manual, and this Consent Judgment;

(7) modification of the SOW or related work plans pursuant to Paragraph 15 and implementation of the work called for by such modifications in accordance with the modified SOW or work plan;

(8) performance of studies and investigations and further response actions pursuant to Section VII (Remedy Review); and

(9) any other requirement of this Consent Judgment that applies to Settling Defendants or Settling Work Defendants and that is not identified in Subparagraph 76.b.

76. Stipulated Penalty Amounts.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance with the requirements identified in Subparagraph 76.b:

Penalty Per Violation Per Day	Period of Noncompliance
$ 1,000	1st through 14th day
$ 2,500	15th through 30th day
$ 5,000	31st day and beyond

b. Compliance Milestones.

(1) permitting split or duplicate samples, quality assurance, and other requirements pursuant to Section VIII (Quality Assurance, Sampling, and Data Analysis);

(2) designation of Settling Work Defendants' Project Coordinator as required by Section XII (Project Coordinators);

(3) obligations imposed by Section XIII (Assurance of Ability to Complete Work);

(4) timely submission and, if necessary, revision and resubmission of the name, title and qualifications of the proposed Supervising Contractor pursuant to Section VI (Performance of the Work by Settling Work Defendants);

(5) requirements set forth in Section XIV (Certification of Completion), including, *inter alia*, both the requirement to make the certification and the requirement that the certification be truthful;

(6) timely notification regarding any delay or anticipated delay, consistent with Paragraph 65;

(7) indemnification and insurance requirements set forth in Section XVII (Indemnification and Insurance);

(8) requirements set forth in Section X (Reporting Requirements);

(9) timely submission of written notification of any off-site shipment of Waste Material from the Site to an out-of-state waste management facility pursuant to Paragraph 17;

(10) submission of documents and other information in accordance with Section XXIV (Access to Information), and

(11) payments required by Section XVI (Payments for Response Costs).

77. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 92 of Section XXI (Covenants by Plaintiff), Settling Work Defendants shall be liable for a stipulated penalty in the amount of $1,000,000 in addition to any other stipulated penalties for which they are liable under this Section.

78. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (1) with respect to a deficient submission under Section XI (EPA Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Settling Work Defendants of any deficiency; (2) with respect to a decision by the ERRD Director, EPA Region II, under Paragraph 71.b or 72.a of Section XIX (Dispute Resolution), during the period, if any, beginning on the 21st day after the date that Settling Work Defendants' reply to EPA's Statement of Position is received until the date that the Director issues a final decision regarding such dispute; or (3) with respect to judicial review by this Court of any dispute under Section XIX (Dispute Resolution), during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Judgment.

79. Following EPA's determination that Settling Work Defendants or Settling Defendants have failed to comply with a requirement of this Consent Judgment, EPA may give Settling Work Defendants or Settling Defendants, as the case may be, written notification of the same and describe the noncompliance. EPA may send the Settling Work Defendants or Settling

Defendants, as the case may be, a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified the Settling Work Defendants or Settling Defendants of a violation.

80. All penalties accruing under this Section shall be due and payable to the United States within 30 days of the given Settling Defendants' receipt from EPA of a demand for payment of the penalties, unless such Settling Defendants invoke the Dispute Resolution procedures under Section XIX (Dispute Resolution). All payments to the United States under this Section shall be made by EFT in the manner provided in Paragraph 56 a. and b.

81. The payment of penalties shall not alter in any way Settling Work Defendants' obligation to complete the performance of the Work required under this Consent Judgment.

82. Penalties shall continue to accrue as provided in Paragraph 78 during any dispute resolution period, but need not be paid until the following:

a. If the dispute is resolved by agreement or by a decision of EPA that is not appealed to this Court, accrued penalties determined to be owing shall be paid to EPA within 15 days of the agreement or the receipt of EPA's decision or order;

b. If the dispute is appealed to this Court and the United States prevails in whole or in part, Settling Work Defendants or Settling Defendants, as the case may be, shall pay all accrued penalties determined by the Court to be owed to EPA within 60 days of receipt of the Court's decision or order, except as provided in Subparagraph c below;

c. If the District Court's decision is appealed by any Party, Settling Work Defendants or Settling Defendants, as the case may be, shall pay all accrued penalties determined by the District Court to be owing to the United States into an interest-bearing escrow account within 60 days of receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days of receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA or to the given Settling Defendants to the extent that they prevail.

83. If Settling Defendants fail to pay stipulated penalties when due, the United States may institute proceedings to collect the penalties, as well as interest. Such Settling Defendants shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 80.

84. Nothing in this Consent Judgment shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of Settling Defendants' violation of this Consent Judgment or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, provided, however, that the United States shall not seek civil penalties pursuant to Section 122(l) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of the Consent Judgment.

85. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Consent Judgment.

XXI. COVENANTS BY PLAINTIFF

86. In consideration of the actions that will be performed and the payments that will be made by the Settling Defendants under the terms of the Consent Judgment, and except as specifically provided in Paragraphs 88, 89, and 91 of this Section, the United States covenants not to sue or to take administrative action against Settling Defendants pursuant to Sections 106 and 107(a) of CERCLA relating to the Site. For the Settling Work Defendants, except with respect to future liability, these covenants not to sue shall take effect upon the Effective Date of the Consent Judgment. With respect to future liability, these covenants not to sue shall take effect as to the Settling Work Defendants upon Certification of Completion of Remedial Action by EPA pursuant to Paragraph 52.b of Section XIV (Certification of Completion). For BeazerEast, Inc. and Koch-Glitsch, LP, these covenants not to sue shall take effect upon the receipt by the Liberty Industrial Finishing Site Trust Account of the payment required from those parties by Paragraph 60 of this Consent Judgment. These covenants not to sue are conditioned upon the satisfactory performance by Settling Defendants of their obligations under this Consent Judgment. These covenants not to sue extend only to the Settling Defendants and do not extend to any other person.

87. In consideration of the payments that will be made by the Settling Federal Agencies under the terms of the Consent Judgment, and except as specifically provided in Paragraphs 88, 89, and 91 of this Section, EPA covenants not to take administrative action against the Settling Federal Agencies pursuant to Sections 106 and 107(a) of CERCLA relating to the Site. Except with respect to future liability, EPA's covenant shall take effect upon the receipt by the Liberty Industrial Finishing Site Trust Account of the $250,000 payment required from the Settling Federal Agencies by Paragraph 58.b.(i) of this Consent Judgment. With respect to future liability, EPA's covenant shall take effect upon Certification of Completion of Remedial Action by EPA pursuant to Paragraph 52.b of Section XIV (Certification of Completion). EPA's covenant is conditioned upon the satisfactory performance by Settling Federal Agencies of their obligations under this Consent Judgment. EPA's covenant extends only to the Settling Federal Agencies and does not extend to any other person.

88. United States' Pre-certification Reservations. Notwithstanding any other provision of this Consent Judgment, the United States reserves, and this Consent Judgment is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel Settling Work Defendants, and EPA reserves the right to issue an administrative order seeking to compel the Settling Federal Agencies,

a. to perform further response actions relating to the Site, or

b. to reimburse the United States for additional costs of response if, prior to Certification of Completion of the Remedial Action:

(1) conditions at the Site, previously unknown to EPA, are discovered, or

(2) information, previously unknown to EPA, is received, in whole or in part,

and EPA determines that these previously unknown conditions or information together with any other relevant information indicates that the Remedial Action is not protective of human health or the environment.

89. United States' Post-certification Reservations. Notwithstanding any other provision of this Consent Judgment, the United States reserves, and this Consent Judgment is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel Settling Work Defendants, and EPA reserves the right to issue an administrative order seeking to compel the Settling Federal Agencies,

a. to perform further response actions relating to the Site, or

b. to reimburse the United States for additional costs of response if, subsequent to Certification of Completion of the Remedial Action:

(1) conditions at the Site, previously unknown to EPA, are discovered, or

(2) information, previously unknown to EPA, is received, in whole or in part,

and EPA determines that these previously unknown conditions or this information together with other relevant information indicate that the Remedial Action is not protective of human health or the environment.

90. For purposes of Paragraph 88, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date the ROD was signed and set forth in the ROD for the Site and the administrative record supporting the ROD. For purposes of Paragraph 89, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date of Certification of Completion of the Remedial Action and set forth in the ROD, the administrative record supporting the ROD, the post-ROD administrative record, or in any information received by EPA pursuant to the requirements of this Consent Judgment prior to Certification of Completion of the Remedial Action.

91. General reservations of rights. The United States reserves, and this Consent Judgment is without prejudice to, all rights against Settling Defendants, and EPA and the federal natural resource trustees reserve, and this Consent Judgment is without prejudice, to all rights against Settling Federal Agencies, with respect to all matters not expressly specified in Paragraphs 86 and 87. Notwithstanding any other provision of this Consent Judgment, the United States reserves all rights against Settling Defendants, and EPA and the federal natural resource trustees reserve all rights against Settling Federal Agencies, with respect to:

a. claims based on a failure by Settling Defendants or the Settling Federal Agencies to meet a requirement of this Consent Judgment;

b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the Site;

c. liability based upon the Settling Defendants' ownership or operation of the Site, or upon the Settling Defendants' transportation, treatment, storage, or disposal, or the arrangement for the transportation, treatment, storage, or disposal of Waste Material at or in connection with the Site, other than as provided in the ROD, the Work, or otherwise ordered by EPA, after signature of this Consent Judgment by the Settling Defendants;

d. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

e. criminal liability;

f. liability for violations of federal or state law which occur during or after implementation of the Remedial Action;

g. liability, prior to Certification of Completion of the Remedial Action, for additional response actions that EPA determines are necessary to achieve Performance Standards, but that cannot be required pursuant to Paragraph 15 (Modification of the SOW or Related Work Plans);

h. liability for Plume B, including but not limited to liability for the implementation of, and for the costs of the implementation of, that portion of the remedy selected in the ROD which is focused on Plume B;

i. liability for the Features Tasks, to the extent the Features Tasks are not fully and properly carried out under the Features AOC, including but not limited to liability for the implementation of, and for the costs of the implementation of the Features Tasks; and

j. liability for the Interim Groundwater Tasks, to the extent the Interim Groundwater Tasks are not fully and properly carried out under the Interim Groundwater UAO, including but not limited to liability for the implementation of, and for the costs of the implementation of the Interim Groundwater Tasks.

92. Work Takeover In the event EPA determines that Settling Work Defendants have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portions of the Work as EPA determines necessary. Settling Work Defendants may invoke the procedures set forth in Section XIX (Dispute Resolution), Paragraph 71, to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by the United States in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Settling Work Defendants shall pay pursuant to Section XVI (Payment for Response Costs).

93. Notwithstanding any other provision of this Consent Judgment, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANTS BY SETTLING DEFENDANTS AND SETTLING FEDERAL AGENCIES

94. Covenant Not to Sue by Settling Defendants. Subject to the reservations in Paragraph 96, Settling Defendants hereby covenant not to sue and agree not to assert any claims

or causes of action against the United States with respect to the Site or this Consent Judgment, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law;

b. any claims against the United States, including any department, agency or instrumentality of the United States under CERCLA Sections 107 or 113 related to the Site or any claim for contribution or reimbursement including those that may arise under State law; or

c. any claims arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law.

Except as provided in Paragraph 103 (waiver of claim-splitting defenses), these covenants not to sue shall not apply in the event that the United States brings a cause of action or issues an order pursuant to the reservations set forth in Paragraphs 88, 89, 91.b - 91.d or 91.g - 91.j, but only to the extent that Settling Defendants' claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

95. Covenant by Settling Federal Agencies. Settling Federal Agencies hereby agree not to assert any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law with respect to the Site or this Consent Judgment. This covenant does not preclude demand for reimbursement from the Superfund of costs incurred by a Settling Federal Agency in the performance of its duties (other than pursuant to this Consent Judgment) as lead or support agency under the NCP (40 C.F.R. Part 300).

96. The Settling Defendants reserve, and this Consent Judgment is without prejudice to:

(a) claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States while acting within the scope of his office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, any such claim shall not include a claim for any damages caused, in whole or in part, by the act or omission of any person, including any contractor, who is not a federal employee as that term is defined in 28 U.S.C. § 2671; nor shall any such claim include a claim based on EPA's selection of response actions, or the oversight or approval of the Settling Work Defendants' plans or activities. The foregoing applies only to claims which are brought pursuant to any statute other than CERCLA and for which the waiver of sovereign immunity is found in a statute other than CERCLA; and

(b) contribution claims against the Settling Federal Agencies in the event any claim is asserted by the United States against the Settling Defendants under the authority of or under Paragraphs 88, 89, 91.b - 91.d, or 91.g - 91.j of Section XXI (Covenants by Plaintiff), but

only to the same extent and for the same matters, transactions, or occurrences as are raised in the claim of the United States against Settling Defendants.

(c) claims, if any, against the United States on account of the failure by Settling Federal Agencies to comply with their obligations under this Consent Judgment.

97. Nothing in this Consent Judgment shall be deemed to constitute preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

98. Settling Defendants agree not to assert any claims for contribution against the Town of Oyster Bay for response actions taken or to be taken and response costs incurred or to be incurred by the United States or any other person with respect to the "Existing Contamination" (as that term is defined in Paragraph 8.f. of the Prospective Purchaser Agreement), provided that nothing herein is intended to affect any claims by the Owner Settling Defendants against the Town of Oyster Bay for compensation in connection with the Town's taking by eminent domain of property owned by any Owner Settling Defendant.

XXIII. EFFECT OF SETTLEMENT; CONTRIBUTION PROTECTION

99. Except as provided in Paragraph 98 (Waiver of Claims Against Town of Oyster Bay) nothing in this Consent Judgment shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Judgment. The preceding sentence shall not be construed to waive or nullify any rights that any person not a signatory to this Consent Judgment may have under applicable law. Except as provided in Paragraph 98 (Waiver of Claims Against Town of Oyster Bay), each of the Parties expressly reserves any and all rights (including, but not limited to, any right to contribution), defenses, claims, demands, and causes of action which each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto.

100. The Parties agree, and by entering this Consent Judgment this Court finds, that the Settling Defendants and the Settling Federal Agencies are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by CERCLA Section 113(f)(2), 42 U.S.C. § 9613(f)(2) for matters addressed in this Consent Judgment. For purposes of the preceding sentence, the "matters addressed" in this Consent Judgment are all response actions taken or to be taken and all response costs incurred or to be incurred by the United States or any other person with respect to the Site. The "matters addressed" in this settlement do not include those response costs or response actions as to which the United States has reserved its rights under this Consent Judgment (except for claims for failure to comply with this Consent Judgment), in the event that the United States asserts rights against Settling Defendants (or EPA or the federal natural resource trustees asserts rights against Settling Federal Agencies) coming within the scope of such reservations.

101. The Settling Defendants agree that with respect to any suit or claim for contribution brought by them for matters related to this Consent Judgment they will notify the United States in writing no later than 60 days prior to the initiation of such suit or claim.

102. The Settling Defendants also agree that with respect to any suit or claim for contribution brought against them for matters related to this Consent Judgment they will notify in

writing the United States within 10 days of service of the complaint on them. In addition, Settling Defendants shall notify the United States within 10 days of service or receipt of any Motion for Summary Judgment and within 10 days of receipt of any order from a court setting a case for trial.

103. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, Settling Defendants shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenants not to sue set forth in Section XXI (Covenants by Plaintiff).

XXIV. ACCESS TO INFORMATION

104. Settling Defendants shall provide to EPA, upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Consent Judgment, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Settling Defendants shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

105. Business Confidential and Privileged Documents.

a. Settling Defendants may assert business confidentiality claims covering part or all of the documents or information submitted to Plaintiff under this Consent Judgment to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Settling Defendants that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Settling Defendants.

b. The Settling Defendants may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Settling Defendants assert such a privilege in lieu of providing documents, they shall provide the Plaintiff with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the contents of the document, record, or information: and (6) the privilege asserted by Settling Defendants. However, no documents, reports or other information created or generated pursuant to the requirements of the Consent Judgment shall be withheld on the grounds that they are privileged.

106. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XXV. RETENTION OF RECORDS

107. Until 10 years after the Settling Defendants' receipt of EPA's notification pursuant to Paragraph 53.b of Section XIV (Certification of Completion of the Work), each Settling Defendant shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to its liability under CERCLA with respect to the Site, provided, however, that Settling Defendants who are potentially liable as owners or operators of the Site must retain, in addition, all documents and records that relate to the liability of any other person under CERCLA with respect to the Site. Each Settling Defendant must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above all non-identical copies of the last draft or final version of any documents or records (including documents or records in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work, provided, however, that each Settling Defendant (and its contractors and agents) must retain, in addition, copies of all data generated during the performance of the Work and not contained in the aforementioned documents required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

108. At the conclusion of this document retention period, Settling Defendants shall notify the United States at least 90 days prior to the destruction of any such records or documents, and, upon request by the United States, Settling Defendants shall deliver any such records or documents to EPA. The Settling Defendants may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Settling Defendants assert such a privilege, they shall provide the Plaintiff with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or information; and (6) the privilege asserted by Settling Defendants. However, no documents, reports or other information created or generated pursuant to the requirements of the Consent Judgment shall be withheld on the grounds that they are privileged.

109. Each Settling Defendant hereby certifies individually that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by the United States or the State or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Section 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

110. The United States acknowledges that each Settling Federal Agency (1) is subject to all applicable Federal record retention laws, regulations, and policies; and (2) has certified that it has fully complied with any and all EPA requests for information pursuant to Section 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XXVI. NOTICES AND SUBMISSIONS

111. Whenever, under the terms of this Consent Judgment, written notice is required to be given or a report or other document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing. All notices and submissions shall be considered effective upon receipt, unless otherwise provided herein. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of the Consent Judgment with respect to the United States, EPA, the Settling Federal Agencies, and the Settling Defendants, respectively.

As to the United States or EPA:

Five (5) copies of all work plans, design documents, and technical reports and one (1) copy of all required written communications shall be sent to:

Chief, Central New York Remediation Section
New York Remediation Branch
Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866
Attention: Lorenzo Thantu, Liberty Industrial Finishing
Superfund Site Remedial Project Manager

One copy of all required written communications other than work plans, design documents and technical reports shall also be sent to each of the following individuals:

Chief, New York/Caribbean Superfund Branch
Office of Regional Counsel
U.S. Environmental Protection Agency, Region II
290 Broadway, 17th Floor
New York, NY 10007-1866
Attention: Michael A. Mintzer, Liberty Industrial Finishing
Superfund Site Attorney

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station

Washington, D.C. 20044
Re: DOJ Case Number 90-11-2-1222

United States Attorney
Eastern District of New York
One Pierrepont Plaza, 14th Floor
Brooklyn, NY 11201
Re: USAO File Number 2002V04083

As to the State:

When submitting to EPA any written communication required hereunder, Settling Defendants shall simultaneously submit one (1) copy of that communication (unless the given document is a plan or report, in which case five (5) copies shall be submitted) to:

NYS Department of Environmental Conservation
Division of Hazardous Waste Remediation
Bureau of Eastern Remedial Action
Federal Projects Section
625 Broadway, Albany, NY 12233-7015
Attention: Heather Bishop, Project Manager

As to the Settling Work Defendants:

Name and address of Settling Work Defendants' Project Coordinator

As to Settling Defendants other than Settling Work Defendants

At the address shown on the signature page of this Consent Judgment for such Settling Defendant

XXVII. EFFECTIVE DATE

112. The effective date of this Consent Judgment shall be the date upon which this Consent Judgment is entered by the Court, except as otherwise provided herein.

XXVIII. RETENTION OF JURISDICTION

113. This Court retains jurisdiction over both the subject matter of this Consent Judgment and the Settling Defendants for the duration of the performance of the terms and provisions of this Consent Judgment for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or modification of this Consent Judgment, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIX (Dispute Resolution) hereof.

114. All disputes relating to the enforcement and interpretation of this Consent Judgment shall be determined in accordance with Federal law.

XXIX. APPENDICES

115. The following appendices are attached hereto and are part of this Consent Judgment:

"Appendix A" is the ROD.

"Appendix B" is the SOW.

"Appendix C" is the description and/or map of the Site.

"Appendix D" is the complete list of the Non-Owner Settling Defendants.

"Appendix E" is the complete list of the Owner Settling Defendants.

"Appendix F" is the complete list of the Settling Federal Agencies.

"Appendix G" is a draft easement.

"Appendix H" is a general depiction of the extent of Plume B.

XXX. COMMUNITY RELATIONS

116. Settling Work Defendants shall propose to EPA their participation in the Community Relations Plan to be developed by EPA. EPA will determine the appropriate role for the Settling Work Defendants under the Plan. Settling Work Defendants shall also cooperate with EPA in providing information regarding the Work to the public. As requested by EPA, Settling Work Defendants shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by EPA to explain activities at or relating to the Site.

XXXI. MODIFICATION

117. Schedules specified in this Consent Judgment for completion of the Work may be modified by agreement of EPA and the Settling Work Defendants. All such modifications shall be made in writing.

118. Except as provided in Paragraph 15 (Modification of the SOW or Related Work Plans), no material modifications shall be made to the SOW without written notification to and written approval of the United States, Settling Work Defendants, and the Court, if such modifications fundamentally alter the basic features of the selected remedy within the meaning of 40 C.F.R. 300.435(c)(2)(B)(ii). Prior to providing its approval to any modification, the United States will provide the State with a reasonable opportunity to review and comment on the proposed modification. Modifications to the SOW that do not materially alter that document, or material modifications to the SOW that do not fundamentally alter the basic features of the selected remedy within the meaning of 40 C.F.R.300.435(c)(2)(B)(ii), may be made by written agreement between EPA, after providing the State with a reasonable opportunity to review and comment on the proposed modification, and the Settling Work Defendants.

119. Nothing in this Consent Judgment shall be deemed to alter the Court's power to enforce, supervise or approve modifications to this Consent Judgment.

XXXII. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

120. This Consent Judgment shall be lodged with the Court for a period of not less than thirty (30) days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Judgment disclose facts or considerations which indicate that the Consent Judgment is inappropriate, improper, or inadequate. Settling Defendants consent to the entry of this Consent Judgment without further notice.

121. If for any reason the Court should decline to approve this Consent Judgment in the form presented, this agreement is voidable at the sole discretion of any Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

XXXIII. SIGNATORIES/SERVICE

122. Each undersigned representative of a Settling Defendant to this Consent Judgment and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Judgment and to execute and legally bind such Party to this document.

123. Each Settling Defendant hereby agrees not to oppose entry of this Consent Judgment by this Court or to challenge any provision of this Consent Judgment unless the United States has notified the Settling Defendants in writing that it no longer supports entry of the Consent Judgment..

124. Each Settling Defendant shall identify, on the attached signature page, the name, address and telephone number of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Judgment. Settling Defendants hereby agree to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including, but not limited to, service of a summons.

XXXIV. FINAL JUDGMENT

125. This Consent Judgment constitutes the final, complete, and exclusive agreement and understanding among the parties with respect to the settlement embodied in the Consent Judgment. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Consent Judgment.

126. Upon approval and entry of this Consent Judgment by the Court, this Consent Judgment shall constitute a final judgment between and among the United States and the Settling Defendants. The Court finds that there is no just reason for delay and therefore enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

SO ORDERED THIS __ DAY OF _____, 20__.

_____

United States District Judge

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR THE UNITED STATES OF AMERICA

3.3.04
Date

Tom Sansonetti
THOMAS L. SANSONETTI
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20530

3/25/04
Date

Catherine Adams Fiske/SMA
Catherine Adams Fiske
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
One Gateway Center - Suite 616
Newton, MA 02493

3/25/04
Date

Michael Rowe/SMA
Michael Rowe
Environmental Defense Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 23986
Washington, D.C. 20026-3986

3/29/04
Date

Sandra L Levy
Sandra L. Levy
Assistant United States Attorney
Eastern District of New York
U.S. Department of Justice
One Pierrepont Plaza, 14th Floor
Brooklyn, NY 11201

FOR: ROSLYNN R. MAUSKOPF
United States Attorney
Eastern District of New York

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

Date: March 29, 2004

ROSLYNN R. MAUSKOPF
United States Attorney
Eastern District of New York

By: _____

CHARLES P. KELLY
Assistant United States Attorney
610 Federal Plaza
Central Islip, NY 11722-4454

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

9/30/03
Date

JANE M. KENNY
Regional Administrator, Region II
U.S. Environmental Protection Agency
290 Broadway
New York, NY 10007

9/30/03
Date

Michael A. Mintzer
Assistant Regional Counsel
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Coltec Industries, Inc. */

September 26, 2003
Date

Signature: John R Mayo
Name (print): John R. Mayo
Title: Assistant Secretary
Address: 5605 Carnegie Blvd.
Charlotte, NC 28209

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): John R. Mayo
Title: Assistant Secretary
Address: 5605 Carnegie Blvd.
Charlotte, NC 28209

Ph. Number: 704-731-1525

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Goodrich Corporation */

September 26, 2003
Date

Signature: [signature]
Name (print): Kevin J. O'Brien
Title: Counsel to Remediation Trust
Address: Thompson Hine LLP
3900 Key Center
127 Public Square
Cleveland, OH 44114

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): R Leonard Rice, Jr.
Title: Legal Counsel II
Address: Goodrich Corporation
Four Coliseum Center
2730 West Tyvola Road
Charlotte, NC 28217
Ph. Number: 704-423-5219

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR 55 McTeer Ave Co. LLC. */

9/26/03
Date

Signature: [signature]
Name (print): J J
Title: Pres Cubbies Prop Inc Member
Address: _____

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): _____
Title: _____
Address: _____

Ph. Number: _____

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Cobbies Prop. Inc */

9/26/03
Date

Signature: [signature] Pres.
Name (print): _____
Title: Pres
Address: _____

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): _____
Title: _____
Address: _____

Ph. Number: _____

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Jeffry Rosmarin */

9/26/03
Date

Signature: Jeffry Rosmarin
Name (print):
Title: B
Address: B

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print):
Title:
Address:

Ph. Number:

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR J. JAY TANENBAUM

9/26/03
Date

Signature: J. Jay Tanenbaum
Name (print): J. JAY TANENBAUM
Title: _____
Address: _____
_____
_____
_____

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): _____
Title: _____
Address: _____
_____
_____

Ph. Number: _____

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Jan Burman */

9-25-03
Date

Signature:
Name (print): Jan Burman
Title:
Address: 2545 Hempstead Tpke
Suite 401
East Meadow NY
11554

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): James Rigano
Title:
Address: Certilman Balin
1393 Veterans Memorial Hwy - Suite 305
Hauppauge, NY 11788
Ph. Number: 631 979-3000

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Jerome Lazarus */

9/25/03
Date

Signature: Jerome Lazarus
Name (print): JEROME LAZARUS
Title:
Address: 21 Homestead Rd.
Old Westbury NY 11568

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): James Rigano
Title:
Address: Certilman Balin
1193 Veterans Memorial Hwy - Suite 301
Hauppauge NY 11788
Ph. Number: 631 979 3000

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Liberty Associates */
By: William Heller, General Partner

Sept 25, 2003
Date

Signature: William Heller
Name (print): WILLIAM HELLER
Title: GENERAL PARTNER
Address: 161 E 11th ave
Roselle N.J. 07203

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): _____
Title: _____
Address: _____
_____
_____
Ph. Number: _____

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR Koch-Glitsch, LP */
by and through its General Partner, KGGP, LP

09/29/03
Date

Signature: [signature] .QK
Name (print): John M. Van Gelder
Title: Director
Address: 4111 E. 37th North
Wichita, Ks 67220

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): [signature]
Title: Bradley E. Haddock
Vice President & General Counsel of KGGP, LLC
Address: 4111 E. 37th North, Wichita, Ks 67220
Ph. Number: (316) 828-5946

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

THE UNDERSIGNED PARTY enters into this Consent Judgment in the matter of *United States v. Coltec Industries, Inc., et al.*, relating to the Liberty Industrial Finishing Superfund Site.

FOR: **BEAZER EAST, INC., on its behalf and on behalf of Lamtex Industries, Inc. and their past and present subsidiaries, parent companies, predecessors, and successors** */

Signature: Jill M Blundon

Date

Name (print): Jill M. Blundon

Title: Vice President

Address: One Oxford Ctr.
Suite 3000
Pittsburgh, PA 15219

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name (print): _____

Title: _____

Address: _____

_____

_____

Ph. Number: _____

*/ A separate signature page must be signed by each corporation, individual or other legal entity that is settling with the United States.

APPENDIX B
to Consent Judgment in the matter of
***United States v. Coltec Industries et al.*, relating to the Liberty Industrial Finishing Superfund Site**

STATEMENT OF WORK

Liberty Industrial Finishing Superfund Site
Village of Farmingdale, Town of Oyster Bay, Nassau County, New York

STATEMENT OF WORK

Liberty Industrial Finishing Superfund Site
Village of Farmingdale, Town of Oyster Bay, Nassau County, New York

I. WORK TO BE PERFORMED

The objectives of the Work to be conducted at the Site pursuant to the Consent Judgment (the terms "Work," "Site" and "Consent Judgment" as used herein are defined in Section IV of the Consent Judgment to which this Statement of Work is attached) are:

Remedial Work Element I - On-Site Soils

- Mitigate soil contaminant concentrations to a level that will not pose unacceptable risks to human health and to a level which will prevent further degradation of groundwater.
- Remove all hazardous waste as defined in RCRA (the term "RCRA" as used herein is defined in Section IV of the Consent Judgment) from the Site.
- Remove any structural impediments that might interfere with pre-design sampling and implementation of soil, subsurface feature, and groundwater remediation.

Remedial Work Element II - On-Site Subsurface Features (on Eastern Portion of the Site) and Underground Storage Tanks (USTs)

- Remove of contaminated aqueous and/or solid materials from subsurface features and USTs.

Remedial Work Element III - On-Site and Off-Site Groundwater

- Prevent or minimize ingestion, dermal contact and inhalation of inorganic- and organic-contaminated groundwater that are above State and Federal maximum contaminant levels (MCLs).
- Restore groundwater quality to levels which meet State and Federal MCLs.

Remedial Work Element IV - Massapequa Creek Pond A Sediments

- Prevent adverse effects to ecological receptors within the Massapequa Creek and associated ponds caused by exposure to Site-related contaminants.

These objectives are expected to be met through the implementation of the remedy selected in the Record of Decision (or ROD) for the Site (the term "Record of Decision" or "ROD" as used herein is defined in Section IV of the Consent Judgment). The major components of the selected remedy include the following four Remedial Work Elements:

Remedial Work Element I - On-Site Soils

- Excavation and off-Site disposal of all soils contaminated above the soil Performance Standards (contamination in soils exceeding groundwater protection soil cleanup levels: 10 milligrams/kilogram (mg/kg) cadmium, 143 mg/kg chromium, 0.7 mg/kg trichloroethene (TCE), 0.25 mg/kg cis-1,2-dichloroethene (cis-1,2-DCE), and 1.4 mg/kg tetrachloroethene (PCE), presently estimated at 73,100 cubic yards),

- Subsequent to excavation of such soils, placement of clean fill in the excavated areas, and

- Implementation of institutional controls to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses.

Remedial Work Element II - On-Site Subsurface Features (on Eastern Portion of the Site) and USTs

- Removal of contaminated aqueous and/or solid materials from three USTs and approximately fifty-six subsurface features, as well as from the northern and eastern sanitary leaching fields, if warranted, and removal of a contaminated above-ground mound of soils (approximately 50 feet by 40 feet) originating from the former building B basement area ("Building B Ramp Pile"), and

- Removal and off-Site disposal of any soil surrounding the subsurface features that exceed 10 mg/kg cadmium, 143 mg/kg chromium, 0.7 mg/kg TCE, 0.25 mg/kg cis-1,2-DCE, 1.4 mg/kg PCE, 1 mg/kg PCBs for soils between zero and 1 foot below ground surface (bgs) and 10 mg/kg PCBs for soils below 1 foot bgs, 35 mg/kg cyanide, 0.29 mg/kg benzo[a]pyrene, or 0.29 mg/kg dibenzo[a,h]anthracene.

The ROD selected the Features Tasks (the term "Features Tasks" is defined in Section IV of the Consent Judgment) as a portion of the comprehensive remedy and the Features Tasks are a part of the Work included within Remedial Work Element II. However, the Features Tasks are required to be addressed in the Features AOC (the term "Features AOC" is defined in Section IV of the Consent Judgment) and will not be addressed under the Consent Judgment and this Statement of Work (SOW) unless EPA notifies Settling Work Defendants (the term "Settling Work Defendants" as used herein is defined in Section IV of the Consent Judgment) that all or any portion of the Features Tasks have not been satisfactorily addressed under the Features AOC, in which event EPA will modify this SOW to cover those portion of the Features Tasks that have not been satisfactorily addressed under the Features AOC.

Remedial Work Element III - On-Site and Off-Site Groundwater

- Continued operation of the groundwater treatment system installed pursuant to the Interim Groundwater UAO (the term "Interim Groundwater UAO" is defined in Section IV of the Consent Judgment), to address the groundwater underlying the 30-acre portion of the Site,

other than Plume B (the term "Plume B"is defined in Section IV of the Consent Judgment), in order to reduce contaminant levels so as to achieve Performance Standards and restore the aquifer (the interim groundwater treatment system is being converted to a conventional pump-and-treat system (Ion Exchange, Precipitation with Coagulation, Filtration, Air Stripping and Granular Activated Carbon) (or other appropriate treatment system configuration as may be approved by EPA in its sole discretion provided that all Performance Standards can be fully achieved and maintained) pursuant to the Interim Groundwater UAO) (Prior to construction of expanded treatment capacity for recovered off-Site groundwater, if groundwater data indicate that the effects of Remedial Work Element I (the source area soil remedy) have reduced or eliminated the need for continued groundwater recovery at the 30-acre portion of the Site, based on achievement of Performance Standards in groundwater under the 30-acre portion of the Site, then, if requested by the Settling Work Defendants and if EPA concurs with the Settling Work Defendants' conclusions, EPA may at such time, in its sole discretion, take steps such as, if required, seeking a modification to the Work by means of an Explanation of Significant Differences to the ROD, as would allow the modification of the SOW and the Remedial Action Work Plan for Remedial Work Element III so as to require the Settling Work Defendants to construct only the treatment system capacity required to achieve the Performance Standards.),

- Construction and operation of a 250-gpm pump-and-treat system (Ion Exchange, Precipitation with Coagulation, Filtration, Air Stripping and Granular Activated Carbon with Four Groundwater Extraction Wells) (or other appropriate treatment system configuration as may be approved by EPA in its sole discretion provided that all Performance Standards can be fully achieved and maintained) to treat groundwater contamination downgradient of the 30-acre portion of the Site, other than Plume B, in order to reduce contaminant levels so as to achieve Performance Standards and restore the aquifer (the exact numbers, depths, pumping rates, and locations of extraction wells to be determined during the RD),

- Construction of all groundwater treatment systems (exclusive of the piping leading to the treatment works) shall be within the area where the current treatment system is located on the 30-acre portion of the Site unless EPA approves of the location of another area (if a separate treatment system with a different location is required for off-Site groundwater, the location of this treatment system will be made by EPA based on engineering and economic criteria as well as community acceptance, compliance with zoning and land use requirements and compliance with all other applicable requirements or relevant and appropriate requirements identified during the RD).

- Continued operation of the groundwater treatment systems in order to restore the aquifer through achievement of groundwater Performance Standards, including reduction of contaminant levels to State and Federal MCLs (e.g., 5 micrograms/liter (µg/l) for cadmium, 50 µg/l for chromium, and 5 µg/l for TCE, cis-1,2-DCE, and PCE),

- Discharge of treated groundwater to Massapequa Creek surface water or reinjection of

treated groundwater into the aquifer,

- Implementation of a groundwater monitoring program, and

- Implementation of institutional controls to prohibit installation or use of groundwater wells for human consumption of the well water or any other purpose which would or could result in human contact with groundwater.

Remedial Work Element IV - Massapequa Preserve

- Removal by excavation or vacuum extraction and off-Site disposal of sediments within Pond A of Massapequa Preserve that are contaminated above Performance Standards (contamination in sediments exceeding sediment cleanup levels: 50 mg/kg cadmium and 260 mg/kg chromium, presently estimated at 2,600 cubic yards), and

- Implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve to demonstrate that the removal of Pond A sediments is protective of the downstream ecosystem from contaminants associated with the Liberty site.

The Work to be performed under the Consent Judgment shall include, but shall not be limited to, the following:

A. Pre-remedial design (pre-RD) activities associated with Remedial Work Elements I, II, III and IV;

B. Remedial design (RD) activities associated with Remedial Work Elements I, II, III and IV;

C. Implementation of the remedial action (RA) for Remedial Work Elements I, II, III and IV; and

D. Monitoring related to Remedial Work Elements III and IV.

II. PERFORMANCE STANDARDS

Performance Standards are the cleanup standards and other measures to achieve the goals of the Remedial Action (the term "Performance Standards" as used herein is defined in Section IV of the Consent Judgment).

Remedial Work Element I - On-Site Soils

Groundwater protection soil cleanup levels: 10 mg/kg cadmium, 143 mg/kg chromium, 0.7 mg/kg

TCE, 0.25 mg/kg cis-1,2-DCE, and 1.4 mg/kg PCE

Remedial Work Element II - On-Site Subsurface Features (on Eastern Portion of the Site) and USTs

Subsurface features soil cleanup levels: 10 mg/kg cadmium, 143 mg/kg chromium, 0.7 mg/kg TCE, 0.25 mg/kg cis-1,2-DCE, 1.4 mg/kg PCE, 1 mg/kg PCBs for soils between zero and 1 foot bgs and 10 mg/kg PCBs for soils below 1 foot bgs, 35 mg/kg cyanide, 0.29 mg/kg benzo[a]pyrene, or 0.29 mg/kg dibenzo[a,h]anthracene

Remedial Work Element III - On-Site and Off-Site Groundwater

State and Federal MCLs (e.g., 5 µg/l for cadmium, 50 µg/l for chromium, and 5 µg/l for TCE, cis-1,2-DCE, and PCE).

Remedial Work Element IV - Massapequa Creek Pond A Sediments

Sediment cleanup levels: 50 mg/kg cadmium and 260 mg/kg chromium

In addition, the remedy shall comply with all Applicable or Relevant and Appropriate Requirements (ARARs) as set forth herein and in the ROD. Accordingly, the remedy will reduce the risk to human health and the environment at the Site.

III. PROJECT SUPERVISION/MANAGEMENT, PROJECT COORDINATOR

The pre-RD, RD, and RA, monitoring, and any other activities performed under the Consent Judgment will be under the direction and supervision of a qualified New York State-licensed professional engineer (hereinafter, Supervising Contractor) and will meet any and all requirements of applicable federal, State and local laws. Within **forty-five (45) days** (when used herein, the term "day" or "Day" shall mean "Day" as defined in Section IV of the Consent Judgment) of the lodging of the Consent Judgment, the Settling Work Defendants shall notify EPA and the New York State Department of Environmental Conservation (NYSDEC), in writing, of the names, titles, and qualifications of the Supervising Contractor proposed to be used in the development and implementation of the work to be performed. Such engineer shall engage in the "practice of engineering" at the Site on behalf of Settling Work Defendants, as the "practice of engineering" is defined at Section 7201 of the New York State Education Law, and shall comply with all applicable New York State legal requirements regarding the practice of professional engineering within the State of New York, including, but not limited to, all applicable requirements of the New York State Education Law and Articles 15 and 15-A of the Business Corporation Law. Selection of any such engineer, contractor, or subcontractor shall be subject to approval by EPA as provided in Section VI of the Consent Judgment.

IV. PRE-REMEDIAL DESIGN ACTIVITIES

The pre-RD activities to be performed in the implementation of the selected remedy for the Site include the following:

A. Collect soil samples to define the excavation boundaries of the contaminated soils exceeding cleanup objectives unless EPA, at the request of Settling Work Defendants, determines that such activity is not necessary to support Remedial Design. These soil samples will be collected to support Remedial Design activities. In addition, geotechnical and hydrogeologic testing may be performed to determine steps that will be taken during construction to ensure excavation stability;

B. Complete investigation of the subsurface features and the USTs (as identified in the URS Corporation's March 12, 2003 letter to Lorenzo Thantu of EPA entitled, "Summary of Known or Suspected Underground Storage Tanks"), as well as the portion of the northern sanitary leaching field, not addressed by the Features AOC, including sampling and analysis, in order for EPA to determine if any remediation is necessary (i.e., exceedance of Performance Standards);

C. Perform a hydrogeologic investigation to collect hydrogeologic and chemical data from relevant monitoring wells necessary for the design of the groundwater extraction/treatment systems;

D. Conduct engineering evaluation of the feasibility of discharging treated groundwater from the groundwater extraction/treatment systems to the Massapequa Creek;

E. Collect sediment samples within Pond A to define the excavation boundaries of the contaminated sediments exceeding Performance Standards. These Pond A sediment samples will be collected to support Remedial Design activities. In addition, sediment dewatering tests may be performed to determine steps that will be taken to manage potential excess water content in the sediments;

F. Prepare a Wetland Mitigation Plan to determine possible measures to mitigate wetland loss from Pond A remedy implementation. The Wetland Mitigation Plan shall outline actions to be taken to avoid disruption of wetlands, minimize impacts to wetlands, and/or compensate (replacement) for wetlands potentially affected by remedial activities associated with the Site. The Wetland Mitigation Plan shall include, but shall not be limited to, a depiction of the wetland boundaries identified by the delineation and a description of major plant communities, soil type(s), and hydrology, with the results clearly plotted on a Site map;

G. Prepare a Wetland Restoration Plan that addresses in detail how the impacted wetlands, as result of Pond A remedy implementation, would be fully restored;

H. Prepare Stage 1A Cultural Resources Survey report, if warranted, for Pond A in accordance with the provision of the National Historic Preservation Act, 16 U.S.C. § 470. (While it has been determined by EPA that the National Historic Preservation Act is not an ARAR for the 30-acre portion of the Site, no such determination has been made for the Massapequa Preserve portion of the Site.);

I. Conduct an ecological study for Pond A that will incorporate data gathered during the Remedial Investigation study and will be supported, if necessary, by additional surface water samples, sediment samples, and bioassays; and

J. Perform an evaluation of the potential impacts the Remedial Action will have on the 100-year and 500-year flood plain.

V. REMEDIAL DESIGN ACTIVITIES

The RD activities to be performed in the implementation of the selected remedy for the Site include the following:

A. Develop plans and specifications for the excavation and off-Site treatment and/or disposal of contaminated Site soils exceeding cleanup objectives.

B. Develop a soil remedy post-excavation confirmatory sampling plan, in accordance with EPA's guidance document entitled, "Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media."

C. Develop plans and specifications for remediation technologies that will be utilized to remove aqueous and/or solid materials from the subsurface features and the USTs (as identified in the URS Corporation's March 12, 2003 letter to Lorenzo Thantu of EPA entitled, "Summary of Known or Suspected Underground Storage Tanks").

D. Develop plans and specifications for remediation of the eastern sanitary leaching field and the northern sanitary leaching field, if warranted based on sampling results from the investigation conducted per **Subsection IV.B**.

E. Design the recontouring and grading for the excavated and backfilled areas.

F. Design the groundwater extraction/treatment systems as outlined in the ROD. The groundwater extraction/treatment systems design shall include, at a minimum:

1. Provision for the extraction of contaminated groundwater utilizing a network of recovery wells;

2. Conducting treatability studies for the on-Site treatment of the on-Site and off-Site contaminated groundwater, if necessary;

3. A final determination of the treatment process for groundwater. The conceptual treatment process outlined in the ROD includes ion exchange, precipitation with coagulation, filtration, air stripping and granular activated carbon (or other appropriate treatment);

4. A determination of the exact number, depth, pumping rates, and location of extraction wells;

5. A final determination of the discharge option for treated groundwater; and

6. Develop an Operation and Maintenance Plan (O&M Plan), prepared in accordance with instructions for preparation of operation and maintenance plans in the "Remedial Design/Remedial Action Handbook," dated June, 1995 (OSWER 9355.0-4A), which includes, but is not limited to, a description of the personnel requirements, responsibilities, and duties, including discussion for training, lines of authority, sampling, analysis, and monitoring conducted under the Consent Judgment.

G. Design a plan to provide for long-term groundwater quality monitoring to evaluate the effectiveness of the remedial action.

H. Develop a plan for performance of air monitoring during construction activities at the Site to ensure that air emissions resulting from construction activities meet applicable or relevant and appropriate air emission requirements

I. Preparation of a plan for establishing institutional controls (i.e., deed restrictions) designed to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses, and to prohibit the installation and use of groundwater wells at the Site for human consumption of the well water or any other purpose which would or could result in human contact with groundwater until groundwater cleanup standards are achieved.

J. Develop a.plans and specifications for the excavation and off-Site treatment and/or disposal of contaminated Pond A sediments exceeding cleanup objectives.

K. Develop a sediment remedy post-excavation confirmatory sampling plan, in accordance with EPA's guidance document entitled, "Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media."

L. Finalize the Wetland Mitigation Plan required by **Subsection IV.F**, which shall detail

actions to be taken during the Pond A remedy implementation to avoid disruption of wetlands, minimize impacts to wetlands, and/or compensate (replacement) for wetlands potentially affected by remedial activities associated with the Site.

M. Design an enhanced monitoring program that will consist of surface water and sediment sampling and bioassays to be periodically conducted to monitor the effectiveness of the Pond A remedy subsequent to its implementation.

VI. REMEDIAL DESIGN WORK PLAN

Within **ninety (90) days** of the date on which Settling Work Defendants receive written notification from EPA of the approval of the Supervising Contractor, Settling Work Defendants shall submit a detailed Remedial Design Work Plan for the design of the selected remedy to EPA for review and approval as provided for below and in Section XI of the Consent Judgment (EPA Approval of Plans and Other Submissions). The Remedial Design Work Plan shall provide for the collection of all data needed for performing the pre-RD and the necessary RD activities.

The Work Plan shall comply with CERCLA and relevant EPA guidance, including EPA document entitled *Guidance on Oversight of Remedial Designs and Remedial Actions performed by Potentially Responsible Parties*, (OSWER directive 9355.5-01, EPA/540/g-90-001), dated April 1990 and shall be in conformance, *inter alia*, with the *Superfund Remedial Design and Remedial Action Guidance*, dated June 1986, and other EPA guidance documents.

A Field Sampling Plan (FSP), Quality Assurance Project Plan (QAP_jP), and Health and Safety Plan (HSP) approved by EPA for the supplemental RI/FS may be utilized with appropriate addenda or revisions to these plans, as necessary, to accomplish the pre-RD and RD tasks. The Remedial Design Work Plan shall include plans and schedules for implementation of pre-RD and RD tasks, and shall include, but not be limited to, the following items and as appropriate, QAP_jP Addendum to be combined with FSP Addendum, and HSP Addendum shall comply with the following requirements:

A. Quality Assurance/Quality Control Project Plan and Field Sampling Plan

A Quality Assurance/Quality Control Project Plan (QAP_jP) shall be prepared consistent with EPA *Requirements for Quality Assurance Project Plans for Environmental Data Operations*, (EPA QA/R-5, October 1998), and shall include the following elements:

1. A detailed description of the sampling, analysis, and monitoring that shall be performed during the RD phase, consistent with this SOW, the ROD, and the Consent Judgment. At a minimum, the QAP_jP shall provide the following:

   a. A plan for the performance of air monitoring, including air

monitoring prior to and during construction at the Site, as necessary, to ensure that any air emissions resulting from the excavation, loading onto trucks, and transportation meet applicable or relevant and appropriate air emission requirements;

b. A plan for defining specific areas of Site soil excavation;

c. A plan for defining specific areas of the subsurface features and the USTs that will be remediated;

d. A plan for defining specific areas of the eastern sanitary leaching field and the northern sanitary leaching field that will be remediated, if warranted based on sampling results from the investigation conducted per **Subsection IV.B;**

e. A plan for conducting treatability studies and for construction of the remediation system for the on-Site treatment of the on-property and off-property contaminated groundwater, and

f. A plan for defining specific areas of Pond A sediment excavation.

2. All sampling, analysis, data assessment, and monitoring shall be performed in accordance with the *Region II CERCLA Quality Assurance Manual*, Revision 1, EPA Region 2, dated October 1989, and any updates thereto, or an alternate EPA-approved test method, and the guidelines set forth in the Consent Judgment. All testing methods and procedures shall be fully documented and referenced to established methods or standards.

3. The QAPjP shall also specifically include the following items:

a. An explanation of the way(s) the sampling, analysis, and monitoring will produce data for the RD phase;

b. A detailed description of the sampling, analysis, and testing to be performed, including sampling methods, analytical and testing methods, sampling locations and frequency of sampling;

c. A map depicting sampling locations; and

d. A schedule for performance of specific tasks.

4. In the event that additional sampling locations and analyses are utilized or required, Settling Work Defendants shall submit to EPA an addendum to the

QAP_jP for approval by EPA.

5. The QAP_jP shall address the following elements:

Project Management

a. Title and Approval Sheet
b. Table of Contents and Document Control Format
c. Distribution List
d. Project/Task Organization and Schedule
e. Problem Definition/Background
f. Project/Task Description
g. Quality Objectives and Criteria for Measurement Data
h. Special Training Requirements/Certification
i. Documentation and Records

Measurement/Data Acquisition

j. Sampling Process Design
k. Sampling Methods Requirements
l. Sample Handling and Custody Requirements
m. Analytical Methods Requirements
n. Quality Control Requirements
o. Instrument/Equipment Testing, Inspection, and Maintenance Requirements
p. Instrument Calibration and Frequency
q. Inspection/Acceptance Requirements for Supplies and Consumables
r. Data Acquisition Requirements (Non-Direct Measurements)
s. Data Management

Assessment/Oversight

t. Assessments and Response Actions
u. Reports to Management

Data Validation and Usability

v. Data Review, Validation, and Verification Requirements
w. Validation and Verification Methods
x. Reconciliation with Data Quality Objectives

6. In order to provide quality assurance and maintain quality control with respect to all samples to be collected, Settling Work Defendants shall ensure

the following:

a. Quality assurance and chain-of-custody procedures shall be performed in accordance with standard EPA protocol and guidance, including the *Region II CERCLA Quality Assurance Manual, Revision 1*, EPA Region 2, dated October 1989, and any updates thereto, and the guidelines set forth in the Consent Judgment.

b. The laboratory to be used must be specified. If the laboratory participates in the Contract Laboratory Program (CLP) for the analysis to be performed for this investigation, then project specific Performance Evaluation (PE) samples will not be required, as CLP laboratories run EPA PEs on a quarterly basis. If the proposed laboratory does not participate in the CLP for the analyses required, PE samples must be analyzed to demonstrate the capability to conduct the required analysis prior to being approved for use. Once a non-CLP laboratory has been selected, the laboratory should submit a copy of their Laboratory Quality Assurance Program Plan to EPA for review and approval.

   For any analytical work performed at a non-CLP laboratory, including that done in a fixed laboratory, in a mobile laboratory, or in on-Site screening analyses, Settling Work Defendants must submit to EPA a "Non-CLP Superfund Analytical Services Tracking System" form for each non-CLP laboratory utilized during a sampling event, within thirty (30) days after acceptance of the analytical results. Upon completion, such documents shall be submitted to EPA Project Coordinator, with a copy of the form and transmittal letter to:

   Regional Sample Control Center Coordinator
   EPA Region 2
   Division of Environmental Science & Assessment
   2890 Woodbridge Avenue, Bldg. 209, MS-215
   Edison, NJ 08837

c. The laboratory utilized for analyses of samples must perform all analyses according to accepted EPA methods as documented in the *Contract Lab Program Statement of Work for Organic Analysis*, (OLM04.2) or the latest revision, and the *Contract Lab Program Statement of Work for Inorganic Analysis*, (ILM04.0) or the latest revision, or other EPA approved methods.

d. Unless indicated otherwise in the approved QAP_jP, all data shall be

validated upon receipt from the laboratory.

e. Submission of the validation package (checklist, report, and Form I containing the final data) shall be made to EPA, prepared in accordance with the provisions of Subparagraph g., below.

f. Assurance that all analytical data that are validated as required by the QAP_jP are validated according to the procedures stated in *EPA Region II Contract Lab Program Organics Data Review and Preliminary Review* (SOP #HW-6, Revision 11), dated June 1996, or the latest revision, and the *Evaluation of Metals Data for the Contract Laboratory Program* (SOP #HW-2, Revision 11), dated January 1992 or the latest revision, or EPA-approved equivalent procedures. Region 2 Standard Operating Procedures are available at: http://www.epa.gov/region02/smb/sops.htm.

g. Unless indicated otherwise in the approved QAP_jP, Settling Work Defendants shall require deliverables equivalent to CLP data packages from the laboratory for analytical data. Upon the EPA's request, Settling Work Defendants shall submit to EPA the full documentation (including raw data) for this analytical data. EPA reserves the right to perform an independent data validation, data validation check, or qualification check on generated data.

h. Settling Work Defendants shall insert a provision in its contract(s) with the laboratory utilized for analyses of samples, which will require granting access to EPA personnel and authorized representatives of EPA for the purpose of ensuring the accuracy of laboratory results related to the Site.

B. Health and Safety Contingency Plan

A Health and Safety Contingency Plan (HSCP) for all activities, except the pre-RD sampling activities, performed under the Consent Judgment shall be developed by Settling Work Defendants to address the protection of public health and safety and the response to contingencies that could impact public health, safety, and the environment. The HSCP that was used for the performance of the supplemental RI at the Site may be used by Settling Work Defendants, with appropriate revisions if necessary, for the pre-RD efforts. The HSCP shall satisfy the requirements of the *Occupational Safety and Health Guidance for Hazardous Waste Site Activities*, (June 1990, DHHS NIOSH Publication No. 90-117), and the Occupational Safety and Health Administration, U.S. Department of Labor (OSHA) requirements cited below:

1. All Site activities shall be performed in such a manner as to ensure the safety and health of personnel so engaged. All Site activities shall be conducted in accordance with all pertinent general industry (29 CFR Part 1910) and construction (29 CFR Part 1926) OSHA standards, and EPA's *Standard Operating Safety Guides* (OSWER, 1988), as well as any other applicable State and municipal codes or ordinances. All Site activities shall comply with those requirements set forth in OSHA's final rule entitled *Hazardous Waste Operations and Emergency Response*, 29 CFR §1910.120, Subpart H.

2. The HSCP shall include, at a minimum, the following items:

   a. Plans showing the location and layout of any temporary facilities to be constructed on or near the Site;

   b. Description of the known hazards and evaluation of the risks associated with the Site and the potential health impacts related to the Site activities;

   c. List of key personnel and alternates responsible for Site safety, response operations, and protection of the public;

   d. Description of levels of protection (based on specified standards) to be utilized by all personnel;

   e. Delineation of Work, decontamination, and safe zones, and definitions of the movement of zones;

   f. Description of decontamination procedures for personnel and equipment, and handling and removal of disposable clothing or equipment;

   g. Incidental emergency procedures which address emergency care for personnel injuries and exposure problems, and containment measures. These procedures shall include evacuation routes, internal and external communications procedures for response to fire, explosion, or other emergencies, the name of the nearest hospital and the route to that hospital. Local agencies with the capability to respond to emergencies shall be identified and their capabilities shall be described. A description of the procedures for informing the community of these measures shall be outlined;

   h. Description of the personnel medical surveillance program in effect;

i. Description of monitoring for personnel safety;

j. Description of routine and special personnel training programs; and

k. Description of an air monitoring program to determine concentrations of airborne contaminants to which workers on-Site and persons near the Site boundary may be exposed. The results of work-zone air monitoring may be used as a trigger for implementing Site-boundary air monitoring.

C. Description of Pre-Remedial Design and Remedial Design Tasks

The Remedial Design Work Plan shall include a detailed description of all other pre-RD and RD tasks **(see Sections IV. and V., above)** to be performed, along with a schedule for performance of those tasks. Such tasks shall include, at a minimum, the preparation of the RD Reports required by **Section VIII., below**, and tasks necessary to ensure compliance with ARARs, as outlined herein and in the ROD. The Remedial Design Work Plan shall include an outline of the requirements of the RD Reports.

1. Access and Other Approvals and Institutional Controls

The Remedial Design Work Plan shall include descriptions of all approvals which Settling Work Defendants will need to obtain to perform the Work and all institutional controls which Settling Work Defendants will need to implement or obtain to comply with the Consent Judgment, with the exception of those approvals needed from EPA. This description shall detail how such approvals will be obtained and how such institutional controls will be obtained or implemented, and shall include a schedule for obtaining or implementing all necessary approvals and institutional controls. Such approvals and institutional controls shall include, without limitation, the consents of owners of property at or near the Site regarding access to conduct sampling, monitoring or other activities, in accordance with the Consent Judgment, institutional controls required by the ROD and the Consent Judgment, and regarding approvals from any off-Site facility accepting waste materials from the Site. This description shall be amended if subsequent approvals are required.

2. RD Schedules, Draft Schedule for Remedial Action, and Monitoring

The Remedial Design Work Plan shall include a schedule covering all pre-RD and RD activities, including but not limited to, the submittal of the RD Reports listed in **Section VIII., below**. The Remedial Design Work Plan

shall also include a draft schedule for remedial action ("RA") and monitoring activities. The schedule shall be in the form of a task/subtask activity bar chart or critical path method sequence of events.

3. The draft schedule for RA and monitoring activities may be revised during the remedial process, subject to the EPA's approval **(see Subsections VIII.A.4. and VIII.C.8., below).**

4. The RD schedule shall provide for the completion and submittal to EPA of the Final Design Reports for Remedial Work Elements I, II, and IV within **eight (8) months** of EPA's written notification of approval of the Remedial Design Work Plan. The RD schedule shall also provide for the completion and submittal to EPA of the Final Design Report for Remedial Work Element III within **eighteen (18) months** of EPA's notification of approval of the Remedial Design Work Plan.

5. The draft schedule for the RA shall provide for the completion of the implementation of Remedial Work Elements II and IV within **eight (8) months** of EPA approval of the RA Work Plan (RAWP) for Remedial Work Element II and IV. The draft schedule for the RA shall also provide for the completion of construction of Remedial Work Elements I and III within **sixteen (16) months** of EPA approval of the RAWP for Remedial Work Element I and III.

VII. APPROVAL OF REMEDIAL DESIGN WORK PLAN

EPA will either approve the Remedial Design Work Plan, or will require modification of such plan in accordance with the procedures set forth in the Consent Judgment. Settling Work Defendants shall implement the EPA-approved Remedial Design Work Plan in accordance with the schedules contained therein.

VIII. REMEDIAL DESIGN

Settling Work Defendants shall perform the pre-RD and RD activities in conformance with the Remedial Design Work Plan approved by EPA and within the time frames specified in the RD schedule contained therein. The RD shall include the preparation of a Preliminary RD Report (30% completion), a Pre-Final RD Report (95% completion), and a Final RD Report (100% completion) for Remedial Work Elements I, II, III, and IV.

A. Preliminary, Pre-Final, and Final RD Reports

The RD reports shall be submitted to EPA and NYSDEC in accordance with the schedule set forth in the approved Remedial Design Work Plan. Each RD report shall include a discussion of the design criteria and objectives, with emphasis on the capacity and ability to meet design objectives successfully. Each such report shall also include the plans and specifications that have been developed at that point in time, along with a design analysis. The design analysis shall provide the rationale for the plans and specifications, including results of all sampling and testing performed, supporting calculations and documentation of how these plans and specifications will meet the requirements of the ROD and shall provide a discussion of any impacts these findings may have on the RD. Each of the design reports for Remedial Work Elements I, II, III, and IV shall also include the following items (unless EPA agrees that such item need not be covered), as appropriate:

1. A technical specification for photographic documentation of the remedial construction work;

2. A discussion of the manner in which the RA will achieve the Performance Standards;

3. A plan for establishing institutional controls (i.e., deed restrictions) designed to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses, and to prohibit the installation and use of groundwater wells at the Site for human consumption of the well water or any other purpose which would or could result in human contact with groundwater until groundwater cleanup standards are achieved.

4. A draft schedule for remedial action activities, and a preliminary schedule for monitoring activities.

B. Additional Preliminary RD Report Requirements

The Preliminary RD Reports (30% completion) for Remedial Work Elements I, II, III, and IV shall include, as appropriate:

1. Preliminary drawings showing general arrangement of all work proposed;

2. A discussion of the manner in which the pre-design components detailed in **Section IV., above,** for the Remedial Action will be considered;

3. Draft Piping & Instrumentation diagrams, as necessary, showing all equipment and control systems;

4. Table of Contents for the specifications, including a listing of items from the Construction Specifications Institute master format that are expected to be

included in the construction specifications. This master format is presented in the Construction Specifications Institute's *Manual of Practice*, 1985 edition, available from the Construction Specifications Institute, 601 Madison Street, Alexandria, Virginia 22314;

5. Engineering plans representing an accurate identification of existing Site conditions and an illustration of the work proposed. Typical items to be provided on such drawings include, at a minimum, the following:

   a. Title sheet including at least the title of the project, a key map, the name of the designer, date prepared, sheet index, and EPA/NYSDEC Project identification;

   b. All property data including owners of record for all properties within 200 feet of the Site;

   c. A Site survey including the distance and bearing of all property lines that identify and define the project Site;

   d. All easements, rights-of-way, and reservations;

   e. All buildings, structures, wells, facilities, and equipment (existing and proposed) if any;

   f. A topographic survey, including existing and proposed contours and spot elevations for all areas that will be affected by the remedial activities, based on U.S. Coast and Geodetic Survey data;

   g. All utilities, existing and proposed;

   h. Location and identification of all significant natural features including, *inter alia*, wooded areas, water courses, wetlands, flood hazard areas, and depressions;

   i. Flood hazard data and 100-year and 500-year flood plain delineation;

   j. North arrow, scale, sheet numbers and the person responsible for preparing each sheet;

   k. Decontamination areas, staging areas, borrow areas and stockpiling areas;

   l. Miscellaneous detail sheets;

m. Definitions of all symbols and abbreviations; and

n. A specification for a sign at the Site. The sign should identify the project, the name of the contractor performing the RD/RA work or the PRP Group, state that the project is being performed under EPA oversight, and provide EPA contact for further information.

6. Survey work that is appropriately marked, recorded and interpreted for mapping property easements and design completion;

7. Drawings of all proposed equipment, improvements, details and all other construction and installation items to be developed in accordance with the current standards and guidelines of the New York State Board of Professional Engineers and Land Surveyors. Drawings shall be of standard size, approximately 24" x 36". A list of drawing sheet titles shall be provided;

8. Engineering plans (as necessary) indicating, at a minimum, the following:

   a. Site security measures;

   b. Roadways; and

   c. Electrical, mechanical, structural, and HVAC drawings, if required.

9. Any value engineering proposals.

C. Additional Pre-Final/Final RD Report Requirements

The Pre-Final and Final RD Reports for Remedial Work Elements I, II, III, and IV shall also include, as appropriate:

1. Final plans and specifications;

2. An O&M Plan. The O&M Plan shall be prepared in accordance with the *Superfund RD and RA Guidance* dated September 1986, OSWER Directive 9355.0-4A. The O&M Plan shall include, but not be limited to, a description and discussion of the following:

   a. personnel requirements, responsibilities, duties, lines of authority and training requirements;

   b. all sampling, analysis, and monitoring to be conducted under the Consent Judgment;

c. all monitoring requirements related to the groundwater extraction and treatment system; and

d. all monitoring requirements related to enhanced Pond A monitoring program including surface water and sediment sampling and bioassays that will be periodically conducted to monitor the effectiveness of the Pond A remedy subsequent to its implementation.

3. A Construction Quality Assurance Project Plan (CQAP$_j$P), which shall detail the approach to quality assurance during construction activities at the Site, shall specify a quality assurance official ("QA Official"), independent of the Supervising Contractor, to conduct a quality assurance program during the construction phase of the project. The CQAP$_j$P P shall address sampling, analysis, and monitoring to be performed during the remedial construction phase of the Work. Quality assurance items to be addressed include, at a minimum, the following:

a. Inspection and certification of the Work;

b. Measurement and daily logging;

c. Field performance and testing;

d. As-built drawings and logs;

e. Testing of the Work to establish whether the design specifications are attained; and

f. Testing methods appropriate to remedial construction including, at a minimum, testing of remedial construction materials, as necessary, prior to use, and testing of constructed remedial components to ensure that they meet design specifications.

4. A report describing those efforts made to secure access and institutional controls and obtain other approvals and the results of those efforts **(see Section VI.C., above)**. Legal descriptions of property or easements to be acquired shall be provided.

5. A final engineer's construction cost estimate, which may be provided under separate cover concurrent with submittal of the Final RD Report.

6. A plan for implementation of construction and construction oversight.

7. A method for selection of the construction contractor(s).

8. A proposed schedule for implementing all of the above.

IX. APPROVAL OF RD REPORTS

A. EPA will review and comment on each of the RD Reports for Remedial Work Elements I, II, III, and IV. Settling Work Defendants shall make those changes required by EPA's comments/modifications in accordance with the procedures set forth in the Consent Judgment.

B. Changes required by EPA's comments on the Remedial Work Elements I, II, III, and IV Preliminary RD Reports shall be made in the Remedial Work Elements I, II, III, and IV Pre-Final RD Reports, respectively. Changes required by EPA's comments on the Remedial Work Elements I, II, III, and IV Pre-Final RD Reports shall be made in the Remedial Work Elements I, II, III, and IV Final RD Reports, respectively.

C. EPA will either approve the Final RD Reports or require modification of each, in accordance with the procedures set forth in the Consent Judgment. The EPA-approved Final RD Reports shall also be referred to as the "Final Design Report I, Final Design Report II, Final Design Report III, and Final Design Report IV" for Remedial Work Elements I, II, III, and IV, respectively.

X. REMEDIAL ACTION

Within **forty (40) days** after approval of the Final Design Report by EPA for a given Remedial Work Element, Settling Work Defendants shall award a contract for the RA for the respective Remedial Work Element.

A. Within **forty (40) days** of the award of the RA contract for a given Remedial Work Element, Settling Work Defendants shall submit an RAWP for remedial construction activities for the respective Remedial Work Element. Each RAWP shall include, at a minimum, the following items:

1. If applicable, a "Request for Modification of Approved Final RD Report," including any requests for modification of the approved Final Design Report, based on construction methods identified by the contractor(s), or proposed modification of the construction schedule developed under **Section VIII., above,** or any other requests for modification, subject to EPA approval in its sole discretion.

2. A Site Management Plan (SMP) for RA activities. The SMP for RA shall include, at a minimum, the following items:

a. Tentative identification of the RA Project Team (including, but not limited to the construction contractor(s)).

b. A final schedule for the completion of the RA and all major tasks therein, as well as a schedule for completion of required plans, and other deliverables **(see Section VI.C., above)**.

c. Methodology for implementation of the Construction Quality Assurance Plan (developed during the RD).

d. Methodology for implementation of the O&M Plan.

e. Procedures and plans for the decontamination of construction equipment and the disposal of contaminated materials.

f. Methods for satisfying permitting requirements.

g. Discussion of the methods by which construction operations shall proceed, addressing, without limitation, the following:

(1) Timing of and manner in which activities shall be sequenced;

(2) Preparation of the Site including security, utilities, decontamination facilities, construction trailers, and equipment storage;

(3) Coordination of construction activities;

(4) Site maintenance during the RA;

(5) Coordination with local authorities regarding contingency planning and potential traffic obstruction; and

(6) Entry and access to the Site during the construction period(s) and periods of inactivity, including provisions for decontamination, erosion control, and dust control.

h. Discussion of construction quality control, including:

(1) Methods of performing the quality control inspections,

including when inspections should be made and what to look for;

(2) Control testing procedures for each specific test. This includes information which authenticates that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used comply with applicable standards;

(3) Procedures for scheduling and managing submittals, including those of subcontractors, off-Site fabricators, suppliers, and purchasing agents; and

(4) Reporting procedures including frequency of reports and report formats.

3. A Quality Assurance/Quality Control Project Plan (QAPjP) consistent with EPA *Requirements for Quality Assurance Project Plans for Environmental Data Operations*, (EPA QA/R-5, October 1998) (**see Section VI.A., above,** for these requirements).

4. An updated HSCP for the Remedial Construction phase of the Work (**see Section VI.B., above,** for these requirements). The HSCP shall address health and safety measures to be implemented and observed by construction personnel, as well as recommended health and safety measures for the adjacent community and general public, together with a description of the program for informing the community of these recommendations. The HSCP shall include the name of the person responsible in the event of an emergency situation, as well as the necessary procedures that must be taken in the event of an emergency, as outlined in the Consent Judgment.

B. Approval of Remedial Action Work Plan

EPA will either approve the RAWP for a given Remedial Work Element or require modification of it in accordance with the procedures set forth in the Consent Judgment.

C. Performance of Remedial Construction

1. Upon the EPA's written approval of the RAWP for a given Remedial Work Element, Settling Work Defendants shall initiate the remedial construction in accordance with the RAWP and the approved Final Design Report for the given Remedial Work Element, which includes the approved remedial

construction schedule.

2. During performance of the remedial construction, Settling Work Defendants may identify and request EPA approval for field changes to the approved RAWP for a given Remedial Work Element, Final Design Report and construction schedule, as necessary, to complete the work. EPA will either approve, disapprove, or require modification of any requests for field changes in accordance with the procedures set forth in the Consent Judgment.

D. Operation and Maintenance Manual (O&M Manual)

1. No later than **forty-five (45) days** prior to the scheduled completion date of the remedial construction phase of Remedial Work Element III, Settling Work Defendants shall submit to EPA an O&M Manual. The O&M Manual shall conform to EPA guidelines for operation and maintenance manuals contained in *Considerations for Preparation of Operation and Maintenance Manuals*, EPA 68-01-0341, and any updates thereto.

2. The O&M Manual shall include, at a minimum, the following:

   a. An amended QAPjP consistent with **Section VI.A., above.**

   b. An HSCP for RA activities consistent with **Section VI.B., above.**

   c. A discussion of potential operating problems and remedies for such problems.

   d. A discussion of alternative procedures in the event of system failure.

   e. A schedule for equipment replacement.

   f. An RA schedule that identifies the frequency of RA activities and the timing of those activities.

3. EPA will either approve the O&M Manual or require modification of it, in accordance with the procedures set forth in the Consent Judgment.

4. Proposed modifications to the approved O&M Manual may be submitted to EPA for consideration upon completion of construction or thereafter if Settling Work Defendants can demonstrate that such modifications would enhance and/or maintain the environmental monitoring programs.

5. EPA will either approve, disapprove, or require modifications of the request

for modification of the O&M Manual in accordance with the procedures set forth in the Consent Judgment.

XI. PRE-FINAL INSPECTIONS, REMEDIAL ACTION REPORTS, NOTICE OF CONSTRUCTION COMPLETION

A. At least **fourteen (14) days** prior to the completion of construction of Remedial Work Elements I, II, III, and IV, Settling Work Defendants and their contractor(s) shall be available to accompany EPA personnel and/or their representatives on a pre-final inspection for each Remedial Work Element. Each pre-final inspection shall consist of a walkover of the Site to determine the completeness of the construction of each Remedial Work Element and its consistency with the RD Reports, the Consent Judgment, the ROD and applicable Federal and State laws, rules, and regulations.

B. Following each pre-final inspection, EPA will either specify the necessary corrective measures to the construction phase of the Remedial Action, as appropriate, or determine that construction is complete. If EPA requires corrective measures to any of the Remedial Work Elements, Settling Work Defendants shall undertake the corrective measures according to a schedule approved by EPA. Within **fourteen (14) days** after completion of the construction of the corrective measures, Settling Work Defendants and their contractor(s) shall be available to accompany EPA personnel or their representatives on a final inspection. Said inspection will be followed by further directions and/or notifications by EPA as provided above in this paragraph.

C. Settling Work Defendants shall submit a Draft Remedial Action Report for Remedial Work Elements I, II, and IV, and a Draft Interim Remedial Action Report for Remedial Work Element III within **thirty (30) days** of EPA's determination that construction of the Remedial Work Element is complete as set forth in **Subsection XI.B., above.** These reports shall include the following sections:

1. Introduction

   a. Include a brief description of the location, size, environmental setting, and operational history of the Site.

   b. Describe the operations and waste management practices that contributed to contamination of the Site.

   c. Describe the regulatory and enforcement history of the Site.

   d. Describe the major findings and results of Site investigation

activities.

e. Describe prior removal and remedial activities at the Site.

2. Background

a. Summarize requirements specified in the ROD. Include information on the cleanup goals, institutional controls, monitoring requirements, operation and maintenance requirements, and other parameters applicable to the design, construction, operation, and performance of the RA.

b. Provide additional information regarding the basis for determining the cleanup goals, including planned future land use.

c. Summarize the RD, including any significant regulatory or technical considerations or events occurring during the preparation of the RD.

d. Identify and briefly discuss any ROD amendments or explanation of significant differences.

3. Construction Activities

a. Provide a step-by-step summary description of the activities undertaken to construct and implement the RA (*e.g.*, mobilization and Site preparatory work; construction of the treatment system; associated Site work, such as fencing and surface water collection and control; system operation and monitoring; and sampling activities).

b. Refer the reader to the Appendices for characteristics, Site conditions, and operating parameters for the system.

4. Chronology of Events

a. Provide a tabular summary that lists the major events for the Remedial Work Element, and associated dates of those events, starting with ROD signature.

b. Include significant milestones and dates, such as, remedial design submittal and approval; ROD amendments; mobilization and construction of the remedy; significant operational events such as treatment system, application start-up, monitoring and sampling events, system modifications, operational down time, variances or

noncompliance situations, and final shutdown or cessation of operations; final sampling and confirmation-of-performance results; required inspections; demobilization; and completion or startup of post-construction operation & maintenance activities.

c. For Remedial Work Element III, indicate when cleanup goals are projected to be achieved for the groundwater restoration.

5. Performance Standards and Construction Quality Control

a. Describe the overall performance of the technology in terms of comparison to cleanup goals.

b. For treatment remedies, identify the quantity of material treated, the strategy used for collecting and analyzing samples, and the overall results from the sampling and analysis effort.

c. Provide an explanation of the approved construction quality assurance and construction quality control requirements or cite the appropriate reference for this material. Explain any substantial problems or deviations.

d. Provide an assessment of the performance data quality, including the overall quality of the analytical data, with a brief discussion of QA/QC procedures followed, use of a QAPjP, comparison of analytical data with data quality objectives.

6. Final Inspection and Certifications

a. Report the results of the various RA contract inspections, and identify noted deficiencies.

b. Briefly describe adherence to health and safety requirements while implementing the RA. Explain any substantial problems or deviations.

c. For Remedial Work Elements I, II, and III, summarize details of the institutional controls (*e.g.*, the type of institutional control, who will maintain the control, who will enforce the control).

d. Describe results of pre-certification inspection.

e. This section shall include a certification statement, signed by a

responsible corporate official of one or more of the Settling Work Defendants or by the Settling Work Defendants' Project Coordinator, which states the following:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

7. Continued Operation and Maintenance Activities

   a. For Remedial Work Element III, describe the general activities for post-construction operation and maintenance activities, such as monitoring, Site maintenance, and closure activities.

   b. Identify potential problems or concerns with such activities.

   c. For Remedial Work Element III, describe the future groundwater restoration activities to meet cleanup goals.

8. Summary of Project Costs

   a. Provide the actual final costs for the project. If actual costs are not available, provide estimated costs.

   b. Provide the costs previously estimated in the ROD for the selected remedy, including, as applicable, RA capital costs, RA operating costs, and number of years of operation. Adjust the estimates to the same dollar basis year as the actual project costs, and provide the index used.

   c. Compare actual RA costs to the adjusted ROD estimates. If outside range of -30 to +50 percent, explain the reasons for differences.

   d. For treatment remedies, calculate unit costs based on the sum of the actual RA capital and RA operating costs divided by the quantity of material treated.

   e. Refer the reader to the Appendix for a detailed breakdown of costs.

9. Observations and Lessons Learned

a. Provide Site-specific observations and lessons learned from the project, highlighting successes and problems encountered and how they were resolved.

10. Contact Information

a. Provide contact information (names, addresses, phone numbers, and contract/reference data) for the major design and remediation contractors, as applicable.

11. Appendices: Cost and Performance Summary

a. The specific parameters for documenting cost and performance information are presented in the *Guide to Documenting and Managing Cost and Performance Information for Remediation Projects*, EPA 542-B-98-007.

b. Identify the matrix characteristics and Site conditions that most affected the cost and performance, the corresponding values measured for each characteristic or condition, and the procedures used for measuring those characteristics or conditions. For Remedial Work Elements I, II, and IV, these items include the soil/sediment type and particle size distribution, environmental setting, media properties, and quantity of soils and sediments excavated for off-Site treatment/disposal.

c. Identify the operating parameters specified by the remediation contractor that most affected the cost and performance, the corresponding values measured for each parameter, and the procedures used for measuring those parameters. For Remedial Work Element III, these items include system throughput, pumping rate, flow rate, mixing rates, residence time, operating pressure and temperature, moisture content, and pH.

d. Provide a detailed breakout of the actual RA capital costs and estimated RA operating costs (e.g., costs to operate and maintain the water treatment process).

e. Provide supplemental information in appendices to the RA Report. These could include a map of the Site and operable unit, a schematic of the treatment system, supplemental performance information, and a list of references.

D. EPA will either approve the Draft Remedial Action Reports for Remedial Work Elements I, II, and IV, and the Draft Interim Remedial Action Report for Remedial Work Element III, thus making them the Final Remedial Action Report for Remedial Work Elements I, II, and IV, and the Final Interim Remedial Action Report for Remedial Work Element III; require modifications of them; and/or require corrective measures to fully and properly implement the Remedial Action(s), in accordance with **Subsection XI.B., above.**

XII. PERFORMANCE OF CONTINUED OPERATION OF THE RA

A. Upon EPA's approval of the Interim Remedial Action Report for Remedial Work Element III in accordance with **Subsection XI.D., above,** Settling Work Defendants shall continue remedial action and monitoring activities in accordance with the approved O&M Manual.

B. Notice of Completion and Final Remedial Action Report for Remedial Work Element III

1. Within **thirty (30) days** of the date that Settling Work Defendants conclude that they have met the Performance Standards as specified in the ROD and this SOW for the third consecutive year (or a shorter period if approved by EPA in its sole discretion), or, if Alternative Remedial Strategies are authorized by EPA, within **thirty (30) days** of completion of those strategies, Settling Work Defendants shall submit to EPA a Notice of Completion and a Final Remedial Action Report.

2. EPA will determine whether the RA (including any Alternative Remedial Strategies) has been completed in accordance with the standards, specifications and reports required by the Consent Judgment. If EPA determines that they have not been so completed, EPA will notify Settling Work Defendants in writing of those tasks which must be performed to complete the RA (including any Alternative Remedial Strategies). Settling Work Defendants shall then implement the specified activities and tasks in accordance with the specifications and schedules established by EPA and shall then submit a further report on the specified activities and tasks and certification signed by a licensed professional engineer, within **thirty (30) days** after completion of the specified activities and tasks. Any modifications to the Final Report for the RA required by EPA shall be in accordance with the procedures set forth in the Consent Judgment.

3. Upon EPA's certification of completion of the RA (including any Alternative Remedial Strategies), Settling Work Defendants shall perform

post-remediation monitoring in accordance with the Post-Remediation Monitoring Plan, as set forth in **Section XIII., below.**

C. Goal for Aquifer Restoration

1. As set forth in the ROD, the Performance Standards for aquifer restoration at the Site are the federal and state MCLs for various chemicals detected in the Site groundwater. Settling Work Defendants shall continue the remedial action related to the groundwater remediation system until the Performance Standards have not been exceeded for a period of three (3) consecutive years, or a shorter period if approved by EPA in its sole discretion.

2. Settling Work Defendants may petition EPA in writing for authorization to amend the groundwater O&M Manual if, based on the results of groundwater monitoring, Settling Work Defendants believe that some or all of the Performance Standards specified in the ROD will not be reached in the time period projected in the approved O&M Manual. Settling Work Defendants shall not submit such a petition until they have performed O&M of the groundwater remediation system for at least three (3) years from the date of EPA's approval of the Interim Remedial Action Report for Remedial Work Element III, as set forth in **Section XI.D., above,** or a shorter period if approved by EPA in its sole discretion.

3. Settling Work Defendants' petition for authorization to amend the groundwater O&M Manual shall include, at a minimum, the following information, as well as any other information and analyses EPA requests prior to or following submission of the petition:

   a. a list identifying each Performance Standard that has not been met;

   b. a description of any changes in the conceptual model for Site contamination since issuance of the ROD, including geological, hydrogeologic, and geochemical characterizations;

   c. comprehensive groundwater monitoring data relevant to the groundwater remedy implemented;

   d. an analysis of the performance of the groundwater remedy which describes the spatial and temporal trends in groundwater contaminant concentrations within the groundwater plume (*e.g.*, whether contaminant migration has been effectively prevented (as well as any reduction or changes in the overall size or location of the groundwater plume), or stabilized (or very slow decreases in contaminant

concentrations));

e. a description of any proposed contingency measures; and

f. a predictive analysis of the approximate time frame required to achieve the Performance Standards with both the existing groundwater remediation systems and that to be implemented with any proposed contingency measures using methods appropriate for the data and Site-specific conditions. Such analysis shall also address the uncertainty, if any, inherent in these predictions.

The petition shall not be deemed complete until all information and analyses required and/or requested by EPA are submitted by the Settling Work Defendants.

D. If, based on the results of groundwater monitoring, EPA believes that one or more of the Performance Standards specified in the ROD will not be reached in the time period projected in the approved O&M Manual and if Settling Work Defendants have not petitioned EPA in writing for authorization to amend the O&M Manual, EPA may require Settling Work Defendants to implement contingency measures and to submit a Contingency Measures Plan **(see Subsection XII.E., below)**.

E. A Contingency Measures Plan shall be submitted to EPA by Settling Work Defendants within **sixty (60) days** of receipt of EPA's written determination that contingency measures are appropriate. The Contingency Measures Plan shall:

1. address design, construction, and O&M of the Contingency Measures, as appropriate;

2. include an amended QAP_jP and HSCP for O&M activities, as appropriate; and

3. include a schedule for the implementation of the Contingency Measures.

F. EPA will either approve the Contingency Measures Plan or disapprove and/or require modification of such plan, in accordance with the procedures set forth in the Consent Judgment.

G. Settling Work Defendants shall commence with the implementation of the Contingency Measures Plan within **thirty (30) days** of receipt of EPA's written approval of the Contingency Measures Plan.

H. No action taken by EPA pursuant to this Section of the SOW, including EPA's

decision on Settling Work Defendants' petition(s), shall be subject to dispute resolution under Section XIX (Dispute Resolution) of the Consent Judgment nor shall it be subject to judicial review.

XIII. POST REMEDIATION MONITORING PLAN

A. Within **sixty (60) days** of the date on which all designated groundwater monitoring points have recorded readings less than or equal to the Performance Standards specified in the ROD and this SOW for the third consecutive year (or a shorter period if approved by EPA in its sole discretion), or within **sixty (60) days** of the date that EPA determines, in its sole discretion, that one or more ARAR waivers are granted and all other groundwater ARARs have been met and/or waived, Settling Work Defendants shall submit to EPA a Post-Remediation Monitoring ("PRM") Plan.

B. The PRM Plan shall include, at a minimum, the following:

1. A QAP_jP for PRM activities consistent with **Section VI.A., above;**

2. An HSCP for PRM activities;

3. A description of work to be performed under PRM activities; and

4. A PRM schedule that identifies the frequency of monitoring and when these activities will commence.

C. EPA will either approve the PRM Plan, or require modification of it, in accordance with the procedures set forth in the Consent Judgment.

XIV. POST-REMEDIATION MONITORING

A. Upon EPA's approval of the PRM Plan, Settling Work Defendants shall commence with the PRM program for a period of three (3) years, in accordance with the PRM Plan, which includes the PRM schedule.

B. If groundwater contaminant concentrations increase above the Performance Standards (as specified in the ROD and this SOW), or contaminant concentrations increase above the alternative Performance Standards as set forth in **Section XIII., above,** during post-remediation monitoring, EPA will evaluate the need for and may require Settling Work Defendants to reinstate the remediation system.

C. Notice of Completion and Final Report for Post-Remediation Monitoring

1. Within **five (5) days** of the completion of post-remediation monitoring, Settling Work Defendants shall submit to EPA a Notice of Completion for Post-Remediation Monitoring. The Notice of Completion for Post-Remediation Monitoring shall be signed by a licensed professional engineer meeting all requirements of applicable Federal, State, and local laws, and shall certify that the PRM activities have been completed in full satisfaction of the requirements of the Consent Judgment, this SOW, and all plans, specifications, schedules, reports and other items developed hereunder.

2. Within **sixty (60) days** of the completion of post-remediation monitoring, Settling Work Defendants shall submit to EPA a Final Report for Post-Remediation Monitoring. The Final Report for Post-Remediation Monitoring shall summarize the Work performed under the PRM Plan and the data so generated. Deliverables under the Final Report for Post-Remediation Monitoring shall be signed by a licensed professional engineer meeting all requirements of applicable Federal, State, and local laws, and shall certify that the PRM activities and report deliverables have been completed in full satisfaction of the requirements of the Consent Judgment, this SOW, and all plans, specifications, schedules, reports and other items developed hereunder. Any modifications to the Final Report for Post-Remediation Monitoring required by EPA shall be in accordance with the procedures set forth in the Consent Judgment.

3. EPA will determine whether the PRM activities or any portions(s) thereof have been completed in accordance with the standards, specifications, and reports required by the Consent Judgment. If EPA determines that PRM activities have not been so completed, EPA will notify Settling Work Defendants in writing of those tasks which must be performed to complete the post-remediation monitoring. Settling Work Defendants shall then implement the specified activities and tasks in accordance with the specifications and schedules established by EPA and shall then submit a further report on the specified activities and tasks, certified by a licensed professional engineer meeting all requirements of applicable Federal, State, and local laws, within **thirty (30) days** after completion of the specified activities and tasks. EPA will notify Settling Work Defendants in writing when PRM activities have been completed in accordance with the requirements of the Consent Judgment.

XIV. INSTITUTIONAL CONTROLS

Institutional Controls shall be required to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses, and to prohibit the installation and use of

groundwater wells at the Site for human consumption of the well water or any other purpose which would or could result in human contact with groundwater until groundwater cleanup standards are achieved.. Settling Work Defendants shall secure Institutional Controls in accordance with the procedures set forth in the Consent Judgment. The restrictions pertaining to future Site use (i.e., commercial/industrial or, where applicable, recreational uses) shall be maintained indefinitely whereas the restrictions pertaining to the installation and use of groundwater wells at the Site shall be maintained until EPA notifies Settling Work Defendants that EPA has determined, after a reasonable opportunity for review and comment by the State, that the restrictions may be lifted from the Site, or a portion of the Site, without posing a threat to human health and the environment.

XVI. CERTIFICATION OF COMPLETION OF THE WORK

Within **ninety (90) days** after Settling Work Defendants conclude that all phases of the Work required by the Consent Judgment have been fully performed, Settling Work Defendants shall schedule and conduct a pre-certification inspection to be attended by Settling Work Defendants and EPA. If, after the pre-certification inspection, Settling Work Defendants still believes that the Work has been fully performed, Settling Work Defendants shall submit a written report by a New York State licensed professional engineer stating that the Work has been completed in full satisfaction of the requirements of the Consent Judgment. If, after review of the written report, EPA, after reasonable opportunity for review and comment by the State, determines that any portion of the Work has not been completed in accordance with the Consent Judgment, EPA will notify Settling Work Defendants in writing of the activities that must be undertaken by Settling Work Defendants pursuant to the Consent Judgment to complete the Work.

If EPA concludes, based on the initial or any subsequent request for Certification of Completion by Settling Work Defendants and after a reasonable opportunity for review and comment by the State, that the Work has been performed in accordance with the Consent Judgment, EPA will so notify Settling Work Defendants in writing.