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REMEDIAL ACTION WORK PLAN

Prepared For:

BASF CORPORATION
RENSSELAER, NEW YORK

Submitted By:

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ACRONYMS

AMSL	above mean sea level
AWQS	Ambient Water Quality Standard
BASF	BASF Corporation
BEDCO	Besicorp-Empire Development Company, LLC
COC	Constituent of Concern
COPC	Constituent of Potential Concern
CSX	CSX Transportation
Dunn	Dunn Geoscience
ENSR	ENSR Corporation
Earth Tech	Earth Tech, Inc.
GAF	GAF Corporation
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operation and Emergency Response
IRM	Interim Remedial Measure
μg/L	micrograms per liter
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PEM	Palustrine Emergent
PEM/PSS	Palustrine Emergent/Palustrine Scrub Shrub
PEM/OW	Palustrine Emergent/Open Water
PPE	personal protective equipment
ppm	parts per million
RA	Remedial Action
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation Recovery Act

Roux	Roux Associates, Inc.
RSCO	Recommended Site Cleanup Objectives
SVOC	Semi volatile Organic Compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Potential
TOGS	Technical and Operational Guidance Series
URS	URS Consultants, Inc.
USDA	United States Department of Agriculture
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) addresses environmental conditions at the BASF Corporation (BASF) South 40 parcel, a 34-acre parcel located in the City of Rensselaer (Site). The remedial approach is based on a cooperative effort between Besicorp-Empire Development Company, LLC (BEDCO) and BASF, and is based on the following concepts:

- Remediation is consistent with the proposed future use of the BASF South 40 property;
- Site development becomes a possible integral part of the remedial solution; and
- Site development dictates a specific timeframe for remediation of the BASF South 40 property.

BEDCO's plans to develop a nominal 505-MW combined-cycle cogeneration power plant on the South 40 parcel. The cogeneration plant would supply steam and electricity to a proposed recycled newsprint manufacturing plant and produce electricity for sale into the wholesale market. The conceptual Site layout is shown on Figure 1-1.

1.1 Overview of the Remedial Action Work Plan

This RAWP specifies the remedial activities and procedures for achieving the remedial action objectives at the Site. The RAWP has been prepared in accordance with the Voluntary Cleanup Agreement (VCA) Index No. A4-0446-0105, dated November 27, 2001.

The Remediation will consist of the following tasks:

- Preparation of pre-mobilization submittals;
- Installation of soil erosion control measures;
- Clearing and grubbing of excavation area;
- Preparation of a laydown and storage area for drums and soils;
- Excavation of previously identified anomaly areas for removal of drums, drum carcasses, debris and visibly stained soils;
- Excavation of hot spot soil locations;
- Staging and containerization of excavated soil and debris for proper waste characterization;
- Collection and analysis of post-excavation samples;

- If necessary, additional excavation of areas exceeding cleanup levels;
- Backfilling of all excavated areas with clean fill; and
- Within twenty-four (24) months of completion of the remedial excavation, either the placement of a minimum of one (1) foot of clean cover with a demarcation layer, or the commencement of the construction of BEDCO's proposed cogeneration facility (Figure 1-1) over all areas identified at the Site with arsenic concentrations in excess of NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs).

In addition to these remedial actions, institutional controls will be implemented to protect human health and the environment by eliminating potential exposure pathways between remaining site contaminants and environmental receptors. The institutional controls will apply to all portions of the site including those not covered by the 1 foot of clean soil with demarcation layer. The institutional controls, which will be established through a deed restriction, will consist of:

- Site Use Restriction. The owner of the site will prohibit it from being used for purposes other than for industrial use and the services associated with such use.
- Soil Management Plan (SMP). A SMP will set forth procedures to be followed by site owners, their agents or any future party for activity involving excavation, the management and disposal of excavated material, or the use of imported soil/fill for purposes such as backfill, grading or landscaping. An action-specific SMP will be required for all future excavation activities.
- Groundwater Use Restriction. The use of groundwater underlying the site will be prohibited without treatment rendering it safe for drinking water or industrial purposes.
- Groundwater Monitoring. The site owner will monitor groundwater quality at down gradient locations at the site perimeter until data indicate that groundwater standards have been achieved. This will be conducted annually for a minimum of 5 years and will be terminated once all samples have met NYSDEC groundwater standards for two consecutive years.
- Site Access Restriction. Access to the site will be restricted by a fence surrounding the site.

The site owner will certify annually that the institutional controls are in place, identify any activities undertaken pursuant to the SMP during the past year, and identify anticipated forthcoming activities that may require implementation of the SMP.

Certain soil remaining in the South 40 after completion of the site remedy may be relocated and reused on-site as backfill during future construction activities. These soils will be managed in accordance with the SMP (Appendix A). Prior to conducting excavation activities, an activity-specific SMP will be submitted to the NYSDEC for approval. The activity-specific SMP will be considered an engineering control, and will therefore include an appropriate engineering analysis. The currently accepted level of engineering analysis is detailed in the DEC's Draft Voluntary Cleanup Program Guide, dated May 2002, Section 7.4 Remedial Action Selection Report (or as amended).

During future site development, excavated soils will only be placed in areas around the site that are not in contact with standing water and above historic groundwater elevations. The existing soils will also be covered with clean imported fill or structures. Previous investigations have shown that concentrations of arsenic are significantly lower outside the drum anomaly area with the exception of four hot spot locations.

Together, the Site remedy and institutional controls will:

- Remove all known Hazardous Waste on the Site
- Eliminate contact with arsenic contaminated soils by on-site workers and the public;
- Eliminate airborne contaminant migration;
- Restrict leaching of contaminants into groundwater; and
- Eliminate exposure to potentially contaminated groundwater.

1.2 Work Plan Organization

This RAWP has been organized into the following sections:

Section 1.0 – Introduction - Presents the purpose and objectives of the RAWP; background information; and project responsibilities.

Section 2.0 - Site Background – Site location, Site description, Site history, Status of Enforcement Actions.

Section 3.0 - Historical Investigations – Administrative Record, Summary of Historical Investigations of the Site, and Hydrogeology.

Section 4.0 - Remedial Action Objectives

Section 5.0 - Engineering Evaluation of the Remedy

Section 6.0 - Institutional Controls

Section 7.0 - Scope of Work – Presents a detailed description of the work tasks associated with implementing the RAWP.

Section 8.0 - Project Plans and Specifications

Section 9.0 - Quality Assurance/Quality Control Activities – Description of QA/QC to be implemented during the RAWP.

Section 10.0 - Schedule – Presents a preliminary schedule for implementing the RAWP.

Section 11.0 – Remediation Summary Report – Narrative and photo-description of project.

Section 12.0 – Project Organization

Section 13.0 – References

Appendix A – Soil Management Plan – A generic plan to guide the development of future activity-specific soil management plans.

Appendix B – Health and Safety Plan

Appendix C – Quality Assurance/Quality Control Plan

Appendix D – Project Plans and Specifications

Appendix E – Community Air Monitoring Plan

1.3 Project Responsibilities

This section identifies the minimum responsibilities of the Engineer, the Contractor, and BASF.

1.3.1 Engineer's Role

Provide the following services during the implementation of the RAWP in accordance with NYSDEC protocols:

- Delineate the limits of the areas at the Site where soil and drum removal activities (i.e., previously identified anomaly areas) will occur;
- Provide full-time, on-site oversight services for the duration of the project to ensure that the remediation is conducted in general accordance with this RAWP;
- Conduct real-time air monitoring (Worker Health and Safety) at the Site and at the downwind perimeter of the drum removal locations and soil excavation locations;
- Collect post-excavation soil samples from the excavation sidewalls and bottom for laboratory analysis;
- Collect waste characterization samples of soil (prior to off-site disposal) for laboratory analysis;
- Document daily activities; quantity of drums, soil removed; and labor hours and equipment used; and

- Provide a Summary Report of the Remedial Action at the completion of the work.

1.3.2 Contractor's Role

The Contractor shall, in general, be responsible for the following:

- Provide all labor, equipment, and materials necessary to implement the RAWP. The Contractor shall ensure that all on-site personnel have Occupational Safety and Health Administration (OSHA) 40-hour HAZWOPER training (in accordance with 29 CFR 1910.120 and corresponding 8-hour refresher updates). The Contractor shall provide evidence of 40-hour training and 8-hour refresher updates (i.e., certificates of training completion), for on-site personnel.
- Implement the remediation in accordance with the RAWP;
- Characterize the waste streams generated during the remediation from analytical provided by Engineer;
- Complete the remediation in a timely fashion, as outlined in Section 10.0;
- Coordinate with Engineer as necessary to complete required work activities; and
- Perform all site work in accordance with Site rules, OSHA regulations, and the existing Site-specific HASP.

1.3.3 BASF's Role

BASF will be responsible for the following:

- Provide timely review and approval of Operations Plan and any deliverables from the Contractor;
- Delineate areas at the Site where activities will and will not be permitted;
- Coordinate with the Engineer regarding the Site layout and location of staging areas; and
- Review and approve the Remedial Action Summary Report.

2.0 SITE BACKGROUND

2.1 Site Location

The Site is located in a heavy industrial zoned area of the City of Rensselaer, New York (Figure 2-1). The Site is located to the south of the former BASF Main Plant manufacturing facility property (Main Plant site) and the Closed Capped Landfill (Figure 2-2). According to various sources, properties along Riverside Avenue in Rensselaer have been characterized by chemical industrial activity for over 100 years. The effect of regional industrial operations on soil and groundwater quality is well documented by regulatory agencies. It is possible that much of the soil in the waterfront area is composed of fill materials. It is alleged that Hudson River dredged materials were deposited at the Site. The historic use of the Hudson River could result in metals and natural organic contents in the historic fills above the background levels of natural in-situ soils (Roux, 2001).

2.2 Site Description

The South 40 parcel consists of approximately 34 acres (Figure 2-3). The parcel was bisected into two areas by the construction of the Port of Rensselaer Access Highway in 1992. The northern portion of the parcel is 25.3 acres in size and lies to the north of the Port of Rensselaer Access Highway. The 8.8-acre portion of the parcel located to the south of the Port of Rensselaer Access Highway is isolated from the remainder of the parcel and has not been historically impacted by disposal activities. As such, this portion of the parcel is not subject to remediation.

A CSX Transportation (CSX) rail spur physically separates the Site from the former Main Plant and Capped Landfill properties. The Site is bounded on the west by Riverside Avenue and across the street by the Port of Rensselaer property, which includes the Coastal cogeneration power plant, a metal scrap recycling facility, and the Hudson River beyond. Located east of the Site is the Port of Rensselaer Access Highway and CSX railroad tracks, with residential and commercial properties beyond. Undeveloped land and several tank farms are located to the south. The site is serviced by the City of Rensselaer for water and sewer.

2.3 Site History

The Site is located in an area that has been heavily industrialized by chemical and other manufacturing facilities since the 1870's. The Main Plant site has been used since the 1880s for the manufacturing of dyestuffs, including coal-tar dyestuffs. BASF acquired the Site when it purchased the entire manufacturing facility from GAF Corporation (GAF) on April 1, 1978. Following the acquisition of the facility by BASF, the NYSDEC alleged that GAF disposed of an unknown quantity of industrial wastes/solvents on the Site. It is also alleged that dredge spoil from the Hudson River had been deposited here, although no records have been located to confirm this allegation. A 1950s-era photograph of the Site shows that a staging area and Site entry road were being used at the time. No filling is known to have occurred in recent years. BASF contacted GAF for information about the alleged waste disposal at the Site; however, GAF could not confirm or deny the allegation. Based upon this lack of information, the NYSDEC requested that BASF perform a Phase II Site Investigation under Order on Consent Index Number 04-0326-85-07, which was completed in 1992 (Roux, 2001).

2.4 Status of Enforcement Actions

The Site is currently listed by the NYSDEC as inactive hazardous waste site (number 442022) and is currently ranked as a Class 3 site. When first placed on the NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites, the Site was listed as a Class 2A site, and was previously subject to a 1986 Order on Consent (04-0326-85-07) with BASF by the NYSDEC for the conduct of environmental investigations. As a result of the investigations conducted in the late 1980's and early 1990's (see Section 2.0), the Site was downgraded to Class 3 status (Roux, 2001). A Class 3 site "does not present a significant threat to the public health or the environment". As stated in Robert Marino's letter (NYSDEC, letter of February 24 1994), the Site classification was changed from Class 2A to Class 3. According to the letter, the classification change was made "Based on previously existing information and data collected during the supplemental investigation, it has been concluded that although hazardous waste disposal has been documented, no significant threat exists since the site is fenced and access is restricted".

Subsequent investigations did not uncover any new conditions that could create a threat to human health or the environment and thereby change the site's current Class 3 ranking.

3.0 HISTORICAL INVESTIGATIONS

3.1 Administrative Record

There have been five previous subsurface investigations conducted at the Site, as described in the following reports:

- Phase II Investigation Report, URS Consultants (URS), 1988;
- Supplemental Site Investigation Report, Dunn Geoscience, Inc. (Dunn), 1990;
- Supplemental Site Investigation Report, Dunn, 1992;
- Site Investigation Report, Roux Associates, Inc. (Roux), 2001; and
- Supplemental Investigation Report, Earth Tech, Inc., 2002.

The Phase II Investigation Report (URS, 1988) and the two Supplemental Site Investigation Reports (Dunn, 1990; Dunn, 1992) were provided to the NYSDEC as appendices to the Voluntary Cleanup Program (VCP) Application (BASF, 2001). The Site Investigation Report (Roux, 2001) was provided to the NYSDEC under separate cover in May 2001.

3.2 Summary of Historical Investigations

Description of previous investigations conducted at the Site and the investigation conclusions are provided below. Figure 3-1 provides historic soil sample results of the South 40.

3.2.1 Phase II Investigation (URS, 1988)

In December 1986, URS performed a Phase II Site Investigation of the Site (URS, 1988). The investigation was designed to determine the nature and extent of any potential hazardous substances and develop an understanding of the Site's geologic, hydrogeologic, and topographic features. The investigation included site reconnaissance, a historical records review, a geophysical survey, surface water sampling, the installation of 15 piezometers and six monitoring wells, and drilling of three soil borings. A summary of the key findings is presented below.

- Significant magnetic anomalies were observed in the central and southwest portion of the parcel, where drums or construction debris were exposed at the surface.
- Arsenic and other metals were detected in soil samples. The maximum observed concentration of arsenic detected was 7.8 parts per million (ppm). URS concluded that the metals

concentrations were within the range expected for eastern United States or New York State (NYS) background.

- Dissolved metals detected in surface water from ponded areas were at concentrations below NYS standards for surface drinking water supplies.

- Mercury was the only metal detected in sediment samples collected from two ponded areas located onsite that exceeded the range for eastern United States background.

- 1,2-Dichloroethane was detected in groundwater at concentrations up to 170 micrograms per liter (μg/L).

- Phenols were detected in groundwater and surface water at concentrations above NYS standards.

3.2.2 Supplemental Site Investigations (Dunn, 1990, 1992)

In 1990, Dunn performed a Supplemental Site Investigation of the Site (Dunn, 1990). The scope of work included a magnetometer survey, a soil gas survey, surface water sampling, sediment sampling, excavation of test pits and trenches in areas exhibiting magnetic anomalies, and, a groundwater-sampling summary of the key findings is presented below.

- Based on the magnetometer survey, Dunn estimated that 100 to 200 drums were buried onsite. Drums visible at the surface or partially buried appeared empty and deteriorated.

- A review of the soil gas survey results indicated trace levels of volatile organic compounds (VOCs), specifically toluene and total xylenes, in four of 23 samples.

- A thin layer of blue and purple-stained soils was observed near the surface in test pits from a central area of the parcel that exhibited a high magnetic anomaly. Arsenic was detected in the stained soil at a concentration up to 13,200 ppm. Zinc was detected in the stained soil at concentrations up to 3,330 ppm.

- Of the magnetic anomalies investigated by URS and Dunn, drums were only found in the main anomaly at the center of the Site.

- 1,2-Dichloroethane was detected in groundwater from one monitoring well (BW-6) at a concentration of 120 μg/L. Arsenic and mercury were detected in one monitoring well (BW-4) at concentrations that exceeded the NYSDEC water quality standards. Phenols were also detected in groundwater at concentrations above NYSDEC water quality standards.

In 1991, Dunn performed additional Supplemental Site Investigation activities for the Site (Dunn, 1992). The scope of work included additional soil sampling in the central portion of the Site. The results of this investigation were combined with the results of the 1990 Supplemental Site Investigation. A summary of the key findings is presented below.

- Dunn revised its estimate of the number of buried drums to between 50 and 100, based on a re-analysis of the magnetometer survey data, prompted by additional soil sampling.
- Along the northern Site property line, groundwater flow is influenced by permeable bedding material associated with buried utilities. Contamination migrating from the capped landfill to the north is not expected to migrate beyond the small area that has historically been impacted by the landfill (BW-6 area).
- Arsenic was detected in an additional 20 soil sample locations in the central portion of the Site at concentrations that exceeded NYSDEC soil quality standards. Soil sample results indicated that the arsenic-impacted soil was confined to the upper four feet of soil within the central portion of the parcel.

3.2.3 Site Investigation (Roux, 2001)

In 2000, Roux performed an additional Site Investigation of the Site (Roux, 2001). The investigation was designed to determine background concentrations of metals in site soils, further characterize soil quality on the Site, and further characterize groundwater quality in the saturated fill beneath the Site. The investigation included completion of 25 soil borings and collection of 30 groundwater samples. A summary of the key findings is presented below.

- Fifteen of 24 Target Analyte List (TAL) metals were detected in soil beneath the Site at concentrations above either background or NYSDEC RSCOs. Of these, only arsenic, chromium, lead, and zinc were considered Constituents of Potential Concern (COPCs). Arsenic is considered the primary metal of concern in soil based on the frequency of detection and concentrations relative to background.
- Four semi volatile organic compounds (SVOCs) were detected in soil at concentrations above NYSDEC RSCOs, including benzo(a)anthracene, benzo(a)pyrene, chrysene, and dibenzo(a,h)anthracene.
- No VOCs, pesticides, or polychlorinated biphenyls (PCBs) were detected in soils at concentrations above NYSDEC RSCOs.
- Arsenic is considered the primary constituent of concern in groundwater. However, all of the groundwater samples with elevated arsenic concentrations were from screening samples obtained using a Geoprobe™, not from permanent monitoring wells, and were very turbid. Arsenic was not detected above NYSDEC Ambient Water Quality Standards (AWQS) in any of the monitoring wells located along the perimeter of the Site.
- Two VOCs, benzene and chlorobenzene, were detected in groundwater from S40-P-12 at concentrations above NYS AWQS.
- No SVOCs, pesticides, or PCBs were detected in groundwater at concentrations above NYSDEC AWQS.

3.2.4 Supplemental Investigation (Earth Tech, 2002)

In 2002, Earth Tech performed a Supplemental Investigation to fill data gaps (See Figure 3-2) as they relate to the South 40 Mounded area, purple/blue stained soil, ash like material and groundwater in the three monitoring wells on the southern portion of the South 40. A summary of the Supplemental Investigation results are provided below:

- **Mounded Area** - mounded area consisted of collection at 42 grid nodes. These samples were analyzed for total arsenic. A total of 205 samples were collected and analyzed for total arsenic. The average concentration of these samples was 75.5 mg/kg. The concentrations of arsenic in the samples collected in the mounded area ranged from ND to 736 mg/kg. A total of 41 samples were analyzed for TCLP arsenic. A TCLP arsenic value was used to develop a site-specific total arsenic value that correlates to the TCLP critical value. The Work Plan called for grid locations with total arsenic concentrations greater than or equal to 75% of the TCLP critical value to be analyzed for TCLP arsenic. No samples analyzed achieved this 75% TCLP critical value. One location collected by ENSR during its field sampling activities in December, 2001 was analyzed and contained 1970 mg/kg. This sample was labeled as being collected from E-8 8-10' interval. Earth Tech re-sampled this location and 10 feet in four directions away from the E-8 location at the same depth. The correlation data shows that 4,120 ppm of total arsenic is required to reach 5 ppm TCLP arsenic.

- **Ash Like Material** - Ash like material locations were sampled by ENSR in March 26, 2002. In all three ash samples and the Duplicate (0326), methylene chloride, acetone and semi-volatiles were detected at concentrations below the NYSDEC RSCO values. Carbon disulfide was detected in Ash 03 below the NYSDEC RSCO value. Ash-03 contained 99 ppb of benzo(a)pyrene, which is above the NYSDEC RSCO of 61 ppb. No PCBs were detected in Ash-01, Ash-02, Ash-03 and Dup-0326. Arsenic was detected above the maximum background of 9.6 mg/kg in each sample. The results ranged from 13.4 mg/kg to 90 mg/kg. Mercury was detected above the background of 0.0456 mg/kg in each of the three sampling locations. The results ranged from 0.12 mg/kg to 0.2 mg/kg. These results exceed the NYSDEC RSCO value of 0.1 mg/kg.

- **Blue- and Purple-Stained** - One sample of stained soil was collected during test pitting activities. The soil sample was analyzed for TCL VOCs+10, TCL SVOCs with Base Neutrals (i.e., aniline compounds), TCL PCBs, TAL Inorganics (including cyanide), and TCLP metals. Due to the presence of drums and free liquid in the excavation, an additional soil and liquid sample were collected (TP-4 and TP-4L). A dark soil sample was collected (TP-4S) for analysis as a potential discolored sample. Arsenic was detected in the sample collected from TP-4 and TP-4S at a concentration of 251 mg/kg and 193 mg/kg, respectively. 2-Chloronaphthalene was detected in the soil samples from TP-4 and TP-4S at concentrations of 46,000 and 5,400,000 ug/kg respectively. Both samples contained low levels of VOCs. The concentrations of arsenic, benzene and naphthalene detected in the liquid sample exceeded NYSDEC AWQS. Arsenic was detected in the liquid sample collected from TP-4L at a concentration of 12,800 ug/l. It should be noted that the liquid sample was taken right from the excavation. The liquid sample was very turbid and was not filtered and the arsenic level is most likely associated with the suspended solids.

- **Surface Soil/Sediment Sampling** - Three surface soil/sediment samples were collected within the southern 8.8-acre parcel, south of the Port of Rensselaer Access Highway. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL PCBs, and TAL inorganics (including cyanide). No VOCs, SVOCS or PCBs were detected above NYSDEC RSCO values. Seven (7) metals were detected above NYSDEC RSCO values, but arsenic was detected below the NYSDEC RSCO value.

- **Groundwater Sampling Results** - Three groundwater samples were collected. No VOCs, PCBs, Pesticides, SVOCs or arsenic was detected in these samples. Inorganics were detected in the samples. Iron, Magnesium, Manganese, and Sodium were detected in the samples above NYSDEC AWQS.

The conclusions of this Supplemental Investigation were consistent with previous investigations performed on the South 40 parcel. Based on this and previous investigations, the drums and soils in the anomaly area appear to be the primary source area of contamination at the Site.

3.3 Hydrogeology

The Site is located in the lower Hudson sub-basin of the Hudson River basin (Phillips, 1996). Regional groundwater flow is to the west and discharges into the Hudson River.

The hydrogeologic conceptual model is comprised of three hydrogeologic units: (1) an upper layer, consisting of the saturated portion of the fill material; (2) the dense lacustrine clay that behaves as a semi-confining unit where present; and (3) a lower sand and gravel zone that overlies bedrock.

Shallow groundwater exists under unconfined conditions. Based on observations at the Main Plant site to the north, groundwater in the sand and gravel layer may exist locally under artesian conditions (potentiometric surface within the confined aquifer rises above the top of the aquifer) and rises approximately 45 feet above the sand and gravel layer on the west side of the Main Plant area to approximately 5 feet above the sand and gravel layer on the east side of the area (Dames & Moore, 1979).

In the vicinity of the Site, 16 shallow piezometers were installed in 1988 (URS, 1988) and the depth-to-water ranged from 3 to 13 feet. Groundwater measurements indicated a southwesterly flow in the southern portion of the area. In the northwestern portion there appeared to be a mounding effect, with radial flow from this mound. In the northern portion of the area, groundwater flow was to the north, in the direction of the East Greenbush sewer line. The groundwater potentiometric surface appears to be influenced by the presence of a storm sewer crossing the northern edge of the property.

No information exists for the lower sand and gravel zone at the Site. Limited information is available for the Main Plant site. Three groundwater monitoring wells were installed in 1979 on the Main Plant site that were screened across the lower permeable layer (Dames & Moore, 1979). Monitoring well MW-23 was located in the southwest corner of the Manufacturing Plant area. Monitoring well MW-5A was located on the east central side of the area, south of Building 89. Monitoring well 24-A was located near the southeast corner of the Main Plant site and boring logs indicate the absence of the clay unit. Based on measurements from these three wells, groundwater flow in the lower sand and gravel zone was southwest, toward the Hudson River.

Groundwater in the area is not regarded as suitable for potable purposes; potable water is provided by the City of Rensselaer. According to the United States Geological Services Water Information Website there are currently no private drinking water wells within one-half mile of the South 40 parcel.

3.3.1 Topography

The ground surface elevation of the Site ranges from approximately 13 feet AMSL in the south to about 27 feet AMSL in the central portion of the Site. The central elevated portion of the Site is relatively flat. Just east of the Site, parallel to its eastern perimeter, lies a 100-foot high escarpment. Most of the Site lies within the 100-year floodplain of the Hudson River (approximately 20.5 feet AMSL).

Brush and tree cover is extensive across the Site. Debris piles are visible, including broken-up asphalt, demolition debris, cinders, soot, and a dark, sand-like material. About a half-dozen partly buried drums or drum skeletons are also in evidence.

Seven wetlands (covering approximately 5.12 acres) were identified at the Site (Figure 2-3). Of the wetlands delineated, three are designated palustrine emergent (PEM), three are designated palustrine emergent/palustrine scrub-shrub (PEM/PSS), and one is designated palustrine emergent/open water (PEM/OW). These wetlands are associated with depressional areas throughout the Site, which may have been created by the excavation or placement and settling of historic fill on the Site. Some wetlands on the Site may be subject to jurisdictional regulation by the United States Army Corps of Engineers (ACOE). None of the wetlands are under the jurisdiction of the NYSDEC, which only applies jurisdiction to wetlands in excess of 12.4 acres. A wetlands jurisdictional report covering all the wetlands of the South 40 parcel has been developed and will be filed with the ACOE, and a copy will be sent to the NYSDEC.

A combination of chain-link fence and barbed wire surrounds the Site. The chain-link fence is present on the western Site boundary and along a portion of the north and south edges. Entry to the Site is made via a locked gate. A roadway extends about halfway across the Site from the gate. A 48-inch storm drain crosses the northern edge of the Site; another enters the Site from the closed landfill area to the north. Several randomly scattered fill berms are present in this area.

3.3.2 Groundwater

A review of the groundwater elevation data indicates that the depth to water beneath the South 40 parcel ranges from zero to 8.5 ft bls. Groundwater elevation contours indicate that there is a mound on the water table beneath the central elevated portion of the parcel. Groundwater flows locally outward from the mound to the north, west, and south.

4.0 REMEDIAL ACTION OBJECTIVES

RAOs are specific goals for protecting human heath and the environment. The RAOs for this Site were developed based on site investigation results and exposure assessment (presented in Section 3.0). These studies characterized the nature and extent of contamination, media of concern, migration pathways, exposure routes and potential receptors. The RAOs also include consideration of actions necessary to achieve productive reuse of a site. The RAOs developed for the Site are as follows:

- Remove intact drums and drum fragments and associated impacted soils;
- Prevent direct contact exposure (dermal absorption, inhalation, and incidental ingestion) with impacted media;
- Prevent or reduce the potential for surface runoff to transport COPCs from surficially-impacted portions of the Site;
- Prevent or reduce the release of primary COPCs in particulate form (dust) to on-site and off-site ambient air;
- Eliminate elevated, leachable soil concentrations of COPCs;
- Restrict the infiltration of precipitation through the impacted media and adverse impacts to groundwater;
- Prevent adverse impacts to offsite groundwater quality;
- Contain and stabilize impacted media in a manner consistent with the planned industrial use of the Site.

5.0 ENGINEERING EVALUATION OF THE REMEDIATION

An engineering analysis has demonstrated that the remedial action specified in this RAWP, together with subsequent site development pursuant to the Soil Management Plan, will achieve the cleanup goals for the site. In accordance with 6 NYCRR 375-1.10(c), the remedial action was evaluated against the following criteria:

- Protection of Human Health and the Environment;
- Achievement of Standards, Criteria, and Guidance (SCG);
- Short-term Effectiveness and Impacts;
- Long-term Effectiveness and Permanence;
- Reduction of Toxicity, Mobility, or Volume;
- Implementability; and
- Community Acceptance.

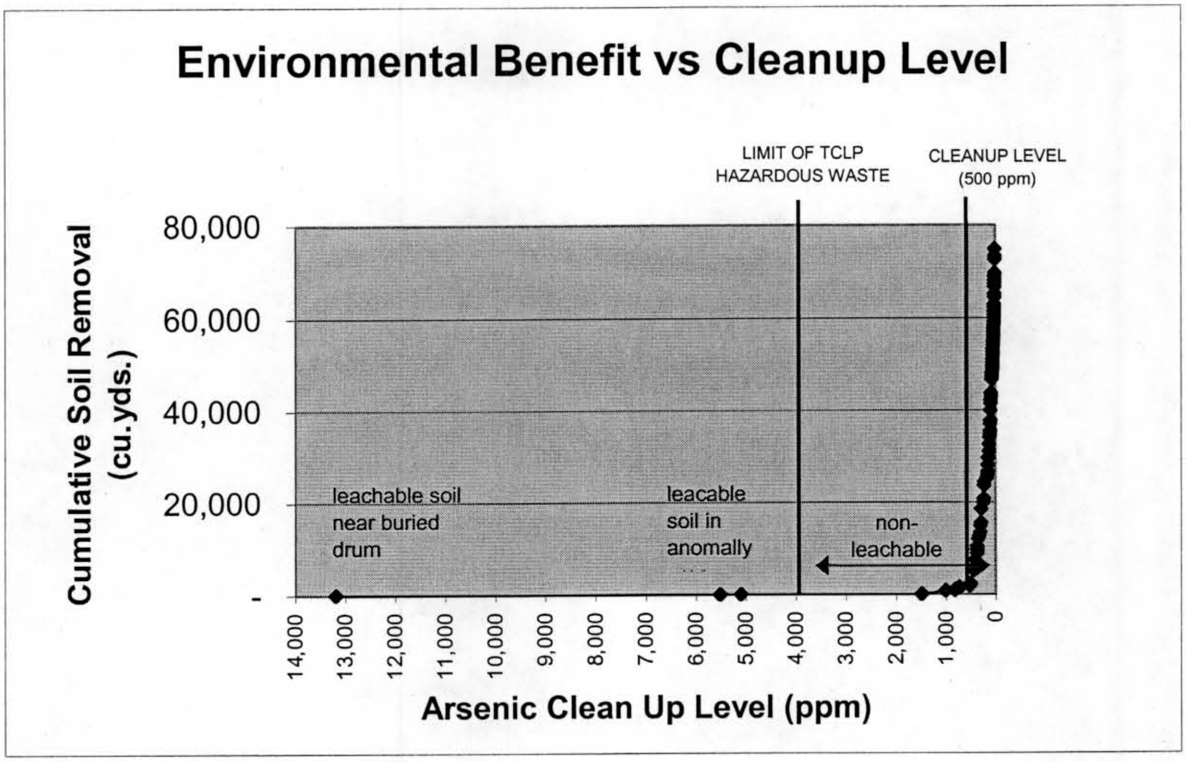
The following subsections summarize how the remedial action addresses these criteria.

5.1 Protection of Human Health and the Environment

The proposed remedial action will be protective of human health and the environment. This evaluation focuses on how the remedial action achieves protection over time; how site risks are eliminated, reduced, or controlled; and whether any unacceptable short-term impacts would result from implementation. The evaluation of overall protection of human health and the environment relies on the assessments for long-term effectiveness and permanence, short-term effectiveness, and compliance with SCGs. As summarized below, the remedial action will protect human health and the environment.

1. **Remove intact drums and drum fragments and associated impacted soils.** Removal of these materials will eliminate the presence of wastes and soils containing the highest concentrations of COPCs at the Site.

2. **Reduce the level of on-site contamination due to the presence of primary COPCs to the greatest extent practicable**. The remedial action will eliminate from the Site all identified wastes and soils containing arsenic in excess of 500 ppm. The following chart illustrates the environmental benefits that would be achieved across the entire range of possible arsenic cleanup levels. During the supplemental investigation, soil samples were collected on a grid across the entire impacted area of the South 40 site. Each data point on the chart represents an arsenic test result and the volume of soil that contains arsenic concentrations at or above that concentration. Thus, the chart illustrates the relationship between cleanup levels and the total volume of soil that would be excavated and transported from the site.



The remedial action cleanup level of 500 ppm was developed based on site-specific correlation data between total arsenic and TCLP arsenic. Laboratory testing (Supplemental Investigation 2002) of the aforementioned grid samples demonstrated that site soils with total arsenic concentrations in excess of 4,120 ppm produce TCLP leachate concentrations that would cause the soils to be classified as a characteristic hazardous waste. The leachable concentrations of arsenic in these soils have the potential to adversely impact groundwater quality if left on site or placed in contact with groundwater. As shown above, three locations were identified with leachable arsenic concentrations. All soil in these locations will be excavated and removed from the Site, thereby eliminating the potential for the arsenic to adversely impact groundwater quality.

The remedial action cleanup level of 500 ppm is more than eight times lower than the concentration that qualifies as hazardous waste and produces leachable arsenic concentrations, and thus provides a large factor of safety. As shown above, the 500 ppm cleanup level will result in the excavation of five areas with non-leachable (non-hazardous) arsenic concentrations.

As shown by the chart, the cumulative volume of excavated soil increases very rapidly at cleanup levels below 500 ppm. Merely decreasing the cleanup level to 400 ppm would cause more than a three-fold increase in the volume of soil that would be excavated and transported off site. Because all exposure pathways would be conclusively eliminated by the 500 ppm cleanup level and the institutional controls, a lower cleanup level would provide no practical gain in the protection of human health and the environment. In fact, lower cleanup levels and the associated large increases in soil excavation and over-the-road transportation could increase the risks of exposure to contaminated soil during these activities.

3. **Prevent direct contact exposure (dermal absorption, inhalation, and incidental ingestion) with impacted media.** Removal of impacted materials and soils, placement of clean cover, and restriction of site access will eliminate future direct contact exposure to site contaminants. Potential future_site development in accordance with the Soil Management Plan will also eliminate direct contact exposure to site contaminants as a result of the placement of clean fill, paving or structures over contaminated soils. Disturbed areas will be backfilled with clean soil and seeded to re-establish vegetative ground cover. Vegetative cover and restricted access to the Site by a secured perimeter fence will provide protection to prevent direct contact exposure. If the Cogeneration plant is not built the long-term protection the Site will be further protected by covering the area with a minimum of one (1) foot of certified clean fill with a new vegetative cover will be installed within twenty-four (24) months. The Site will also remain fenced which will minimize site access and will eliminate direct contact exposure to site contaminants.

4. **Prevent or reduce the potential for surface runoff to transport COPCs from surficially-impacted portions of the Site.** Erosion of contaminated soils will be controlled by covering them with clean fill, vegetation, paving or structures. Lawns and landscaping will be maintained on unpaved areas. During remedial construction, erosion control measures will prevent migration of contaminated soils exposed at the surface.

5. **Restrict precipitation from infiltrating through the impacted media and adversely impacting groundwater.** The remedial action will remove wastes with leachable concentrations of COPCs and backfill with clean soil, thereby reducing the potential for COPCs to adversely impact groundwater. During any future site development, remaining impacted soils will be isolated from contact with groundwater in accordance with the Soil Management Plan. Proposed site development activities would incorporate filling, paving and/or structures being placed over remaining impacted soils. Structures or pavement incorporating appropriate storm drainage provisions will limit or prevent entirely the percolation of precipitation through underlying impacted soils. It is important to note that there are not significant groundwater impacts even in the current pre-remediation condition.

6. **Prevent off-Site migration of primary COPCs in groundwater**. Monitoring of groundwater quality at existing wells located around the perimeter of the Site indicates that groundwater quality meets NYS groundwater standards with the exception of one location where groundwater contaminant concentrations are only slightly elevated above these standards. The removal of wastes and subsequent site development will further reduce the potential for any adverse impact to groundwater by reducing the potential for COPCs to leach into groundwater and by reducing groundwater gradients. As a result, groundwater quality at the Site perimeter is expected to achieve NYS standards after completion of the remedial action and implementation of the institutional controls. Groundwater monitoring will be conducted annually for a minimum of 5 years and will be terminated once all samples have met NYSDEC groundwater standards for two consecutive years.

7. **Prevent exposure to COPCs in Site groundwater**. Through a deed restriction, the use of groundwater underlying the Site will be prohibited without treatment rendering it safe for drinking water or industrial purposes.

8. **Prevent or reduce the release of primary COPCs in particulate form (dust) to on-site and off-site ambient air.** Dust control measures to be implemented during remedial action and subsequent site development will prevent the generation of dust by construction activities. The placement of clean fill and vegetative will prevent the generation of contaminated dust. The condition will be further enhanced through site development or installation of a future one (1) foot of clean soil cover within 2 years.

9. **Contain and stabilize impacted media in a manner consistent with the planned industrial use of the Site.** In accordance with the soil management plan, remaining impacted soils will be isolated from contact with groundwater or surface water. Cover consisting of clean fill, paving or structures will eliminate direct human contact with impacted soils and restrict leaching into groundwater and the generation of particulates.

5.2 Standards, Criteria and Guidelines (SCGs)

In New York State, a remedial program is governed by the Environmental Conservation Law (ECL) and the regulations in 6 NYCRR Part 375. These regulations are analogous to the Federal National Contingency Plan (40 CFR 300) which requires that the selection of remedial actions meet applicable or relevant and appropriate requirements (ARARs) of state and federal environmental laws and regulations. SCGs are defined in 6 NYCRR Part 375 as follows: "A site's program must be designed so as to conform to standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable, or that are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with. Such good cause exists if any of the following are present:

a) The proposed action is only part of a complete program that will conform to such standard or criterion [of guidance] upon completion; or

b) Conformity to such standard or criterion will result in greater risk to the public health or to the environment than alternatives; or

c) Conformity to such standard or criterion is technically impracticable from an engineering perspective; or

d) The program will attain a level of performance that is equivalent to that required by the standard or criterion through the use of another method or approach."

SCGs are identified as chemical-specific, location-specific, or action-specific:

Chemical-specific SCGs are health- or risk-based numerical values or methodologies. Chemical-specific SCGs establish the amount or concentration of a chemical that may be found in, or discharged to, the environment.

Action-specific SCGs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes. As such, these do not define site cleanup levels or remedial action objectives, but affect the implementation of specific types of remediation.

Location-specific SCGs set restrictions on activities based on the characteristics of special locations. Remedial action may be restricted or precluded depending on the location or characteristics of the site and the requirements that apply to it.

The evaluation of SCGs for the Site's remedial program will take into consideration the fact that the Site is listed as a Class 3 site on NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites, indicating that the Site does not pose a significant threat to public health or the environment. The Site is surrounded by a locked fence limiting public access to the Site. Furthermore, proposed future use of the Site will result in the development of buildings, importing and placement of clean soil cover, and paved parking areas, effectively capping the Site and minimizing the potential exposure to residual materials that may be left in place.

5.2.1 Chemical-Specific SCGs

Chemical specific SCGs applicable to this remedial action are summarized in the following table:

Program / Authority	Synopsis	Application
STATE:		
- Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Water Quality Regulations - ECL Article 15, Title 3 and ECL Article 17, Titles 3 and 8 - 6 NYCRR Parts 700 – 706	Establishes water body classifications and ambient water quality standards for surface waters and groundwaters of NYS. Provides ambient water quality standards for approximately 200 listed contaminants.	Ambient groundwater standards are applicable for the site. Groundwater monitoring data indicate that groundwater standards are not being exceeded. The remedial action will further reduce or eliminate the potential for adverse impacts.
- Technical and Administrative Guidance Memorandum (TAGM) #4046	- Established recommended soil cleanup objectives to protect human health and groundwater in conditions of unrestricted use.	- Human health will be protected by eliminating direct contact with impacted soils through a deed restriction and placement of clean fill, paving and site structures. TAGM 4046 RSCOs will be utilized for fills that will have complete exposure pathways remaining after the remedial action is complete.
FEDERAL:		
- National Drinking Water Standards	- Establishes primary and secondary standards for public	- Not Applicable. Groundwater in the immediate vicinity of the site

- Safe Drinking Water Act, 42 U.S.C. §§ 300f – 300j-26 - 40 CFR Parts 141 through 143	water supply systems.	and downgradient is not utilized as a potable source of water.

5.2.2 Action-Specific SCGs

Action-specific SCGs applicable to this remedial action are summarized in the following table:

Program/Authority	Synopsis	Application
STATE:		
- Hazardous Waste Management Regulations - ECL Article 27, Title 3, 7 , 9 and 13 - ECL Article 3, Title 3 - 6 NYCRR Parts 370 through 376	- Establishes definition of hazardous wastes. Establishes standards and requirements for generators and transporters of hazardous waste. Establishes standards, permit requirements and construction and operating requirements for hazardous waste storage, treatment and disposal facilities. Establishes standards for the development and implementation of remedial programs for inactive hazardous waste disposal sites.	- Applicable. Generator and transporter standards would apply to the excavation, and offsite disposal of hazardous wastes.
- Standards for Waste Transportation - ECL Article 27, Title 3 - 6 NYCRR Part 364	- Establishes standards for collection, transport and delivery of regulated wastes, including NYS-defined solid hazardous wastes.	- Applicable. Remedial activities include collection, transport and delivery of NYS-defined hazardous wastes.
- Air Pollution Control Regulations - ECL Article 19, Title 3 - 6 NYCRR Parts 200, et al	- Establishes strict prohibition on emission of air contaminants that jeopardize human, plant or animal life, or is ruinous to property, or causes a level of discomfort. Establishes prohibition for emission of an air contaminant source except in accordance with a permit or registration certificate issued under Part 201.	- Applicable. Emissions of fugitive dust will be controlled during remedial construction.

Action-specific SCGs applicable to this remedial action are summarized in the following table:

Program/Authority	**Synopsis**	**Application**
- New York State Pollutant Discharge Elimination System (SPDES) Requirements - ECL Article 17, Title 5 - 6 NYCRR Parts 750 through 758	- Establishes prohibitions and standards for discharge of pollutants to storm water runoff, surface waters and ground waters. Establishes prohibition of discharge of pollutants to waters of the State except in accordance with a permit issued under Part 752	- Applicable. There will be no discharge of impacted storm water from the site.
- Fish and Wildlife Law – Water Pollution Prohibition - ECL Article 11, Title 5 - Citation N/A	- Establishes that no deleterious or poisonous substances shall be thrown or allowed to run into any public or private waters in quantities injurious to fish life, protected wildlife or waterfowl inhabiting those waters, or injurious to the propagation of fish, protected wildlife or waterfowl therein.	- Applicable. General "performance" standard that would apply to the overall remedial activities. There will be no discharge of impacted storm water from the site.
- Contravention of Water Quality Standards - ECL Article 17, Title 5 - Citation N/A	- Establishes as an unlawful act for any person, directly or indirectly, to throw, drain, run or otherwise discharge into waters of the State organic or inorganic matter that shall cause or contribute to a condition in contravention of the applicable ambient water quality standards established at 6 NYCRR § 701.1.	- Applicable. General "performance" standard that would apply to the overall remedial activities.
FEDERAL:		
- Hazardous Materials Transportation - 49 U.S.C. §§ 5101-5127 - 49 CFR Part 171	- Establishes Federal Department of Transportation standards for transport of hazardous materials, including standards for packaging, labeling, manifesting and transporting hazardous materials.	- Applicable. Hazardous materials includes hazardous wastes. Remedial activities encompassing transport of hazardous waste will comply with the Part 171 standards.

Action-specific SCGs applicable to this remedial action are summarized in the following table:

Program/Authority	Synopsis	Application
- National Pollutant Discharge Elimination System General and Categorical Pre-treatment Standards - 40 CFR 403	- Establishes responsibilities of Federal, State, and local government, industry and the public to implement National Pretreatment Standards to control pollutants which pass through or interfere with treatment processes in Publicly Owned Treatment Works (POTWs) or which may contaminate sewage sludge.	- Not Applicable. No remedial activities include discharge of water directly to a local POTW.
- Federal Water Quality Criteria (FWQC) Summary. - CERCLA Section 121[d][2][B] -	- The FWQC include guidance values issued by the USEPA Office of Science and Technology, Health and Ecological Criteria Division, 1994. However, these guidance values should be considered if more stringent than the promulgated values, "where relevant and appropriate under the circumstances of the release or threatened release"	- Applicable. Measures will be implemented during remedial construction to insure that no impacted storm water runoff will be discharged from the site.
- Identification and Listing of Hazardous Waste - 40 CFR 261	- Identifies those solid wastes which are subject to regulation as hazardous wastes under parts 262 through 265, 268, and parts 270, 271, and 124 of this chapter and which are subject to the notification requirements of section 3010 of RCRA.	- Applicable for remedial activities where potentially hazardous materials are removed from the ground and actively managed. Will apply to any characteristic hazardous wastes excavated and removed from the site.
- Standards Applicable to Generators of Hazardous Waste - 40 CFR 262	- Specifies that generators who treat, store, or dispose of hazardous waste on-site must only comply with the following sections of this part with respect to that waste: Section 262.11 for determining whether or not he has a hazardous waste, § 262.12 for obtaining an EPA identification number, § 262.34 for accumulation of hazardous waste, and § 262.40 (c) and (d) for recordkeeping.	- Applicable for remedial activities where potentially hazardous materials are removed from the ground and actively managed (i.e., treated, stored or disposed). Will apply to any characteristic hazardous wastes excavated and removed from the site.

Action-specific SCGs applicable to this remedial action are summarized in the following table:

Program/Authority	**Synopsis**	**Application**
- Standards Applicable to Transporters of Hazardous Waste - 40 CFR 263	- Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR part 262.	- Applicable for remedial activities where potentially hazardous materials are removed from the ground and transported off site for treatment or disposal.
- Standards Applicable to Owners and Operators of Treatment, Storage, and Disposal Facilities - 40 CFR 264-267	- Establishes minimum national standards which define the acceptable management of hazardous waste	- Applicable for remedial activities where potentially hazardous materials are removed from the ground and actively managed (i.e., treated, stored or disposed). Will apply to offsite facilities selected for disposal of hazardous wastes excavated and removed from the site.
- Land Disposal Restrictions - 40 CFR 268	- Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.	- Applicable for remedial activities where potentially hazardous materials are removed from the ground and transported off site for disposal. Will apply to any characteristic hazardous wastes excavated and removed from the site.
- Hazardous Materials Transportation Regulations - 49 CFR 107, 171-177	- Provides DOT regulations for transport of hazardous materials.	- Applicable for remedial activities where potentially hazardous materials are removed from the ground and transported off site for treatment or disposal.

5.2.3 Location-Specific SCGs

Location-specific requirements pertain to existing natural or cultural features in the vicinity of the Site that are specifically protected. Location-specific SCGs are addressed in the following table.

Program/Authority	**Synopsis**	**Project Application**
STATE:		
- Use and Protection of Waters - ECL Article 15, Title 5 and ECL Article 17, Title 3 - 6 NYCRR Part 608	Establishes permit requirements to change, modify, or disturb any protected stream, its bed or banks, or remove from its bed or banks sand or gravel or any other material; or to excavate from or place fill in any of the navigable waters of the state or in any marsh, estuary or wetland that are adjacent to and contiguous at any point to any of the navigable waters of the state and that are inundated at mean high water level or tide. Also establishes requirement that any application for a federal license or permit to conduct any activity which may result in a discharge into navigable water must obtain a State Water Quality Certification under Section 401 of the Federal Water Pollution Control Act, 33 USC § 1341.	Not applicable. The remedial action will not include any modification of, activity in, or discharge to the Hudson River or protected wetlands.
- Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern - ECL Article 11, Title 5 - 6 NYCRR Part 182	Establishes prohibition for the taking or possession of any NYS endangered or threatened species, except in accordance with permit issued under this Part. "Taking" may include destruction or degrading of critical habitat of any such species.	Potentially applicable. Since no Fish and Wildlife Impact Assessment was considered necessary at the site, the presence of endangered or threatened species is unknown. However, the remedial action does not include disruption of a wetland or any other obvious fish/wildlife resources.

Action-specific SCGs applicable to this remedial action are summarized in the following table:

Program/Authority	Synopsis	Application
- National Contingency Plan. - 40 CFR 300	- The purpose of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) is to provide the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants.	- Applicable. The remediation of the site will be substantially consistent with the National Contingency Plan.
- OSHA Worker Protection. - 29 CFR 1904, 1910, 1926	- 1904 Recording and Reporting Occupational Injuries and Illnesses - 1910 General Industry Selected Topics - 1926 Construction Industry Standards -	- Applicable. Remedial construction activity will be performed in accordance with applicable OSHA regulations by HAZWOPER-trained personnel.
- National Pollutant Discharge Elimination System (NPDES). - 40 CFR 122, 125	- Subpart 122 - The NPDES program requires permits for the discharge of pollutants from any point source into waters of the United States. Subpart 125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under section 301(b) of the Act, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under section 402(a)(1) of the Act.	- Applicable. Measures will be implemented during remedial construction to insure that no impacted storm water runoff will be discharged from the site.

Program/Authority	Synopsis	Project Application
- Freshwater Wetlands - ECL Article 24, Title 7 - 6 NYCRR Parts 662-665	Establishes prohibition on alteration or disturbance of freshwater wetlands and adjacent areas except in accordance with permit issued under this Part. Establishes procedural requirements and standards for issuance of freshwater wetlands permit.	Potentially applicable, However, the remedial action does not include disruption of a wetland.
FEDERAL:		
- Endangered Species Act - 16 U.S.C §§ 1531-1544 - 40 CFR Part 17, Subpart I - 40 CFR Part 402	Establishes requirement that federal agencies must confirm that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of a critical habitat of such species, unless the agency has been granted an appropriate exemption by the Endangered Species Committee.	Potentially applicable. Since no Fish and Wildlife Impact Assessment was considered necessary at the site, the presence of endangered or threatened species is unknown. However, the remedial action does include disruption of a wetland or any other obvious fish/wildlife resources.
- National Historic Preservation Act - 16 U.S.C § 470 <u>et seq.</u> - 36 CFR Part 800	Establishes requirements that proposed site activities must take into account potential effects on properties (i.e., historic and archaeological resources) listed or eligible for listing in the National Registry of Historic Places. Any Federal agency undertaking a project which may have a potential effect on any such property must provide the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project.	Potentially applicable. The history of waste burial activities indicates a very low probability that any intact cultural resources remain on site.
- Statement of Procedures on Floodplain Management and Wetlands Protection - Executive Order 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands) - 40 CFR Part 6, Appendix A	Establishes EPA policy and guidance for implementing Executive Orders 11988 and 11990.Executive Order 11988 required federal agencies to evaluate potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with development within a floodplain. The agencies must avoid adverse impacts or minimize them if no practical alternative exists.	Potentially applicable. The remedial action will not include any modification of, activity in, or discharge to the Hudson River or protected wetlands.

5.3 Short-Term Effectiveness

This evaluation criterion is used to assess short-term impacts (community, worker and environmental protection) associated with the construction and implementation phase of remediation.

The remedial action will require handling of contaminated soils and waste. Site workers will wear appropriate PPE to minimize exposure to contamination and as protection from physical hazards. Site access barriers, the community air monitoring plan and dust control measures will be implemented to eliminate public exposure to site contaminants during remedial construction.

The RAOs will be met immediately upon completion of the removal activities, placement of cover, and implementation of the institutional controls.

5.4 Long-Term Effectiveness and Permanence

This criterion addresses the long-term effectiveness and permanence of the remediation with respect to the quantity of residual chemicals remaining at the site after response goals have been met. The principal focus of this analysis is the adequacy and reliability of controls necessary to manage any untreated media and treatment residuals.

Residual risk: The remedial action cleanup level of 500 ppm is more than <u>eight</u> times lower than the concentration that qualifies as hazardous waste and produces leachable arsenic concentrations, and thus provides a large factor of safety. Merely decreasing the cleanup level to 400 ppm would cause more than a three-fold increase in the volume of soil that would be excavated and transported off site. Because all exposure pathways would be conclusively eliminated by the 500 ppm cleanup level and the proposed physical and institutional controls, a lower cleanup level would provides no practical gain in the protection of human health and the environment. In fact, lower cleanup levels and the associated large increases in soil excavation and over-the-road transportation could increase the short-term risks of exposure to contaminated soil during these activities. Exposure to residual impacted soil will be precluded by placement of clean cover over area exceeding the NYSDEC RSCO for arsenic, site access restrictions and restrictions placed on future use of the site. Proposed development would result in the placement of additional clean fill and/or paving and construction of buildings.

Adequacy of controls: Site groundwater monitoring data indicate that current, unremediated levels of COPCs are not significantly impacting groundwater quality. The remediation activity will enhance the protection of groundwater quality by removing soils with leachable concentrations of arsenic. The deed restriction and associated Soil Management Plan will provide permanent, institutional controls to prevent unacceptable exposure to residual contaminated soils during and after future site development.

Reliability of controls: The permit requirements for the disposal facility at which contaminated soils and drums will be disposed will ensure that these wastes are reliably isolated from environmental receptors. The deed restriction will require that any future site development be conducted in a manner that prevents unacceptable exposure to contaminated soils and adequately restricts groundwater impacts by COPCs. The site owner will be required to annually certify that the institutional controls are being maintained.

5.5 Reduction of Toxicity, Mobility or Volume

This criterion is used to assess the degree to which the remedial action utilizes recycling and/or treatment technologies that permanently decrease toxicity, mobility, or volume of the chemicals as their primary element. It also assesses the effectiveness of the treatment in addressing the predominant health and environmental threats presented by the site. The specific factors considered under this evaluation criterion include:

- Treatment process the remedy would employ and the materials it would treat;
- Amount of contaminants that would be treated or destroyed;
- Degree of expected reduction in toxicity, mobility, or volume (expressed as a percentage of reduction or order of magnitude);
- Degree to which the treatment would be irreversible;
- Type and quantity of treatment residuals that would remain following treatment accounting for persistence, toxicity, mobility and the tendency to bioaccumulate; and
- Whether the alternative would satisfy the statutory preference for treatment as a primary element.

Treatment of the arsenic contamination in excavated soils may be necessary to comply with restrictions on the land-disposal of hazardous waste in permitted landfills. There may be some underlying hazardous constituents (e.g. naphthalene) in the excavated soil that will require treatment by the permitted disposal facility prior to landfilling. Any such constituents will be identified during waste characterization at the time of excavation and disposal.

5.6 Implementability

This criterion assesses the technical and administrative feasibility of implementing the remedial action and the availability of various services and materials that would be required during its implementation. Factors considered include the following.

- Technical feasibility: includes the difficulties and unknowns relating to construction and operation of a technology, the reliability of the technology (including problems resulting in schedule delays), the ease of performing additional remedial actions, and the ability to monitor the effectiveness of the remedy.
- Administrative feasibility: involves coordinating with governmental agencies to obtain necessary permits or approvals.
- Availability of services and materials: includes sufficiency of off-site treatment, storage and disposal capacity; access to necessary equipment, specialists and additional resources; potential

for obtaining competitive bids especially for new and innovative technologies; and availability of state-of-the-art technologies.

The excavation and transportation of wastes and contaminated soils utilizes ordinary construction equipment and techniques. With proper planning and contractor selection, no schedule delays are anticipated. The effectiveness of the remedy can be readily monitored through post excavation sampling and analysis, and through continued groundwater monitoring at the existing monitoring wells.

No administrative difficulties are anticipated as remediation is being conducted under the Voluntary Cleanup Program pursuant to an agreement between BASF and the NYSDEC. Deed restrictions and Soil Management Plans have been used in the Voluntary Cleanup Program as effective components ofremedies at other sites.

The services needed to implement the remedy are widely available in a competitive market. Regional permitted landfill capacity and transporter capacity is more than adequate.

5.7 Community Acceptance

The proposed remedy is likely to achieve acceptance by a substantial majority of the community residents. Contaminant exposure pathways that have been present at the site for many years will be permanently eliminated. The remedial action and the implementation of institutional controls will eliminate the possibility of exposure to arsenic contaminated soils through direct contact and wind-blown dust (dermal and inhalation pathways). The contamination of groundwater by soils containing leachable arsenic will cease, and groundwater quality will be monitored until it achieves groundwater standards for protection of human health and the environment. Legally enforceable deed restrictions, including the Soil Management Plan, will ensure that any future site development will not create exposure pathways for site workers or community residents.

Measures will be taken to ensure that certain positive visual qualities of the site will be preserved. During excavation of contaminated soils, care will be taken to avoid the destruction of mature trees in unimpacted areas. Following remedial excavation, the selection and placement of clean cover will be performed in a manner that will not endanger the health of the trees. All disturbed areas will be seeded and cultivated to ensure the establishment of vegetation and the prevention of soil erosion. Finally, the existing perimeter fence will be maintained in good order, thereby preventing its deterioration to an unsightly and ineffective condition.

The community will be assured of the ongoing safety of the remedial action and subsequent institutional controls through several mechanisms. Remedial action will be performed under the on-site supervision of DEC and DOH representatives as well as licensed professional engineers. A community air monitoring program will ensure that no contaminated dust will impact the areas surrounding the site during construction. All air monitoring results will be reported to the NYSDOH and NYSDEC on a daily basis. Groundwater monitoring results will be reported to the NYSDEC annually until NYS standards are achieved. Following implementation of the institutional controls, the site owner will be required to certify annually that the controls are being maintained and adhered to.

6.0 INSTITUTIONAL CONTROLS

Institutional controls are non-physical mechanisms which restrict the use of a site, limit human exposure, prevent any actions which would threaten the effectiveness or operation and maintenance of a remedy at or pertaining to the site. Under NYSDEC policy, institutional controls apply when contaminants remain at a site at levels above the SCGs which would allow unrestricted human use of the property. Institutional controls may include restrictions on the use of structures, land and groundwater as well as deed notices and covenants.

Institutional controls will be implemented at the BASF South 40 to protect human health and the environment by eliminating exposure pathways for residual contaminants. The following institutional controls will be implemented and enforced through a deed restriction:

1. Site Use Restriction. The owner of the site will prohibit it from being used for purposes other than for industrial use and the services associated with such use. Future use of the Site is expected to be a nominal 505-megawatt combined-cycle cogeneration power plant. As such, the planned future use of the Site will be consistent with the current land use (i.e., industrial).

2. Soil Management Plan (SMP). A generic SMP (Appendix A), will set forth procedures to be followed by site owners, their agents or any future party for activity involving excavation, the management and disposal of excavated material, or the use of imported soil/fill for purposes such as backfill, grading or landscaping. Within twenty-four (24) months of the remedial excavation, if the Cogeneration Facility is not constructed, the SMP will require the maintenance of a minimum of six (6) inches of clean fill and vegetative cover over areas with arsenic concentrations in excess of the NYSDEC RSCO identified in TAGM 4046 (Figure 6-1). An action-specific SMP will be submitted for all such activities in the future. The action-specific SMP will contain an Engineering Analysis demonstrating that the proposed action is protective of human health and the environment. The Engineering Analysis will address the following criteria in accordance with applicable DEC guidance:

- Protection of Human Health and the Environment
- Standards, Criteria and Guidance (SCGs)
- Short Term Effectiveness and Impacts
- Long Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility and Volume
- Implementability
- Community Acceptance

3. Groundwater Use Restriction. The use of groundwater underlying the site will be prohibited without treatment rendering it safe for drinking water or industrial purposes.

4. Groundwater Monitoring. The site owner will monitor groundwater quality at down gradient locations at the site perimeter until data indicate that groundwater standards have been achieved. This will be conducted annually for a minimum of 5 years and will be terminated once all samples have met NYSDEC groundwater standards for two consecutive years.

5. Site Access Restriction. Access to the site will be restricted by a fence surrounding the site. The existing fence will be maintained and augmented as needed to prevent the public from entering areas where residual contamination has been identified in excess of NYSDEC RSCOs identified in TAGM 4046.

6. The site owner will certify on a yearly basis that the institutional controls are in place and remain effective for the protection of public health and the environment. The site owner will identify any activities undertaken pursuant to the SMP during the past year, and identify anticipated forthcoming activities that may require implementation of the SMP.

7.0 SCOPE OF WORK

The scope of work for the RAWP will consist of the excavation and off-site disposal of soils, buried drums and debris encountered in an area of previously identified anomalies and two soil hot spot locations outside the anomaly areas. Additional soil removal from the excavation area will be performed based on visual observations and post-excavation sampling results. It is estimated that there are approximately 50 to100 drums/carcasses present in the area (Dunn, 1992).

In general, remediation activities under the RAWP will consist of the following tasks:

- Initial survey;
- Mobilization and work site preparation;
- Implementation and management of a Site HASP;
- Drum excavation;
- Soil excavation;
- Waste sampling, transportation and off-Site disposal; and
- Site restoration and demobilization.

7.1 Initial Site Survey

An EM-31 survey of the mounded area will be performed to re-delineate the locations of the buried drum carcasses and fragments. The limits of the identified anomalies will be marked with survey stakes, flagging or other appropriate methods. Following the EM survey, an initial Site survey shall be performed by a professional surveyor licensed within the State of New York. At a minimum, this survey shall identify the following features:

The limits of excavation of the anomalous areas; and

All utilities within the work zone, including but not limited to gas, electric, water and other miscellaneous utilities.

7.2 Mobilization/Demobilization

Prior to beginning on-site remedial activities, the Contractor shall be responsible for conducting the following activities:

- Attend a project kick-off meeting prior to the commencement of any intrusive activities.

- Submittal of Health & Safety certificates. The Contractor and any subcontractors shall supply all labor (HAZWOPER CERTIFIED) in accordance with OSHA 1910.120.

- Mobilization of all materials required for the removal, staging, and disposal of drums and excavated soil.

- In addition, all necessary permits, insurance and licenses required to complete all work shall be obtained by the Contractor.

7.2.1 Coordinate Activities Prior to the Start of Work

The Contractor will provide BASF and the Engineer with the following information, prior to the start of work:

- Generate an Operations Plan detailing all proposed project activities including a Waste Management Plan and a schedule;

- Contractor shall provide 40 Hour HAZWOPER certification and 8-hour refresher updates to its employees;

- Contractor shall provide a schedule for completion of each task;

- Contractor shall identify the proposed hours of operation during work activities, any changes or requests for work hours outside of normal work hours must be approved by BASF and the Engineer;

- Contractor shall provide the names of all personnel who will be on-site during work activities, description of all equipment to be used for completing work, and the name and phone number of the Contractor's project manager.

7.2.2 Meetings

Pre-Remediation Meeting

Prior to mobilization, a pre-remediation meeting will be held at the Site to introduce the project team members representing BASF, the Engineer, NYSDEC, and the Contractor. The meeting will be conducted to review the scope of work, establish a detailed schedule of operations, and resolve issues (if any) raised by attending parties. The Engineer will prepare a summary of the pre-remediation meeting. A copy of this summary will be provided to each of the attending parties.

Post-Remediation Meeting

Following completion of the remedial action, a post-remediation meeting between BASF, the Engineer, and the Contractor will be held at the Site to discuss the completed remediation. In addition, remaining issues associated with the Site, if any will be discussed. The post-remediation meeting will be scheduled following the completion of the remedial action at the Site.

7.2.3 Mobilization/Demobilization Activities

The Contractor will be responsible, at minimum, for the following mobilization tasks:

- Prior to beginning work, the Contractor shall field verify and mark all locations of utilities. Utility and subsurface marking shall be performed in a manner that will allow equipment operators and other personnel a clear view of the utility locations. The Contractor shall contact the Underground Facilities Protective Organization (UFPO) for marking the location of all underground and aboveground utilities;

- Mobilizing all manpower, equipment, and materials to the Site as necessary to implement the RAWP. Equipment mobilized to the Site shall be subjected to visual inspection by the Engineer Equipment that arrives at the Site in unsatisfactory condition (i.e., soiled, poor operating condition, leaking oil, etc.) will be removed from the Site and replaced by the Contractor at no additional cost;

- Furnish source of electricity (if required) and a source of potable water to support the RA;

- Providing and maintaining portable, temporary sanitation facilities for personnel on-site during the RA.

- Demobilization activities to be conducted by the Contractor shall include, at a minimum, the dismantling and removal from the Site of all personnel, equipment, materials, and other support services.

7.3 Site Preparation

Site preparation activities will include the following tasks (Figure 7-2):

- Construction fencing will be installed to delineate the support area, work zone, which will also function as a work Site security measure, and staging area;

- A support area to accommodate all equipment so that the Project will proceed safely and efficiently;

- Construction of on-site staging area(s) outside the limits of the excavation locations. The Contractor shall construct the on-site staging areas using at a minimum 10-mil polyethylene sheeting. The staging area should have adequate capacity to stage the waste streams generated during the RA prior to off-site disposal. Any soil generated during the RA will also be covered with a minimum of 10-mil poly;

- A decontamination pad will be constructed to contain the largest piece of equipment used on the site for the RA activities. The decontamination pad will drain to a sump for collection of decontamination water. The water shall be collected in appropriate containers and stored on-site prior to testing for off-site disposal. The decontamination area shall be covered during times it is not being used to minimize the collection of any precipitation;

- Implementation of a soil erosion and sedimentation control measures. Soil erosion and sediment control measures will be installed prior to excavation activities and will be maintained throughout the duration of all remedial construction activities. These measures (i.e., hay bales, silt fences, etc.) will be used to protect any storm drain in proximity to any excavation area. Silt fence shall also be placed around each staging area and alongside Site roads and Riverside Avenue; and

- Temporary construction of fencing and traffic barricades to protect all work areas shall be used.

7.4 Health and Safety

All remediation activities will be performed in a manner consistent with 29 CFR Parts 1910 and 1926. The Contractor will be required to prepare and submit a Site-specific Health and Safety Plan (HASP) prior to initiation of work activities. Earth Tech's HASP is included in Appendix B of this RAWP. This HASP shall be available for the Contractor's reference. During all phases of Site work, the Contractor shall monitor safety and health conditions and fully enforce his own Site-specific Health and Safety Plan. Ambient air shall be sampled throughout the course of the work for particulate matter and elevated VOCs. The Contractor shall monitor the work zones and perform any upgrades of personal protective equipment. During the course of the work, the Contractor shall take abatement measures as directed to minimize the levels of particulates and VOCs at the limits of the work area. Finally, the Contractor shall also be responsible for monitoring general Site conditions and for safety hazards. Specifically, monitoring will be performed to verify that all requirements of the Occupational Safety and Health Administration as outlined in 29 CFR Parts 1910 and 1926 are adhered to. The Health & Safety plan shall also incorporate a Community Air Monitoring Plan.

7.5 Drum Excavation

The Contractor will be responsible for providing all labor, equipment, and materials to complete the excavation of the anomalous areas. In general, the Contractor shall perform the following activities:

- The Contractor shall initiate excavation at the locations shown on Figure 7-1. The surveyed locations will be excavated to a depth of approximately 6 feet based on historic test pits data in the anomalous area(s). These areas will be excavated to remove all drums;

- Drums encountered will be staged in a lined roll-off container and the roll-off shall remain covered during times of inactivity;

- Stained soil excavated as part of the RA will be staged on polyethylene sheeting as described in Section 7.3- Site Preparation;

- The Contractor shall control dust during the RA based on the results of airborne particulate monitoring within the worker's breathing zone. If dust monitoring indicates that ambient dust levels in the worker's breathing zone exceed the action level established in the Health & Safety Plan or airborne dust is observed, the Contractor shall implement appropriate dust control measures. Stockpiled material shall remain covered to control dust generation from staged material;

- The actual limits of the excavation area during remediation activities will be determined with concurrence with the NYSDEC; and

- It is not anticipated that groundwater will be encountered during excavation activities, however, Contractor shall control surface water run-off and storm water that enters the excavation. The water shall be pumped to holding vessels on-site. Contractor shall to the extent practical and control surface water by using diversion berms and covering excavations during any rain events.

7.6 Soil Excavation

The Contractor will be responsible for providing all labor, equipment, and materials to complete the excavation of the hot spot locations outside of the anomaly areas. In general, the Contractor shall perform the following activities:

- The Contractor shall initiate excavation at the locations shown on Figure 7-2. The surveyed locations will be excavated to a depth of approximately 2 and 6 feet respectively, based on historic sampling events and as depicted on Figure 7-2. These areas will be excavated to remove soils from a predetermined depth and a 25-foot radius around the previous sampling locations. Additional excavation may be required based on post-excavation sampling results (section 7.6.1);

- Soil excavated as part of the RA will be staged on polyethylene sheeting as described in Section 7.3 – Site Preparation;

- The Contractor shall control dust during the RA based on the results of airborne particulate monitoring within the worker's breathing zone. If dust monitoring indicates that ambient dust levels in the worker's breathing zone exceed the action level established in the Health & Safety Plan or airborne dust is observed, the Contractor shall implement appropriate dust control measures. Stockpiled material shall remain covered to control dust generation from staged material;

- The actual limits of the excavation area during remediation activities will be determined with concurrence with the NYSDEC; and
- It is not anticipated that groundwater will be encountered during excavation activities; however, Contractor shall control surface water run-off and storm water that enters the excavation. The water shall be pumped to holding vessels on-site. Contractor shall to the extent practical control surface water by using diversion berms and covering excavations during any rain events.

7.6.1 Post Excavation Sampling

After soil is removed to the appropriate depth, post-excavation samples will be collected from the base of each excavation using an approximately 10' x 10' square sampling grid. The samples will not be composited; one sample will be collected and analyzed from each grid point. Soil samples will not be collected when bedrock or extremely large boulders cover the base of an excavation. Post-excavation samples will also be collected from the walls of the excavation. In all excavations, side wall samples will be collected approximately every 10 to 15 lineal feet along excavation walls from the interval between 0-1 foot below the original ground surface. Additional side wall samples will be collected approximately every 10 to 15 lineal feet along excavation walls from the interval between 1 foot below the original ground surface and the base of the excavation. In excavations deeper than 5 feet, two side wall samples will be collected approximately every 10 to 15 lineal feet along excavation walls from the interval between 1 foot below the original ground surface and the base of the excavation.

Samples will be placed in coolers and shipped under chain-of-custody to a NYSDOH ELAP-approved laboratory. Samples in the anomaly areas (2a, 2b, 3 and 4) will be analyzed for TCL Volatiles +10, TCL Semi-Volatiles and Base Neutrals, TCLP Metals. Samples collected in all remaining areas will be analyzed for arsenic only. All analyses will be performed by NYSDEC ASP with Category B deliverables.

7.7 Waste Sampling, Transportation, and Off-Site Disposal

The Contractor shall be responsible for handling, storing, containerizing, transporting (including providing and preparing manifests, bill-of-ladings, etc.), and disposing the following waste streams in accordance with all applicable federal, state, and local laws:

- Drums and drum carcasses removed during this RA;
- Soils excavated as part of this RA;
- Surface and storm water which enters the excavated areas;

- Materials used to construct sediment and erosion control measures;
- Decontamination liquids;
- Personal protective equipment; and
- Stained soil encountered during drum removal RA.

The Contractor will develop a list of anticipated waste streams to be generated, the proposed methods of handling and containerizing each waste stream, and the disposal facilities for each type of waste stream generated and forward them to BASF, Engineer, and the NYSDEC for advanced approval. All waste material generated during the RA shall be disposed of at a BASF approved disposal facility. The Contractor shall also use hazardous waste transporters with a valid 6 NYCRR Part 364 transporter permit, as required, for all waste streams generated during the RA. The Engineer will sample all waste streams for analysis and provide the analysis to the Contractor for characterization. The sampling and testing will be performed in accordance with the existing Quality Assurance/Quality Control Plan (QA/QC) for this Project, which is included as Appendix C of this RAWP.

Copies of manifests or certificates of disposal will be maintained by the Contractor at the Site and will be submitted to the Engineer. BASF will review and sign all manifests and bill-of-ladings. The Engineer will provide copies of manifests or certificates of disposal to BASF at the conclusion of the project. The Contractor shall be responsible for obtaining documentation of weights for each waste shipment from the disposal facilities for invoice payment purposes. The documentation should present the weights of materials disposed at the facility for each manifest or bill-of-lading identification number. A copy of generator's copy of the waste manifest will be sent to BASF purchasing in Mt Olive, NJ when the shipment is loaded. The TSD returned manifest will also be forwarded to BASF purchasing in Mt Olive. BASF purchasing will be responsible for verifying deliveries have been made to the designated TSD.

7.8 Site Restoration

Under this work task, the Contractor shall be responsible for implementing Site restoration activities to restore areas disturbed during the implementation of the RA. The Contractor shall provide all labor, equipment, and materials necessary to complete the following:

- Provide and install a geotextile membrane to act as a separation layer between the bottom of the excavation and any clean material installed. The geotextile membrane shall cover the entire excavation and be of sufficient length to protrude one foot above the surface of the excavation;
- Import clean fill to backfill all excavation locations and disturbed areas;
- Graded to minimize erosion from drainage of stormwater; and
- Mulch and seed areas to establish vegetative cover over disturbed areas.

8.0 REMEDIATION PROJECT PLANS AND SPECIFICATIONS

Remediation Project plans and specifications are provided in Appendix D of this document.

Note: The specifications for the soil cover area are not provided in the attached Technical Specifications, however these specifications will be developed if the Cogeneration plant is not constructed.

9.0 QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

Quality Assurance /Quality Control activities are described in the Quality Assurance Project Plan (QAPP), which also includes the Sampling and Analysis Plan (Appendix C to the RAWP).

All field activities will be conducted with oversight by the Engineer. QA/QC is a responsibility, and a high priority of, the Project Manager. All analytical laboratories used for sample analysis will comply with the requirements of the NYSDEC document "Analytical Laboratory Terms, Division of Environmental Remediation", and will hold current NYSDOH Environmental Laboratory Approval Program (ELAP) certification in all categories of CLP analysis. The 1995 NYSDEC Analytical Services Protocol (ASP) will be followed unless approved otherwise by the NYSDEC Project Manager, for example, if necessary to achieve lower detection limits for evaluation of remedial goals and standards. The laboratory data will be reported in a NYSDEC ASP Category B deliverables package.

All analytical methods, both ASP and non-ASP, are specified in the Quality Assurance Project Plan (QAPP), and any deviations from these methods will be approved in advance by the NYSDEC. Accordingly, the Quality Assurance Officer will maintain close contact with both the NYSDEC and the analytical laboratory to correct any analytical problems that may arise during analysis. A Data Usability Study Report (DUSR), prepared independently of the analytical laboratory, will be prepared for all analytical data to ensure that the data are obtained in a manner to ensure sufficient quality to support subsequent decisions.

The collection of QA/QC samples such as duplicates/replicates, blanks, and Matrix Spikes/Matrix Spikes Duplicates, and use of standard Reference Materials are summarized in the QA/QC Plan.

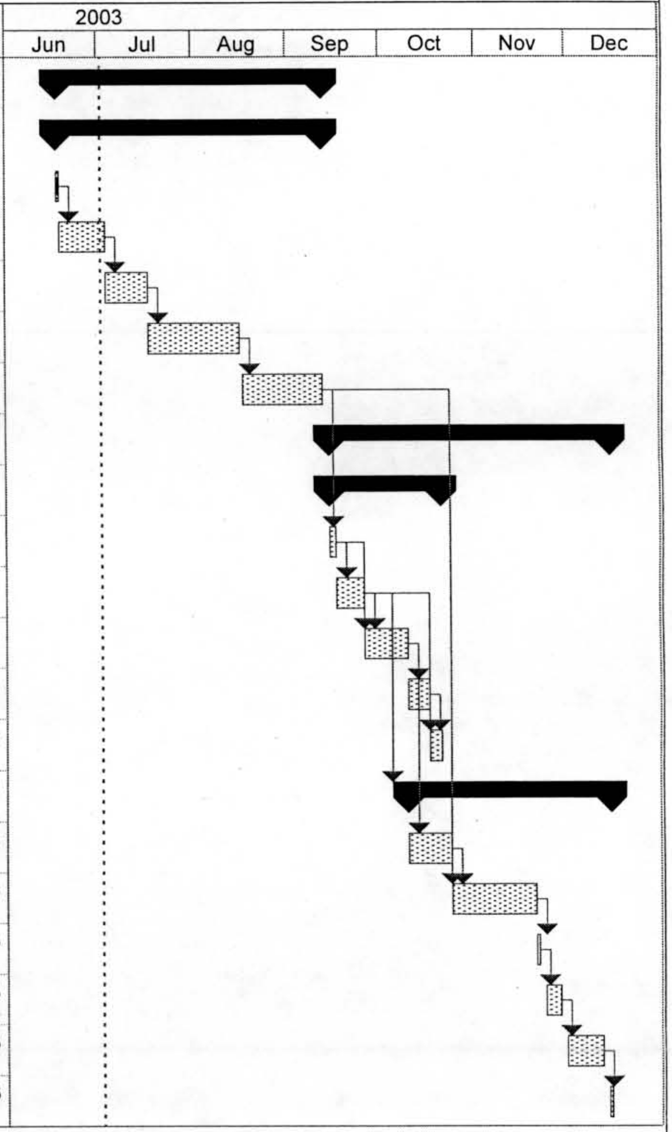
10.0 PROJECT SCHEDULE

A copy of the project schedule (Gantt Chart) is presented in Figure 10-1. Finish and start date dates are also listed.

The schedule reflects an overall project duration of approximately 90 days from submittal of work plan to completion of the RA summary report. This assumes an approval of the work plan by May 4, 2003 and commencement of field work by 5/30/03 and scheduled completion date of draft report on August 29, 2003. The Gantt Chart will be updated on a regular basis.

South 40 Remediation Work Plan
Figure 10-1

ID	ℹ	Task Name	Duration	Start	Finish
1		**Investigation & Work Plans**	**63 days**	**Wed 6/18/03**	**Fri 9/12/03**
2		**Remediation Action Work Plan (RAWP)**	**63 days**	**Wed 6/18/03**	**Fri 9/12/03**
3	✓	NYSDEC Comments Received	1 day	Wed 6/18/03	Wed 6/18/03
4		Final Response to NYSDEC	11 days	Thu 6/19/03	Thu 7/3/03
5		NYSDEC NYSDOH Issuance of Public Notice	10 days	Fri 7/4/03	Thu 7/17/03
6		Public Comment Period	30 edays	Thu 7/17/03	Sat 8/16/03
7		NYSDEC Approval of RAWP	20 days	Mon 8/18/03	Fri 9/12/03
8		**Remedial Action**	**66 days**	**Mon 9/15/03**	**Mon 12/15/03**
9		**Remediation Field Work**	**26 days**	**Mon 9/15/03**	**Mon 10/20/03**
10		Contractor Mobilization	2 days	Mon 9/15/03	Tue 9/16/03
11		Drum Remediation	7 days	Wed 9/17/03	Thu 9/25/03
12		Soil Removal	10 days	Fri 9/26/03	Thu 10/9/03
13		Site Restoration	5 days	Fri 10/10/03	Thu 10/16/03
14		Contractor Demobilization	2 days	Fri 10/17/03	Mon 10/20/03
15		**Remedial Action Report (RAR)**	**47 days**	**Fri 10/10/03**	**Mon 12/15/03**
16		As Built Survey	10 days	Fri 10/10/03	Thu 10/23/03
17		RA Report Preparation	20 days	Fri 10/24/03	Thu 11/20/03
18		Draft RAR to Besicorp/BASF	1 day	Fri 11/21/03	Fri 11/21/03
19		Besicorp/BASF Review	5 days	Mon 11/24/03	Fri 11/28/03
20		Incorporate Comments	10 days	Mon 12/1/03	Fri 12/12/03
21		Draft RAR to NYSDEC (Final Report)	1 day	Mon 12/15/03	Mon 12/15/03

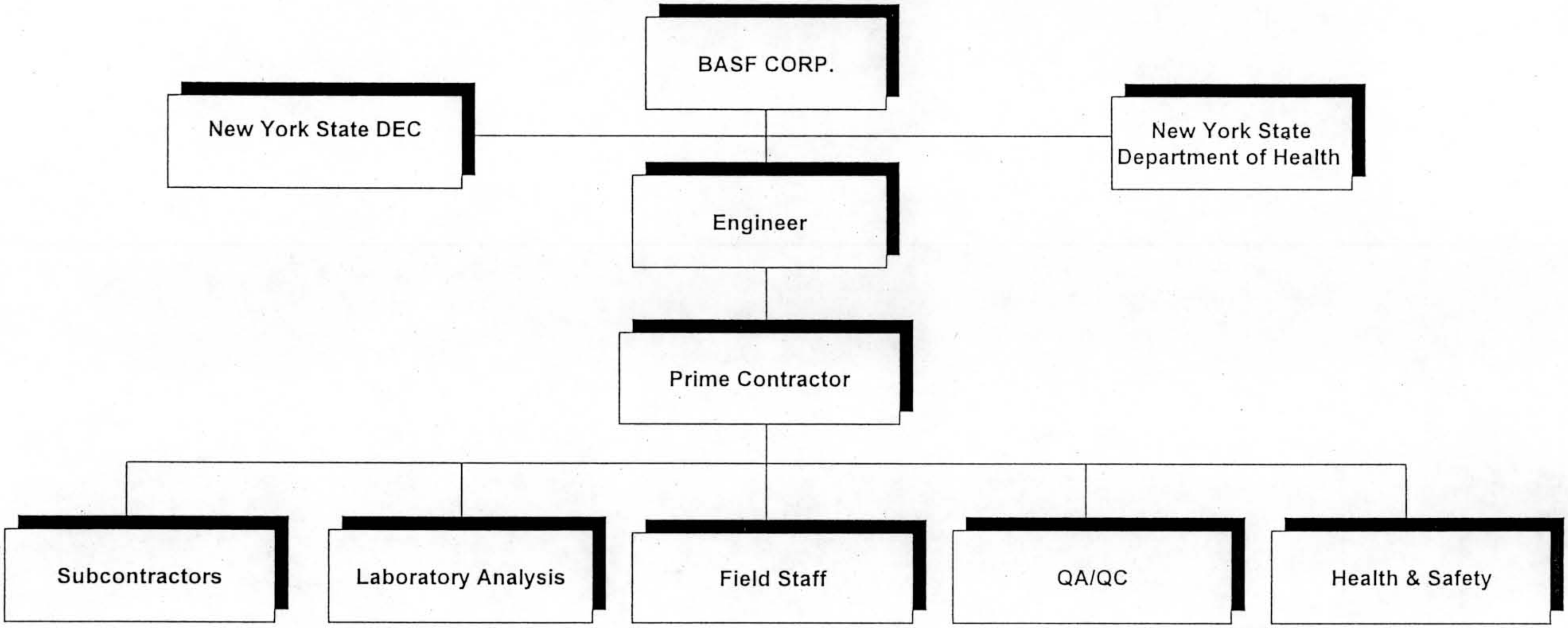


11.0 REMEDIAL ACTION SUMMARY REPORT

Following the completion of the RA at the Site, the Engineer will prepare a draft RA Summary Report. This Report will consist of a narrative and photo-documentation of the work completed by the Contractor, any deviations from the scope of work, quantities of materials utilized, transportation and disposal volumes, types of material, disposal facilities, transporters, analytical data (post-excavation sampling and waste characterization results) and a drawing illustrating the extent of excavation and drum removal area(s). The Report will also include manifests, bills-of-lading, and certificates of disposal. The Engineer will certify that the field activities were performed by the Contractor in accordance with the RAWP. The Report will be stamped and signed by a professional engineer (PE) licensed to practice in the State of New York.

12.0 PROJECT ORGANIZATION

BASF, South 40, Rensselaer, NY Remediation



BASF CORP.

New York State DEC

New York State Department of Health

Engineer

Prime Contractor

Subcontractors

Laboratory Analysis

Field Staff

QA/QC

Health & Safety

13.0 REFERENCES

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New York State Department of Environmental Conservation (NYSDEC). 2000. Addendum to June 1998 Division of Water Technical and Operational Guidance Series (TOGS) No. 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

NYSDEC. 1994. Technical and Administrative Guidance Memorandum on Determination of Soil Cleanup Objectives and Cleanup Levels, dated January 24, 1994.

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Shatkin, J. and R.G. Kowalski. 1998. *Contaminated Soils, Volume 3*. E.J. Calabrese, P.T. Kostecki, and M. Bonazountas, eds. Amherst Scientific Publishers.

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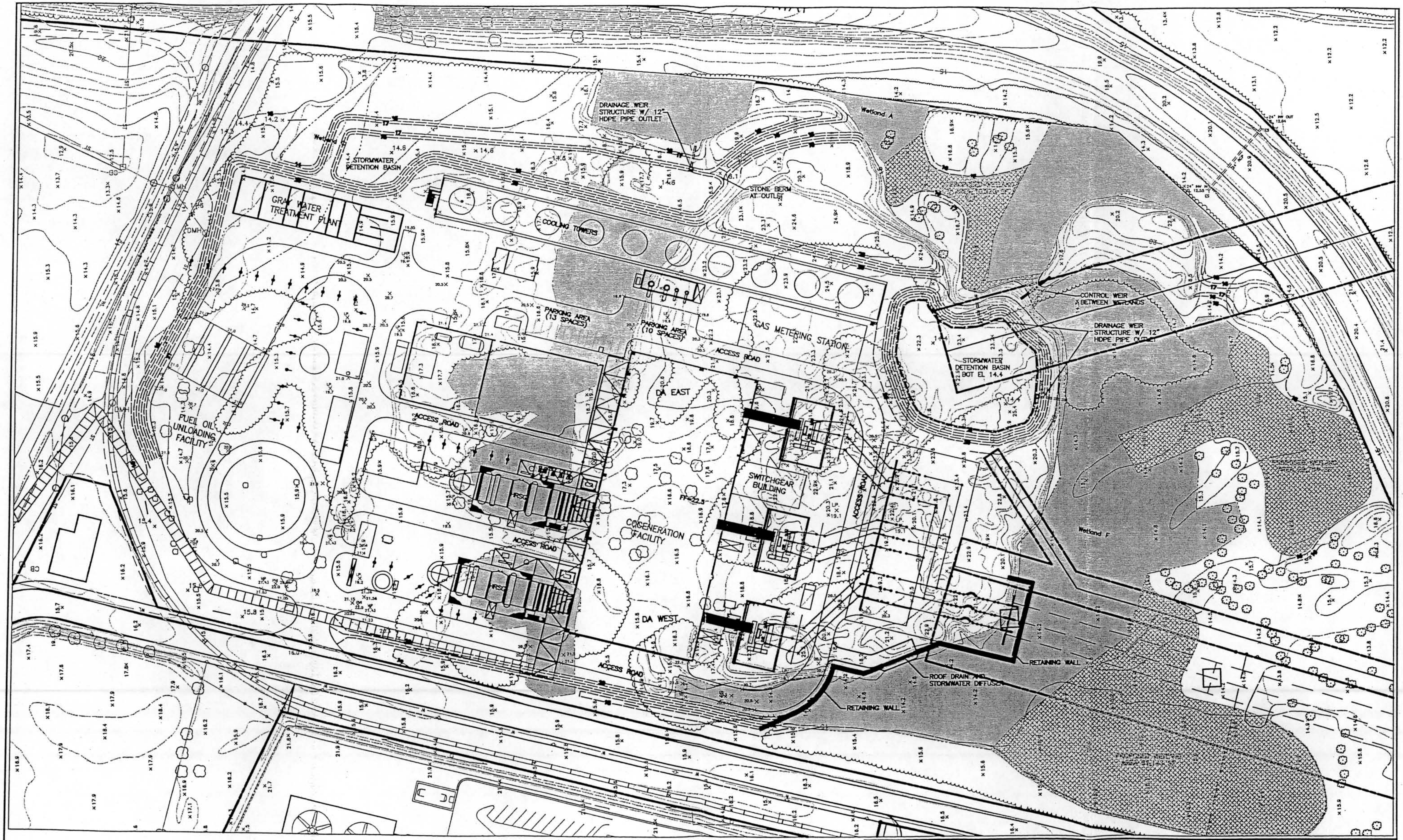
United States Department of Agriculture (USDA). 1988. Soil Survey of Rensselaer County, New York.

FIGURES



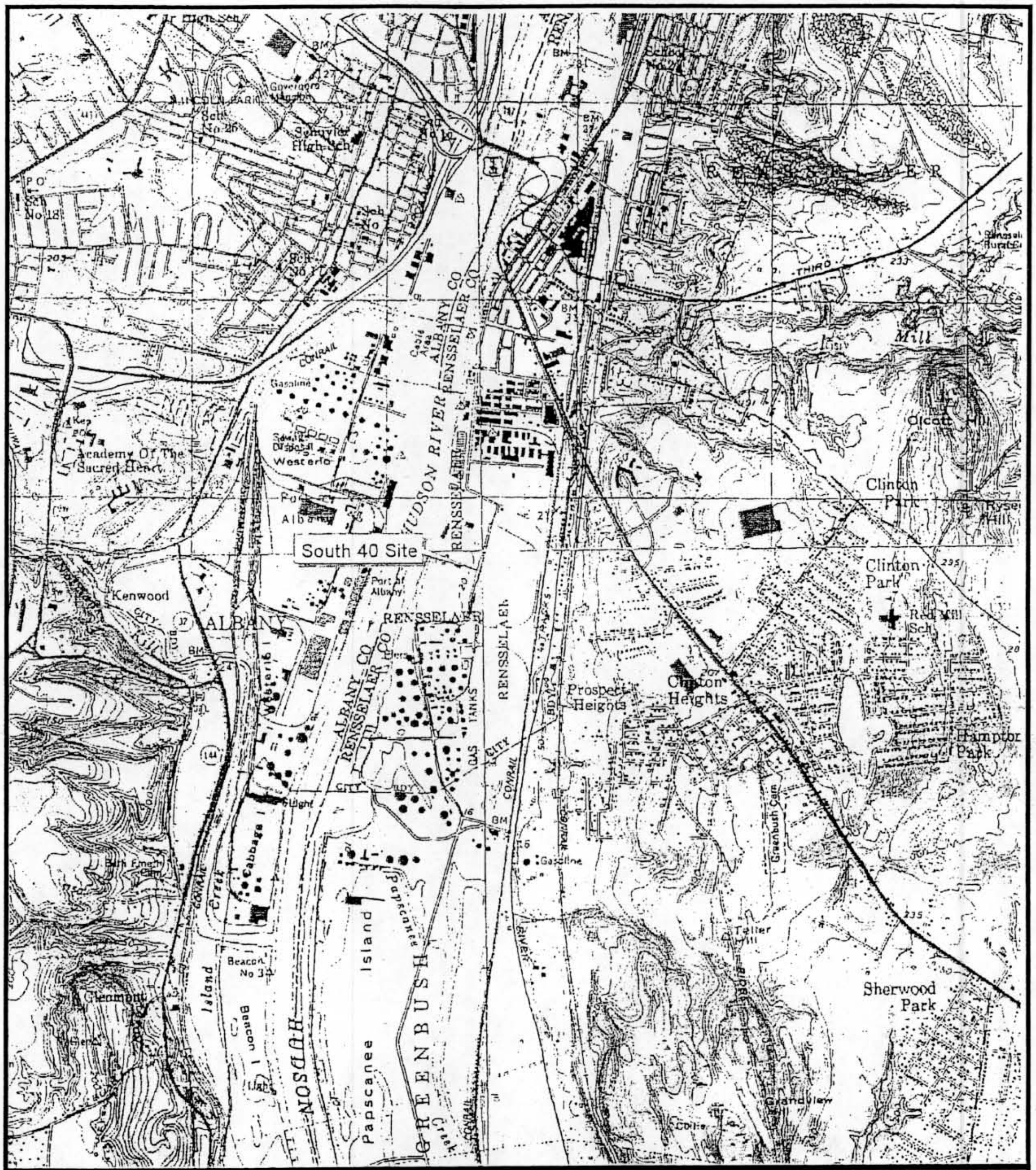
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
40 BRITISH AMERICAN BOULEVARD
LATHAM, NY 12110

CONCEPTUAL SITE LAYOUT

REMEDIATION WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY	DATE	PROJECT NUMBER	FIGURE NUMBER
WPI	03/21/03	60094	1—1

SHEET NUMBER



Base Map Source:
USGS 7.5 Minute Series Topographic Quadrangle Maps
Albany, NY (1980)
Troy South, NY (1980)
Delmar, NY (1980)
East Greenbush, NY (1980)

Figure 2 - 1
Site Location Map
South 40 Site
Rensselaer, New York

NOTE: PHOTOGRAPH DATE: APRIL 14, 2000

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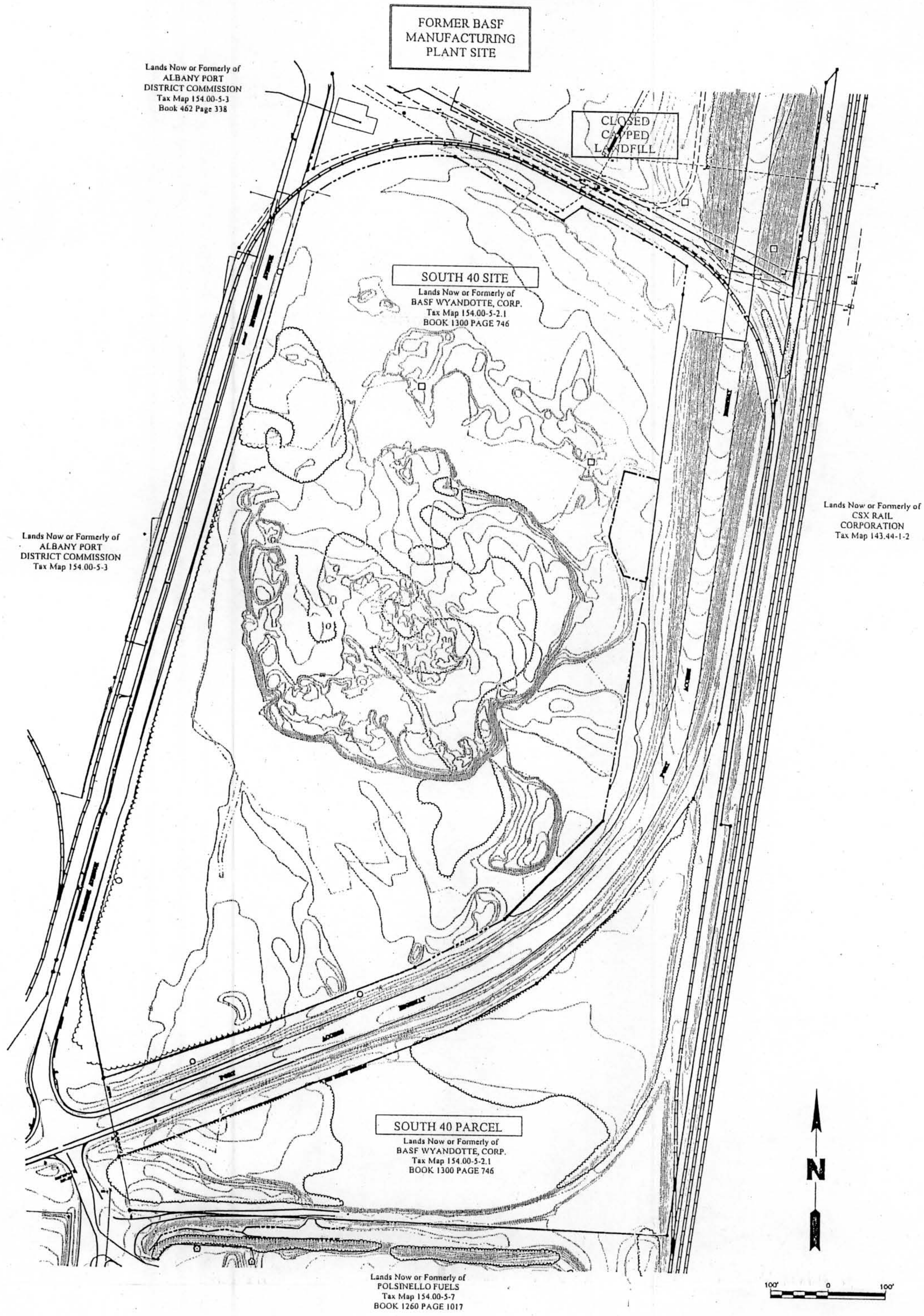
40 British American Blvd.
Latham, New York 12110

BASF PROPERTY AREAS
SOUTH 40 SITE
RENSSELAER, NEW YORK

			FIGURE NUMBER
			2 - 2
DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
LKE	6/27/02		



LEGEND

—×—×—	FENCE LINE
═╪═╪═	RAILROAD TRACKS
┈┈┈	APPROXIMATE WETLAND BOUNDARY
⌒⌒⌒⌒	WOODED AREA
—·—·—	SOUTH 40 SITE BOUNDARY
———	SOUTH 40 PARCEL PROPERTY LINE
——40——	TOPOGRAPHIC ELEVATION LINE (FT AMSL) (CONTOUR INTERVAL = 5')
┄┄┄	TOPOGRAPHIC ELEVATION LINE (FT AMSL) (CONTOUR INTERVAL = 1')

NOTES:

SOUTH 40 SITE IS PART OF THE SOUTH 40 PARCEL.

SITE BASE MAP FROM ROUX ASSOCIATES, INC. DRAWING "SUMMARY OF SOIL SAMPLING DATA" DATED 6/11/2001 (FILE#: BF1115702).

PROPERTY BOUNDARY FROM C.T. MALE ASSOCIATES, P.C. DRAWING "PROPOSED SUBDIVISION PLAN" DATED 5/22/2001 (DWG#: 01-297).

WETLANDS BOUNDARIES FROM ENSR DRAWING "WETLAND PLANS" DATED 9/18/01 (DWG#:WETLANDPLANS) (DRAFT).

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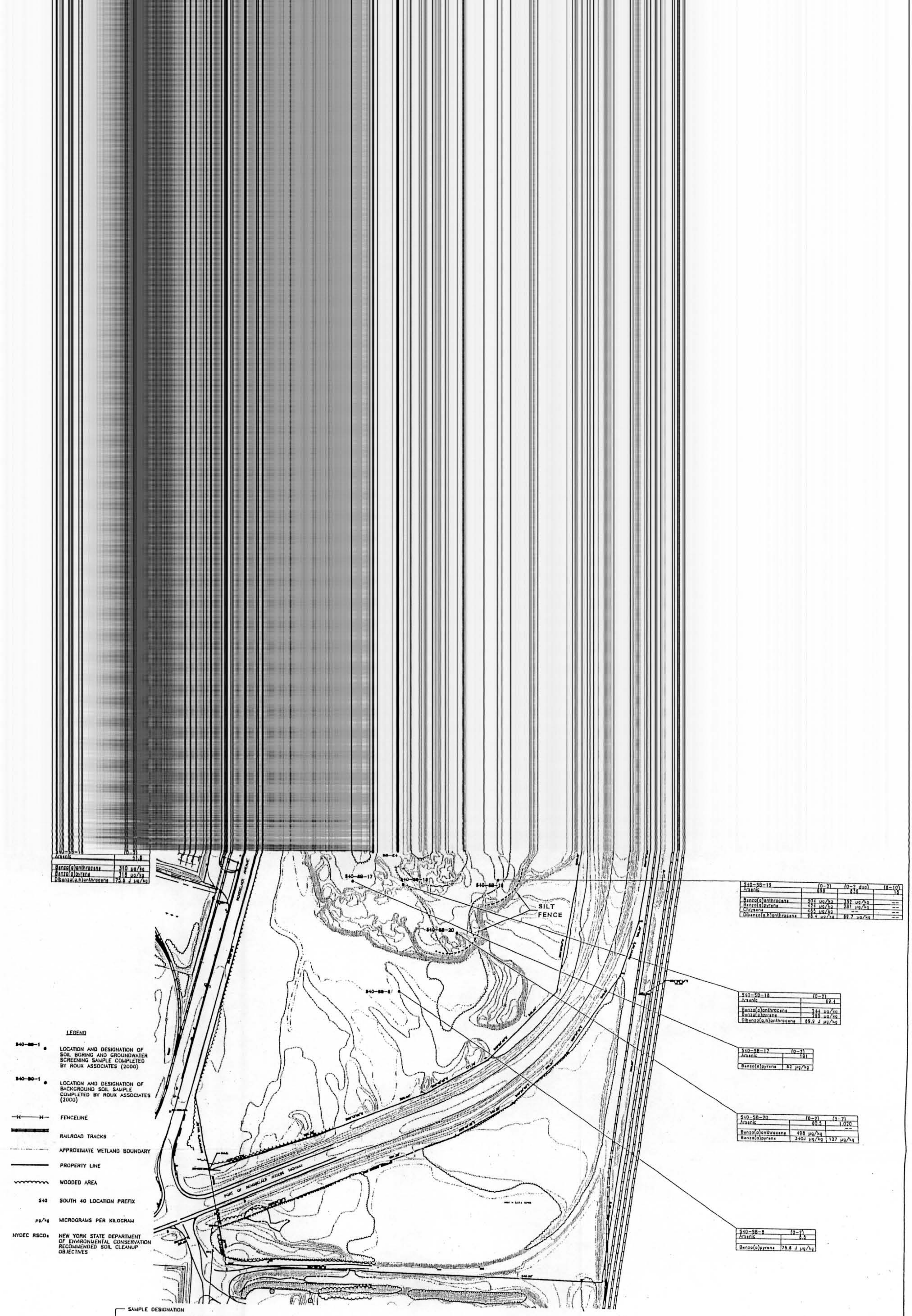
40 BRITISH AMERICAN BOULEVARD
LATHAM, NY 12110

SITE FEATURES

REMEDIATION WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY	DATE	PROJECT NUMBER	FIGURE NUMBER
WPL	03/21/03	60094	2–3

SHEET NUMBER



S40-SB-1	(0-2)
Arsenic	31.8
Benzo(a)anthracene	310 µg/kg
Benzo(a)pyrene	318 µg/kg
Dibenzo(a,h)anthracene	75.8 J µg/kg

S40-SB-19	(0-2)	(0-2 dup)	(8-10)
Arsenic	698	836	18
Benzo(a)anthracene	504 µg/kg	352 µg/kg	--
Benzo(a)pyrene	424 µg/kg	281 µg/kg	--
Chrysene	465 µg/kg	--	--
Dibenzo(a,h)anthracene	98.4 µg/kg	69.7 µg/kg	--

S40-SB-18	(0-2)
Arsenic	69.4
Benzo(a)anthracene	244 µg/kg
Benzo(a)pyrene	295 µg/kg
Dibenzo(a,h)anthracene	89.9 J µg/kg

S40-SB-17	(0-2)
Arsenic	191
Benzo(a)pyrene	82 µg/kg

S40-SB-20	(0-2)	(5-7)
Arsenic	60.5	1,020
		--
Benzo(a)anthracene	498 µg/kg	
Benzo(a)pyrene	340J µg/kg	127 µg/kg

S40-SB-8	(0-2)
Arsenic	8.8
Benzo(a)pyrene	75.6 J µg/kg

LEGEND

S40-SB-1 ●	LOCATION AND DESIGNATION OF SOIL BORING AND GROUNDWATER SCREENING SAMPLE COMPLETED BY ROUX ASSOCIATES (2000)
S40-BG-1 ●	LOCATION AND DESIGNATION OF BACKGROUND SOIL SAMPLE COMPLETED BY ROUX ASSOCIATES (2000)
—×—×—	FENCELINE
═══	RAILROAD TRACKS
----	APPROXIMATE WETLAND BOUNDARY
——	PROPERTY LINE
⌒⌒⌒	WOODED AREA
S40	SOUTH 40 LOCATION PREFIX
µg/kg	MICROGRAMS PER KILOGRAM
NYDEC RSCOs	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION RECOMMENDED SOIL CLEANUP OBJECTIVES

SAMPLE DESIGNATION

DEPTH INTERVAL OF SOIL BORING IN FEET BELOW LAND SURFACE

FIELD DUPLICATE

S40-SB-13	(0-2)	(Dup)
Chromium	16.2	16.2
Copper	25.6	25.6
Nickel	23.2	23.2
Potassium	2,210	2,210
Zinc	74.7 J	--

NOT DETECTED OR DETECTED BELOW NYSDEC RSCOs

INDICATES AN ESTIMATED VALUE

CONCENTRATION IN MILLIGRAMS PER KILOGRAM UNLESS OTHERWISE INDICATED

ANALYTE

E A R T H T E C H

A tyco INTERNATIONAL LTD. COMPANY

40 British American Blvd.
Latham, NY 12110

HISTORICAL SAMPLING LOCATIONS

REMEDIAL ACTION
WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY	DATE	PROJECT NUMBER
WPL	03/21/03	60094

FIGURE NUMBER

3-1

SHEET NUMBER

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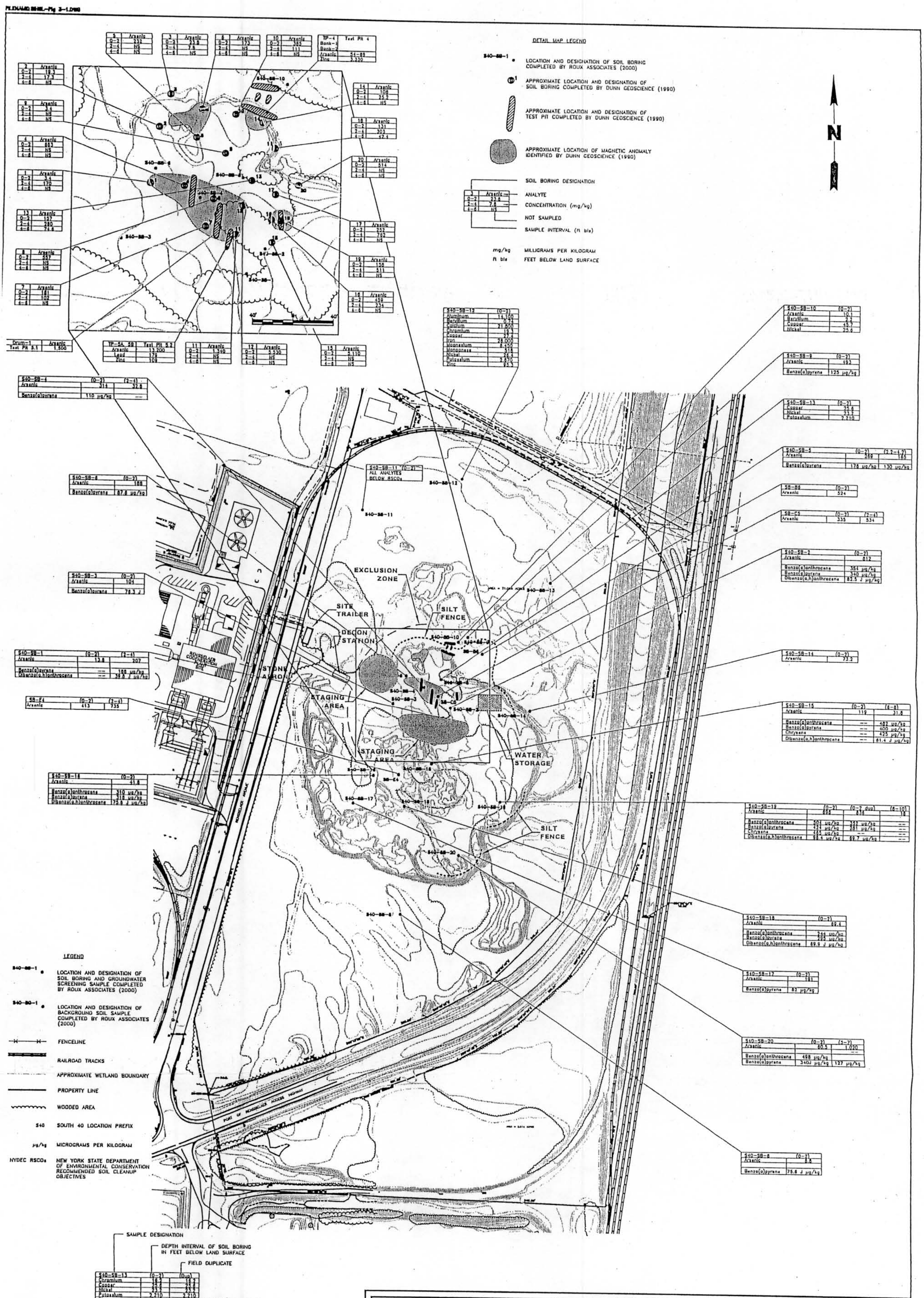

DETAIL MAP LEGEND

- S40-SB-1 ● LOCATION AND DESIGNATION OF SOIL BORING COMPLETED BY ROUX ASSOCIATES (2000)
- ⓓ¹ APPROXIMATE LOCATION AND DESIGNATION OF SOIL BORING COMPLETED BY DUNN GEOSCIENCE (1990)
- ▨ APPROXIMATE LOCATION AND DESIGNATION OF TEST PIT COMPLETED BY DUNN GEOSCIENCE (1990)
- ● APPROXIMATE LOCATION OF MAGNETIC ANOMALY IDENTIFIED BY DUNN GEOSCIENCE (1990)

3	Arsenic
0-2	23.8
2-4	7.8
4-6	NS

SOIL BORING DESIGNATION
ANALYTE
CONCENTRATION (mg/kg)
NOT SAMPLED
SAMPLE INTERVAL (ft bls)

mg/kg MILLIGRAMS PER KILOGRAM
ft bls FEET BELOW LAND SURFACE

1	Arsenic
0-2	3.4
2-4	170
4-6	NS

2	Arsenic
0-2	19.3
2-4	17.3
4-6	NS

3	Arsenic
0-2	23.8
2-4	7.8
4-6	NS

4	Arsenic
0-2	883
2-4	NS
4-6	NS

5	Arsenic
0-2	232
2-4	NS
4-6	NS

6	Arsenic
0-2	173
2-4	NS
4-6	NS

7	Arsenic
0-2	181
2-4	102
4-6	NS

8	Arsenic
0-2	557
2-4	NS
4-6	NS

9	Arsenic
0-2	3.4
2-4	NS
4-6	NS

10	Arsenic
0-2	385
2-4	111
4-6	NS

11	Arsenic
0-2	1,340
2-4	NS
4-6	NS

12	Arsenic
0-2	5,530
2-4	NS
4-6	NS

13	Arsenic
0-2	157
2-4	280
4-6	74.6

14	Arsenic
0-2	108
2-4	25.2
4-6	NS

15	Arsenic
0-2	5,110
2-4	NS
4-6	NS

16	Arsenic
0-2	459
2-4	234
4-6	NS

17	Arsenic
0-2	252
2-4	782
4-6	NS

18	Arsenic
0-2	131
2-4	303
4-6	42.4

19	Arsenic
0-2	156
2-4	511
4-6	NS

20	Arsenic
0-2	514
2-4	NS
4-6	NS

TP-4	Test Pit 4
Bank-1 Bank-2	
Arsenic	54-89
Zinc	3,330

Drum-1 Test Pit 5.1	Arsenic 1,500

TP-5A, 5B	Test Pit 5.2
Arsenic	13,200
Lead	179
Zinc	109

S40-SB-4	(0-2)	(2-4)
Arsenic	314	32.8
Benzo(a)pyrene	110 µg/kg	--

S40-SB-12	(0-2)
Aluminum	14,100
Beryllium	0.74
Calcium	21,800
Chromium	19.3
Copper	27.4
Iron	28,000
Magnesium	8,450
Manganese	518
Nickel	26.4
Potassium	2,570
Zinc	95.3

S40-SB-10	(0-2)
Arsenic	10.1
Beryllium	2.2
Copper	45.7
Nickel	25.6

S40-SB-9	(0-2)
Arsenic	493
Benzo(a)pyrene	125 µg/kg

S40-SB-13	(0-2)
Copper	25.6
Nickel	23.2
Potassium	2,210

S40-SB-5	(0-2)	(2.2-4.2)
Arsenic	269	165
Benzo(a)pyrene	178 µg/kg	130 µg/kg

SB-B6	(0-2)
Arsenic	524

SB-C5	(0-2)	(2-4)
Arsenic	335	534

S40-SB-2	(0-2)
Arsenic	812
Benzo(a)anthracene	354 µg/kg
Benzo(a)pyrene	340 µg/kg
Dibenzo(a,h)anthracene	82.5 J µg/kg

S40-SB-11 (0-2)
ALL ANALYTES BELOW RSCOs

S40-SB-8	(0-2)
Arsenic	188
Benzo(a)pyrene	87.8 µg/kg

S40-SB-3	(0-2)
Arsenic	104
Benzo(a)pyrene	78.3 J

S40-SB-1	(0-2)	(2-4)
Arsenic	13.8	207
Benzo(a)pyrene	--	188 µg/kg
Dibenzo(a,h)anthracene	--	39.8 J µg/kg

SB-E4	(0-2)	(2-4)
Arsenic	413	735

S40-SB-14	(0-2)
Arsenic	73.2

S40-SB-15	(0-2)	(6-8)
Arsenic	119	31.8
Benzo(a)anthracene	--	482 µg/kg
Benzo(a)pyrene	--	400 µg/kg
Chrysene	--	425 µg/kg
Dibenzo(a,h)anthracene	--	81.4 J µg/kg

S40-SB-16	(0-2)
Arsenic	41.8
Benzo(a)anthracene	310 µg/kg
Benzo(a)pyrene	318 µg/kg
Dibenzo(a,h)anthracene	75.8 J µg/kg

S40-SB-19	(0-2)	(0-2 dup)	(8-10)
Arsenic	898	836	18
Benzo(a)anthracene	504 µg/kg	332 µg/kg	--
Benzo(a)pyrene	424 µg/kg	281 µg/kg	--
Chrysene	465 µg/kg	--	--
Dibenzo(a,h)anthracene	98.4 µg/kg	69.7 µg/kg	--

S40-SB-18	(0-2)
Arsenic	69.4
Benzo(a)anthracene	244 µg/kg
Benzo(a)pyrene	295 µg/kg
Dibenzo(a,h)anthracene	89.9 J µg/kg

S40-SB-17	(0-2)
Arsenic	191
Benzo(a)pyrene	82 µg/kg

S40-SB-20	(0-2)	(5-7)
Arsenic	60.5	1,020
		--
Benzo(a)anthracene	498 µg/kg	
Benzo(a)pyrene	340J µg/kg	127 µg/kg

S40-SB-6	(0-2)
Arsenic	8.8
Benzo(a)pyrene	75.6 J µg/kg

LEGEND

- S40-SB-1 ● LOCATION AND DESIGNATION OF SOIL BORING AND GROUNDWATER SCREENING SAMPLE COMPLETED BY ROUX ASSOCIATES (2000)
- S40-BO-1 ● LOCATION AND DESIGNATION OF BACKGROUND SOIL SAMPLE COMPLETED BY ROUX ASSOCIATES (2000)
- FENCELINE
- RAILROAD TRACKS
- APPROXIMATE WETLAND BOUNDARY
- PROPERTY LINE
- WOODED AREA
- S40 SOUTH 40 LOCATION PREFIX
- µg/kg MICROGRAMS PER KILOGRAM
- NYDEC RSCOs NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION RECOMMENDED SOIL CLEANUP OBJECTIVES

SAMPLE DESIGNATION
DEPTH INTERVAL OF SOIL BORING IN FEET BELOW LAND SURFACE
FIELD DUPLICATE

S40-SB-13	(0-2)	(Dup)
Chromium	16.2	16.2
Copper	25.6	25.6
Nickel	23.2	23.2
Potassium	2,210	2,210
Zinc	74.7 J	--

NOT DETECTED OR DETECTED BELOW NYSDEC RSCOs
INDICATES AN ESTIMATED VALUE
CONCENTRATION IN MILLIGRAMS PER KILOGRAM UNLESS OTHERWISE INDICATED
ANALYTE

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HISTORICAL SAMPLING LOCATIONS
REMEDIAL ACTION
WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

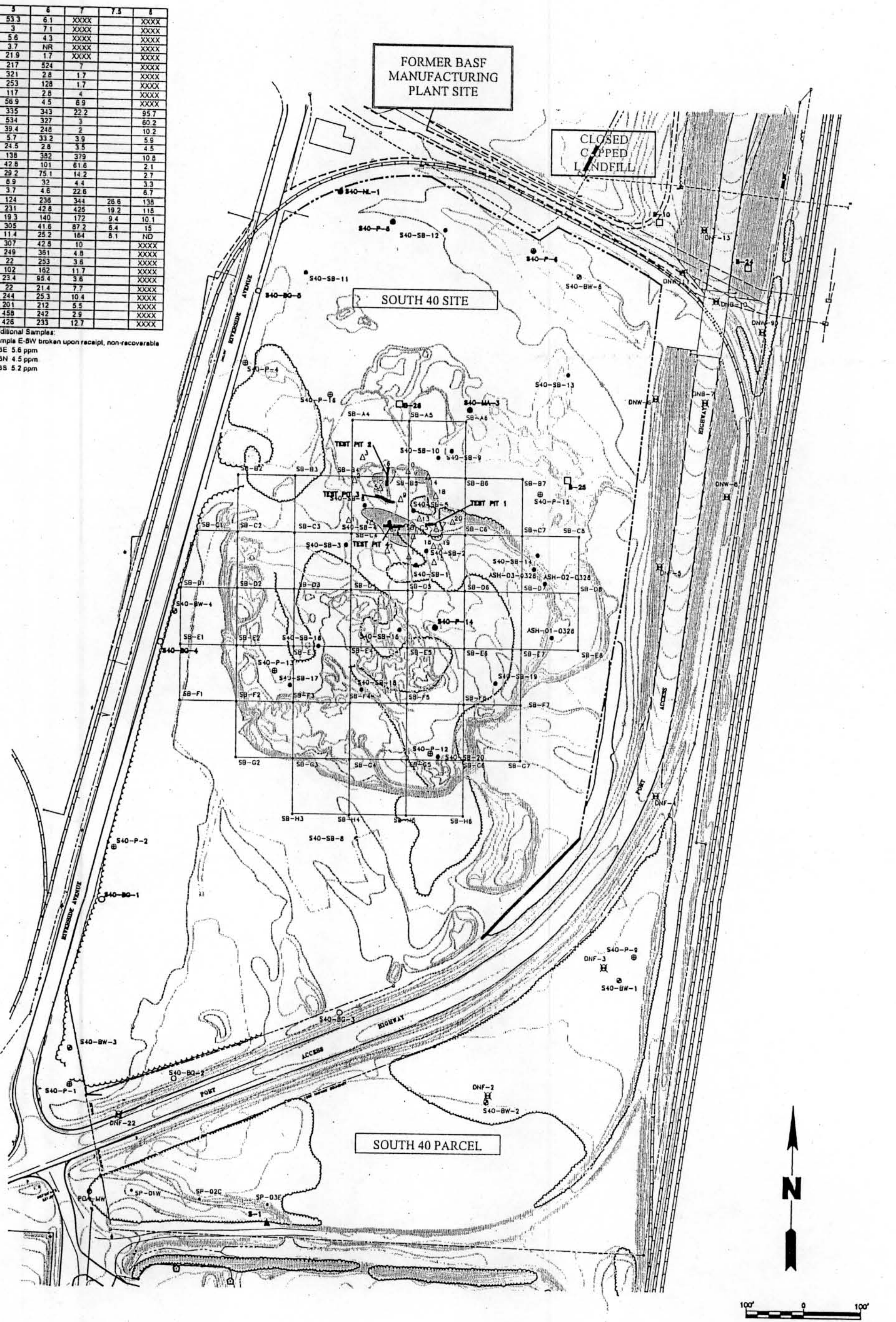
DRAWN BY	DATE	PROJECT NUMBER
WPL	03/21/03	60094

FIGURE NUMBER
3-1
SHEET NUMBER

Grid	Interval	1	2	3	4	5	6	7	7.5	8
A	0-2	XXXX	XXXX	XXXX	12.3	53.3	6.1	XXXX		XXXX
A	2-4	XXXX	XXXX	XXXX	8.2	3	7.1	XXXX		XXXX
A	4-6	XXXX	XXXX	XXXX	3.7	5.6	4.3	XXXX		XXXX
A	6-8	XXXX	XXXX	XXXX	7.1	3.7	NR	XXXX		XXXX
A	8-10	XXXX	XXXX	XXXX	4.2	21.9	1.7	XXXX		XXXX
B	0-2	XXXX	21.6	28.7	110	217	524	7		XXXX
B	2-4	XXXX	7.6	7.9	7.2	321	2.8	1.7		XXXX
B	4-6	XXXX	8.3	6.9	3.8	253	128	1.7		XXXX
B	6-8	XXXX	5.9	3.5	3.9	117	2.8	4		XXXX
B	8-10	XXXX	4	2.8	5.9	56.9	4.5	6.9		XXXX
C	0-2	7.5	19.8	64	65.1	335	343	22.2		95.7
C	2-4	5.1	112	7.2	30	534	327	3		60.2
C	4-6	6.8	NS	6.7	17.4	39.4	248	2		10.2
C	6-8	ND	NS	6.6	4.5	5.7	33.2	3.9		5.9
C	8-10	NS	NS	3.9	4.4	24.5	2.8	3.5		4.5
D	0-2	8.4	42.6	35.4	55.4	138	382	379		10.8
D	2-4	5.1	6.4	110	24.2	42.8	101	61.6		2.1
D	4-6	3.1	15.3	12.4	28.1	29.2	75.1	14.2		2.7
D	6-8	2.6	12.1	9	5.9	8.9	32	4.4		3.3
D	8-10	3.8	13.8	13.1	4.4	3.7	4.6	22.6		8.7
E	0-2	6.5	52.5	193	413	124	236	344	26.6	138
E	2-4	9.5	384	4.8	736	231	42.8	425	19.2	118
E	4-6	XXXX	165	16	74.5	19.3	140	172	9.4	10.1
E	6-8	XXXX	51.6	10.5	6.8	305	41.6	87.2	6.4	15
E	8-10	XXXX	33.1	15.9	15.4	11.4	25.2	164	8.1	ND
F	0-2	XXXX	XXXX	111	78.8	307	42.8	10		XXXX
F	2-4	XXXX	XXXX	42	61.6	249	361	4.8		XXXX
F	4-6	XXXX	XXXX	24.2	68.3	22	253	3.6		XXXX
F	6-8	XXXX	XXXX	8.8	80.1	102	162	11.7		XXXX
F	8-10	XXXX	XXXX	20.1	63.2	23.4	95.4	3.6		XXXX
G	0-2	XXXX	XXXX	XXXX	XXXX	22	21.4	7.7		XXXX
G	2-4	XXXX	XXXX	XXXX	XXXX	244	25.3	10.4		XXXX
G	4-6	XXXX	XXXX	XXXX	XXXX	201	212	5.5		XXXX
G	6-8	XXXX	XXXX	XXXX	XXXX	458	242	2.9		XXXX
G	8-10	XXXX	XXXX	XXXX	XXXX	426	233	12.7		XXXX

XXXX indicates no samples taken
Results are shown in milligrams per kilogram (mg/kg)
ND-Arsenic not Detected
NS-Native Soil
Sample result exceeds RSCO of 7.5 ppm

Additional Samples:
Sample E-8W broken upon receipt, non-recoverable
E-8E 5.6 ppm
E-8N 4.5 ppm
E-8S 5.2 ppm



LEGEND

○ BACKGROUND SOIL SAMPLE LOCATION, INSTALLED BY ROUX (2000)

⊙ MONITORING WELL, INSTALLED BY URS (1988)

⊕ PIEZOMETER, INSTALLED BY URS (1987)

△ SOIL BORING, INSTALLED BY DUNN GEOSCIENCE (1990)

☐ SOIL BORING, INSTALLED BY DAMES & MOORE (1978)

⌘ SOIL BORING, INSTALLED BY CLOUGH HARBOR AND ASSOCIATES (FOR NYSDOT) (1985)

| APPROXIMATE LOCATION AND DESIGNATION OF TEST PIT COMPLETED BY EARTH TECH (2002).

▨ APPROXIMATE LOCATION OF MAGNETIC ANOMALY IDENTIFIED BY DUNN GEOSCIENCE (1990)

☐ 100' GRID

● SB-A1 SAMPLING LOCATION

LEGEND

FENCE LINE

RAILROAD TRACKS

APPROXIMATE WETLAND BOUNDARY

WOODED AREA

SOUTH 40 SITE BOUNDARY

SOUTH 40 PARCEL PROPERTY LINE

TOPOGRAPHIC ELEVATION LINE (FT AMSL) (CONTOUR INTERVAL = 5')

TOPOGRAPHIC ELEVATION LINE (FT AMSL) (CONTOUR INTERVAL = 1')

NOTES:

SOUTH 40 SITE IS PART OF THE SOUTH 40 PARCEL.

SITE BASE MAP FROM ROUX ASSOCIATES, INC. DRAWING "SUMMARY OF SOIL SAMPLING DATA" DATED 6/11/2001 (FILE#: BF1115702).

PROPERTY BOUNDARY FROM C.T. MALE ASSOCIATES, P.C. DRAWING "PROPOSED SUBDIVISION PLAN" DATED 5/22/2001 (DWG#: 01-297).

WETLANDS BOUNDARIES FROM ENSR DRAWING "WETLAND PLANS" DATED 9/18/01 (DWG#:WETLANDPLANS) (DRAFT).

ROUX, URS, AND DUNN SAMPLING LOCATIONS FROM ROUX ASSOCIATES, INC. DRAWING "SUMMARY OF SOIL SAMPLING DATA", DATED 6/11/2001 (FILE#:BF1115702).

CLOUGH HARBOR SAMPLING LOCATIONS FROM ENSR DRAWING "SOIL BORING LOCATIONS", DATED 4/21/2001 (FILE#:SOIL BORING LOCS).

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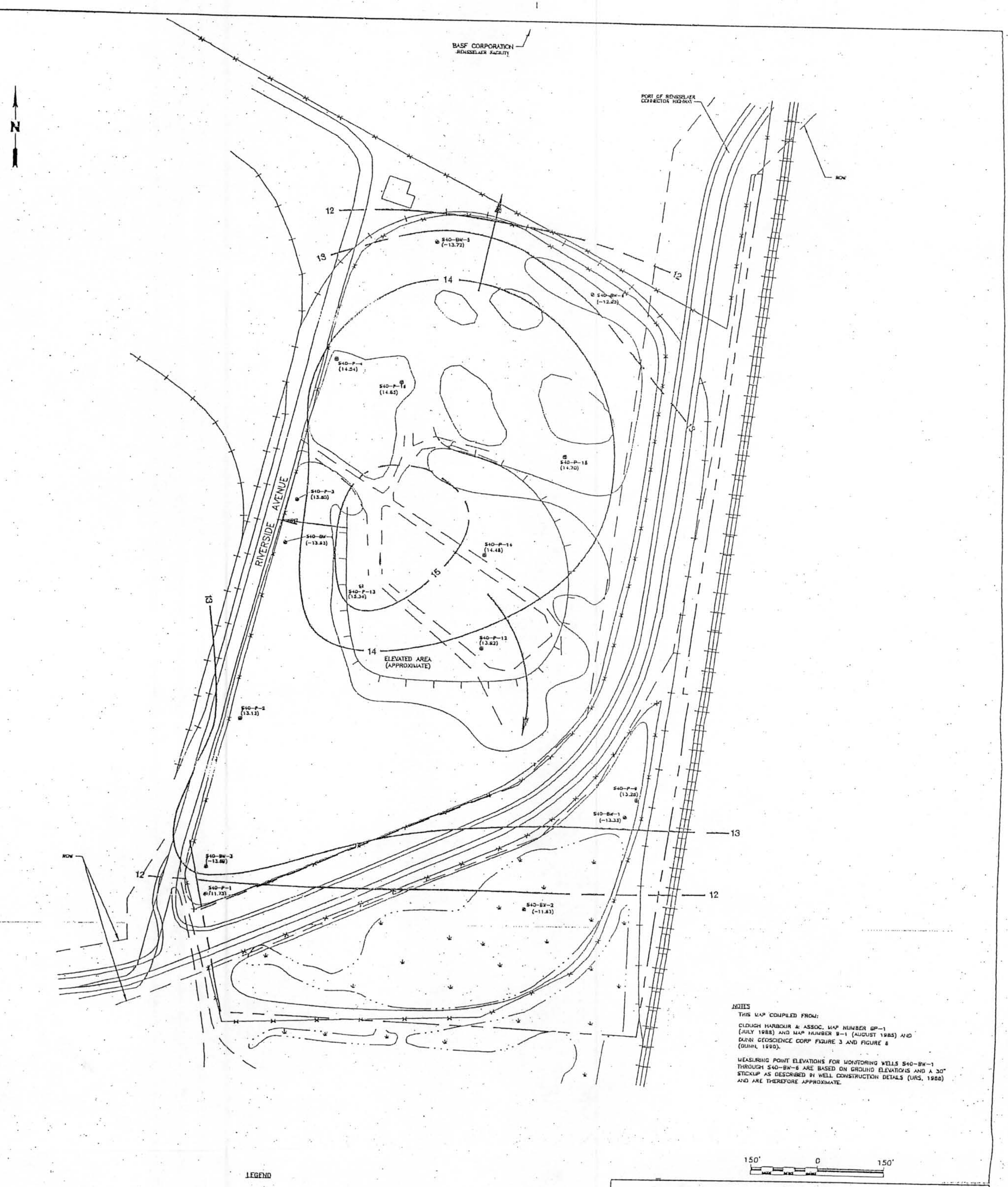
SAMPLING RESULTS
SUPPLEMENTAL SITE INVESTIGATION
REPORT
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY:	DATE:	PROJECT NUMBER:
WPL	03/21/03	

FIGURE NUMBER:
3-2
SHEET NUMBER:



NOTES

THIS MAP COMPILED FROM:

CLOUGH HARBOUR & ASSOC. MAP NUMBER GP-1 (JULY 1988) AND MAP NUMBER B-1 (AUGUST 1985) AND DUNN GEOSCIENCE CORP FIGURE 3 AND FIGURE 6 (DUNN, 1990).

MEASURING POINT ELEVATIONS FOR MONITORING WELLS S40-BW-1 THROUGH S40-BW-6 ARE BASED ON GROUND ELEVATIONS AND A 30" STICKUP AS DESCRIBED IN WELL CONSTRUCTION DETAILS (URS, 1988) AND ARE THEREFORE APPROXIMATE.

LEGEND

S40-P-8 ⊕	EXISTING PIEZOMETER	— — ——	PROPERTY LINE
S40-BW-1 ●	EXISTING MONITORING WELL	⫝	MARSHLAND
(14.70)	WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL	~~~	DENSELY WOODED AREA
(-13.89)	APPROXIMATE WATER LEVEL ELEVATION (SEE NOTE) IN FEET ABOVE MEAN SEA LEVEL	S40	SOUTH 40 LOCATION PREFIX
☐	EXISTING BUILDING	—— 12	CONTOUR OF EQUAL WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE INFERRED)
—×——×—	FENCELINE	←——	INFERRED DIRECTION OGROUNDWATER FLOW
—+——+—	RAILROAD TRACKS		

WATER-LEVEL ELEVATIONS
APRIL 2000

SOUTH 40 PARCEL, RENSSELAER, NEW YORK

DATE: AUGUST 2002 | SCALE: AS SHOWN

FIGURE 4-1

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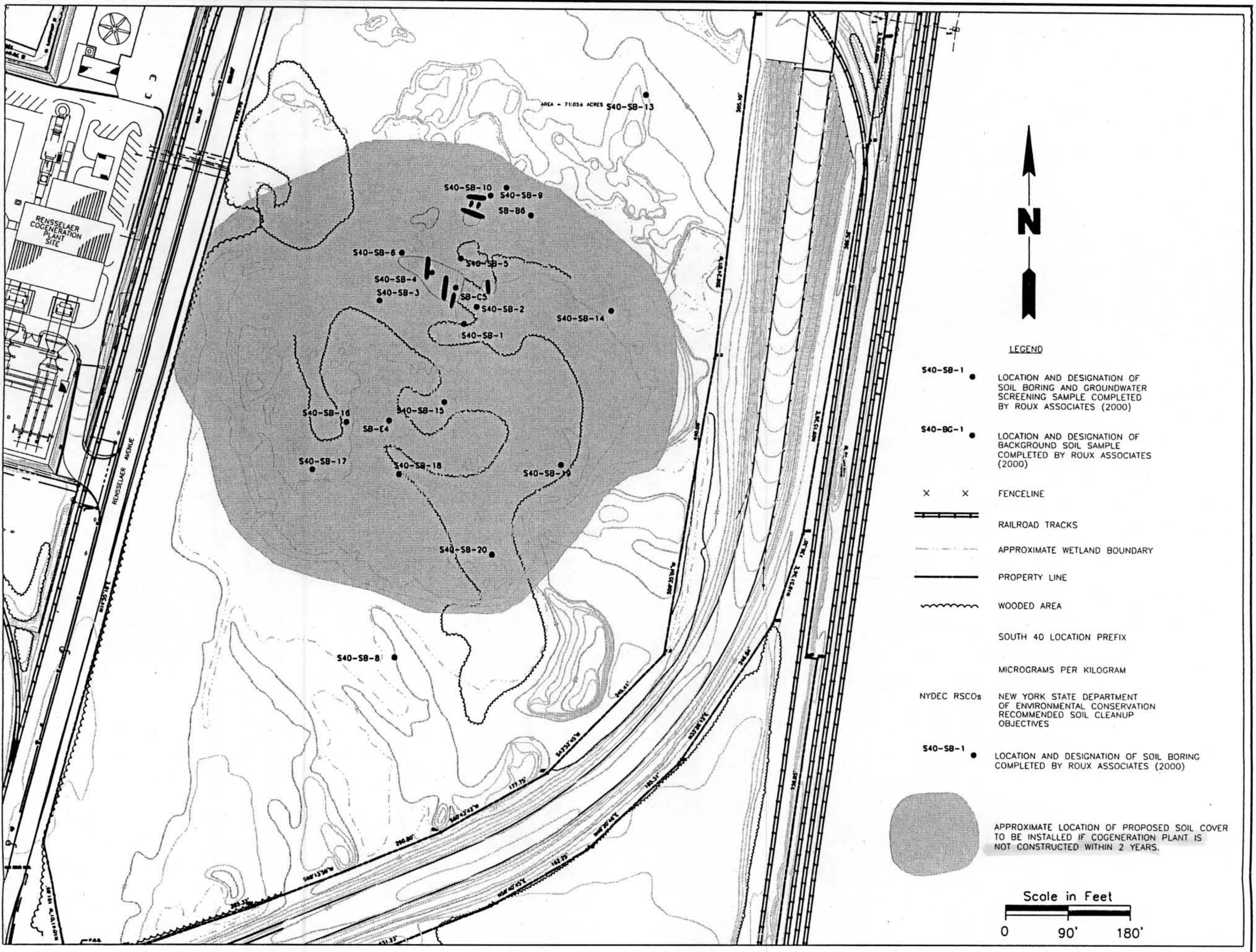
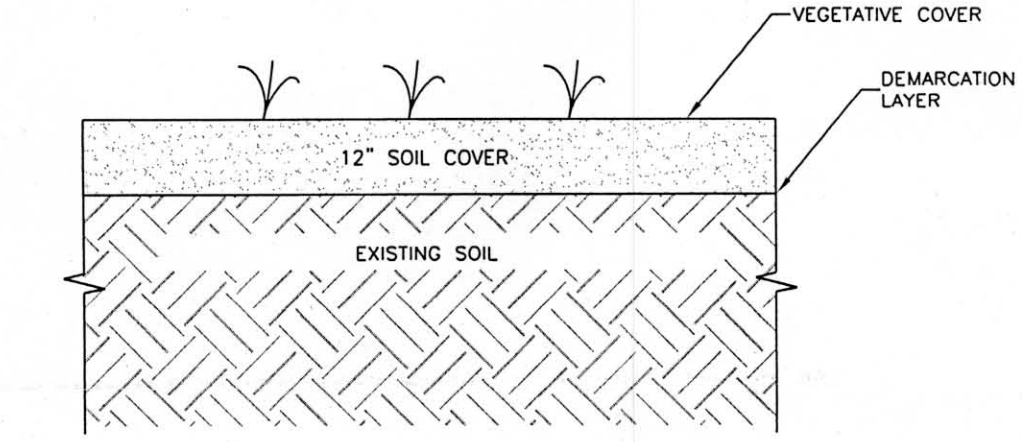
\60094\CADD\Remedial\proposed-soil-cover-area_Fig6-1.dwg





PROPOSED SOIL COVER DETAIL

NTS

EARTH TECH
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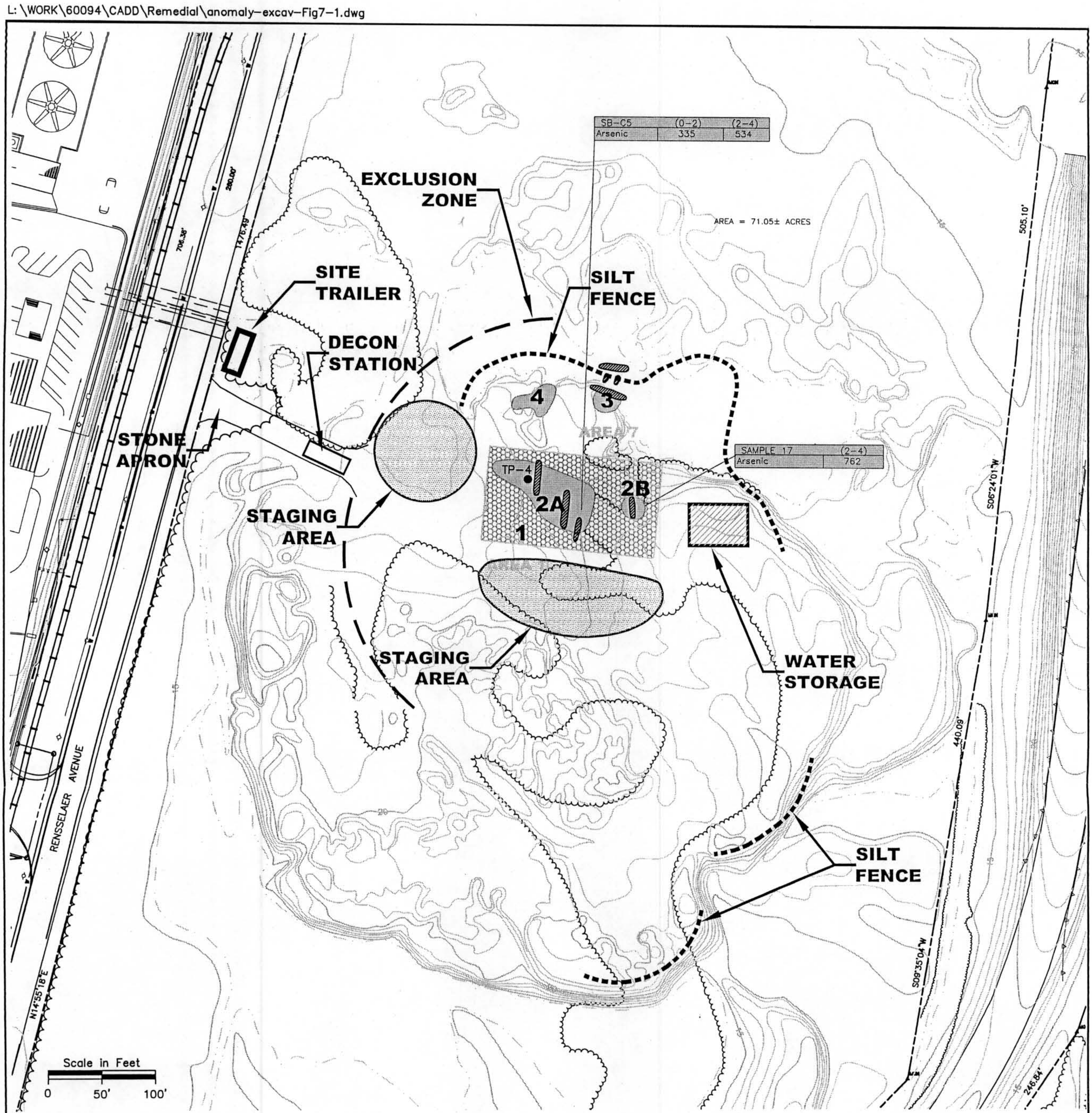
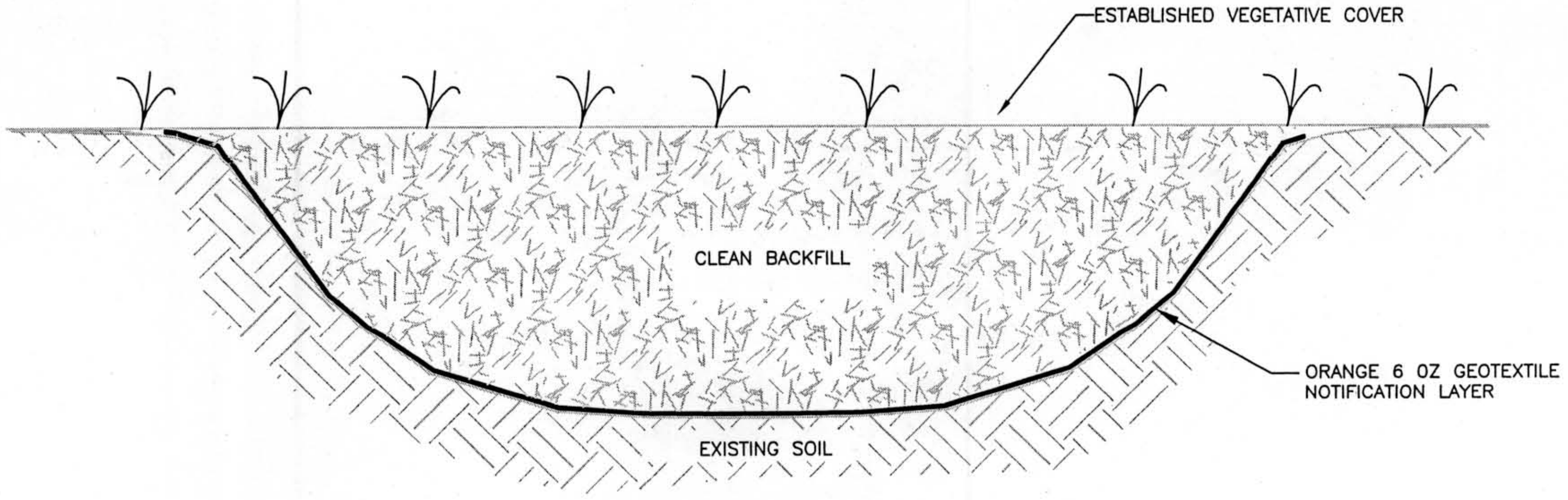
PROPOSED SOIL COVER AREA
REMEDIAL ACTION
WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY:	DATE:	PROJECT NUMBER:
WPL	03/31/03	60094

FIGURE NUMBER:
6–1
SHEET NUMBER:

L:\WORK\60094\CADD\Remedial\anomaly-excav-Fig7-1.dwg





EXCAVATION RESTORATION DETAIL

NTS

LEGEND

▨ 0 – 2 FT. EXCAVATION

NOTE
NUMBERED ITEMS TO BE EXCAVATED BASED ON VISUAL AND CONFIRMATION ANALYSIS.

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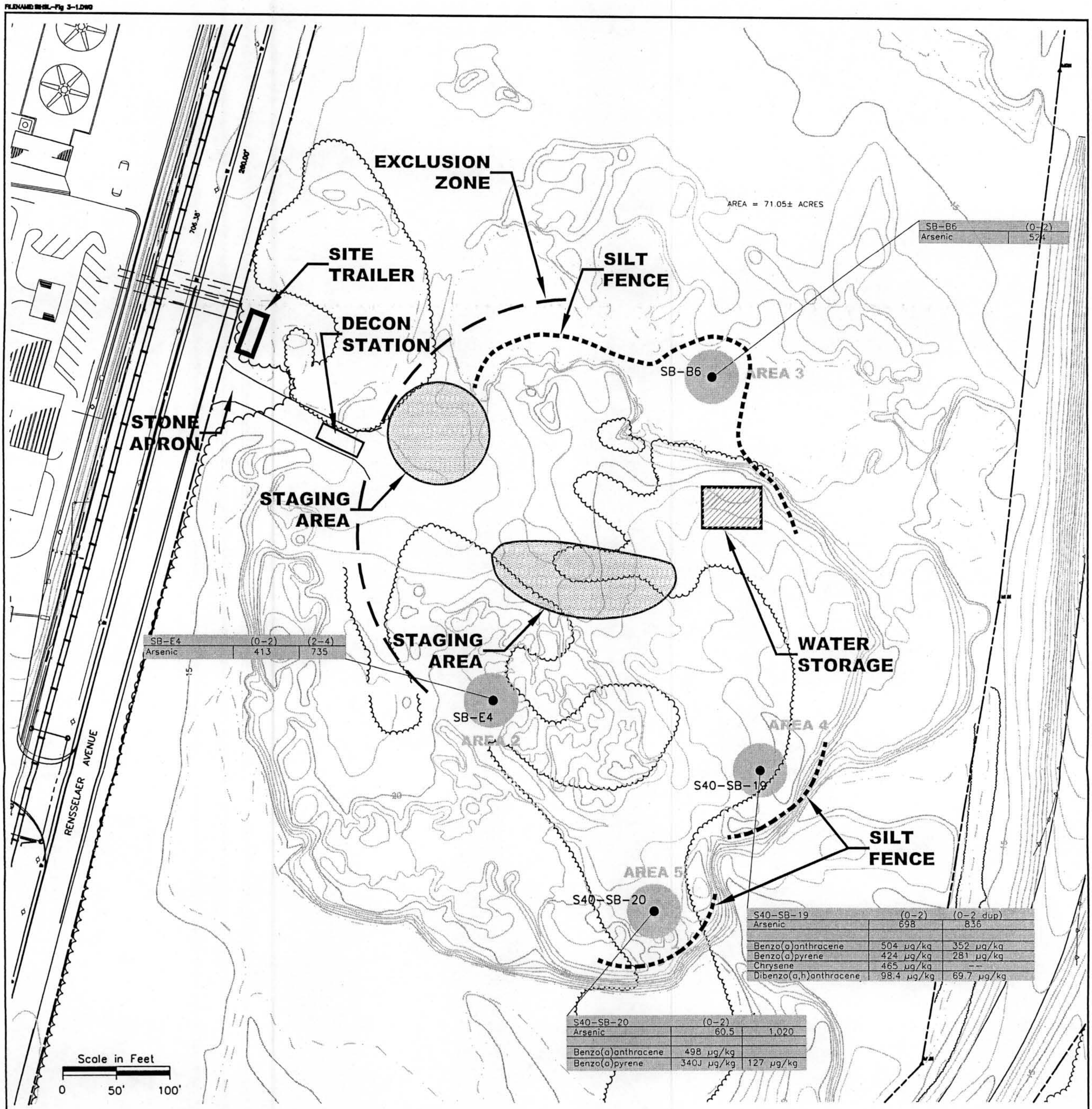
ANAMOLY AREA EXCAVATION LOCATIONS
REMEDIAL ACTION
WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY:	DATE:	PROJECT NUMBER:
WPL	3/28/03	60094

FIGURE NUMBER:
7–1
SHEET NUMBER:

FILENAME: SHSL-Fig 3-1.DWG

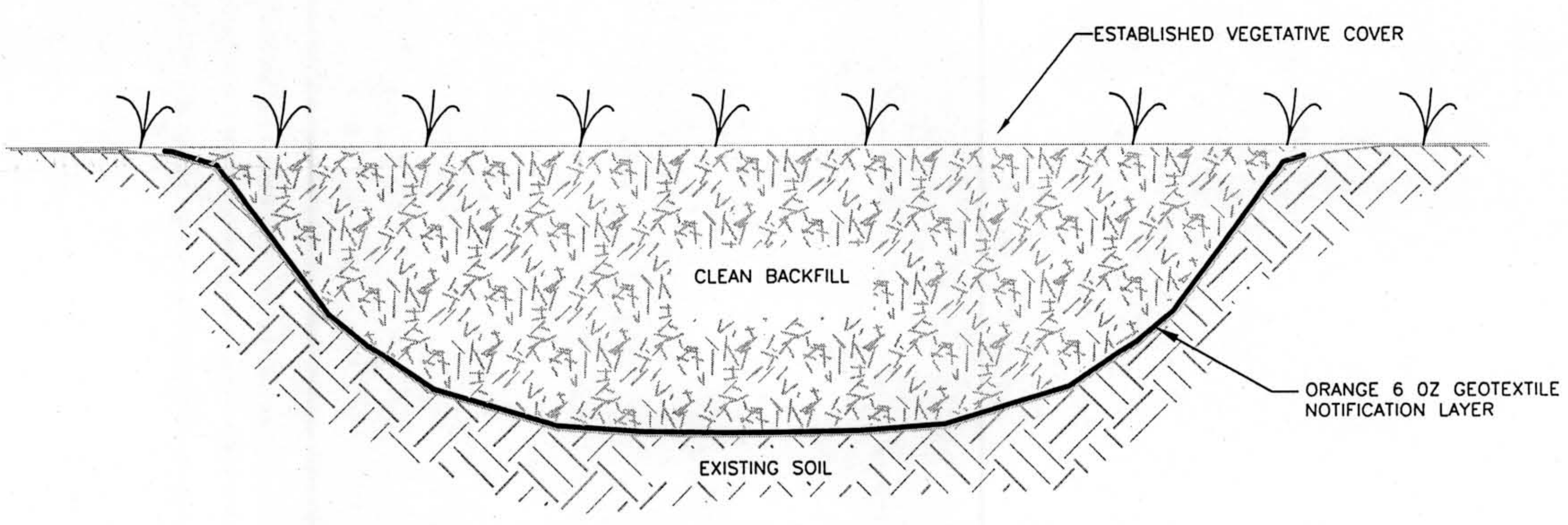


SB-B6	(0-2)
Arsenic	524

SB-E4	(0-2)	(2-4)
Arsenic	413	735

S40-SB-19	(0-2)	(0-2 dup)
Arsenic	698	836
Benzo(a)anthracene	504 µg/kg	352 µg/kg
Benzo(a)pyrene	424 µg/kg	281 µg/kg
Chrysene	465 µg/kg	--
Dibenzo(a,h)anthracene	98.4 µg/kg	69.7 µg/kg

S40-SB-20	(0-2)	
Arsenic	60.5	1,020
Benzo(a)anthracene	498 µg/kg	
Benzo(a)pyrene	340J µg/kg	127 µg/kg



EXCAVATION RESTORATION DETAIL

NTS

EARTH TECH
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40 British American Blvd.
Latham, NY 12110

ARSENIC EXCAVATION LOCATIONS
REMEDIAL ACTION
WORK PLAN
SOUTH 40 SITE
RENSSELAER, NEW YORK

DRAWN BY:	DATE:	PROJECT NUMBER:
WPL	03/21/03	60094

FIGURE NUMBER:
7-2
SHEET NUMBER: