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Soil Sampling Plan

Aerovox, Inc. Facility
New Bedford, Massachusetts

April 1998

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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1. Introduction

1.1 General

This document presents a work plan for implementing soil sampling activities in connection with the potential cleanup/demolition of the Aerovox, Inc. (Aerovox) facility in New Bedford, Massachusetts (the site). This work plan has been prepared by Blasland, Bouck & Lee, Inc. (BBL) at the request of Ropes & Gray, attorneys for Aerovox, and presents a detailed description of the soil sampling activities that will be implemented. Background information related to the soil sampling activities is presented below followed by a description of the work to be performed.

1.2 Background Information

This section presents background information related to the soil sampling activities, including the location and physical setting of the site, the geology and hydrogeology of the site, and a brief history of investigation and remedial activities conducted at the site. This section also summarizes the results obtained from review of the following:

- Aerial photographs and Sanborn Map Company fire insurance maps to confirm that one of the areas which is the focus of this soil sampling plan (i.e., the parking lot south of the manufacturing building) has historically been used as a parking lot. The aerial photographs and Sanborn Map Company fire insurance maps which were reviewed are identified in Subsection 1.2.4; and

- Historical analytical data generated for soil and ground water at the site to confirm that PCBs are the only chemical concern. The historical analytical data which was reviewed is listed in Subsection 1.2.5.

The objective of the soil sampling activities is also presented within this section after the review of aerial photographs, Sanborn Map Company fire insurance maps, and historical analytical data.

1.2.1 Location and Physical Setting

The Aerovox site is located on an approximately 10 acre parcel at 740 Belleville Avenue in New Bedford, Massachusetts. The location of the site is shown on a Figure 1. The site contains an approximately 450,000 square foot manufacturing building which has been used to produce film, paper, and aluminum electrolytic capacitors. A parking lot is located south of the manufacturing building. Aerovox and various predecessor companies have occupied the site for over 80 years. During 1995, Aerovox purchased a small parcel located west of the original property (opposite Belleville Avenue) which has been used for additional parking space. The site is located within a highly developed urban/industrial area of New Bedford, Massachusetts. The Acushnet River borders the site to the east. The ground surface at the site slopes gently from the west to the east. The elevation along Belleville Avenue at the west edge of the original property is approximately 14 feet above mean sea level (MSL) while the elevation toward the eastern edge of the property (prior to reaching a seawall constructed along the bank of the Acushnet River) is generally between 4 and 7 feet above MSL.

1.2.2 Geology and Hydrogeology

Based on previous drilling work conducted at the site by GHR Engineering Corporation (GHR), fill materials have been encountered at depths ranging from just below grade to approximately 6 feet. The fill materials encountered consisted mainly of medium to coarse sand and fine to medium gravel with varying amounts/types of construction

debris and refuse. Materials such as concrete, steel, wood, paper, rubber, and brick were encountered in the fill materials. Layers of native-appearing sand/gravel were encountered at most locations below the fill material. A layer of peat, which was variable in thickness and randomly interlayered with the sand, was encountered at most of the drilling locations except in the northern portion of the site. The top of the peat layer was generally at depths ranging from 2 to 6½ feet below grade, and the peat layer was up to six feet thick southeast of the manufacturing building.

Based on soil boring logs prepared by GHR, the depth to bedrock at the site is highly variable. Bedrock has been encountered at depths ranging from approximately 1½ feet below grade to approximately 21 feet below grade (within soil borings separated by only 16½ feet). The variability in the depth to bedrock at the site may partially be a result of prior blasting/bedrock removal work. Based on previous water level measurements obtained by GHR in monitoring wells installed at the site, the depth to ground water below the majority of the site is approximately 4-5 feet below grade.

1.2.3 Site History

An investigation of the site was conducted during July and August 1982 pursuant to a Consent Order entered into by Aerovox in May 1982 with the United States Environmental Protection Agency (USEPA) under Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9606. Aerovox also entered into a similar Consent Order with the Massachusetts Department of Environmental Quality Engineering [now known as, and referred to hereafter, as the Massachusetts Department of Environmental Protection (MDEP)] at the same time. The investigation focused on an unpaved area at the eastern end of the site bordering the Acushnet River and an unpaved strip of land to the north of the manufacturing building. Combined, these areas which were the focus of the investigation represent approximately a ½-acre area. The results of the investigation are presented in the "Report of Sampling and Analysis Program at the Aerovox Property, New Bedford, Massachusetts," prepared by GHR, dated October 7, 1982. The results of the investigation indicated that PCBs were present in soil at concentrations exceeding 50 parts per million (ppm) and PCBs were also present within the shallow, perched ground-water system at the site.

An evaluation of remedial action alternatives for the Aerovox property was prepared by GHR in accordance with the Consent Orders entered into by Aerovox in May 1982 with the USEPA and the MDEP. The final remedial action alternative selected for the property (as described in an article entitled "On-Site Containment of PCB-contaminated soils at Aerovox, Inc., New Bedford, Massachusetts," prepared by John J. Gushue and Robert S. Cummings) consisted of capping the impacted soil areas (by paving with hydraulic asphalt concrete) and installing a steel sheet pile cutoff wall to serve as a vertical barrier to ground water and tidal flow into and out of the impacted soils. Construction of the final remedial action alternative was started in October 1983 and completed in June 1984. By letter dated September 21, 1998, the USEPA advised that Aerovox had fully complied with the Consent Order.

An assessment of soil and ground water at and in the vicinity of a former concrete oil containment bunker located south of the manufacturing building boiler room (shown on Figure 2) was conducted during July 1988 by GHR. The assessment was conducted following removal of two 10,000 gallon No. 6 fuel oil storage tanks and one 250 gallon condensate collection tank from the bunker during June and July, 1988 by Clean Harbors, Inc. The assessment was conducted pursuant to a request from the MDEP after Aerovox reported that a release of petroleum had occurred at the property. The assessment involved the installation/sampling of soil borings and monitoring wells to determine the extent of petroleum in the vicinity of the concrete oil containment bunker. An additional assessment of soil and ground water in the vicinity of the former concrete oil containment bunker was conducted during February and March 1989 to provide additional information required by the MDEP.

As required by the MDEP, a short-term measure was implemented at the facility to eliminate (or at a minimum, significantly reduce) the potential for further oil migration by removing the source material from the vicinity of the concrete oil containment bunker. The short-term measure included the following work: 1) removing petroleum product and water from the concrete oil containment bunker; 2) excavating petroleum-impacted soils for on-site treatment and recycling into an asphalt base course for the parking lot; 3) constructing an oil-water separator to control and recover floating petroleum product; and 4) performing post-construction monitoring of the oil-water separator system to confirm the effectiveness of the short-term measure. Construction activities associated with the short-term measure were completed during November and December 1990. The MDEP determined that no further remedial action was necessary for this matter by a letter dated July 26, 1993.

An inspection of the manufacturing building was conducted by the USEPA during June 1997. As part of the inspection, the USEPA collected wood shaving samples from floor areas inside the manufacturing building and collected oil samples from various oil storage tanks/degreaser operations for PCB analysis. The USEPA data indicated the presence of PCBs in the wood floor samples at concentrations exceeding 50 ppm. PCBs were not detected above laboratory detection limits in the oil samples collected from tanks/equipment at the Aerovox facility. In October 1997, a consultant for Aerovox (East Coast Engineering, Inc.) under USEPA oversight collected wipe samples for PCB analysis. The analytical results indicated the presence of PCBs at concentrations greater than the USEPA-recommended cleanup criteria of 10 micrograms (ug) per 100 square centimeters (cm^2) for low- and high-contact interior surfaces as presented in the USEPA PCB Spill Policy (40 CFR Part 761.120).

BBL conducted additional sampling of building materials/equipment during November 1997 [i.e., full-core building material samples (wood, brick, and concrete), composite scrape samples of dust/dirt from elevated horizontal surfaces, wipe samples from non-porous building material surfaces (tile floor, painted walls, steel surfaces), and wipe samples from equipment]. The purpose of the additional sampling of building materials/equipment was to supplement the existing PCB database, determine the approximate extent of impacted building materials, develop information regarding the approximate quantities of different building materials, and characterize PCB concentrations on equipment surfaces inside the building. BBL also conducted soil sampling activities beneath the concrete floor slab of the manufacturing building during February 1998. Soil samples beneath the concrete floor slab of the manufacturing building were submitted for laboratory analysis for PCBs. The results of the building materials/equipment sampling conducted by BBL during November 1997 and the soil sampling conducted by BBL during February 1998 were presented in the Preliminary Building Demolition Alternative Report (BBL, March 1998).

Based on the concentrations of PCBs detected in two soil samples collected during February 1998 from the 0-2 inch depth interval below the concrete floor slab inside the manufacturing building (18,000 ppm in sample IB6 and 14,000 ppm in sample ID7), the USEPA requested that soil samples be collected from the 4-6 foot depth interval below the concrete floor slab to confirm that the PCB concentrations at this depth are consistent with the concentrations previously left in-place and capped as part of the prior remedial activities conducted at the site. These samples will be collected as described in Section 2.0.

1.2.4 Review of Aerial Photographs and Sanborn Mapping

BBL reviewed aerial photographs and Sanborn Map Company fire insurance maps showing the facility to confirm that the property immediately south of the Aerovox building was historically used as a parking lot. The aerial photographs and Sanborn Map company fire insurance maps reviewed were presented in a report entitled "Historical Assessment of Aerovox-PCB Related Facility, New Bedford, Massachusetts," prepared for the USEPA by The Bionetics Corporation, dated May 1982. Three sets of Sanborn Map Company fire insurance maps were included in the report. The first set was dated 1924, the second set was revised at an unknown time between 1924

and 1950, and the third set was revised at an unknown time between 1950 and 1975. Based on review of the first set, a possible small coal storage area and an "oil house" were located south of the manufacturing building. The remainder of the area south of the manufacturing building appeared to be vacant (i.e., possible parking lot). Based on review of the second and third sets, the small coal storage area and "oil house" were not present, and the remainder of the area south of the manufacturing building appeared to be vacant. Aerial photographs dated 1951, 1962, and 1974, which show parked vehicles in the area south of the manufacturing building, confirm that the area south of the manufacturing building (during these years) was a parking lot.

BBL also reviewed the aerial photographs to confirm the previous use of the small parcel west of Belleville Avenue which was purchased in 1995 for additional parking space. Based on information provided by Aerovox, the parcel was vacant until 1987 when Aerovox obtained permission from the owner, Acushnet Rubber Company, to have the parcel paved for use as additional parking space. Following paving, Aerovox rented the parcel from 1987 until the Acushnet Rubber Company sold Aerovox the parcel in August 1995. Based on the aerial photographs dated 1951 and 1962, three small buildings (i.e., possible homes/offices) were formerly located on the parcel. The three small buildings were removed prior to 1974 and the property was left vacant as observed on the aerial photograph dated 1974. Based on the information provided by Aerovox, the absence of any past industrial use, and the review of aerial photographs showing the past use of the parcel, no environmental concerns were identified which warrant sampling and analysis of soil from the parcel.

1.2.5 Review of Historical Analytical Data

BBL conducted a review of the available historical analytical data for soil and ground water samples collected at the site to confirm whether PCBs are the only chemical concern at the site. As part of this activity, BBL reviewed past reports summarizing the analytical results from previous sampling activities at the facility and compared the results to soil and ground-water standards presented in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, issued by the MDEP Bureau of Waste Site Cleanup, effective October 31, 1997. Direct comparison of site data to the various standards contained in the MCP is valuable as a screening tool to assess which constituents other than PCBs, if any, could be considered a chemical concern. Applicable MCP standards which were used to screen the historical analytical data are listed below followed by the screening results.

- MCP Method 1, Category GW-3 standards were used to screen the results of ground-water samples collected from monitoring wells at the facility. The Category GW-3 standards were used based on the fact that ground water in the vicinity of the facility is not used as a current source of drinking water and it is not a potential source for future drinking water use. Although at least three monitoring wells at the facility are located within 30 feet of the manufacturing building and the depth to ground water is less than 15 feet, Category GW-2 standards (which are applicable for cases where monitoring wells are located within 30 feet of an occupied building and the average depth to ground water is less than 15 feet) would not be applicable for this situation because the manufacturing building will be demolished in the future; and

- MCP Method I, Category S-3/GW-3 standards were used to screen the results of soil samples collected from soil borings and test pits completed at the facility. Category S-3/GW-3 standards were used because soil at the facility is essentially inaccessible (i.e., covered with asphalt pavement or concrete), children are not present at the facility, and the frequency and intensity of exposure to the soil by adults is low.

The past reports reviewed by BBL summarizing the analytical results generated from previous sampling activities at the facility indicate that volatile organic compounds (VOCs) were not detected in ground-water samples at concentrations exceeding the MCP Method 1, Category GW-3 ground-water standards and VOCs were not detected in soil samples at concentrations exceeding the MCP Method 1, Category S-3/GW-3 soil standards. Limited metals

data obtained during the short-term remedial measures that were implemented for oil-stained soil adjacent to the concrete oil containment bunker (prior to removal and treatment of the oil-stained soil) indicated that the soil did not contain metals at concentrations exceeding the MCP Method 1, Category S-3/GW-3 soil standards. The past reports reviewed by BBL which summarize the analytical results generated from previous sampling activities at the facility are listed below along with a summary of the analytical results obtained from laboratory analysis of the soil and ground-water samples which were collected:

- The "Report of Sampling and Analysis Program at the Aerovox Property, New Bedford, Massachusetts," prepared by GHR Engineering Corporation (GHR), dated October 7, 1982. As indicated in this report, ground-water samples collected from four monitoring wells during August 1982 were submitted for laboratory analysis for priority pollutant VOCs using USEPA Method 624. The analytical results indicate that seven VOCs were present at concentrations above laboratory detection limits in ground-water samples collected from monitoring wells toward the eastern edge of the property. The VOCs which were detected include chlorobenze [up to 114 parts per billion (ppb)], chloroform (up to 10 ppb), trace levels of 1,1-dichloroethane (i.e., <10 ppb), ethylbenzene (up to 269 ppb), trans-1,2-dichloroethylene (up to 23 ppb), trichloroethylene (up to 99 ppb), and vinyl chloride (up to 90 ppb). The concentrations of these detected VOCs did not exceed the Category GW-3 ground-water standards. Selected soil samples collected as part of the sampling and analysis program were analyzed for volatile solids concentrations (analytical method not referenced). The Category S-3/GW-3 soil standards do not provide a concentration for volatile solids.

- The "Report of Evaluation of Remedial Alternatives for the Aerovox Property, New Bedford, Massachusetts," prepared by GHR, dated February 11, 1983. As indicated in this report, ground-water samples collected from four additional monitoring wells that were installed during November 1982 were submitted for laboratory analysis for priority pollutant VOCs using USEPA Method 624. The analytical results indicate that eight VOCs were present at concentrations above laboratory detection limits in ground-water samples collected from monitoring wells toward the eastern edge of the property. The VOCs which were detected inelude trace levels of benzene (i.e., <10 ppb), chlorobenzene (up to 77 ppb), 1,1-dichloroethylene (up to 31 ppb), trace levels of ethylbenzene (i.e., <10 ppb), toluene (up to 16 ppb), trans-1,2-dichloroethylene (up to 1,830 ppb), trichloroethylene (up to 4,490 ppb), and vinyl chloride (up to 3,500 ppb). The concentrations of these detected VOCs did not exceed the Category GW-3 ground-water standards. Additional soil samples do not appear to have been collected as part of the evaluation of remedial alternatives.

- The "Site Assessment Report of Soils and Groundwater in the Vicinity of a Concrete Oil Containment Bunker, Aerovox Property," dated August 23, 1988. As indicated in this report, soil samples collected from two soil borings (completed in the vicinity of the former concrete oil containment bunker) were submitted for laboratory analysis for VOCs using an HNU-301 scan (gas chromatograph method). The analytical results indicated that chlorinated solvents were not detected above the laboratory detection limit of 0.2 ppm in the samples collected from the two soil borings. One composite soil sample was also collected from a soil stockpile generated by removal of material from the concrete oil containment bunker and analyzed for VOCs using USEPA Method 8010. The analytical results of the composite sample indicated that toluene, ethylbenzene, and xylene were present at concentrations of 0.45 ppm, 0.33 ppm, and 2.8 ppm, respectively. These concentrations are less than the Category S-3/GW-3 soil standards.

- The "Phase 1 - Limited Site Investigation Addendum of Soils and Groundwater in the Vicinity of a Concrete Oil Containment Bunker, Aerovox, Inc. Property," prepared by GHR, dated June 30, 1989. As indicated in this report, soil samples were collected from one test pit and seven soil borings for laboratory analysis for total VOCs using the HNU-301 scan (gas chromatograph method) calibrated to gasoline. The analytical results indicate that the total VOC concentrations detected did not exceed 0.10 ppm in any of the soil samples. Soil in the area where

data obtained during the short-term remedial measures that were implemented for oil-stained soil adjacent to the concrete oil containment bunker (prior to removal and treatment of the oil-stained soil) indicated that the soil did not contain metals at concentrations exceeding the MCP Method 1, Category S-3/GW-3 soil standards. The past reports reviewed by BBL which summarize the analytical results generated from previous sampling activities at the facility are listed below along with a summary of the analytical results obtained from laboratory analysis of the soil and ground-water samples which were collected:

- The "Report of Sampling and Analysis Program at the Aerovox Property, New Bedford, Massachusetts," prepared by GHR Engineering Corporation (GHR), dated October 7, 1982. As indicated in this report, ground-water samples collected from four monitoring wells during August 1982 were submitted for laboratory analysis for priority pollutant VOCs using USEPA Method 624. The analytical results indicate that seven VOCs were present at concentrations above laboratory detection limits in ground-water samples collected from monitoring wells toward the eastern edge of the property. The VOCs which were detected include chlorobenze [up to 114 parts per billion (ppb)], chloroform (up to 10 ppb), trace levels of 1,1-dichloroethane (i.e., <10 ppb), ethylbenzene (up to 269 ppb), trans-1,2-dichloroethylene (up to 23 ppb), trichloroethylene (up to 99 ppb), and vinyl chloride (up to 90 ppb). The concentrations of these detected VOCs did not exceed the Category GW-3 ground-water standards. Selected soil samples collected as part of the sampling and analysis program were analyzed for volatile solids concentrations (analytical method not referenced). The Category S-3/GW-3 soil standards do not provide a concentration for volatile solids.

- The "Report of Evaluation of Remedial Alternatives for the Aerovox Property, New Bedford, Massachusetts," prepared by GHR, dated February 11, 1983. As indicated in this report, ground-water samples collected from four additional monitoring wells that were installed during November 1982 were submitted for laboratory analysis for priority pollutant VOCs using USEPA Method 624. The analytical results indicate that eight VOCs were present at concentrations above laboratory detection limits in ground-water samples collected from monitoring wells toward the eastern edge of the property. The VOCs which were detected include trace levels of benzene (i.e., <10 ppb), chlorobenzene (up to 77 ppb), 1,1-dichloroethylene (up to 31 ppb), trace levels of ethylbenzene (i.e., <10 ppb), toluene (up to 16 ppb), trans-1,2-dichloroethylene (up to 1,830 ppb), trichloroethylene (up to 4,490 ppb), and vinyl chloride (up to 3,500 ppb). The concentrations of these detected VOCs did not exceed the Category GW-3 ground-water standards. Additional soil samples do not appear to have been collected as part of the evaluation of remedial alternatives.

- The "Site Assessment Report of Soils and Groundwater in the Vicinity of a Concrete Oil Containment Bunker, Aerovox Property," dated August 23, 1988. As indicated in this report, soil samples collected from two soil borings (completed in the vicinity of the former concrete oil containment bunker) were submitted for laboratory analysis for VOCs using an HNU-301 scan (gas chromatograph method). The analytical results indicated that chlorinated solvents were not detected above the laboratory detection limit of 0.2 ppm in the samples collected from the two soil borings. One composite soil sample was also collected from a soil stockpile generated by removal of material from the concrete oil containment bunker and analyzed for VOCs using USEPA Method 8010. The analytical results of the composite sample indicated that toluene, ethylbenzene, and xylene were present at concentrations of 0.45 ppm, 0.33 ppm, and 2.8 ppm, respectively. These concentrations are less than the Category S-3/GW-3 soil standards.

- The "Phase I - Limited Site Investigation Addendum of Soils and Groundwater in the Vicinity of a Concrete Oil Containment Bunker, Aerovox, Inc. Property," prepared by GHR, dated June 30, 1989. As indicated in this report, soil samples were collected from one test pit and seven soil borings for laboratory analysis for total VOCs using the HNU-301 scan (gas chromatograph method) calibrated to gasoline. The analytical results indicate that the total VOC concentrations detected did not exceed 0.10 ppm in any of the soil samples. Soil in the area where

the samples were collected was excavated and treated on-site based on the presence of fuel oil in the soil. Ground-water samples were collected from four monitoring wells in the vicinity of the former concrete oil containment bunker for laboratory analysis for VOCs. Three of the ground-water samples were analyzed using USEPA Method 601/602, and one of the ground-water samples was analyzed using USEPA Method 624. The analytical results indicate that VOCs were not detected above laboratory detection limits in a ground-water sample from a monitoring well located south of the concrete oil containment bunker (MW-2), and VOCs were present at low concentrations in ground-water samples collected from monitoring wells located east of the concrete oil containment bunker (MW-5B and MW-6B). Twelve VOCs, including trichloroethene at a concentration of 1,800 ppb, were detected in a monitoring well located west of the concrete oil-containment bunker (MW-4B). The concentrations of VOCs detected in the ground-water samples did not exceed the Category GW-3 ground-water standards.

- A draft copy of the "Short Term Measure Report, Soils and Groundwater in the Vicinity of a Former Oil Containment Bunker, Aerovox, Inc.," prepared by GHR, dated June 25, 1991. As indicated in this report, soil samples were collected from the vicinity of the concrete oil containment bunker for characterization to determine if the petroleum-impacted soils could be recycled/reused on-site or if the petroleum-impacted soils would have to be disposed of off-site as a hazardous waste. The sample containing the highest concentration of PCBs was also submitted for laboratory analysis for VOCs using USEPA SW-846 Method 8240 and for RCRA metals (analytical method not identified in the report). The analytical results obtained from laboratory analysis of the sample indicated that VOCs were not detected at concentrations exceeding laboratory detection limits. The concentrations of metals detected in the soil sample (silver at 0.628 ppm, barium at 0.618 ppm, chromium at 8.22 ppm, lead at 93.7 ppm, and arsenic at 5.24 ppm) did not exceed the Category S-3/GW-3 soil standards.

Based on BBL's review of the above-mentioned reports summarizing analytical results from previous sampling activities at the facility and a comparison of the results to soil and ground-water standards presented in the MCP, 310 CMR 40.0000, issued by the MDEP Bureau of Waste Site Cleanup, effective October 31, 1997, PCBs are the only chemical concern at the site.

1.3 Objective

The objective of this soil sampling plan is to provide data to confirm that PCB concentrations in soil at locations beneath the concrete floor slab of the manufacturing building are consistent with the concentrations which were left in-place and capped as part of the remedial action alternative conducted in the northern and eastern portions of the property during 1984 and to determine whether PCBs are present at locations beneath the asphalt parking lot (which has historically been used as a parking lot).

3:40 - Michael -
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Coordinated - [illegible] -
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3:30 pm
Paul Craig
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227 5

2. Soil Sampling Activities

2.1 General

This section presents a detailed description of the additional soil sampling activities in connection with the potential cleanup/demolition of the Aerovox facility. The soil sampling activities to be implemented consist of the following: 1) completing soil borings to collect additional soil samples from beneath the concrete floor slab of the manufacturing building; and 2) completing soil borings to collect soil samples from beneath the parking lot south of the manufacturing building. Prior to implementing the field work associated with the soil sampling, BBL will coordinate the identification of underground utilities with the appropriate locating organization(s) (i.e., Dig Safe) and with facilities personnel. BBL will also review available facility drawings showing the locations of underground utilities. The locations of the soil borings (shown on Figure 2) will be adjusted in the field, as necessary, based on the locations of underground utilities. In addition, BBL will set up traffic cones and barricades to facilitate access to sampling locations in the parking lot. If necessary, soil borings located within the parking lot will be completed during the second work shift to minimize disruption of facility activities. Details associated with the collection of soil samples from beneath the concrete floor slab of the manufacturing building and from beneath the parking lot south of the manufacturing building are presented below.

2.1.1 Soil Samples Beneath the Concrete Floor Slab

As indicated in the Preliminary Building Demolition Alternative Report (BBL, March 1998), 15 soil samples were previously collected from depths of 0-2 inches beneath the concrete floor slab of the manufacturing building and submitted for laboratory analysis for PCBs. In addition, soil samples were collected from depths of 2-6 inches beneath the concrete floor slab of the manufacturing building and submitted for laboratory analysis for PCBs from 14 of the 15 sampling locations. The highest concentrations of PCBs detected as part of the soil sampling beneath the concrete floor slab were from locations IB-6 and ID-7 (within the pamp room), where samples from the 0-2 inch depth interval contained PCBs at concentrations of 18,000 parts per million (ppm) and 14,000 ppm, respectively. As part of this soil sampling plan (and as requested by the USEPA), one soil boring will be completed adjacent to previous sampling location IB-6, and one soil boring will be completed adjacent to previous sampling location ID-7 to collect additional soil samples for laboratory analysis for PCBs from a greater depth (i.e., 4-6 feet). The purpose of the samples is to confirm that the PCB concentrations within soils beneath the building floor slab are consistent with the concentrations which were left in-place and capped as part of the remedial action alternative conducted in the northern and eastern portions of the property during 1984.

After identifying utilities in the vicinity of the proposed soil boring locations within the pump room (and adjusting the locations as necessary), BBL will use a coring machine to core through the concrete floor slab. After coring through the concrete floor slab, a macro-core sampling device advanced using mechanical means (i.e., sledge hammer) will be used by BBL to complete the soil borings. Procedures for completing the soil borings are presented in Appendix A. Samples recovered from each two-foot interval within the borings will be characterized for visible oil staining/free product, and the boreholes will be screened using a photoionization detector (PID). Sampling equipment which is not dedicated will be decontaminated using the procedures in Appendix B. Each soil boring will be installed to a depth of 6 feet, unless bedrock is encountered first. At the request of the USEPA, one soil sample will be collected from each of the soil borings at a depth of 4-6 feet beneath the concrete floor slab. The soil samples from the 4-6 foot depth will be submitted to or laboratory subcontractor, Galson Laboratories, Inc. (Galson) of Syracuse, New York, for laboratory analysis for PCBs using USEPA SW-846 Method 8082. Procedures for handling and documenting the samples are presented in Section 3.0. Upon completion, the soil borings will be grouted using a cement/bentonite grout mixture.

2.1.2 Soil Samples Beneath the Parking Lot

Soil borings will be completed within the parking lot area south of the manufacturing building to collect soil samples (as requested by the USEPA) to determine the PCB concentrations, if any, in the soil beneath the parking lot. For the purposes of this work task, the soil boring locations have been identified using a 120-foot by 120-foot sampling grid established across the parking lot. A total of ten soil borings (shown on Figure 2) will be completed within the parking lot area. The soil borings will be installed by BBL's drilling subcontractor [Environmental Drilling, Inc. (Environmental Drilling)] using a truck-mounted drill rig and hollow-stem auger drilling techniques. Procedures for installing the soil borings are presented in Appendix A.

Continuous soil samples will be obtained from each soil boring using a two-foot long, two-inch outer diameter split-spoon sampling device as described in ASTM Method D-1586. Split spoons will be decontaminated using the procedures presented in Appendix B. The soil samples recovered from each soil boring will be characterized for visible oil staining/free product, and the borehole will be screened using a PID. Each soil boring will be completed to the depth of bedrock or ground water, whichever is encountered first. As indicated in Subsection I.2.2, the depth to bedrock at the site is highly variable. Bedrock has been encountered at depths ranging from approximately 1½ feet below grade to approximately 21 feet below grade (within soil borings separated by only 16½ feet). Based on previous water level measurements obtained by GHR in monitoring wells east and west of the parking lot, the depth to ground water below the parking lot is anticipated to be approximately 4-5 feet below grade.

For the purpose of this work task, we have assumed that each of the soil borings will be completed to a depth of approximately 5 feet. Based on the occurrence of visibly oil-stained soil samples (if any) recovered from a boring, one soil sample will be submitted to Galson for laboratory analysis for PCBs using USEPA SW-846 Method 8082. If no visibly oil-stained soil is observed in samples recovered from a boring, then a sample will be submitted for laboratory analysis for PCBs from the first soil interval beneath the asphalt parking lot (i.e., beneath stone/gravel subgrade material). Procedures for handling and documenting the samples are presented in Section 3.0. Upon completion of each soil boring, Environmental Drilling will grout the borehole to grade using a cement/bentonite grout mixture.

3. Sample Handling and Documentation

3.1 General

This section presents procedures for the handling and documentation of samples collected as part of this Soil Sampling Plan. This section also presents information related to the management of sampling-derived materials and wastes.

3.2 Sample Containers and Preservation

Galson will supply appropriate sample containers in sealed cartons, as well as sample labels. The field personnel will be responsible for properly labeling containers and preserving samples (as appropriate). Sample labeling procedures are described in Appendix C.

3.3 Packing, Handling, and Shipping Requirements

Sample custody seals and packing materials for filled sample containers will also be provided by the laboratory. The filled, labeled, and sealed containers will be placed in a cooler on ice and carefully packed to eliminate the possibility of container breakage.

All samples will be packaged by the field personnel and transported as low-concentration environmental samples. The packaged samples will be hand delivered by sampling persounel to the laboratory within 24 hours of sample collection. General procedures for packing, handling, and shipping environmental samples are included in Appendix C.

3.4 Documentation

Field personnel will provide comprehensive documentation covering all aspects of field sampling, field analysis, chain-of-custody. This documentation constitutes a record which allows reconstruction of all field events to aid in the data review and interpretation process. All documents, records, and information relating to the performance of the field work will be retained in a project file at the Blasland, Bouck & Lee, Inc. office in Syracuse, New York.

3.4.1 Daily Production Documentation

Each field crew will maintain a field notebook consisting of a waterproof, bound notebook which will contain a record of all activities performed at the site. The specific measurements from field testing and sampling will be recorded in the field notebook or on separate documentation forms. At the time of sampling, detailed notes of the exact site of sampling will be recorded in the field notebook.

3.4.2 Sampling Information

During sampling, detailed notes will be made as to the exact site of sampling, physical observations, sample depths, and weather conditions. Tie distances to the soil borings will be measured following completion of the borings. These notes will be recorded in the field notebook.

3.4.3 Sample Chain-of-Custody

Persons will have custody of samples when the samples are in their physieal possession, in their view after being in their possession, or in their physical possession and secured so they cannot be tampered with. In addition, when

samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel.

Chain-of-custody forms will provide the record of responsibility for sample collection, transport, and submittal to the laboratory. A sample chain-of-custody form is provided in Appendix C. The chain-of-custody will be filled out at each sampling site, at a group of sampling sites, or at the end of each day of sampling by one of the field personnel designated to be responsible for sample custody. In the event that the samples are relinquished by the designated sampling person to other sampling or field personnel, the chain-of-custody form will be signed and dated by the appropriate personnel to document the sample transfer. The original chain-of-custody form will aecompany the samples to the laboratory.

3.5 Management of Investigation-Derived Materials and Wastes

The handling of investigation-derived materials and wastes is discussed below.

3.5.1 Excess Soil

Solids generated by the soil boring and sampling activities (i.e., soil cuttings, disposable sampling equipment, and personal protective equipment) will be placed into steel 55-gallon drums which will be stored at the facility for characterization and off-site disposal in accordance with applicable rules and regulations.

3.5.2 Disposable Equipment and Debris

Disposable equipment and debris such as health and safety equipment, plastic sheeting, sampling equipment, and other equipment and/or sampling debris not reused in the investigation will be collected in plastic bags during the sampling events and then placed into a steel 55-gallon drum which will be stored at the facility for characterization and off-site disposal in accordance with applicable rules and regulations.

3.5.3 Decontamination Rinsate

The downhole drilling equipment will be steam-cleaned prior to initiatmg the soil borings. In addition, split-spoon sampling devices will be decontaminated between each two-foot sampling interval. The steam cleaning will be conducted over a temporary decontamination pad so that decontamination waters can be collected. Decontamination rinsate generated by cleaning re-useable sampling equipment (e.g., tap and distilled water containing small amounts of hexane and alconox) will be containerized at each sampling location or group of locations. Upon completion of the field activities, the decontamination waters will be placed into a steel 55-gallon drum to be stored at the facility for characterization and off-site disposal in accordance with applicable rules and regulations.

4. Quality Assurance/Quality Control

Soil samples submitted for PCB analysis will be analyzed using USEPA SW-846 Method 8082. Field and laboratory quality assurance/quality control (QA/QC) samples will be analyzed as part of the soil sampling and analysis work. These controls will be used to verify the quality of the data. Analytical results for the soil samples will be presented in a standard laboratory report [i.e., without full Contract Laboratory Procedure- (CLP-) type data deliverables]. The following QA/QC samples will be collected and analyzed for VOCs as part of this program.

Field Duplicate

One field duplicate soil sample will be collected and analyzed to verify the reproducibility of the sampling methods. The duplicate sample will be collected using methods to maximize the compatibility of the samples. For example, a single soil sample will be divided between the sample and the duplicate sample container.

Matrix Spike/Matrix Spike Duplicate

Triple soil sample volumes from one soil boring will be collected in order for the laboratory to perform matrix spike/matrix spike duplicate analysis.

Rinse Blank

One rinse blank sample will be collected by pouring distilled water over decontaminated sampling equipment as a check that the decontamination procedure has been adequately performed and that cross-contamination of samples will not occur due to the equipment. The intent of the rinse blank is for water making up the blank to follow the same path, and therefore, come in contact with the same equipment as the samples.

5. Schedule and Reporting

BBL will implement the activities outlined in this Soil Sampling Plan within one week following USEPA approval of the Soil Sampling Plan. BBL anticipates that the activities outlined in this Soil Sampling Plan will be completed during a one week period. Following completion of the field work, a letter report summarizing the results of the soil sampling work will be submitted to the USEPA. Analytical results obtained from laboratory analysis of the soil samples will be presented with the letter report in tabular format and on a figure. The laboratory analytical report will be included as an attachment.

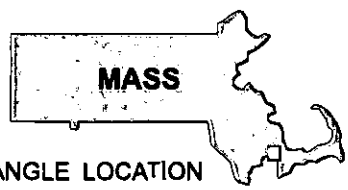
Analytical results will be available approximately one week following laboratory receipt of the soil samples. The letter report summarizing the results of the soil sampling and analysis activities will be submitted to the USEPA within two weeks following receipt of laboratory analytical results.

Figures

REFERENCE: NEW BEDFORD NORTH, MASS. USGS QUADS., 7.5 MIN. SERIES, 1979.

2000' 0 2000'

APPROXIMATE SCALE: 1" = 2000'



QUADRANGLE LOCATION

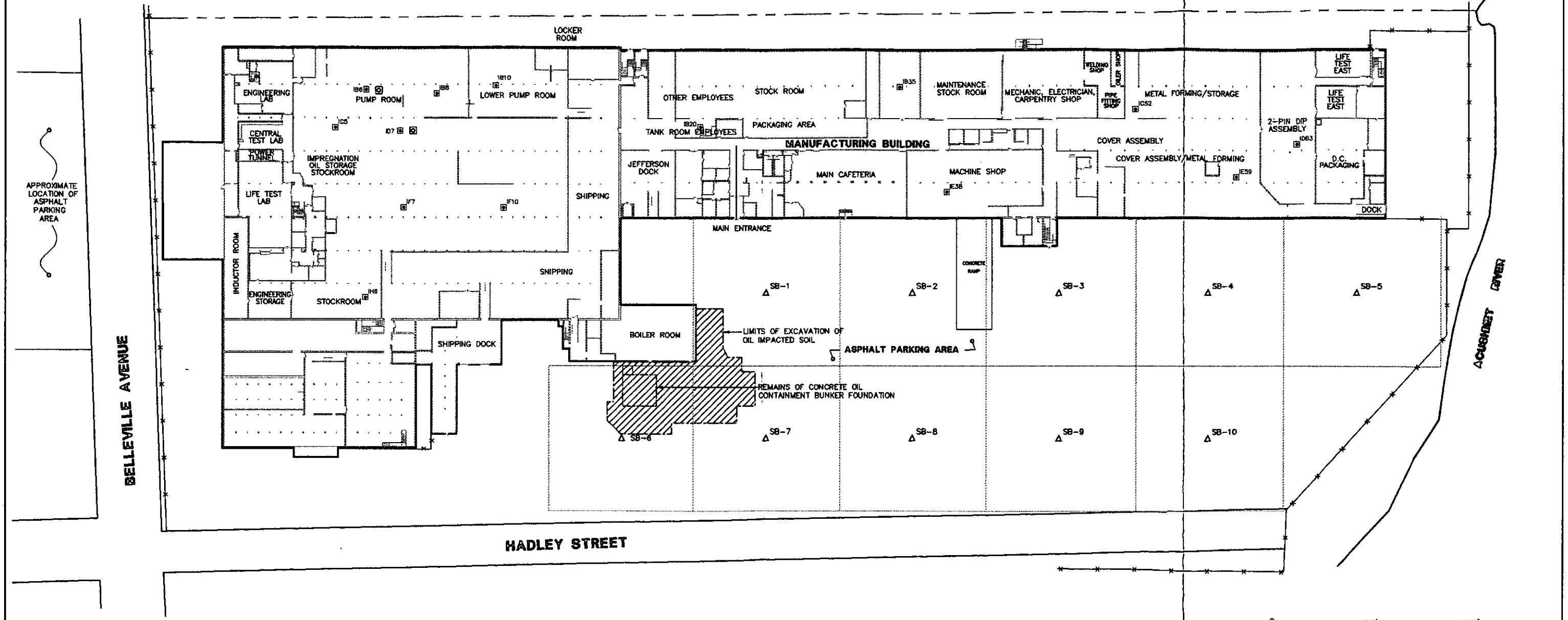
03/98 SYR-D54-DJH
03855003/03855n01.CDR

AEROVOX, INC.
740 BELLEVILLE AVENUE
NEW BEDFORD, MASSACHUSETTS

SITE LOCATION PLAN

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1



NOTES

1. EXTERIOR AND INTERIOR BUILDING WALL LOCATIONS WERE OBTAINED FROM AN ELECTRONIC FILE (DRAWING NO. PAVXX-AG-0002, REVISION A, DRAWN BY D. JENKINS, DATED NOVEMBER 18, 1997) PROVIDED BY AEROVOX, INC.
2. SITE FEATURES OUTSIDE THE BUILDING (INCLUDING FENCE, PROPERTY LINE, PARKING LOT, AND ROADWAYS) WERE DIGITIZED FROM A SITE PLAN AT A SCALE OF 1"=50' PREPARED BY INDUSTRIAL RISK INSURERS, DATED MAY 8, 1992.
3. THE LIMIT OF THE FORMER SOIL EXCAVATION AT AND IN THE VICINITY OF THE CONCRETE OIL CONTAINMENT BUNKER FOUNDATION (WHICH FORMERLY SUPPORTED TWO 10,000 GALLON OIL STORAGE TANKS) WAS DIGITIZED FROM A DRAWING ENTITLED, "CONSTRUCTION SITE PLAN, SHORT TERM MEASURE, AEROVOX, INC.," PREPARED BY SAIC ENGINEERING, INC. AT A SCALE OF 1"=10', DATED JUNE 4, 1991.

LEGEND

- ID63 — PREVIOUS SOIL SAMPLING LOCATION
- SB-6 — PROPOSED SOIL BORING LOCATION IN PARKING LOT
- PROPOSED SOIL BORING LOCATION BENEATH FLOOR SLAB
- EXISTING FENCE
- EXISTING PROPERTY LINE
- 120' X 120' SAMPLE GRID

0 80' 160'

APPROXIMATE GRAPHIC SCALE

Aerovox INC.
740 BELLEVILLE AVE., NEW BEDFORD, MA 02745 USA

SOIL SAMPLING PLAN

PROPOSED SAMPLING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2

X (XREF)
LAYERS OFF=0,CONCRETEFLOOR,FIG3,REF,SAMPLELOCATION,SCRAPES,SEALEDAREAS,WIPES,WOODLOT
P: AERO.PCP
3/31/98 DIV54-RC8, PGL
03855003/03855SM3

Appendices

APPENDIX A
SOIL BORING AND SAMPLING PROCEDURES

I. Introduction

Soil borings beneath the concrete floor slab of the manufacturing building will be completed using a macro-core sampling device advanced using mechanical means (i.e., sledge hammer). Soil borings beneath the asphalt parking lot south of the manufacturing building will be completed using a truck-mounted drill rig and hollow-stem auger drilling methods. The depths of the soil borings will be as specified in Section 2.

Prior to commencing drilling activities, the soil boring locations will be cleared for underground utilities by contacting Dig-Safe to have appropriate utilities representatives mark the location of underground lines. Private utilities may be delineated by field personnel using appropriate devices and/or by a private utility locating contractor (if necessary). This contractor will survey the project area to determine the presence of known, as well as unknown, utilities/underground piping at the project area, especially in those areas where drilling is proposed.

II. Soil Sampling

Samples of the encountered subsurface material beneath the concrete floor slab of the building will be collected continuously using a 2-foot or 4-foot long macro-core sampling device. Samples of the encountered subsurface material beneath the asphalt parking lot will be collected continuously using standard 2-inch diameter, 2-foot split spoons driven by a 140-lb. hammer, unless otherwise specified. The sampling method employed outdoors will be ASTM D-1586/Split-Barrel Sampling (Standard Method for Penetration Test and Split-Barrel Sampling of Soils, ASTM D 1586-84) published in Annual Book of ASTM Standards, Volume 04.08. Upon retrieval of the macro-core sampling device or split-barrel sampler, representative portions of each soil sample (for each 2-foot depth interval) will be placed in the appropriate laboratory containers for visual observations. This container will be labeled with: 1) site; 2) boring number; 3) sample interval; 4) date; and 5) initials of sampling personnel. Personnel from BBL will be on site during the drilling operations to describe each soil sample including the following:

- Visible staining/free product;
- Components (sand, gravel, peat, etc.);
- Color;
- Moisture content;
- Odors/discoloration;
- Fill or native material;
- Items that may indicate age of fill (i.e., archaeological artifacts, newspapers, etc.); and
- Fill component description (i.e., cinder, metal, wood, tires, etc.).

The descriptions will be recorded in a dedicated field notebook. As requested by the USEPA, one soil sample will be submitted for laboratory analysis for PCBs from the 4-6 foot depth interval of each soil boring completed beneath the concrete floor slab of the manufacturing building. One soil sample will be submitted for laboratory analysis for PCBs from each soil boring completed beneath the asphalt parking lot based on the occurrence of visibly oil-stained soil samples (if any) recovered from the borings. If no visibly oil-stained soil is observed in samples recovered from a boring, then a sample will be submitted for laboratory analysis for PCBs from the first soil interval beneath the asphalt parking lot (i.e., beneath stone/gravel subgrade material).

BBL personnel will be responsible for documenting drilling events in the field notebook. BBL personnel will also be responsible for screening the boreholes for organic vapors using a photoionization detector (PID). BBL personnel will calibrate the PID meter to isobutylene daily or more frequently if field conditions warrant.

The Drilling Contractor will be responsible for obtaining accurate and representative samples, informing the supervising geologist of changes in drilling pressure and loss of circulation, and keeping a separate general log of soils encountered, including blow counts (i.e., the number of blows from a soil sampling drive weight [140 pounds] required to drive the split-barrel sampler in 6-inch increments).

Soils generated during drilling of the soil borings will be placed into steel 55-gallon drums for characterization and off-site disposal (by Aerovox) in accordance with applicable rules and regulations.

III. Equipment Cleaning

Equipment cleaning will occur prior to use on the site, between each drilling location, and upon completion of the drilling prior to leaving the site. All drilling equipment and associated tools including augers, drill rods, core barrels, sampling equipment, wrenches, and any other equipment or tools that may have come in contact with the soil will be cleaned with high-pressure steam cleaning equipment using a tap water source or manual scrubbing. The drilling equipment will be cleaned in an area designated by the supervising geologist. Cleaning water and residual materials will be collected and transferred to a central location for subsequent disposal. Equipment cleaning procedures are described in Appendix B.

APPENDIX B - EQUIPMENT DECONTAMINATION AND CLEANING PROCEDURES

I. Introduction

This appendix presents procedures which will be used to decontaminate equipment used to collect soil samples. In addition, this appendix presents the procedures to be followed in cleaning equipment used to complete soil borings.

II. Sampling Equipment Decontamination

Sampling equipment that is not dedicated (e.g., split-spoon sampler) will be decontaminated prior to each use to mitigate the potential for cross-contamination of the samples collected for laboratory analysis. The decontamination procedures to be utilized during the sampling activities are presented below:

1. Non-phosphate detergent solution wash.
2. Tap water rinse.
3. Hexand rinse.
4. Distilled water rinse.
5. Allow to air-dry to the extent practicable.
6. Any sampling equipment (including split spoons) that is not immediately used following decontamination will be wrapped in aluminum foil or polyethylene.

III. Drilling Equipment Cleaning

In addition to the above-discussed decontamination proeedures, the drilling rig and all downhole equipment associated with the drilling of soil borings will be steam cleaned prior to arrival on site and between each drilling location. Steam cleaning of equipment will take place over a plastic-lined decontamination pad. Water generated during steam cleaning will be pumped from the decontamination pad into steel 55-gallon drums.

APPENDIX C - SAMPLE PACKING, HANDLING, AND SHIPPING PROCEDURES

I. Handling

1. After collecting a sample, record the following information on the daily field log or in the field notebook, as appropriate:

   a. Project name and number;
   b. Sample number and depth;
   c. Sample method;
   d. Date;
   e. Name of sampler(s);
   f. Sample collection time (military);
   g. Location (project reference);
   h. Analyses to be completed; and
   i. Any comments.

2. Fill in sample label (sample label in Exhibit 1) with:

   a. Project number and site name;
   b. Sample identification code and other sample identification information, if applicable;
   c. Date;
   d. Sample matrix (soil);
   e. Sample type (grab);
   f. Time sampled (military);
   g. Analysis required;
   h. Initials of sampling personnel; and
   i. Name, affiliation, and contact phone number.

3. Cover the label with clear packing tape to secure the label onto the container.

4. Check the caps on the sample containers to ensure that they are tightly sealed.

5. Mark the level of the sample in the container using an indelible ink marker or grease pencil (rinse blank samples only).

6. Wrap the sample container cap with clear packing tape to prevent it from becoming loose.

7. Initiate chain-of-custody by designated sampling personnel responsible for sample custody (Exhibit 2) (after sampling or prior to sample packing). Note: If the designated sampling person relinquishes the samples to other sampling or field personnel for packing or other purposes, the samplers will complete the chain-of-custody prior to this transfer. The appropriate personnel will sign and date the chain-of-custody form to document the sample custody transfer.

EXHIBIT 1

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

PROJECT #		
SAMPLE I.D.		DATE
SAMPLE TYPE ☐ Soil/Sediment ☐ Water	COLLECTION MODE ☐ Composite ☐ Grab	TIME
ANALYSIS		
SAMPLER(S)	PRESERVATIVE	

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

EXHIBIT 2

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
SAMPLERS: *(Signatura)*	

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers							REMARKS

Relinquished by: *(Signature)*	DATE	TIME	Received by: *(Signature)*	Relinquished by: *(Signature)*	DATE	TIME	Relinquished by: *(Signature)*
Relinquished by: *(Signature)*	DATE	TIME	Received by: *(Signature)*	Relinquished by: *(Signature)*	DATE	TIME	Relinquished by: *(Signature)*
Relinquished by: *(Signature)*	DATE	TIME	Received for Laboratory by: *(Signature)*	DATE	TIME	Remarks:	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

EXHIBIT 3

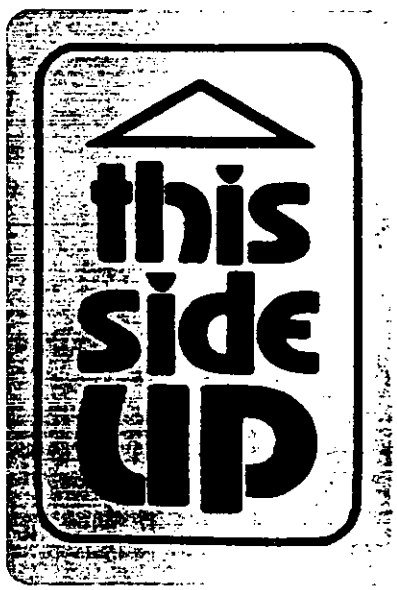


EXHIBIT 4

CUSTODY SEAL		SEALED BY
	BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists 6723 Towpath Road, Box 66, Syracuse, N.Y. 13214-0066 TEL (315) 446-9120	_____ DATE_____TIME _____