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APRIL
March 5, 1998

Hari O. Agrawal, P.E.
Environmental Engineer
New York State Department of Environmental Conservation
Hazardous Waste Remediation - Region 2
47-40 21st Street
Long Island City, New York 11101

Re: Final Report titled "Results of Soil Sampling in the Selected Work Areas Located in Operable Unit ~~1~~ 3, Sunnyside Yard, Queens, New York"

Dear Mr. Agrawal:

Enclosed for your review and approval please find one copy of the March 18, 1998 Roux Associates, Inc. document titled "Results of Soil Sampling in Selected Work Areas Located in Operable Unit 1, Sunnyside Yard, Queens, New York."

If you have any questions or require additional information, please do not hesitate to call.

Sincerely,

ROUX ASSOCIATES, INC.

Joseph D. Duminuco
Principal Hydrogeologist

Attachment

cc: R. Gardineer, P.E., NYSDEC
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S. Ervolina, P.E., NYSDEC
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C. Rosenthal, Esq., Kalkines, Arky, et al.

RESULTS OF SOIL SAMPLING IN SELECTED WORK AREAS LOCATED IN OPERABLE UNIT 3

Sunnyside Yard
Queens, New York

March 18, 1998

Prepared for:

National Railroad Passenger Corporation
30th Street Station
4th Floor South
Philadelphia, Pennsylvania 19104

Prepared by:

ROUX ASSOCIATES, INC.
1377 Motor Parkway
Islandia, New York 11788

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1.0 INTRODUCTION

The National Railroad Passenger Corporation (Amtrak) owns a property known as Sunnyside Yard (Yard), located at 39-29 Honeywell Street in Queens County, a borough of New York City, New York (Figure 1). Portions of the Yard have been designated by Amtrak for construction of a new High Speed Trainset Facility (HSTF) Service and Inspection (S&I) Building and its ancillary structures (i.e., the access road and utilities route, the parking area, the construction easement area which surrounds the building, and the construction laydown area). Additionally, modifications to other areas of the Yard are required to accommodate the HSTF program including the installation of new tracks, such as those exiting the HSTF S&I Building which are the subject of this report.

The Sunnyside Yard is listed as a Class II Site in the New York State Department of Environmental Conservation's (NYSDEC) Registry of Inactive Hazardous Waste Disposal Sites. As a result of the listing, Amtrak, New Jersey Transit Corporation (NJTC), and the NYSDEC entered into an Order on Consent (OOC) Index #W2-0081-87-06 effective October 1989.

In accordance with the OOC, several investigations have been performed throughout the Yard, including, but not limited to, remedial investigations, feasibility studies and a risk assessment. Each of these investigations was performed by Roux Associates, Inc. (Roux Associates). As a result of these investigations, areas of the Yard were identified where levels of contamination require remedial efforts. With the NYSDEC's concurrence, to accommodate the HSTF S&I Building construction schedule and still address remedial efforts sitewide in a timely and orderly manner, the Yard has been subdivided into six operable units. The operable units are described as follows:

- Operable Unit 1 (OU-1) designated as the soil above the water table within the footprint of the proposed HSTF S&I Building;
- Operable Unit 2 (OU-2) designated as the soil above the water table within the footprint of the HSTF S&I Building ancillary structures (i.e., the access road and utilities route, the parking area, the construction easement area which surrounds the building, and the construction laydown area);

- Operable Unit 3 (OU-3) designated as the soil and separate-phase petroleum accumulation above the water table in Area 1 of the Yard, as defined in the Phase I Remedial Investigation (RI) report;
- Operable Unit 4 (OU-4) designated as the soil above the water table in the remainder of the Yard;
- Operable Unit 5 (OU-5) designated as the sewer system beneath the Yard; and
- Operable Unit 6 (OU-6) designated as the ground water including the saturated soil beneath the Yard.

Based on an evaluation of the Yard conditions, in a February 25, 1997 letter to Roux Associates, the NYSDEC and New York State Department of Health (NYSDOH) issued the following NYSDEC-recommended soil cleanup levels for the contaminants of concern at the Yard:

- Semivolatile organic compounds (SVOCs) - 10 parts per million (ppm) for both surface and subsurface soil for total carcinogenic polycyclic aromatic hydrocarbons (cPAHs);
- Lead - 1,000 ppm for both surface and subsurface soil; and
- Polychlorinated biphenyls (PCBs) - 25 ppm for both surface and subsurface soil.

The letter further acknowledged that, while certain metals were found in soil throughout the Yard above the NYSDEC's Recommended Soil Cleanup Objectives (RSCOs), none (with the exception of lead) were present at levels high enough to require any remediation. Additionally, the letter did not address specific soil cleanup levels for volatile organic compounds (VOCs), since none were detected at the Yard above the RSCOs.

In a January 9, 1998 letter submitted to the NYSDEC, Roux Associates, on behalf of Amtrak, proposed that a cleanup level of 25 ppm for cPAHs, rather than a 10 ppm level, was appropriate for the Yard and requested that the NYSDEC consider this alternative. A favorable response to this proposal from the NYSDEC and the NYSDOH is anticipated, however, for this investigation, cPAHs were delineated based on the 10 ppm cleanup level in place at the time and soil will be removed and disposed accordingly.

1.1 Objectives

In order for trains to exit the HSTF S&I Building, two new sets of tracks will be installed to the west of OU-1 and OU-2. These tracks and corresponding fill material will be constructed over a portion of OU-3, some of which is underlain by the thin, trailing edge of the separate-phase petroleum accumulation. The limit of the HSTF related work area is shown in Figure 2.

At Amtrak's request, Roux Associates prepared the September 25, 1997 Work Plan titled "Work Plan for the Delineation and Further Characterization of Soil in the HSTF-Related Work Area Located in Operable Unit 3, Sunnyside Yard, Queens, New York" (Work Plan). The Work Plan, modified by NYSDEC comments as discussed in Section 3.1, was designed to accomplish the following:

- delineate, in-situ, the vertical and horizontal extent of previously identified lead concentrations above the NYSDEC-recommended soil cleanup level;
- further characterize both saturated and unsaturated soil in the HSTF related work area located in OU-3 for the contaminants of concern at the Yard (PCBs, cPAHs, and lead);
- determine removal and disposal options for soil where the contaminants of concern exceed the NYSDEC-recommended cleanup levels; and
- evaluate the portion of the separate-phase petroleum accumulation located beneath the investigation area.

The remainder of this report is organized as follows:

- 2.0 - Previous Investigations;
- 3.0 - Methods of Investigation;
- 4.0 - Discussion of Results; and
- 5.0 - Summary and Conclusions.

2.0 PREVIOUS INVESTIGATIONS

Soil quality data generated from five soil borings previously completed in the study area in OU-3 (S-122, MW-58, HST-1, HST-16, and HST-17; Figure 2) west of the proposed HSTF S&I Building footprint, identified one sample, the 0 to 2-feet below land surface (bls) interval at location MW-58, where the total lead concentration of 1,160 ppm exceeded the NYSDEC-recommended soil cleanup level of 1,000 ppm. The lead concentration in the sample from the 2 to 3-feet bls interval at this location was below the cleanup level. No PCB or cPAH concentrations exceeded their respective NYSDEC-recommended soil cleanup level.

In early 1993, during field work for the Phase II RI conducted at the Yard, the areal extent of the separate-phase petroleum accumulation in OU-3 was delineated. With the NYSDEC's concurrence, this was accomplished by completing a series of soil borings in the area to a depth of approximately two feet below the water table and examining them for indications of separate-phase petroleum contamination. The data developed during this screening investigation and the subsequent Phase II Addendum were used to determine the areal extent of the accumulation.

3.0 METHODS OF INVESTIGATION

To achieve the objectives of the investigation, soil borings intended for both characterization and delineation were completed and sampled. To ensure that the soil borings would not disrupt any unmapped utilities, Amtrak requested that at a minimum, the first three feet of all soil borings, be advanced by hand. For this investigation, all soil borings were completed using hand tools (i.e., posthole digger, hand-driven sampler, or hand auger).

3.1 Soil Boring and Sampling Program

The first phase of the soil boring and sampling program was conducted on December 8, 1997. The soil borings were completed by Land, Air, Water Environmental Services, Inc., Center Moriches, New York under the supervision of Roux Associates. The soil sampling was performed by Roux Associates. The analytical program (PCBs, cPAHs and lead) was completed by Industrial Corrosion Management, Inc. (ICM) laboratory, Randolph, New Jersey following 1995 NYSDEC Analytical Services Protocols with Category B deliverables. All downhole equipment was decontaminated prior to beginning each soil boring and all sampling equipment was decontaminated prior to collecting each sample interval.

Excavated soil from each distinct sampling interval was placed on clean plastic sheeting, homogenized, and a representative sample collected. The lithology of all samples was recorded in the project field book. All samples were labeled and placed on ice immediately following collection and during transport to the laboratory.

All field work was completed in accordance with the scope of work as specified in the Work Plan as modified by NYSDEC comment letters and our response letters which are included in Appendix A. The NYSDEC's December 1, 1997 letter commenting on the Work Plan requested that samples HST-26 through HST-28 (Figure 2) be analyzed for cPAHs in addition to lead. The Work Plan as modified (expressed in our December 5, 1997 response letter to the NYSDEC; Appendix A) was implemented on December 8, 1997; and a total of eight soil borings were completed for this investigation. The soil borings designated HST-21 through HST-28 (Figure 2), were completed to a maximum of three feet bls. Soil samples were collected and analyzed in accordance with the Work Plan, as modified.

In a December 22, 1997 letter to Roux Associates (Appendix A), the NYSDEC expressed concern regarding the possibility of contamination extending into the saturated soil and requested that additional saturated soil samples be collected at locations HST-21 through HST-25 (Figure 2). Amtrak agreed (expressed in our December 31, 1997 letter to the NYSDEC; Appendix A) and on January 12, 1998, soil borings HST-21 through HST-25 were redrilled at the NYSDEC's request to a depth of three feet below the water table. Soil samples from the 2-feet interval intersecting the water table (i.e., one foot above and one foot below) and the following deeper 2-feet interval were collected and analyzed for PCBs, cPAHs, and lead.

Additionally, on January 12, 1998 and January 20, 1998, soil sampling to complete horizontal delineation at locations where contaminant concentrations were identified which exceeded the NYSDEC-recommended cleanup levels was conducted.

3.2 Separate-Phase Petroleum Accumulation Evaluation

In conjunction with the January 12, 1998 soil borings which were completed to a depth of 3 feet into saturated soil, soil boreholes were examined for the presence of separate-phase petroleum on top of the water table. Additionally, Recovery Ring 3 (a component of the original separate-phase petroleum interim remedial measures system) and Monitoring Well MW-22 (Figure 2), both located within the HSTF related work area, were measured for separate-phase petroleum thickness using a MMC™ oil-water interface detector.

4.0 DISCUSSION OF RESULTS

The results of the soil boring and sampling program and the evaluation of the separate-phase petroleum accumulation are discussed below.

4.1 Soil Quality

The lithology encountered generally consisted of approximately 1 foot of ballast with black/brown fine to coarse sand, gravel, coal ash and cinders overlying orange/brown fine to coarse sand with a trace of gravel (geologic logs for soil borings completed during this investigation can be found in Appendix B). Slight hydrocarbon odors were noted in soil samples collected within the areal extent of the separate-phase petroleum accumulation. Photoionization detector (PID) readings from samples in this area ranged from 0 ppm in soil boring HST-25 to 1.8 ppm in soil boring HST-23.

The analytical data are presented in Tables 1 through 3 and are summarized below. An evaluation of the analytical data was performed to determine the overall quality and usability of the sample results generated by ICM Laboratory. A data quality and usability report can be found in Appendix C.

Polychlorinated Biphenyls - Results of the PCB analyses are presented in Table 1. As shown in the table, PCB concentrations range from not detected to a high of 2,900 micrograms per kilogram (µg/kg) or 2.9 ppm in sample HST-24 (0-1), which is well below the NYSDEC-recommended soil cleanup level for PCBs of 25 ppm. Of the remaining detections, none exceeded 280 µg/kg (0.28 ppm).

PCB concentrations in the saturated soil samples including those collected within the areal extent of the separate-phase petroleum accumulation did not exceed 200 µg/kg (0.2 ppm), which is well below the 25 ppm cleanup level.

Carcinogenic Polycyclic Aromatic Hydrocarbons - Results of the cPAH analyses are presented in Table 2. As shown in the table, of all the soil characterization samples collected on December 8, 1997 in the investigation area, only HST-22 (0-1) exceeded the NYSDEC-recommended soil cleanup level for cPAHs of 10 ppm which was in place during the investigation. The cPAH concentration in samples from the 1 to 2-feet bls and 2 to 3-feet bls intervals at this location was below the cleanup level. Further horizontal delineation samples were collected from the 0 to 1-foot bls interval around the HST-22 location on January 12, 1998 (HST-22A through HST-22D) and January 20, 1998 (HST-22A+10, HST-22B+20 and HST-22D+10) (Figure 2). Results of the January 12, 1998 delineation sampling detected cPAH concentrations ranging from 1,743 µg/kg (1.743 ppm) in sample HST-22C to a high of 108,200 µg/kg (108.2)ppm) in sample HST-22B. Samples HST-22A, HST-22B, and HST-22D exceeded the 10 ppm soil cleanup level for cPAHs. Results of the January 20, 1998 delineation sampling (i.e., locations HST-22A+10, HST-22B+20, and HST-22D+10) indicate cPAH concentrations in all samples was below the NYSDEC-recommended cleanup level (Table 2). As shown in the table, locations HST-22A+10, HST-B+20, HST-22C and HST-22D+10 are all below the 10 ppm soil cleanup level for cPAHs, completing the horizontal delineation of the HST-22 exceedance (Figure 2).

Concentrations of cPAHs in the saturated soil samples, including those collected within the areal extent of the separate-phase petroleum accumulation, ranged from not detected in HST-21 (5-7) to a high of 6,690 µg/kg or 6.69 ppm in sample HST-24 (6.5-8.5), which is below the 10 ppm cleanup level in place during the investigation.

Lead - Results of the lead analyses are presented in Table 3. As shown in the table, lead concentrations range from a low of 2.6 milligrams per kilogram (mg/kg) or 2.6 ppm in sample HST-21 (2-3) to a high of 1,180 mg/kg or 1,180 ppm in sample HST-28 (0-2). This sample, collected for horizontal delineation of the MW-58 exceedance, is the only sample with a concentration above the NYSDEC-recommended soil cleanup level for lead of 1,000 ppm. Sample HST-29 (0-2) collected on January 12, 1998 (lead concentration of 30.8 ppm), as well as locations HST-25, HST-26, and HST-27, all below the cleanup level for lead, completed the horizontal delineation of the lead exceedance detected in MW-58 (Figure 2).

Additionally, lead concentrations in the saturated soil samples collected on January 12, 1998 did not exceed 76.5 ppm, which is well below the 1,000 ppm cleanup level.

4.2 Separate-Phase Petroleum Accumulation

The extent of the separate-phase petroleum accumulation in OU-3 was delineated from January through March, 1993 during field work for the Phase II RI. With the NYSDEC's concurrence, a series of screening borings were completed to a depth of 2 feet below the water table along the perimeter of the accumulation. The open boreholes were examined for the presence or absence of separate-phase petroleum, thereby defining the estimated areal extent of the accumulation. Subsequently, monitoring wells were installed at locations based on the results of the screening procedure and an excellent correlation was noted while delineating the extent of the accumulation.

On January 12, 1998, the same petroleum screening procedure was utilized at boring locations HST-21 through HST-25 and the presence of petroleum, although not measurable, was noted at locations HST-22 and HST-23. Additionally, the separate-phase petroleum accumulation was measured in Monitoring Well MW-22 (0.02 feet, measured with an oil-water interface detector) and no measurable separate-phase petroleum was noted in Recovery Ring 3. It is important to note that this is a measured thickness not an actual thickness. Based on previous work at the Yard, actual thickness is approximately one third of the measured thickness. The extent of the accumulation shown in Figure 2 was based on any amount of petroleum observed, including unmeasurable sheens. This overly conservative approach was adopted to ensure no potential source areas would be overlooked. Therefore, the line indicating the extent of the accumulation does not coincide with the extent of recoverable petroleum. In fact, a significant portion of the areal extent of the accumulation does not contain recoverable petroleum. The petroleum is primarily a combination of diesel fuel and No. 2 fuel oil that is significantly degraded after being released decades ago and, accordingly, it is very viscous. In addition, the extremely small thicknesses found in the area (including many that are so small as to be unmeasurable), indicate that the vast majority of the petroleum is bound to the aquifer matrix and does not exist as a floating phase and is, therefore, unrecoverable.

WHERE ?

IS IT BOUND TO SOIL, WHY CAN IT BE EXCAVATED ?

5.0 SUMMARY AND CONCLUSIONS

In summary, the analytical results for soil characterization in the HSTF related work area of OU-3 indicate the following:

- PCBs were not detected in either saturated or unsaturated soil above the NYSDEC-recommended soil cleanup level of 25 ppm;
- only four of the 30 samples analyzed for cPAHs exceeded the NYSDEC-recommended soil cleanup level of 10 ppm (i.e., the 0 to 1-foot bls interval at locations HST-22, HST-22A, HST-22B, and HST-22D);
- with the exception of the 0 to 2-feet bls interval delineated around location MW-58 (including HST-28), no lead was detected in saturated or unsaturated soil above the NYSDEC-recommended soil cleanup level of 1,000 ppm; and
- the separate-phase petroleum data indicate an actual accumulation of less than 0.02 feet in the HSTF related work area.

The analytical results from the saturated soil samples, including those collected at and below the oil-water interface in the HSTF related work area, indicate that concentrations of the contaminants of concern, where present, are well below the NYSDEC-recommended soil cleanup levels. The results of the oil-water interface samples are also indicative, in part, of the separate-phase petroleum characteristics in this area.

The analytical results also indicate two locations where only the surface sample interval exceeded the respective NYSDEC-recommended soil cleanup level (i.e., the 0 to 1-foot bls interval around location HST-22 for cPAHs and the 0 to 2-feet bls interval around location MW-58 for lead). Both of these exceedances were further delineated horizontally (i.e., soil samples collected in four directions around the exceedance until analytical results indicated the respective NYSDEC-recommended soil cleanup levels were met) as shown in Figure 2.

Amtrak intends to remove and properly dispose of soil identified as containing cPAHs and lead in excess of the respective NYSDEC-recommended soil cleanup level (shown in Figure 2). Excavated soil, a total of approximately 200 cubic yards, will be staged in an appropriate location and sampled for disposal characterization in accordance with the requirements of the facility

accepting the waste. Surface concrete and asphalt paving material from around the HST-22 location (approximately 60 cubic yards) will be disposed as construction and demolition debris to a recycling facility.

A report which includes a summary of the remedial activities for locations HST-22 and MW-58 will be prepared and submitted to the NYSDEC following completion of the work. No other soil remedial efforts are required in the HSTF related work area of OU-3.

Since the petroleum in the HSTF related work area is unrecoverable and does not contain any contaminants of concern at concentrations above the NYSDEC-recommended soil cleanup levels, Amtrak recommends no further action in this area. Amtrak proposes to monitor the petroleum thickness in this area during field work for the OU-3 RI and in the event conditions change so that recoverable petroleum is detected, it will be addressed at that time.

Respectfully Submitted,

ROUX ASSOCIATES, INC.

Harry Gregory
Project Hydrogeologist/
Project Manager

Joseph D. Duminuco
Principal Hydrogeologist/
Office Manager

Table 1. Summary of Polychlorinated Biphenyl Compound Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens ,New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	**Sample Designation:** **HST-21** **Sample Depth (ft bls):** **0-1** **Sample Date:** **12/8/97**	**HST-21** **1-2** **12/8/97**	**HST-21** **2-3** **12/8/97**	**HST-21** **3-5** **1/12/98**	**HST-21** **5-7** **1/12/98**	**HST-22** **0-1** **12/8/97**	**HST-22** **1-2** **12/8/97**	**HST-22** **1-3** **1/12/98**	**HST-22** **3-5** **1/12/98**
Aroclor-1016	--	38 U	36 U	37 U	39 U	39 U	42 U	41 U	43 U	43 U
Aroclor-1221	--	38 U	36 U	37 U	39 U	39 U	42 U	41 U	43 U	43 U
Aroclor-1232	--	38 U	36 U	37 U	39 U	39 U	42 U	41 U	43 U	43 U
Aroclor-1242	--	38 U	36 U	37 U	39 U	39 U	42 U	41 U	43 U	43 U
Aroclor-1248	--	38 U	36 U	37 U	39 U	39 U	42 U	41 U	43 U	43 U
Aroclor-1254	--	38 U	36 U	37 U	39 U	39 U	42 U	41 U	43 U	43 U
Aroclor-1260	--	**32 J**	36 U	37 U	39 U	39 U	42 U	**97**	**110**	43 U
Total Aroclors	25,000	**32 J**	0	0	0	0	0	**97**	**110**	0

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 1. Summary of Polychlorinated Biphenyl Compound Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens ,New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	**Sample Designation:**	**HST-23**	**HST-23**	**HST-23**	**HST-24**	**HST-24**	**HST-24**	**HST-24**	**HST-24**
		Sample Depth (ft bls):	**0-1**	**1-2**	**1-3**	**3-5**	**0-1**	**1-2**	**2-3**	**4.5-6.5**	**6.5-8.5**
		Sample Date:	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**	**12/8/97**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**
Aroclor-1016	--		38 U	38 U	38 U	38 U	390 U	39 U	38 U	39 U	39 U
Aroclor-1221	--		38 U	38 U	38 U	38 U	390 U	39 U	38 U	39 U	39 U
Aroclor-1232	--		38 U	38 U	38 U	38 U	390 U	39 U	38 U	39 U	39 U
Aroclor-1242	--		38 U	38 U	38 U	38 U	390 U	39 U	38 U	39 U	39 U
Aroclor-1248	--		38 U	38 U	38 U	38 U	390 U	39 U	38 U	39 U	39 U
Aroclor-1254	--		38 U	38 U	38 U	38 U	**1200 JV**	39 U	38 U	39 U	39 U
Aroclor-1260	--		**170**	**270 JV**	**200**	**72**	**1700 JV**	**220**	**280**	39 U	39 U
Total Aroclors	25,000		**170**	**270 JV**	**200**	**72**	**2900 JV**	**220**	**280**	0	0

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 1. Summary of Polychlorinated Biphenyl Compound Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens ,New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	**Sample Designation:** **HST-25** **Sample Depth (ft bls):** **0-2** **Sample Date:** **12/8/97**	**HST-25** **1-3** **1/12/98**	**HST-25** **3-5** **1/12/98**
Aroclor-1016	--	38 U	40 U	38 U
Aroclor-1221	--	38 U	40 U	38 U
Aroclor-1232	--	38 U	40 U	38 U
Aroclor-1242	--	38 U	40 U	38 U
Aroclor-1248	--	38 U	40 U	38 U
Aroclor-1254	--	38 U	40 U	38 U
Aroclor-1260	--	**170**	40 U	38 U
Total Aroclors	25,000	**170**	0	0

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 2. Summary of Carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	**Sample Designation:**	**HST-21**	**HST-21**	**HST-21**	**HST-21**	**HST-22**	**HST-22**	**HST-22**	**HST-22**
		Sample Depth (ft bls):	**0-1**	**1-2**	**2-3**	**3-5**	**5-7**	**0-1**	**1-2**	**1-3**	**3-5**
		Sample Date:	**12/8/97**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**
Benzo(a)anthracene	--		**110 J**	360 U	370 U	**20 J**	390 U	**1900 JV**	**84 J**	**140 J**	**300 J**
Benzo(a)pyrene	--		**100 J**	360 U	370 U	390 U	390 U	**2400 JV**	**110 J**	**190 J**	**35 J**
Benzo(b)fluoranthene	--		**390**	**97 J**	370 U	**62 J**	390 U	**6000 JV**	**67 J**	**430**	**59 J**
Benzo(k)fluoranthene	--		380 U	360 U	370 U	390 U	390 U	410 UJV	410 U	430 U	440 U
Chrysene	--		**160 J**	360 U	370 U	**35 J**	390 U	**2000 JV**	**130 J**	**160 J**	**300 J**
Dibenzo(a,h)anthracene	--		380 U	360 U	370 U	390 U	390 U	**500 JV**	410 U	**46 J**	440 U
Indeno(1,2,3-cd)pyrene	--		**45 J**	360 U	370 U	390 U	390 U	**990 JV**	**62 J**	**120 J**	440 U
Total cPAHs	25,000		**805 J**	**97 J**	0	**117 J**	0	**13,790 JV**	**453 J**	**1,086 J**	**694 J**

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 2. Summary of Carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	**Sample Designation:** **HST-22A** **Sample Depth (ft bls):** **0-1** **Sample Date:** **1/12/98**	**HST-22B** **0-1** **1/12/98**	**HST-22C** **0-1** **1/12/98**	**HST-22D** **0-1** **1/12/98**	**HST-22A+10** **0-1** **2/20/98**	**HST-22B+20** **0-1** **2/20/98**	**HST-22D+10** **0-1** **2/20/98**	**HST-23** **1-2** **12/8/97**
Benzo(a)anthracene	--	**5100 J**	**21000**	**330 J**	**3200 J**	**820**	**230 J**	**120 J**	**690 J**
Benzo(a)pyrene	--	**2100 J**	**16000**	**250 J**	**3600 J**	**1300**	**310 J**	**200 J**	3800 U
Benzo(b)fluoranthene	--	**13000**	**40000**	**550**	**8100 J**	**3200**	**680**	**200 J**	**720 J**
Benzo(k)fluoranthene	--	12000 U	11000 U	390 U	12000 U	420 U	**280 J**	**200 J**	3800 U
Chrysene	--	**7000 J**	**20000**	**430**	**3900 J**	**1000**	**330 J**	**140 J**	**960 J**
Dibenzo(a,h)anthracene	--	**2100 J**	**3600 J**	**63 J**	**1100 J**	**190 J**	**270 J**	770 U	3800 U
Indeno(1,2,3-cd)pyrene	--	**4200 J**	**7600 J**	**120 J**	**2800 J**	**750**	**290 J**	770 U	3800 U
Total cPAHs	25,000	**33,500 J**	**108,200 J**	**1,743 J**	**22,700 J**	**7,260 J**	**2,390 J**	**860 J**	**2,370 J**

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 2. Summary of Carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	HST-23 1-3 1/12/98	HST-23 3-5 1/12/98	HST-24 0-1 12/8/97	HST-24 1-2 12/8/97	HST-24 2-3 12/8/97	HST-24 4.5-6.5 1/12/98	HST-24 6.5-8.5 1/12/98	HST-25 0-2 12/8/97
Sample Designation:		**HST-23**	**HST-23**	**HST-24**	**HST-24**	**HST-24**	**HST-24**	**HST-24**	**HST-25**
Sample Depth (ft bls):		**1-3**	**3-5**	**0-1**	**1-2**	**2-3**	**4.5-6.5**	**6.5-8.5**	**0-2**
Sample Date:		**1/12/98**	**1/12/98**	**12/8/97**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**	**12/8/97**
Benzo(a)anthracene	--	**38 J**	**45 J**	**960 JV**	**380 J**	**700**	**500**	**690**	**920 JV**
Benzo(a)pyrene	--	380 U	**22 J**	**640 JV**	**660**	**930**	**1000**	**1200**	**750 JV**
Benzo(b)fluoranthene	--	**47 J**	**60 J**	**4600 JV**	**1400**	**2300**	**2300**	**2900**	**2200 JV**
Benzo(k)fluoranthene	--	380 U	380 U	390 UJV	390 U	380 U	390 U	390 U	380 UJV
Chrysene	--	**59 J**	**76 J**	**1800 JV**	**580**	**970**	**690**	**930**	**980 JV**
Dibenzo(a,h)anthracene	--	380 U	380 U	**250 JV**	**86 J**	**130 J**	**340 J**	**360 J**	**220 JV**
Indeno(1,2,3-cd)pyrene	--	380 U	380 U	**460 JV**	**170 J**	**250 J**	**580**	**610**	**580 JV**
Total cPAHs	25,000	**144 J**	**203 J**	**8,710 JV**	**3,276 J**	**5,280 J**	**5,410 J**	**6,690 J**	**5,650 JV**

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 2. Summary of Carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in µg/kg)	NYSDEC - Recommended Cleanup Level	**Sample Designation:** **HST-25** **Sample Depth (ft bls):** **1-3** **Sample Date:** **1/12/98**	**HST-25** **3-5** **1/12/98**	**HST-26** **0-2** **12/8/97**	**HST-27** **0-2** **12/8/97**	**HST-28** **0-2** **12/8/97**
Benzo(a)anthracene	--	**370 J**	**51 J**	**250 J**	**1200 JV**	**440 JV**
Benzo(a)pyrene	--	**250 J**	**57 J**	**250 J**	**1100 JV**	**500 JV**
Benzo(b)fluoranthene	--	**550**	**120 J**	**830**	**3000 JV**	**1800 JV**
Benzo(k)fluoranthene	--	400 U	380 U	400 U	410 UJV	410 UJV
Chrysene	--	**330 J**	**63 J**	**320 J**	**1500 JV**	**680 JV**
Dibenzo(a,h)anthracene	--	**68 J**	**20 J**	**67 J**	**350 JV**	**160 JV**
Indeno(1,2,3-cd)pyrene	--	**140 J**	**48 J**	**130 J**	**620 JV**	**320 JV**
Total cPAHs	25,000	**1,708 J**	**359 J**	**1,847 J**	**7,770 JV**	**3,900 JV**

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for but not detected
J - Estimated value
V - Qualifier added during data validation

Table 3. Summary of Lead Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in mg/kg)	NYSDEC - Recommended Cleanup Level	HST-21 0-1 12/8/97	HST-21 1-2 12/8/97	HST-21 2-3 12/8/97	HST-21 3-5 1/12/98	HST-21 5-7 1/12/98	HST-22 0-1 12/8/97	HST-22 1-2 12/8/97	HST-22 1-3 1/12/98	HST-22 3-5 1/12/98
Sample Designation:		**HST-21**	**HST-21**	**HST-21**	**HST-21**	**HST-21**	**HST-22**	**HST-22**	**HST-22**	**HST-22**
Sample Depth (ft bls):		**0-1**	**1-2**	**2-3**	**3-5**	**5-7**	**0-1**	**1-2**	**1-3**	**3-5**
Sample Date:		**12/8/97**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**
Lead	1,000	**118**	**8.1**	**2.6**	**3**	**4**	**768**	**333**	**48**	**69**

mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

Table 3. Summary of Lead Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in mg/kg)	NYSDEC - Recommended Cleanup Level	HST-23 0-1 12/8/97	HST-23 1-2 12/8/97	HST-23 1-3 1/12/98	HST-23 3-5 1/12/98	HST-24 0-1 12/8/97	HST-24 1-2 12/8/97	HST-24 2-3 12/8/97	HST-24 4.5-6.5 1/12/98	HST-24 6.5-8.5 1/12/98
Sample Designation:		**HST-23**	**HST-23**	**HST-23**	**HST-23**	**HST-24**	**HST-24**	**HST-24**	**HST-24**	**HST-24**
Sample Depth (ft bls):		**0-1**	**1-2**	**1-3**	**3-5**	**0-1**	**1-2**	**2-3**	**4.5-6.5**	**6.5-8.5**
Sample Date:		**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**	**12/8/97**	**12/8/97**	**12/8/97**	**1/12/98**	**1/12/98**
Lead	1,000	**626**	**153**	**12**	**18**	**991**	**165**	**259**	**10**	**7**

mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

Table 3. Summary of Lead Concentrations Detected in Soil Samples Collected in the HSTF Related Work Area in OU-3, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in mg/kg)	NYSDEC - Recommended Cleanup Level	Sample Designation: HST-25 / Sample Depth (ft bls): 0-2 / Sample Date: 12/8/97	Sample Designation: HST-25 / Sample Depth (ft bls): 1-3 / Sample Date: 1/12/98	Sample Designation: HST-25 / Sample Depth (ft bls): 3-5 / Sample Date: 1/12/98	Sample Designation: HST-26 / Sample Depth (ft bls): 0-2 / Sample Date: 12/8/97	Sample Designation: HST-27 / Sample Depth (ft bls): 0-2 / Sample Date: 12/8/97	Sample Designation: HST-28 / Sample Depth (ft bls): 0-2 / Sample Date: 12/8/97	Sample Designation: HST-29 / Sample Depth (ft bls): 0-2 / Sample Date: 1/12/98
Lead	1,000	**448**	76.5	**23.9**	**863**	**559**	**1,180**	30.8

mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

SOURCE:
CENTRAL PARK AND BROOKLYN, NEW YORK
QUADRANGLE 7.5 MINUTE SERIES (TOPOGRAPHIC)

Title:

YARD LOCATION MAP

SUNNYSIDE YARD QUEENS, NEW YORK

Prepared For:

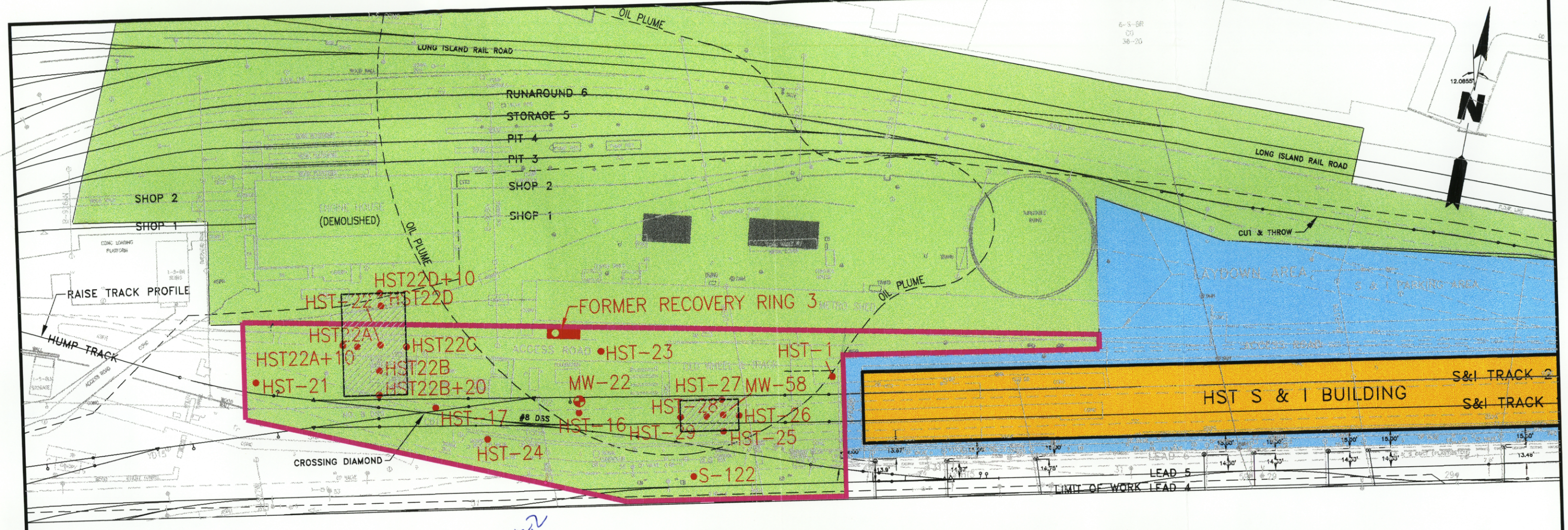
AMTRAK

ROUX

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by:	H.G.	Date:	9/97	FIGURE
Prepared by:	R.R	Scale:	1"=2,000'	1
Project Mgr:	J.D	Status:	Final	
File No:	A5214402	Project:	05552Y	

N:\AM055Y\AM52Y\14402\A5214402.WOR



$13\frac{1}{16} + \frac{1}{2} = 13\frac{15}{16}$

$63\frac{1}{2} \times 90' = 5850 Ft^2$

$5\frac{1}{2} + \frac{1}{2} = 5\frac{3}{4}$

$50 \times 35' = 1750 Ft^2$

LEGEND

HST-21 ● SOIL BORING AND SAMPLING LOCATION AND DESIGNATION	OU-1
MW-22 ◔ MONITORING WELL LOCATION AND DESIGNATION	OU-2
LIMIT OF HSTF RELATED WORK AREA ≅ 500 × 160' = 2 ACRES	OU-3
	AREA TO BE REMEDIATED

Title:

HSTF RELATED WORK AREA MAP

SUNNYSIDE YARD, QUEENS, NEW YORK

Prepared For: AMTRAK

ROUX ROUX ASSOCIATES INC *Environmental Consulting & Management*

Compiled by: H.G.	Date: 2/98	FIGURE
Prepared by: R.K.	Scale: As Shown	2
Project Mgr: H.G.	Status: FINAL	
File No: A5216201	Project: 05552Y02	

N:\AM05SY\AM52Y\144\A5214401.DWG

APPENDIX A

NYSDEC Comment Letters and Roux Associates' Response Letters

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street, Long Island City, NY 11101
(718) 482-4995, Fax (718) 482-4954

John P. Cahill
Commissioner

December 1, 1997

Mr. Joseph Duminuco
Roux Associates
1377 Motor Parkway
Islandia, New York 11788

Re: Amtrak Sunnyside Yard, Site Code 241006
Work Plan For the Investigation and Remediation
of Portion of OU-3

Dear Mr. Duminuco:

The Department has completed a detailed review of the above - referenced work plan for the investigation and remediation of the portion of Operable Unit 3 below the tracks that will serve the High Speed Trainset facility ("HSTF"). This technical review included not only the technical staff from the Region, but a number of experts from the Bureaus of Spill Prevention and the Eastern Remedial Action in Albany. On the basis of that review, the Department developed the following comments on the Work Plan for OU-3, which must be addressed before the plan can be approved:

1. The investigation and remediation of this portion of OU-3 must include not only the soil above the groundwater level, but also the removal of the free product as well as removal of the contaminated soil beneath the groundwater table, to the extent that the contaminants exceed the cleanup levels established in the Record of Decision issued for OU-1

2. The remediation of soil contamination in Area 1, among Operable Units 3 and 6, would potentially include one or more of three methods; an active pumping system, a passive trench collection system, and removal through excavation. These methods, among other feasible methods, will be discussed in the Feasibility Study.

3. We understand that the placement of tracks must occur as part of the construction of the HSTF, ahead of the completion of the RI/FS for Operable Units 3 and 6. Based on the location of these tracks over the upgradient side of the free product and potentially contaminated groundwater - saturated soil and the uncertainty of the selected method of remediation, the appropriate course of action is to remove the contamination as part of the track construction. This will result in the certainty that after investigation and remediation, if needed, the track will not have to be relocated in the future.

4. The free product underneath the proposed HSTF tracks must be actively pumped out and the residual product in the smear zone and the saturated soils must be excavated before the new tracks are laid.

5. The 2-3 ft interval in boring MW-58 was found to contain 13.6 ppm of semivolatiles (SVOCs). Since the analytical detection limits for most of the carcinogenic PAHs were very high (7.3 ppm), the total CPAHs in many locations may be higher than the 10 ppm clean up levels. The resampling done in March 1996 in the nearby could have easily missed it. For this reason, the Department asks that the proposed delineation for high lead in MW 52 should also include for CPAHs in samples HST 26 through 28.

6. If a sample requires dilution because of a high concentration of a target compound, the target compound concentration must be reported at a dilution within the instrument calibration range. If a sample requires dilution because of the high concentration of non-target compounds, the non-target compounds must be reported as tentatively identified compounds. In either case, if the analysis dilution results in high detection limits (above the action limit) for site compounds of concern, the contamination that is causing the high detection limits must be remediated and then the location should be resampled and analyzed to obtain data for the site compounds of concern that is reported at the method practical quantitaion limit, which is below the action limit.

7. Please provide me with a copy of boring logs for HST 16 and HST-17. Apparently, these borings were done without the Department's input.

8. The laboratory, AEN of Monroe, Connecticut, is not approved by the ELAP. All analyses must be done by an ELAP accredited laboratory.

A quick resolution of the above comments and concerns will greatly expedite the Department's approval of the OU-3 HSTF work plan. If you have any questions, please contact me immediately at 718-482-4909.

Sincerely,

Hari O. Agrawal, P.E.
Environmental Engineer

cc:
Richard Gardineer/ file
Sal Ervolina, DER, Albany 7010
Christine McGrath, DER, Albany, 7010
Steve Bates, NYSDOH, Albany
Rosalie Rusinko, DEE, Tarrytown
Frank Peduto, BSPR, Albany 3510

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, New York 11101
(718) 482-4995 Fax: (718) 482-6358

John P. Cahill
Commissioner

December 22, 1997

VIA TELECOPY

Mr. Joseph Duminuco
Principal Hydrogeologist
Roux Associates
1377 Motor Parkway
Islandia, New York 11788

Re: Work Plan for the Delineation and Further Characterization of Soil in the HSTF related Work Area Located in the Operable Unit 3 Sunnyside Yard, Queens, New York

Dear Mr. Duminuco:

In response to your December 5, 1997 letter, this is to advise you that Comment Numbers 1 thru 4 of the Department's December 1, 1997 letter are pertinent and essential to the investigation, as well as the remediation, of OU3, including the area where the tracks serving the HSTF Maintenance Building will be located. You have stated that Amtrak wishes to postpone consideration of remedial issues until after the completion of the investigation phase. Because of the time constraints which Amtrak faces with respect to the HSTF, however, the Department provided these comments up-front to prevent any future problems.

The Department is working from the premise that Amtrak wants to do everything within its power to ensure that once the HSTF tracks are laid that they need not be disturbed or removed. As you may be aware, 6 NYCRR 375-1.2(e)(2)(i)(a) prohibits any person from engaging in any activity "that will, or that reasonably is anticipated to, prevent or interfere significantly with any proposed, ongoing, or completed program at any site listed in the Registry."

The Department agrees with the number and location of borings to characterize subsurface contamination, and the only other comment the Department has (in addition to comments 5 through 8 of the Department's December 1 letter) is that Borings HST-21 through 25 should be advanced into the saturated soils as deep as necessary to characterize and delineate the extent of contamination in the saturated zone. This may necessitate taking more than two samples per location.

If you have any questions, please call Hari Agrawal, of my staff at 718-482-4909, or myself at 482-4895.

Respectfully,

Richard A. Gardineer

Richard A. Gardineer, P.E.

CC: Rosalie Rusinko
Hari Agrawal/ file

ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES INC

ROUX

1377 MOTOR PARKWAY
ISLANDIA, NEW YORK 11788
TEL 516 232-2600 FAX 516 232-9898

December 31, 1997

Richard Gardineer, P.E.
Regional Remediation Engineer
New York State Department of Environmental Conservation
47-40 21st Street
Long Island City, New York 11101

Re: Work Plan for the Delineation and Further Characterization of Soil in the HSTF Related Work Area Located In Operable Unit 3 Sunnyside Yard, Queens, New York

Dear Mr. Gardineer:

As your are aware, Roux Associates, Inc. on behalf of Amtrak, prepared and submitted the above referenced work plan for your review and comment. This letter is intended to memorialize the items that were discussed and the resolutions reached during our December 23 and 24, 1997 telephone conversations regarding your December 22, 1997 comment letter to Roux Associates . If your understanding of these issues is different than what is presented below, please contact Roux Associates immediately as we are striving to perform the additional sampling sometime during the week of January 5, 1998.

It is our understanding that additional soil samples are to be collected and analyzed from previously sampled borings HST-21 through HST-25. Two additional soil samples will be collected at each location; these samples will consist of a two-foot sample straddling the water table (i.e., one foot above and one foot below the water table) and a two-foot sample immediately below the water table sample (i.e., one to three feet below the water table). The upper sample from each borehole will be analyzed for three site-specific compounds consisting of polychlorinated biphenyls (PCBs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and lead. If any of these compounds are detected above the site-specific cleanup levels in the upper samples, the corresponding lower samples will then be analyzed (within holding times) for the compound(s) that was in exceedance of the cleanup level. In addition, a few samples will be collected to determine the physical characteristics of the soil in the area, as per the recommendation of Frank Peduto of the NYSDEC.

Data already collected as part of this investigation has been reviewed and, as a result, additional sampling will be performed while we are on-site. This work is designed to determine the extent of lead above the soil cleanup level in the vicinity of MW-58 as well as the extent of cPAHs in one shallow ballast sample. All sampling and analysis will be performed in accordance with the procedures presented in the above-referenced work plan.

We appreciate your cooperation regarding this matter as Amtrak is working with a very accelerated construction schedule for the High Speed Rail Project. If you have any questions or would like to be present during the sampling, please do not hesitate to call.

Sincerely

ROUX ASSOCIATES, INC.

Joseph Duminuco
Principal Hydrogeologist

cc: H. Agrawal, P.E., NYSDEC
R. Mohlenhoff, P.E., Amtrak
C. Warren, Esq., Robinson, Silverman, et al.

ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES INC

ROUX

1377 MOTOR PARKWAY
ISLANDIA, NEW YORK 11788
TEL 516 232-2600 FAX 516 232-9898

December 5, 1997

Hari O. Agrawal, P.E.
Environmental Engineer
New York State Department of Environmental Conservation
Hazardous Waste Remediation - Region 2
27-20 21st Street
Long Island City, New York 11101

Re: Work Plan for the Delineation and Further Characterization of Soil in the HSTF Related Work Area Located in Operable Unit 3 Sunnyside Yard, Queens, New York

Dear Mr. Agrawal:

Roux Associates, Inc. (Roux Associates) has reviewed the New York State Department of Environmental Conservation's (NYSDEC) December 1, 1997 letter regarding the above referenced Work Plan. It is important to note that this document is intended as an investigative work plan to support construction of the High Speed Trainset Facility (HSTF) at the Sunnyside Yard, Queens, New York (Yard), and makes no reference to remediation of soil or separate-phase petroleum as you suggest. As such, Roux Associates has prepared this response on behalf of the National Railroad Passenger Corporation (Amtrak) and the New Jersey Transit Corporation (NJT).

We appreciate the NYSDEC's concerns as expressed in comments 1 through 4. However, as they refer specifically to remediation of soil and/or separate-phase petroleum, they are not applicable to this Work Plan. Following a review of the data, we will certainly take your comments into consideration when developing any necessary remedial alternatives. Amtrak, like the NYSDEC, does not wish to be in a position where additional excavation may be needed following completion of HSTF track construction in this area. The NYSDEC's remaining comments are presented below in italics, followed by our response.

5. *The two to three foot interval in boring MW-58 was found to contain 13.6 ppm of semivolatiles (SVOCs). Since the analytical detection limits for most of the carcinogenic PAHs were very high (7.3 ppm), the total CPAHs in many locations may be higher than the ten ppm cleanup levels. The resampling done in March*

1996 in the nearby could have easily missed it. For this reason, the Department asks that the proposed delineation for high lead in MW-52 should also include CPAHs in samples HST-26 through HST-28.

We agree to include analyses for CPAHs in samples from Soil Borings HST-26 through HST-28.

6. *If a sample requires dilution because of a high concentration of a target compound, the target compound concentration must be reported at a dilution within the instrument calibration range. If a sample requires dilution because of the high concentration of non-target compounds, the non-target compounds must be reported as tentatively identified compounds. In either case, if the analysis dilution results in high detection limits (above the action limit) for site compounds of concern, the contamination that is causing the high detection limits must be remediated and then the location should be resampled and analyzed to obtain data for the site compounds of concern that is reported at the method practical quantitation limit, which is below the action limit.*

We agree with the first two sentences of this comment. However, the last sentence is clarified as follows:

Where there is "contamination" which necessitates dilution to a high detection limit, both the initial analysis and reanalysis will be reported. The reanalysis detection limits will only be used for the compound(s) detected above the initial calibration range. These results are then included in the investigative report. If concentrations for any of the reported compounds of concern at the Yard exceed the NYSDEC recommended cleanup level, the extent of contamination will then be delineated (i.e., additional sampling). At that point, remedial alternatives will be evaluated and a remedial plan, as necessary will be prepared. In no case will remediation be performed solely to achieve a lower detection limit.

7. *Please provide me with a copy of boring logs for HST-16 and HST-17. Apparently, these borings were done without the Department's input.*

The boring logs for Soil Boring s HST-16 and HST-17 will be provided under separate cover.

8. *The laboratory, AEN of Monroe, Connecticut, is not approved by the ELAP. All analyses must be done by an ELAP accredited laboratory.*

All analyses will be will be performed by an ELAP accredited laboratory.

As you are aware, this Work Plan was submitted to the NYSDEC for approval in September, 1997. We assume the Work Plan will be approved as amended by this letter. Due to the extraordinary time constraints associated with the HSTF construction project, we have scheduled the investigative work to commence on December 8, 1997.

If you have any questions, please do not hesitate to call.

Sincerely,

ROUX ASSOCIATES, INC.

Joseph D. Duminuco

Joseph D. Duminuco
Principal Hydrogeologist

cc: Richard Gardineer, P.E., NYSDEC
Sal Ervolina, P.E., NYSDEC
Steve Bates, NYSDOH
Rosalie Rusinko, Esq., DEE
Robert Noonan, Amtrak
Robert LaRosa, P.E., Amtrak
Jared Roberts, Esq., Amtrak
Richard Mohlenhoff, P.E., Amtrak
Irfan Oncu, P.E., Amtrak
Lawrence Steffes, Esq., Amtrak
Steven Jurow, NJT
Charles Warren, Esq., Robinson, Silverman, et al.
Carol Rosenthal, Esq., Kalkines, Arky, et al.

APPENDIX B

Geologic Logs

ROUX

Project: **Amtrak** Sunny Side Yard Queens, New York		Log of Soil Boring No. **HST-21**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **1/12/98**	Date Completed: **1/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **7.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **7 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **4.0** **feet**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown fine to coarse SAND; trace gravel	SM			0.0	
	Orange/Brown fine to coarse SAND	SM			0.0	
					0.0	
						Wet at 4.0 feet below land surface
5						
10						
15						
20						
25						

ROUX

Project: Amtrak Sunny Side Yard Queens, New York		Log of Soil Boring No. HST-22	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **1/12/98**	Date Completed: **1/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **5.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **5 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **2.0**	**feet**

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown to orange-brown and Tan fine to coarse SAND; trace silt, trace gravel, trace ballast	SM			0.0	
					1.2	
	Grey/Brown fine to coarse SAND; trace silt	SM				Wet at 1.8 to 2.0 feet below land surface. Hydrocarbon odor and separate phase noted
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak** Sunny Side Yard Queens, New York		Log of Soil Boring No. **HST-22A**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **2/12/98**	Date Completed: **2/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **1.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **1 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **Not Encountered**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black to Brown fine to coarse SAND; with ballast; trace gravel, trace ash	SM				
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak** Sunny Side Yard Queens, New York		Log of Soil Boring No. **22A+10'**	
Logged By: **Harry G**	Checked By: **Rob T.**	Date Started:	Date Completed:
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **1.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **1 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **Not Encountered**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black to Brown fine to coarse SAND; with ballast; trace gravel, trace ash	SM				
5						
10						
15						
20						
25						

ROUX

Project: Amtrak Sunny Side Yard Queens, New York		Log of Soil Boring No. HST-22B	
Logged By: Harry G	Checked By: Rob T.	Date Started: 2/12/98	Date Completed: 2/12/98
Drilling Co: LAW Environmental		Drill Bit Diameter:	Total Depth: 1.0 ft
Driller:		Backfill Material: Cuttings	from 0 ft to 1 ft
Drilling Method: Hand		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: Not Encountered	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black to Brown fine to coarse SAND; trace silt, trace gravel, trace ballast, trace ash	SM				
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak** **Sunny Side Yard Queens, New York**		**Log of Soil Boring No.** **22B+20'**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **2/12/98**	Date Completed: **2/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **1.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **1 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **Not Encountered**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black to Brown fine to coarse SAND; with ballast; trace gravel, trace ash	SM				
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak Sunny Side Yard Queens, New York**		**Log of Soil Boring No. HST-22C**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **1/12/98**	Date Completed: **1/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **1.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **1 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **Not Encountered**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Tan fine to coarse SAND; trace gravel, trace cobbles	SM				
	Wood	WOOD				
	Brown fine to coarse SAND; trace silt	SM				
5						
10						
15						
20						
25						

ROUX

Project: Amtrak Sunny Side Yard Queens, New York		Log of Soil Boring No. HST-22D	
Logged By: Harry G.	Checked By: Rob T.	Date Started: 2/20/98	Date Completed: 2/20/98
Drilling Co: LAW Environmental		Drill Bit Diameter:	Total Depth: 1.0 ft
Driller:		Backfill Material: Cuttings	from 0 ft to 1 ft
Drilling Method: Hand		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: Not Encountered	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black fine to coarse SAND; trace silt, trace gravel	SM				
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak Sunny Side Yard Queens, New York**		**Log of Soil Boring No. 22D+10'**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **2/20/98**	Date Completed: **2/20/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **1.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **1 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **Not Encountered**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black to Brown fine to coarse SAND; trace silt, trace gravel, trace ballast, trace ash	SM				

ROUX

Project: **Amtrak Sunny Side Yard Queens, New York**		**Log of Soil Boring No. HST-23**	
Logged By: **Harry G**	Checked By: **Rob T.**	Date Started: **1/12/98**	Date Completed: **1/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **5.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **5 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **1.7** **feet**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	ASPHALT	ASPHALT			0.2	
	Brown to Grey/Brown fine to coarse SAND; trace gravel, trace ballast	SM			1.8	
	Grey/Brown fine to coarse SAND; trace gravel	SM				Wet at 1.7 to 2.0 feet below land surface. Separate phase product noted on top of water table.
5					1.0	
10						
15						
20						
25						

ROUX

Project: **Amtrak Sunny Side Yard Queens, New York**		**Log of Soil Boring No. HST-24**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **1/12/98**	Date Completed: **1/12/98**
Drilling Co: **Law Environmental**		Drill Bit Diameter:	Total Depth: **8.5 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **8.5 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **5.5** **feet**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown fine to medium SAND; trace gravel	SM			0.0	
					0.0	
	Brown/Tan fine to medium SAND; trace gravel, trace silt	SM			0.0	
5						Wet at 5.5 feet below land surface
10						
15						
20						
25						

ROUX

Project: **Amtrak Sunny Side Yard Queens, New York**		**Log of Soil Boring No. HST-25**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **1/12/98**	Date Completed: **1/12/98**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **5.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **5 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: **1.7 feet**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Black-brown fine to coarse SAND; with gravel, ballast and ash	SM			0.0	
	Tan fine to coarse SAND; trace gravel; trace cobbles	SM			0.0	Wet at 1.7 feet below land surface
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak** **Sunny Side Yard Queens, New York**		**Log of Soil Boring No.** **HST-26**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **12/8/97**	Date Completed: **12/8/97**
Drilling Co: **Law Environmental**		Drill Bit Diameter:	Total Depth: **2.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **2 ft**
Drilling Method: **Hand Dig**		Sampler:	
Drilling Equipment: **Post Hole**		Depth to Water at Time of Drilling: **2.0** **feet**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown-black fine to coarse SAND; trace gravel	SM			0.0	
					0.0	Wet at 2.0 feet below land surface
5						
10						
15						
20						
25						

ROUX

Project: **Amtrak Sunny Side Yard Queens, New York**		**Log of Soil Boring No. HST-27**	
Logged By: **Harry G.**	Checked By: **Rob T.**	Date Started: **12/8/97**	Date Completed: **12/8/97**
Drilling Co: **LAW Environmental**		Drill Bit Diameter:	Total Depth: **2.0 ft**
Driller:		Backfill Material: **Cuttings**	from **0 ft** to **2 ft**
Drilling Method: **Hand**		Sampler:	
Drilling Equipment: **Post Hole/ Hand Auger**		Depth to Water at Time of Drilling: **1.7** **feet**	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown-black fine to coarse SAND; trace gravel	SM			0.0	
					0.0	Wet at 1.7 feet below land surface
5						
10						
15						
20						
25						

ROUX

Project: Amtrak Sunny Side Yard Queens, New York		Log of Soil Boring No. HST-28	
Logged By: Harry G.	Checked By: Rob T.	Date Started: 12/8/97	Date Completed: 12/8/97
Drilling Co: Law Environmental		Drill Bit Diameter:	Total Depth: 2.0 ft
Driller:		Backfill Material: Cuttings	from 0 ft to 2 ft
Drilling Method: Hand		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: 2.0 feet	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown-black fine to coarse SAND; trace silt; trace gravel; trace ballast	SM			0.0	
	Tan fine to coarse SAND; trace gravel	SM				
	Brown/Black fine to coarse SAND; trace gravel	SM			0.0	Wet at 2.0 feet below land surface
5						
10						
15						
20						
25						

ROUX

Project: Amtrak Sunny Side Yard Queens, New York		Log of Soil Boring No. HST-29	
Logged By: Harry G.	Checked By: Rob T.	Date Started: 1/12/98	Date Completed: 1/12/98
Drilling Co: LAW Environmental		Drill Bit Diameter:	Total Depth: 2.0 ft
Driller:		Backfill Material: Cuttings	from 0 ft to 2 ft
Drilling Method: Hand		Sampler:	
Drilling Equipment:		Depth to Water at Time of Drilling: 1.8 feet	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sampler	Blows per 6"	PID (ppm)	REMARKS
	Brown to Black fine to coarse SAND; trace silt, trace gravel, trace ballast, trace ash	SM			0.0	
	Tan fine to coarse SAND; trace gravel	SM			0.0	
	Brown/Black fine to coarse SAND; trace gravel	SM			0.0	Wet at 1.8 feet below land surface. slight hydrocarbon odor
5						
10						
15						
20						
25						

APPENDIX C

Data Quality and Usability Report

1.0 DATA QUALITY AND USABILITY

An evaluation of the overall quality and usability of the data generated by Industrial Corrosion Management, Inc. (ICM) of Randolph, New Jersey for Operable Unit 3 to support the High Speed Trainset construction at Sunnyside Yard, Queens, New York was completed. Thirty-five soil samples were collected; however, only 33 samples were analyzed based on the delineation results (i.e., below the cleanup levels). The soil samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) according to New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) 95-2, polychlorinated biphenyls (PCBs), according to NYSDEC ASP 95-3, and/or lead, according to the United States Environmental Protection Agency (USEPA) Contract Laboratory Program Statement of Work. One sample (HST-23 [1-3]) was also analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX), phosphorous, potassium, oil and grease, and nitrate nitrogen. These sample results are not included as part of this assessment as the data packages were not intended for validation.

2.0 DATA REVIEW

The data review is presented by sampling parameter and evaluates the following criteria based on the laboratory documentation provided.

- Holding Times;
- Gas Chromatograph/Mass Spectrometer (GC/MS) Instrument Performance Check;
- Initial Calibration;
- Continuing Calibration;
- Blanks;
- Surrogate Spikes;
- Matrix Spikes/Matrix Spike Duplicates/Matrix Spike Blanks;
- Sample Duplicates (inorganics);
- Laboratory Control Samples; and
- Internal Standards.

Data were reviewed for laboratory precision, accuracy, and completeness in accordance with the National Functional Guidelines for Organic Data Review, and the National Functional Guidelines for Inorganic Data Review, as well as the USEPA Region II Standard Operating Procedures.

2.1 Polycyclic Aromatic Hydrocarbons

Holding times were met for all sample processing. Initial and continuing calibration standards were within the required limits. The matrix spike blanks were also within the recommended limits. Method blanks and instrument performance checks were compliant with the protocol requirements.

Sample matrix spikes and duplicates were performed on samples HST-21 (2-3), HST-23 (1-3), HST-25 (1-3) and HST-22D (0-1). All recoveries and duplicate correlation values were within recommended limits in samples HST-21 (2-3), HST-25 (1-3) and HST-22D (0-1); however, both acenaphthene and pyrene recoveries were outside the quality control (QC) limits in both the

matrix spike (MS) and matrix spike duplicate (MSD) in sample HST-23 (1-3). The surrogate recoveries and internal standards for this sample were all within the recommended limits; therefore no qualification is necessary.

Surrogate recoveries were within the recommended limits with the exceptions noted below.

Sample Number	Compound (Surrogate)	% Recovery	Control Limits
HST-23 (1-2)	2,4,6-tribromophenol	6	19-122
HST-25RE (0-2)	2,4,6-tribromophenol	13	19 -122
HST-22RE (0-1)	2,4,6-tribromophenol	0	19-122
HST-22RE (1-2)	2,4,6-tribromophenol	9	19- 122
HST-24RE (0-1)	2,4,6-tribromophenol	6	19-122
HST-21 (5-7)	2,4,6-tribromophenol	7	19-122
HST-23 (3-5)	2,4,6-tribromophenol	0	19-122
HST-25 (1-3) MS	2,4,6-tribromophenol	0	19-122
HST-22C (0-1)	2,4,6-tribromophenol	0	19-122
HST-25 (1-3) MSD	2,4,6-tribromophenol	0	19-122
HST-22 (3-5)	2,4,6-tribromophenol	0	19-122
HST-24 (4.5-6.5)	2,4,6-tribromophenol	0	19-122
HST-24 (6.5-8.5)	2,4,6-tribromophenol	0	19-122
HST-22 (1-3)	2,4,6-tribromophenol	0	19-122
HST-22 (0-1)	terphenyl-d14	141	18-137
HST-23 (3-5)DL	2-fluorophenol	18	25-121
HST-23 (1-2)	2-fluorophenol	8	25-121
HST-22A (0-1)	2,4,6-tribromophenol	1,719	19-122

Data are not qualified with respect to surrogate recovery unless two or more semivolatile surrogates within the same fraction are out of specification. However, because 2,4,6-tribromophenol was recovered at less than 10 percent in 13 samples (ranging from 0 to 9 percent), only the acid extractable compounds need to be qualified. As the acid extractable compounds are not required for this project, no action is required.

Standard area responses/retention times were within the recommended limits with the exceptions noted below.

Sample Number	Initial analysis	Reanalysis
HST-25 (0-2)	perylene-d12	chrysene-d12/perylene-d12
HST-27 (0-2)	chrysene-d12/perylene-d12	perylene-d12
HST-28 (0-2)	chrysene-d12/perylene-d12	chrysene-d12/perylene-d12
HST-24 (0-1)	perylene-d12	perylene-d12
HST-22 (1-2)	perylene-d12	perylene-d12
HST-22 (0-1)	chrysene-d12/perylene-d12	perylene-d12

The semivolatile analysis of samples produced depressed responses for internal standards indicating a matrix effect. These samples were reanalyzed and produced the same depressed responses. Detected values for these samples should be qualified as estimated and reported detection limits for these samples should be considered estimated, possibly biased low.

2.2 Polychlorinated Biphenyls

Holding times were met for all sample processing. Method blank, initial and continuing calibration standards were compliant with protocol requirements. Sample matrix spikes and duplicates were performed on samples HST-21(2-3) and HST-25 (1-3). All recoveries and duplicate correlation values were within recommended limits with the exception of the matrix spike recovery of 4,4'-DDT in sample HST-25(1-3). The MSD indicated good precision, and pesticides are not constituents of concern; therefore, no qualification is necessary. Matrix spike blank and QC check standard recoveries were within the required range.

Surrogate standard recoveries met protocol requirements with the exceptions provided below.

Sample Number	Compound (Surrogate)	% Recovery	Control Limits
HST-25 (1-3) MSD	Tetrachloro-m-xylene (TCX) Decachlorobiphenyl (DCB)	174/193* 170/163*	30-150 30-150
HST-24 (4.5-6.5)	DCB	160	30-150
HST-24 (6.5-8.5)	DCB	173	30-150
HST-23 (1-2)	TCX	201/175*	30-150
HST-22 (0-1)	DCB	156/171*	30-150
HST-24 (0-1)	DCB	167/229*	30-150
*Both columns			

The high recoveries of these surrogates indicates a high bias due to co-eluting interferences. All detected PCBs for the samples listed above are qualified as estimated; nondetects are not qualified.

2.3 Lead

All protocol requirements for sample processing and quality control were evaluated and were found to be compliant and acceptable.

3.0 OVERALL DATA QUALITY/USABILITY ASSESSMENT

Based upon the evaluation of the data, and a review of laboratory and field quality assurance/quality control, the chemical data generated have generally met the data quality objectives established for the sampling.

3.1 Precision

The overall precision review was based upon laboratory samples. A review of laboratory duplicate samples, as measured by the sample duplicate (lead) and MS/MSD results, demonstrates adequate reproduction of all sample results when detectable concentrations of analytes were present.

3.2 Accuracy

The accuracy of the chemical data generated was reviewed based on the results for holding times, laboratory control samples, calibration criteria, spiked samples, and surrogate standards. Based upon this review, the accuracy of the chemical analyses is acceptable.

3.3 Completeness

The data completeness as measured by the percentage of overall usable data is considered acceptable based on the data review.