

TASK 210: SUBSURFACE SITE INVESTIGATION

Reconstruction of Bridge No. 431 Route 4 Over the Farmington River Farmington, Connecticut

ConnDOT Assignment No. 202-2951
ConnDOT Project No. 170-1867

Prepared for:



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Department of Transportation
Newington, Connecticut 06131

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1.0 INTRODUCTION

On behalf of the Connecticut Department of Transportation (ConnDOT), Maguire Group Inc. has conducted a Task 210 - Subsurface Site Investigation in association with the Reconstruction of Bridge No. 431, Route 4 Over the Farmington River in Farmington, Connecticut. Based upon a review of the construction plans, it is anticipated that the project will involve rights-of-way taking, cut and fill activities, and utility realignments. This Task 210 - Subsurface Site Investigation was conducted in areas of anticipated construction and/or right-of-way activities, adjacent to properties that were identified as having a moderate or high risk designation in MGI's January, 2004 Task 110 – Corridor Land Use Evaluation report. Figure 1 depicts the project area.

The purpose of the Task 210 - Subsurface Site Investigation was to verify the absence or presence and location of subsurface contamination, and to assess the potential pollutant impacts to be encountered during construction. It is anticipated that Task 310 Plans and Specifications will subsequently be prepared to assess construction related activities (i.e. proper storage, classification, transport and disposal of contaminated materials), in relationship to the environmental conditions prevalent within the project limits, as well as to specify remedial work to be included in the Contract Bid Documents.

2.0 SITE DESCRIPTION

The Task 210 - Subsurface Site Investigation was conducted on land owned by the State of Connecticut in areas of anticipated construction and/or right-of-way activities, adjacent to properties that were identified as having a moderate or high risk designation in MGI's January, 2004 Task 110 Corridor Land Use Evaluation report. Properties within the project corridor include two gasoline stations, a dry cleaning business, a tire sales and repair garage, a sewage treatment plant, a pistol range, commercial businesses, and undeveloped parcels. The site area is depicted in Figures 2a and 2b - Task 210 Project Area & Sampling Locations.

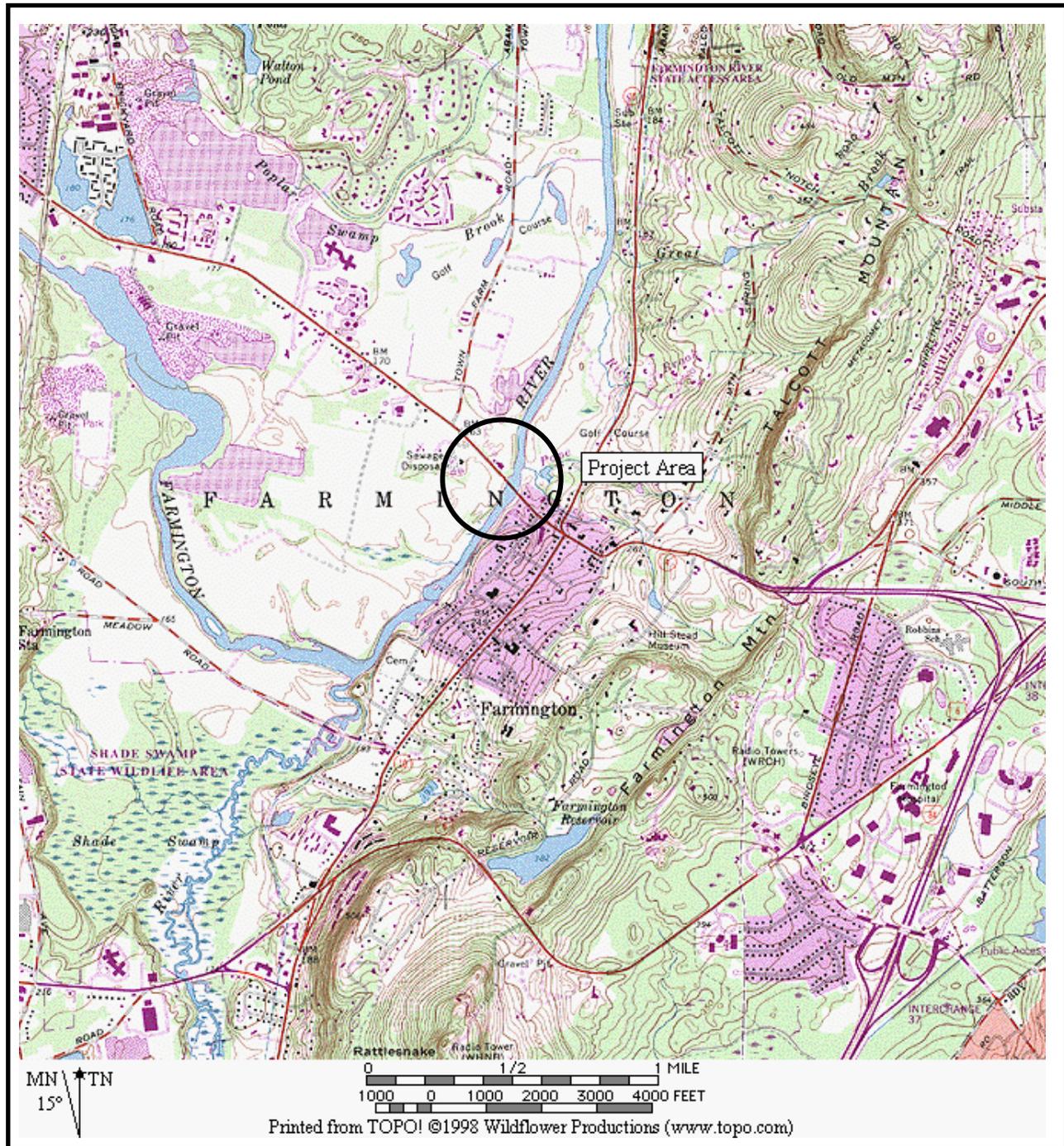
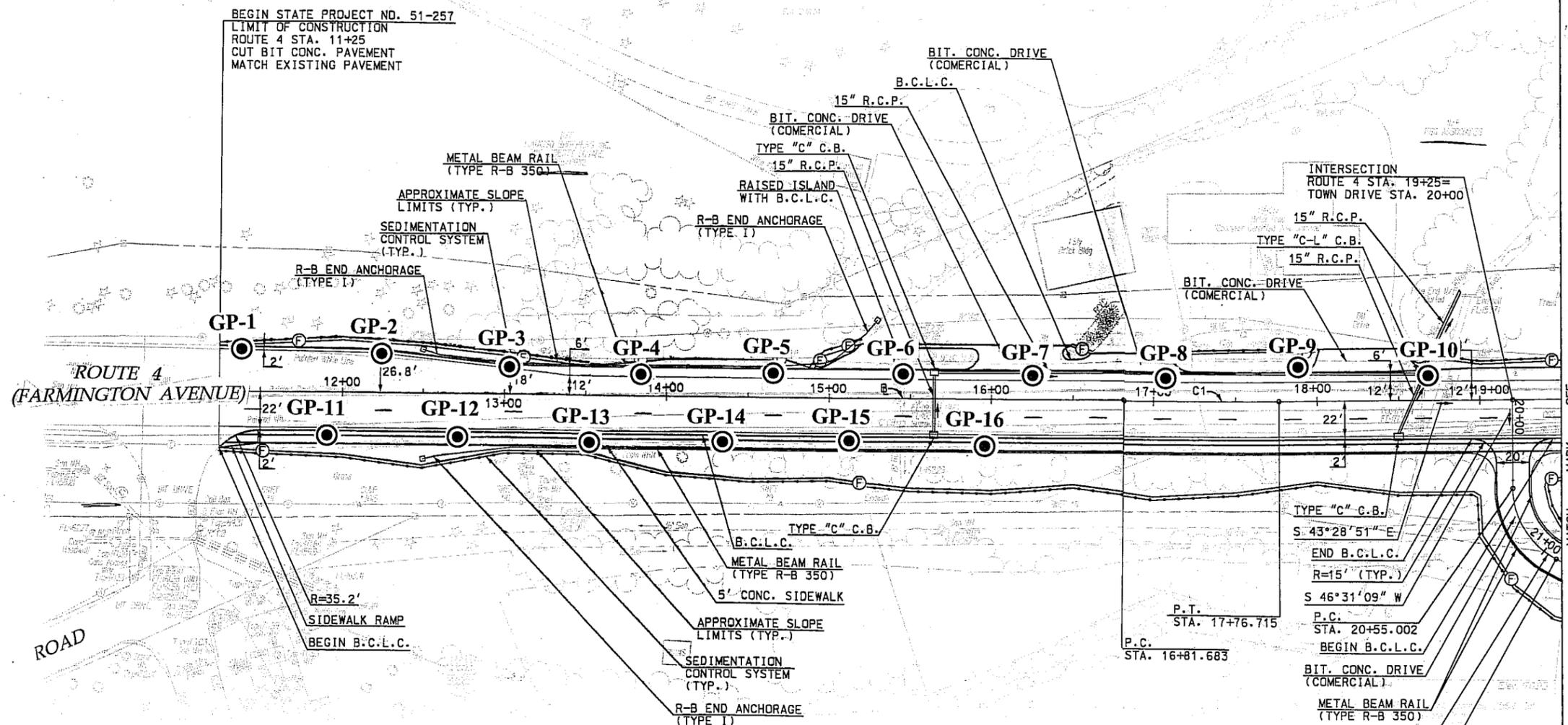
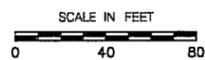


FIGURE 1 - Site Location Plan
Reconstruction of Bridge # 431, Route 4 Over the Farmington River
Farmington, Connecticut



LEGEND

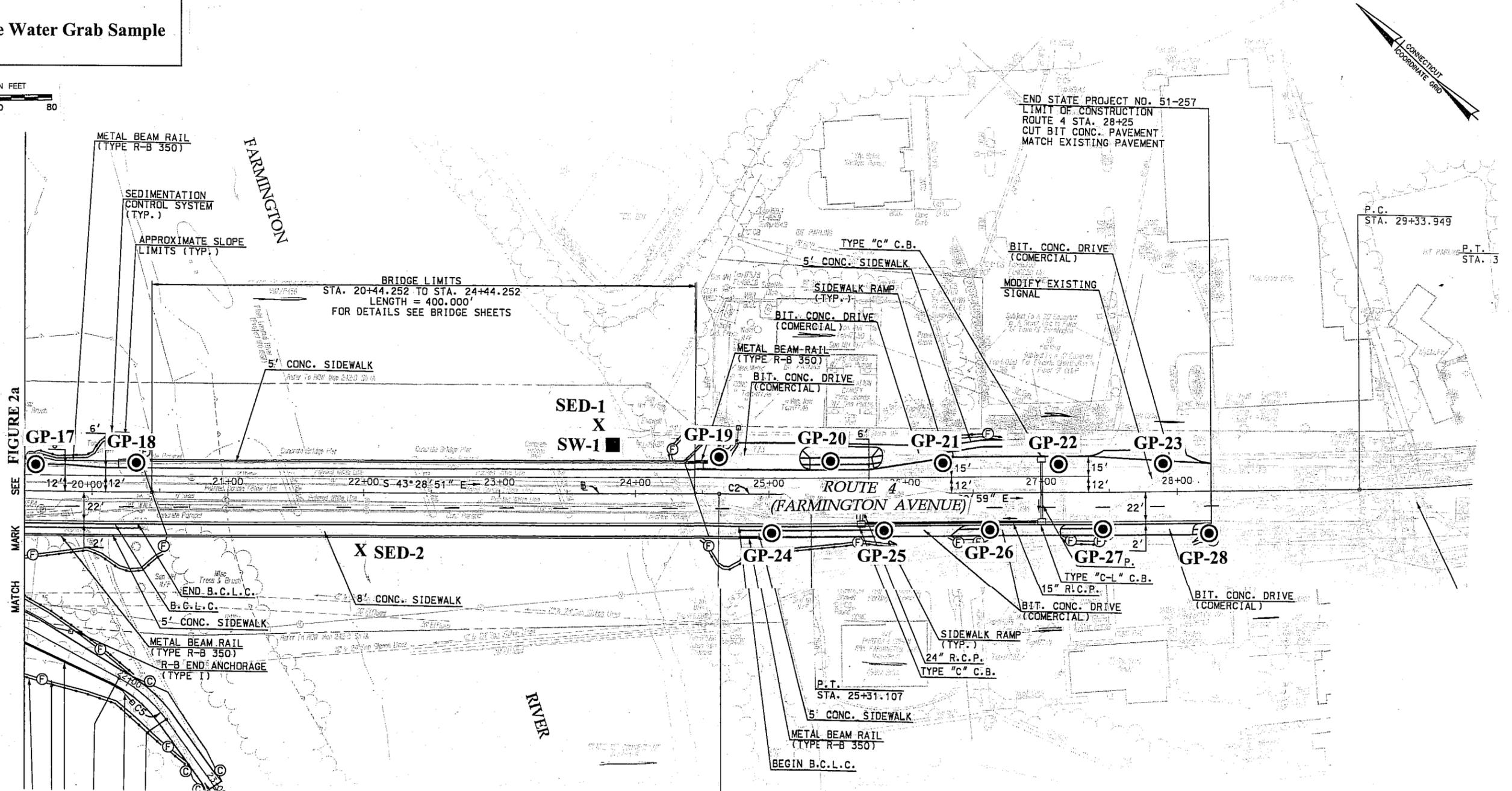
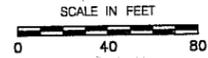
- ⊙ GP = Geoprobe Boring
- X SED = Sediment Grab Sample
- SW = Surface Water Grab Sample



**FIGURE 2a - Task 210 Project Area & Sampling Locations
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

LEGEND

- ⊙ GP = Geoprobe Boring
- X SED = Sediment Grab Sample
- SW = Surface Water Grab Sample



**FIGURE 2b - Task 210 Project Area & Sampling Locations
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

3.0 LOCAL ENVIRONMENT & RECEPTORS

3.1 Groundwater & Topography

According to the Connecticut Department of Environmental Protection's (CTDEP) 1999 Water Quality Classifications for the Upper Connecticut River and South Central Coastal Basins, the groundwater classification for the portion of the project corridor located on the southern side of Route 4, to the west of the Farmington River is "GB". A "GB" groundwater classification indicates that the groundwater may not be suitable for direct human consumption without the need for treatment due to waste discharges, spills or leaks of chemicals, or land use impacts. The groundwater classification for the remainder of the project corridor is "GA". A "GA" groundwater classification indicates that groundwater may be within the area of influence of public and private wells. The groundwater is assumed suitable for direct human consumption without the need for treatment. The properties within the project corridor are connected to the public water distribution system and municipal sewer system. Groundwater was not encountered in any of the soil borings advanced during this investigation.

The project area is located within the Farmington Regional Basin, within the Connecticut Major Drainage Basin. The Farmington River crosses beneath Route 4 and flows in a southerly direction. The Farmington River is classified as a Class "B" surface water body. A Class "B" classification indicates that the surface water body can be used for recreation, fish and wildlife habitat, agricultural and industrial supply, and other legitimate uses including navigation.

3.2 Geology

The United States Department of Agriculture Soil Conservation Service's *1980 Soils of Connecticut (Bulletin 787)* indicate that the soils in the project area are classified as the Haley-Winooski Formation. The Haley-Winooski Formation is described as a brown, well-drained alluvial soil with a silty or sandy substratum. The Bedrock Geological Map of Connecticut, compiled by John Rodgers in 1985, indicates that the bedrock unit underlying the project area is the New Haven Arkose, which is a red-brown arkosic sandstone.

Soils encountered during this investigation consisted of fill and brown to tan sand and silt units with varying amounts of gravel and cobbles. Samples collected from borings GP-19 and GP-20 also contained fill comprised of ash and cinders. Bedrock was not encountered in any of the soil borings, although refusal on basalt and schist cobbles occurred at depths ranging from 6 to 10 feet below grade in the GP-2, GP-3, GP-4, GP-5, GP-6, GP-7, GP-8, GP-9, GP-10, GP-17, GP-18, and GP-21 borings.

4.0 SUBSURFACE INVESTIGATION

Based upon the current and former industrial and commercial nature of the project area, a comprehensive sampling program was conducted. The following subsections detail the investigation.

4.1 Geoprobe® Soil Borings & Soil Sample Analyses

On November 29, 30, and December 1, 2004, twenty-eight (28) Geoprobe® soil borings (GP-1 to GP-28) were advanced throughout the project corridor. The Geoprobe® borings were advanced by Logical Environmental Solutions, under the direction of MGI. The locations of the Geoprobe® soil borings are depicted on Figures 2a and 2b - Task 210 Project Area & Sampling Locations.

The Geoprobe® soil borings were advanced to 12 feet below grade or sampler refusal utilizing a 4-foot long, 2-inch diameter Macro Core Sampler with dedicated acetate liners. Due to utility conflicts, borings GP-11 to GP-16, GP-24 to GP-26, and GP-28 were advanced utilizing the manual Geoprobe®, and were therefore only advanced to 4 feet below grade. The soil samples from each boring were visually inspected in the field for staining, and described as to physical characteristics and soil type. In addition, the soil samples were screened in the field for total volatile organic compounds utilizing a Photovac photoionization detector (PID). Soil boring logs were generated in the field by Maguire field personnel. The boring logs denote the types of soil encountered, the depth to groundwater and/or bedrock, the total depth reached in each boring, and the highest observed PID reading. Copies of the boring logs are included at the end of this report in Appendix A.

Based upon field screening results and visual observations, one (1) soil sample from each boring was placed in glassware supplied by Con-Test Analytical Laboratory, and stored in an ice-filled cooler. When sufficient sample recovery permitted, the first macro core sample from each boring was segregated and split into a 0' to 2' sample and a 2' to 4' sample. The soil sample collected from 2' to 4' below grade was selected for laboratory analyses if field screening and visual observation did not indicate the presence of contaminants in the other sample intervals. The analyses for each soil sample included volatile organic compounds (VOCs) utilizing EPA Method 8260, polynuclear aromatic hydrocarbons (PAHs) utilizing EPA Method 8270, petroleum hydrocarbons utilizing the Connecticut ETPH method, and total and SPLP RCRA 8 metals. Twelve (12) selected soil samples (GP-1 to GP-6 and GP-11 to GP-16) were also analyzed for pesticides utilizing EPA Method 8081A and herbicides, utilizing EPA Method 8151.

All Geoprobe® soil borings were back-filled and patched upon completion utilizing clean sand and/or hydrated bentonite. All down-hole sampling equipment was decontaminated in accordance with Maguire's October 2004 Task 210 - Subsurface Site Investigation Work Plan.

4.2 Sediment Sample Collection & Analyses

Two (2) sediment grab samples (SED-1 & SED-2) were collected adjacent to the Route 4 (Farmington Avenue) bridge. The sediment sample locations are depicted on Figure 2b – Task 210 Project Area & Sampling Locations. The sediment samples were analyzed for VOCs utilizing EPA Method 8260, PAHs utilizing EPA Method 8270, petroleum hydrocarbons utilizing the Connecticut ETPH method, pesticides utilizing EPA Method 8081A, herbicides utilizing EPA Method 8151, and total and SPLP RCRA 8 metals.

4.3 Surface Water Sample Collection & Analyses

One (1) surface water sample (SW-1) was collected from the Farmington River adjacent to the Route 4 (Farmington Avenue) bridge. The surface water sample location is depicted on Figure 2b – Task 210 Project Area & Sampling Locations. The surface water sample was analyzed for VOCs utilizing EPA Method 8260, PAHs utilizing EPA Method 8270, petroleum hydrocarbons utilizing the Connecticut ETPH method, pesticides utilizing EPA Method 8081A, herbicides utilizing EPA Method 8151, and total RCRA 8 metals.

4.4 Project Quality Assurance/Quality Control Practices

To assess the collection of samples in the field in terms of the sampling techniques and decontamination procedures followed, quality control and quality assurance samples were collected on each day of sampling activities. Three (3) trip blank samples were prepared by Con-Test Analytical Laboratory and three (3) field blank samples were collected in the field. The field and trip blank samples were stored with the daily samples in the sample cooler until subsequent delivery to the laboratory. Field blank samples FB-1 and FB-3 were collected by pouring laboratory supplied de-ionized water through an acetate liner and macro-core cutting shoe, and collecting the rinsate in appropriate sample containers. The FB-2 field blank sample was collected by directly pouring the laboratory supplied de-ionized water into the appropriate sample containers to check the quality of the de-ionized water, glassware, and laboratory sample handling and analytical procedures. The field blank samples were analyzed for the same parameters as the daily samples and the trip blank samples were analyzed for VOCs.

All samples collected in the field were stored in a manner that preserved the integrity of the sample chemistry. Samples intended for organic analyses were stored in an ice-filled cooler until delivery to the laboratory. Chain-of-Custody (COC) forms were filled out and accompanied all samples collected as a legal record of possession of the sample. The COC was initiated in the field and accompanied the containers during sample collection, transportation to the lab, analysis, and final disposal of the sample. All sampling equipment was either dedicated to a specific sample or was decontaminated prior to and between each use. Sampling equipment was not placed near solvents, gasoline, or materials that may have impacted the sample integrity.

5.0 DISCUSSION OF SAMPLE RESULTS

5.1 Regulatory Criteria

The CTDEP adopted Remediation Standard Regulations (Regulations of Connecticut State Agencies, Section 22a-133k-1 to 3 and 22a-133q-1) as of January 31, 1996. The Remediation Standard Regulations (RSRs) apply to any site undergoing voluntary remediation under Public Acts 95-183 or 95-190, a transfer of an “establishment” under Public Act 95-183, or any site as ordered by the CTDEP Commissioner. The Regulations also outline the processes for establishing alternative site-specific numerical standards for certain sites, upon approval by the CTDEP.

The RSRs criteria applicable to the soil, sediment, and surface water sampled during this investigation are summarized below. The application of these RSRs to the results of the laboratory analyses from this investigation is discussed in subsections 5.2, 5.3, 5.4 of this section.

Soils Criteria: The RSRs are organized into two sets of criteria: the Direct Exposure Criteria (DEC) and the Pollutant Mobility Criteria (PMC). The DEC and PMC are briefly explained in the following sub-sections, in relation to how they would be applicable to the types of analyses conducted on the soil samples collected for this investigation. Please refer to the RSRs for a complete explanation of the Regulations.

Direct Exposure Criteria

The purpose of the Direct Exposure Criteria (DEC) is to protect human health from risks associated with the direct contact with or ingestion of various common soil contaminants. The DEC are applicable to soil within approximately fifteen (15) feet of the ground surface. Concentrations of contaminants are evaluated based upon mass-based analyses and different criteria are established for residential and commercial/industrial properties. The use of the less stringent commercial/industrial standards requires the placement of a land use restriction on the property.

The DEC is not applicable to inaccessible soils, including soil more than four (4) feet below the ground surface, two (2) feet below pavement greater than three (3) inches thick, or below an existing building, provided that an Environmental Land Use Restriction (ELUR) is placed in effect for the property.

Pollutant Mobility Criteria

The purpose of the Pollutant Mobility Criteria (PMC) is to evaluate the potential for contaminants to leach from the soil in concentrations that may degrade groundwater quality. Different numerical criteria are established for GA and GAA groundwater areas, versus GB groundwater areas.

Groundwater Criteria: Contaminants in the groundwater are compared either to background quality or the Groundwater Protection Criteria (GPC), the Volatilization Criteria, as well as the Surface Water Protection Criteria (SWPC). The GPC, Volatilization Criteria, and SWPC are briefly explained in the following sub-sections, in relation to how they would be applicable to the types of analyses conducted on the soil samples collected for this investigation.

Groundwater Protection Criteria

The purpose of the Groundwater Protection Criteria is to protect the groundwater quality in areas that have the potential to use groundwater as a drinking water resource (GA & GAA groundwater classification areas).

Volatilization Criteria

The purpose of the Volatilization Criteria standard is to ensure that volatile organic compounds (VOCs) in groundwater do not pose an unacceptable risk to human health due to the inhalation of VOCs that may enter into a structure on the property. The Volatilization Criteria only apply when impacted groundwater is located within fifteen (15) feet of the ground surface or any structure. Different criteria exist for residential and commercial/industrial properties. The use of the less stringent commercial/industrial standards requires the placement of an ELUR on the property.

Surface Water Protection Criteria

The purpose of the Surface Water Protection Criteria (SWPC) standards are to ensure that groundwater discharging to a surface water body will not adversely effect surface water quality.

5.2 Results of Soil Sample Analyses

Soil samples collected during the advancement of the Geoprobe® borings were sent to Con-Test Analytical Laboratory for laboratory analyses. Summaries of the laboratory results from the Geoprobe® boring soil samples are presented in Tables 1(a) to 1(g), which are located at the end of this report, and copies of the soil sample analytical results are included in Appendix B. The following summarizes the results of the analyses conducted on the soil samples.

Varying concentrations of petroleum hydrocarbons were detected in all of the samples from ND (Not Detected) to 110 parts per million (ppm). None of the soil samples contained petroleum hydrocarbons at concentrations that exceed any applicable CTDEP RSR criteria.

The VOC toluene was detected in the GP-15 (0.001 ppm) and GP-20 (0.001 ppm) soil samples. In addition, the GP-28 sample contained the compound naphthalene (0.004 ppm) at a low concentration. The toluene and naphthalene concentrations detected do not exceed any applicable CTDEP RSR criteria. No other VOCs were detected in any of the soil samples.

Several polynuclear aromatic hydrocarbon (PAH) compounds were detected at varying total concentrations ranging from ND to 18.36 ppm. Four (4) soil samples contained concentrations of PAHs that exceed applicable CTDEP RSR Criteria. The 2 to 4 foot soil sample from borings GP-10 and GP-18 contained the compound benzo(b)fluoranthene (1.3 ppm and 1.15 ppm, respectively) at concentrations that exceed its GA PMC and Residential DEC.

The 0 to 2 foot soil sample from boring GP-14 contained the compounds benzo(a)anthracene (1.74 ppm), benzo(a)pyrene (1.53 ppm), benzo(b)fluoranthene (1.78 ppm), and chrysene (1.9 ppm) at concentrations that exceed their respective GB PMC. The compounds benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene were also detected at concentrations that exceed their respective Residential DEC. In addition, the compound benzo(a)pyrene was detected at a concentration that exceeds its Commercial/Industrial DEC.

The 0 to 2 foot soil sample from boring GP-28 contained the compounds benzo(a)pyrene (1.06 ppm), benzo(b)fluoranthene (1.57 ppm), and chrysene (1.14 ppm) at concentrations that exceed their respective GB PMC. The compounds benzo(a)pyrene and benzo(b)fluoranthene were also detected at concentrations that exceed their respective Residential DEC. In addition, the compound benzo(a)pyrene was detected at a concentration that exceeds its Commercial/Industrial DEC.

Herbicides were not detected in any of the soil samples. The pesticides 4,4-DDD, 4,4-DDE, and 4,4-DDT were detected in varying concentrations in the GP-1, GP-11, GP-12, GP-13, GP-14, GP-15, and GP-16 soil samples. The soil samples from borings GP-11 (2.93 ppm) and GP-12 (5.61 ppm) contained the pesticide 4,4-DDT at a concentration that exceeds its Residential DEC of 1.8 ppm. In addition, the GP-12 sample also contained the pesticide 4,4-DDE (2.15 ppm) at a concentration that exceeds Residential DEC of 1.8 ppm.

Total and leachable (via SPLP) barium, cadmium, chromium, lead, mercury, and silver were detected at varying concentrations in the soil samples. Leachable barium was detected at elevated concentrations that exceed its GA GPC of 1.0 ppm in the GP-1 (1.32 ppm), GP-6 (1.03 ppm), GP-9 (1.33 ppm), GP-10 (1.07 ppm), GP-17 (1.03 ppm), GP-20 (1.12 ppm), GP-21 (1.26 ppm), GP-23 (1.36 ppm), GP-26 (1.34 ppm), and GP-28 (1.87 ppm) samples. Leachable lead was also detected at elevated concentrations that exceed its GA GPC of 0.015 ppm in the GP-2 (0.05 ppm), GP-10 (0.02 ppm), GP-20 (0.04 ppm), GP-21 (0.08 ppm), GP-24 (0.02 ppm), and GP-28 (0.04 ppm) samples. No other total or leachable metals were detected at concentrations that exceed any applicable CTDEP RSR criteria.

5.3 Results of Sediment Grab Sample Analyses

The sediment grab samples (SED-1 & SED-2) collected during the investigation were sent to Con-Test Analytical Laboratory for laboratory analyses. Summaries of the laboratory results from the sediment grab samples are presented in Table 2, which is located at the end of this report, and copies of the sediment grab sample analytical results are included in Appendix C. The following summarizes the results of the analyses conducted on the sediment grab samples. For the purpose of comparison, the results were compared to the CTDEP RSR soil criteria.

The sediment grab samples did not contain detectable concentrations of petroleum hydrocarbons, VOCs, PAHs, and herbicides. The SED-1 grab sample contained the pesticide 4,4-DDT at a low concentration of 0.01 ppm, which does not exceed any CTDEP RSR criteria.

Total and leachable (via SPLP) barium, cadmium, chromium, lead, mercury, and silver were detected at varying concentrations in the sediment samples. Total chromium was detected at an elevated concentration of 109 ppm in the SED-1 sample, which exceeds its Residential and Commercial/Industrial DEC of 100 ppm. In addition, both sediment grab samples contained leachable barium (SED-1: 1.98 ppm, and SED-2: 1.9 ppm) and leachable lead (SED-1: 0.07 ppm, and SED-2: 0.03 ppm) at concentrations that exceed their respective GA PMC of 1.0 ppm, and 0.015 ppm, respectively. No other total or leachable metals were detected at concentrations that exceed any CTDEP RSR criteria.

5.4 Results of Surface Water Sample Analyses

The surface water sample (SW-1) collected during the investigation was sent to Con-Test Analytical Laboratory for laboratory analyses. A summary of the laboratory results from the surface water sample is presented in Table 3, which is located at the end of this report, and copies of the surface water grab sample analytical results are included in Appendix D. For the purpose of comparison, the results were compared to the CTDEP RSR groundwater criteria. The surface water sample did not contain detectable concentrations of VOCs, PAHs, pesticides, and herbicides.

The surface water sample contained petroleum hydrocarbons at a concentration of 0.227 ppm, which exceeds the GPC of 0.1 ppm. A SWPC has not been established for total petroleum hydrocarbons. In addition, the surface water sample contained total barium at a low concentration of 0.017 ppm, which does not exceed any applicable CTDEP RSR criteria.

5.5 Quality Assurance/Quality Control Samples

The three trip blank samples (TB-1, TB-2, & TB-3) did not contain detectable concentrations of VOCs. The three field blank samples (FB-1, FB-2 & FB-3) did not contain detectable concentrations of VOCs and PAHs. All of the field blank samples contained detectable concentrations of petroleum hydrocarbons ranging from 0.099 ppm to 0.168 ppm. The presence of the petroleum hydrocarbon contamination in the field blank samples is likely due to laboratory contamination because the FB-2 field blank (0.106 ppm petroleum hydrocarbons) sample was collected by directly pouring the laboratory-supplied water into the glassware. The petroleum hydrocarbon contamination was therefore due to contaminated de-ionized water, contaminated glassware, or contaminated laboratory analytical equipment. The presence of the petroleum hydrocarbons in the field blank samples should be considered when addressing the petroleum hydrocarbon concentration detected in the surface water (SW-1) grab sample (0.227 ppm). No sheen was observed on the surface water sample during collection, and while the reported concentration is above the GPC, it is likely due to laboratory contamination and the surface water should not be considered contaminated. An additional surface water sample should be collected and analyzed for petroleum hydrocarbons (via CT ETPH) prior to the start of construction in order to verify this conclusion.

The FB-2 and FB-3 field blank samples also contained low detectable concentrations of total metals. The FB-2 sample contained the metals cadmium (0.0006 ppm) and lead (0.003 ppm), and the FB-3 sample contained the metal mercury (0.00004 ppm). The presence of the low concentrations of total metals in the FB-2 sample is likely due to laboratory contamination for the reasons stated previously, and the presence of total mercury in the FB-3 sample is likely due

to laboratory or field contamination. The concentrations of total metals detected in the field blank samples are negligible and do not affect any of the results of the samples collected during this investigation. Copies of the analytical reports associated with the quality assurance/quality control samples are included in Appendix E.

6.0 DISCUSSION OF AFFECTED RESOURCES

Based upon the results of laboratory analyses performed on the soil, sediment, and surface water samples for this Task 210 investigation, seven (7) areas of environmental concern (AOECs) have been identified where contaminants are present at concentrations that exceed applicable CTDEP RSR criteria. In addition, five (5) low-level areas of environmental concern (LLAOECs) have been identified, where contaminants were detected at concentrations below applicable CTDEP RSR standards, but above laboratory detection limits. The locations of the AOECs and the LLAOECs within the project corridor are discussed in the following sections.

6.1 Areas of Environmental Concern

AOEC #1: Samples GP-1, GP-2, GP-11 & GP-12:

Analytical results from the soil samples collected from borings GP-1 and GP-2 indicate the presence of leachable barium and leachable lead contamination at slightly elevated concentrations in shallow soil ranging from 2 to 4 feet below grade. The contamination detected exceeds the GA PMC. In addition, the soil samples collected from borings GP-11 and GP-12 indicate the presence of pesticide contamination (4,4-DDE and 4,4-DDT) at concentrations that exceed the Residential DEC. The contamination was encountered in shallow soil ranging from 0 to 4 feet below grade.

AOEC #2: Sample GP-14:

Analytical results from the soil sample collected from boring GP-14 indicate the presence of PAH contamination at slightly elevated concentrations in soil ranging from 0 to 2 feet below grade. The contamination detected exceeds the GA PMC, Residential DEC, and Commercial/Industrial DEC.

AOEC #3: Sample GP-6:

Analytical results from the soil sample collected from boring GP-6 indicate the presence of leachable barium contamination at a slightly elevated concentration in soil ranging from 4 to 8 feet below grade. The contamination detected exceeds the GA PMC.

AOEC #4: Samples GP-9, GP-10, GP-17 & GP-18:

Analytical results from the soil samples collected from borings GP-9 and GP-17 indicate the presence of leachable barium contamination at slightly elevated concentrations in shallow soil ranging from 2 to 4 feet below grade. The contamination detected exceeds the GA PMC. In addition, the soil samples from borings GP-10 and GP-18 contain PAH contamination in shallow soil ranging from 2 to 4 feet below grade. The contamination detected exceeds the GA PMC, Residential DEC, and Commercial/Industrial DEC. The soil sample from GP-10 also contains leachable lead at a concentration that exceeds the GA PMC.

AOEC #5: Samples SED-1 & SED-2:

Analytical results from the sediment grab samples SED-1 and SED-2 collected from the Farmington River indicate the presence of leachable barium, leachable lead, and total chromium contamination at concentrations that exceed the GA PMC, Residential DEC, and Industrial DEC.

AOEC #6: Samples GP-20, GP-21, GP-24 & GP-26:

Analytical results from the soil samples collected from borings GP-20, GP-21, GP-24, and GP-26 indicate the presence of leachable barium and lead contamination at slightly elevated concentrations in shallow soil ranging from 0 to 4 feet below grade. The contamination detected exceeds the GA PMC.

AOEC #7: Samples GP-23 and GP-28:

Analytical results from the soil samples collected from borings GP-23 and GP-28 indicate the presence of leachable barium contamination at slightly elevated concentrations in shallow soil ranging from 2 to 4 feet below grade. The contamination detected exceeds the GA PMC. In addition, the soil sample from boring GP-28 contains leachable lead and PAH contamination that exceeds the GA PMC, Residential DEC, and Commercial/Industrial DEC.

6.2 Low-Level Areas of Environmental Concern**LLAOEC #A:** Sample GP-13:

Analytical results from the soil sample collected from boring GP-13 indicate the presence of TPH, PAHs, and pesticides at concentrations below CTDEP RSR standards. The contaminants were detected in the soil ranging from 2 to 4 feet below grade.

LLAOEC #B: Samples GP-15 & GP-16:

Analytical results from the soil samples collected from borings GP-15 and GP-16 indicate the presence of TPH, VOCs, PAHs, and pesticides at concentrations below CTDEP RSR standards. The contaminants were detected in the soil ranging from 2 to 4 feet below grade.

LLAOEC #C: Sample GP-19:

Analytical results from the soil sample collected from boring GP-19 indicate the presence of TPH and PAHs at concentrations below CTDEP RSR standards. The contaminants were detected in the soil ranging from 0 to 4 feet below grade.

LLAOEC #D: Sample GP-22:

Analytical results from the soil sample collected from boring GP-22 indicate the presence of TPH and PAHs at concentrations below CTDEP RSR standards. The contaminants were detected in the soil ranging from 2 to 4 feet below grade.

LLAOEC #E: Sample GP-25:

Analytical results from the soil sample collected from boring GP-25 indicate the presence of TPH and PAHs at concentrations below CTDEP RSR standards. The contaminants were detected in the soil ranging from 2 to 4 feet below grade.

7.0 RECOMMENDATIONS

The results of the Task 210 – Subsurface Site Investigation for the Reconstruction of Bridge No. 431, Route 4 Over the Farmington River in Farmington, Connecticut indicate the presence of PAH, leachable barium, leachable lead, and pesticide contamination in shallow soil samples collected from the project area, at concentrations that slightly exceed applicable RSR criteria. The contamination was detected in soils ranging in depth from 0 to 8 feet below grade. In addition, the sediment samples collected from the Farmington River indicate the presence of leachable barium, leachable lead, and total chromium contamination at concentrations that exceed the RSR criteria. The surface water sample from the Farmington River contained petroleum hydrocarbons at a concentration that exceeds the RSR criteria, but is not considered contaminated due to the presence of detected petroleum hydrocarbon concentrations in the field blanks for the project. An additional sample should be collected and analyzed prior to the start of construction in order to verify this conclusion. Seven (7) Areas of Environmental Concern (AOECs), and five (5) Low-Level Areas of Environmental Concern (LLAOECs) have been identified within the project corridor. Special considerations for treatment/disposal, and worker health and safety must be given to these areas in order to ensure compliance with all local, State and Federal laws. Task 310 Plans and Specifications are therefore recommended for the areas of construction within the Areas of Environmental Concern and Low-Level Areas of Environmental Concern described in Section 6.0 above.

8.0 LIMITATIONS

All work product and reports provided by Maguire Group Inc. (MGI) in connection with the performance of this Task 210 - Subsurface Site Investigation are subject to the following limitations:

1. The observations described in this report were made under the conditions stated therein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services provided to ConnDOT.
2. In preparing this report, MGI has relied on certain information provided by State and local officials and information and representations made by other parties referenced therein, and on information contained in the files of State and/or local agencies made available to MGI at the time of this investigation. To the extent that such files are missing, incomplete or not provided to MGI, MGI is not responsible. Although there may have been some degree of overlap in the information provided by these various sources, MGI did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this investigation.
3. The conclusions and recommendations contained in this report are based in part upon the data from subsurface explorations. The nature and extent of variations between these explorations may not become evident until further explorations are completed. If variations or other latent conditions become evident, it will be necessary to re-evaluate the conclusions and recommendations of this report.
4. The water level readings made for this investigation were made at the times and conditions stated on the boring logs. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, passage of time and other factors. Should additional data become available in the future, these data should be reviewed by MGI, and the conclusions and recommendations presented herein modified accordingly.

5. Where quantitative laboratory analyses have been conducted by an outside certified laboratory, MGI has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these tests.
6. If the conclusions and recommendations contained in this report are based, in part, upon various types of chemical data then the conclusions and recommendations are contingent upon the validity of such data. These data have been reviewed and interpretations made in the report. It should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by MGI and the conclusions and recommendations presented herein modified accordingly.
7. Chemical analyses were performed for specific parameters during the course of this investigation, as described in the text. However, it should be noted that testing for all known chemical constituents was not performed. The conclusions and recommendations contained in this report are based only upon the chemical constituents for which testing was accomplished.

The following qualifications apply to the undersigned's opinion:

The activities described and opinions included herein are based on information gathered during this exploratory site investigation which was limited in scope in adherence to the terms of our agreement. The professional opinion provided herein is based on the information described in this report.

The information contained herein was prepared for the use of ConnDOT solely in conjunction with the task descriptions for this assignment. The conclusions and recommendations set forth in this report are based on site conditions at the time of the investigation. Future studies and findings could change the contents of this report. The professional opinions presented in this report have been developed by using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental engineering consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional opinions included in this report.

Prepared by:

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Reviewed by:

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TABLES

**TABLE 1(a) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-1 2'-4' (GA)	GP-2 2'-4' (GA)	GP-3 2'-4' (GA)	GP-4 2'-4' (GA)	CTDEP PMC GA Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	ND	68	ND	ND	500 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)	ND	ND	ND	ND		
PAHs - Method 8270 (ppm)						
Benzo(a)anthracene	ND	0.34	ND	ND	1 ppm	1/7.8 ppm
Benzo(a)pyrene	ND	0.44	ND	ND	1 ppm	1/1 ppm
Benzo(b)fluoranthene	ND	0.67	ND	ND	1 ppm	1/7.8 ppm
Benzo(g,h,i)perylene	ND	0.3	ND	ND	4.2 ppm	1,000/2,500 ppm
Benzo(k)fluoranthene	ND	0.29	ND	ND	1 ppm	8.4/78 ppm
Chrysene	ND	0.5	ND	ND	1 ppm	84/780 ppm
Fluoranthene	ND	0.8	ND	ND	5.6 ppm	1,000/2,500 ppm
Indeno(1,2,3-cd)pyrene	ND	0.34	ND	ND	1 ppm	1/7.8 ppm
Phenanthrene	ND	0.37	ND	ND	4 ppm	1,000/2,500 ppm
Pyrene	ND	0.77	ND	ND	4 ppm	1,000/2,500 ppm
Total PAHs	ND	4.82	ND	ND		
Pesticides – Method 8081A (ppm)						
4,4-DDT	0.05	ND	ND	ND	No Standard	1.8/17 ppm
Herbicides – Method 8151 (ppb)	ND	ND	ND	ND		
Total RCRA 8 Metals – ppm						
Barium	42.9	20.3	38.3	49.2		4,700/140,000 ppm
Cadmium	0.41	0.16	0.21	0.21		34/1,000 ppm
Chromium	12.0	11.6	10.8	12.5		100/100 ppm
Lead	16.5	131	6.21	8.61		500/1,000 ppm
Mercury	0.033	0.022	0.022	0.048		20/610 ppm
Silver	ND	0.72	ND	ND		340/10,000 ppm
SPLP RCRA 8 Metals - ppm						
Barium	1.32	0.98	0.78	0.95	1.0 ppm	
Lead	0.01	0.05	ND	ND	0.015 ppm	
Mercury	ND	ND	0.00004	ND	0.002 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 1(b) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-5 2'-4' (GA)	GP-6 4'-8' (GA)	GP-7 4'-8' (GA)	GP-8 2'-4' (GA)	CTDEP PMC GA Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	ND	ND	ND	ND	500 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)	ND	ND	ND	ND		
PAHs - Method 8270 (ppm)	ND	ND	ND	ND		
Pesticides – Method 8081A (ppm)	ND	ND	NA	NA		
Herbicides – Method 8151 (ppb)	ND	ND	NA	NA		
Total RCRA 8 Metals – ppm						
Barium	90.7	83.8	67.1	47.0		4,700/140,000 ppm
Cadmium	0.15	0.13	0.13	0.59		34/1,000 ppm
Chromium	16.3	13.8	10.3	10.2		100/100 ppm
Lead	5.27	4.0	4.09	4.03		500/1,000 ppm
Mercury	ND	0.041	0.04	0.022		20/610 ppm
SPLP RCRA 8 Metals - ppm						
Barium	0.83	1.03	1.0	0.53	1.0 ppm	
Mercury	0.00004	0.00004	0.00005	0.00004	0.002 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

NA – Not Analyzed for this procedure

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 1(c) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-9 2'-4' (GA)	GP-10 2'-4' (GA)	GP-11 0'-2' (GB)	GP-12 2'-4' (GB)	CTDEP PMC GA/GB Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	34	53	21	38	500/1,000 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)	ND	ND	ND	ND		
PAHs - Method 8270 (ppm)						
Benzo(a)anthracene	ND	0.68	0.26	0.42	1/1 ppm	1/7.8 ppm
Benzo(a)pyrene	ND	0.87	0.34	0.52	1/1 ppm	1/1 ppm
Benzo(b)fluoranthene	0.2	1.3	0.49	0.76	1/1 ppm	1/7.8 ppm
Benzo(g,h,i)perylene	ND	0.43	0.26	0.36	4.2/42 ppm	1,000/2,500 ppm
Benzo(k)fluoranthene	ND	0.5	ND	0.27	1/1 ppm	8.4/78 ppm
Chrysene	ND	0.95	0.37	0.54	1/1 ppm	84/780 ppm
Fluoranthene	0.27	1.26	0.63	0.89	5.6/56 ppm	1,000/2,500 ppm
Indeno(1,2,3-cd)pyrene	ND	0.48	0.27	0.39	1/1 ppm	1/7.8 ppm
Phenanthrene	ND	1.0	0.3	0.45	4/40 ppm	1,000/2,500 ppm
Pyrene	0.28	1.54	0.64	0.93	4/40 ppm	1,000/2,500 ppm
Total PAHs	0.75	9.01	3.56	5.53		
Pesticides – Method 8081A (ppm)	NA	NA				
4,4-DDD			0.44	0.67	No Standard	2.6/24 ppm
4,4-DDE			0.83	2.15	No Standard	1.8/17 ppm
4,4-DDT			2.93	5.61	No Standard	1.8/17 ppm
Herbicides – Method 8151 (ppb)	NA	NA	ND	ND		
Total RCRA 8 Metals – ppm						
Barium	42.9	36.8	17.3	25.7		4,700/140,000 ppm
Cadmium	0.4	0.27	0.24	0.19		34/1,000 ppm
Chromium	11.5	10.6	9.2	10.8		100/100 ppm
Lead	16.4	137	137	197		500/1,000 ppm
Mercury	0.035	0.027	0.045	0.031		20/610 ppm
SPLP RCRA 8 Metals - ppm						
Barium	1.33	1.07	0.75	0.92	1.0/10.0 ppm	
Cadmium	0.003	ND	ND	ND	0.005/0.05 ppm	
Lead	0.01	0.02	0.02	0.03	0.015/0.15 ppm	
Mercury	0.00005	ND	0.00005	ND	0.002/0.02 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

NA – Not Analyzed for this procedure

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 1(d) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-13 2'-4' (GB)	GP-14 0'-2' (GB)	GP-15 2'-4' (GB)	GP-16 2'-4' (GB)	CTDEP PMC GB Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	29	27	72	30	1,000 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)						
Toluene	ND	ND	0.001	ND	67 ppm	500/1,000 ppm
PAHs - Method 8270 (ppm)						
Anthracene	ND	0.71	ND	0.36	400 ppm	1,000/2,500 ppm
Benzo(a)anthracene	ND	1.74	0.31	0.69	1 ppm	1/7.8 ppm
Benzo(a)pyrene	ND	1.53	0.32	0.71	1 ppm	1/1 ppm
Benzo(b)fluoranthene	0.22	1.78	0.4	0.78	1 ppm	1/7.8 ppm
Benzo(g,h,i)perylene	ND	0.75	ND	0.34	42 ppm	1,000/2,500 ppm
Benzo(k)fluoranthene	ND	0.6	ND	0.31	1 ppm	8.4/78 ppm
Chrysene	ND	1.9	0.35	0.74	1 ppm	84/780 ppm
Dibenz(a,h)anthracene	ND	0.2	ND	ND	1 ppm	1/1 ppm
Fluoranthene	0.27	2.46	0.62	1.33	56 ppm	1,000/2,500 ppm
Indeno(1,2,3-cd)pyrene	ND	0.77	ND	0.34	1 ppm	1/7.8 ppm
Phenanthrene	ND	2.59	0.57	1.42	40 ppm	1,000/2,500 ppm
Pyrene	0.28	3.33	0.72	1.62	40 ppm	1,000/2,500 ppm
Total PAHs	0.77	18.36	3.29	8.64		
Pesticides – Method 8081A (ppm)						
4,4-DDD	0.02	ND	ND	ND	No Standard	2.6/24 ppm
4,4-DDE	0.05	0.02	0.08	0.16	No Standard	1.8/17 ppm
4,4-DDT	0.21	0.04	0.13	0.27	No Standard	1.8/17 ppm
Herbicides – Method 8151 (ppb)	ND	ND	ND	ND		
Total RCRA 8 Metals – ppm						
Barium	28.4	39.9	27.5	25.7		4,700/140,000 ppm
Cadmium	0.14	0.15	0.13	0.13		34/1,000 ppm
Chromium	14.8	12.2	11.6	8.37		100/100 ppm
Lead	156	8.56	16.6	13.1		500/1,000 ppm
Mercury	0.053	0.044	0.032	0.037		20/610 ppm
SPLP RCRA 8 Metals - ppm						
Barium	1.03	0.96	1.46	1.2	10.0 ppm	
Lead	0.05	ND	0.01	ND	0.15 ppm	
Mercury	0.00005	0.00004	0.00004	ND	0.02 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

NA – Not Analyzed for this procedure

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 1(e) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-17 2'-4' (GA)	GP-18 2'-4' (GA)	GP-19 0'-4' (GA)	GP-20 2'-4' (GA)	CTDEP PMC GA Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	42	110	35	21	500 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)						
Toluene	ND	ND	ND	0.001	20 ppm	500/1,000 ppm
PAHs - Method 8270 (ppm)						
Benzo(a)anthracene	0.37	0.58	ND	0.26	1 ppm	1/7.8 ppm
Benzo(a)pyrene	0.45	0.74	ND	0.27	1 ppm	1/1 ppm
Benzo(b)fluoranthene	0.67	1.15	0.2	0.35	1 ppm	1/7.8 ppm
Benzo(g,h,i)perylene	0.23	0.37	ND	0.2	4.2 ppm	1,000/2,500 ppm
Benzo(k)fluoranthene	0.3	0.44	ND	ND	1 ppm	8.4/78 ppm
Chrysene	0.48	0.79	ND	0.33	1 ppm	84/780 ppm
Fluoranthene	0.77	1.25	0.22	0.49	5.6 ppm	1,000/2,500 ppm
Indeno(1,2,3-cd)pyrene	0.25	0.4	ND	0.19	1 ppm	1/7.8 ppm
Phenanthrene	0.39	0.64	ND	0.33	4 ppm	1,000/2,500 ppm
Pyrene	0.84	1.23	0.24	0.54	4 ppm	1,000/2,500 ppm
Total PAHs	4.75	7.59	0.66	2.96		
Pesticides – Method 8081A (ppm)	NA	NA	NA	NA		
Herbicides – Method 8151 (ppb)	NA	NA	NA	NA		
Total RCRA 8 Metals – ppm						
Barium	33.1	36.5	34.8	33.2		4,700/140,000 ppm
Cadmium	0.38	0.65	0.15	0.12		34/1,000 ppm
Chromium	10.5	19.9	8.55	7.01		100/100 ppm
Lead	80.8	33.6	16.3	9.79		500/1,000 ppm
Mercury	0.037	0.025	0.04	0.018		20/610 ppm
SPLP RCRA 8 Metals - ppm						
Barium	1.03	0.94	0.62	1.12	1.0 ppm	
Lead	ND	0.01	ND	0.04	0.015 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

NA – Not Analyzed for this procedure

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 1(f) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-21 0'-2' (GA)	GP-22 2'-4' (GA)	GP-23 2'-4' (GA)	GP-24 2'-4' (GA)	CTDEP PMC GA Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	24	26	34	39	500 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)	ND	ND	ND	ND		
PAHs - Method 8270 (ppm)						
Benzo(a)anthracene	0.26	0.22	0.45	0.27	1 ppm	1/7.8 ppm
Benzo(a)pyrene	0.27	0.25	0.53	0.33	1 ppm	1/1 ppm
Benzo(b)fluoranthene	0.34	0.33	0.76	0.43	1 ppm	1/7.8 ppm
Benzo(g,h,i)perylene	0.2	0.21	0.2	0.26	4.2 ppm	1,000/2,500 ppm
Benzo(k)fluoranthene	ND	ND	0.31	ND	1 ppm	8.4/78 ppm
Chrysene	0.3	0.26	0.53	0.36	1 ppm	84/780 ppm
Fluoranthene	0.5	0.29	0.94	0.57	5.6 ppm	1,000/2,500 ppm
Indeno(1,2,3-cd)pyrene	0.19	ND	0.21	0.26	1 ppm	1/7.8 ppm
Phenanthrene	0.3	ND	0.4	0.33	4 ppm	1,000/2,500 ppm
Pyrene	0.53	0.37	0.85	0.58	4 ppm	1,000/2,500 ppm
Total PAHs	2.89	1.93	5.18	3.39		
Pesticides – Method 8081A (ppm)	NA	NA	NA	NA		
Herbicides – Method 8151 (ppb)	NA	NA	NA	NA		
Total RCRA 8 Metals – ppm						
Barium	41.1	38.2	39.1	51.8		4,700/140,000 ppm
Cadmium	0.27	0.3	0.16	3.35		34/1,000 ppm
Chromium	16.9	12.4	8.96	32.6		100/100 ppm
Lead	17.0	12.9	22.3	57.0		500/1,000 ppm
Mercury	0.028	0.023	0.033	0.116		20/610 ppm
SPLP RCRA 8 Metals - ppm						
Barium	1.26	0.99	1.36	0.9	1.0 ppm	
Lead	0.08	ND	0.01	0.02	0.015 ppm	
Mercury	ND	ND	0.00004	ND	0.002 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

NA – Not Analyzed for this procedure

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 1(g) - Results of Geoprobe Boring Soil Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Boring I.D.: Sample Depth: (Groundwater Classification)	GP-25 2'-4' (GA)	GP-26 2'-4' (GA)	GP-27 4'-8' (GA)	GP-28 0'-2' (GA)	CTDEP PMC GA Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	20	20	ND	90	500 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)						
Naphthalene	ND	ND	ND	0.004	5.6 ppm	500/1,000 ppm
PAHs - Method 8270 (ppm)						
Benzo(a)anthracene	ND	ND	ND	0.93	1 ppm	1/7.8 ppm
Benzo(a)pyrene	ND	ND	ND	1.06	1 ppm	1/1 ppm
Benzo(b)fluoranthene	0.22	0.26	ND	1.57	1 ppm	1/7.8 ppm
Benzo(g,h,i)perylene	ND	ND	ND	0.85	4.2 ppm	1,000/2,500 ppm
Benzo(k)fluoranthene	ND	ND	ND	0.57	1 ppm	8.4/78 ppm
Chrysene	ND	0.21	ND	1.14	1 ppm	84/780 ppm
Dibenz(a,h)anthracene	ND	ND	ND	0.23	1 ppm	1/1 ppm
Fluoranthene	0.35	0.41	ND	1.65	5.6 ppm	1,000/2,500 ppm
Indeno(1,2,3-cd)pyrene	ND	ND	ND	0.91	1 ppm	1/7.8 ppm
Phenanthrene	ND	ND	ND	0.7	4 ppm	1,000/2,500 ppm
Pyrene	0.31	0.36	ND	1.55	4 ppm	1,000/2,500 ppm
Total PAHs	0.88	1.24	ND	11.16		
Pesticides – Method 8081A (ppm)	NA	NA	NA	NA		
Herbicides – Method 8151 (ppb)	NA	NA	NA	NA		
Total RCRA 8 Metals – ppm						
Barium	45.3	59.1	32.7	62.8		4,700/140,000 ppm
Cadmium	0.22	0.35	0.07	0.45		34/1,000 ppm
Chromium	13.0	11.4	11.1	16.6		100/100 ppm
Lead	20.0	45.1	2.98	86.9		500/1,000 ppm
Mercury	0.045	0.03	ND	0.056		20/610 ppm
SPLP RCRA 8 Metals - ppm						
Barium	0.47	1.34	0.92	1.87	1.0 ppm	
Lead	ND	ND	ND	0.04	0.015 ppm	
Mercury	ND	ND	0.00005	0.00005	0.002 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

NA – Not Analyzed for this procedure

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 2 - Results of Sediment Grab Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Sample I.D.:	SED-1	SED-2	CTDEP PMC GA Groundwater Area	CTDEP DEC Residential/Commercial & Industrial
CT ETPH - (ppm)	ND	ND	500 ppm	500/2,500 ppm
VOCs - Method 8260 (ppm)	ND	ND		
PAHs - Method 8270 (ppm)	ND	ND		
Pesticides – Method 8081 (ppm)				
4,4-DDT	0.01	ND	No Standard	1.8/17 ppm
Herbicides – Method 8151 (ppm)	ND	ND		
Total RCRA 8 Metals – ppm				
Barium	169	97.5		4,700/140,000 ppm
Cadmium	4.85	2.06		34/1,000 ppm
Chromium	109	34.7		100/100 ppm
Lead	106	43.6		500/1,000 ppm
Mercury	0.243	0.097		20/610 ppm
Silver	1.18	ND		340/1,000 ppm
SPLP RCRA 8 Metals – ppm				
Barium	1.98	1.9	1.0 ppm	
Cadmium	0.004	ND	0.005 ppm	
Lead	0.07	0.03	0.015 ppm	

ND – Not Detected (see laboratory reports for compound specific detection limits)

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

**TABLE 3 - Results of Surface Water Grab Sample Analyses
Reconstruction of Bridge No. 431, Route 4 Over the Farmington River
Farmington, Connecticut**

Sample I.D.:	SW-1	CTDEP Groundwater Protection Criteria	CTDEP Surface Water Protection Criteria	CTDEP Volatilization Criteria Residential/Commercial & Industrial
CT ETPH - (ppm)	<i>0.227*</i>	0.1 ppm		
VOCs - Method 8260 (ppb)	ND			
PAHs - Method 8270 (ppb)	ND			
Pesticides – Method 8081 (ppb)	ND			
Herbicides – Method 8151 (ppb)	ND			
Total RCRA 8 Metals – ppm				Not Applicable
Barium	0.017	1.0 ppm	No Standard	

ND – Not Detected (see laboratory reports for compound specific detection limits)

The compounds listed above are those that were detected - please see laboratory reports for full lists of compounds and their specific detection limits.

* It should be noted that petroleum hydrocarbons were detected in the laboratory field blank samples at concentrations ranging from 0.099 ppm to 0.168 ppm. Its presence in the surface water sample may be due to laboratory contamination.