



Memorandum

To: Rhode Island Department of
Transportation
Two Capitol Hill
Providence, RI 02903

Date: March 15, 2019

Project #: 72900.00

From: Peter Grivers and Fred Bevans

Re: Reconstruction of the Pell Bridge Approaches Hazardous Materials
Draft EA Technical Memo

1. Introduction

The Claiborne Pell Newport Bridge (Pell Bridge) carries State Route 138 between Jamestown and Newport and is the only road connection between Jamestown and Aquidneck Island. The Proposed Action Alternative of the Pell Bridge Interchange Project (Project) would provide direct connection from the northern part of the City to the downtown area, reduce queued vehicle traffic onto the Pell Bridge, reduce traffic in downtown Newport, and provide a portion of the bicycle and pedestrian facilities envisioned in the Aquidneck Island Transportation Study. The Proposed Action (Project) would occur in the City of Newport and Town of Middletown, Rhode Island. In accordance with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) is being developed to evaluate the impacts of construction and operation of the re-designed interchange on environmental resources.

2. Study Area and Methodology

Study Area

Several Corridor Land Use Evaluations (CLUEs) have been completed that collectively encompass the entire Study Area, and a Limited Subsurface Investigation (LSI) was completed within a significant portion of the Project Area. Information contained in Environmental Database Resources, Inc. (EDR) reports and additional publicly available environmental resources were reviewed. Properties associated with OHM within and surrounding the Study Area are shown on Figure 1, in accordance with industry standard protocols for the purpose of evaluating any surrounding properties that pose a potential to impact conditions within the Project.

Data Sources

This analysis relied on several previous assessments of environmental conditions within the Study Area, including:

- CLUE, Proposed Pell Bridge Approach Roadway Project, 2013.
- Updated CLUE, Reconstruction of Pell Bridge Approach, October 6, 2017 (draft).
- Limited Subsurface Investigation (LSI) Memo, Reconstruction of Pell Bridge Approach, January 26, 2018 (draft).
- Extended CLUE, including JT Connell Highway & Coddington Highway Extension, October 4, 2018 (draft).

These studies relied on a variety of sources to reach conclusions about potential contamination in the Study Area, including:

- "Windshield survey" inspections.

- Environmental Data Resources, Inc. (EDR) Regulatory Database Report, Sanborn Fire Insurance Map Report and Historical City Directories.
- Review of additional historical resources, Rhode Island Department of Environmental Management (RIDEM) Environmental Resources Map, published land use information and State/Federal environmental databases.
- Soil and groundwater sampling and analytical testing for certain areas within the area of construction disturbance.
- RIDEM Site Remediation Program and Underground Storage Tank (UST) Program files.

Methodology

In 2013, a CLUE relative to the storage and use of oil and/or hazardous materials (OHM) in the vicinity of the Project to assess the potential for OHM in soils and groundwater within the Study Area. The CLUE identified several properties where a release of OHM had been documented or where overt evidence of a release or threat of release was identified. As a result, limited subsurface investigations in the vicinity of properties that were identified to have a potential to impact the Study Area were recommended.

In October 2017, an updated CLUE at the request of RIDOT due to the amount of time that had passed since the previous CLUE in 2013 was completed. The purpose of the 2017 CLUE was to identify any new potential sources or threats of OHM contamination which could have appeared since 2013, and to confirm that the scope of work for the previously recommended limited subsurface investigation was still adequate. The 2017 CLUE determined that overall, there were no significant changes to the findings of the 2013 CLUE and that the previous scope of work for the proposed subsurface investigation would sufficiently evaluate the environmental concerns documented in the CLUEs.

In November and December 2017, forty-four (44) soil borings were advanced and sixteen (16) groundwater monitoring wells were installed in the Study Area. Soil and groundwater samples were submitted for laboratory analysis for a variety of analytes.

Exceedances of applicable RIDEM Regulatory Criteria within the Study Area were reported to RIDEM by RIDOT for the investigations completed to date. If any exceedances of applicable RIDEM Regulatory Criteria are identified during the future investigation within the Bike Path portion of the Study Area, they will be reported and regulated accordingly.

In October of 2018, VHB performed a CLUE for the extended Study Area, including proposed milling and paving along JT Connell Highway and Coddington Highway. The CLUE identified documented releases of OHM or observations of use/storage of OHM at properties located in close proximity to the additional Review Area which may have the potential to impact future construction. Any site investigation activities based on the findings of the CLUE will be performed subsequent to the completion of this EA.

3. Applicable Regulations and Criteria

Federal Regulations

The United States Environmental Protection Agency (EPA) is the federal governing body for environmental health in the United States; however, EPA relies on state regulations for small cleanups and other regulatory actions. The agency undertakes large-scale cleanups under the Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR Parts 300, 311, 355, 370, and 373), often referred to as the "Superfund" program) and manages wastes that are considered hazardous based on characterizations. Superfund sites are contaminated by hazardous waste and have been placed on the National Priorities List (NPL) based on their threat or potential threat to human health and/or the environment. EPA may also manage cleanups for hazardous waste sites that have been abandoned and where no potentially responsible party can be identified, or in situations where the potentially responsible party is not able to finance cleanup operations due to bankruptcy or other financial issues.

EPA also regulates hazardous substances under the Resource Conservation and Recovery Act (RCRA, 40 CFR Parts 240-299) and the Toxic Substances Control Act (TSCA, 40 CFR Parts 745, 761, and 763).

State Regulations

The Rhode Island Department of Environmental Management (RIDEM) is the primary governing body for environmental regulations in the state of Rhode Island. RIDEM's Bureau of Environmental Protection is responsible for preventing and minimizing pollution to, and monitoring the quality and overseeing the restoration of, water, air, and land. This includes oversight of the storage and management of oil and/or hazardous materials, as well as the assessment and remediation of contaminated sites. Such work is governed by the *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* (DEM-DSR-01-93, as amended, also known as the Remediation Regulations).

In addition to the Remediation Regulations, other programs within RIDEM, such as the Office of Water Resources, also have regulations and guidelines that are applicable to this Project. These include the *Regulations for the Rhode Island Pollutant Discharge Elimination System (RIPDES)*, which establish discharge limitations for various activities, including point source discharges to receiving waters resulting from dewatering of construction sites.

4. Impact Assessment

Baseline Conditions

This section summarizes the types of hazardous material contamination or potential contamination that have been identified during previous studies for the Project.

Corridor Land Use Evaluation (CLUE), 2013

VHB completed a CLUE relative to the storage and use of OHM in the vicinity of the proposed Pell Bridge Approaches Project to assess the potential of OHM in soils and groundwater within the proposed Study Area

at the request of the RIDOT. The observations and conclusions of the CLUE were ultimately updated and summarized in the updated CLUE in October of 2017 as described below.

CLUE, October 2017

VHB completed an updated CLUE related to the storage and use of OHM in the vicinity of the proposed Pell Bridge Approaches Project to assess the potential of OHM in soils and groundwater within the proposed Study Area at the request of RIDOT. Based on the amount of time that had passed since the previous CLUE in 2013, it was necessary to evaluate if any new conditions were present in the vicinity of the Study Area. Based on historical aerial photographs and Sanborn Fire Insurance Maps, portions of the Review Area were developed prior to 1884 for both residential and commercial uses as well as the Old Colony & Newport Railroad. Site development in the area continued for over a century until the present-day conditions were reached. The existing ramps for the Pell Bridge were constructed sometime between 1963 and 1968.

As part of the CLUE, VHB conducted a windshield survey to identify obvious signs of oil and hazardous material storage and other indications of environmental degradation. Some of the notable observations during the site reconnaissance are summarized below.

- › There are multiple gasoline and/or automobile service stations adjacent or in close proximity to the proposed Study Area.
- › Viking Tours is located at the terminus of Connell Highway. The facility contains several garage bays for storage of buses and trolleys. A large, concrete vault/tank is located in a fence enclosure in the parking lot.
- › A large aboveground storage tank (AST), possibly around 10,000-gallons, was observed behind the Waste Management Facility building at 65 Halsey Street.
- › The City of Newport Department of Public Works (DPW) stores various heavy machinery and construction related supplies/debris on the property located at the western side of Halsey Street at the intersection of Admiral Kalbfus Road. The survey noted dumpsters, concrete structures (jersey barriers, etc.), soil piles, brick piles, plows, and sander trucks at the property.
- › The Newport Grand property at 150 Admiral Kalbfus Road includes a large building and associated paved parking area. The property, which is listed on the EDR report as "Jai Alai," has an Environmental Land Usage Restriction and is known to be located over a portion of the former Newport City Dump.
- › Two plastic ASTs, size uncertain, of magnesium chloride (MgCl₂) were observed in the area proposed for the train platform and associated parking.
- › Two residential properties are located at the corner of JT Connell Highway and Van Zandt Avenue. At least one of the homes appears to have a home heating oil storage tank, based on observations of vent and fill pipes along the side of the house.

The CLUE concluded that the following properties were listed on various databases associated with the release, storage and/or handling of OHM and were located in close proximity to the Project. Listed databases

included State Hazardous Waste Sites (SHWS), Resource Conservation and Recovery Act (RCRA) Generators and Non-Generators, Underground Storage Tanks (USTs), Above Ground Storage Tanks (ASTs), Leaking Underground Storage Tanks (LUSTs) and Solid Waste Facility's and Landfills (SWF/LFs). Based on these findings the following properties may have the potential to have impacted the Project. These properties are highlighted in Figure 2:

- › 105 Admiral Kalbfus Road – Rolling Green Village Apartment
- › 150 Admiral Kalbfus Road – Jai Alai/Newport Grand/Newport City Dump
- › 9 Connell Highway – Providence Gas Newport Division/Aardvark Antiques
- › 10 Connell Highway - Fred's Texaco/K and K Food Mart
- › 88 Connell Highway – Viking Tours of Newport/Haslam Texaco
- › 111 Connell Highway – U-Haul International
- › 138 JT Connell Highway – Shell Service Station
- › 163 JT Connell Highway – Mobil Gasoline Station
- › 166 Connell Highway – Barry Pontiac Buick, Inc.
- › 199 Connell Highway – R.K. Festival Shoppes/Walmart/Newport Mall/Stop & Shop
- › 65 Halsey Street – Newport Transfer Station/Safeway System, Inc./Waste Management of Newport
- › 80 Halsey Street – Newport Public Works Garage/City of Newport Igloo
- › 143 Third Street – Bayside Village
- › 58 Van Zandt Avenue – B & C Auto/Bridge Citgo

Based on the findings of the CLUE, VHB recommended subsurface investigations, including drilling, soil sampling, monitoring well installation and groundwater sampling, to understand and characterize the subsurface conditions throughout the Review Area. The locations of these recommended investigations, which were approved by RIDOT, are also shown in Figure 2.

Limited Site Investigation (LSI), November and December 2017

The LSI included the advancement of forty-four (44) soil borings, sixteen (16) of which were constructed as groundwater monitoring wells, in November and December of 2017. The LSI was completed in areas expected to require excavation for Project construction based on the preferred layout at the time the investigation was completed. Soil and groundwater from the borings and wells were analyzed and compared to applicable RIDEM regulatory criteria set forth in the Remediation Regulations. Site investigation activities related to soil and groundwater sampling are illustrated on Figures 3 and 4, respectively. Results regarding the soil and groundwater analysis are summarized in Table 1 and Table 2, respectively. Overall findings regarding soil and groundwater sampling and analysis have been summarized below.

Soil Data

- › Total petroleum hydrocarbons (TPH) were detected in all but six of the soil borings. Two of the borings exceeded applicable RIDEM Residential Direct Exposure Criteria (RDEC). The highest TPH value, 31,000 mg/kg, was present in boring B-16 from 5 to 7.5 feet below grade and was the only exceedance of the RIDEM Industrial/Commercial Direct Exposure Criteria (I/CDEC), which also exceeded the Upper Concentration Limit (UCL). All other detections of TPH were below the RIDEM criteria.
- › PCBs were analyzed in three of the 44 borings. PCBs were detected in two of the three samples, but did not exceed applicable RIDEM criteria.

Metals

- › Arsenic was detected above RIDEM RDEC and the I/CDEC in 24 of the 44 borings. The highest concentration of arsenic in soil, 29 mg/kg, was detected at boring B-22 from 5 to 7 feet below grade.
- › Lead was detected above applicable RIDEM RDEC and/or I/CDEC in 16 of the 44 borings. The highest concentration of lead in soil, 3,600 mg/kg, was detected at boring B-26 from 7.5 to 10 feet below grade.
- › Copper was detected in every soil sample; however, only boring B-16, in which copper was reported at 9,700 mg/kg from 0 to 2.5 feet below grade, exceeded the RIDEM RDEC.
- › Antimony was detected in several borings, but was only detected above the RIDEM RDEC at boring B-26 from 7.5 to 10 feet below grade. All other detections were below applicable RIDEM standards.
- › Thallium was detected in several borings, but was only detected above RIDEM RDEC at boring B-1 from 7.5 to 10 feet below grade. All other detections were below applicable RIDEM standards.
- › Various other metals were detected above the laboratory detection limits throughout the Study Area; however, all of these detections were below applicable RIDEM criteria.

Volatile Organic Compounds (VOCs)

- › Various VOC constituents were detected in 24 of the 44 soil borings. It should be noted, however, that in nine of those borings, the only detections were for acetone and/or methylene chloride. Both of these constituents are common laboratory contaminants, as they are used for various cleaning processes.
- › Naphthalene was the only constituent that was detected above RIDEM RDEC criteria. Naphthalene was detected in boring B-26 from 7.5 to 10 feet below grade at a concentration of 120 mg/kg, exceeding the RIDEM RDEC.

Semi-Volatile Organic Compounds (SVOCs) and Polycyclic Aromatic Hydrocarbons (PAHs)

- › Various SVOC constituents were detected in 21 of the 44 soil borings.
- › Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in several of the borings at concentrations above the RIDEM RDEC.

- › Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected in several of the borings at concentrations above the RIDEM I/CDEC.

Groundwater Data

- › A variety of VOC constituents were detected in monitoring wells MW-3 and MW-15; however, all of the detections were below applicable RIDEM GB Groundwater Objectives.
- › Other than MW-3 and MW-15, several VOC constituents were also detected in seven of the 14 remaining monitoring wells. All these concentrations were at levels below applicable RIDEM GB Groundwater Objectives.
- › Although no groundwater concentrations were reported above the applicable Remediation Regulation objectives, some compounds were detected at levels that would likely exceed RIPDES discharge limitations, thereby requiring a Remediation General Permit should dewatering and a point source discharge to a surface water be proposed. Additional testing would be necessary to address RIPDES permit applicability and groundwater treatment requirements. Alternatively, impacted groundwater, if removed from the subsurface during dewatering activities to facilitate construction, could be containerized, characterized and transported off-site to a licensed disposal facility.

CLUE, September 2018

VHB completed a CLUE in September 2018 which included an additional portion of the Project Area, based on changes in the project design. This area begins at the entrance to the R.K. Center shopping plaza at 199 JT Connell Highway, proceeding north until the road becomes Coddington Highway and ultimately ending at the intersection of West Main Road and Coddington Highway in Middletown. Adjacent land use to the areas included in the 2018 CLUE includes, but is not necessarily limited to, commercial properties (restaurants, shopping plazas, a brewery, a storage facility, etc.), residential properties, the Community College of Rhode Island's Newport Campus, the Newport Water Pollution Control Plant, and the U.S. Naval Base of Newport.

The CLUE concluded that the following properties were listed on various databases associated with the release, storage and/or handling of OHM and were located in close proximity to the Project. Listed databases included the Superfund Enterprise Management System (SEMS) Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), RCRA Generators and Non-Generators, SHWS, UST, AST and LUST. Based on these findings the following properties may have the potential to have impacted the Project. These properties are highlighted in Figure 5:

- 10 Coddington Highway – Getty Service Station #68002 (a/k/a Middletown Getty Inc.)
- Farewell Avenue & Conrail Tracks – Newport Naval Educational and Training Center (and DOD/NETC/Coddington Rubble Fill)
- 350 Coddington Highway (RIPTA Facility garage & pumping station)
- 1 John H Chafee Boulevard – Community College of Rhode Island – Newport Campus

- 312 Connell Highway – Newport Biodiesel Inc. (a/k/a Moriarty's LLC)
- 286 Connell Highway – Bell Atlantic (Nynex; Verizon New England/Maintenance Facility; National Grid Property – Newport)
- 250 JT Connell Highway – City of Newport Water Pollution Control Plant (a/k/a City of Newport WWTF; United Water)

No Action Alternative

Under the No Action Alternative, there would be no ground disturbance and therefore less opportunity for workers and other people in the vicinity to be exposed to contaminants in soil or groundwater. In addition, no potential would exist for hazardous material releases during construction. However, there would also be less opportunity to address the contamination identified in the vicinity of the proposed improvements by removing contaminated soil and groundwater.

5. Cumulative Impacts

Environmental Consequences

Proposed Action

Based on the records research and testing completed for the study area, the disturbance of soil during Project construction has a relatively high potential of encountering hazardous materials. Previous studies suggest that contaminants encountered could include petroleum hydrocarbons, metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SCOVs) and/or polycyclic aromatic hydrocarbons (PAHs). If not properly managed, these materials have the potential to affect worker health and safety and result in releases of contamination to the surrounding environment.

Impacts identified by reviewing the previous investigations are categorized as either direct impacts or indirect impacts. A direct impact is an immediate consequence to the environment or construction program as a result of the implementation of the Proposed Action. Direct impacts would include encountering existing contamination, acquiring a contaminated property, or generating regulated materials during building demolition, storage tank removals, or construction activities. The following are anticipated direct impacts related to this Project:

- › **Exposure of contaminated soils through excavation activities.** Excess soils generated during construction that cannot be used for fill and require disposal because of contamination must be tested and disposed of at a licensed and approved facility. Contaminated soils that can be re-interred and left at the Project site will need to be managed with an engineered control, such as a RIDEM approved cap. If soils are left in place beneath a cap, an institutional control, such as an Environmental Land Usage Restriction (ELUR), will be required to be recorded in the City of Newport and/or Middletown Land Evidence Records to restrict use of the site. Taking appropriate actions and following the requirements laid out in the Remediation Regulations will remove some known

contamination and properly manage residual contamination, improving the long-term conditions for human health.

- › **Groundwater generated through excavation activities.** No exceedances of applicable RIDEM GB Objectives currently exist within the Study Area; however, various contaminants were detected by the laboratory that would likely require containerization and either off-site disposal, or on-site treatment prior to permitted discharge to a local receiving water. If the anticipated quantity of groundwater to be generated is less than 20,000 gallons, it may be prudent to pump the groundwater into a holding tank and ship it off-site for disposal rather than discharging it directly to a receiving water. Larger quantities of water would likely need to be discharged to an adjacent surface water body under a RIPDES permit after treatment (e.g. settling, bag filtration, ion exchange, etc.).
- › **Debris generated during construction.** Subsurface debris may be encountered during intrusive construction activities, especially in the portion of the Study Area located within the boundaries of the former Newport City Dump. This material will need to be assessed for possible contamination, managed and disposed of properly.
- › **Releases of contaminants during construction.** There is some potential for new releases to occur or to be identified during construction, such as a release of oil or diesel from construction equipment. There is also the potential that buried debris or impacted material beyond what was discovered during subsurface investigation activities may be found and could require reporting and/or additional remediation.

Potential indirect impacts could occur if the Project has the potential to affect the ongoing remediation of existing subsurface contamination or would produce additional sources of contamination or waste materials. This is currently not anticipated to occur as a result of the Proposed Action, but could be the case if previously undiscovered contaminants are encountered during construction. Another potential indirect impact, albeit unlikely, is the accidental mismanagement of regulated soil or groundwater waste materials outside the Study Area, such as dumping of contaminated, regulated soils at an unlicensed facility or location. The Proposed Action may also result in an indirect beneficial impact if it results in the removal and disposal of contaminated materials in accordance with state and Federal regulations.

6. Mitigation

During construction activities, a number of best management practices and other requirements would need to be followed to mitigate potential impacts from the Project. From a regulatory perspective, the Rhode Island Department of Transportation (RIDOT) and any selected contractors/sub-contractors would be required to follow a Remedial Action Work Plan (RAWP), which details specific measures that need to be taken by the contractor, the process for handling and managing impacted materials (soil and groundwater), and specifications on the construction of any cap. The measures outlined below have been provided as a general guideline and may change once the RAWP is written and submitted to the RIDEM for comment following the Site Investigation Report (SIR).

- During construction activities, the contractor will monitor construction to document that soil management activities are properly conducted. Operating logs and photo-documentation will be kept and submitted monthly and/or upon the completion of the Project. These logs will be the primary documentation for Project compliance and mitigation of Project impacts;

- All excavated material which requires stockpiling will be temporarily stockpiled on 6-mil polyethylene sheeting and covered with 6-mil polyethylene sheeting in a contractor-designated stockpile area on Site. This procedure will reduce the possibility of entrainment of the soil by wind or erosion of the stockpile from precipitation. This procedure will also reduce the potential for contact with the stockpile by members of the public by restricting access to exposed soils;
- All reasonable precautions will be taken to prevent the excessive generation of dust during soil excavation, stockpiling, loading, and other soil handling activities. Work at the site must comply with all applicable federal, state, and local regulations, including the RIDEM Air Pollution Control Regulations, and specifically Regulation No. 5 regarding control of fugitive dust. Dust control measures must be implemented, as required, to prevent airborne particulate matter from leaving the site at all times. Dust control measures (e.g., wetting soils) shall be implemented on an as needed basis (i.e. visual evidence of airborne dust) throughout the Project. All stockpiles shall be inspected on a daily basis to ensure compliance with RIDEM Air Pollution Control Regulations. VHB will conduct periodic inspections of the Site to ensure all dust control measures are in place. This information will then be recorded in the Operating Log. Dust control measures will help to mitigate entrainment of impacted soils via wind to reduce potential impacts to nearby receptors;
- Prior to the start of excavation activities, installation of sediment and erosion controls will be required. A stabilized construction entrance, or entrances if multiple entrances to the Study Area are needed, to reduce the tracking of soils into the area roadways will also be installed. The construction entrance will be installed consistent with the *Rhode Island Soil Erosion and Sediment Control Handbook (2014)*;
- Any remediation waste generated will be managed in accordance with state and federal requirements and disposal documentation will be provided to RIDEM. If excess soil is generated, the material will be characterized via sampling for disposal parameters and disposed of at a permitted facility. Any disposal manifests, bills of lading, or other transportation documentation (e.g., disposal facility weight slips) will be included in the Remedial Action Closure Report (RACR);
- Upon completion of the Project, a RACR will be submitted to the RIDEM summarizing field activities that were completed and overall compliance with the RAWP;
- An ELUR will be recorded for contaminated properties or portions of such properties as necessary. The ELUR and associated Soil Management Plan (SMP) will be finalized by RIDOT within 60 days following RIDEM's approval of the RACR. A recorded copy of the ELUR is expected to be forwarded to RIDEM within 15 days of filing; and
- Successful completion of the soil management activities documented in the periodic Operating Logs will be used to demonstrate compliance with the work plan. All information associated with these actions will be submitted to RIDEM as required.

7. Regulatory Coordination and Required Permits

Mr. Jeffrey Crawford, Principal Environmental Scientist for the Rhode Island Department of Environmental Management (RIDEM) Office of Waste Management, is the RIDEM Project Manager for the Project. Communications have taken place with Mr. Crawford at various stages throughout the Project to determine that appropriate regulatory

guidelines were being adhered to. Mr. Crawford is the RIDEM representative who sent RIDOT the Letter of Responsibility, after the Department received the Release Notification Form.

8. Summary of Impacts

Contaminated subsurface soils containing TPH, VOC, SVOC, and metals above RIDEM thresholds have been identified within the Study Area in locations where excavation or other intrusive construction activity is anticipated. Properties located adjacent to or in close proximity to areas where only surficial roadway disturbances (i.e., milling and paving) are currently anticipated could potentially impact the project if the construction scope of work changes and more intrusive work is implemented. Excess soils that require disposal must be sampled, analyzed for disposal parameters, and disposed of at a licensed and approved facility. Contaminated soils that can be re-interred and left at the Project site will need to be managed with an engineered barrier (i.e., Site cap) and institutional control (i.e., (ELUR).

Although no groundwater concentrations were reported above the applicable Remediation Regulation objectives, some compounds were detected at levels that would likely exceed RI Pollution Discharge Elimination System discharge limitations, thereby requiring a Remediation General Permit should dewatering and a point source discharge to a surface water be proposed. Additional testing would be necessary to address RIPDES permit applicability and groundwater treatment requirements. Alternatively, impacted groundwater, if removed from the subsurface during dewatering activities to facilitate construction, could be containerized and transported off-site to a licensed disposal facility.

Subsurface debris may be encountered during intrusive construction activities, especially in the portion of the Study Area located within the boundaries of the former Newport City Dump. This material will need to be managed and disposed of properly.

There is some potential for new releases to occur or to be identified during construction, such as a release of oil or diesel from construction equipment.

Tables

Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-1		B-2		B-3		B-4		B-5	
				1-3'	7.5-10'	1-3'	5-8'	1-3'	11-14'	1-3'	10-12.5'	0-2'	5-7'
Sample Depth				11/3/2017		11/3/2017		11/3/2017		11/3/2017		11/3/2017	
Date Sampled				1711-24023		1711-24023		1711-24023		1711-24023		1711-24023	
Lab Work Order #	Residential	Industrial/Commercial	GB Leachability										
PID				0.2	4.8	0.1	ND	ND	0.5	ND	0.6	ND	0.2
Total Petroleum Hydrocarbons													
TPH	500	2,500	NS	69	ND<10	19	12	ND<10	ND<10	ND<10	ND<10	19.2	ND<10
Priority Pollutant Metals													
Antimony	10	820	NS	ND<5.34	ND<5.65	ND<5.68	ND<5.69	ND<5.42	ND<5.80	ND<5.58	ND<5.54	ND<5.63	ND<5.82
Arsenic	7	7	NS	5.9	10	9.3	8.5	3.8	7.7	7.3	9.6	3	7.9
Copper	3,100	10,000	NS	22	36	24	22	9.4	21	18	27	14	18
Lead	150	500	NS	160	20	20	9.9	4.9	11	8.6	11	26	14
Thallium	5.5	140	NS	ND<2.7	6.5	ND<2.8	ND<2.8	ND<2.7	ND<2.9	ND<2.8	ND<2.8	ND<2.8	ND<2.9
Volatile Organic Compounds (mg/kg)													
Naphthalene	54	10,000	NS	-	ND<0.0040	ND<0.0042	-	-	ND<0.0051	-	ND<0.0044	-	ND<0.0045
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	0.9	7.8	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Benzo(a)pyrene	0.4	0.8	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Benzo(b)fluoranthene	0.9	7.8	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Benzo(k)fluoranthene	0.9	78	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Benzo(g,h,i)perylene	0.8	10,000	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Chrysene	0.4	780	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Fluoranthene	20	10,000	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	0.67	ND<0.39
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Naphthalene	54	10,000	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	ND<0.38	ND<0.39
Phenanthrene	40	10,000	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	0.56	ND<0.39
Pyrene	13	10,000	NS	ND<0.36	ND<0.39	ND<0.38	ND<0.38	ND<0.36	ND<0.39	ND<0.37	ND<0.37	0.53	ND<0.39

Notes:

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3. **Bold results indicate concentrations reported above laboratory detection limits.**
4. **Bold and lightly shaded results indicate concentrations reported above RIDEM Residential Direct Exposure Criteria (RDEC).**
5. **Bold and darklyshaded results indicate concentrations reported above RIDEM Industrial/Commercial Direct Exposure Criteria (I/CDEC).**
6. "NS" indicates that no Method 1 Criteria has been established in the Remediation Regulations.
7. All results reported in milligrams/kilogram (mg/kg)
8. "-" indicates that the analysis was not run on that sample
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Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-6		B-7		B-8		B-9		B-10	
				1-3'	4-6'	0.5-2'	3.5-5.5'	0-2'	4-6'	1-3'	3-5'	0-2'	5-7'
Sample Depth				11/6/2017		11/6/2017		11/6/2017		11/6/2017		11/6/2017	
Date Sampled				1711-24244		1711-24244		1711-24244		1711-24244		1711-24244	
Lab Work Order #	Residential	Industrial/Commercial	GB Leachability										
PID				ND	ND	5.6	1363	0.2	ND	0.1	0.5	ND	ND
Total Petroleum Hydrocarbons													
TPH	500	2,500	NS	ND<11	ND<12	52	410	420	130	210	290	450	ND<12
Priority Pollutant Metals													
Antimony	10	820	NS	ND<5.41	ND<6.17	ND<5.73	ND<5.72	ND<5.42	ND<6.41	ND<6.33	ND<6.87	ND<5.08	ND<6.03
Arsenic	7	7	NS	6.4	ND<3.1	13	5.8	3	5.8	17	11	4.4	4.3
Copper	3,100	10,000	NS	60	3.7	17	16	12	15	24	24	32	6
Lead	150	500	NS	270	ND<2.5	18	12	16	24	17	23	200	3.8
Thallium	5.5	140	NS	ND<2.7	ND<3.1	ND<2.9	ND<2.9	ND<2.7	3.5	ND<3.2	ND<3.4	ND<2.5	ND<3.0
Volatile Organic Compounds (mg/kg)													
Naphthalene	54	10,000	NS	-	ND<0.0052	ND<0.0056	4.2	ND<0.0062	-	-	0.012	-	ND<0.0047
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	0.9	7.8	NS	ND<0.36	ND<0.41	ND<0.39	-	0.4	ND<0.43	ND<0.42	ND<0.46	24	ND<0.41
Benzo(a)pyrene	0.4	0.8	NS	ND<0.36	ND<0.41	ND<0.39	-	0.59	ND<0.4	ND<0.4	ND<0.4	23	ND<0.4
Benzo(b)fluoranthene	0.9	7.8	NS	ND<0.36	ND<0.41	ND<0.39	-	0.49	ND<0.43	ND<0.42	ND<0.46	20	ND<0.41
Benzo(k)fluoranthene	0.9	78	NS	ND<0.36	ND<0.41	ND<0.39	-	0.43	ND<0.43	ND<0.42	ND<0.46	18	ND<0.41
Benzo(g,h,i)perylene	0.8	10,000	NS	ND<0.36	ND<0.41	ND<0.39	-	0.4	ND<0.43	ND<0.42	ND<0.46	12	ND<0.41
Chrysene	0.4	780	NS	ND<0.36	ND<0.41	ND<0.39	-	0.48	ND<0.4	ND<0.4	ND<0.4	24	ND<0.4
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.36	ND<0.41	ND<0.39	-	ND<0.36	ND<0.4	ND<0.4	ND<0.4	3.4	ND<0.4
Fluoranthene	20	10,000	NS	ND<0.36	ND<0.41	ND<2.0	-	ND<1.8	ND<0.43	ND<0.42	ND<0.46	46	ND<0.41
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	ND<0.36	ND<0.41	ND<0.39	-	ND<0.36	ND<0.43	ND<0.42	ND<0.46	12	ND<0.41
Naphthalene	54	10,000	NS	ND<0.36	ND<0.41	ND<2.0	-	ND<1.8	ND<0.43	ND<0.42	ND<0.46	ND<3.5	ND<0.41
Phenanthrene	40	10,000	NS	ND<0.36	ND<0.41	ND<2.0	-	ND<1.8	ND<0.43	ND<0.42	ND<0.46	13	ND<0.41
Pyrene	13	10,000	NS	ND<0.36	ND<0.41	ND<2.0	-	ND<1.8	ND<0.43	ND<0.42	ND<0.46	38	ND<0.41

Notes:

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Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-11			B-12		B-13		B-14	
				0-2'	8-10'	10-12'	0-1'	7-9'	1-3'	5-7'	0-2'	3-5'
Sample Depth				11/6/2017			11/9/2017		11/9/2017		11/9/2017	
Date Sampled				1711-24244			1711-24617		1711-24617		1711-24617	
Lab Work Order #	Residential	Industrial/Commercial	GB Leachability									
PID				0.5	1.6	1.8	0.8	0.1	0.1	0.1	0.1	0.3
Total Petroleum Hydrocarbons												
TPH	500	2,500	NS	ND<11	950	-	240	97	21	32	200	110
Priority Pollutant Metals												
Antimony	10	820	NS	ND<5.20	ND<9.07	-	ND<5.75	ND<5.63	ND<5.26	ND<5.48	ND<5.38	ND<5.34
Arsenic	7	7	NS	4	24	-	3.3	8.6	2.9	ND<2.7	3.7	5.6
Copper	3,100	10,000	NS	10	390	-	19	48	11	15	20	21
Lead	150	500	NS	5.8	690	-	24	300	7.8	6.7	46	62
Thallium	5.5	140	NS	ND<2.6	ND<4.5	-	ND<2.9	ND<2.8	ND<2.6	ND<2.7	ND<2.7	ND<2.7
Volatile Organic Compounds (mg/kg)												
Naphthalene	54	10,000	NS	-	0.7	-	ND<0.0062	-	-	ND<0.0042	-	ND<0.0038
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	0.9	7.8	NS	-	29	1.2	ND<0.38	0.79	ND<0.35	ND<0.37	ND<0.36	ND<0.36
Benzo(a)pyrene	0.4	0.8	NS	-	20	1.3	ND<0.38	0.85	ND<0.35	ND<0.37	0.44	0.42
Benzo(b)fluoranthene	0.9	7.8	NS	-	16	0.85	ND<0.38	0.74	ND<0.35	ND<0.37	ND<0.36	ND<0.36
Benzo(k)fluoranthene	0.9	78	NS	-	16	0.99	ND<0.38	0.7	ND<0.35	ND<0.37	ND<0.36	ND<0.36
Benzo(g,h,i)perylene	0.8	10,000	NS	-	9.6	0.68	ND<0.38	0.45	ND<0.35	ND<0.37	ND<0.36	ND<0.36
Chrysene	0.4	780	NS	-	22	1.4	ND<0.38	1	ND<0.35	ND<0.37	ND<0.36	0.38
Dibenz(a,h)anthracene	0.4	0.8	NS	-	3.4	ND<0.40	ND<0.38	ND<0.38	ND<0.35	ND<0.37	ND<0.36	ND<0.36
Fluoranthene	20	10,000	NS	-	74	3.3	0.62	2	ND<0.35	ND<0.37	ND<1.8	ND<1.8
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	-	9.6	0.53	ND<0.38	0.43	ND<0.35	ND<0.37	ND<0.36	ND<0.36
Naphthalene	54	10,000	NS	-	12	ND<2.0	ND<0.38	ND<0.38	ND<0.35	ND<0.37	ND<1.8	ND<1.8
Phenanthrene	40	10,000	NS	-	78	ND<2.0	ND<0.38	0.92	ND<0.35	ND<0.37	ND<1.8	ND<1.8
Pyrene	13	10,000	NS	-	53	2.7	0.51	1.7	ND<0.35	ND<0.37	ND<1.8	ND<1.8

Notes:

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Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-15		B-16		B-17		B-18		B-19	
				1-2.5'	5-10'	0-2.5'	5-7.5'	0-2'	3-5'	0-2'	3-5'	0-2'	5-10'
Sample Depth				11/9/2017		11/10/2017		11/10/2017		11/10/2017		11/10/2017	
Date Sampled				1711-24617		1711-24652		1711-24652		1711-24652		1711-24652	
Lab Work Order #	Residential	Industrial/Commercial	GB Leachability										
PID				0.1	98.9	ND	2.4	0.1	1.5	0.1	2.1	0.6	ND
Total Petroleum Hydrocarbons													
TPH	500	2,500	NS	470	230	870	31,000	110	183	400	140	230	ND<10
Priority Pollutant Metals													
Antimony	10	820	NS	ND<5.56	ND<6.99	ND<6.20	ND<10.4	ND<6.04	ND<5.77	8.95	ND<6.9	ND<5.5	8.47
Arsenic	7	7	NS	ND<2.8	ND<3.5	13	ND<5.2	ND<3.0	9.3	26	4.1	11	16
Copper	3,100	10,000	NS	59	62	9,700	190	45	180	410	17	180	160
Lead	150	500	NS	270	240	2,900	1,000	110	580	1,000	17	320	1,100
Thallium	5.5	140	NS	ND<12.8	ND<3.5	ND<3.1	ND<5.2	ND<3.0	ND<2.9	ND<3.0	ND<3.4	2.9	ND<3.3
Volatile Organic Compounds (mg/kg)													
Naphthalene	54	10,000	NS	ND<0.0044	-	ND<0.0074	-	-	ND<0.0047	-	8.6	0.37	-
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	0.9	7.8	NS	1.2	ND<0.46	1.1	20	0.52	0.55	0.46	ND<0.46	1.1	ND<0.45
Benzo(a)pyrene	0.4	0.8	NS	1.4	0.35	1.2	23	0.48	0.53	0.53	ND<0.4	1.2	ND<0.4
Benzo(b)fluoranthene	0.9	7.8	NS	1.2	ND<0.46	1.1	24	0.46	0.49	0.57	ND<0.46	0.8	ND<0.45
Benzo(k)fluoranthene	0.9	78	NS	1.2	ND<0.46	1	20	0.41	0.5	0.5	ND<0.46	0.9	ND<0.45
Benzo(g,h,i)perylene	0.8	10,000	NS	0.81	ND<0.46	1.7	21	ND<0.40	ND<0.39	0.42	ND<0.46	0.7	ND<0.45
Chrysene	0.4	780	NS	1.3	0.38	1.2	23	0.56	0.58	0.61	ND<0.4	1.1	ND<0.4
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.37	ND<0.19	0.21	6.1	ND<0.40	ND<0.39	ND<0.4	ND<0.4	ND<0.37	ND<0.4
Fluoranthene	20	10,000	NS	2.3	0.82	2.1	32	1.1	1.2	1	ND<0.46	2.4	ND<0.45
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	0.82	ND<0.46	0.74	16	ND<0.40	ND<0.39	ND<0.41	ND<0.46	0.63	ND<0.45
Naphthalene	54	10,000	NS	ND<0.37	ND<0.46	ND<0.41	ND<3.5	ND<0.40	ND<0.39	ND<0.41	ND<0.46	ND<0.37	ND<0.45
Phenanthrene	40	10,000	NS	1.3	0.83	0.92	13	0.57	0.76	ND<0.41	ND<0.46	1.6	ND<0.45
Pyrene	13	10,000	NS	1.8	0.69	1.8	30	0.86	0.96	0.82	ND<0.46	2	ND<0.45

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Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-20		B-21		B-22		B-23		B-24	
				0-2.5'	7.5-10'	0-2'	5-8'	0-2.5'	5-7'	0-2'	2-4'	0-2'	3-5'
Sample Depth													
Date Sampled				11/10/2017		11/10/2017		11/10/2017		11/13/2017		11/13/2017	
Lab Work Order #	Residential	Industrial/Commercial	GB Leachability	1711-24652		1711-24652		1711-24652		1711-24696		1711-24696	
PID				25	ND	0.1	7.9	ND	0.6	ND	ND	ND	0.1
Total Petroleum Hydrocarbons													
TPH	500	2,500	NS	72	110	340	34	ND<10	54	181	ND<10	ND<10	ND<10
Priority Pollutant Metals													
Antimony	10	820	NS	ND<5.7	ND<5.4	ND<5.5	ND<6.0	6.51	ND<5.8	ND<5.8	ND<5.5	ND<5.2	ND<5.6
Arsenic	7	7	NS	14	19	15	11	8	29	5.8	3.7	3.2	3.4
Copper	3,100	10,000	NS	87	58	130	59	210	220	18	12	11	9.9
Lead	150	500	NS	560	560	940	390	350	1,000	47	5.6	15	5.0
Thallium	5.5	140	NS	ND<2.9	ND<2.7	ND<2.7	ND<3.0	ND<2.7	3.6	ND<2.9	ND<2.8	ND<2.6	ND<2.8
Volatile Organic Compounds (mg/kg)													
Naphthalene	54	10,000	NS	0.014	-	-	ND<0.0059	-	ND<0.0051	-	ND<0.0037	-	ND<0.0039
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	0.9	7.8	NS	ND<0.38	1.2	ND<0.37	ND<0.41	0.75	0.68	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Benzo(a)pyrene	0.4	0.8	NS	ND<0.38	1.9	ND<0.37	ND<0.4	0.85	0.64	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Benzo(b)fluoranthene	0.9	7.8	NS	ND<0.38	2	ND<0.37	ND<0.41	0.59	0.54	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Benzo(k)fluoranthene	0.9	78	NS	ND<0.38	1.9	ND<0.37	ND<0.41	0.62	0.55	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Benzo(g,h,i)perylene	0.8	10,000	NS	ND<0.38	2	ND<0.37	ND<0.41	0.55	ND<0.39	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Chrysene	0.4	780	NS	ND<0.38	1.6	ND<0.37	ND<0.4	0.78	0.71	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.38	0.52	ND<0.37	ND<0.4	ND<0.37	ND<0.39	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Fluoranthene	20	10,000	NS	ND<0.38	1.4	ND<0.37	ND<0.41	0.97	1.4	0.7	ND<0.37	ND<0.35	ND<0.38
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	ND<0.38	1.8	ND<0.37	ND<0.41	0.47	ND<0.39	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Naphthalene	54	10,000	NS	ND<0.38	ND<0.36	ND<0.37	ND<0.41	ND<0.37	ND<0.39	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Phenanthrene	40	10,000	NS	0.48	0.46	ND<0.37	ND<0.41	ND<0.37	1	ND<0.39	ND<0.37	ND<0.35	ND<0.38
Pyrene	13	10,000	NS	0.41	0.98	ND<0.37	ND<0.41	1.1	1.2	0.54	ND<0.37	ND<0.35	ND<0.38

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Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-25		B-26			B-27		B-28		B-29	
				0-2'	5-7'	0-2'	7.5-10'	13-15'	0-2'	3-5'	0.5-1.5'	1.5-3'	0.5-2'	3-5'
Sample Depth				11/13/2017		11/13/2017			11/14/2017		11/14/2017		11/14/2017	
Date Sampled				1711-24696		1711-24696 1712-26268			1711-25023 1712-26267		1711-25023 1712-26267		1711-25023 1712-26267	
Lab Work Order #	Residential	Industrial/ Commercial	GB Leachability											
PID				ND	0.1	ND	42.5	287.1	ND	ND	1.2	1.5	0.1	0.1
Total Petroleum Hydrocarbons														
TPH	500	2,500	NS	12	ND<10	ND<10	640	-	ND<10	ND<10	45	16	17	63
Priority Pollutant Metals														
Antimony	10	820	NS	ND<5.2	ND<5.3	ND<5.2	29	-	ND<5.26	ND<5.62	ND<5.10	ND<6.07	ND<5.72	ND<5.96
Arsenic	7	7	NS	4	2.9	3.1	25	-	3	3.42	3.6	6.9	7.6	3
Copper	3,100	10,000	NS	13	10	12	790	-	9.6	9.3	11	14	16	11
Lead	150	500	NS	41	5.5	8	3,600	-	6	27	6.2	8.8	13	14
Thallium	5.5	140	NS	ND<2.6	ND<2.7	ND<2.6	4.5	-	ND<2.6	ND<2.8	ND<2.6	ND<3.0	ND<2.9	ND<3.0
Volatile Organic Compounds (mg/kg)														
Naphthalene	54	10,000	NS	-	ND<0.0035	-	120	0.02	-	ND<0.0044	-	ND<0.0051	-	ND<0.0047
Semi-Volatile Organic Compounds														
Benzo(a)anthracene	0.9	7.8	NS	ND<0.35	ND<0.36	ND<0.35	1.5	-	ND<0.35	ND<0.38	ND<0.35	0.98	ND<0.38	ND<0.40
Benzo(a)pyrene	0.4	0.8	NS	ND<0.35	ND<0.36	ND<0.35	1.6	-	ND<0.35	ND<0.38	ND<0.35	1.2	ND<0.38	ND<0.40
Benzo(b)fluoranthene	0.9	7.8	NS	ND<0.35	ND<0.36	ND<0.35	1.6	-	ND<0.35	ND<0.38	ND<0.35	0.96	ND<0.38	ND<0.40
Benzo(k)fluoranthene	0.9	78	NS	ND<0.35	ND<0.36	ND<0.35	1.4	-	ND<0.35	ND<0.38	ND<0.35	1	ND<0.38	ND<0.40
Benzo(g,h,i)perylene	0.8	10,000	NS	ND<0.35	ND<0.36	ND<0.35	1.1	-	ND<0.35	ND<0.38	ND<0.35	0.71	ND<0.38	ND<0.40
Chrysene	0.4	780	NS	ND<0.35	ND<0.36	ND<0.35	1.6	-	ND<0.35	ND<0.38	ND<0.35	1.1	ND<0.38	ND<0.40
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.35	ND<0.36	ND<0.35	0.32	-	ND<0.35	ND<0.38	ND<0.35	ND<0.40	ND<0.38	ND<0.40
Fluoranthene	20	10,000	NS	ND<0.35	ND<0.36	ND<0.35	2.7	-	ND<0.35	ND<0.38	ND<0.35	1.7	ND<0.38	ND<0.40
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	ND<0.35	ND<0.36	ND<0.35	0.98	-	ND<0.35	ND<0.38	ND<0.35	0.67	ND<0.38	ND<0.40
Naphthalene	54	10,000	NS	ND<0.35	ND<0.36	ND<0.35	1.5	-	ND<0.35	ND<0.38	ND<0.35	ND<0.41	ND<0.38	ND<0.40
Phenanthrene	40	10,000	NS	ND<0.35	ND<0.36	ND<0.35	2.4	-	ND<0.35	ND<0.38	ND<0.35	ND<0.41	ND<0.38	ND<0.40
Pyrene	13	10,000	NS	ND<0.35	ND<0.36	ND<0.35	2.4	-	ND<0.35	ND<0.38	ND<0.35	17	ND<0.38	ND<0.40

Notes:

1. Only compounds with results reported above applicable RIDEM Criteria are included in this table.
2. Regulatory criteria obtained from the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations).
3. **Bold results indicate concentrations reported above laboratory detection limits.**
4. **Bold and lightly shaded results indicate concentrations reported above RIDEM Residential Direct Exposure Criteria (RDEC).**
5. **Bold and darklyshaded results indicate concentrations reported above RIDEM Industrial/Commercial Direct Exposure Criteria (I/CDEC).**
6. "NS" indicates that no Method 1 Criteria has been established in the Remediation Regulations.
7. All results reported in milligrams/kilogram (mg/kg)
8. "-" indicates that the analysis was not run on that sample
9. "ND" indicates not present above laboratory detection limit.

Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-30		B-31		B-32		B-33		B-34	
				0.5-2'	2-4'	0-2'	10-13'	0-2'	3-5'	3-5'	15-18'	0-2'	7-9'
Sample Depth													
Date Sampled				11/14/2017		11/14/2017		11/14/2017		11/15/2017		11/15/2017	
Lab Work Order #	Residential	Industrial/ Commercial	GB Leachability	1711-25023		1711-25023		1711-25023		1711-25024		1711-25024	
PID				1712-26267		1712-26267		1712-26267		1712-26275		1712-26275	
Total Petroleum Hydrocarbons													
TPH	500	2,500	NS	98	57	ND<10	ND<10	52	85	62	170	ND<10	74
Priority Pollutant Metals													
Antimony	10	820	NS	ND<5.16	ND<6.28	ND<5.60	ND<5.27	ND<5.59	ND<5.99	ND<5.4	ND<5.6	ND<5.1	ND<5.5
Arsenic	7	7	NS	6.6	6.8	2.9	ND<2.6	9.1	7.8	4.0	3.5	ND<2.6	ND<2.8
Copper	3,100	10,000	NS	15	13	12	8.4	24	43	19	18	13	8.9
Lead	150	500	NS	8.1	22	14	5.3	34	140	40	77	7.9	5.3
Thallium	5.5	140	NS	ND<2.6	ND<3.1	ND<2.8	ND<2.6	ND<2.8	ND<3.0	ND<2.7	ND<2.8	ND<2.6	ND<2.8
Volatile Organic Compounds (mg/kg)													
Naphthalene	54	10,000	NS	-	ND<0.0055	-	ND<0.0039	ND<0.0057	-	ND<0.0046	1.9	-	ND<0.0039
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	0.9	7.8	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	0.47	ND<2.0	ND<0.36	12	ND<0.34	ND<0.37
Benzo(a)pyrene	0.4	0.8	NS	ND<0.35	ND<0.40	ND<0.38	ND<0.36	0.53	0.48	ND<0.36	9.7	ND<0.34	ND<0.37
Benzo(b)fluoranthene	0.9	7.8	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	0.41	0.42	ND<0.36	9.9	ND<0.34	ND<0.37
Benzo(k)fluoranthene	0.9	78	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	0.43	ND<0.40	ND<0.36	9.1	ND<0.34	ND<0.37
Benzo(g,h,i)perylene	0.8	10,000	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	ND<0.37	0.41	ND<0.36	5.7	ND<0.34	ND<0.37
Chrysene	0.4	780	NS	ND<0.35	ND<0.40	ND<0.38	ND<0.36	0.48	0.42	ND<0.36	12	ND<0.34	ND<0.37
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.35	ND<0.40	ND<0.38	ND<0.36	ND<0.37	ND<0.40	ND<0.36	1.8	ND<0.34	ND<0.37
Fluoranthene	20	10,000	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	ND<1.9	ND<2.0	ND<0.36	30	ND<0.34	ND<0.37
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	ND<0.37	ND<0.40	ND<0.36	5.3	ND<0.34	ND<0.37
Naphthalene	54	10,000	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	ND<1.9	ND<2.0	ND<0.36	3.8	ND<0.34	ND<0.37
Phenanthrene	40	10,000	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	ND<1.9	ND<2.0	ND<0.36	26	ND<0.34	ND<0.37
Pyrene	13	10,000	NS	ND<0.35	ND<0.42	ND<0.38	ND<0.36	ND<1.9	ND<2.0	ND<0.36	23	ND<0.34	ND<0.37

Notes:

1. Only compounds with results reported above applicable RIDEM Criteria are included in this table.
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3. **Bold results indicate concentrations reported above laboratory detection limits.**
4. **Bold and lightly shaded results indicate concentrations reported above RIDEM Residential Direct Exposure Criteria (RDEC).**
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6. "NS" indicates that no Method 1 Criteria has been established in the Remediation Regulations.
7. All results reported in milligrams/kilogram (mg/kg)
8. "-" indicates that the analysis was not run on that sample
9. "ND" indicates not present above laboratory detection limit.

Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-35		B-36		B-37		B-38		B-39	B-40
				0-2'	5-7'	0-2'	5-8'	1-3'	12-15'	1-3'	7.5-10'	3-5'	3-5'
Sample Depth													
Date Sampled				11/15/2017		11/15/2017		11/15/2017		11/16/2017		11/16/2017	11/16/2017
Lab Work Order #	Residential	Industrial/ Commercial	GB Leachability	1711-25024		1711-25024		1711-25024		1711-25174		1711-25174	1711-25174
PID				1712-26275		1712-26275		1712-26275		1712-26276		1712-26276	1712-26276
Total Petroleum Hydrocarbons													
TPH	500	2,500	NS	18	83	ND<10	260	ND<10	150	31	10	11	35
Priority Pollutant Metals													
Antimony	10	820	NS	ND<5.2	ND<5.4	ND<5.33	ND<5.46	ND<5.28	ND<5.97	ND<5.36	ND<5.60	ND<5.64	ND<5.97
Arsenic	7	7	NS	ND<2.6	6.8	3.2	9.6	5.2	13	3.9	4.8	9.8	4.9
Copper	3,100	10,000	NS	9.6	17	12	130	15	310	14	30	18	18
Lead	150	500	NS	6.4	62	7.4	690	9.3	990	16	12	15	21
Thallium	5.5	140	NS	ND<2.6	ND<2.7	ND<2.7	ND<2.7	ND<2.6	ND<3.0	ND<2.7	ND<2.8	ND<2.8	3.4
Volatile Organic Compounds (mg/kg)													
Naphthalene	54	10,000	NS	-	ND<0.0036	-	0.0055	-	0.38	ND<0.0038	-	ND<0.0056	ND<0.0063
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	0.9	7.8	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.9	ND<0.35	1.8	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Benzo(a)pyrene	0.4	0.8	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.4	ND<0.35	1.6	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Benzo(b)fluoranthene	0.9	7.8	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.9	ND<0.35	1.5	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Benzo(k)fluoranthene	0.9	78	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.9	ND<0.35	1.6	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Benzo(g,h,i)perylene	0.8	10,000	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.8	ND<0.35	1.1	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Chrysene	0.4	780	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.4	ND<0.35	1.8	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Dibenz(a,h)anthracene	0.4	0.8	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.4	ND<0.35	ND<0.40	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Fluoranthene	20	10,000	NS	ND<0.35	ND<0.36	ND<0.36	ND<1.8	ND<0.35	3.9	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	ND<0.35	ND<0.36	ND<0.36	ND<0.9	ND<0.35	0.89	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Naphthalene	54	10,000	NS	ND<0.35	ND<0.36	ND<0.36	ND<1.8	ND<0.35	ND<0.40	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Phenanthrene	40	10,000	NS	ND<0.35	ND<0.36	ND<0.36	ND<1.8	ND<0.35	3.1	ND<0.36	ND<0.38	ND<0.38	ND<0.40
Pyrene	13	10,000	NS	ND<0.35	ND<0.36	ND<0.36	ND<1.8	ND<0.35	3.1	ND<0.36	ND<0.38	ND<0.38	ND<0.40

Notes:

1. Only compounds with results reported above applicable RIDEM Criteria are included in this table.
2. Regulatory criteria obtained from the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations).
3. **Bold results indicate concentrations reported above laboratory detection limits.**
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6. "NS" indicates that no Method 1 Criteria has been established in the Remediation Regulations.
7. All results reported in milligrams/kilogram (mg/kg)
8. "-" indicates that the analysis was not run on that sample
9. "ND" indicates not present above laboratory detection limit.

Table 1 - Soil Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island
VHB Project #72900.00

Sample ID	RIDEM Direct Exposure Criteria		RIDEM Leachability Criteria	B-41		B-42		B-43		B-44	
				0-2'	3-5'	0.5-2.5'	2.5-4'	0.5-4'	5-10'	0-2'	4-5.5'
Sample Depth				11/16/2017		12/6/2017		12/6/2017		12/6/2017	
Date Sampled				1711-25174		1712-26676		1712-26676		1712-26676	
Lab Work Order #	Residential	Industrial/Commercial	GB Leachability	1712-26276							
PID				0.8	5.4	0.2	0.1	ND	0.1	ND	ND
Total Petroleum Hydrocarbons											
TPH	500	2,500	NS	84	14	20	29	33	ND<10	51	30
Priority Pollutant Metals											
Antimony	10	820	NS	ND<5.46	ND<5.63	ND<5.05	ND<5.70	ND<5.22	ND<5.40	ND<6.26	ND<5.27
Arsenic	7	7	NS	8.7	9.8	ND<2.5	2.9	ND<2.6	4.6	7.7	ND<2.6
Copper	3,100	10,000	NS	16	16	13.6	17	14	23	15	9.3
Lead	150	500	NS	14	11	14	18	37	16	41	11
Thallium	5.5	140	NS	ND<2.7	ND<2.8	ND<2.5	ND<2.8	ND<2.6	ND<2.7	ND<3.1	ND<2.6
Volatile Organic Compounds (mg/kg)											
Naphthalene	54	10,000	NS	-	ND<0.0051	ND<0.0046	-	-	ND<0.0034	-	ND<0.0044
Semi-Volatile Organic Compounds											
Benzo(a)anthracene	0.9	7.8	NS	1.6	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	ND<0.36
Benzo(a)pyrene	0.4	0.8	NS	2.6	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.40	ND<0.36
Benzo(b)fluoranthene	0.9	7.8	NS	2	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	ND<0.36
Benzo(k)fluoranthene	0.9	78	NS	2	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	ND<0.36
Benzo(g,h,i)perylene	0.8	10,000	NS	1.7	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	ND<0.36
Chrysene	0.4	780	NS	2	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.40	ND<0.36
Dibenz(a,h)anthracene	0.4	0.8	NS	0.41	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.40	ND<0.36
Fluoranthene	20	10,000	NS	2.6	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	0.43
Indeno(1,2,3-cd)pyrene	0.9	7.8	NS	1.6	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	ND<0.36
Naphthalene	54	10,000	NS	ND<0.37	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	ND<0.36
Phenanthrene	40	10,000	NS	0.61	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	0.38
Pyrene	13	10,000	NS	2.2	ND<0.38	ND<0.38	ND<0.39	ND<0.36	ND<0.37	ND<0.42	0.4

Notes:

1. Only compounds with results reported above applicable RIDEM Criteria are included in this table.
2. Regulatory criteria obtained from the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations).
3. **Bold results indicate concentrations reported above laboratory detection limits.**
4. **Bold and lightly shaded results indicate concentrations reported above RIDEM Residential Direct Exposure Criteria (RDEC).**
5. **Bold and darklyshaded results indicate concentrations reported above RIDEM Industrial/Commercial Direct Exposure Criteria (I/CDEC).**
6. "NS" indicates that no Method 1 Criteria has been established in the Remediation Regulations.
7. All results reported in milligrams/kilogram (mg/kg)
8. "-" indicates that the analysis was not run on that sample
9. "ND" indicates not present above laboratory detection limit.

Table 2 - Groundwater Analytical Results
Pell Bridge Re-Alignment
Newport, Rhode Island

Sample ID	RIDEM Groundwater Objectives		RIDEM Upper Concentration Limits for GB Groundwater	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	
	GA	GB		12/26/2017	12/27/2017	12/27/2017	12/29/2017	12/27/2017	12/27/2017	12/21/2017	12/21/2017	12/26/2017	12/21/2017	12/21/2017	12/29/2017	12/26/2017	12/26/2017	12/27/2017	12/26/2017	
Date Sampled				8.51	4.33	2.97	11.76	3.31	2.04	5.38	10.61	10.66	4.19	6.5	3.56	9.66	9.83	5.63	5.38	
Depth to Groundwater (ft)																				
Volatile Organic Compounds (VOCs)																				
Benzene	0.005	0.14	18	0.0023	ND<0.001	0.04	ND<0.001	ND<0.001	ND<0.001	ND<0.001	ND<0.001	ND<0.001	ND<0.001							
Methyl-tertiary-butyl-ether	0.04	5	NS	0.0067	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002	0.012	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002	0.13	0.0025

Notes:

1. Only compounds with concentrations above the RIDEM Standards are shown.
2. Regulatory criteria obtained from the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations).
3. **Bold results indicate concentrations reported above laboratory detection limits.**
4. **Bold and lightly shaded results indicate concentrations reported above applicable RIDEM GB Groundwater Objectives.**
5. "NS" indicates that no Method 1 Criteria has been established in the Remediation Regulations.
6. All results reported in milligrams per liter (mg/L).

Figures



Source: ESRI, VHB

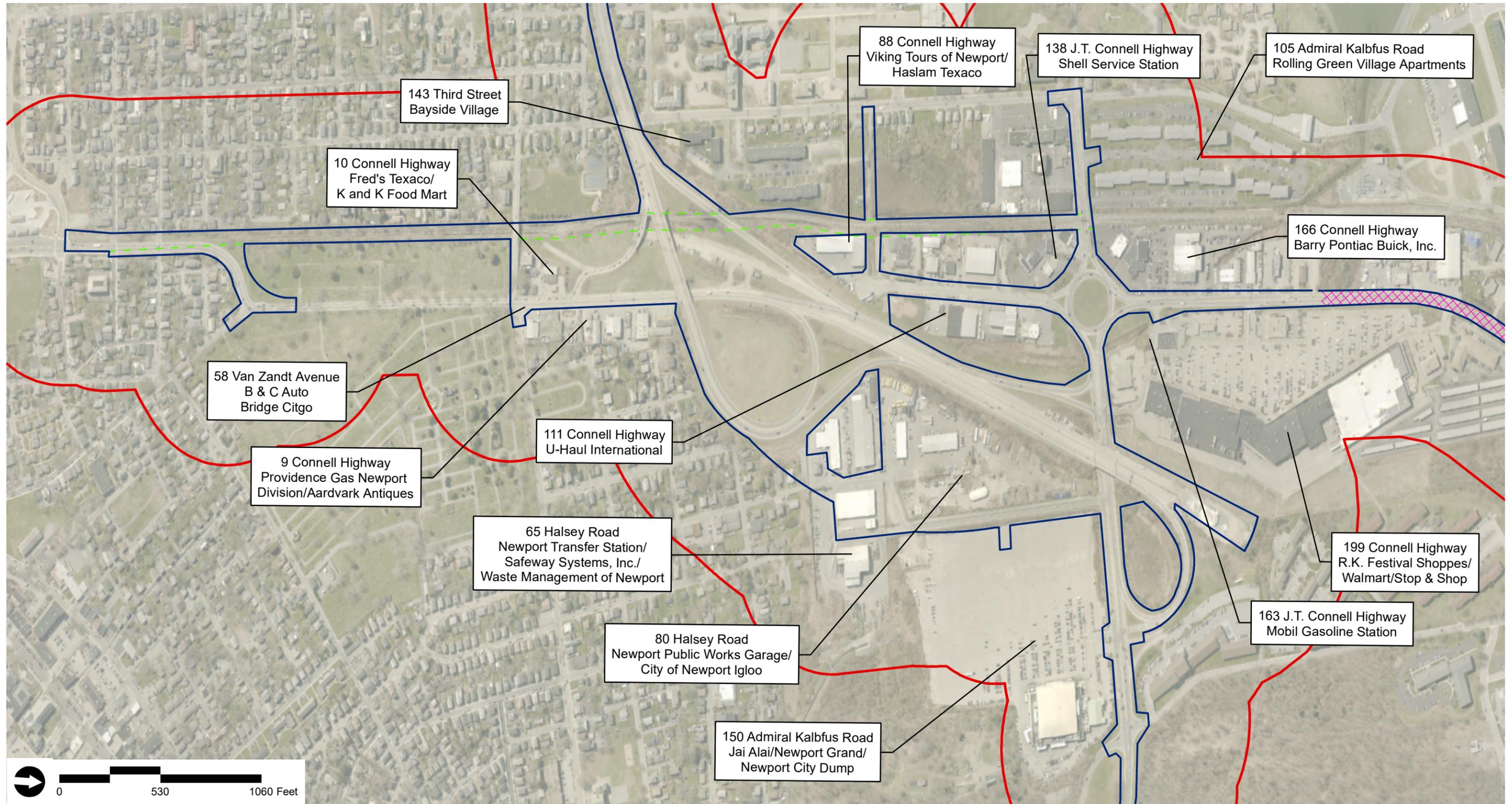
Legend

- Study Area
- Proposed Bike Path Area
- Limit of Disturbance
- JT Connell and Coddington Hwy Project Area
- Newport-Middletown Line



Figure 1
Study Area Location Map

**Reconstruction at Pell Bridge Ramps
Newport/Middletown, Rhode Island**



Source: ESRI, VHB

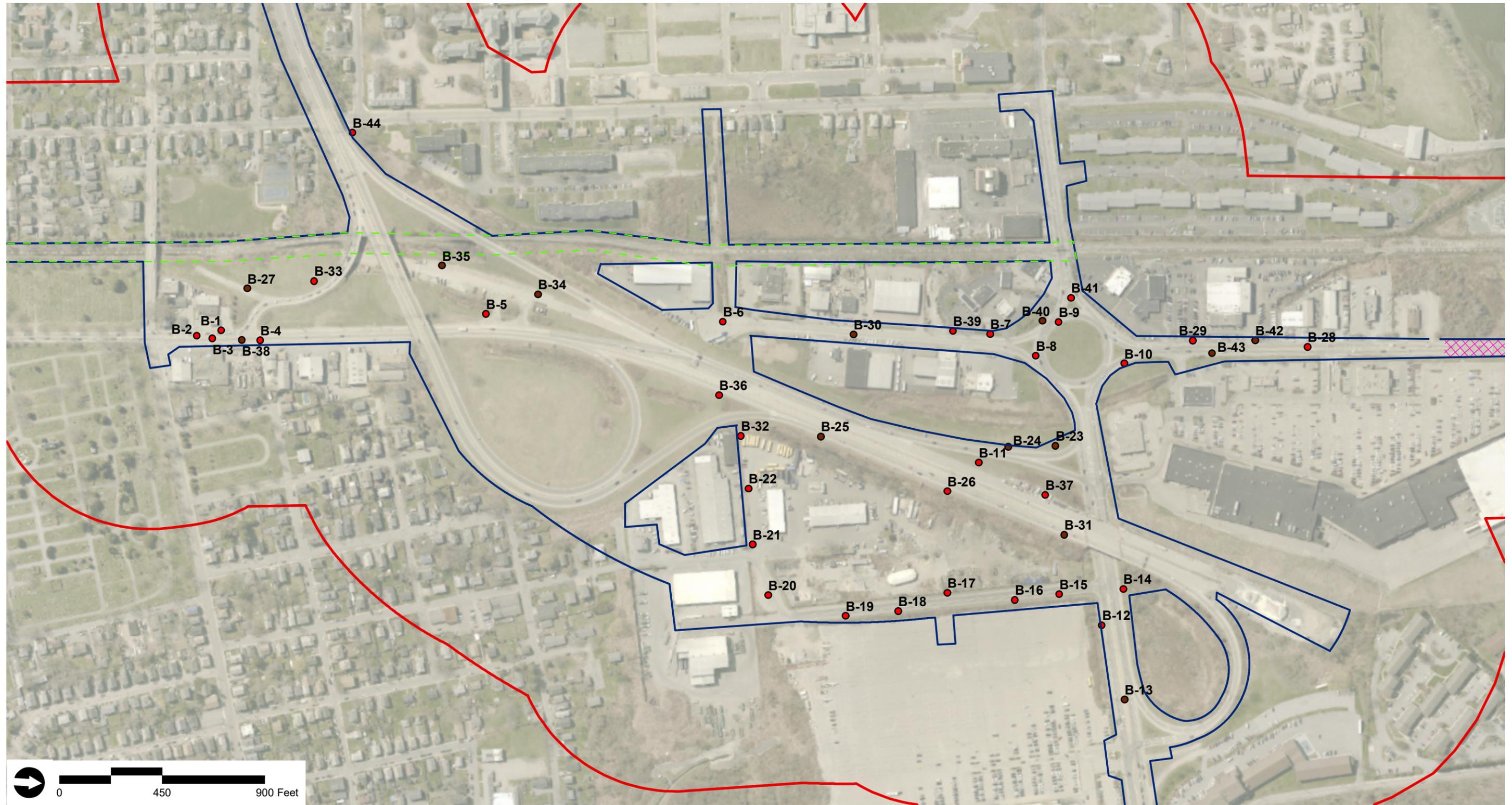
Legend

-  Study Area
-  JT Connell and Coddington Hwy Project Area
-  Proposed Bike Path Area
-  Limit of Disturbance



Figure 2
Project Area CLUE Detail Map

**Reconstruction at Pell Bridge Ramps
Newport/Middletown, Rhode Island**



Source: ESRI, VHB

Legend

-  Study Area
-  Proposed Bike Path Area
-  Limit of Disturbance
-  Soil Boring
-  Soil Boring - Exceedance(s) of RIDEM Standards
-  JT Connell and Coddington Hwy Project Area



Figure 3
LSI Soil Boring Location Map

**Reconstruction at Pell Bridge Ramps
Newport/Middletown, Rhode Island**



Source: ESRI, VHB

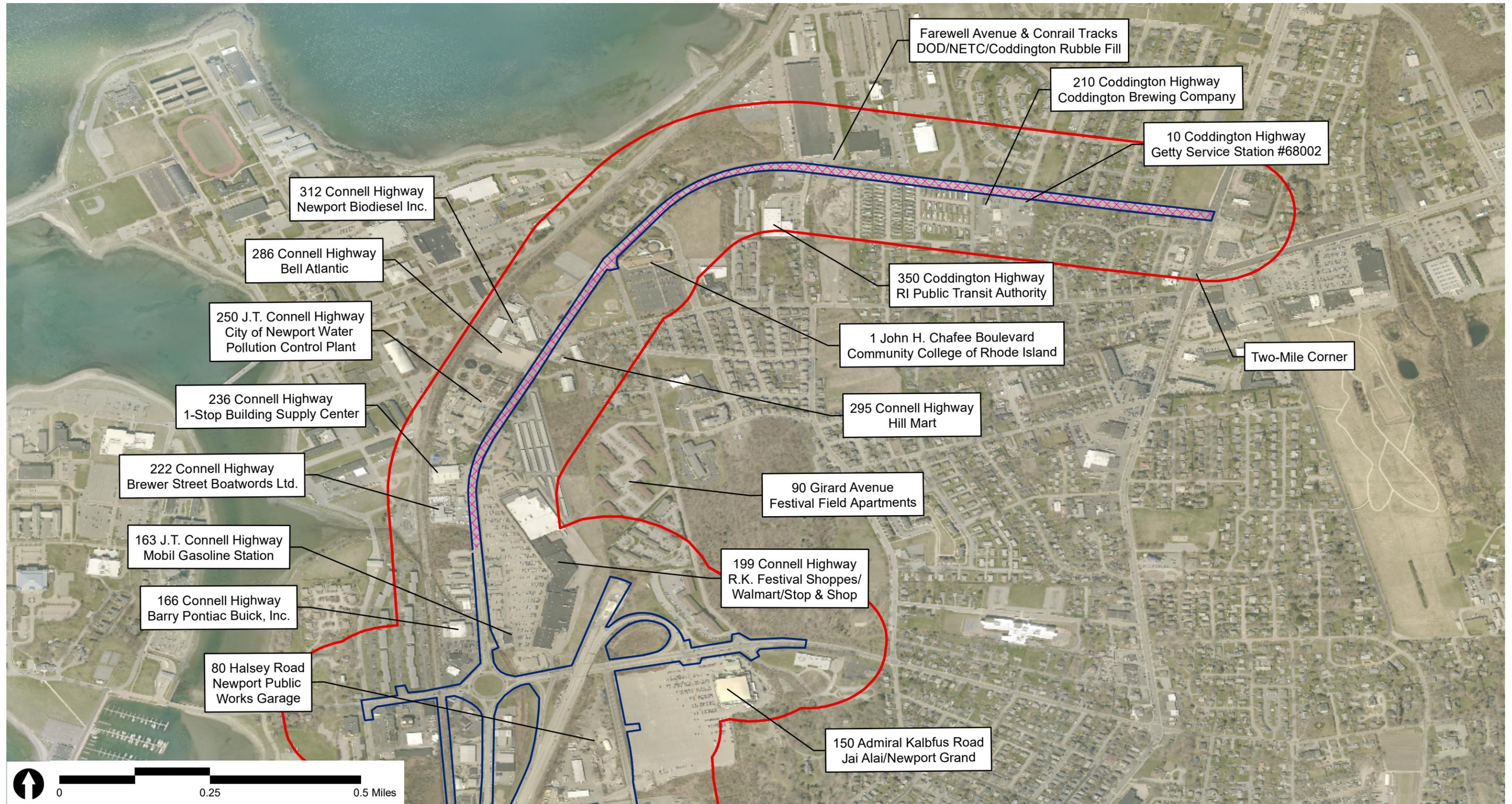
Legend

-  Proposed Bike Path Area
-  Monitoring Well
-  Monitoring Well - Exceedance(s) of RIPDES Discharge Limits (if applicable)
-  Study Area
-  JT Connell and Coddington Hwy Project Area
-  Limit of Disturbance



Figure 4
LSI Groundwater Monitoring Well
Location Map

**Reconstruction at Pell Bridge Ramps
Newport/Middletown, Rhode Island**



Source: ESRI, VHB

Legend

- Study Area
- Limit of Disturbance
- JT Connell and Coddington Hwy Project Area



Figure 5
Project Area Extended CLUE Detail Map

**Reconstruction at Pell Bridge Ramps
Newport/Middletown, Rhode Island**