**Self-Implementing Plan to Address PCB-Impacted Soil**

# *Pawtucket No. 1 Substation*

## 6 Thornton Street
## Pawtucket, Rhode Island

Prepared for **The Narragansett Electric Company d/b/a National Grid**
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# Table of Contents

# 1.0 Introduction

Vanasse Hangen Brustlin, Inc. (VHB), on behalf of the Narragansett Electric Company d/b/a National Grid (National Grid), has prepared this Self Implementing Plan to address PCB-impacted soils identified at the Pawtucket No. 1 Substation in Pawtucket, Rhode Island (the Site).

A historical release of polychlorinated biphenyls (PCBs) was identified at the Site during investigation and remediation completed to address a release of non-PCB mineral oil dielectric fluid (MODF) from a damaged capacitor. Although the capacitor released non-PCB MODF, capacitors that potentially contained elevated concentrations of PCBs were historically used at the Site. As such, a sample of the trap rock impacted by the non-PCB MODF was sampled and analyzed for PCBs. The laboratory analytical results indicated that PCBs were present as Aroclor 1242 at a concentration of 1,960 milligrams per kilogram (mg/kg). A *Hazardous Material Release Notification Form* was submitted to the Rhode Island Department of Environmental Management (RIDEM), Office of Compliance and Inspection on June 1, 2007.

Based upon this information, National Grid retained VHB to conduct subsurface investigations to evaluate soil conditions and delineate PCB impacts. The results of the investigation indicate that PCBs were detected in Site media (concrete, asphalt, trap rock, and soil) at concentrations that ranged from non-detectable to a maximum of 3,140 mg/kg.

National Grid plans to remediate PCB impacted media within the release area to the extent that any media impacted by PCBs over 50 ppm will be removed and disposed at a facility permitted to accept such material. Media (trap rock, soil, and/or concrete) which exhibit concentrations less than 50 ppm will remain in place, consistent with 40 CFR § 761.61(a)(4). This will require a United States Environmental Protection Agency (USEPA) low-occupancy deed restriction, fencing that secures the Site (already in place) and large mark ($M_L$) signage. RIDEM will also require an application for a variance from the GB Leachability Criteria for PCBs (10 ppm), an environmental land use restriction (ELUR) and a Soil Management Plan (SMP).

An estimated 95 tons of PCB-impacted trap rock, soil, and concrete is slated for removal. Remaining PCB impacted media within the excavations (exhibiting PCB

concentrations of less than 50 ppm) will be capped by clean common borrow. A site location map, a plan depicting the Property and surrounding features, and a Site plan are attached as **Figure 1**, **2**, and **3**, respectively.

National Grid will be completing the self implementing clean up and disposal. Project contact information is as follows:

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The data and information presented in this plan is based upon recent subsurface data obtained on behalf of National Grid by VHB. The Certification Statement required by §761.61(a)(3)(E) is included in **Appendix B** of this plan.

The self implementing plan follows in this document.

# 2.0 Background

## 2.1 Site History

The Pawtucket No. 1 Substation is located at 6 Thornton Street in Pawtucket, Rhode Island (refer to **Figure 1**). The substation is situated on the northwestern portion of an approximately 10-acre industrial property that also houses an active electrical switching station and towers that support overhead wires. **Figure 2** depicts the location of the substation relative to other property features and abutting property uses.

The property formerly operated as a power plant (the Pawtucket No. 1 Power Station). The property is bound on the north by a former Manufactured Gas Plant (MGP) that is currently operated as a natural gas regulating facility by National Grid, on the west by a steep slope leading up to residential properties, on the southwest by a school and associated ball fields, and to the south by vacant land owned by National Grid. State-regulated site investigation activities are currently ongoing at the property, the northern abutting property and the southerly abutting property and are related to their former land uses as an MGP and power plant.

The southern and western portions of the substation are underlain with approximately six inches of trap rock over soil. The northeastern portion of the substation is underlain with approximately four to six inches of asphalt over soil. The northwestern portion of the substation is underlain with trap rock, asphalt, and soil. A control house, which is constructed on a concrete pad, is located east of the capacitor area where the PCBs were initially found. The southeastern capacitor rack is set on a concrete slab while the remaining capacitor racks are set on concrete footings. A Site Plan depicting the substation is attached as **Figure 3**.

During response actions associated with the release of approximately one gallon of non-PCB MODF at the Site, a sample of trap rock was collected and analyzed for PCBs. Laboratory analytical results indicated that PCBs, present as Aroclor 1242, were present at concentrations of 1,960 mg/kg. Based on these results, additional Site investigation activities were conducted over several mobilizations to further characterize the Site.

## 2.2 Site Characterization

Over six mobilizations to the Site, VHB collected 144 samples from 58 locations. Sample media included trap rock, soil, concrete, and asphalt. These investigations are discussed in the following section.

## 2.3 Subsurface Investigation

On August 17, 2007, October 11 and 12, 2007, November 21, 2007, April 21 and 22, 2008, June 5 and 9, 2008 and October 17, 2008, VHB mobilized to the Site to conduct investigatory activities.

Sample locations were established over a 3-meter grid, consistent with 40 CFR 761 Subpart N (§761.265, §761.283 and §761.286). Samples of all media types (trap rock, soil, asphalt, and/or concrete) were collected when encountered at the designated sampling locations. Trap rock and soil samples were collected using dedicated and disposable hand trowels to an approximate depth of 0.5 feet below surface grade (bsg). To collect deeper soil samples, Clean Harbors Environmental Services, Inc. (CHES) of East Providence, Rhode Island used a soil vactor truck to advance the excavations within the substation to approximate depths of 6 feet bsg. To collect samples below the asphalt, CHES cut an approximately one foot by one foot section of asphalt which was removed. VHB collected asphalt samples from the removed section of asphalt. Concrete samples were collected using an impact hammer drill in accordance with the Region 1, EPA-New England *Draft Standard Operating Procedure for Sampling Concrete in the Field* dated December 30, 1997. All samples were submitted to ESS Laboratory of Cranston, Rhode Island for PCB analysis via EPA Method 8082 with a manual soxhlet extraction.

In general, the 58 sample points advanced at the Site were located at the nodes of a 3-meter grid (approximately 10 feet), as required by §761.265. Due to the use of the Site as an electrical substation and the presence of subsurface utilities, some borings were re-located 0.5 to 2 feet from their intended grid location. During VHB's investigation, subsurface soil generally consisted of light brown to dark brown, fine to medium sands with gravel and cobbles to a depth of 2 feet. Beyond 2 feet, the soil generally became coarser in texture and the presence of cobbles increased. Refusal on apparent rock was encountered in boring SS-1B at an approximate depth of 5.5 feet. Several borings contained by-products associated with the former use of the Site as a power plant/MGP and included coal, clinker, and greenish-stained gravel.

At each soil boring, VHB attempted to collect soil samples from the following depth intervals:

0 to 0.5 feet bsg;
0.5 to 2 feet bsg;
2 to 4 feet bsg; and
4 to 6 feet bsg.

Concrete samples were collected from the following depth intervals:

0 to 0.5 inches bsg;
0.5 to 2 inches bsg; and
2 to 4 inches bsg.

The asphalt surface was approximately 0.5 feet thick and samples were collected from the entire profile.

The samples were placed in clean, laboratory-prepared containers. All samples were submitted to ESS Laboratory of Cranston, Rhode Island for PCB analysis via EPA Method 8082 with a manual soxhlet extraction. Initially each of the soil samples collected from the 0 to 0.5 foot interval and concrete samples from the 0 to 0.5 inch interval were submitted for laboratory analysis. For the samples that displayed PCB concentrations greater than 1 ppm, the sample collected from the consecutively deeper sample intervals were submitted for PCB analysis. In all, VHB collected 144 samples from 58 locations.

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### 2.3.1 Laboratory Analytical Results

As shown in **Table 1** and **Figure 3**, PCBs in excess of 1 ppm were detected in 63 of 144 samples, with concentrations ranging from 1.16 to 3,140 mg/kg. The PCBs detected included Aroclor 1242, Aroclor 1248, Aroclor 1254, and Aroclor 1260. The maximum PCB concentration was detected at sample location SS-4G. At this location, Aroclor 1242 was detected in the 0 to 0.5 inch sample from one of the capacitor rack footings. Laboratory Certificates of Analysis are included in **Appendix C**.

## 2.4 Extent of Contamination

Given the Site characteristics, VHB evaluated the data with respect to the low occupancy area requirements of §761.61. In these areas, PCB remediation wastes may remain at the Site at concentrations less than 50 ppm under certain conditions. PCBs in excess of 50 ppm were detected in 19 of 144 samples and occurred at 12 locations (refer to Figure 3). Based on the concentrations of PCBs detected, VHB estimated

that 95 tons of trap rock, soil, and concrete are impacted at concentrations above 50 ppm and that the US EPA Self- Implementing procedures may be applied. The lateral extent of PCB-contaminated media which exhibits concentrations above 50 ppm is depicted on **Figure 3**. Impacted media have been divided into four Areas of Concern (AOC) as summarized below.

AOC 1 – Consists of the trap rock and soil surrounding sample location SS-2B, located west of the southeastern-most capacitor rack. The preliminary extent of excavation is proposed to be one half the distances to the next location with PCB concentrations below 50 ppm. This represents an approximately 50 square foot area to an approximate depth of 1 foot bsg.

AOC-2 – Consists of the upper 0.5 inches of the concrete slab associated with samples SS-1I and SS-2E, located beneath the southeastern-most capacitor rack. These two locations combine for an approximate area of 16 square feet

AOC-3 – Consists of the upper 0.5 inches of the concrete slab on the northwest portion of the control house pad. This represents an approximate area of 42 square feet.

AOC-4 – Consists of the trap rock and soil surrounding sampling locations SS-4B, SS-4C, SS-5B and concrete footings associated with sampling locations SS-4F, SS-4G, SS-5J, and SS-5K. These samples are located proximate to the northeastern-most capacitor rack. This represents an approximately 310 square foot area to an approximate depth of 3 feet on the southwestern portion of the excavation to an approximate depth of 6 feet bsg on the northeastern portion of the excavation.

## 2.5 Estimated Quantity of PCB-Impacted Soil Above 50 PPM

Based on the results of the investigations completed at the Site, VHB estimates that approximately 95 tons of PCB impacted trap rock, soil, and concrete are present above 50 ppm. These soils are proposed to be remediated and disposed via excavation. The concrete slabs are proposed to be remediated by removal of the upper 0.5 inches of the concrete surface. In addition, four concrete, capacitor rack footings will be removed and concrete from the northwestern portion of the control house pad will also be removed.

## 2.6 Data Usability/Validation

A data validation assessment was completed by VHB in an effort to assess the usability/validity of the laboratory data obtained during the investigation work described above. This assessment included an evaluation of the following parameters

as provided in the laboratory reports: sample integrity, laboratory information, chain of custody, laboratory report details and Quality Assurance/Quality Control.

No laboratory quality control issues were identified that would have the potential to adversely impact the usability of the data. Laboratory Certificates of Analysis are provided in **Appendix C**.

## 2.7 Surrounding Receptors

The Site consists of an electrical substation and the surrounding property is industrial in nature. It should be noted that the substation is surrounded by chain link fence equipped with barbed wire that is tied into the existing switching galleries building. Also, the Property is surrounded by a chain link fence equipped with barbed wire.

There are residential properties present approximately 75 feet west of the Site. There is an elementary school and athletic fields located approximately 300 feet and 500 feet, respectively, to the southwest of the Site. The residences, the school and the athletic fields are considered sensitive receptors. It should be noted that these sensitive receptors are located topographically upgradient of the Site. Based on a review of the United States Geographic Survey Providence Quadrangle Topographic Map and Property observations, these sensitive receptors are approximately 10 to 15 feet above the grade of the Site. **Figure 2** depicts the Site and Property fences and the surrounding receptors.

The Site property is occupied less than 16.8 hours/week and could be considered low occupancy pursuant to §761.61(a)(4). Based upon the above, the goal of the remedial effort will be to complete the removal of the PCB impacted soil to less than or equal to 50 ppm.

According to the Providence Groundwater Classification Overlay Map (dated March 2005), groundwater underlying the Site has been classified by the RIDEM as category GB. This classification is considered by the RIDEM to be known or presumed to be degraded. Nearby surface waters include the Seekonk River, located approximately 225 feet east of the subject Site. The Seekonk River has been designated by the Coastal Resource Management Council (CRMC) as Type 4 waters, defined as multipurpose waters and Type 6 waters, industrial waterfronts and commercial navigation channels. The RIDEM Office of Water Resources has classified the Seekonk River as SB1{a} waters. These waters are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. The partial use designation "{a} "denotes specific restrictions of use assigned to a waterbody segment that may affect the application of criteria. The partial use designation "{a}", denotes waters that are likely impacted by combined sewer overflows. Therefore,

primary contact recreational activities such as shell-fishing and fish and wildlife habitat will likely be restricted.

# 3.0 Cleanup Plan

Cleanup activities will be observed and documented by VHB and performed by National Grid's contractor. Removal of trap rock, soil, and concrete will be completed with consideration of OSHA requirements.

## 3.1 Objective

The objective of the cleanup activities conducted under this Plan is to remove soil as depicted on **Figure 3** so that compliance with §761.61 is achieved.

## 3.2 Cleanup Goal

The cleanup goal for PCBs in soil remaining at the Site will be less than or equal to 50 mg/kg.

## 3.3 Public Notification

National Grid will notify the U.S. EPA, RIDEM, and property abutters regarding the performance of the work fourteen (14) days prior to implementation of the work plan.

## 3.4 Soil Excavation Activities

VHB will be on Site to observe the excavation, stockpiling and disposal of soil that has been determined to be impacted by PCBs in excess of 50 ppm. Based on our current understanding of Site conditions, VHB estimates that a total of approximately 95 tons of PCB-impacted trap rock, soil, and concrete will be removed from the portion of the Site as described in Section 2.3 and **Figure 3**.
Because of the use of the Site as an electrical substation and the presence of subsurface utilities, the soil excavation work will be performed using a soil vactor truck and hand tools. All excavated soil will be temporarily stockpiled on and covered by polyethylene sheeting at the Site for subsequent disposal. Staked hay

bales will be placed around the stockpile. Polyethylene piping will be used as a soil vactor hose and will be disposed with other solid debris including personal protective equipment as a PCB waste.

Any hand tools used during removal activities will be cleaned and decontaminated in accordance with §761.79(c)(2)(ii) and Subpart S, Double Wash/ Rinse Method for Decontaminating Non-Porous Surfaces. Hay bales will also be placed around the perimeter of the Site and stockpile for erosion control. The temporary storage of the stockpile will be in accordance with §761.65(c)(9). Following appropriate waste characterization activities and coordination with an appropriate disposal facility, the excavated soil will likely be disposed at CWM Chemical Services, LLC of Model City, New York.

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### 3.4.1 Cleanup Verification

Following the excavation and removal of soils impacted by PCBs at concentrations greater than 50 ppm, residual soil impacts will be documented. Confirmatory samples will be collected from each media at grid intervals of 1.5 meters (approximately 5 feet).

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### 3.4.2 Soil Sample Laboratory Analysis and Laboratory Analytical Requirements

The soil samples at the Site will be submitted to ESS under chain-of-custody protocols and analyzed for PCBs by USEPA Method 8082 and a manual soxhlet extraction with results reported on a dry weight basis.

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### 3.4.3 Backfilling

Following the removal of the PCB-impacted soil, the excavation will be backfilled with clean backfill from a known source. New concrete footings will be poured for the northeastern capacitor rack.

## 3.5 Contingencies

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### 3.5.1 Dewatering of Excavation

Based on results of previous investigation activities (depth to water is approximately 8 feet bsg) and the estimated quantities of PCB-contaminated soil that will require excavation, it is unlikely that dewatering efforts will be required as part of the

remedial program. In the event dewatering is necessary, it will be accomplished under a Rhode Island Pollutant Discharge Elimination System (RIPDES) permit. A system scenario would likely include pumping groundwater to a 21,000 gallon fractionation (frac) tank. Effluent from the frac tank would be routed through a series of bag filters, a bentonite/anthrate filter and then through two 200-pound carbon canisters connected in series. Sampling would be per RIDEM's requirements. Any sediment, tank cleanup, used filters and carbon would be managed as PCB remediation waste.

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### 3.5.2 Higher PCB Concentrations

Investigation activities have been completed at the Site and the nature and extent of PCB impacts has been well-defined. There were three locations where vertical extent of PCB impacts has not been defined.

An unknown concrete subsurface structure(s) was encountered at sample locations SS-4B and SS-4C at an approximate depth of 3.5 feet bsg. National Grid has been unable to identify this structure(s) from existing plans of the Site. Once the structure(s) has been uncovered by remedial excavations, it may be possible to identify the structures as footings for the capacitor racks, as relic concrete structures associated with the former use of the property as a power generation station, or as an electrical duct.

If these structures are not part of an electrical duct, they will be sampled and sent for laboratory analysis for PCBs on an expedited turnaround time so that, in the event that PCB concentrations greater than 50 ppm are detected, removal of the concrete can be conducted while the excavation is open. If these structures are part of an electrical duct, then a power outage will be initiated and the concrete will be sampled. If laboratory analytical results of the concrete indicate PCB concentrations greater than 50 ppm, the cables within the ductwork will be pulled and the PCB-impacted section of ductwork will be removed, replaced, and the cables will be re-installed.

The collection of soil samples below 5 feet was not possible at sample location SS-5B due to a layer of cobbles encountered in the boring. During remedial excavations of this area, the layer of cobbles will be removed facilitating the collection of deeper soil samples. These deeper samples will be submitted to the laboratory on an expedited turnaround time so that, in the event that PCB concentrations greater than 50 ppm are detected, additional soil removal actions can be conducted.

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### 3.5.3 Wider Distribution of PCB Remediation Waste

Based on our current understanding of Site conditions, VHB estimates that approximately 95 tons of PCB impacted media will be removed from the Site. Should the results of laboratory analysis indicate that the removal of additional PCB-contaminated media is necessary to achieve the cleanup goal of less than 50 mg/kg of PCBs, EPA and RIDEM will be advised.

## 3.6 Data Usability/Validation

To assess the usability and validity of the data, VHB will complete a data validation assessment using the document *Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses* as a general guideline. The data validation will be conducted so far that the analytical data generated during the cleanup is of defensible analytical quality. The Data Quality Objective (DQO) of the work conducted under this Plan is to obtain analytical data sufficient to ensure that PCB Remediation Waste does not remain at the Site following the cleanup performed under this Plan. In other words, a sufficient quantity and quality of analytical data must be obtained to ensure that PCBs do not remain at the Site at a concentration greater than 50 mg/kg.

For each set of laboratory data generated during the cleanup, the equivalent of the components of a Tier I and Tier II Data Validation (DV) will be conducted. In general, these DVs will consist of the following:

Tier I: Completeness and documentation review. VHB will review information provided by the laboratory for sample integrity (e.g., sample temperature, preservation, holding time, etc.), ensure that the proper chain-of-custody procedures were followed and check the laboratory report for necessary components; and

Tier II: Sample results and QC review. This will include a review of Data Quality Indicators (DQIs) for accuracy, precision, and sensitivity. Specifically, VHB will review quality assurances/ quality control (QA/QC) measures used by the laboratory such as surrogate recoveries, method blank results, laboratory control sample (LCS) results, and matrix spike (MS)/ matrix spike duplicates (MSD) results.

As a quality-control measure, at least one blind duplicate for every ten samples will be collected and one MS/MSD for every 20 samples will be collected for all media types. VHB will review and compare the blind duplicate results to the original sample during the Tier II review.

The results of the DV will be documented on the Laboratory Report Checklist which will be attached to the laboratory report. A copy of a Laboratory Report Checklist is provided in **Appendix D.**

# 4.0 Proposed Implementation Schedule

This work must be completed during the spring or fall, when the capacity for summer loads is not needed. VHB proposes the following implementation schedule for the Plan:

| Activity | Completion Date (week of) |
|---|---|
| Submittal of Plan | February 20, 2009 |
| U.S. EPA Approval | March 20, 2009 |
| Cleanup Activities | Mid-April 2009 |
| Soil Loading and Off Site Transport | Mid-June 2009 |

At the completion of the cleanup activities under the self implementing procedure, National Grid will submit a report documenting the cleanup and sampling activities to the USEPA and RIDEM.

# References

AES, 1996. *Remedial Investigation at the Tidewater Former MGP Site, Pawtucket, Rhode Island*, December 1996.

Environmental Protection Agency. *Part 761- Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibition*.

Rhode Island Department of Environmental Management October 2005. *Groundwater Classification Map*.

ESS Laboratory, Division of Thielsch Engineering, Inc., 2007-2008. *Certificates of Analysis.*

USEPA, 1997. *Draft Standard Operating Procedure for Sampling Concrete in the Field*. Region 1 USEPA-New England. December 30, 1997.

USGS, 1975. US Geological Survey 7.5 Minute Series Topographic Map Providence Quadrangle 1975.

# Figures

# Tables

# Appendix A – Limitations

- This report has been prepared for the sole and exclusive use of National Grid (Client), and is subject to and issued in connection with the Agreement and the provisions thereof. Any use or reliance upon information provided in this report, without the specific written authorization of Client and VHB, shall be at the User's sole risk.

- In preparing this report, VHB has obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property. Except as otherwise noted, no attempt has been made to verify the accuracy or completeness of such information.

- No attempt has been made to assess the compliance status of any past or present Owner or Operator of the Site with any federal, state, or local laws or regulations.

- The findings, observations, and conclusions presented in this report are limited by the scope of services outlined in our Agreement. Furthermore, the assessment has been performed in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.

The assessment presented in this report is based solely upon information gathered to date. Should further environmental or other relevant information be developed at a later date, VHB may modify the report and its conclusions.

# Appendix B – Certification

As required by §761.61(a)(3)(E), VHB submits the following statements of certification.

***Certification by Preparer:***

I, Claude Masse, an employee of Vanasse Hangen Brustlin, Inc. and the preparer of this report, hereby certify that the information contained within this report is complete and accurate to the best of my knowledge.

I, Timothy O'Connor, P.E., an employee of Vanasse Hangen Brustlin, Inc. have reviewed this report and certify that it is accurate and complete to the best of my knowledge.

| | |
|---|---|
| Preparer's Signature | Date |
| Reviewer's Signature | Date |

***Certification by Owner/Operator***

I certify that the information contained in this report is a complete and accurate representation of the circumstances known about the release to the best of my knowledge.

| | |
|---|---|
| Owner/Operator Signature | Date |
| Title | |

# Appendix C – Certificates of Analysis

# Appendix D - Laboratory Report Checklist