DEPARTMENT OF ENERGY & ENVIRONMENT | GOVERNMENT OF THE DISTRICT OF COLUMBIA MURIEL BOWSER, MAYOR

PROPOSED PLAN
PEPCO BENNING ROAD FACILITY
LANDSIDE AREA (OPERABLE UNIT 1)

BENNING ROAD FACILITY, 3400 BENNING ROAD NE, WASHINGTON, D.C. 20019

INTRODUCTION

The Department of Energy and Environment (DOEE) is asking for the community's input on a proposed cleanup plan for the Potomac Electric Power Company's (Pepco) Benning Road Facility located at 3400 Benning Road NE in Washington, District of Columbia (DC) (the Site). This proposed cleanup plan (the Proposed Plan) focuses on the portion of the Site identified as the "Landside Investigation Area" on **Figure 1.** This area has been designated as "Operable Unit 1." The Landside Investigation Area does not include any portion of the Anacostia River, which will be addressed by a separate cleanup action to be proposed in the future for the "Waterside Investigation Area" shown on **Figure 1** (designated as "Operable Unit 2").

Pepco completed a detailed study, called a Remedial Investigation (RI), of the environmental conditions and potential health risks at the Site. The RI identified three locations within the Landside Investigation Area where cleanup is needed for certain contaminants that could pose a particular health risk if they were to come into contact with people present at the site (referred to as "actionable risk"):

- Soils in the Transformer Shop Area in the southeastern portion of the site containing chemicals known as polychlorinated biphenyls (PCBs).
- Soils in the Warehouse and Laydown Area in the northeastern portion of the site that contain a metal called vanadium.
- Shallow groundwater in the southern portion of the Site that contains the organic chemicals perchloroethylene (PCE) and trichloroethylene (TCE).

Following the RI, Pepco conducted an evaluation, called a Feasibility Study (FS), of different possible methods to address contamination in these three areas of actionable risk in the Landside Investigation Area. These different methods are referred to as "remedial alternatives."

This Proposed Plan describes the remedial alternatives considered for the Landside Investigation Area, identifies the remedial method that DOEE proposes to use, and explains why that method was chosen.

DOEE is asking for public input on the proposed cleanup method for the three areas of actionable risk in the Landside Investigation Area identified above. The Proposed Plan follows the requirements under District of Columbia law (District of Columbia Brownfields Revitalization Act (DCBRA)) (DC Official Code §§ 8-634 et seq.), the Comprehensive Environmental Response, Compensation, and

Liability Act of 1980 (CERCLA) (42 USC §§ 9601 et. seq.), also known as Superfund, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300). After considering public comments on the Proposed Plan and any new information obtained after the issuance of the Proposed Plan, DOEE will issue a Record of Decision (ROD) selecting the final remedial actions to reduce risks to people who may be present at the site (now and in the future). The ROD will document the selection of the preferred remedial action to address each of the three areas posing actionable risks and will contain a Responsiveness Summary that presents DOEE's responses to public comments and new information.

The Proposed Plan and the ROD will be added to the Benning Road Facility Administrative Record, in accordance with DCBRA, § 8-634.11(d) and the NCP, 40 CFR § 300.825(a)(2). This record includes important documents and studies that DOEE used to create the cleanup plan, including the RI (AECOM 2020) and the FS (AECOM 2024). You can find these documents online at the DOEE website: https://doee.dc.gov/page/pepco-benning-road-facility-plans-and-deliverables (DOEE 2023). Members of the public are encouraged to review these materials to learn more about the Landside Area and the cleanup activities.

The DOEE will be accepting written comments on the Proposed Plan and will hold a public meeting to explain the plan. Associated details are as follows:

<table>
<tr><th colspan="2">MARK YOUR CALENDAR!</th></tr>
<tr><td>Public Comment Period:

December 16, 2024 to January 31, 2025

DOEE will accept written comments on the Proposed Plan and supporting documents during the public comment period. Written comments may be submitted via mail or email to DOEE:

apurva.patil@dc.gov

Please include subject line:
Benning Road Facility OU1 Proposed Plan Public Comment</td><td>Public Meeting:

January 18, 2025
10:00 AM – 1:00 PM

DOEE will hold a public meeting to explain the Proposed Plan. DOEE will also accept oral and written comments at this meeting.

The public meeting will be held at the following location:

Department of Employment Services
4058 Minnesota Avenue, NE, Room #1
Washington, DC 20019</td></tr>
<tr><td colspan="2">For questions, please contact:

Apurva Patil | Remedial Project Manager
1200 First Street, NE | Washington, DC 20002 | (202) 654-6004 | apurva.patil@dc.gov</td></tr>
</table>

LANDSIDE INVESTIGATION AREA DESCRIPTION

The 77-acre Landside Investigation Area is surrounded by various landmarks: the District of Columbia Solid Waste Transfer Station to the north; Kenilworth Maintenance Yard (KMY) (which is owned by the National Park Service (NPS)) to the northwest; a narrow strip of NPS land and shoreline to the west (between the Site and the Anacostia River); Benning Road to the south; and residential areas to the east and south. These areas are depicted on **Figure 1**.

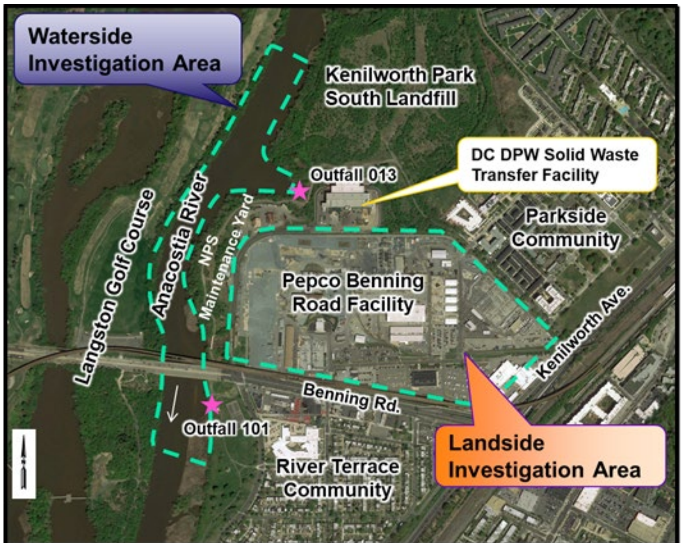

FIGURE 1.
SITE PLAN AND
INVESTIGATION AREAS

Most of the Landside Investigation Area is occupied by the Benning Service Center, which supports activities related to Pepco's electric power transmission and distribution system in the Washington, DC area. About 700 Pepco employees work at the service center handling tasks such as maintenance, construction, system engineering, vehicle fleet maintenance and refueling, and warehousing associated with operation of the Pepco electrical distribution system. There are also three active substations located within the Landside Area, with one substation each in the eastern, northern, and western portions of the Site. A power plant building used to be located in the westernmost portion of the Landside Investigation Area, but that building was demolished following the shut down of the plant in 2012.

Since the 1960s, the southeast corner of the Landside Investigation Area has been used for repairing transformers and other electrical equipment. Currently, these activities take place in and around Buildings 56 and 57. The center portion of the Landside Investigation Area has buildings used for office space, fleet services, stores, and waste management activities. Outdoor areas are used for storing equipment and materials and there is a vehicle fueling facility in the western portion of the service center area. The Landside Investigation Area is fully enclosed by a fence with two guarded entrances - one of these entrances is staffed 24 hours a day, 7 days a week and the other is guarded during all times when it is open. **Figure 2** shows the locations of buildings and other features within the Landside Investigation Area.

A ten-acre parcel at the west end of the Site (formerly the location of the Benning generating station – the former power plant building referred to above) was sold to a third party in 2023. This area, referred to as "Lot 800," is noted on **Figure 2**. The new owner intends to redevelop the parcel as a warehouse/distribution center with associated surface parking. In connection with the redevelopment activity at Lot 800, the new owner conducted additional sampling of subsurface soil, concrete pads formerly used to support station transformers, and soil vapor within the footprint of the proposed warehouse building. To accommodate

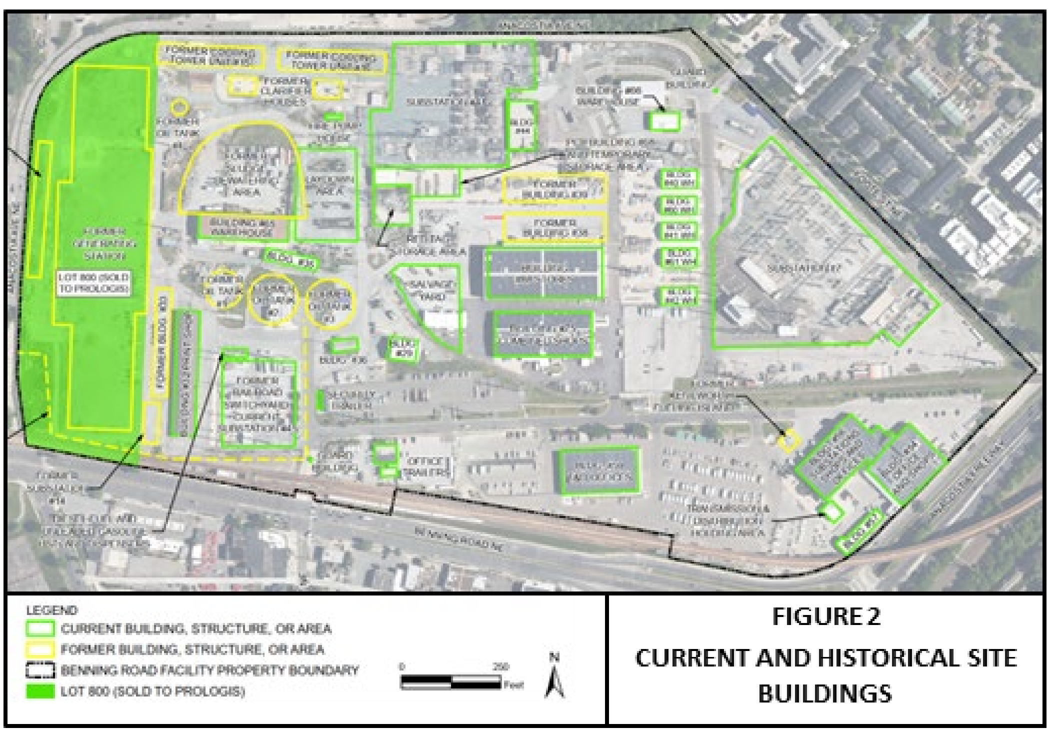

FIGURE 2
CURRENT AND HISTORICAL SITE BUILDINGS

this change in land use, additional risk evaluation[1] is currently in progress and may or may not result in mitigation measures (separate from this Proposed Plan) affecting construction.

Most of the Landside Investigation Area is covered with impervious material, including concrete and asphalt. The Site discharges stormwater to the nearby Anacostia River (the River) under a National Pollutant Discharge Elimination System (NPDES) permit issued by U.S. Environmental Protection Agency (No. DC0000094). This discharge has been regulated under the facility's NPDES permit since 1976. The permit requires Pepco to monitor concentrations of site contaminants (including polychlorinated biphenyls [PCBs]) in the stormwater discharged at the two Anacostia River outfalls (Outfall 013 and Outfall 101) and the six (6) Municipal Separate Storm Sewer System (MS4) outfalls (Outfall 005, Outfall 006, Outfall 014, Outfall 015, Outfall 016, and Outfall 401). The majority of the stormwater runoff from the Landside Investigation Area is channeled through a main storm drainpipe that discharges to a cove in the Anacostia River through Outfall 013. This outfall discharges to a cove in the Waterside Investigation Area along with five other non-Pepco outfalls and potential overflow from a silt pond located on the Kenilworth Park South (KPS) landfill site just to the north of the cove. Stormwater runoff from a smaller drainage area to the west of the former power plant discharges to the Anacostia River just south of the Benning Road bridge through Outfall 101. Outfall 101 historically handled stormwater that collected in transformer secondary containment basins; the transformers and the associated containment basins were removed in 2015 as described in the RI (AECOM 2020) and FS (AECOM 2024). Outfalls 014, 015, 401, and 005 are located on the northeastern site boundary and discharge to a drainage ditch leading to Watts Branch. Outfalls 006 and 016 are located on the southern site boundary and discharge to a storm drainage conveyance that parallels Benning Road and empties to the Anacostia River. The locations of the site NPDES and MS4 outfalls are shown on **Figure 3** below.

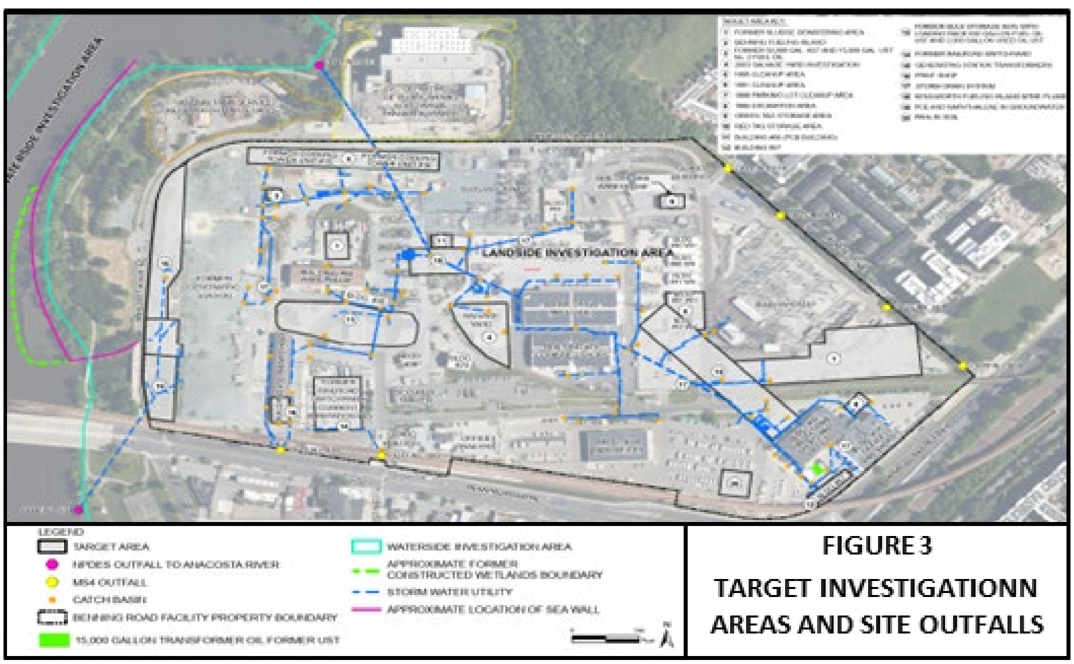

FIGURE 3
TARGET INVESTIGATIONN AREAS AND SITE OUTFALLS

LANDSIDE INVESTIGATION AREA ENVIRONMENTAL SETTING

The Site is located in Ward 7 in Washington, DC, within the 20019 zip code. Across Benning Road, the property use is mostly commercial. The area to the northeast is mainly residential, while the area to the north and northwest, which includes the DC

[1] With the designation of a portion of the site as new development, an updated human health risk evaluation (outside of the site BHHRA) is underway to ascertain if unacceptable risk exists for the various relevant exposure scenarios. Risk mitigation measures separate from this Proposed Plan may be necessary in response to this risk evaluation.

Solid Waste Transfer Station and the Kenilworth Maintenance Yard, is not zoned. The Landside Investigation Area itself is used for commercial and industrial purposes, and this use is expected to continue into the foreseeable future.

A 2009 United States Environmental Protection Agency (USEPA) Site Inspection Report indicated that there are no drinking water intake wells within 15 miles of the Site and an August 2023 Environmental Data Resources report noted that no public water supply wells are located within a 1-mile radius of the Site.

The subsurface investigation conducted as part of the RI identified three geologic units underlying the Landside Investigation Area: (1) historical fill material used to level the property, (2) the Patapsco Formation, a mixture of clays, silts, sands, and gravels underlying the fill, and (3) Arundel Clay, a very stiff clay layer underlying the Patapsco Formation. The historical fill material is about 5 to 8 feet (ft) thick across much of the property, and up to 20 ft thick near subsurface utilities. The Patapsco Formation has an upper water-bearing zone (UWZ) and a lower water-bearing zone (LWZ), separated by a silt-clay layer. The Arundel Clay is found at depths between 45 and 85 feet below ground surface feet below ground surface. The top of the Arundel Clay is erosional and generally slopes toward the west at the Site.

The top of the UWZ within the Patapsco Formation generally ranges from 9 to 16 feet below the ground surface and the water level of the LWZ generally averages 0 to 2 feet deeper than the UWZ. Groundwater in both water-bearing zones flows primarily to the west, toward the Anacostia River.

The groundwater in DC is not currently used for drinking; however, groundwater beneath the Landside Investigation Area is classified as a potential future drinking water source (Class G1 aquifer) and is subject to local regulations (Title 21 of the District of Columbia Municipal Regulations (DCMR)).

Nature and Extent of Contamination

Extensive sampling was done in various "Target Areas" within the Landside Investigation Area, based on past and current land use activities and operations at the facility and areas where contaminants were known to have been released. **Figure 3** shows these Target Areas. During the investigation, samples were tested for many chemicals. The test results were compared to select Project Screening Levels (PSLs) and established background levels to determine the need for further assessment. The individual PSLs and their sources are provided in Tables 4-1 through 4-39 in the RI Report (AECOM 2020). The results of this screening evaluation are summarized below.

Surface and Subsurface Soil

- Vanadium, polycyclic aromatic hydrocarbons (PAHs), diesel range organics (DRO), and PCBs were found in surface and subsurface soils at concentrations greater than the PSLs and established background levels in several Target Areas.
- Dioxin concentrations were greater than the PSLs in the surface and subsurface soils, but less than established background levels in the subsurface soils.
- Volatile organic compounds (VOCs), gasoline range organics (GRO), and pesticides were not found at concentrations greater than the PSLs in soils at any of the Target Areas.
- Concentrations of all other COIs in the soils were consistent with established background levels.

Groundwater

- The investigation did not find any non-aqueous phase liquids in the groundwater.
- Several metals were detected in the UWZ and LWZ at concentrations greater than the PSLs but similar to or below established background levels.
- PCBs, PAHs, and dioxins were not found at levels exceeding the PSLs.
- One pesticide was found at one location at concentrations slightly greater than the PSL.

Five organic compounds (PCE, TCE, vinyl chloride (VC), tertiary butyl alcohol (TBA), and methyl tert-butyl ether [MTBE]) were detected in groundwater at concentrations greater than their PSLs.

Summary of Site Risk

Figure 4 below shows the human health Conceptual Site Model (CSM) for the Landside Investigation Area based on the approved Baseline Human Health Risk Assessment (BHHRA) (AECOM 2020, Appendix AA).

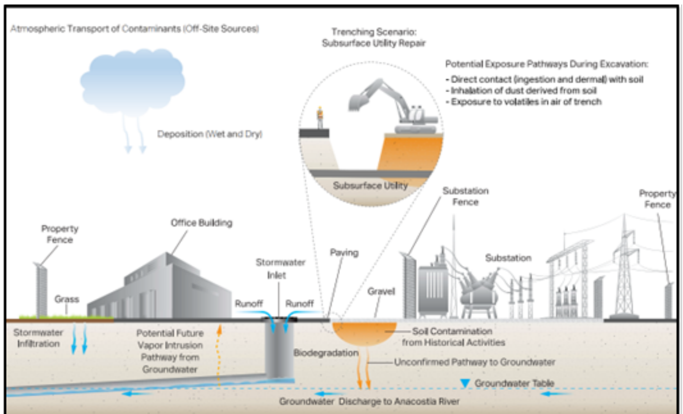

FIGURE 4
CONCEPTUAL SITE MODEL FOR OU1

No one is currently exposed to contamination within the Landside Investigation Area because:

- Groundwater is not currently used for drinking water.
- Direct contact with soil is unlikely due to limited site access, tight security, and the presence of pavement and hard-packed gravel across most of the property.
- Health and safety protocols are in place to protect against exposure during excavation activities.

In addition, in areas with chlorinated VOCs in the ground, there are no occupied buildings where vapors could enter the buildings (a process known as vapor intrusion).

However, the BHHRA also evaluated possible future risks if conditions in the Landside Investigation Area change. It considered the following potential scenarios:

- **Current/future construction workers** might be exposed by ingesting, contacting, or inhaling dust derived from soil and by inhaling vapors from groundwater in an excavation trench.
- **Future outdoor industrial workers** could be exposed by ingesting or contacting surface soil or by inhaling dust derived from surface soil.
- **Future indoor industrial workers** might be exposed to indoor air contamination if a building is constructed in an area where groundwater is contaminated with VOCs.
- **Potential future recreational visitors** could be exposed by ingesting or contacting surface soil or by inhaling dust from surface soil.

The BHHRA identified a subset of chemicals found in the Landside Investigation Area for detailed risk evaluation by comparing the highest detected levels to risk-based screening levels. Chemicals that exceeded these risk-based screening levels were identified as Chemicals of Potential Concern (COPCs) and were further assessed for health risks based on site conditions. Any COPC with a potential cancer risk greater than one in a million (10^{-6}) or a hazard index (HI) greater than 1 (based on the risk evaluation in the BHHRA) was identified as a potential Contaminant of Concern (potential COC) in evaluating the need for cleanup.

Based on this evaluation, the BHHRA identified the following chemicals as potential COCs within the Landside Investigation Area:

- In soil: arsenic, 2,3,7,8-tetrachlorodibenzo(p)dioxin-toxicity equivalents, total PCBs, and vanadium.
- In groundwater: chloroform, PCE, TCE, and VC.

However, arsenic in soil was eliminated as a potential COC because it was found at levels consistent with natural background (AECOM 2020).

Figure 4 shows site surface water runoff to a stormwater inlet. DOEE defined the surface water quality criteria for PCBs as 0.064 ng/L based on human consumption of gamefish tissue (21 D.C. Municipal Regulations Chapter 11). Pepco is conducting stormwater PCB monitoring as part of the NPDES Program under regulatory oversight by EPA. Although compliance monitoring under the Site's NPDES permit shows that the concentration of PCBs in stormwater discharged from the site is below the detection limit for the test method specified in the permit (typically 0.5 ug/L), additional testing required by the permit using more sensitive methods shows that stormwater discharges from the Site contain PCBs at concentrations great than 0.64 ng/L. Achieving this standard in Site stormwater discharges may not be possible due to technology limitations and background concentrations in rainwater. However, in accordance with the NPDES permit, Pepco is following an adaptive management approach that involves iterative implementation of control measures focusing first on the sources or best-management-practice controls. Pepco will continue to monitor PCB concentrations in stormwater to assess progress toward attainment of the water quality standard.

Basis for the Proposed Action

Consistent with the standards defined for the Anacostia River Sediment Project (ARSP) (Tetra Tech 2019), an excess lifetime cancer risk of 1 in 100,000 (10^{-5}) and a non-cancer HI of 1 were used to identify areas of actionable risk posed by potential COCs in the Landside Investigation Area. Based on these targets, the detailed risk evaluation presented in the BHHRA identified actionable risks for three areas involving four potential COCs, as shown in the following table:

	Landside		
	Soil	Groundwater (Vapor Intrusion)	Groundwater (DCMR Groundwater Standards)
Total PCBs	X [a]		
Vanadium	X [b]		
Perchloroethylene (PCE)		X [c]	X [c]
Trichloroethylene (TCE)		X [c]	X [c]

Notes:
[a] Transformer Shop Area [b] Warehouse and Laydown Area [c] Groundwater at Southern Property Boundary

The three areas of actionable risk (PCBs in Transformer Shop soil, vanadium in Warehouse and Laydown Area soil, and PCE and TCE in Southern Boundary groundwater) are shown in **Figure 5**.

To address these areas of actionable risk within the Landside Investigation Area, a number of cleanup methods and technologies were evaluated to arrive at the Preferred Alternatives (discussed later in this Proposed Plan).

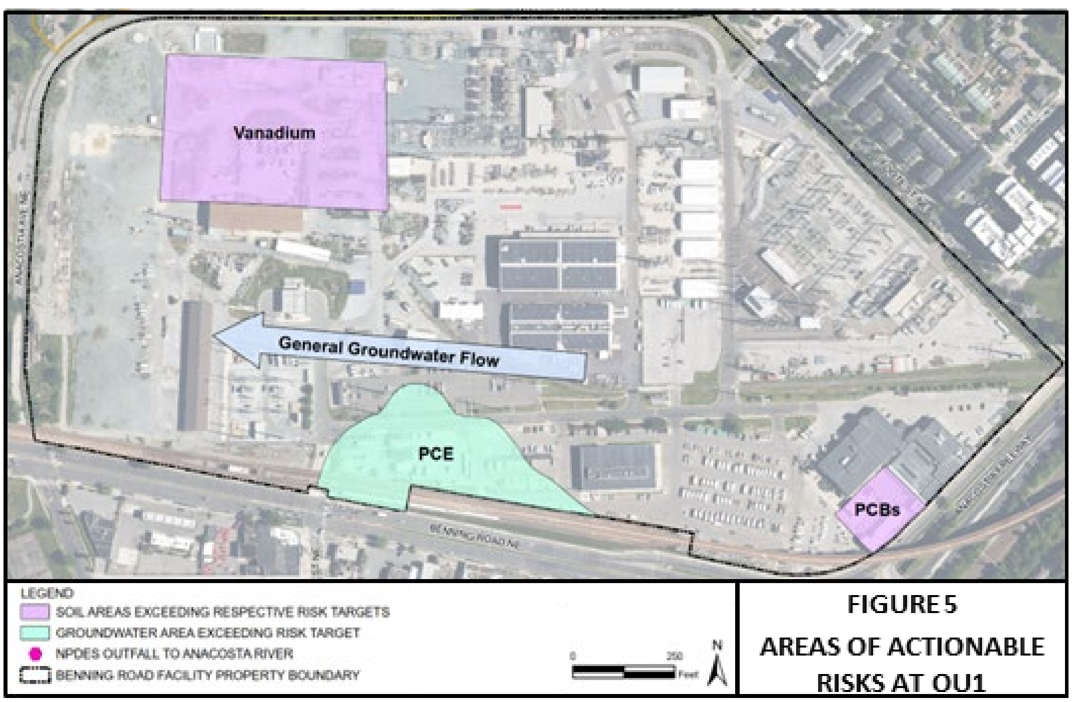

FIGURE 5
AREAS OF ACTIONABLE RISKS AT OU1

REMEDIAL ACTION OBJECTIVES AND PRELIMINARY REMEDIAL GOALS

Cleanup goals, referred to as Remedial Action Objectives (RAOs), provide an important basis for planning and evaluating cleanup options. RAOs are statements that help set specific cleanup targets to protect human health and the environment. RAOs focus on areas where actionable risks have been identified. As described above, for the purpose of this Proposed Plan, actionable risk is defined as any risk exceeding an excess lifetime cancer risk of 1 in 100,000 (10^{-5}) and a non-cancer HI of 1. These targets are appropriate for the current and anticipated future industrial/commercial use of the Site and are consistent with the risk targets used for the ARSP.

The following RAOs were used to develop cleanup actions for the potential COCs in the areas of actionable risks in the Landside Area:

- **RAO 1:** Remove and/or treat soil contaminated with PCBs that poses an excess human health lifetime cancer risk exceeding 1 in 1000 (10^{-3}), referred to as a Principal Threat Source Material (PTSM), in the Transformer Shop Area.
- **RAO 2:** Reduce excess human health lifetime cancer risks to less than 1 in 100,000 (10^{-5}) and non-cancer hazards (HI to less than 1) from direct contact with PCBs in soil in the Transformer Shop Area.
- **RAO 3:** Reduce non-cancer hazards (to HI less than 1) from direct contact with vanadium in soil in the Warehouse and Laydown area.
- **RAO 4:** Reduce the concentrations of PCE and its breakdown chemicals in Site groundwater to meet the District of Columbia Water Groundwater Quality Standards, or the lowest feasible concentrations.
- **RAO 5:** Control vapor intrusion risks from PCE and its breakdown chemicals in future buildings overlying the PCE groundwater plume in the southern portion of the Landside Area.

Preliminary cleanup goals, known as Preliminary Remedial Goals (PRGs), are the specific chemical concentrations, for example in soil or groundwater, that allow for protection of human health and/or the environment under the site conditions. PRGs are based on legal requirements referred to as Applicable or Relevant and Appropriate Requirements (ARARs) and on risk-based target concentrations (RBTCs) that take background concentrations into consideration. PRGs are used to evaluate remedial alternatives to meet the RAOs. The following table presents a summary of the PRGs for the three areas of actionable risk in the Landside Investigation Area.

SUMMARY OF PRGs

	Transformer Shop Area	Warehouse and Laydown Area	Southern Boundary	
Chemical	Outdoor Worker/ Construction Worker Combined Surface and Subsurface Soil (0-16 ft) (mg/kg)	Construction Worker Combined Surface and Subsurface Soil (0-16 ft) (mg/kg)	Indoor Worker Groundwater (Vapor Intrusion) (µg/L)	Groundwater Protection (µg/L)
Total PCBs	7 (a, b)	NA	NA	NA
Vanadium	NA	277	NA	NA
PCE	NA	NA	242	5
TCE	NA	NA	22	5
cis-1,2-DCE (c)	NA	NA	NA	70
trans-1,2-DCE (c)	NA	NA	NA	100
1,1-DCE (c)	NA	NA	NA	7
Vinyl Chloride (c)	NA	NA	NA	2

Chemical	Transformer Shop Area	Warehouse and Laydown Area	Southern Boundary	
	Outdoor Worker/ Construction Worker Combined Surface and Subsurface Soil (0-16 ft) (mg/kg)	Construction Worker Combined Surface and Subsurface Soil (0-16 ft) (mg/kg)	Indoor Worker Groundwater (Vapor Intrusion) (µg/L)	Indoor Worker Groundwater Protection (µg/L)

Notes:

a. For PCBs in the Transformer Shop Area, the PRG is 7 mg/kg, corresponding to a target hazard index of 1 and based on the construction worker scenario, which is stricter for non-cancer effects than for the cancer-based risk level of 1 in 100,000.

b. For outdoor workers, the surface soil RBTC of 10.5 mg/kg is selected, which corresponds to a cancer risk level of 1 in 100,000.

c. Chemical formed in the breakdown of PCE and TCE.

NA = Not applicable (chemical is not an environmental concern in the given area)
ft = feet
mg/kg = milligrams per kilogram
µg/L = micrograms per liter

SUMMARY OF REMEDIAL TECHNOLOGIES

Remedial technologies are the methods to treat, stabilize, contain, remove, or prevent exposure to contamination. The FS identified suitable remedial technologies to address the potential COCs in each of the areas of actionable risks using a screening process consisting of three criteria from EPA's *Guidance for Conducting RI/FS Under CERCLA* (USEPA 1988):

a) Effectiveness (short-term and long-term);
b) Ease of Implementation (technical and administrative), and
c) Cost (one-time and ongoing).

The suitable technologies for each area of actionable risk identified based on this screening evaluation are described below.

Technologies for All Areas of Actionable Risks

Institutional Controls (ICs): These are engineering methods to reduce potential human exposure to contaminants or protect the cleanup efforts through restrictions on site use or activities. ICs may be used together with other actions. Examples of ICs include fencing, site security, soil management plans, signs, land use restrictions, permit limits, and designating special areas where certain activities are restricted.

Technologies for Soils in Transformer Shop and Warehouse and Laydown Areas

Containment: This involves placing a cover (also known as a cap) over contaminated soils to prevent direct human contact. Commonly used capping materials include asphalt, gravel, geomembranes, concrete, or combinations of these items.

Treatment: This consists of treating soils to remove contaminants either in place (in-situ) or after excavating the soils (ex-situ). Examples include incineration, stabilization, thermal desorption (the use of heat to remove organic contaminants from solid materials), soil washing, solvent extraction (a chemical technique that separates compounds based on their solubility in different liquids), and dehalogenation (for halogenated compounds).

Removal and Disposal/Re-Use: This involves digging up contaminated soils that exceed cleanup goals (PRGs) and either reusing or disposing of them on-site or off-site. Soils that have been treated to reduce contaminant concentrations of potential COCs to less than the PRGs can be reused (for example, as backfill material). Disposal options include facilities that can safely handle the excavated material, with or without treatment.

Technologies for PCE and TCE in Groundwater (to Reduce Vapor Intrusion Risks)

Containment: This involves isolating contaminated groundwater or controlling groundwater vapor pathways using engineered materials or vapor control systems. This helps reduce human exposure to vapors inside future buildings that may be located above the groundwater that contains the organic chemicals PCE and TCE.

Technologies for PCE and TCE in Groundwater (for Groundwater Restoration)

Monitored Natural Attenuation (MNA): MNA is a technique that uses natural processes to reduce the toxicity, amount, concentration, or mobility of contaminants. Examples of these natural processes include dilution, dispersion, biological degradation, and chemical breakdown/degradation.

Treatment: This involves treating contaminated groundwater using chemical or biological methods to reduce the toxicity, movement, and/or amount of contaminants. Treatment can be done directly in the ground (in-situ) or after removing/extracting the water (ex-situ). In-situ treatment methods use substances like oxidants, a specific form of iron known as zero valent iron (ZVI), and substrates, nutrients, and dechlorinating bacteria to clean the water. Ex-situ treatment typically involves collecting and removing the impacted groundwater and treating it with processes such as filtration, precipitation, adsorption (attachment of chemicals to treatment media), and evaporation. After treatment, the water can be discharged, under the appropriate permits, to public treatment works or the municipal separate storm sewer system (MS4).

Screening of Remedial Alternatives

After the initial screening, suitable technologies were assembled into specific remedial alternatives to address each RAO. These assembled remedial alternatives were further evaluated using the following criteria in accordance with EPA's RI/FS guidance (USEPA 1988):

- **Effectiveness:** This criterion evaluates how well the remedial alternative protects human health and the environment.
- **Ease of Implementation:** This criterion assesses the ease and ability to obtain permits, construct, operate, and maintain the remedial alternative.
- **Cost:** This criterion evaluates the costs (both one-time and ongoing) of the remedial alternatives. Because there are uncertainties in the screening-level cost estimates, this criterion is used for comparison purposes but not to exclude any remedial alternatives.

The following assembled remedial alternatives, referred to as "Retained Alternatives," were identified further evaluation.

<u>Retained Alternatives for PCB-Contaminated Soils</u>

- **LSS-PCB-1:** No Action
- **LSS-PCB-2:** Removal with Off-Site Treatment and Disposal of PTSM, and ICs
- **LSS-PCB-4:** Removal with Off-Site Treatment/Disposal of PTSM, Surface Soils with PCBs > 7 mg/kg, and Select Sub-Surface Soils (1-2 ft), and ICs
- **LSS-PCB-5:** Removal with Off-Site Treatment/Disposal of PTSM and Soils (0-2 ft) with PCBs > 7 mg/kg, and ICs

<u>Retained Alternatives for Vanadium-Contaminated Soils</u>

- **LSS-V-1:** No Action
- **LSS-V-2:** Institutional Controls and Additional Protective Measures (maintain a three-inch thickness of well-graded gravel over the impacted area)
- **LSS-V-3:** Excavation with Off-Site Disposal, and ICs

<u>Retained Alternatives for Addressing Vapor Intrusion Risks from PCE and TCE in Groundwater</u>

- **LGW-VB-1:** No Action
- **LGW-VB-3:** Thermoplastic Membrane Vapor Barriers with Passive Venting System (for any future building within areas above PCE/TCE Plume)

<u>Retained Alternatives for Groundwater Restoration</u>

- **LGW-GR-1:** No Action
- **LGW-GR-2:** MNA, Groundwater Monitoring, and ICs

- **LGW-GR-4:** Treatment via ZVI Injection, with MNA and ICs
- **LGW-GR-5:** Treatment via Biowalls and ZVI Injection, with MNA and ICs
- **LGW-GR-6:** Groundwater Extraction and Treatment using Granular Activated Carbon (GAC), with MNA and ICs

More details regarding each of these Retained Alternatives is provided in the OU1 FS (AECOM 2024).

Detailed Evaluation Of Retained Remedial Alternatives

The NCP and USEPA RI/FS Guidance (USEPA, 1988) require nine criteria to be considered when evaluating remedial alternatives. These nine criteria are divided into three categories: threshold criteria; primary balancing criteria; and modifying criteria, as described below.

Threshold criteria:

- Protection of human health and the environment.
- Compliance with legal requirements (ARARs).

Remedial alternatives that meet the threshold criteria are then evaluated according to five primary balancing criteria.

Primary balancing criteria:

- Reduction of toxicity, mobility, or volume through treatment.
- Long-term effectiveness and permanence.
- Short-term effectiveness.
- Ease of implementation.
- Cost.

The final two evaluation criteria are known as modifying criteria.

Modifying criteria:

- Regulatory agency acceptance.
- Community acceptance.

Each remedial alternative is evaluated individually and compared against the first seven criteria (threshold and primary balancing). The last two criteria (modifying) are considered following public comments on the Proposed Plan.

A “No Action” alternative is also evaluated for each area of actionable risk. The No Action alternatives do not involve any cleanup activities or institutional controls and would not meet the cleanup goals in a reasonable timeframe; however, the NCP and CERCLA require consideration of No Action as a baseline for comparing other alternatives.

A detailed evaluation of each of the Retained Remedial Alternatives – according to the first seven criteria – is presented in the tables below.

DETAILED EVALUATION OF RETAINED ALTERNATIVES FOR PCB CONTAMINATED SOIL

Evaluation Criteria	LSS-PCB-1 No Action	LSS-PCB-2 Removal with Off-Site Treatment and Disposal of PTSM, and ICs	LSS-PCB-4 Removal with Off-Site Treatment / Disposal of PTSM, Surface Soils with PCBs > 7 mg/kg, and Select Sub-Surface Soils (1-2 ft), and ICs	LSS-PCB-5 Removal with Off-Site Treatment / Disposal of PTSM and Soils (0-2 ft) with PCBs > 7 mg/kg, and ICs
Overall Protection of Human Health and Environment	No protection	Protective	Protective	Protective
Compliance with ARARs	Not compliant	Complies with ARARs	Complies with ARARs	Complies with ARARs
Reduction in Toxicity, Mobility, and Volume Through Treatment	None	Substantial reduction in toxicity [a]	Large reduction in toxicity [b]	Large reduction in toxicity [c]

Evaluation Criteria	LSS-PCB-1 No Action	LSS-PCB-2 Removal with Off-Site Treatment and Disposal of PTSM, and ICs	LSS-PCB-4 Removal with Off-Site Treatment / Disposal of PTSM, Surface Soils with PCBs > 7 mg/kg, and Select Sub-Surface Soils (1-2 ft), and ICs	LSS-PCB-5 Removal with Off-Site Treatment / Disposal of PTSM and Soils (0-2 ft) with PCBs > 7 mg/kg, and ICs
		Minor reduction in volume (d)	Moderate reduction in volume (e)	Moderate reduction in volume (f)
Long-Term Effectiveness and Permanence	None	Provides long-term effectiveness and permanence	Provides long-term effectiveness and permanence	Provides long-term effectiveness and permanence
Short-Term Effectiveness	None	Provides short-term effectiveness	Provides short-term effectiveness	Provides short-term effectiveness
Ease of Implementation	Easy	Moderate	Moderate	Difficult
Cost	No cost	$253,000	$502,000	$976,000

Notes

EPC: Exposure Point Concentration

(a) 40% reduction in EPC for combined soils

(b) 77% reduction in EPC for combined soils

(c) 94% reduction in EPC for combined soils

(d) 1.8 CY of soil with PCBs > PRG removed

(e) 75 CY of soil with PCBs > PRG removed

(f) 126 CY of soil with PCBs > PRG removed

DETAILED EVALUTATION OF RETAINED REMEDIAL ALTERNATIVES FOR VANADIUM-CONTAMINATED SOIL

Evaluation Criteria	LSS-V-1 No Action	LSS-V-2 Institutional Controls and Additional Protective Measures	LSS-V-3 Excavation with Off-Site Disposal, and ICs
Overall Protection of Human Health and Environment	No protection	Protective	Protective
Compliance with ARARs	Not compliant	Complies with ARARs	Complies with ARARs
Reduction in Toxicity, Mobility, and Volume Through Treatment	None	None	Large reduction in toxicity (a) Large reduction in volume (b)
Long-Term Effectiveness and Permanence	None	Provides long-term effectiveness and permanence	Provides long-term effectiveness and permanence
Short-Term Effectiveness	None	Provides short-term effectiveness	Provides short-term effectiveness
Ease of Implementation	Easy	Easy	Moderate
Cost	No cost	$268,000	$670,000

Notes

(a) 94% reduction in EPC for soils

(b) 1530 CY of soil with vanadium concentrations > PRG removed

DETAILED EVALUATION OF RETAINED REMEDIAL ALTERNATIVES FOR REDUCING VAPOR INTRUSION RISKS IN FUTURE BUILDINGS FROM PCE AND TCE IN GROUNDWATER

Evaluation Criteria	LGW-VB-1 No Action	LGW-VB-3 Thermoplastic Membrane Vapor Barriers with Passive Venting System
Overall Protection of Human Health and Environment	No protection	Protective
Compliance with ARARs	None	Complies with ARARs
Reduction in Toxicity, Mobility, and Volume Through Treatment	None	None
Long-Term Effectiveness and Permanence	None	Provides long-term effectiveness and permanence
Short-Term Effectiveness	None	Provides short-term effectiveness
Ease of Implementation	Easy	Easy
Cost	No cost	$680,000

DETAILED EVALUATION OF RETAINED REMEDIAL ALTERNATIVES FOR GROUNDWATER RESTORATION

Evaluation Criteria	LGW-GR-1 No Action	LGW-GR-2 MNA, Groundwater Monitoring, and ICs	LGW-GR-4 Treatment via ZVI Injection, with MNA and ICs	LGW-GR-5 Treatment via Biowalls and ZVI Injection, with MNA and ICs	LGW-GR-6 Groundwater Extraction and Treatment using GAC, with MNA and ICs
Overall Protection of Human Health and Environment	No protection	Protective	Protective	Protective	Protective
Compliance with ARARs	None	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs
Reduction in Toxicity, Mobility, and Volume Through Treatment	None	None	Significant	Significant	Significant
Long-Term Effectiveness and Permanence	None	Provides long-term effectiveness and permanence	Provides long-term effectiveness and permanence	Provides long-term effectiveness and permanence	Provides long-term effectiveness and permanence
Short-Term Effectiveness	None	Provides short-term effectiveness	Provides short-term effectiveness	Provides short-term effectiveness	Provides short-term effectiveness
Ease of Implementation	Easy	Easy	Moderate	Difficult	Moderate to Difficult
Cost	No cost	$586,000	$1.88M	$2.79M	$2.95M

COMPARISON OF CLEANUP OPTIONS/ALTERNATIVES

This section compares the different remedial alternatives to determine how they perform based on specific evaluation criteria and identifies key tradeoffs. A scoring system was used to compare and rank the alternatives. Each alternative must meet the two threshold criteria (overall protection of human health and the environment and compliance with ARARs) to be eligible for selection. The balancing criteria (reduction of toxicity, mobility, and volume through treatment; long-term effectiveness and permanence; short-term effectiveness; ease of implementation; and cost) generally present tradeoffs among the alternatives and were scored on a scale of 1 to 5 (where: 1 = low, 2 = low to moderate, 3 = moderate, 4 = moderate-high, and 5 = high). The scores help in comparing the alternatives, with 1 being the minimum performance and 5 being the maximum performance.

PCB-Contaminated Soil

Different methods were compared for cleaning up PCB-contaminated soils in the Landside Investigation Area. The table below shows the summary of that evaluation. Although the different methods had equal overall scores, alternative LSS-PCB-5 is notable because it would:

- Remove more PCB contamination when compared to LSS-PCB-2 and LSS-PCB-4.
- Reduce the concentration of PCBs that construction workers could be exposed to by 94%.
- Achieve a final PCB concentration in the soil (7.1 mg/kg) that is very close to the target cleanup goal (PRG of 7 mg/kg).

Therefore, LSS-PCB-5 is considered to be the best option or "Preferred Alternative."

COMPARISON OF RETAINED REMEDIAL ALTERNATIVES FOR PCB-CONTAMINATED SOIL

Evaluation Criteria	LSS-PCB-1 No Action	LSS-PCB-2 Removal with Off-Site Treatment and Disposal of PTSM, and ICs	LSS-PCB-4 Removal with Off-Site Treatment / Disposal of PTSM, Surface Soils with PCBs > 7 mg/kg, and Select Sub-Surface Soils (1-2 ft), and ICs	LSS-PCB-5 Removal with Off-Site Treatment / Disposal of PTSM and Soils (0-2 ft) with PCBs > 7 mg/kg, and ICs
Overall Protection of Human Health and Environment	X	ü	ü	ü
Compliance with ARARs	X	ü	ü	ü
Reduction of Toxicity, Mobility, and Volume Through Treatment	X	1	3	5
Long-Term Effectiveness and Permanence	X	1	3	5
Short-Term Effectiveness	X	4	3	2
Ease of Implementation	Not applicable	4	3	2
Cost Effectiveness	Not applicable	5	3	1
Total Score	**Not Applicable**	**15**	**15**	**15**
Total Cost	**$0**	**$253,000**	**$502,000**	**$976,000**

Vanadium-Contaminated Soil

Different methods were compared for cleaning up vanadium-contaminated soils in the Landside Area. The table below shows the summary of that evaluation. Alternative LSS-V-2 received the highest score and is therefore the Preferred Alternative.

COMPARISON OF REMEDIAL ALTERNATIVES FOR VANADIUM-CONTAMINATED SOIL

Evaluation Criteria	LSS-V-1 No Action	LSS-V-2 Institutional Controls and Additional Protective Measures	LSS-V-3 Excavation with Off-Site Disposal, and ICs
Overall Protection of Human Health and Environment	X	ü	ü
Compliance with ARARs	X	ü	ü
Reduction in Toxicity, Mobility, and Volume Through Treatment	X	1	5
Long-Term Effectiveness and Permanence	X	4	5
Short-Term Effectiveness	X	4	2
Ease of Implementation	Not applicable	5	3
Cost Effectiveness	Not applicable	4	1
Total Score	**Not applicable**	**18**	**16**
Total Cost	**$0**	**$268,000**	**$670,000**

Vapor Intrusion Risks

Different methods for controlling vapor intrusion risk were evaluated. Only one method, LGW-VB-3 was considered further after the initial screening. This method, which uses a special membrane and a passive venting system, is important if a building were to be constructed above the area where groundwater is contaminated with chlorinated VOCs before the groundwater cleanup goal (PRG) is achieved. LGW-VB-3 had a high rating on all criteria and is therefore the Preferred Alternative. The table below shows the comparison between LGW-VB-1 and LGW-VB-3.

COMPARISON OF REMEDIAL ALTERNATIVES FOR REDUCING VAPOR INTRUSION RISKS IN FUTURE BUILDINGS FROM PCE AND TCE IN GROUNDWATER

Evaluation Criteria	LGW-VB-1 No Action	LGW-VB-3 Thermoplastic Membrane Vapor Barriers with Passive Venting System
Overall Protection of Human Health and Environment	X	ü
Compliance with ARARs	X	ü
Reduction in Toxicity, Mobility, and Volume Through Treatment	X	5
Long-Term Effectiveness and Permanence	X	5
Short-Term Effectiveness	X	5
Ease of Implementation	Not applicable	5
Cost Effectiveness	Not applicable	5
Total Score	**Not applicable**	**20**
Total Cost	**$0**	**$680,000**

Groundwater

Several techniques were compared for cleaning up groundwater in the Landside Investigation Area. The table below shows a summary of that evaluation. LGW-GR-2 (MNA) is the option that had the highest score and is therefore the Preferred

Alternative. DOEE will review groundwater monitoring results to determine how well this remedial approach is performing. If that evaluation shows that faster progress toward cleanup is needed, other alternatives (such as LGW-GR-4, LGW-GR-5, or LGW-GR-6) would be considered to improve the results achieved under LGW-GR-2. In the meantime, the groundwater use restrictions that make up part of the ICs for LGW-GR-2 would protect human health.

COMPARISON OF REMEDIAL ALTERNATIVES FOR GROUNDWATER RESTORATION

Evaluation Criteria	LGW-GR-1 No Action	LGW-GR-2 MNA, Groundwater Monitoring, and ICs	LGW-GR-4 Treatment via ZVI Injection, with MNA and ICs	LGW-GR-5 Treatment via Biowalls and ZVI Injection, with MNA and ICs	LGW-GR-6 Groundwater Extraction and Treatment using GAC, with MNA and ICs
Overall Protection of Human Health and Environment	X	ü	ü	ü	ü
Compliance with ARARs	X	ü	ü	ü	ü
Reduction in Toxicity, Mobility, and Volume Through Treatment	X	1	4	3	3
Long-Term Effectiveness and Permanence	X	3	5	4	3
Short-Term Effectiveness	X	5	3	1	4
Ease of Implementation	Not applicable	5	3	1	3
Cost Effectiveness	Not applicable	5	2	1	1
Total Score	**Not applicable**	**19**	**17**	**10**	**14**
Total Cost	**$0**	**$586,000**	**$1.88M**	**$2.79M**	**$2.95M**

Preferred Alternatives

The table below summarizes DOEE's Preferred Alternatives, selected from the alternatives described above, for each area of actionable risk within the Landside Investigation Area.

SUMMARY OF PREFERRED ALTERNATIVES FOR AREAS OF ACTIONABLE RISKS IN OU1

Areas of Actionable Risks	Media	Potential COCs	Preferred Alternatives	Remedial Alternative Components	Present Worth Cost
Transformer Shop	Soil	PCB	LSS-PCB-5	Removal with Off-Site Treatment / Disposal of PTSM and Soils (0-2 ft) with PCBs > 7 mg/kg, and ICs	$976,000
Warehouse and Laydown Area	Soil	Vanadium	LSS-V-2	Gravel Cover Enhancement (Where Needed) and ICs	$268,000
Shallow Groundwater near Southern Property Boundary	Groundwater (Vapor Intrusion)	PCE and TCE	LGW-VB-3	Thermoplastic Membrane Vapor Barriers with Passive Venting System, MNA, and ICs	$680,000

Areas of Actionable Risks	Media	Potential COCs	Preferred Alternatives	Remedial Alternative Components	Present Worth Cost
Shallow Groundwater near Southern Property Boundary	Groundwater (Groundwater Restoration)	PCE and TCE	LGW-GR-2	MNA, Groundwater Monitoring, and ICs	$586,000

DOEE believes that the Preferred Alternative for each area of actionable risk meets the requirements of the two threshold criteria (i.e., protection of human health and the environment and compliance with legal requirements) and provides the best balance of the tradeoffs among the other alternatives with respect to the five primary balancing criteria. Based on public comments received on this Proposed Plan, DOEE will review the alternatives in light of the two modifying criteria (i.e., regulatory agency acceptance and community acceptance).

DOEE expects that each Preferred Alternative will meet the following legal requirements of DCBRA (DC Official Code § 8-634.01) and CERCLA (42 USC §9621):

- Protect human health and the environment.
- Comply with the applicable laws and regulations (ARARs).
- Be cost-effective.
- Use permanent solutions and alternative treatment methods as much as possible.
- Use treatment as a preferred approach or explain why this preference will not be met.

Additional details about the comparison of remedial alternatives and the reasons for choosing the Preferred Alternatives can be found in the FS (AECOM, 2024).

COMMUNITY PARTICIPATION

DOEE will publish a brief description of this Proposed Plan in the local newspaper. An electronic copy of this Proposed Plan is also available online at: https://doee.dc.gov/page/pepco-benning-road-facility-plans-and-deliverables.

DOEE will hold a 45-day public comment period that will run from December 16, 2024, to January 31, 2025. The comment period can be extended an additional 30 days upon DOEE's receipt of a written request for extension from a stakeholder. Written comments can be submitted by either mail or email to:

Apurva Patil
Remedial Project Manager
1200 First Street NE, 5th Floor
Washington, DC 20002
Email: apurva.patil@dc.gov
(202) 654-6004

A public meeting will be held on January 18, 2025 from 10:00 AM to 1:00 PM, where DOEE will explain this Proposed Plan, answer questions, and provide the public with the opportunity to submit oral and written comments. The public meeting will be held at the following location:

Department of Employment Services
4058 Minnesota Avenue, NE, Room #1
Washington, DC 20019

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