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LOCKHEED MARTIN

March 2, 2021 **VIA PRIVATE CARRIER**

Ruth Prince, PhD Toxicologist
3LD10, RCRA Corrective Action Branch 1
Land, Chemicals and Redevelopment Division
U.S. Environmental Protection Agency III
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3118

Subject: Transmittal of Final Risk-Based Disposal Approval Application (RBDAA)
For PCB-Contaminated Soil Removal in Block E, Revision 4
Lockheed Martin Corporation – Middle River Complex
2323 Eastern Boulevard, Middle River, Baltimore County, Maryland

Dear Ms. Prince,

For your final approval, find enclosed one hard copy of the above-referenced document. The objective of this cleanup will be to remove soil and other materials contaminated with polychlorinated biphenyls from Tax Block E at the Lockheed Martin Middle River Complex in Middle River, Maryland. This submittal represents the final update (the draft watermark on each page has been removed) and is being submitted along with the following changes:

- On page 2-19 of the RBDAA, it stated that confirmation sampling will be performed for VOCs by Method 8260B, when in actuality, this statement was intended to match the specifications, which describe confirmation sampling and analysis will be specifically performed for 1,2,4-TCB by Method 8260B. This change was made.
- Replaced Section 4 with a scan of the wet signed Certification Statement
- Replaced Figure 2-43 - In the legend on the purple pipe section there is a parenthetical that was deleted that read “To be abandoned if past concrete edge”
- Replaced C-2 in Appendix C - In the legend on the purple pipe section there is a parenthetical that was deleted that read “To be abandoned if past concrete edge”

We respectfully request to receive U.S. EPA’s written approval of the RBDAA by March 12, 2021.

Please let me know if you have any questions. My office phone is (301) 548-2209.

Sincerely,

Thomas D. Blackman
Project Lead, Environmental Remediation

cc: (via email without enclosure)
Mark Mank, MDE
Christine Kline, Lockheed Martin
Norman Varney, Lockheed Martin
Tom Green, LMCPI
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RISK-BASED DISPOSAL APPROVAL APPLICATION FOR PCB-CONTAMINATED SOIL REMOVAL IN BLOCK E, MIDDLE RIVER COMPLEX MIDDLE RIVER, MARYLAND

Prepared for:
Lockheed Martin Corporation

Prepared by:
Tetra Tech, Inc.

March 2021

Revision: 4

Michael Martin, P.G.
Regional Manager

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Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES (IN APPENDIX A)

LIST OF FIGURES (CONTINUED)

LIST OF FIGURES (CONTINUED)

LIST OF TABLES (IN APPENDIX A)

APPENDICES

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
AST	aboveground storage tank
BaPEq	benzo(a)pyrene equivalent
BCSCD	Baltimore County Soil Conservation District
bgs	below ground surface
BMP	best management practice
CFR	*Code of Federal Regulations*
COMAR	*Code of Maryland Regulations*
DEPS	Department of Environmental Protection and Sustainability
DPT	direct-push technology
DRO	diesel-range organics
GAC	granular activated-carbon
gpd	gallons per day
gpm	gallons per minute
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene
Lockheed Martin	Lockheed Martin Corporation
MAA	Maryland Aviation Administration
MDE	Maryland Department of the Environment
µg/L	microgram(s) per liter
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MRC	Middle River Complex
NPDES	National Pollutant Discharge Elimination System
NPL	*National Priorities List*
OCP	Oil Control Program

OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POTW	publicly owned treatment works
PRG	preliminary remedial goal
RAO	remedial action objective
RAP	remedial action plan
RBDA	risk-based disposal approval
RBDAA	risk-based disposal approval application
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RRA	residual risk analysis
SCD	Soil Conservation District
1,2,4-TCB	1,2,4-trichlorobenzene
TCLP	toxicity characteristic leaching procedure
Tetra Tech	Tetra Tech, Inc.
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
UCL	upper confidence limit
U.S.C.	*United States Code*
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

SECTION 1
INTRODUCTION

The objective of this cleanup is to remove soil and other materials contaminated with polychlorinated biphenyls (PCBs) from Tax Block E (Block E) at the Lockheed Martin Middle River Complex (MRC) in Middle River, Maryland, such that remaining soil will not pose an unacceptable risk to human health (based on industrial worker and construction worker exposure scenarios) or to the environment (through erosion of contaminated soil to Dark Head Cove). Lockheed Martin Corporation (Lockheed Martin) is submitting this risk-based disposal approval application (RBDAA) for the soil cleanup to Region 3 of the United States Environmental Protection Agency (USEPA), pursuant to the Toxic Substances Control Act (TSCA) and 40 *Code of Federal Regulations* 761.61(c) (40 CFR 761.61(c)). The cleanup plan addresses excavation and removal of approximately 32,000 tons of soil and storm drain debris and approximately 3,000 tons of concrete building foundation and storm drain pipe with polychlorinated biphenyl concentrations greater than 50 milligrams/per kilogram (mg/kg), and subsequent disposal at a TSCA-permitted landfill. The overall project also includes the excavation and off-site disposal of approximately 2,000 tons of non-TSCA regulated soil and 800 tons of non-TSCA regulated asphalt. Approximately 24,000 tons of noncontaminated concrete will be either crushed and reused as backfill onsite or disposed of offsite.

1.1 PROJECT OVERVIEW

Lockheed Martin hereby requests written approval from the USEPA to document that the removal and management of impacted materials (as summarized below) in accordance with this RBDAA will not pose an unreasonable risk of injury to health or the environment. The elements of the project covered in this RBDAA include the following:

- excavation of approximately 32,000 tons of PCB-contaminated soil and debris (with PCBs exceeding 50 mg/kg) from Block E

- removal of approximately 3,000 tons of PCB-contaminated concrete (i.e., concrete with PCBs exceeding 50 mg/kg)
- disposal of PCB-contaminated soil and concrete with PCB concentrations greater than 50 mg/kg at an approved landfill facility that meets the permit requirements of 40 CFR 761

Submittal of this RBDAA complies with the requirements of 40 CFR 761.61(c)(1), which stipulates that any person wishing to sample, cleanup, or dispose of PCB remediation waste in a manner other than prescribed in 40 CFR 761.61(a) or (b) must apply in writing to the USEPA Regional Administrator. Each application must include information described in the notification required by 40 CFR 761.61(a)(3). No person may conduct cleanup activities prior to obtaining written approval by USEPA. Community outreach regarding this and other remediation projects at the MRC is ongoing and includes information about soil removal and management activities. All tables and figures subsequently referenced in the text are in Appendix A.

Other project activities include radiological surveying and screening, removal of soil that slid onto the slab on northern and western sides, construction of a temporary retaining wall on the western side of the site, removal of the entire concrete foundation slab, removal of most roads and paved areas, removal of contaminated storm sewers, on-site crushing and re-use of noncontaminated concrete or off-site disposal/recycling of concrete, off-site disposal of non-PCB-contaminated concrete, removal of the former fuel product pipeline, installation of stormwater swales, conveyance areas, and pipelines, backfilling, final grading, and post-remediation groundwater and storm-sewer sediment monitoring.

1.2 BACKGROUND

The MRC remediation projects are overseen by the Maryland Department of the Environment (MDE) Land Management Administration, Land Restoration Program (also known as the State Superfund Program). The Land Restoration Program's responsibilities include overseeing the assessment and cleanup of historically contaminated hazardous waste sites that have not been placed on the *National Priorities List* (NPL). On December 15, 2015, Lockheed Martin entered into an Administrative Order on Consent (Consent Order) with the MDE to address the remediation of environmental contamination at the MRC. The USEPA also has jurisdiction over this soil cleanup under TSCA, in accordance with 40 CFR 761.61, because PCBs have been detected in soil on the MRC property at concentrations greater than 50 parts per million (equivalent to 50 milligrams per kilogram [mg/kg]).

The MRC is at 2323 Eastern Boulevard in Middle River, Maryland (Figure 1-1). The facility is owned by LMC Properties, Inc., and lies approximately 3.2 miles upstream of Chesapeake Bay. It consists of multiple land parcels designated as tax blocks (referred to herein as “Blocks” [Figure 1-2]). Operating facilities are in Block I; surrounding Block I are Blocks A, B, D, E, F, G, and H.

The MRC has been used for aircraft and missile launching systems design, development, and manufacturing since the late 1920s. Block E is the site of former Building D, which was built in the early 1940s and demolished to the basement floor in 1971. The building had an assembly floor (first floor) that exited at the grade of the current Tilley Chemical Company property, along with a basement level (the current concrete slab). The former building occupied approximately 400,000 square feet. Historical engineering drawings show that the former basement areas were used for welding, extrusion milling, engine preparation, and assembly, as well as various radiological activities. Elevators and heater rooms were along the northern, eastern, and southern interior perimeter of the former building, and five electrical transformer rooms on the slab were along the northern and southern interior perimeter. (Due to the suspected former existence of transformers with PCB-containing oils, the transformer room areas have been investigated extensively.) A cafeteria and cleaning/plating and finishing rooms were along the southern interior wall, near the center of the building. Figure 1-3 shows historical features of Block E.

The area occupied by former Building D has not been redeveloped since the building was demolished in 1971. A 500,000-gallon, aboveground water storage tank (AST) and pump-house associated with the facility fire suppression system were in the southeastern corner of Block E. A two-inch-diameter fuel product pipeline runs underground from the former 500,000-gallon fuel oil AST to the MRC power plant in Block I. Tilley Chemical Company owns and occupies the western adjoining property, and currently stores trailers on the concrete parking apron of former Building D in the southwestern corner of Block E (see Figure 1-4).

The basement floor consists of concrete slabs with ceramic tiles overlaying the concrete in several locations. Construction joints or expansion joints (with associated cracking) are between the slabs. Former sumps and floor drains, some of which have been plugged with concrete or grouted, remain within the existing concrete slab. Areas off the foundation slab are either concrete ancillary parking and access points or are covered in grass or other vegetation.

Steep soil slopes along the western and northwestern edges of Block E represent areas where the existing grade was higher than the eastern ground surface (with elevation differences of approximately 12 feet), and the topography was lowered to provide a level surface to construct the building. In these sloped areas, the soil has slumped onto the outer edge of the foundation slab since the building removal.

Investigations related to Block E have included reviews of records, maps, and design drawings, discussions with current and former MRC personnel, geophysical surveys, geotechnical studies, physical site condition evaluations, and extensive multimedia sampling. Comprehensive sampling at Block E has included collecting 112 concrete samples, more than 1,000 surface soil samples, more than 600 subsurface soil samples, 116 groundwater samples from more than 50 monitoring wells and over 40 temporary well points, stormwater sewer sediment samples from more than 16 manholes and inlets, and other miscellaneous samples.

Numerous environmental investigations were conducted at Block E from 2003 to 2017, culminating with a comprehensive remedial investigation (RI) report [Tetra Tech, 2018b]. The RI report served as the primary reference for the remedial action plan (Tetra Tech, 2019c) which included an evaluation of technologies and remedial alternatives and the recommendation of a preferred alternative for remediation of the PCB-contaminated soil. As described in the RI report (Tetra Tech, 2018b), the PRG for PCBs in surface soil, based on an industrial worker exposure scenario, is 10 mg/kg, and the PRG for PCBs in subsurface soil, based on a construction worker exposure scenario, is 58 mg/kg. A residual risk analysis (Tetra Tech, 2018c), which identified sample locations that needed to be removed to meet the PRGs on a site-wide basis, was prepared for the remedial action plan.

1.3 SOIL REMEDY ACTION

The MDE and the USEPA will oversee the soil remedy activities at Block E (Figure 1-5). The full soil remedy at the site will include the following actions; only the activities indicated with an asterisk involve the management of material contaminated with PCBs. The quantities of different waste streams are summarized on Table 1-1.

- Removal of salt shed, wooden storage shed, and any other debris on the ground surface
- Surveying slab, subslab soil, and drains for possible radioactive residue, followed by removal and disposal of radioactive (or mixed waste) material
- Field testing for radiological parameters
- Removal of existing soil that has slumped onto and overlies the concrete slab on its western and northwestern sides with installation of a temporary retaining wall near the western end of the concrete slab
- *Demolition and disposal of the concrete slab and some foundation footers, as well as other adjacent concrete and asphalt surfaces (off-site disposal of TSCA waste and non-TSCA waste (Table 2-1); noncontaminated concrete and asphalt can be crushed and recycled on-site or disposed of off-site)
- Removal of subslab cast iron floor drain piping
- *Removal and disposal of the current stormwater system piping located in the area south of the foundation and under Block F (off-site disposal of TSCA waste soil and TSCA waste concrete piping) (Table 2-1)
- Removal and disposal or recycling of the diesel fuel product pipeline
- *Removal of soil to allow industrial site use (off-site disposal of TSCA and non-TSCA waste soil) (Table 2-1)
- *Treatment of contaminated groundwater (obtained from dewatering) and water that contacts contaminated soil with filtration and granular activated carbon (GAC) and disposal of PCB-contaminated solids and GAC
- Backfilling with clean soil and re-grading
- Construction of gravel access road to water tank, pump house, and trichloroethene groundwater treatment system

- Reconstruction of a stormwater management system to drain post-remediation surfaces and grading
- *Post-removal confirmation sampling and analysis
- *Characterization, transport, and off-site disposal of removed materials
- Site restoration
- At least two years of semiannual groundwater and storm sewer sediment monitoring
- Implementation of institutional controls

1.4 REMEDIATION COMPLETED AT THE SITE

An interim remedial measure for the Block E storm sewer system was completed in 2011 to minimize transport of contaminated sediment to off-site locations (Tetra Tech, 2012d). Accumulated sediment was cleaned from the storm sewers in the northeastern corner and eastern side of Block E; these storm sewers discharge to Outfalls 006 and 008, respectively. Storm sewers within Block E that discharge to Outfalls 005(E) and 005(W) were not included in this effort due to significant blockage from debris and sediment that prevented cleaning (see Figure 1-3). Sediment and debris removed from the storm sewer system were disposed of properly, as was wastewater generated by these actions. A video inspection followed sediment removal, and inlets and manholes were repaired or replaced.

A separate interim remedial measure was conducted to remove an underground storage tank (UST) and associated trichloroethene (TCE) contamination in groundwater in the southeastern corner of the site. Approximately 804 tons of TSCA-regulated soil and 2,384 tons of non-TSCA regulated soil were excavated and disposed of off-site as part of groundwater treatment system installation (Tetra Tech, 2014b). Groundwater treatment for TCE contamination included multi-phase extraction and *in situ* bioremediation.

1.5 PERMITTING

Local and state permits, approvals, and notifications will be required for soil remediation in Block E. A list of the anticipated permits and regulatory approvals and notifications needed to complete this work is in Table 1-2. Activities associated with soil remediation could affect regulated material and/or activity (and therefore require regulatory review and approval), and include ground disturbance, site grading, and disposal of treated groundwater obtained via dewatering.

The project will be reviewed for potential impacts to listed species and critical/essential fish habitats per guidelines from the Maryland Department of Natural Resources. However, the site is mostly paved and has very little habitat for wildlife. The Block E site is inland, and proposed work does not directly affect aquatic habitats or species.

The Maryland Heritage Trust will conduct a project review pursuant to Section 106 of the National Historic Preservation Act, to address potential historical/cultural resources. However, such resources, if present, were likely eliminated by the original construction and subsequent demolition of Building D on Block E.

Concrete removal, contaminated soil excavation, and related construction activities will disturb approximately 14.5 acres. Because grading and ground disturbance will exceed 5,000 square feet, a grading permit will be required (under Article 33 Title 5 of the *Baltimore County Code*) from the Baltimore County Department of Environmental Protection and Sustainability (DEPS) Stormwater Engineering Department, as well as an erosion and sediment control plan that must be approved by both the Baltimore County Department of Environmental Protection and Sustainability and the Baltimore County Soil Conservation District (SCD). A stormwater management plan approved by Baltimore Department of Environmental Protection and Sustainability will be required as much of the stormwater management system is being removed and replaced. However, because existing impervious surfaces will be eliminated and replaced with pervious surfaces, with the exception of an access road to the water tank and groundwater treatment system, water quality of stormwater runoff will be substantially improved by the remediation project.

An erosion and sediment control plan will be submitted to the Baltimore County Soil Conservation District (BCSCD), prepared in accordance with the Maryland Standards and Specifications for Soil Erosion and Sediment Control (MDE, 2011) and the Baltimore County Urban Policy and Guidelines Manual (BCSCD, 1999). The BCSCD review of erosion and sediment control plans will be coordinated with and incorporated into the Baltimore County review of the stormwater management variance and grading plans.

Because an area greater than one acre will be disturbed, a “Notice of Intent” application for a “Construction General Permit” for stormwater associated with construction will have to be submitted to MDE, along with an erosion and sediment control plan to be approved by BCSCD. Work within the tidal buffer will be identified and mitigated, as needed.

Excavated soil will be stockpiled and/or loaded directly into trucks prior to transport to the disposal facility, backfill will be delivered on-site and graded, and concrete will be cut and crushed on site prior to reuse or disposal. All of these activities can generate fugitive dust; therefore, mitigation measures for particulate matter will be necessary to ensure compliance with Maryland’s *Code of Maryland Regulations* (COMAR) 26.11.06.03D.

Contaminated water from dewatering and stormwater management will be treated on-site and discharged to the local Baltimore County publicly owned treatment works (POTW). Discharging water to a POTW will be subject to a permit issued by the Baltimore County Public Works Department under *Baltimore County Code*, Article 20, Title 5, Section 114, “Industrial Wastewater Discharges.” Details for water management and disposal are in Section 2.4.6.

Block E is within the Chesapeake Bay Critical Area. An area of approximately one acre in size contains trees that constitutes protected forest area. It is anticipated that mitigation will be required on a 1:1 ratio by the Baltimore County Environmental Impact Review Department. Mitigation may occur on Tax Block E or may be completed elsewhere on the Middle River Complex, completed off Lockheed Martin property at an alternate location within the Chesapeake Bay Critical Area, or achieved via fee payment as directed by Baltimore County. Additionally, a segment of storm sewer replacement extending from Block E into Block F is in the Chesapeake Bay Critical Area Buffer and will require approval from the Baltimore County Department of Environmental Protection and Sustainability under *Baltimore County Code* Article 33, Subtitle 2.

A Baltimore County Department of “Right-of-Way Improvement Agreement,” which is required for any work in a public right-of-way, will be needed to replace the storm sewer extending beneath the Chesapeake Park Plaza roadway and remove soil in the median of Chesapeake Park Plaza.

An “Airport Zoning” permit (MAA-010) may also be required from the Maryland Aviation Administration (MAA) to allow use of a high crane during excavation because the remedial activity is near Martin State Airport.

A “Water Well Abandonment-Sealing Report” must be completed and submitted for each abandoned monitoring well. An “Application for Permit to Drill Well” form must be prepared and submitted before each new monitoring well is installed, and after installation is complete, a “Well Completion Report” must be prepared and submitted for each well. These forms are submitted to the County and to MDE.

SECTION 2
REQUEST FOR A RISK-BASED DISPOSAL APPROVAL

Lockheed Martin Corporation (Lockheed Martin) is submitting this risk-based disposal approval application (RBDAA) in accordance with 40 *Code of Federal Regulations* (CFR) Part 761.61(c). This RBDAA seeks approval to allow the removal and off-site disposal of polychlorinated biphenyl (PCB)-contaminated soil, storm sewer sediment, and concrete, and associated remediation-related material such as granular activated carbon (GAC) from Block E of the Middle River Complex (MRC). The following sections of this request provide information required under 40 CFR §761.61(a)(3)(i)(A)–(D). Information required per 40 CFR §761.61(a)(3)(i)(E) is provided in Section 4.

2.1 NATURE OF CONTAMINATION

- *40 CFR §761.61(a)(3)(i)(A): The nature of the contamination, including kinds of materials contaminated.*

PCBs are the primary constituents of concern in surface soil (zero to two feet below the soil surface), subsurface soil (deeper than two feet below the soil surface), concrete, storm sewer pipe, storm sewer sediment, and storm sewer pipe bedding. Aroclor 1260 is the most commonly detected PCB, but in one area (the Southeastern Area) the predominant PCB is Aroclor 1254.

Figure 2-1 (Appendix A) depicts the extent of surface soil sampling and PCB concentrations exceeding PRGs developed in the RRA in Block E. (See Section 2.3 for details of sampling locations and extent of contamination.) PCBs in surface soil are found over broad areas in Block E but are primarily located near three former transformer rooms and in the southeastern corner of the Block E. PCB fluids apparently were used in both the transformers and cables associated with these rooms. The source of PCB in outdoor areas, and away from these rooms, is unknown. The maximum PCB concentration in surface soil is 5,300 milligrams per kilogram (mg/kg), while the average PCB concentration is 50 mg/kg.

PCBs in subsurface soil are concentrated in four areas: former Transformer Room 2, former Transformer Room 3, former Transformer Room 4, and the Southeastern area. Subsurface soil data is also grouped into individual datasets according to these areas for the residual risk analysis (Tetra Tech, 2018c) (See Section 2.4). Figure 2-2 depicts the extent of subsurface soil sampling and concentrations. (See Section 2.3 for details of sampling locations and extent of contamination.) As noted above, PCB-fluids were used in both the transformers and cables associated with the former transformer rooms. The source of PCBs in outdoor areas, away from these rooms, is unknown. At former Transformer Room 2, the depth of PCB-contaminated soil to be removed is 16 feet below the soil surface, with the maximum PCB concentration of 9,400 mg/kg and the average concentration of 129 mg/kg. At former Transformer Room 3, the depth of PCB-contaminated soil to be removed is 18 feet below the soil surface, and the maximum and average concentrations of PCBs are 7,700 mg/kg and 224 mg/kg, respectively. At former Transformer Room 4, the depth of PCB-contaminated soil to be removed is 20 feet below the soil surface, and the maximum and average concentrations of PCBs are 37,000 mg/kg and 441 mg/kg (respectively). In the Southeastern Area, the depth of PCB-contaminated soil to be removed is six feet below the soil surface, with respective maximum and average PCB concentrations of 3,500 mg/kg and 22 mg/kg. Note that unlike the other areas, Aroclor 1254 is the predominant PCB in the Southeastern Area.

The remaining soil sampling locations that were not in any of the four main areas discussed previously were also evaluated. The maximum and average PCB concentrations in the remaining areas are 22 mg/kg and 0.16 mg/kg, respectively.

Concrete samples were collected from over 100 locations on the foundation slab. (See Section 2.3 for details of sample locations and extent of contamination.) The maximum PCB concentration detected in concrete is 3,800 mg/kg, and ten sampling results had PCB concentrations greater than 50 mg/kg.

PCBs have been detected in sediment samples collected from storm sewer manholes and inlets. The sediment in some of the storm sewers has been cleaned out. (See Section 2.3 for details of sample locations and extent of contamination.) The maximum PCB concentration detected in storm sewer sediment is 910 mg/kg, and eight sampling results are greater than 50 mg/kg. Concrete sewers are similarly assumed to be contaminated with PCBs, although no samples of the concrete pipes have been collected and analyzed. Because contaminated sediment might have possibly leaked through pipe joints, the pipe bedding of the storm sewers is also assumed to be contaminated, although no samples have been collected.

"Soil piles" refers to soil that is mounded above the slab-grade at the western, northwestern, and north-central margins of the former Building D foundation slab. These piles represent soil that formerly rested against the western building face, where the basement was below ground. The soil had presumably slumped onto the slab or was relocated to piles during building demolition. When defining nature and extent of soil contamination at Block E, these soil piles were considered a unique soil unit because they exist above the foundation grade, do not represent soils underlying the former Building D, and have been largely isolated from other historical environmental impacts in Block E. Aroclor concentrations detected from soil pile sampling did not exceed the Block E preliminary remedial goal (PRG) for Aroclors. The maximum total Aroclor concentration detected in soil piles was 6.4 mg/kg. (See Section 2.3 for details of sampling locations and extent of contamination.)

Shallow groundwater is contaminated with PCBs; however, the United States Environmental Protection Agency (USEPA) maximum contaminant level for PCBs (0.5 micrograms per liter [μg/L]) is exceeded in only one well which is within one of the contaminated subsurface soil areas. PCBs in groundwater will be monitored per the soil remedy groundwater and storm-sewer sediment monitoring plan. Groundwater is also contaminated with 1,2,4-trichlorobenzene (1,2,4-TCB) and other chlorinated benzenes. Chlorinated benzenes and 1,2,4-TCB are being monitored and remediated per a groundwater remedial action plan overseen by the Maryland Department of the Environment (MDE).

2.2 SAMPLING PROCEDURES

- *40 CFR §761.61(a)(3)(i)(B): A summary of the procedures used to sample contaminated and adjacent areas and a table or cleanup site-map showing PCB concentrations measured in all pre-cleanup characterization samples. The summary must include sample collection and analysis dates.*

Soil samples were collected during several investigations between 2003 and 2017. These sampling events are summarized below. Generally, subsurface soil samples were collected using either direct-push technology (DPT) or rotosonic methods. Surface soil samples at sampling locations below concrete were collected using the same equipment as used for subsurface soil sample collection. At locations where surface soil was exposed, samples were collected using a hand auger or trowel. Surface soil sampling results are summarized on Table 2-1, and subsurface soil sampling results are summarized on Table 2-2.

1. The Block E site characterization was conducted in 2003–2005. Continuous soil samples were collected using a four-foot long, two-inch diameter, stainless steel Macrocore sampler fitted with disposable acetate liners (Tetra Tech, 2005b).

2. The Block E soil and storm sewer sediment characterization from 2007 to 2009 collected continuous soil samples using a 2.125-inch outside diameter, four-foot long stainless steel Geoprobe Macrocore sampler containing a disposable acetate liner (Tetra Tech, 2010).

3. The Block E investigation in 2011 collected continuous DPT soil samples using a Geoprobe Dual Tube Soil Sampling System with a 1.5-inch diameter, five-foot long, stainless steel Macrocore sampler fitted with a disposable acetate liner. Samples were collected with a hand auger at an additional 12 shallow soil boring locations (Tetra Tech, 2012a).

4. The Block E investigation in 2012 collected continuous DPT soil samples from shallow borings (~4 feet) using a 1.5-inch diameter stainless steel Macrocore sampler fitted with a disposable liner. For deep borings, samples were collected using the RotoSonic method with a six-inch by eight-inch drill rod/override casing set-up (with temporary casing) to advance drilling to the target depth (Tetra Tech, 2012f).

5. Near the groundwater remediation system, continuous soil samples were collected during the soil investigation in June 2012 using a 1.5-inch diameter, four-foot long, stainless steel Macrocore sampler fitted with a disposable acetate liner (Tetra Tech, 2012c).

6. During the investigation associated with underground storage tanks (USTs) in 2013, soil samples were collected via a dual-tube sampling system, using 2.25-inch- or 3.25-inch-

outer-diameter probe rods as an outer casing and 1.0-inch- or 1.25-inch-diameter inner rods. As this was a UST investigation, samples were analyzed for PCBs as part of a larger analytical suite (Tetra Tech, 2013).

7. During the Block E soil remedial investigation conducted from 2016 through 2017, samples were collected by DPT using a 1.5-inch-diameter, four-foot long, stainless steel Macrocore sampler fitted with a disposable acetate liner. For soil pile-transformer room locations, samples were collected with a sonic drill using a six-inch-diameter steel casing to obtain continuous soil cores by advancing a four-inch-diameter steel casing through the six-inch casing. Samples were collected using DPT at some soil pile locations. Samples were collected in western soil pile locations using a hand auger. (Tetra Tech, 2018b).

Concrete samples were collected during several investigations between 2007 and 2017. These sampling events are summarized below. Generally, concrete samples were collected by drilling or coring into the concrete to remove the top half-inch of concrete. Sampling methods reduced the concrete to dust or small pieces. Concrete sampling results are summarized in Table 2-3.

1. Concrete surface samples were collected at 10 borings during the Block E soil and storm sewer sediment characterization from 2007 to 2009 (Tetra Tech, 2010).

2. During the Block E investigation in 2011, concrete chips (from 0 to 0.1 feet) were pulverized in the field before sending samples to the laboratory (Tetra Tech, 2102a).

3. Concrete samples collected during the Block E investigation in 2012 were obtained by drilling a hole approximately 0.5-inch deep into the concrete surface using a one-inch-diameter carbide drill bit to generate approximately 10 grams of powder (Tetra Tech, 2012f).

4. Concrete samples were collected at a depth of 0-0.25 feet (from the top of the concrete surface) during the Block E soil remedial investigation (from 2016 through 2017). Concrete borings were advanced through the slab surface to the bottom of the concrete using a DPT percussion bit. The DPT percussion bit pulverized the concrete as it drilled, and the concrete powder was collected and homogenized in a sample container (Tetra Tech, 2018b).

Sediment samples from storm sewers were collected during several investigations between 2007 and 2017. The sampling methods for these sampling events are summarized below. Storm sewer sediment sampling results are summarized in Table 2-4.

1. Sediment samples were collected from storm sewer inlets and manholes using a stainless steel scoop during the Block E soil and storm sewer sediment characterization from 2007 to 2009 (Tetra Tech, 2010).
2. Samples collected during storm sewer sampling in 2013 were obtained using a flat, stainless steel scoop (Tetra Tech, 2014b).
3. Sediment samples were collected from shallow catch basins using a hand auger during the 2016–2017 Block E soil remedial investigation (Tetra Tech, 2018b).
4. Samples collected during storm sewer sampling in 2016 were obtained by lowering a clean, disposable, stainless steel spoon with an extended handle into the manholes and inlets (Tetra Tech 2017).
5. Sediment samples were collected during storm sewer sampling in 2017 using a stainless steel scoop on an extended handle (Tetra Tech, 2018a).

Soil, sediment, and concrete samples collected before and up to 2012 were analyzed for PCBs using USEPA Method SW-846 8082. Soil, sediment, and concrete samples collected after 2012 were analyzed using USEPA Method SW-846 8082A.

2.3 SAMPLING LOCATIONS AND EXTENT OF CONTAMINATED AREA

- *40 CFR §761.61(a)(3)(i)(C): The location and extent of the identified contaminated area, including topographic maps with sample locations for samples in the summary table.*

Because of the large numbers of samples collected and analyzed at the site, PCB results are presented separately for surface soil (zero to two feet below ground surface [bgs]), subsurface soil (deeper than two feet bgs), concrete, and storm sewer sediment. Figures 2-1 and 2-2 (respectively, in Appendix A) are simplified figures showing the locations of surface and subsurface soil samples that exceed the surface soil PRGs. Figure 2-3 (Appendix A) shows concrete sampling locations, Figure 2-4 (Appendix A) shows sediment sampling locations in the Block E storm sewer system, and Figure 2-5 (Appendix A) shows soil pile sampling locations.

Table 2-1 (Appendix A) summarizes total Aroclors detected in Block E surface soil. Figures 2-6 through 2-11 (Appendix A) show the surface soil sampling locations that correspond to Table 2-1. Figures 2-12 through 2-16 (Appendix A) are tag maps from the soil remedial action plan (RAP)

(Tetra Tech, 2019c) that show the results of surface soil analyses. Figure 2-1 shows the locations of surface soil samples that exceed the surface soil PRGs and that are to be excavated. Figure 2-17 (Appendix A) shows the locations of surface soil samples in the median of Chesapeake Park Plaza that exceed a residential cleanup goal. The methodology for determining which samples are to be excavated is included in Section 2.4.

The results of the subsurface sampling are presented in a similar manner, but because of the large number of borings and multiple sampling intervals in each boring, the results are difficult to represent pictorially. Table 2-2 (Appendix A) summarizes total Aroclors detected in subsurface soil. Figures 2-18 through 2-23 (Appendix A) show the subsurface soil sampling locations that correspond to Table 2-2. Figures 2-24 through 2-28 (Appendix A) are tag maps from the soil RAP (Tetra Tech, 2019c) that show the results of the deepest subsurface sample in each boring that exceeds the subsurface soil PRG. Figure 2-2 is a simplified figure that shows the locations of samples that exceed the PRG and are to be excavated. The methodology for determining which samples are to be excavated is included in Section 2.4. The sampling results from intermediate depths are depicted in the figures in Appendix B. In these figures, a software program (LeapFrog) was used to interpolate the results to generate isoconcentration contours for depth intervals of two feet.

Table 2-3 (Appendix A) summarizes total PCBs detected in concrete samples. Figure 2-3 shows the concrete sample locations that correspond to Table 2-3. Figure 2-29 (Appendix A) is a tag map that shows the results of concrete samples, and highlights those that exceed the Toxic Substances Control Act (TSCA) disposal criteria of 50 mg/kg. Because the entire foundation slab will be removed, additional delineation based on other criteria, such as industrial exposure, is not needed.

Table 2-4 (Appendix A) summarizes total Aroclors detected in storm sewer sediment samples. Figure 2-4 shows the storm sewer sample locations that correspond to Table 2-4. Figure 2-30 (Appendix A) depicts sediment sampling results in the storm sewers. Sediment has already been removed from some of the storm sewers on the eastern side of Block E and within Block F south of Block E, as noted on the figure. The concentrations shown on Figure 2-30 are only for those samples that remain or that were collected after the sediment removal (except as noted).

Table 2-5 (Appendix A) summarizes total Aroclors detected in soil pile samples. Figure 2-5 shows the soil pile sample locations that correspond to Table 2-5. Because PCB concentrations in soil piles did not exceed the PRG, no tag map was created.

2.4 SOIL REMEDY APPROACH TO REMOVE PCBS

- *40 CFR §761.61(a)(3)(i)(D): The cleanup plan for the site, including schedule, disposal technology, and approach. This plan should contain contingencies to be used if unanticipated higher concentrations or wider distributions of PCB remediation wastes are found or other obstacles force change in the cleanup approach.*

The soil remedy will be conducted to achieve the remedial action objectives (RAOs) identified for the site. The risk-based PRGs for Block E soil were developed to meet the RAOs. The findings of the remedial investigation and risk assessment (Tetra Tech, 2018b), which are described in the RAP (Tetra Tech, 2019c), were used to develop the RAOs. The following RAOs have been defined to remediate PCBs in Block E soil:

- RAO 1: Reduce site-related chemicals of concern in Block E soil to not exceed a cumulative human health cancer-risk limit of 1×10^{-5} and a cumulative noncarcinogenic hazard index of 1 for industrial and construction workers.
- RAO 2: Prevent transfer of PCBs to the extent practicable from surface soil and storm drains to discharged stormwater at concentrations that would affect the sediment remedy.
- RAO 3: Prevent to the extent practicable transfer of PCBs from soil to groundwater at concentrations above the maximum contaminant level (MCL) of 0.0005 milligram per liter (mg/L) for total PCBs as demonstrated by a groundwater monitoring plan.

The extent of soil excavation was determined using residual risk analysis (RRA) and is described in detail in the Block E RRA (Tetra Tech, 2018c). The RRA identified the Block E locations targeted for remediation that would mitigate risks posed to the hypothetical industrial worker (exposed to surface soil) and construction worker (exposed to surface and subsurface soil) to less than target levels of cumulative cancer risk level of 1×10^{-5} and cumulative hazard index of 1. PCB results in the datasets for surface soil and four separate subsurface soil areas were ranked in order from highest concentration to lowest concentration. Then, the highest concentration was replaced by a clean value (less than detection limit) and the risks were recalculated. This process was repeated until the target risk levels were reached. As a margin of safety, samples with PCB concentrations greater than 25 mg/kg in surface soil and 100 mg/kg in subsurface soil were also replaced. Limits of excavation were then drawn to encompass the locations of the replaced samples. Three-dimensional modelling of subsurface soil sampling results was also considered to select the lateral limits of excavation in subsurface soil remediation areas.

The remedial approach for soil removal at Block E is described below. Figures 2-31 through 2-40 (Appendix A) are the tag maps discussed earlier in this document with the excavation outlines superimposed on them. Figure 2-41 (Appendix A) depicts an overview of the design from the design drawings. Most activities are related directly to the excavation and off-site disposal of the PCB-contaminated soil. However, some activities are unrelated to the PCB remediation, and are being performed as part of the overall remediation of Block E. Contingency plans are discussed in Section 2.6. Design drawings and specifications from the final design are included in Appendices C and D, respectively.

2.4.1 Health and Safety

All soil remediation work will be done in accordance with a site-specific health and safety plan prepared under 29 *Code of Federal Regulations* (CFR) 1910.120 (Hazardous Waste Operations and Emergency Response) and applicable sections of 29 CFR 1926 (Safety and Health Regulations for Construction). The health and safety plan presents the programs, processes, and work practices to be followed for the planned tasks and operations. The health and safety plan will be prepared by the selected construction contractor and approved for use by Lockheed Martin. Elements of the plan will include:

- Site history
- Scope of work to be performed
- Project personnel and responsibilities
- Identification of the Occupational Safety and Health Administration (OSHA) Competent Person for excavation activities
- List of the site-specific training and medical monitoring requirements
- List of personal protective equipment to be used for each task
- Activity Hazard Analyses, detailing task specific hazards and safe work practices
- List of potential chemical hazards and the appropriate controls
- Monitoring plan for the hazards, including air monitoring

- Site control plan, including temporary fencing and site security measures to control the potential for contaminant transfer from work zones to clean zones
- Spill containment plan
- Emergency action plan

The plan will address specific activities, such as contamination avoidance, hazard avoidance, personnel decontamination, equipment decontamination, fall protection at excavations, heat and cold stress, first aid, confined space entry, mechanized equipment operation, portable tools, and excavations. All on-site workers will certify that they have completed OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and then annual 8-hour refresher course, and that they have completed site-specific training for hazard control and contamination-avoidance principles. All workers will be required to read and acknowledge that they will perform their work in a manner consistent with their training and with the health and safety plan. Further, all work will be overseen by an appropriately qualified health and safety officer who will be on site during all operations, and who will have authority to make any necessary revisions to plans and practices that may arise to protect worker health and safety.

2.4.2 Radiological Testing

Radiological surveys will be performed during the remedial action to ensure that radiological materials or residual radiological contamination, if encountered, are properly removed and disposed of. Radiological surveys will also verify that no radioactive materials above release criterion remain, thereby releasing the site from post-remediation radiological restrictions. The following activities will support remediation activities:

- work-area exposure surveys for personnel protection during demolition
- work-area radiation surveys for personnel protection during demolition
- work-area air monitoring for personnel protection during demolition
- contamination surveys of piping, concrete, soil, and debris to identify/segregate materials and determine disposal options
- building slab and foundation demolition
- soil removal

- final status survey after removal of the building structure to verify that the site can be released with no restrictions
- contamination surveys on equipment and materials during decontamination activities and for unconditional release from the site
- report results from field activities

The subsurface soil beneath the Building D slab consists of imported backfill material and native soil graded during pre-construction site preparation. Hundreds of soil samples and soil cores have been screened and approximately 180 samples have been analyzed since 2013. All radioactive compound concentrations collected during soil sampling, except for two concentrations in core borings, fall within the variable ranges of natural background concentrations. Note that this activity does not involve management of PCB remediation waste.

2.4.3 Soil Pile Removal

The soil piles on the northern and western sides of the former Building D foundation were sampled during the remedial investigation (Tetra Tech, 2018b). No PCB concentrations detected were greater than the PRG. However, the PRG for benzo(a)pyrene equivalents (BaPEq) was exceeded at five shallow soil sampling locations. BaPEq-impacted soil will be excavated and disposed of off-site, and the balance of the soil piles that meets the requirements of the Soil Management Plan (Tetra Tech, 2019b) may be used as backfill. Prior to removal of the soil piles, a temporary retaining wall will be installed near the western end of the former building foundation to stabilize the Tilley Chemical Company property during soil pile removal. A retaining wall is not needed along the northern side of the slab because sufficient space is available to grade the slope to a stable configuration while removing soil from the slab. Note that this activity does not involve management of PCB remediation waste (see Figure 2-42 [Appendix A]).

2.4.4 Concrete and Floor Slab Demolition

Although Building D was demolished in the early 1970s, the building's foundation and basement floor slab, as well as other concrete and an asphalt access roadway, remain in Block E. The floor slab measures 1,000 feet by 400 feet and consists of concrete with ceramic tiles overlying the concrete in several locations. The concrete slab contains construction or expansion joints and has cracks between and within the slabs.

All surface concrete and pavement in Block E (an estimated 28,000 tons) will be removed during the remedial action (see Figure 2-43 in Appendix A). This includes the entire floor slab of former Building D and other concrete within Block E, such as roadways and paved areas. Foundation slab footers and piles will be removed where they interfere with the excavation; deep piles will be cut at the bottom of the excavation. The work will likely progress in stages, such that after slab removal, soil excavation, and confirmation sampling in one area has been completed, backfilling will begin while slab removal and excavation begin in another area. This will minimize the area of PCB-impacted soil exposed to stormwater and minimize the subsequent volume of water to be treated. It will be necessary for some concrete to be disposed of at a permitted facility as TSCA waste.

The concrete slab will be removed in pieces in a manner to preserve the integrity of the underlying piping to facilitate radiological screening and sampling of the concrete and underlying floor drains. All concrete previously tested and having elevated PCB concentrations (i.e., PCB concentrations above 50 mg/kg), including pile caps in the excavation areas, will be segregated for disposal at a TSCA approved facility. The remaining concrete foundation will be visually surveyed for staining and will be surveyed for radiological materials per the radiological remediation plan (Tetra Tech, 2019d). All stained concrete will be segregated in a storage area separate from non-impacted material and will be characterized for appropriate handling and disposal or recycling. All concrete with radiological material concentrations above the *Atomic Energy Commission Regulatory Guide 1.86* levels for surface contamination for isotopic uranium will be segregated in a storage area separate from non-impacted material. Residual concrete and asphalt adjacent to the foundation slab will also be removed as part of removing the concrete foundation.

Vertical and lateral floor drain pipes in the slab have been abandoned since the demolition of the building, and many were historically plugged with concrete. The floor drain system (part of the storm drain system), as it is encountered during slab demolition, will be visually inspected to determine if it has been damaged. Radiation and contamination surveys of exposed drain system areas and surrounding soil will determine if conditions are safe before removal of the next section of concrete begins. If an area of elevated radionuclide activity is found after slab removal, it will be covered and secured to prevent the spread of contamination until further investigation and, if necessary, remediation can be performed. These areas will be barricaded to prevent the entry of unauthorized personnel. This protocol will be repeated for each section of slab removed.

In areas where the slab has been removed, the floor drain system and surrounding soil will be surveyed under the supervision of a health physicist before other personnel enter the area. The results of the radiological survey will determine how materials will be packaged, removed, staged, and disposed of. Care will be taken to remove as little dirt as possible when materials such as concrete or floor drains are removed. If no radiological contamination above the limits identified in the radiological remediation plan is found, material will be removed and disposed of as nonradioactive waste. If concrete is not stained or contaminated by petroleum hydrocarbons, it will be broken up, temporarily stored, and crushed and recycled on-site, recycled off-site, or disposed of off-site as described in Section 2.4.9.

Radiological contamination in the underlying soil is not expected, provided the floor drain piping is removed in accordance with procedural guidance. However, unknown piping failures might have occurred in the past, so coverage surveys, as described in the radiological remediation plan, will be performed to monitor for this possibility. Potentially contaminated soil and debris will be removed, staged, and sampled for analysis, and, if necessary, disposed of as low-level radioactive material. This material will be bagged, wrapped, or containerized before being moved to the staging area, to prevent the spread of contamination during movement. Staging areas for these materials will be covered with disposable materials (e.g., tarps, plastic) before use and designated/barricaded as radiological areas until the material has been removed for disposal.

Monitoring wells within the footprints of the concrete removal areas will be abandoned prior the demolition activity. Monitoring wells outside of the concrete removal areas along with injection wells and piping associated with the groundwater treatment system in the southeastern area will be protected from damage. Refer to Figure 2-41 (Appendix A) for the status of each existing monitoring well during remedial action. The groundwater and storm sewer monitoring plan contains the monitoring well network that will be established after remediation to verify RAO No. 3 is achieved.

2.4.5 Current Storm Sewer System and Product Pipeline Removal and Disposal

Storm sewer lines impacted with PCBs in the current southern portion of Block E, along with surrounding contaminated soil, will also be removed. Figure 2-43 shows the storm sewers that will be removed. During removal of the storm sewer along the eastern side, the groundwater treatment system discharge pipeline, fire protection water lines, and electrical and communication service must be protected. A new stormwater management system, as described in Section 2.4.7, will be designed and constructed as part of the remediation program. The new stormwater management system will include swales and conveyance areas. If existing data suggests that potentially PCB-contaminated soil that could be eroded by stormwater from the bottom of the new swales and conveyance areas, then the bottom of the swales and conveyance areas will be replaced with at least six inches of clean backfill. Vegetation and/or riprap will be used to stabilize the bottom of the swales and conveyance areas. After the existing storm sewers and soil are removed and confirmation sample results are evaluated, the trench will first be filled with any soil excavated from above the storm sewers that is suitable for reuse and then backfilled to grade with clean soil.

The abandoned product pipeline is a two-inch-diameter pipe that runs underground from a former 500,000-gallon fuel oil aboveground storage tank (AST) previously located in Block E that connected to the MRC power plant in Block I. Approximately 1,500 feet of the pipeline is in Block E, but approximately 200 feet have already been removed. The location of the pipeline along the western and southern boundary of Block E is shown on Figure 2-43. Once the pipeline exits Block E, it runs through a tunnel that historically connected Building D with Building C in Block I. The underground portion of the product pipeline in Block E will be removed as part of the remedial alternative under the oversight of an MDE Oil Control Program (OCP) inspector, and in compliance with *Code of Maryland Regulations* (COMAR) Title 26.10. Note that this product pipeline activity does not involve management of PCB remediation waste.

2.4.6 Excavation, Dewatering, and Water Treatment

Excavation

Excavation of PCB-impacted soil identified in the Block E soil RAP, is the main element of the TSCA cleanup for Block E. Erosion and sedimentation controls specified in the grading plan (to be approved by the Baltimore County Soil Conservation District [BCSCD]) will be installed, then inspected by the county before excavation begins. The county will issue a grading permit upon approval of the installation. The excavation of Block E and the Chesapeake Park Plaza median can proceed once that, and all other permits associated with this aspect of the project, have been issued. Per the 100% design of the Block E RAP (currently being developed) and soil remedy, approximately 34,000 cubic yards of soil in Block E have been identified for excavation and disposal (see Figure 2-42). Note that although unsupported excavation walls were assumed during development of this alternative, the sheet pile approach will be implemented for the subsurface soil excavations, as shown on Figure 2-42. Soil will be excavated using conventional equipment such as excavators and front-end loaders. Removal of soil in some areas to depths below the water table (approximately seven feet below soil surface) is required. Also, due to subsurface structures (i.e., concrete footings and sub-slab piping) that impede rainwater infiltration, pockets of shallow, undrained water are expected to be encountered below the slab. Therefore, dewatering of both shallow and deep excavations is planned.

The removal limits are based on the RAP (Tetra Tech, 2019c). The final limits of removal for the surface soil excavations will be determined after post-removal confirmation sampling of excavation side walls and bottoms has been completed, and the residual risk has been re-calculated per RRA guidelines using confirmation sampling data. The final limits of removal for the sheet-pile-supported subsurface soil excavation were based on delineation samples collected from borings along the lines of the proposed sheet piles prior to their installation (see Appendix E). Post-excavation bottom confirmation samples will be collected in the same manner as for the surface soil excavations. As for surface soil, the residual risk will be re-calculated per RRA guidelines using the delineation and confirmation sampling data. Block E soil with PCB concentrations greater than 50 mg/kg will be removed and disposed of at a TSCA-permitted hazardous waste facility.

Dewatering

Subsurface soil removal areas will be dewatered to facilitate excavation and backfilling. Stormwater that flows into the excavations or contacts possibly impacted soil and water from excavated soil stockpiles will also be collected and treated. Based on the excavation depth and soil types, a dewatering rate up to 25 gallons per minute (gpm) is required.

Runoff from active work areas around the excavations where PCB-contaminated soil is being handled will be captured by diversion fences and treated (see Section 2.4.14). A combination of collection sumps and excavations will be used to capture water and prevent off-site migration per erosion and sediment control requirements. Excavation of the areas will be performed sequentially (see Section 2.5) so that contact of active areas by precipitation is minimized. Soil exposed at ground surface after remediation or removal of the concrete slab in areas where remediation is not required will be covered with backfill as soon as possible to eliminate erosion of soil that is potentially contaminated with PCBs and to prevent spread of contaminated soil from vehicle traffic and activity.

Because the stormwater runoff rate could be greater than the dewatering flow rate, the stormwater will be pumped to frac tanks for temporary storage, as needed, followed by treatment at a lower flow rate.

Water treatment

Under dry weather conditions, the maximum dewatering flow rate is estimated to be 25 gpm. After significant rainfall, the collected runoff could exceed that rate, and the system is designed to treat an additional 25 gpm rate. As described below, water treatment entails two parallel treatment trains.

A total sanitary-sewer discharge rate (from all sources) of 72,000 gallons per day (gpd) (50 gpm) will be requested from Baltimore County. Water from the excavations will be pumped through hoses or pipes, with secondary containment, to the treatment system. Water will be pumped to two frac tanks in series to remove settleable solids. These solids include soil fines and iron compounds that will likely precipitate upon contact with air. The pH of the water in the second frac tank will be monitored. Clarified water will flow into a third frac tank that provides additional equalization, surge storage, and a consistent static head for the treatment system feed pump.

During dry weather, water from the collection sump will be pumped by a small pump (pumping rate of 10 to 25 gpm) to the settling frac tanks described above. During major rainfall, a high-volume pump will convey the water to the runoff storage frac tanks, if necessary. After the rainfall ends, the water would be treated as described below.

Each of the two parallel treatment trains will be sized for 25 gpm. One train will remain in operation to treat water from dewatering. The other train will be on standby to treat runoff when/if necessary. The redundant system will also provide some flexibility in system maintenance or malfunction.

The first step in water treatment is filtration using bag filters. The bag filters will remove solids that could clog granular activated carbon (GAC) in the subsequent step. PCBs are also likely to be sorbed to the soil solids, so filtration will also remove PCBs. The filtration system will contain two sets of filters, one online and a second on standby to minimize disruption of treatment. When the filter bags reach capacity, they will be taken offline for replacement, and the standby set will be put online. Each set consists of two filter housings with a mesh size of 25 microns in the first housing and a mesh size of 5 microns in the second housing.

Filtered water will be treated with GAC to reduce concentrations of organic compounds, primarily PCBs, 1,2,4-TCB, dichlorobenzenes, chlorobenzenes, and trace amounts of chlorinated ethenes, such as TCE. Two 4-foot-diameter tanks, each containing 2,000 pounds of GAC, will be placed in series. The discharge from each GAC tank will be sampled and analyzed routinely (at least weekly) to monitor for breakthrough and in accordance with the permit for reporting to the Baltimore County POTW.

The GAC-treated water from dewatering will then pass through an inline mixer where caustic (e.g., sodium hydroxide) will be added to increase the pH to the POTW discharge range (pH of 6 to 10), if needed. Following pH adjustment, the water will flow into an effluent storage tank.

From the effluent storage tank, the water will be pumped into the existing 2-inch-diameter high-density polyethylene (HDPE) pipeline to the sewer associated with the POTW system. The effluent storage tank will provide level control for the effluent discharge pump.

At least two empty frac tanks will be available for diversion of untreated dewatering water if the GAC system is out of service. Water from the settling tanks or from the excavation will be directed to these offline tanks if the GAC system is offline.

Solids trapped by filtration will be analyzed and, depending on the results, transported to an approved facility for disposal. GAC used to treat the excavation and stormwater will also be characterized and disposed of appropriately. Permits required for the remedial action are described in Section 1.5 and the Water Management Plan describing the treatment system in more detail is provide in Appendix D.

2.4.7 Post-Construction Stormwater Management System

To achieve RAO No. 2, the remedial alternative entails building a new stormwater management system to replace existing Block E storm sewers. A design for site grading and stormwater conveyance (see Figures 2-44 and 2-45, respectively, in Appendix A), and a final stormwater study to assess site drainage is part of the final design. The existing storm sewer system will be replaced with surface swales and pipelines to accommodate stormwater requirements associated with a 100-year-storm, with considerations given to higher intensity events, such as a 500-year-storm. Although most of the surface will be replaced by clean backfill, some areas potentially impacted by PCBs that are not subject to this remedial action but do not meet the sediment cleanup criterion will remain, and can be exposed to stormwater in swales and conveyance areas such that soil could be eroded and discharged. In those areas, at least six inches of soil below the swales and conveyance areas will be replaced with clean backfill underlain with geotextile (see Figure 2-45).

2.4.8 Confirmation Soil Sampling

Post-removal confirmation samples will be collected from the excavation bases and the surface soil excavation sidewalls of the soil removal areas before backfilling. Sidewall samples will not be collected if sheet piles are used to support an excavation, as this data will be collected before the sheet pile wall is installed.

The results will be used in the RRA to confirm that recalculated 95% upper confidence limit (UCL) exposure-point concentrations continue to result in a cumulative residual cancer risk at or below 1×10^{-5} and a hazard index less than 1. The margins of safety used in the original RRA (25 mg/kg PCBs for surface soil and 100 mg/kg PCBs for subsurface soil) will also be used. A sample will be collected per each approximately 25-foot segment of sidewall. If sidewalls extend deeper than 5 feet, sidewall confirmation samples will be collected from the 0 to 2-foot interval and then from every 5-foot interval below that. Base samples will be collected from approximately every 625-square-foot base area. All samples will be grab samples since volatile organic compounds (VOCs) are part of the analytical suite for verification of PCB removal.

Base and sidewall samples will be analyzed for PCBs using USEPA Method 8082A and 1,2,4-TCB using USEPA Method 8260B. Analyses for polycyclic aromatic hydrocarbons (PAHs) using USEPA Method 8270 will be performed at limited locations where these contaminants are being remediated per the RRA.

Confirmation samples collected from the cast iron floor drains and storm sewer piping excavations will be collected from the bases of the trenches and analyzed for PCBs. Samples will be collected from the bottom of the trenches at 50-foot intervals.

Post-removal confirmation samples will also be collected from the base and sidewalls of the product pipeline excavation and analyzed to verify that residual total-petroleum-hydrocarbon diesel-range organics (TPH-DRO) concentrations in remaining soil are less than the MDE OCP residential-cleanup goal of 230 mg/kg. The compliance division of the MDE OCP will be notified of the planned pipeline removal 30 days before excavation. Confirmation sampling requirements and results could be subject to OCP review and approval, and such requirements would be set forth by OCP officials upon notification. Preliminary discussion with OCP staff suggests that confirmation soil samples collected from the base and sidewall will likely be required every 50 feet along the length of the pipe within Block E. This activity is not part of the PCB remediation.

2.4.9 Waste Characterization and Disposal

Much of the remediation includes TSCA regulated waste that has already been shown to have concentrations of PCBs greater them 50 mg/kg during the characterization phase of the project. Some soil in the excavation areas and concrete debris that did not exceed 50 mg/kg must be sampled and analyzed for waste disposal characterization as required by the selected Subtitle D waste disposal facility. Sampling frequency might be increased depending on the volume of soil to be removed and waste disposal facility requirements. Samples will be analyzed by the toxicity characteristic leaching procedure (TCLP) and for parameters required by the waste disposal facility.

Stockpiles of excavated soil and contaminated materials will be managed on 20-millimeter (mil) (minimum or equivalent, such as doubled 10-mil plastic) polyethylene plastic (high density polyethylene or linear low-density polyethylene) to prevent contamination of surface soil/storage materials. The material used under the stockpile will either be a continuous product, or it will include appropriately sealed overlap seams to prevent leakage. The stockpile will be managed appropriately to minimize dust and erosion. Excavated soil and materials must be stockpiled on a clear surface free of anything that may serve to puncture or otherwise damage the plastic. The polyethylene sheeting will be bermed around the edges to prevent infiltration of stormwater, exfiltration of leachate, or transport of contaminated soil by stormwater. If excavated soil contains free liquids, the base of the temporary stockpile will be sloped to create leachate collection points. All leachate generated from the stockpiles will be collected and treated in the onsite water treatment system. Routine accumulation area inspections will include inspection of liners and berms for signs of wear and tear or indication of leaks. If leaks or wear are discovered, corrective actions will be taken to address and correct the identified substandard condition. Stockpiles of excavated soil that contain PCB contamination greater than 50 mg/kg will be covered when not in use for soil loading or unloading.

In an exception to 40 CFR 761.65, stockpiles of debris will not be covered because of rebar projections from concrete and irregular surfaces of concrete and other debris. Workers placing the cover on the debris piles would be at great risk of injury due to the irregular and unstable surfaces.

Additionally, protrusions will likely tear covers and only a minimal amount of soil adheres to the debris.

Excavated soil will generally be loaded for transport for off-site disposal after waste characterization is complete and the waste disposal facility has accepted the waste. The transportation method to the disposal facility (e.g., truck, rail, or barge) will be determined by the selected construction contractor. Soil identified during pre-design delineation sampling as having PCB contamination greater than 50 mg/kg will be disposed of at a TSCA-regulated facility approved by Lockheed Martin; the tentatively selected facility is Chemical Waste Management Emelle, Alabama. The remaining removed soil will be disposed of as nonhazardous waste at an approved Subtitle D landfill or recycling facility approved by Lockheed Martin (tentatively selected facility as the King George Landfill located in King George, Virginia). Approximately 35,000 tons of soil and debris will be excavated and transported to the selected facilities during this remedial action. The actual disposal facilities will be selected by the construction contractor.

Approximately 28,000 tons of concrete will be removed and disposed or recycled offsite or recycled on-site as part of the selected remedy. Following radiological testing, concrete will be disposed of or recycled as follows:

- If contaminated, concrete will be transported to a selected facility as follows:
    - Concrete with PCB concentrations greater than 50 mg/kg would be disposed of at a TSCA-approved facility (approximately 3,000 tons).
    - Concrete and asphalt with PCB concentrations less than 50 mg/kg or unsuitable for recycling (for example, due to staining) would be disposed of at a nonhazardous waste landfill (approximately 800 tons).
- If noncontaminated, concrete may be broken on-site with crushing equipment and may be used on-site as backfill (approximately 24,000 tons). Alternatively, the concrete would be broken up on-site and transported off-site for disposal or recycling.

Air quality during soil and concrete handling would be evaluated using a combination of direct observation and perimeter fugitive dust and VOCs sampling/monitoring stations. Water sprays would be used to control fugitive dust.

Trucks will be loaded continuously during working hours, anticipated to be 10 hours per day and five days per week. The number of trucks operating at the site might vary depending on availability. Approximately two to three trucks per hour could be filled using direct-load techniques. Storm sewer piping, concrete, steel, and other construction/demolition materials resulting from the removal of the former structure's foundations will be cleaned/decontaminated (as appropriate) and subsequently either crushed and recycled on-site as backfill or disposed or recycled at an off-site facility permitted to accept such materials.

All transport vehicles will have a cover placed over the top of the material that is sealed before the vehicle leaves the operations area to prevent loss of material during transport. All vehicles transporting material offsite for disposal will be screened for radioactivity and, if loading operations cannot be conducted cleanly, will travel through a decontamination pad for removal of material before leaving the operations area. Any decontamination water will be collected and treated in the excavation dewatering treatment system. Vehicles will be placarded in accordance with United States Department of Transportation regulations and USEPA and MDE hazardous waste regulations. Truck safety systems (e.g., brakes, signal lights), covering, gates, and hauling weight will be checked before the truck departs from the site. Trucks will exit the site directly onto Chesapeake Park Plaza and follow the routes shown on Figure 2-46.

2.4.10 Backfilling

Excavated areas will be backfilled after completion of post-removal confirmation sampling and excavation dewatering. Areas where the concrete and pavement has been removed will also be backfilled to the final contours per Figure 2-44 (Appendix A). Additional fill (at least six inches) over the original grade will be needed for final grading and contouring for stormwater management and for stormwater swales and conveyance areas to prevent erosion of soil with PCB concentrations greater than the sediment criterion (see Section 2.4.7). Clean backfill soil will be obtained primarily from an off-site borrow source and will be similar in grain size to the removed soil, as appropriate. The estimated quantity of backfill needed is 63,000 tons, which may be offset by using onsite recycled concrete as backfill. The portion of soil piles not impacted by BaPEq may be used as backfill as it meets the requirements of the Soil Management Plan for Blocks E and I

(Tetra Tech, 2019b). Other materials, such as crushed stone, might also be used as backfill. Backfill material acceptance-criteria will be described in the final design.

The off-site borrow source material will be evaluated according to procedures described in the MDE document *Facts about (Voluntary Cleanup Program) VCP—Clean Imported-Fill Material* (MDE, undated). The off-site borrow source will be identified by the selected construction contractor, and its environmental and geologic documentation will be obtained. The environmental and geotechnical properties of the material will be evaluated to determine its suitability for use. If the borrow source is judged acceptable by Lockheed Martin, soil samples will then be obtained and analyzed for chemicals of concern using the methods listed in the Soil Management Plan for Blocks E and I.

The minimum sampling frequency will be as recommended in the MDE clean-fill document and based on the size (i.e., area and volume) of the borrow source. Constituents detected in samples will be compared to MDE cleanup levels, to eastern-(Maryland) region anticipated typical concentrations (MDE, 2008), or to other MDE-approved risk-based concentrations. The off-site borrow source must be approved by MDE before transporting any backfill material onto the site.

Backfill material will be compacted to at least 90% of its maximum dry density. As noted in Section 2.5, the work will progress in stages, such that after slab removal, soil excavation, and confirmation sampling in one area has been completed, backfilling will begin while slab removal and excavation begin in another area.

2.4.11 Restoration

The top six inches of backfill in areas to be restored with vegetation will be medium-textured loam suitable for establishing vegetation (i.e., topsoil). The backfilled and regraded areas, along with other areas disturbed during implementation of the remedial action, will be restored/stabilized using permanent vegetative stabilization practices. Vegetative restoration will consist of surface preparation, fertilizing, seeding with grass or other vegetation, and mulching. A crushed stone road will be built in the southeastern corner to provide access to the water tank, pump house, and groundwater treatment systems. The final grading is shown in Figure 2-44.

2.4.12 Groundwater/Storm Sewer Sediment Monitoring and Site Inspections

The Block E Soil Remedy Monitoring Plan to evaluate the effects of the soil removal on groundwater and storm sewer sediment is provided in Appendix F. This plan includes groundwater and storm sewer sediment sampling locations, analyses, and sampling frequency. These results will also be used to establish that PCB concentrations in groundwater and storm sewer sediment confirm attainment of RAO No. 3 (Section 2.4). Figure 2-47 shows the historical cumulative PCB results for groundwater samples collected from monitoring wells in Blocks E and F. The monitoring plan also includes provisions for annual site inspections to confirm attainment of RAO No. 2.

2.4.13 Institutional Controls

Institutional controls are needed so that site use and activities are consistent with PRGs. MDE will document institutional controls applicable to Block E soil in the "No Further Action" letter that will be issued once the three RAOs have been met. The environmental covenants defined in the "No Further Action" letter will be filed in local land use records and will pass to subsequent property owners as part of the deed documentation. MDE regards all institutional controls as existing in perpetuity unless the related environmental covenants are eliminated or modified by mutual consent of the stakeholders. As part of the "No Further Action" letter and supporting documentation, MDE will present certain environmental covenants that will give stakeholders legal standing to enforce them.

MDE will determine final disposition of any institutional controls. Institutional controls will typically apply to the entire tax block as to be agreed upon by MDE and Lockheed Martin Corporation (Lockheed Martin). As noted, the environmental covenants are issued after the remediation is completed. Based on deed restrictions recorded after remedial actions at other MRC blocks, the following components are anticipated:

- Use of groundwater beneath the site is prohibited.
- Future use of property is limited to industrial use.
- Written notification to MDE is required 30 days prior to planned future excavation (for example, for maintenance of buried utilities).

- Verbal notification to MDE is required within 24 hours of any emergency excavation (with follow-up written report).
- All excavated material shall be thoroughly characterized and properly handled or disposed per analytical results.
- Environmental covenant(s) specific to the subject tax block(s) will be established.
- Block E excavations will be described in an annual report to the USEPA that also includes any other activities pertinent to the site remedies. The description of each excavation will include the location and dates of the excavation, excavated volume, and disposition of the excavated material.

2.4.14 Best Management Practices

Potential impacts during construction of the remedy and during soil removal will be limited by implementing the following measures and best management practices (BMPs) during construction, as appropriate:

- ***Erosion and sedimentation controls:*** Erosion and sediment controls will be installed at the site as they are approved by Baltimore County. The contractor will implement these controls throughout the project and adjust as needed to comply with the grading permit and other agency requirements. Runoff from noncontaminated surfaces will be diverted away from contaminated surfaces and potentially contaminated areas using diversion fences or similar erosion and sediment control structures to minimize the volume of contaminated water that must be collected and treated.

- ***Management of water that has contacted contaminated soil and concrete:*** Stormwater that contacts soil stockpiles, ground surface near active excavations, exposed contaminated soil surfaces, and contaminated foundation slab surfaces, and water draining from stockpiles of soil from the saturated zone will be collected in sumps or excavations, contained, and treated on-site (see Section 2.4.6). Treated water will be sampled to comply with county permit discharge requirements.

- ***Spill prevention controls:*** A spill prevention, control, and countermeasure plan per Maryland state guidelines, if needed, will protect the environment from spills and releases of any hazardous materials or petroleum products. Spill prevention measures will be applied during construction and when transporting excavated soil. Trucks used for soil transport will be equipped with an impermeable liner to prevent leaks. The trucks will be inspected to prevent any spills during transport.

- ***Air, noise, and dust/odor monitoring:*** Dust particles and odors from project activities will be controlled at all times. Dust and odor management can include wetting excavation areas, unpaved traffic lanes, and soil stockpiles; covering trucks loaded with soil and concrete; covering stockpiles with plastic sheeting during inactive periods; and at least daily sweeping during dry weather of any paved on-site truck routes, loader paths, and loading and stockpile areas. Monitoring of fugitive dust and VOCs within the work zone and along the perimeter will evaluate and confirm or trigger the use of best management practices to ensure acceptable conditions exist beyond the work zone. Noise will be controlled by limiting work activities to normal working hours.

2.5 SEQUENCE OF SOIL REMOVAL ACTION ACTIVITIES

Remediation is projected to be performed from March 2021 through December 2021. The sequence and scheduling of work will be determined by the construction contractor after the final design is completed. An anticipated general sequence of activities is described below; however, several steps may be performed simultaneously. In addition, excavation and slab removal will progress in stages, such that after slab removal and soil excavation in one area has been completed, backfilling will begin at that location while slab removal and excavation begins in another area. Work sequencing must minimize the amount of open excavation and carefully control the water that comes in contact with impacted soils. The general work sequence is:

- mobilization of equipment, setup of water treatment system
- site survey
- waste characterization
- placement, and Baltimore County approval, of erosion and sediment controls
- placement of fugitive dust and VOC monitoring equipment
- abandonment of monitoring wells within the footprints of the excavations and foundation slab, and removal of existing salt storage shed
- initial radiological screening and setup of radiological monitoring and controls
- demolition and disposal of the concrete slab and some foundation footers and piles over PCB-contaminated areas. Deep piles will be cut at the bottom of the excavation or pulled out. (Note that slab removal, excavation, and backfilling activities in different areas will overlap.)
- installation of shoring for deep excavations
- continued radiological screening and floor drain removal
- dewatering of excavations, as needed, and treatment of all contact water

- excavation and disposal of PCB-contaminated soil from deep excavation
- post-removal confirmation sampling and analysis (only excavation base sampling in deep excavations)
- backfilling (with clean backfill) of initial excavated areas to minimize dewatering
- concrete removal, and contaminated soil removal in shallow impact areas
- excavation and disposal of contaminated soil from shallow excavations
- backfill placement
- removal and stockpiling of existing soil piles overlying the concrete slab, with disposal of PAH-contaminated portion
- installation of retaining wall on western side of site to facilitate complete removal of the foundation slab
- demolition and disposal of other adjacent concrete and asphalt surfaces including remaining slab (noncontaminated concrete and asphalt can be recycled)
- removal and disposal or recycling of the product pipeline
- excavation and disposal of PCB-contaminated soil, and subsequent backfilling, in the median of Chesapeake Park Plaza
- removal and disposal of designated storm drains in Block E and Block F, and subsequent backfilling
- installation of new storm drains in Block E and Block F
- installation of replacement monitoring wells
- final backfilling, grading, and revegetation
- final site survey
- demobilization of equipment
- groundwater and storm sewer sediment monitoring

2.6 CONTINGENCIES

The remediation plan outlined in Sections 2.4 and 2.5 includes contingency actions that may be required if challenges or unexpected conditions are encountered during remedy implementation. These contingencies are summarized below.

Post-removal confirmation samples will be collected from the surface soil and subsurface soil excavation bottoms and sidewalls before backfilling. Sidewall samples will not be required if sheet piles are used to support an excavation. Post-removal confirmation samples will be collected from the bottoms of storm sewer excavations before backfilling. Individual confirmation sampling results will be added as input to the Block E surface- and subsurface-soil data sets used for the RRA to confirm that the recalculated 95% UCL exposure-point concentrations continue to result in a cumulative residual-cancer-risk at or below 1×10^{-5} (i.e., a one-in-100,000 probability), a noncancer risk and hazard index less than 1, and is within the margins of safety (25 mg/kg PCBs for surface soil and 100 mg/kg PCBs for subsurface soil). If this risk level is not met, additional soil will be removed beyond the design soil removal limits until the risk management criteria are met through additional confirmation sampling.

Previous sampling in 2003 did not identify impacts to soil beneath the product pipeline, and total petroleum hydrocarbons (TPH) are not considered a significant contributor to risk. Confirmatory sampling will be conducted in the product pipeline excavation to verify removal of soil with TPH-DRO concentrations greater than the MDE OCP residential cleanup goal (230 mg/kg). Confirmatory sampling will determine whether additional soil removal might be required from the product pipeline footprint until concentrations of TPH-DRO in the base soil samples are confirmed to be below the MDE OCP residential cleanup goal. Note that this activity is not part of the PCB remediation.

The foundation slab, subgrade soil, and drain lines will be surveyed for possible radioactive residue from materials that might have historically been used at former Building D. All radioactive material identified during radiological surveys will be packaged, removed to an isolated material accumulation area, sampled for offsite disposal facility waste acceptance criteria, and staged for offsite shipment.

Groundwater monitoring, with analyses for PCBs, will continue for at least two years after the remedial action is complete to verify that the remedial action satisfies RAOs. If the results show statistically significant increases in contaminant concentrations, then additional actions such as continued monitoring or groundwater remediation will be considered. Similarly, sediment monitoring in storm sewers, with analysis for PCBs, will continue at several manholes and inlets for at least two years after the remedial action is complete to verify that RAO #3 is satisfied. These results will be compared to the action level for sediment remediation in Dark Head Cove. If the results show statistically significant increases, then additional actions, such as continued monitoring or storm sewer sediment removal, will be considered.

SECTION 3
COMMUNITY OUTREACH/COMMUNICATIONS PLAN

A site community outreach plan was developed and will continue to be implemented before any of the remediation work outlined in this application begins. The plan helps establish, maintain, and develop working relationships with stakeholders to ensure that constructive communication channels are maintained, and to ensure that issues or concerns that might arise are efficiently and effectively resolved. Community outreach includes a systematic plan to communicate information regarding remedial actions to the local community neighbors and to solicit feedback. These outreach efforts aim to:

- continue Lockheed Martin Corporation's (Lockheed Martin's) commitment to engage the public in an informational and educational process;
- better understand stakeholders' concerns, issues, and needs; and
- resolve issues efficiently and effectively while maintaining the integrity of Lockheed Martin's remediation and community outreach efforts.

The outreach program ensures that interested stakeholders have front-end input; Lockheed Martin considers this input to make appropriate decisions for the impacted area. The community outreach plan is intended to enable resolution of all stakeholder issues and concerns efficiently and effectively with mutual gains for all parties whenever possible. The plan is designed to be resilient so that it meets changing needs of stakeholders, Lockheed Martin, and regulators.

To date, community outreach for this project has included:

- briefing Civic Association Leaders (October 16, 2019)
- distributing a Citizens Guide providing project information, an invitation to participate in a public information session, and notification of a public comment period on draft plans prior to their finalization (October 2019)
- holding a public information session (November 20, 2019)

- holding a public comment period (November 20 through December 30, 2019).

Media inquiry response resulted in a newspaper story on the public information session and comment period.

Once the construction phase of the project is underway, ongoing outreach will continue to keep the local community informed about the work until the project is completed.

SECTION 4
CERTIFIED STATEMENT FOR U.S. ENVIRONMENTAL PROTECTION AGENCY REQUIREMENTS

- *40 CFR §761.61(a)(3)(i)(E): A written certification, signed by the owner of the property where the cleanup site is located and the party conducting the cleanup, that all sampling plans, sample collection procedures, extraction procedures, and instrumental/chemical procedures used to characterize polychlorinated biphenyl (PCB) contamination at the cleanup site are on file at the location designated in the certificate and are available for United States Environmental Protection Agency (USEPA) inspection.*

Lockheed Martin Corporation hereby certifies that all sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize polychlorinated biphenyl contamination in the soil at Block E of the Middle River Complex in Middle River, Maryland, have been submitted to the United States Environmental Protection Agency and are on file and available for review at the Essex Public Library, 1110 Eastern Boulevard, Essex, Maryland. The list of documents submitted to the United States Environmental Protection Agency is in Appendix G. Tables of all polychlorinated biphenyl data, laboratory reports, and data validation reports for all samples collected by Lockheed Martin for soil, concrete, and sediment at Block E in the Middle River Complex is in Appendix H.

FEB. 25, 2021

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SECTION 5
REFERENCES

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APPENDICES

Appendix A—Figures and Tables [Provide paper copy of this Appendix to USEPA]

Appendix B—Leapfrog Figures from Remedial Investigation Report [CD only]

Appendix C—Soil Remedy Design Drawings [CD only]

Appendix D—Soil Remedy Specifications and Water Management Plan [CD only]

Appendix E—Block E Pre-Excavation Confirmation Soil Sampling Report [CD only]

Appendix F—Block E Soil Remedy Monitoring Plan [CD only]

Appendix G—Documents Submitted to the United States Environmental Protection Agency [CD only]

Appendix H—Site PCB Data, Laboratory and Validation Reports [CD only]

APPENDIX A—FIGURES AND TABLES

[Provide paper copy of this appendix to USEPA.]