WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

FINAL DECISION
CHEMOURS POTOMAC RIVER WORKS FACILITY

PURPOSE

The West Virginia Department of Environmental Protection (WVDEP) is issuing this Final Decision and Response to Comments (FDRTC or Final Decision) selecting the Final Remedy for the Chemours Potomac River Works facility located at Martinsburg, WV (hereinafter referred to as the Facility). The Final Decision is issued pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. Sections 6901, et seq.

On June 28, 2017, WVDEP issued a Statement of Basis (SB) in which it described the information gathered during environmental investigations at the Facility and proposed a Final Remedy for the Facility. The SB is hereby incorporated into this Final Decision by reference and made a part hereof as Attachment A.

This FDRTC selects the remedy that WVDEP evaluated under the SB. Consistent with the public participation provisions under RCRA, WVDEP solicited public comment on its proposed Final Remedy in the SB as well as the Corrective Action Post Closure Permit (Permit) to be drafted based on the proposed remedy therein. On June 28, 2017, a notice of the SB was published in the Journal newspaper, Martinsburg, WV, and also on the WVDEP website: http://www.dep.wv.gov/dlr/oer/superfund/Documents/Chemours%20PRW%20SB%20Rev%20WVDEP_May%2012%202017_Final.pdf]; and The forty-five (45) day public comment period ended on August 12, 2017.

Since WVDEP did not receive any comments on the proposed remedy described in the SB, WVDEP has determined it is not necessary to modify the proposed remedy set forth in the SB; thus, the remedy proposed in the SB is the Final Remedy selected by EPA for the Facility.

FINAL DECISION

WVDEP's Final Remedy for the Facility consists of various combinations of the following:

- Long term site-wide groundwater monitoring;
- Capping and cap maintenance;
- Soil management, namely, off-site disposal; and
- Institutional and Engineering controls (both existing and potential future controls). See specific remedy for each Facility area in the attachment below.

DECLARATION

Based on the Administrative Record compiled for the corrective action at the Chemours Potomac River Works Facility, I have determined that the remedy selected in this Final Decision and Response to Comments, which incorporates the June 28, 2017 Statement of Basis, is protective of human health and the environment.

Date: 8/29/2017

Jason S. McDougal, Program Manager
Office of Remediation
West Virginia Department of Environmental Protection

Attachment A: Statement of Basis (June 28, 2017)

Attachment A:

WEST VIRGINIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATEMENT OF BASIS

CHEMOURS POTOMAC RIVER WORKS SITE
Martinsburg, West Virginia

EPA ID NO. WVD 041952714

May 2017

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I. Introduction

The West Virginia Department of Environmental Protection (DEP) has prepared this Statement of Basis (SB) to solicit public comment on its proposed remedy and the Post Closure Permit modification for the Chemours Potomac River Works Facility (PRW) located in Martinsburg, West Virginia (Facility or Site). DEP's proposed remedy for the Facility consists of soil excavation and offsite disposal, groundwater monitoring, engineering controls consisting of capping and fencing, and institutional controls to implement land and groundwater use restrictions.

The Facility is subject to the United States Environmental Protection Agency's (EPA) Corrective Action program under the Solid Waste Disposal Act, as amended, commonly referred to as the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901, et seq. The Corrective Action program requires that facilities subject to certain provisions of RCRA investigate and address releases of hazardous waste and hazardous constituents, usually in the form of soil or groundwater contamination, that have occurred at or from their properties.

DEP is providing a forty-five (45) day public comment period on this SB and Corrective Action Post Closure Permit (Permit) modification. DEP may modify its proposed remedy based on comments received during this period. DEP will announce its selection of a final remedy for the Facility in a Final Decision and Response to Comments (Final Decision) after the public comment period has ended.

DEP will make a final decision on the modification of the Permit after considering any information submitted during the public comment period. The Final Remedy will be incorporated into the Permit. If no comments are received during the public comment period, the final Permit will be signed and will become effective upon signature. Otherwise, the final Permit will become effective thirty (30) days after the service of notice of the final decision or upon conclusion of any appeals filed. DEP will issue a Final Decision and Response to Comments (FDRTC) after considering any comments submitted with respect to the SB. The FDRTC will be incorporated into the final Permit and made a part thereof.

Information on the Corrective Action program as well as a fact sheet for the Facility can be found by navigating https://www.epa.gov/hwcorrectiveactionsites.

II. Facility Background

The 1,242-acre Chemours PRW site is located on U.S. Route 11 in Berkeley County at Falling Waters, West Virginia. Manufacturing facilities were constructed between 1950 and 1952 and operations began in 1953. From 1953 to 1977 the plant manufactured nitroglycerine (NG) and dynamite. Water gel explosives and smokeless powder were manufactured at the plant in the 1970s, and ammonia nitrate fuel oil explosives were manufactured in the 1970s and 1980s. Flexible explosives were also manufactured until 1994. In 1994, DuPont ceased all explosive manufacturing operations.

Currently, the only remaining manufacturing operation, Fasloc, is leased and operated by JENNMAR-Systems USA (Jennmar). Current operations at the plant consist of the

manufacturing and assembly of Fasloc cartridges (non-explosive roof bolt grouting systems used in mining and construction).

Current land use at the site consists of the following:

- 63 acres of Active Manufacturing Area (long-term lease)
- 354 acres of Buffer Land
- 163 acres of Former Manufacturing Area
- 662 acres of Former Landfill and Product Storage Area

Planned future land use includes areas for restricted redevelopment (industrial/manufacturing) on the former manufacturing areas at the site while other portions of the PRW site may be re-developed for unrestricted, recreational, or commercial land use.

The area around PRW was largely rural up until the 1990s when a transition to a more suburban community occurred. The PRW site is located in a fast growing area with development led by the housing sector and suburban retail.

A. Site Geology

The Site is located within the Great Valley sub-province that is characterized by a folded complex of Cambrian to Ordovician-aged shales and limestones. Regionally, the area is underlain by the Martinsburg Formation (shale) and Chambersburg Limestone. The bedrock types identified at the site are limited to the heavily folded Ordovician-aged shales of the Martinsburg Formation and the limestones of the Trenton-Black River Group. The Martinsburg Formation is younger than the limestone units and is primarily composed of homogeneous shales and siltstones.

The Trenton-Black River Group is represented by the Chambersburg Limestone and the New Market Limestone. The Chambersburg Limestone is shale-like near the contact with the Martinsburg Formation but grades quickly downward into a hard, thin- to medium-bedded dark-gray to grayish-black limestone. On-site, the New Market Limestone is characterized by karst topographic features, such as sinkholes, caves, and uneven terrain. The Trenton Black River Group forms a 2,000-foot wide limestone belt that trends northeast southwest across the center of the site. The main structure of this central limestone belt is an asymmetric plunging anticline.

The remainder of the property is underlain by the younger Martinsburg Formation shale. On the southeastern portion of the site, the shale is approximately 6,500 feet wide and is structurally complicated, containing a large syncline with a smaller anticlinal structure in the middle.

The surficial sediments observed at the site are classified as either residuum or as alluvium. Residuum refers to soils originating from the weathering of the underlying bedrock and consists of clay, silty clay, clayey silt, silt, and some rock fragments. The thickness of the residuum varies from a few feet to approximately 75 feet. The alluvium refers to sediments (sand, gravel, silt and clay) deposited in the Potomac River floodplain area and are known as alluvial terrace deposits.

B. Hydrogeology

Groundwater

The site aquifer consists of alluvial terrace deposits, underlain by Martinsburg Formation shale in the floodplain area of the site, and shallow soil cover and residuum, underlain by Martinsburg Formation shale or Chambersburg Limestone in the upland areas of the site. Groundwater elevations in the upland areas of the site are higher than in the alluvium, indicating that groundwater flow is from the upland areas toward the floodplain area and the Potomac River. Depth to groundwater in the upland areas ranges from 5 feet to 100 feet below ground surface (bgs). Depth to groundwater in the alluvium ranges from 10 to 25 feet bgs. Groundwater elevations measured at monitoring well clusters (locations where a shallow well screened in the alluvium are adjacent to a deep well in the shale) are similar. Pumping tests of deep wells resulted in a water-level response (drawdown) in the shallow wells completed in the alluvium. In general, these data indicate that groundwater flows freely between the shale and alluvium. Groundwater flow in the shale portions of the aquifer follows topography, tending to move downward from the hilltop areas toward the valleys. Groundwater discharges to springs and seeps along the flow path on the hillsides and in the valley bottoms. Groundwater flow is more complicated in the main limestone belt, but overall flow at the site is in a north and northeasterly direction toward the Potomac River.

Within the remaining portions of the site underlain by shale, groundwater flow is also generally from the southwest toward the northeast. However, a groundwater divide is observed within the shale and limestone in the southwestern portion of the site. It runs in a southeast to northwesterly direction and divides the Former Dynamite Manufacturing Area. On the northern side of the divide, groundwater flows in an east to northeasterly direction toward the Potomac River. Groundwater on the southern and western sides of the divide flows westward and southwestward to the edges of the property, discharging to springs and seeps along the flow path, eventually discharging to Opequon Creek.

The groundwater flow directions and hydraulic gradients in the limestone appear to be more variable than those observed for the alluvium or the shale. Depth to groundwater in wells screened within limestone is 20 feet bgs or greater. The groundwater flow directions and hydraulic gradient are better characterized in the northeastern portion of the limestone belt where more wells are located. The groundwater flow direction in this area is northeast toward the Potomac River. The identification of karst features in the limestone indicates that there is likely to be a component of groundwater flow that is channelized in karst features, in addition to more diffuse fracture flow

C. Hydrology

Surface Water

To the north, the site borders the Potomac River, which is the major water body in the area. Opequon Creek, a tributary to the Potomac River, is located to the south of the site. Sulphur Springs, a tributary to Opequon Creek, is located approximately 1/4 mile southwest of the site. Currently, the Potomac River is used as a source of public water supply with intakes located upstream of the site. The Potomac River is also used for fishing and recreational activities.

Within the property, two distinct types of natural surface-water systems have been identified. The first system occurs in areas underlain by the Martinsburg Formation. These areas are characterized by small perennial and intermittent streams that flow in well-defined, continuous channels. During non-precipitation periods, the flows are supported by a base flow component that is reflective of groundwater discharge via channel seeps and springs. For a short period after precipitation events, the flows are also supported by overland flow or stormwater runoff. At the eastern side of the site, there are six of these unnamed streams that serve as tributaries to either the Potomac River or Opequon Creek.

The second and more complex type of surface-water system occurs in the central portion of the site, which is underlain by a band of the Chambersburg Limestone. In this area, the valley bottom is poorly defined and has discontinuous flow channels. Because the groundwater system lies below the stream bottom, generally 20 to 30 feet lower, it does not contribute to base flow. The only time any flow exists in the discontinuous channels is for short periods after precipitation events or during extended snowmelt.

The main production area of the site, which is underlain by the Martinsburg Formation shale, is drained by a series of storm sewers and earthen drainage ditches. Most of these ditches drain to the northwestern portion of the site toward the Potomac River. Ditches located in the southwestern portion of the site drain to an outfall at Sulphur Springs, located southwest of the site.

III. Summary of Environmental History

In February 1999, EPA issued the Corrective Action portion of the RCRA Permit for the PRW site (Permit No. WVD041952714). In October 2008, EPA extended the expiration date of the RCRA permit until a new permit is issued by WVDEP. As required by the RCRA permit, DuPont completed a release assessment and RCRA Facility Investigation (RFI) at 21 solid waste management units (SWMUs) and one area of concern (AOC). In addition, DuPont investigated several former operating areas at the site that were not identified as SWMUs or AOCs. These areas are referred to as voluntary investigation areas (VIAs). The SWMUs, AOC, and VIAs are collectively referred to as units.

The RFI was conducted in three phases for the PRW site. All units were fully investigated for releases and for potential impact to human health and the environment. The RFI findings were presented in the Comprehensive RCRA Facility Investigation Report (URS, 2013a), which concluded that the RFI was considered complete and recommended initiation of a Corrective Measures Study (CMS) for the following units: eight SWMUs (SWMUs 3, 16, 22A, 36, 37, 46A, 46B, and 47), one AOC (AOC A), and two VIAs (VIA C and VIA G). In addition, groundwater monitoring was recommended for wells located downgradient and in the vicinity of SWMUs 16, 21A, 21B, 21C, 22A, 36, and 22C. The Comprehensive RFI Report was approved by EPA on August 7, 2013.

Following the approval of the RFI report, DuPont developed a CMS Work Plan (URS, 2013b) for the site pursuant to Section II.D and Attachment E of the RCRA permit. The CMS work plan was submitted in November 2013 and was approved by EPA in December 2013. The CMS work plan identified potential corrective measure technologies to be evaluated further in the CMS; briefly described the potential technologies; discussed how the remedies will be

evaluated in the CMS; and specified how the CMS will be prepared consistent with the HSWA permit. The CMS work plan also identified additional data collection activities to support corrective measure alternative evaluations in the CMS.

In 2015 DuPont created Chemours Company FC LLC, a wholly owned subsidiary, to take over management of the PRW site. Later that year Chemours began operating as an independent publicly owned company fully responsible for the PRW site. The CMS Report was submitted by AECOM on behalf of Chemours to EPA and WVDEP for review on August 2, 2016. The CMS included the elements required to evaluate proposed remedies including Media Cleanup Standards and a Monitored Natural Attenuation Groundwater Evaluation. The final revised CMS was submitted to EPA and WVDEP on February 28, 2017.

A. SWMU 3 – Smokeless Powder Burning Ground Area

The former Smokeless Powder Burning Ground Area operated from 1970 until 1986. The unit consisted of a 40-foot by 50-foot outdoor concrete pad located in the central part of the site northwest of the Open Burning Area. SWMU 3 was used for the thermal treatment of smokeless powder (nitrocellulose that contained nitroglycerine (NG)). In 1986, the area was removed from service, decontaminated, and covered with approximately 6 inches to 1 foot of clean soil.

Sampling results from the RFI investigation indicated that a release to surface soil had occurred. NG detected in soil was the only organic constituent found at concentrations above EPA Regional Screening Levels (SLs) for residential soil. However, concentrations were below SLs for industrial soil. NG and 2,4-DNT were also detected above EPA Regional SLs for protection of migration to groundwater [soil screening levels (SSLs)]. Downgradient groundwater data do not indicate a release to groundwater.

B. SWMU 16 - Storm Sewer and Plant Ditch System

The Storm Sewer and Ditch System includes a series of underground sewers and open, unlined earthen ditches that convey stormwater (and previously conveyed wastewater) throughout the manufacturing portion of the site. The sewer system and ditches are located at the western side of the site property where former explosive manufacturing occurred. Given the physical and hydrological differences of the ditches above and below the plant area, the RFI presented this SWMU in two portions. The portion north of the manufacturing plant area is called Upper SWMU 16 and the portion south of the manufacturing plant area is called Lower SWMU 16.

Several former explosive process areas were located adjacent to the storm sewer and ditch network at the facility. The storm sewers were used to collect rainwater and washdown water from most of the paved surfaces at the site. The storm sewers consist of a grated drain connected to 4- to 8-inch polyvinyl chloride (PVC) piping that discharged to either the Holding Pond (SWMU 10) or one of several natural streams that lead to SWMU 10. The several thousand feet of drainage ditches were used to collect stormwater runoff and rinse water that may have contained constituents discharged from operations areas. The ditches are earthen, unlined depressions generally located on the sides of roads and between hilly areas of the operation buildings. SWMU 16 ditches discharged to three locations: Holding Pond (SWMU 10) via

gravity flow; Shooting Pond (SWMU 1), which contains an emergency overflow National Pollutant Discharge Elimination System (NPDES)-permitted Outfall 001; Former NPDES-permitted Outfall 002, which discharges south of the site to Opequon Creek. Outfall 002 is no longer part of the NPDES system.

Soil and sediment samples were collected at 103 locations in the Upper and Lower SWMU 16 ditches during the RFI. Soil sampling stations were located to get broad coverage of areas along potential exposure or migration pathways. Where possible, SWMU 16 soil sampling stations were located near surface-water and sediment stations, in typical grassy habitat of the area, and within existing grass swales that convey surface runoff during storm events. Sediment samples were collected from depositional areas where the greatest sediment accumulation was apparent. Surface water is present intermittently in the ditch system. As a result, co-located surface water samples were collected from 14 locations where surface water was present at the ditch sediment sampling location. Groundwater data from six wells (W-36, W-44, W-45, W-48, W-49, and W-53) were also evaluated for potential impacts from SWMU 16.

Sampling results indicated a release to environmental media. In order to better characterize specific areas of the large ditch system where continued evaluation occurred, releases observed in Upper SWMU 16 and Lower SWMU 16 are presented separately. In addition, Lower SWMU 16 has been subdivided into the following subareas:

- SWMU 16A: Ditch portion near NG Spill Areas (SWMUs 46A and 46B)
- SWMU 16B: Ditch portion located east of VIA G and Building 122 (DS-16/DS-18 area)
- SWMU 16C: Downstream of Building 460 (Smokeless Powder Blender Screen and Pack House)
- SWMU 16D: Ditch Adjacent to Building 455 (Smokeless Power Blending Facility)

Five polycyclic aromatic hydrocarbon (PAH) compounds [benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene] were detected above SLs for residential soil in surface and subsurface soil at Upper SWMU 16. One explosive-related constituent (NG) was detected above SLs for residential soil in ditch sediment. PAH concentrations were less than those reported in literature background. Three metals, arsenic, cobalt and thallium, exceeded industrial SLs and site-specific soil background concentrations. None of the cobalt and thallium detections were above the unadjusted SL for industrial soil [based on a hazard quotient (HQ) = 1]. Detections observed in surface water were not screened against the human health surface water criteria since the presence of surface water in the ditch is intermittent and mostly occurs during rain events.

PAH concentrations in Lower SWMU 16A were less than those reported in literature background, and no distinct pattern of metal (arsenic, cobalt, and thallium) exceedances was observed in soil or ditch sediment. Additional PAHs, explosive-related constituents, and metals were also detected above SSLs. Of these, explosive-related constituents (DNTs) have been detected in downgradient monitoring wells above tap water SLs. A release of nitrate and perchlorate to groundwater downgradient of this area was also indicated.

Six PAH compounds [benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene], two explosive related

constituents (2,4-DNT and NG), and four metals (arsenic, cobalt, thallium, and vanadium) were detected above SLs for residential soil in Lower SWMU 16B. With the exception of benzo(k)fluoranthene and vanadium, these constituents were also detected above SLs for industrial soil.

One Semi-Volatile Organic Constituent (SVOC) [bis(2-ethylhexyl)phthalate] and three explosive-related constituents (2,4-DNT, 2,6-DNT, and NG) were detected in soil and ditch sediment above SLs for residential soil in Lower SWMU 16C. Of these, 2,4-DNT and NG were also detected above SLs for industrial soil.

Two explosive-related constituents (2,4-DNT and NG) were detected in surface soil at SWMU 16D above SLs for residential soil. NG was also detected above SLs for industrial soil. One metal (arsenic) was detected above SLs for industrial soil and site specific soil background concentrations.

Further delineation and evaluation were completed to support risk management decisions for potential ecological receptors at SWMU 16B. Potential contaminant migration pathways were evaluated by collecting top of bank soil samples from the drainage areas. Soil samples were analyzed for PAHs. Additional sampling was also conducted at SWMUs 16A and 16D to further define the horizontal and vertical extent of areas that require corrective measures. Delineation sampling confirmed that soil concentrations (surface soil and subsurface soil) were less than or approximated the Media Cleanup Standards (MCS) that are the site-specific cleanup endpoints derived for the site and included in the CMS.

The open ditches of SWMU 16B receive stormwater runoff and convey water during different times of the year. During these periods, the ditches may be used as temporary habitat for aquatic insects. However, owing to the intermittent nature of the SWMU 16B ditches, it is not likely that they provide permanent aquatic habitat that will sustain aquatic ecological communities. PAH concentrations in sediments are attributed to crumbling asphalt from nearby parking areas and particles of asphalt from debris piles located near the ditch entering the ditch through stormwater runoff. Asphalt debris near the ditch system will be removed and disposed.

C. SWMUs 21A, 21B, and 21C – Water Gel Landfills

The Water Gel Landfills are former landfills that consisted of approximately 130 trenches lined with 8-mil polyethylene for disposal of water gel wastes. The wastes contained ammonium nitrate, sodium nitrate, and fuel oil. The wastes were in a slurry form and were transferred to the unit via tank wagons. Once the wastes were disposed of in a trench, the waste was allowed to settle. When a trench was filled, water from the settled material was pumped out of the trench into a tank wagon and transferred to the Holding Pond (SWMU 10). After this procedure was completed at each trench, the trench was covered over with soil.

Disposal in SWMU 21A began in 1970 and landfilling operations ceased in the late 1970s. Landfilling in SWMU 21C began in the mid-1970s and ceased operations in 1980. It is not clear when disposal in SWMU 21B began or ceased operations.

The landfills are currently covered with soil. However, portions of the soil cover do erode, occasionally exposing underlying landfill materials (water gel) at the unit. These eroded areas are addressed as part of the on-going cap maintenance activities at the site.

During the RFI, groundwater data from eight wells were evaluated to determine whether SWMUs 21A, 21B, and 21C have impacted groundwater. Constituents of potential concern (COPCs) in SWMU groundwater include one Volatile Organic Constituent (VOC) (1,2-dichloroethane), one SVOC [bis(2-ethylhexyl)phthalate], perchlorate, and nitrate. No explosives (nitroaromatic/nitramine) were detected in the groundwater samples. One VOC (1,2-dichloroethane) was detected above the screening criteria. Bis(2-ethylhexyl)phthalate, a common laboratory contaminant and also a potential artifact of PVC well casings, was detected in three wells exceeding the screening criteria. Perchlorate and nitrate exceeded screening criteria in downgradient wells. Perchlorate exceedances were noted in two locations. Nitrate also exceeded screening criteria in two locations. Nitrate is the primary indicator constituent to evaluate potential impacts from the Water Gel Landfills. A release of excess nitrate from the landfill materials is evident. However, the number of nitrate exceedances and concentrations has generally indicated a decreasing trend in groundwater near the units. Additionally, relatively low nitrate levels in groundwater further downgradient of the area do not indicate continuing migration with groundwater.

Exposure to COPCs in groundwater is low since groundwater is not used as drinking water. VOCs above vapor intrusion screening levels (1,2-dichloroethane) are limited to one monitoring well location, which is not located near currently occupied structures; and, groundwater to surface-water migration is not a significant migration pathway.

SWMUs 21A, 21B, and 21C are covered with clean soil caps and do not pose an exposure threat to ecological receptors; therefore, no further ecological evaluation was warranted.

D. SWMU 22A and SWMU 36 – First Fasloc Sanitary Landfill and Solvent Pit

The First Fasloc Sanitary Landfill consisted of a series of unlined trenches located in the central portion of the site. The first two trenches operated from 1974 to 1980 while the third operated until 1984. All of the trenches were used to dispose of off-specification Fasloc cartridges containing polyester resin, limestone fill, benzoyl peroxide, styrene monomer, and Mylar® film. The first two trenches were covered with 18 to 24 inches of compacted soil once the trenches were full. The other series of trenches were capped with 6 inches of a clay-bentonite mixture.

The Solvent Pit was an unlined pit located within the SWMU 22A. The unit received approximately 50 to 100 gallons of spent solvent, such as acetone and methylene chloride from Fasloc production, per month for about 1 year. The unit was covered with soil when it ceased operations in 1975.

In the Phase I RFI, potential releases to groundwater, surface water, and sediment from these SWMUs were investigated and characterized. One surface-water sample and sediment sample were collected from a small stream (Stream 10) that drains the area of SWMUs 22A and 36. Groundwater sampling results from the Phase II RFI indicated a potential release from

SWMU 36. Methylene chloride was known to be disposed at the Solvent Pit, and methylene chloride has been detected in groundwater sampled from downgradient. Groundwater from wells further downgradient does not indicate any impact from the SWMU, and the extent of methylene chloride in groundwater is delineated in all directions from SWMU 36.

Other COPCs in groundwater include VOCs (1,2-dichloroethane and chloroform), SVOCs [bis(2-ethylhexyl)phthalate], and metals (total antimony, total arsenic, total barium, total beryllium, total and dissolved cobalt, total and dissolved copper, total nickel, total thallium, total vanadium and total zinc), and nitrate. Surface-water and sediment sampling results do not indicate a significant environmental impact at the units. However, three metals (arsenic, cobalt, and thallium) were detected above SLs for residential and industrial soil in stream sediment.

The potential for exposure to COPCs in Stream 10 is low for most receptors because the stream is located away from active manufacturing areas. The potential for exposure to COPCs in groundwater is low since groundwater is not currently used as drinking water and groundwater to surface-water migration is not a significant migration pathway. SWMUs 22A and 36 have been covered with a clean cap and do not pose an exposure threat to ecological receptors; therefore, no further ecological evaluation of Stream 10 surface water and sediment was undertaken.

E. SWMU 37 - Catch Tanks and Sump

SWMU 37 - Catch Tanks and Sumps were identified in the release assessment as a series of underground collection tanks and sumps located adjacent to manufacturing buildings and laboratory buildings at the western portion of the facility. The sumps at the main dynamite manufacturing area of the site were described as being approximately 4 feet diameter by 4 feet deep. The tanks were originally constructed of concrete with wooden bottoms in the 1950s. Steel tanks were inserted into these units in 1965. The units were used to collect wastewater washed down from floors and floor drains at the various manufacturing and laboratory buildings. The wastewater collected in the catch tanks was discharged through the storm sewer system, which flowed overland through the Drainage Ditches (SWMU 16) to either the Holding Pond (SWMU 10) or one of the NPDES-permitted outfalls. After dynamite manufacturing operations ceased in 1977 and during decommission of the explosives manufacturing (much during 1979) buildings, most of the sumps were filled with concrete or filled with clean soil and capped and crowned with concrete.

During the RFI, 26 catch tanks and sumps were sampled as part of the SWMU 37 investigation and two were sampled with the SWMU 16 investigation. The objective of the sampling was to determine if a release had occurred at these areas as a result of wastewater discharges. Soil samples collected at the SWMU identified two explosive-related constituents (2,4-DNT and NG) and five SVOCs [4-chloroaniline, 4-dimethylaminoazobenzene, benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene] detected above SLs for residential soil. Of these, both explosive-related constituents (DNT and NG) and one SVOC [benzo(a)pyrene] were also detected above SLs for industrial soil. NG concentrations ranged between 16 mg/kg and 160 mg/kg. The maximum detected concentration was observed at location BLDG91B-02 collected near Building 91 within a ditch adjacent to a sump. All locations sampled at the Building 91 ditch were vertically delineated with samples collected at 1 to 2 feet.

Of the inorganic constituents detected, antimony, arsenic, cobalt, thallium, and vanadium were detected above SLs for residential soil and site-specific background concentrations. Of these, antimony, arsenic, cobalt, and thallium were also detected above SLs for industrial soil. However, antimony was detected above the SL in one out of 28 samples. Arsenic and cobalt concentrations observed at the unit are consistent with site background. None of the cobalt and thallium detections were above the unadjusted SL for industrial soil (based on a HQ = 1).

COPCs in soil were identified in sample locations collected near Buildings 22, 23, 28, 91, 455, 1017 and 1071. Under current conditions, some exceedances were observed in the vicinity of active site operations (such as Buildings 22, 23, and 28). Some exceedances were located away from current active manufacturing operations (such as Buildings 91, 455, 1017, and 1071). All of the buildings are located within the security fence, and excavation limitations are in place to prevent access. The potential for exposure to COPCs in groundwater is low because groundwater is not currently used as drinking water and groundwater to surface-water migration is not a significant migration pathway.

The ditch immediately north of Building 91 is a terrestrial exposure area and was the focus of the ecological evaluation for this SWMU. Soil represents the potential exposure medium to ecological receptors in this area. Soil samples were collected within the ditch and adjacent to the ditch to the east and west, making up an area of less than 0.5 hectares (1.2 acres). COPECs identified in soil include NG and metals (arsenic, cobalt, copper, lead, mercury, thallium, vanadium, and zinc). The spatial distribution of the data showed that locations with concentrations that exceeded screening values were limited to the ditch in this SWMU. Concentrations at locations east and west of the ditch were below their respective screening values. Based on the exposure scenarios evaluated in the Screening Level Ecological Risk Assessment, there is adequate information to conclude that the potential for ecological risk from metals at Building 91 is very low. NG may pose a risk to small mammals feeding in the vicinity of Building 91; however, exposure to high concentrations of NG is limited to the north/south ditch.

F. SWMU 49 – NG Spill Area

The NG Spill Areas consist of five separate areas (SWMUs 46A, 46B, 46C, 46D, and 46E) where unknown quantities of NG were spilled onto the ground surface. These spill areas are located in grassy fields by the former manufacturing buildings in the western portion of the site. The spills occurred prior to 1977, which is when the facility shut down its NG manufacturing and processing operation. The largest spill was a line release near the NG Packaging Operation (Building 87) at the central portion of the site (SWMU 46C). There are three separate spill areas near Building 87 (SWMUs 46C, 46D, and 46E), including a sump located to the south of the building (SWMU 46E). Other NG spills are documented releases to the open ditch system in proximity to Building 20, Neutralizer Facility, (SWMU 46B) and Building 29, Equipment Wash (SWMU 46A). At the time of the spills, plant personnel treated the areas with NG killer. The solution was mixed when a spill of NG occurred and was liberally applied at a rate of 2 gallons of NG killer per a gallon of NG spilled. After the NG killer was applied, the spills were covered with straw and sawdust for absorption of the spilled material. The straw and sawdust were collected and burned at the burning ground (SWMU 5). Because

NG is an impact-sensitive explosive and the effectiveness of NG killer on NG spills in soil is unclear, no remediation work on soils has been performed. Access to this area is currently restricted by fences and posted signs.

The objective of the Phase III RFI at SWMU 46 was to characterize the soil quality at the spill areas. Sampling results from the RFI do not indicate significant impact to soil at three of the five spill areas (SWMUs 46C, 46D, and 46E). Clean-up activities and remediation efforts were made at the time of the spill events. No explosive-related constituents were detected in the soil samples. Nitrate and perchlorate were detected, but concentrations were below screening criteria. As a result and based on the evaluation of analytical results, no further investigation is warranted for these spill areas.

G. SWMU 47 – Testing Shooting Barricade

The Testing Shooting Barricade consists of a timber barricade with a sand pad embedded in wooden surroundings. It is approximately 30 feet by 60 feet and is located north of the Burning Ground Decontamination Field in the central area of the plant. The area was used as a detonation area for explosives testing. Concrete-filled barrels were used as additional barricading. At one time, there was a small metal building that served as a storage area for supplies and protected workers during testing. It has been determined that SWMU 47 was part of the original explosive testing facilities, which began operations in the early 1950s. It is believed that this testing area operated into the 1980s.

Sampling results from the investigation at SWMU 47 do not indicate any significant environmental impacts due to the operation of the Testing Shooting Barricade. Four PAHs [benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene] were detected in surfaces soil above SLs for residential soil. Three of the four PAHs were also detected in surface soil above SLs for industrial soil. Four PAHs [benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene], four explosive-related constituents (2,4,6-TNT, DNTs, and NG) and one SVOC (diallate) were detected above SSLs.

Under current conditions, the potential for exposure is low for most receptors because the SWMU is located away from current active manufacturing operations and is covered by a well-established vegetative cover. In addition, the unit is located within the security fence, and excavation limitations are in place to prevent access. Based on the exposure scenarios evaluated and the small size of this SWMU, there is adequate information to conclude that the potential for ecological risk at SWMU 47 is very low; therefore, there is no need for further action at SWMU 47 on the basis of ecological risk..

H. AOC A – Empty Drum Area Oil Filter Unit

The Empty Drum Storage Area Oil Filter Unit consisted of a 2-foot high, 8-inch diameter cylindrical steel oil filtration device. The duration of operational use is unknown. The soil in this area was removed and disposed of as part of the gasoline tank removal project. The area was then backfilled.

One SVOC [benzo(a)pyrene] and one metal (cobalt) were detected in soil at concentrations above SLs for residential soil at this SWMU. Cobalt also exceeded the SL for industrial soil; however, the concentration is close to the site background upper tolerance limit (UTL) for soil. Benzo(a)pyrene (and other PAHs) are common in asphalt pavement, and the source of detected benzo(a)pyrene is uncertain. It is believed that the relative low concentration may have resulted from weathering of pavement and not by a release from AOC A. The evaluation of soil analytical results from AOC A indicates that there have been no significant releases from the SWMU.

I. VIA C – DNT Storage and Melt House

VIA C is located in the central area of the manufacturing portion of the site on the western side of the former explosives manufacturing area.

During the RFI, four explosive-related constituents (1,3-DNB, 2,4,6-TNT, 2,4-DNT, and 2,6-DNT) were detected above SLs for residential soil at 11 locations associated with VIA C. In eight of the 11 locations, 2,4-DNT and 2,6-DNT were also detected above SLs for industrial soil. Exceedances of SLs for industrial soil were noted in subsurface soil intervals collected at the VIA. Maximum detected concentrations of 2,4-DNT and 2,6-DNT (2,100 mg/kg and 2,900 mg/kg, respectively) were observed at location VIA-C- 15 collected at a depth of 2 to 3 feet bgs. A decrease in concentration was observed vertically in the boring locations. At the VIA, delineation was achieved horizontally and vertically by non-detect samples at perimeter sampling locations and by physical features such as bedrock and/or former building foundations. Explosives-related constituents were also seen exceeding SSLs at the VIA. Those compounds exceeding SSLs include 1,3-DNB, 1-methyl-3-nitrobenzene, 1-methyl-4-nitrobenzene, 2,4,6-TNT, 2,4-DNT, 2,6-DNT, 2-nitrotoluene, and nitrobenzene. Of these, 2,4-DNT, 2,6-DNT, and 2-nitrotoluene have been detected above tap water SLs in downgradient monitoring well W-54. 5-Nitro-ortho-toluidine, a breakdown product of 2,4-DNT, has also been detected above tap water SLs in well W-54. Monitoring well W-54 was installed west of the groundwater divide and downgradient of the Former Dynamite Manufacturing Area, in particular VIA C. Three additional monitoring wells (W-62, W-63, and W-64) were installed west of the groundwater divide and downgradient of the Former Dynamite Manufacturing Area. DNTs were also detected above the tap water SL in location W-64, which is crossgradient of W-54. However, DNTs were not detected in downgradient locations W-62 and W-63. Groundwater in the eastern portion of the facility near SWMU 3 contains concentrations of TCE, vinyl chloride, 1,4-dioxane, and BEHP that exceed the human health screening levels. TCE and vinyl chloride are suspected to be from an offsite source; however, BEHP and 1,4-dioxane appear to be facility-related constituents that may be affecting a small portion of the UCC Institute Facility to the east and sidegradient of the facility.

VIA C is located in the vicinity of current site operations. Exceedances of industrial soil SLs were observed in subsurface soil. The area is currently covered with pavement and building foundations. Excavation limitations are also in place to prevent access to potential receptors. The potential for exposure to COPCs in groundwater is low because groundwater is not currently used as drinking water and groundwater to surface-water migration is not a significant migration pathway.

J. VIA G – DNT Storage Tank

VIA G (the DNT Storage Tanks) is located in the southern area of the manufacturing portion of the site at the southwestern side of Building 122. During the RFI, two explosive-related constituents (2,4-DNT and 2,6-DNT) were detected above SLs for residential soil at three locations (VIA-G-08, VIA-G-10, and VIA-G-19) associated with the VIA. One of these constituents (2,4-DNT) was also detected above SLs for industrial soil. Exceedances were observed in surface soil and subsurface soil. SL exceedances were adequately delineated at the VIA. Explosives-related constituents were also seen exceeding SSLs at VIA G. Those compounds exceeding SSLs include 1,3-DNB, 1-methyl-3-nitrobenzene, 1-methyl-4-nitrobenzene, 2,4-DNT, 2,6-DNT, 2-nitrotoluene, and NG. However, no detections of explosive-related constituents above the tap water SL were found in groundwater down-gradient of VIA G.

Under current conditions, the potential for exposure to COPCs in surface soil and subsurface soil is low for most receptors because the SWMU is located away from current active manufacturing operations. In addition, the unit is located within the security fence, and excavation limitations are in place to prevent access.

K. Site-Wide Groundwater

Groundwater was sampled during the RFI to evaluate site-wide groundwater quality, potential impacts from SWMUs, and groundwater quality at site boundaries. Groundwater samples were analyzed for Appendix IX VOCs, SVOCs, and metals, explosives, perchlorate, chloride, and nitrates/nitrites, depending on the location and the sampling event. A release to groundwater was indicated downgradient of the Former Dynamite Manufacturing Area, west of the groundwater divide. Several explosive-related constituents, including 2,4-DNT and 2,6-DNT, were detected above screening criteria in monitoring well W-54, which was installed downgradient of VIA C (DNT Storage and Melt House). The extent of DNT-impacted groundwater is limited. DNT was not detected downgradient of the area.

East of the groundwater divide, perchlorate and nitrate detected in monitoring well W-47 indicate potential impacts from the manufacturing areas. The source of these constituents may be related to a release from SWMUs 10, 16, 37, and/or 46 because the SWMUs are located upgradient of W-47. In addition, a review of the site history in the immediate vicinity of W-47 suggests that explosive testing may have taken place. Analysis of the data collected over the past 10 years has shown an overall decrease in the perchlorate and nitrate concentrations in this well.

In other portions of the site, RFI groundwater sampling results do not indicate significant environmental impacts due to the former operations. In general, other constituents (VOCs, SVOCs, and metals) detected exceeding screening criteria appear to be isolated occurrences that are not indicative of groundwater plumes.

Groundwater is not used currently on-site for drinking water purposes, and residential and non-residential users have not been identified downgradient of the site. Deed restrictions would prohibit the use of groundwater as drinking water in the future. Furthermore, the downgradient Potomac River is not used for water-supply purposes nearby.

IV. Corrective Action Objectives

DEP has identified the following Corrective Action Objectives for soils and groundwater at PRW:

A. Soils

Media Cleanup Standards were developed for soil at SWMUs 16, 37, 46A, 46B and 47, and VIAs C and G as part of the CMS. These SWMUs and VIAs are located within portions of the site designated for industrial, commercial, or recreational land use. Potential receptors in these areas, therefore, include on-site industrial/commercial workers, on-site utility/excavation workers, short-term on-site construction workers, and on-site trespassers.

EPA RSLs for industrial soil were identified as the MCSs for on-site industrial/commercial workers. MCSs protective of multiple-route exposure were calculated for the other potential receptors (utility/excavation workers, construction workers, and trespassers) using EPA risk assessment methodology. The EPA risk assessment equations calculate risk levels based on the constituent concentration, magnitude of exposure, and the toxicity of the constituent. The lower of the calculated MCS values for the carcinogenic and non-carcinogenic endpoints was identified as the MCS for each constituent. At units where a release to groundwater is indicated [SWMU 16A (SWMU 46A and 46B portion) and VIA C], EPA Soil Screening Levels (SSLs) for protection of migration to groundwater were also identified as MCSs in subsurface soil.

Ecologically-based MCSs (EMCSs) for soil were developed for the protection of ecological receptors that may be exposed to COPECs in soil at these SWMUs: Lower SWMU 16 (SWMUs 16A, 16B, 16C, and 16D) and SWMU 37 (Building 91).

Therefore, DEP's Corrective Action Objective for PTO soils is to manage exposure to the hazardous constituents remaining in surficial and subsurface soils by removal and offsite disposal, capping, and requiring compliance with and maintenance of land use restrictions and engineering controls.

B. Groundwater

DEP expects to return usable groundwater to its maximum beneficial use, which are generally levels acceptable for drinking. However, where waste is left in place, final cleanups should achieve groundwater cleanup levels at and beyond the waste unit boundary. Therefore DEP does not expect to clean up groundwater located within the boundaries of waste management units to drinking water levels where waste is left in place. Redevelopment should be avoided in areas of unacceptable vapor intrusion risk and where necessary use institutional and engineering controls to prevent unacceptable exposures.

DEP's Corrective Action Objectives for PRW for groundwater were identified from federal drinking water standards (Federal MCLs). Where Federal MCLs were unavailable, EPA RSLs for tap water were identified. For the PRW site, the use of drinking water criteria for potential groundwater exposure pathways is highly conservative because groundwater is not a current source of drinking water on-site and the downgradient Potomac River is not used for water-supply purposes near the site. Deed restrictions and/or an environmental covenant will be implemented to prevent on-site groundwater use as a drinking water supply in the future.

V. Proposed Remedy

The proposed remedy for PRW consists of various combinations of Institutional and Engineering Controls (both existing and potential future controls), off-site disposal, capping, and site-wide groundwater monitoring. Specifically, the remedy for each Area consists of:

- SWMU 3: Institutional Controls
- Upper SWMU 16: I&ECs
- Lower SWMU 16 (SWMU 16A): Off-site disposal, I&ECs
- Lower SWMU 16 (SWMU 16B): I&ECs
- Lower SWMU 16 (SWMU 16C): Off-site disposal, I&ECs
- Lower SWMU 16 (SWMU 16D): I&ECs
- SWMU 21A: Capping, I&ECs
- SWMU 21B: Capping, I&ECs
- SWMU 21C: I&ECs
- SWMU 22A (with SWMU 36): Cap maintenance, I&ECs
- SWMU 22B: Capping, I&ECs
- SWMU 37 (Building 455): I&ECs
- SWMU 37 (Building 91): Off-site disposal, I&ECs
- SWMU 46A: Off-site disposal, I&ECs
- SWMU 46B: Off-site disposal, I&ECs
- SWMU 47: I&ECs
- AOC A: Institutional Controls
- VIA C: Off-site disposal, asphalt cap, I&ECs
- VIA G: I&ECs
- Site-wide groundwater: I&ECs.

A. Land and Groundwater Use Restrictions

Because contaminants remain in the soil and groundwater at PRW above levels appropriate for residential use, DEP's proposed remedy requires land and groundwater use restrictions to restrict activities that may result in exposure to those contaminants. DEP proposes that the restrictions be implemented and maintained through institutional controls (ICs). ICs are non-engineered instruments, such as administrative and legal controls, that minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land or resource use.

DEP is proposing the following land and groundwater use restrictions be implemented through ICs:

a) Portions of the PRW Facility shall only be used for industrial purposes;
b) Impacted groundwater shall not be used for any purpose, including, but not limited to, use as a potable water source, other than to conduct the maintenance and monitoring activities required by DEP and/or EPA;
c) The owner shall notify DEP of all future construction activity at the facility and demonstrate that such construction activity will not pose an unacceptable risk to human health or the environment. The construction activity shall not adversely

affect the integrity of the selected remedy or the owner shall provide for the restoration of the selected remedy. The demonstration shall take into consideration existing site conditions including buried waste, impacted subsurface soils, and impacted groundwater. The owner shall not commence construction activities until written approval is provided by DEP;

d) Existing soil cover and cap shall be maintained to limit infiltration and prevent exposure in compliance with the approved Operations and Maintenance Plan;
e) All earth moving activities at the PRW Facility, including excavation, drilling and construction activities, shall be conducted in compliance with the an approved Soil Management Plan that includes appropriate Personal Protective Equipment requirements sufficient to meet DEP's acceptable risk and complies with all applicable OSHA requirements in a manner such that the activity will not pose an unacceptable threat to human health and the environment or adversely affect or interfere with the integrity of the final remedy;
f) The PRW Facility shall not be used in a way that will adversely affect or interfere with the integrity and protectiveness of the final remedy.

The land and groundwater use restrictions necessary to prevent human exposure to contaminants at PRW will be implemented through enforceable ICs such as a permit and/or an Environmental Covenant pursuant to the West Virginia Uniform Environmental Covenants Act (WV Code Chapter 20 Article 22B). If DEP determines that additional maintenance and monitoring activities, institutional controls, or other corrective actions are necessary to protect human health or the environment, DEP has the authority to require and enforce such additional corrective actions through an enforceable mechanism which may include a permit or Environmental Covenant, provided any necessary public participation requirements are met.

B. Site-Wide Groundwater

DEP is proposing groundwater monitoring in combination with ICs as the remedy for site-wide groundwater. The institutional control would prohibit use of site-wide groundwater as a drinking water supply. The institutional control would be implemented through an environmental covenant or the site's RCRA permit.

Groundwater monitoring would consist of select monitoring well sampling (existing site perimeter, on-site, and SWMU-specific wells). Analytical testing for select VOCs, SVOCs, and explosives-related constituents will be performed during well sampling events. The groundwater monitoring program will be further developed during the CMI.

The proposed remedy will prohibit the use of groundwater as drinking water now and into the future. In the long term, groundwater conditions are expected to improve due to the source control measures proposed for implementation at specific SWMUs and VIAs. Groundwater monitoring will confirm that COPC concentrations are stable or declining and that COPCs continue to not move off-site above MCSs.

C. Off-Site Disposal

Off-site disposal involves excavation and removal of soil and/or waste materials from the site. The soil and/or wastes are then transported to an approved disposal facility.

Off-site disposal will be effective in areas with dispersed contamination (like spills) where the limits have been delineated. Off-site disposal is proposed for the following areas that exceed MCS:

- SWMU 16A and 16C
- SWMU 37 – Building 91
- SWMU 46A
- SWMU 46B
- VIA C

D. Capping

Capping involves placing a physical barrier (soil, geosynthetic material, or both) over the contaminants. Capping, with either existing caps or proposed cap upgrades, is recommended for the Water Gel Landfills (SWMUs 21A and 21B), Fasloc Landfills (SWMU 22A/SWMU 36 and SWMU 22B), and VIA C (after off-site disposal of source material).

Based on the CMS evaluations, the existing caps are sufficient to limit the potential for exposure to waste materials at SWMU 21 C and 22A/SWMU 36. Continued cap maintenance is proposed for these SWMUs. Cap upgrades are proposed for SWMU 21A, SWMU 21B, and SWMU 22B to reduce the potential for exposure to waste materials (primarily water gel).

After completion of source removal activities at VIA C, the area will be restored with clean fill and asphalt paving will be provided to match the existing pavement. Maintenance of this asphalt cap will be part of this remedy.

VI. Evaluation of Proposed Remedy

This section provides a description of the criteria DEP used to evaluate the proposed remedy consistent with EPA guidance, "Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities; Proposed Rule," 61 Federal Register 19431, May 1, 1996. The criteria are applied in two phases. In the first phase, DEP evaluates three decision threshold criteria as general goals. In the second phase, for those remedies which meet the threshold criteria, DEP then evaluates seven balancing criteria to determine which proposed remedy alternative provides the best relative combination of attributes.

A. Threshold Criteria

1. <u>Protect Human Health and the Environment</u> – DEP's proposed remedy will be protective of human health and the environment. Off-site disposal for material exceeding MCSs (at SWMU 16A, 16C, SWMU 37 – Building 91, and VIA C) will eliminate potential exposure. Engineering controls are currently in place to restrict access to the site and prevent disturbance of soil and waste to prevent exposure. The controls include a fence and security controls, an excavation permitting program, and an established Health and Safety Plan. The recommended corrective measure will continue to protect human health and the environment from exposure to contamination, including future exposure. Land and groundwater use restrictions will prohibit future uses through the use of an environmental covenant or the site's RCRA permit. Capping will prevent potential future exposure of underlying waste materials.

2. Achieve Media Cleanup Objectives - DEP's proposed remedy meets the cleanup objectives appropriate for the expected current and reasonably anticipated future land use. The recommended corrective measures will prohibit the use of groundwater as drinking water now and into the future. In the long term, groundwater conditions are expected to improve due to the source removal and control measures to be implemented at specific SWMUs and VIAs. Caps effectively eliminate direct exposure pathways and reduce infiltration through the underlying waste. Groundwater monitoring will confirm that COPC concentrations are stable or declining and continue to not move off-site above MCSs.

3. Control the Source of Releases - In its RCRA Corrective Action proposed remedies, DEP seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. Removal of material at select units will eliminate the potential to act as a source to groundwater contamination. Removal of the waste materials in the landfill areas is impractical and capping is an effective containment method for waste. The cap components reduce infiltration to underlying wastes and minimize migration of constituents to groundwater.

B. Balancing/Evaluation Criteria

1. Long-Term Reliability and Effectiveness - The proposed remedy will maintain protection of human health and the environment over time by controlling exposure to the COPCs remaining in soils and groundwater. The long term effectiveness is high as I&ECs are readily implementable and easily maintained. Off-site disposal is also readily implementable and immediately effective. Capping is easily maintained and highly effective in the long term.

2. Reduction of Toxicity, Mobility, or Volume of Waste - The recommended off-site disposal corrective measure reduces toxicity, mobility, and volume by removing the waste and soil exceeding MCSs from the site. Caps also reduce mobility of COPCs by minimizing infiltration of water through the waste.

3. Short-Term Effectiveness - I&ECs could be readily implemented in the short term. Groundwater use restrictions would effectively eliminate exposure to COPCs. In addition, routine monitoring would identify any constituent migration. Engineering controls are already in place and are effectively minimizing exposure to COPCs. The recommended off-site disposal corrective measure poses short-term exposure to COPCs to on-site workers during excavation activities.

4. Implementability - DEP's proposed remedy is readily implementable. ECs will be implemented using existing monitoring wells and existing site controls. DEP proposes that the ICs be implemented through an enforceable mechanism such as the existing permit and/or an Environmental Covenant pursuant to the West Virginia Uniform Environmental Covenants Act. Therefore, DEP does not anticipate any regulatory constraints in implementing its proposed remedy. In addition, off-site disposal and capping are easily completed using well-known earth-moving technology.

5. Cost - Costs were defined under two categories: capital costs and annual operation and

maintenance (O&M) costs. Capital costs include pre-design, design, institutional controls, and construction costs. Annual O&M costs include O&M and long-term monitoring (LTM) requirements. The total cost for the proposed remedies ranges from $2.8 million to $3.8 million in capital cost and $100,000 to $135,000 in annual operation and maintenance cost. Cost estimates will be refined in the Corrective Measures Implementation phase when more information is available.

6. Community Acceptance - There have been no known conflicts within the community regarding the investigation and remediation efforts. Ultimately, community acceptance of DEP's proposed remedy will be evaluated based on comments received during the public comment period and will be described in the Final Decision and Response to Comments.

7. State/Support Agency Acceptance - WVDEP has reviewed and concurred with the proposed remedy for PRW. Furthermore, EPA has provided input and been involved throughout the investigation and remedy selection process.

VII. Financial Assurance

Chemours will be required to demonstrate and maintain financial assurance for completion of the remedy pursuant to the standards contained in West Virginia regulations.

VIII. Public Participation

Interested persons are invited to comment on DEP's proposed remedy. The public comment period will last forty-five (45) calendar days from the date that notice of the start of the comment period is published in a local newspaper. Comments may be submitted by mail, e-mail, or phone to Jason McDougal at the address listed below.

A public hearing will be held upon request. Requests for a public hearing should be made to Jason McDougal of the WVDEP Office by phone 304-926-0499 ext. 1130 or by email at Jason.S.McDougal@wv.gov. A hearing will not be scheduled unless one is requested.

DEP may modify the proposed remedy based on new information and/or public comments. Therefore, the public is encouraged to review the Administrative Record and to comment on the proposed remedy presented in this document.

The Administrative Record contains all the information considered by DEP for the proposed remedy at this Facility. The Administrative Record is available to the public for review and can be found at the following location:

West Virginia Department of Environmental Protection
Division of Land Restoration
Office of Environmental Remediation
601 57th Street SE
Charleston, WV 25304
Contact: Jason McDougal
Phone: (304) 926-0499 ext. 1130
Jason.S.McDougal @wv.gov

Attachment 1 Administrative Record File Index of Documents
Figure 1 Site Location Map
Figure 2 Site Map

ATTACHMENT 1

ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS
for
STATEMENT OF BASIS
CHEMOURS POTOMAC RIVER WORKS SITE
Martinsburg, West Virginia

1. E.I. DuPont de Nemours Inc. (DuPont). 1999. Permit For Corrective Action, Permit ID No.: WVD 041 952 714, Potomac River Works, Martinsburg, West Virginia. February 28.
2. U.S. Environmental Protection Agency (USEPA). 2003a. Documentation of Environmental Indicators Determination DuPont Potomac River Works Site, Martinsburg, West Virginia. September.
3. USEPA. 2003b. Documentation of Environmental Indicators Determination DuPont Potomac River Works Site, Martinsburg, West Virginia. September.
4. E.I. DuPont de Nemours Inc. (DuPont). 2008. Corrective Action Permit Application, Potomac River Works Site. June.
5. USEPA. 2013. Letter from Erich Weissbart; RE: RCRA RFI Approval/CMS Request, Dupont Potomac River Works, Martinsburg, West Virginia. August 7.
6. URS. 2013a. Comprehensive RCRA Facility Investigation Report, DuPont Potomac River Works Site Martinsburg, West Virginia. June.
7. URS. 2013b. Corrective Measures Study Work Plan DuPont Potomac River Works Site Martinsburg, West Virginia. December.
8. USEPA. 2015. Letter from Erich Weissbart; RE: Class 1 Permit Modification, Chemours Potomac River Works, Martinsburg, West Virginia. October 19.
9. AECOM. 2017. Corrective Measures Study Report Chemours Potomac River Works Site, Martinsburg, West Virginia. February.

Figure 1 - Site Location Map

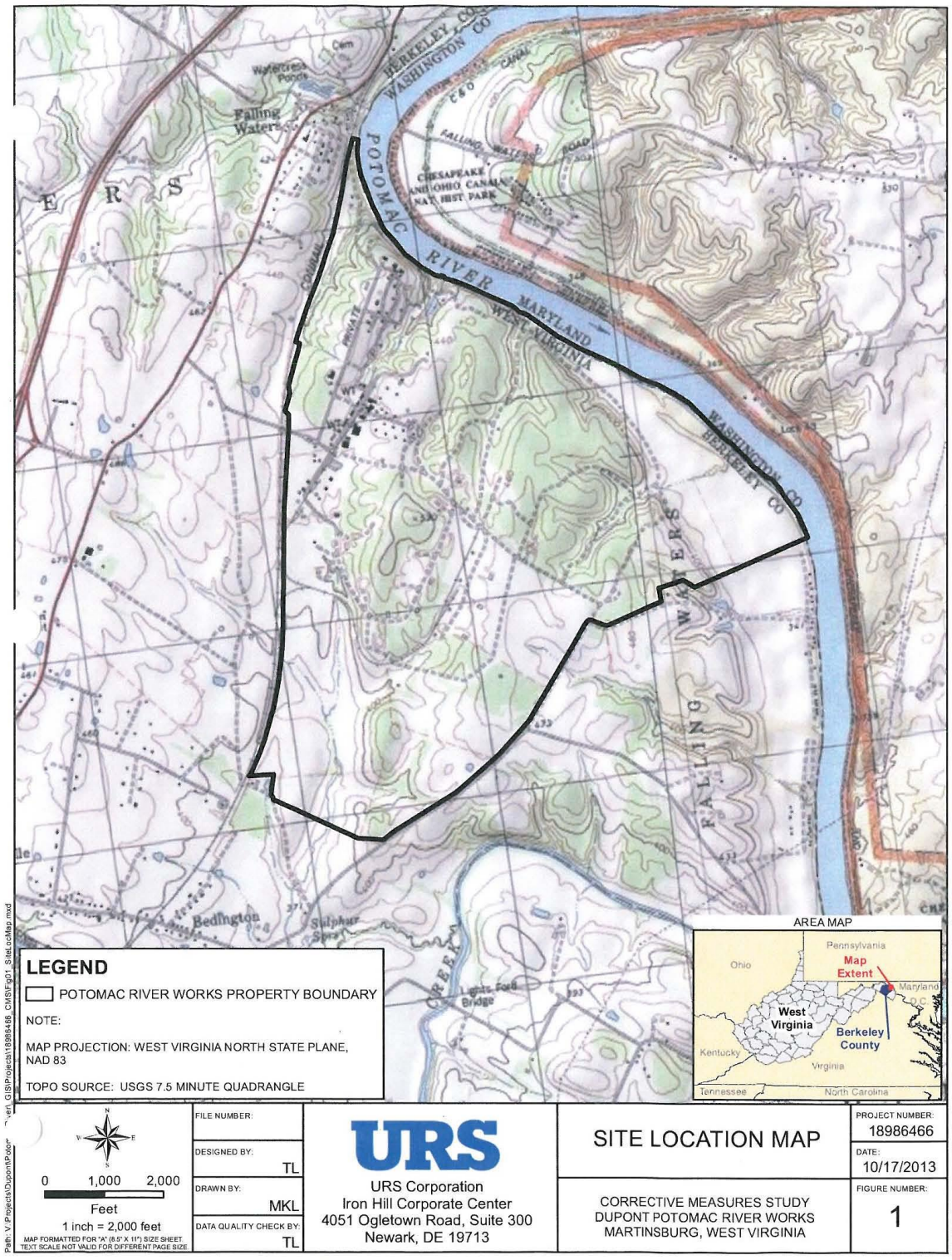

Figure 2 - Site Map