
# STATEMENT OF BASIS

# DUPONT MARTINSVILLE
# (VAD003114865)

**September 2012**

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## I. INTRODUCTION

The United States Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) to solicit public comment on its proposed remedy for the DuPont Martinsville facility in Martinsville, Virginia (hereinafter referred to as the Facility or Site). EPA's proposed remedy for the Facility consists of soil vapor extraction, zero-valance iron (ZVI) clay treatment, capping, groundwater monitoring, other engineering controls and institutional controls.

The Facility is subject to the Corrective Action program under 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 to 6992k. The Corrective Action program is designed to ensure that certain facilities subject to RCRA have investigated and cleaned up any releases of hazardous waste and hazardous constituents that have occurred at their property.

The Administrative Record (AR) for the Facility contains all documents, including data and quality assurance information, on which EPA's proposed decision is based. See Section X, Public Comment, for information on how you may review the AR .

Information on the Corrective Action program as well as a fact sheet for the DuPont Martinsville Facility can be found by navigating http://www.epa.gov/reg3wcmd/correctiveaction.htm.

## II. DUPONT MARTINSVILLE HISTORY

The Facility occupies approximately 500 acres on a large bend of the Smith River immediately adjacent to the City of Martinsville, Virginia (see Figure 1). Figure 2 is a more detailed Site map that shows solid waste management units (SWMUs) and areas of concern (AOCs).

Beginning in 1941, the Facility was used to produce nylon fiber and equipment components, known as spinnerettes, for manufacturing nylon and other fibers. Nylon manufacturing at the Facility ceased in June 1998 and the manufacturing plant was demolished. Some of the remaining structures on Site include the DuPont Precision Concepts machine shop (DPC) and administrative buildings. Koch Invista currently owns the Precision Concepts Building and uses it to manufacture spinnerettes.

The Site is surrounded on three sides (north, west, and south) by the Smith River. The southeastern third of the Site was the area used for manufacturing. Much of the remainder of the Site is wooded and undeveloped, although former disposal areas are located in portions of the northern half of the Site. In addition, the Lynwood Golf Club occupies the central portion of the Site. A parcel north of the golf course that includes the former residence of DuPont plant managers was donated to the Martinsville Christian Fellowship Church in 1995.

Property located across the Smith River and to the east of the Site is primarily undeveloped, with only scattered residences along State Highway 174 south of the Site and along U.S. Highway 220, west of the Site. Property adjacent to the east side of the Site is incorporated in the City of Martinsville and is largely undeveloped.

The Henry County Public Service Authority provides water for drinking and industrial use to the Site. Former deep production wells that were used for high-quality process water were abandoned and grouted in 1998. The Smith River is used for recreational purposes (e.g., boating and fishing) by the general population. Fishing opportunities around the Site are not good due to the sediment layer that exists in the Smith River at this location.

## III. SUMMARY OF ENVIRONMENTAL INVESTIGATIONS

In February 1986, Virginia's Department of Waste Management, which subsequently changed its name to Virginia Department of Environmental Quality (DEQ), issued a RCRA permit, Permit No. VAD 003114865, to E. I. du Pont de Nemours and Company (DuPont) for the operation of a hazardous waste storage pad (DEQ Permit) at the Facility. The DEQ Permit addresses the provisions of the Virginia Waste Management Act, Virginia Code §§ 10.1-1400 et seq.; for which the Commonwealth of Virginia (State) has received authorization under Section 3006(b) of RCRA, 42 U.S.C. § 6926(b).

The complete RCRA permit for purposes of Section 3005(c) of RCRA, 42 U.S.C. §6925(c), consists of the DEQ Permit and a Corrective Action permit (CA Permit) issued by EPA in July 1991 under RCRA Section 3004(u), 42 U.S.C. Section 6924(u). The CA Permit requires DuPont, among other things, to investigate SWMUs at the Facility, prepare a Comprehensive RCRA Facility Investigation (RFI) Report and prepare a Corrective Measures Study (CMS).

DuPont closed the permitted waste pad and the DEQ Permit expired February 21, 1996. The CA Permit, which on its terms expired in July 2001, has been administratively extended.

DuPont submitted a Comprehensive RFI Report to EPA in January 2007 (2007 Comprehensive RFI Report). EPA approved the 2007 Comprehensive RFI Report in August 2011. The table immediately below lists and describes the 10 SWMUs and 8 AOCs identified in the Comprehensive RFI Report.

| No. | Designation | SWMU or AOC Description |
|---|---|---|
| 1 | SWMU A - Nylon Fiber Landfills | Approximately 5,000 cubic yards of inert waste nylon fiber was used to help level three portions of the Facility property along the entrance road. The nylon was covered with soil and is presently either grass-covered or under a road. The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this SWMU and that no further action was required. |
| 2 | SWMU B – Inactive Coal Ash Pond | This unit was constructed by building a small impoundment dam across a ravine. Unit B received approximately 5,000 cubic yards of flyash (from the combustion of coal at the on-site power plant). In 1957, ash was no longer deposited in this unit, and it was covered with soil. It is currently covered by part of the golf fairway and tennis courts. The EPA-approved Comprehensive RFI Report determined that this unit had been fully characterized. |

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| 3 | SWMU C –<br>Former Burning Ground | The unit was described as a former burning ground for wooden pallets and waste plastic sheeting. Unit C is now grass-covered and part of Lynwood Golf Club's 18th fairway. The EPA-approved Comprehensive RFI Report determined that this unit had been fully characterized. |
| 4 | SWMU D –<br>Inactive Flyash Pond | This unit was used to dispose of flyash. It is used as a storm-water basin and has a vegetative cover. DuPont monitors the groundwater associated with this unit. The EPA-approved Comprehensive RFI Report determined that this unit had been fully characterized. |
| 5 | SWMU E –<br>Spinneret Burial Area | Associated with the DPC building, unit E received proprietary equipment components manufactured on-Site and used in the manufacture of nylon fiber. The unit is described as a series of boreholes drilled into the ground that received the equipment. It is believed that each vault was capped with concrete. A portion of the unit is covered by the DPC and the rest is under asphalt. The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this SWMU and that no further action was required. |
| 6 | SWMU F –<br>Former Trash/Ash Landfill | This unit was constructed by building a berm across a ravine in the northern portion of the Site. Based on an evaluation of Site photographs, it was built sometime between 1963 and 1970. The unit is reported to have received primarily municipal trash from the plant. Coal ash was also placed into Unit F. Unit F is capped with a soil cover. The EPA-approved Comprehensive RFI Report determined that this Unit had been fully characterized. |
| 7 | SWMU G –<br>Closed Flyash Landfill | Unit G was constructed across a wide ravine in the northern portion of the Site. Reports indicate that the unit began receiving coal ash in the 1950s; however, Site photographs do not show Landfill G until sometime between 1970 and 1982. After being seeded with grass, a large portion of Unit G was converted to a driving range. This driving range was closed during Site demolition, and inert debris (brick and concrete) was placed over a portion of Unit G. Under the DEQ Permit, DuPont is required to conduct post-closure monitoring and maintenance. The EPA-approved Comprehensive RFI Report determined that this unit had been fully characterized. |

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| 8 | SWMU H–<br>Former Finish Oil Disposal Ponds | Unit H consisted of three unlined ponds referred to as Units H1, H2 and H3. The ponds received spent nylon finish oils (vegetable or animal-based oils) until 1977. Each pond was excavated into the underlying clayey saprolite. Units H1, H2, and H3 have been filled in with native soil, flyash, and some coal tailings. Traces of chlorinated volatile organic compounds (VOCs) and constituents of concern (COCs) associated with coal ash were detected during the site investigations in unit H1. The EPA-approved Comprehensive RFI Report recommended that this unit (H1) be included in the Corrective Measures Study. |
| 9 | SWMU I –<br>Former Lab Disposal Pits | Unit I consisted of two pits that reportedly received laboratory wastes including nitric and formic acids, carbon tetrachloride, phenol, and chromate (see Figure 2). Both pits were unlined at the bottom and filled with limestone gravel. One pit had concrete walls. Both pits were filled in with soil and gravel. This unit is at the edge of a hillside that overlooks Unit D. The EPA-approved Comprehensive RFI Report recommended that this unit be included in the Corrective Measures Study. |
| 10 | SWMU J –<br>Spent Finish Oil Collection System | Unit J consisted of three units referred to as J1 - Finish Oil Above-ground Storage Tank; J2 - Finish Oil Collection Sewer; and J3 - Finish Oil Collection Sump. These units handled waste finish oil used in the nylon manufacturing process (see Figure 1-13). Early in the plant history, these oils were trucked to Unit H ponds, but the oil was later reclaimed and burned in the power plant. The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this SWMU and that no further action was required. |
| 11 | AOC - Fire Training Area (FTA) | This AOC was used for fire training field exercises from the mid-1960s until 1997. A concrete pit, approximately 20 feet by 10 feet by 3 feet deep, was used for the fire training. During the RFI, a former buried interceptor ditch was found on the east side of the fire pit. This ditch intercepted water used to fight the fire and unburned fuel before a drain to an oil water separator was built. The EPA-approved Comprehensive RFI Report recommended that this Unit be included in the Corrective Measures Study. |

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| 12 | AOC - DuPont Precision Concepts (DPC) | The DPC building houses a machine shop that manufactures proprietary equipment components for nylon and other manufacturing. Historically, equipment had been degreased in "glove-box" cleaning booths using trichloroethene (TCE), tetrachloroethene (PCE), and possibly carbon tetrachloride and chloroform. These solvents were replaced with a soapy water mixture in 1986. A storage tank contained in an underground vault is believed to have been the source of the COCs detected in groundwater in the parking lot area near this AOC. The EPA-approved Comprehensive RFI Report recommended that this unit be included in the Corrective Measures Study. |
| 13 | AOC- Bedrock Production Wells | Four production wells (Maintenance, Beaming, Railroad, and New Well) were located on-Site. The wells ranged from 300 to 550 feet deep, and reportedly produced water from fractures in "granite." The wells were used only for the production of high purity water for process use in the production of nylon polymer. The New Well was never used. Nylon flake production (producing nylon from its intermediates) at the Site ceased in 1994, and all four wells were removed from service and plugged in 1998.<br>The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this SWMU and that no further action was required. |
| 14 | AOC- Construction Landfill | This AOC was used to dispose of construction debris. It is covered by a soil cover. The EPA-approved Comprehensive RFI Report determined that this unit had been fully characterized. |
| 15 | AOC- Dredge Spoil Area | This AOC was never reported to have received industrial solid waste; however, dredge sediments were removed from the Intake Channel and placed in this area. The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this AOC and that no further action was required. |
| 16 | AOC – Former Incinerator Area | The incinerator was used from 1967 until early 1976 to burn trash, waste nylon yarn, and papers. DuPont decommissioned the incinerator around 1977. According to available documents, the foundation of the incinerator was to be buried in-place. The area was covered with approximately a foot of soil in 1998.<br>The EPA-approved Comprehensive RFI Report determined that this AOC had been fully characterized. |

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| 17 | AOC –Former No. 6 Fuel Storage | This tank was built in 1947 and held 270,000 gallons of No. 6 fuel oil, a highly viscous fluid that is unpumpable at standard temperature and pressure. Prior to pumping to the Site's power house, the oil would be pre-heated to between 110 and 245 degrees Fahrenheit and gravity fed through an underground 8-inch steel pipeline to a steam-driven reciprocating pump. This tank was located immediately east of the Finish Oil Above-Ground Storage Tank (AST) and north of the coal yard. The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this AOC and that no further action was required. |
| 18 | AOC - Former Dowtherm® Area | The former Dowtherm® area was on the west side of the manufacturing building across the street from the power house. Most of the Dowtherm® containing equipment was located on either side of the railroad tracks. Dowtherm® was heated in the Dowtherm® Vaporizers near the powerhouse, and the heated Dowtherm® was used in the nylon plant as a non-contact heat transfer fluid.<br>The EPA-approved Comprehensive RFI Report determined that there were no hazardous constituents released at this AOC and that no further action was required. |

DuPont submitted a supplemental workplan to EPA in March 2009 to address concerns raised by DEQ with respect to the Smith River's Total Maximum Daily Load ( TMDL) for polycyclic aromatic hydrocarbons (PAHs). The TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards. DEQ was concerned that existing SWMUs and AOCs maybe contributing to the TMDL for PAHs. DuPont submitted the 2009 Annual Monitoring and Supplemental RFI data Report in October 2009 (October 2009 Report). The October 2009 Report did not identify any new concerns related to the existing units.

Data from the Comprehensive RFI Report and the annual groundwater sampling reports show that Well MWD-04, located on edge of Unit D and next to the Smith River, had arsenic concentrations above that contaminant's applicable Maximum Contaminant Level (MCL) promulgated at 40 C.F.R. 141, pursuant to Section 1412 of the Safe Drinking Water Act (SDWA), 42 USC Section 300g-1. In January 2010, EPA requested additional sampling for arsenic around Unit D. DuPont conducted extensive surface water and pore water sampling in the spring of 2011. EPA subsequently approved a Smith River Investigative Report in June 2011. The results of the sampling showed that arsenic concentrations in sediment and pore water samples collected adjacent to Unit D are lower than the threshold effect concentration (TEC) and National Recommended Water Quality Criterion (NRWQC), respectively.

In October 2010, DuPont notified EPA of a release of fly ash from the former Conoco Pond. The former Conoco Pond had been previously capped with a soil cover and had not been identified as a SWMU or AOC in the 2007 Comprehensive RFI Report. DuPont determined that the release was due to a storm drain failure under the former Conoco Pond. DuPont rerouted the storm drain, filled in the old storm drain and repaired the soil cap. EPA added the former Conoco Pond to the list of SWMUs requiring long-term monitoring.

EPA approved the 2007 RFI Comprehensive Report in August 2011 after approving the Smith River Investigative Report in June 2011. EPA approved the Corrective Measures Study in January 2010, with the understanding that the additional Unit D investigation might require an addendum to the CMS. The subsequent investigation of Unit D did not require any changes to the CMS.

## IV. CONSTITUENTS OF POTENTIAL CONCERN (COPCs)

### A. Groundwater COPCs

The 2007 RFI Comprehensive Report evaluated groundwater analytical data from monitoring events conducted between October 2005 and April 2006. During the monitoring period, groundwater was sampled from 30 monitoring wells. Nine off-site monitoring well locations were also sampled. Monitoring well locations are shown in Figure 3. Groundwater samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides, metals and sulfide, depending on event and location. Groundwater seeping through springs near Unit H was included in the surface-water data set.

The following constituents of potential concern (COPCs) exceeded their respective MCL or tap water Risk Based Screening Concentration (RBSC) in at least one sample: PCE, TCE, chloroform, cis-1,2-DCE, carbon tetrachloride, CFC-11, methylene chloride, arsenic, alpha-BHC, benzene, vinyl chloride, heptachor epoxide, thallium, 1,1,2-trichloroethane, thallium, aldrin, bromodichloromethane.

### B. Soil COPCs

#### 1. Surface Soil – Potential Direct Contact Pathways

During the RFI investigations, approximately 69 surface soil samples (defined as 0- to 2-foot below ground surface [bgs]) were collected. Samples were analyzed for VOCs, SVOCs, dioxin and furan congeners, and metals, depending on location and event. Soil samples results from each unit were compared to RBSCs for residential and industrial criteria. The following COPCs exceeded their respective RBSCs for industrial soil: arsenic, benzene, benzo(a)pyrene, iron, and PCE.

### 2. Subsurface Soil – Potential Direct Contact Pathways

During the RFI and supplemental investigations, approximately 146 subsurface soil samples taken at a depth of greater than 2-feet bgs were collected. Samples were analyzed for VOCs, SVOCs, dioxin and furan congeners, and metals, depending on location and event. The following COPCs exceeded their respective RBSCs for industrial soil: arsenic, benzene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, iron, TCE, and PCE. Concentrations of dioxin-like PCBs exceeded the applicable RBSC for industrial soil at one sample collected at Unit H1. However, the sample results from this location did not exceed EPA action levels of 5,000 picograms per gram (pg/g) for dioxin in commercial/industrial soil.

Two VOCs detected in subsurface soils, 2-hexanone and methyl chloride, did not have a screening level.

## C. Surface Water COPCs

Between October 2005 and July 2006, surface water was sampled at the Facility from golf course ponds, groundwater seeping through springs near Unit H, a Smith River Outfall Channel, and the Smith River Intake Channel. The surface water samples were analyzed for VOCs, total and dissolved arsenic and lead, depending on the event and location.

Carbon tetrachloride and PCE were detected above screening criteria in groundwater seep samples collected below AOC No. 12, the DPC, in the Outfall Channel and in the inland end of the Intake Channel. Total lead exceeded screening criterion in samples collected from the Smith River entrance to the Intake Channel, however, dissolved lead was not detected at the same location. None of these constituents was detected in downstream sample locations.

## D. Indoor Air COPCs

Indoor air samples were collected in the DPC and administration buildings in 1998. These samples were collected to evaluate the potential for Site-related VOCs to migrate from the groundwater into these buildings. These samples were non-detect for the COPCs.

In addition, an evaluation of the vapor intrusion to indoor air from groundwater pathways was completed for Site. The evaluation followed the principles outlined in *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, Subsurface Vapor Intrusion Guidance,* (USEPA, 2002). Shallow groundwater data from on-Site monitoring wells located near the DPC and administration buildings were evaluated. Based on this evaluation, there were no VOCs that exceeded the applicable screening levels.

Based on the above-described data, EPA has determined that vapor intrusion of VOCs from groundwater to indoor areas is not a potential concern at this time.

## V. INTERIM MEASURES

Following the recommendation of the 2000 RFI Update Report, pursuant to the Interim Measure (IM) provisions of the CA Permit DuPont implemented zero-valance iron (ZVI) treatment to remediate carbon tetrachloride at SWMU I, the Spent Finish Oil Collection System. DuPont mixed iron and kaolinite into shallow soil during October and November 2002.

Post-remediation soil sampling was conducted in September 2003 and October 2004 and confirmatory soil samples were taken twice after the ZVI treatment was completed. Sample results show that carbon tetrachloride concentrations in the source area at Unit I were reduced by approximately five orders of magnitude to below carbon tetrachloride's direct contact residential RBSC.

Since completion of the ZVI treatment, groundwater monitoring data have shown a steady decrease in carbon tetrachloride concentrations. Unit I was subsequently capped with asphalt to prevent groundwater infiltration.

## VI. SUMMARY OF EXPOSURE PATHWAYS

Potential receptors are defined as human populations or individuals and environmental systems that are susceptible to contaminant exposure from the Site. Current land- and water-use conditions were considered in determining exposure scenarios in the 2007 Comprehensive RFI Report.

DuPont, or its successor, will control land use as industrial. The following potential receptors were identified, given the Site setting and anticipated land uses at and adjacent to the Site:

- On-site Industrial Worker
- On-site Construction/Excavation Worker
- On-site Youth Trespasser
- Recreational User of the Smith River (swimming, fishing and boating)

Ecological receptors (terrestrial and aquatic) were also considered relevant receptors. Results of an EPA-approved May 2000 Habitat Survey concluded that natural areas at the Site are in good condition, offer good-quality habitat for wildlife, and are not impacted by potential releases from SWMUs and AOCs. The Smith River is the main receptor for potential releases from the RFI units.

No downgradient receptors of off-Site groundwater exist due to the prevailing flow direction towards the Smith River. Likewise, impacted soils are contained within Facility boundaries. Therefore, off-Site residents or workers were not considered potential receptors.

### A. Soil Exposure Pathways

The potential for exposure to COPCs in surface soil is low for most receptors under current conditions because the principal areas of surface soil contamination have limited access, are located in remote/inactive portions of the Site, or are covered by gravel, asphalt or an established

vegetative cover. The receptor with the greatest potential for exposure is the on-Site construction/excavation worker, where a greater likelihood of direct contact with impacted soil is associated with intrusive activities, e.g., boring, drilling and excavation.

The Facility currently uses an internal permitting process that requires authorization from DuPont Martinsville Site Manager before any intrusive activities into Site soils or building foundations may occur. The purpose of the internal permitting process is to ensure that:

- Appropriate measures are taken to protect personnel should subsurface activity encounter impacted soils or groundwater (i.e., personal protective equipment [PPE]).
- Construction methods are protective from groundwater contamination or transfer of contaminants laterally or vertically.
- Construction practices minimize the generation of potentially impacted media and ensure that such media are properly characterized and disposed of in accordance with regulatory requirements.

In addition to the internal permitting process, the former operating areas of the Site are fenced, and security is present seven (7) days a week from 6:00AM until 12:00PM (Midnight).

Due to the Site permitting process required for intrusive work and the location and limited accessibility of surface soilexceedances, potential on-Site receptor exposures to impacted surface soil are not significant.

### B. Subsurface

Because subsurface soil contamination is only present on-Site and exposure to subsurface soil is only achieved during excavation and construction activities, the only potential receptor for this medium is the on-Site construction/excavation worker through incidental ingestion of and dermal contact with soil and inhalation of soil-derived particulates or vapors.

The internal permitting process for intrusive activities would preclude access to impacted soils without protective measures, such as PPE, to prevent exposures. Due to the intrusive activity permitting process that is required at the Site, potential on-site construction/excavation worker exposures to impacted subsurface soil are not significant.

### C. Groundwater Exposure Pathways

Groundwater is not used at the Facility or downgradient of the Facility for drinking water due to the prevailing groundwater flow direction towards the Smith River, the hydraulic sink for regional groundwater. The Smith River is classified as a public water supply. However, the nearest downstream public water intake is in Eden, North Carolina (slightly over 15 miles downstream). Therefore, direct contact (ingestion or dermal contact) with groundwater for on-Site industrial workers and off-Site residents is remote.

Since impacted groundwater underlies much of the Site, there are potentially complete exposure pathways for on-Site construction/excavation workers engaged in excavation activities where the water table might be encountered. With regard to the on-Site construction worker, the exposure

pathway would be considered insignificant since most construction, excavation, or utility workers would not spend any appreciable time in contact with the water. Furthermore, DuPont's current internal permitting process greatly reduces the potential exposure of on-Site construction/excavation workers to impacted groundwater.

### D. Surface Water

Exceedances of screening criteria in surface water at the Site are localized to the Intake Channel and the near bank of the Outfall Channel below AOC No. 12, the DPC. No detections were observed in downstream surface water samples. Occasional maintenance on pumps in the Intake Channel does occur. Similarly, the habitat survey conducted in 2000 identified potential ecological receptors in the Smith River. Therefore, DuPont evaluated on-Site industrial worker receptors through incidental ingestion of and dermal contact with surface water and ecological receptors (Terrestrial and Aquatic) through ingestion/uptake of and dermal contact with surface water.

On-site Industrial Workers conduct maintenance at the Intake Channel infrequently. In addition, any maintenance work would be performed in accordance with a Site-specific health and safety plan (HSP) that includes extensive procedures and mandated PPE to prevent contaminant exposure. As a result, potential exposure to COPCs in the Intake Channel by on-Site industrial workers is considered insignificant.

Exceedances of ecological screening criteria in surface water at the Site are localized in the Intake Channel and near the bank of the Outfall Channel below AOC No. 12, the DPC. No detections were observed in downstream surface water samples, suggesting that the minor local effects on surface water quality are not affecting water quality downstream of the Site As a result, potential exposure of COPCs in surface water by ecological receptors is also considered insignificant.

## VII. CORRECTIVE ACTION OBJECTIVES

EPA has identified the following Corrective Action Objectives for soils and groundwater at the Facility:

### A. Soils

The Corrective Action Objective for Facility soils is the control of human and environmental exposure to the hazardous wastes and hazardous constituents that remain in place at the Facility. EPA has determined that EPA Region III's Screening Levels for Industrial Soils for direct contact with soils are protective of human health and the environment for individual contaminants at this Facility, provided that the Facility is not used for residential purposes.

### B. Groundwater

The Corrective Action Objective for contaminated groundwater at the Facility is the restoration of groundwater to drinking water standards. These standards are established by the Maximum Contaminant Levels (MCLs) promulgated at 40 CFR 141, pursuant to Section 1412 of the Safe

Drinking Water Act (SDWA), 42 USC Section 300g-1. For contaminants of concern without an applicable MCL, EPA's Risk Based Screening Concentration (RBSC) for tap water established by EPA Region III in 2012 was used.

## VIII. SUMMARY OF PROPOSED REMEDY

EPA's proposed remedy for the Site consists of the following components which EPA intends to implement through the issuance of a Permit Modification to DuPont's CA Permit:

### A. EPA's Proposed Remedies for SWMUs and AOCs

| | SWMU or AOC | EPA Proposed Remedy |
|---|---|---|
| 1 | SWMU A – Nylon Fiber Landfills | No Action |
| 2 | SWMU B - Inactive Coal Ash Pond | Maintenance and monitoring of existing soil and/or vegetative cap. |
| 3 | SWMU C - Former Burning Ground | Maintenance and monitoring of existing soil and/or vegetative cap. |
| 4 | SWMU D - Inactive Flyash Pond | Maintenance and monitoring of existing soil and/or vegetative cap. Groundwater shall be monitored to ensure groundwater objectives are met. |
| 5 | SWMU E – Spinneret Burial Area | No Action |
| 6 | SWMU F - Former Trash/Ash Landfill | Maintenance and monitoring of existing soil and/or vegetative cap. |
| 7 | SWMU G - Closed Flyash Landfill: (required by the DEQ permit) | Maintenance and monitoring of existing soil and/or vegetative cap. |
| 8 | SWMU H1 - Former Finish Oil Disposal Ponds | EPA proposes ZVI-clay treatment for the contaminated source soils. ZVI-clay will destroy the constituents of concern. A one-foot soil cap will be placed over the treated material to help stabilize SWMU H1 soils and allow vegetation to be reestablished. Maintenance and monitoring of the cap will be required. In conjunction with the ZVI clay treatment, groundwater will be monitored to ensure that groundwater objectives are met. |

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| 9 | SWMU I - Former Lab Disposal Pits | Under an interim measures, the SWMU I source area (soil) was remediated in 2002. While constituents in groundwater have decreased from this unit after the interim measure was implemented, groundwater will continue to be monitored to ensure groundwater objectives are met. |
| 10 | SWMU J- Spent Finish Oil Collection System | No Action |
| 11 | AOC - Fire Training Area | EPA proposes capping the Fire Training Area. DuPont performed a preliminary analysis of the soil in the Fire Training Area in September 2011 to test the feasibility of using passive bioventing. Soil results indicated that passive bioventing would not work in remediating the contaminated soils, therefore capping is being proposed as the final remedy. Operation, maintenance and monitoring of the cap will be required. In conjunction with the proposed cap, groundwater will be monitored to ensure groundwater objectives are met. |
| 12 | AOC - DuPont Precision Concepts | EPA proposes soil vapor extraction (SVE) treatment for the source soils and enhanced biological stimulation for groundwater. A SVE pilot study conducted by DuPont under the DPC building in September 2011 was successful. These technologies will destroy the constituents of concern and are readily implementable. In conjunction with the proposed SVE and enhanced biological stimulation, groundwater will continued to be monitored to ensure groundwater objectives are met. |
| 13 | AOC - Bedrock Production Wells | No Action |
| 14 | AOC -Construction Landfill | Maintenance and monitoring of existing soil and/or vegetative cap. |

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| 15 | AOC- Dredge Spoil Area | No Action |
| 16 | AOC -Former Incinerator Area | Maintenance and monitoring of existing soil and/or vegetative cap. |
| 17 | AOC – Former No. 6 Fuel Storage | No Action |
| 18 | AOC- Former Dowtherm Area | No Action |
| 19 | Former Closed Conoco pond – Flyash | Maintenance and monitoring of existing soil and/or vegetative cap. |

Along with the SWMU and AOC specific corrective measures listed above, EPA proposes to require DuPont to develop and implement an EPA-approved Facility-wide Materials Management Plan which will detail how all excavated soils will be handled and disposed so as to protect human health and the environment in the SWMUs and AOCs listed in Section VIII.A (excluding those SWMUs and AOCs for which No Action is proposed). EPA proposes that the Materials Management Plan include, at a minimum, the requirements already contained in DuPont's internal permitting process described in Section VI.A, above.

### B. Surface Water

EPA is proposing to require DuPont to continue the surface water monitoring in conjunction with the groundwater monitoring. Surface water detections in the Intake Channel, associated with SWMU I, Former Lab Disposal Pits, and surface water detections associated with AOC DPC area will continue to be monitored until groundwater cleanup levels are met for these two units.

### C. Compliance with and Maintenance of Institutional Controls

ICs are non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use and inform subsequent purchasers of the environmental conditions at the Facility and of EPA's final remedy for the Facility. Under EPA's proposed remedy, some contaminants remain in the groundwater and soil at the Facility above levels appropriate for residential uses. Because some contaminants remain in the soil and groundwater at the Facility at levels which exceed residential use, EPA's proposed decision requires the compliance with and maintenance of land and groundwater use restrictions.

ICs may include, but may not be limited to, an environmental covenant to be entered pursuant to the Virginia Uniform Environmental Covenants Act, § 10.1-1238 et seq. of the Code of Virginia (UECA) and to be recorded with the deed for the Facility property. The Environmental Covenant is required to include the following:

> **1.** Groundwater at the Facility shall not be used for any purpose other than 1) industrial use as non-contact cooling water and 2) the operation, maintenance, and monitoring activities required by DEQ and EPA, unless it is demonstrated to EPA, in consultation with DEQ, that such use will not pose a threat to human health or the environment or adversely affect or interfere with the final remedy to

be selected by EPA after public comment on this SB (Final Remedy); and EPA, in consultation with DEQ, provides prior written approval for such use;

**2.** The Facility property shall not be used for residential purposes unless it is demonstrated to EPA, in consultation with DEQ, that such use will not pose a threat to human health or the environment or adversely affect or interfere with the Final Remedy, and EPA, in consultation with DEQ, provides prior written approval for such use;

**3.** No new groundwater wells shall be installed at the Facility unless it is demonstrated to EPA, in consultation with DEQ, that such wells are necessary to implement the Final Remedy, and EPA provides prior written approval to install such wells.;

**4.** EPA, DEQ and their authorized agents and representatives will be provided access to the Facility to inspect and evaluate the continued effectiveness of the final remedy;

**5.** EPA and DEQ shall be notified at least thirty (30) calendar days prior to the sale of any interest in the Facility property or any portion thereof; and

6. All earth moving activities, including excavation, drilling and construction activities, in the SWMUs and AOCs listed in Section VIII.A (excluding those SWMUs and AOCs for which No Action is proposed) at the Facility shall be conducted in accordance with a Materials Management Plan approved by EPA in consultation with DEQ and in such a manner that such activity will not pose a threat to human health and the environment or adversely affect or interfere with the Final Remedy.

**D. Reporting Requirements**

EPA's proposed remedy includes the following reporting requirements:

**1.** Compliance with and effectiveness of institutional controls and engineering controls implemented at the Facility shall be evaluated at a minimum every three (3) years. The evaluation will include, but not be limited to, a review of groundwater and land uses within one (1) mile of the Facility property boundary, and zoning maps or planning documents that may affect future land use in the impacted area. A report documenting the findings of the evaluation shall be provided to EPA and DEQ, and

**2.** Compliance with and effectiveness of the Final Remedy for SWMU H1, the Former Finish Oil Disposal Ponds; AOC No. 11, the FTA; and AOC No. 12, the DPC, in reducing contaminant concentrations and restoring the groundwater to MCLs shall be evaluated and included in the Groundwater Monitoring Plan. Groundwater results from SWMU I, Former Lab Disposal Pits, and SWMU D, Inactive Flyash Pond, shall also be reported in Groundwater Monitoring Plan.

## IX. EVALUATION OF PROPOSED REMEDY

This section provides a description of the criteria EPA used to evaluate the proposed remedy consistent with EPA guidance. The criteria are applied in two phases. In the first phase, EPA evaluates three decision threshold criteria as general goals. In the second phase, for those remedies which meet the threshold criteria, EPA then evaluates seven balancing criteria.

### A. Threshold Criteria

#### 1. Protect Human Health and the Environment

With respect to groundwater, while significant levels of contaminants remain in the groundwater beneath the Facility, the contaminants that flow into the Smith River are below ecological screening criteria. In addition, groundwater is not used for drinking water at the Facility or downgradient of the Facility. Furthermore, the groundwater monitoring program already in place will continue until groundwater clean-up standards are met. With respect to future uses, the proposed remedy requires groundwater use restrictions to minimize the potential for human exposure to contamination and protect the integrity of the remedy.

With respect to Facility soils, three areas (SWMU H1, AOC DPC, AOC FTA) will undergo soil treatment or capping as either the remedy or part of the remedy for those areas. Existing units that contain fly ash, construction material or incinerator ash will maintain their existing soil or vegetative caps to prevent exposure. These capped units have not impacted groundwater, with the exception of SWMU D. Results of an 2011 investigation indicated arsenic concentrations measured in sediment and pore water samples collected adjacent to SWMU D are lower than the threshold effect concentration (TEC) and National Recommended Water Quality Criterion (NRWQC) respectively.

There is no direct exposure of industrial workers to subsurface soil under current land use, and direct exposure of construction/excavation workers is controlled by the existing Facility administrative controls including the internal permitting process and appropriate health and safety plans. With respect to future uses, EPA has proposed land use restrictions in order to minimize the potential for human exposure to contamination. In addition, EPA proposes to require compliance with a Materials Management Plan. The Materials Management Plan will require DuPont, among other things, to continue to implement and maintain its internal permitting process.

#### 2. Achieve Media Cleanup Objectives

The proposed soil remedy for SWMU H1 and AOC DPC will target the source areas which will reduce contamination in soil and, eventually, in groundwater. The cleanup objective for SWMUH H and AOC DPC is to eliminate, to the extent practicable, the source of contamination to groundwater. Enhanced biological stimulation will be used to further remediate groundwater

in the AOC DPC area. In addition, a groundwater monitoring program and a surface water monitoring program already in place will continue until the groundwater clean-up standards are met. EPA's proposed remedy also requires the implementation and maintenance of institutional controls to ensure that Facility property is not used for residential purposes and a restriction on the use of groundwater beneath the property for potable purposes until groundwater is restored to drinking water standards.

#### 3. Remediating the Source of Releases

EPA seeks to eliminate or reduce further releases of hazardous wastes and hazardous constituents that may pose a threat to human health and the environment. The proposed remedy for SWMU H1 and AOC DPC will remediate the two main sources of groundwater contamination at the Facility. For AOC FTA, capping the PAH contaminated soil will prevent migration to groundwater. In addition, a groundwater monitoring program already in place will continue until groundwater clean-up standards are met.

### B. Balancing/Evaluation Criteria

#### 1. Long-Term Effectiveness

A groundwater monitoring and surface water monitoring program already in place will continue until groundwater clean-up standards are met. With respect to Facility soils, SWMU H1, AOC DPC, and AOC FTA will be treated or capped thereby eliminating the source of groundwater contamination at the Facility. In addition, EPA's proposed remedy requires the compliance with and maintenance of land use and groundwater use restrictions at the Facility. The proposed restrictions will maintain protection of human health and the environment over time by controlling exposure to the hazardous constituents remaining in soils and groundwater.

#### 2. Reduction of Toxicity, Mobility, or Volume of the Hazardous Constituents

The proposed remedies for SWMU H1, AOC DPC, and AOC FTA will reduce the toxicity, mobility and volume of hazardous constituents at the Facility in soil and groundwater by eliminating the source of groundwater contamination at the Facility. In addition, a groundwater monitoring program already in place will continue until groundwater clean-up standards are met.

#### 3. Short-Term Effectiveness

EPA's proposed remedy does not involve any activities, such as construction or excavation, that would pose short-term risks to workers, residents, and the environment. In addition, EPA anticipates that the land use and groundwater use restrictions can be fully implemented shortly after the issuance of the Final Decision and Response to Comments (FDRTC).

#### 4. Implementability

EPA's proposed remedy is readily implementable. DuPont has performed a preliminary feasibility study using soil vapor extraction (SVE) at AOC DPC. That study showed that SVE is

capable of remediating the source area at AOC DPC. In addition, EPA proposes to implement the Final Remedy through modifying the existing DuPont's CA Permit. EPA does not anticipate any regulatory constraints in issuing the modified permit since EPA is the issuing authority.

### 5. Cost-Effectiveness

EPA's proposed remedy for SWMU H1, AOC DPC and AOC FTA was evaluated during a pilot program to determine how the concepts of remediation sustainability could be applied to remedy selection during the CMS process. The sustainability measures were compared with other balancing factors, including cost, to propose the remedy that best fit the criteria. The proposed remedies for SWMU H1, AOC DPC and AOC FTA provided the best combination of balancing factors, including cost.

### 6. Community Acceptance

EPA will evaluate Community acceptance of the proposed decision during the public comment period and it will be described in the FDRTC.

### 7. State/Support Agency Acceptance

DEQ has reviewed and concurred with the proposed remedy for the Facility. Furthermore, EPA has solicited DEQ input and involvement throughout the investigation process at the Facility.

## X. PUBLIC COMMENT

Before EPA makes a final decision on its proposed remedy for the Facility, the public may participate in the decision selection process by reviewing this SB and documents contained in the Administrative Record (AR) for the Facility. The AR contains all information considered by EPA in reaching this proposed decision. It is available for public review during normal business hours at:

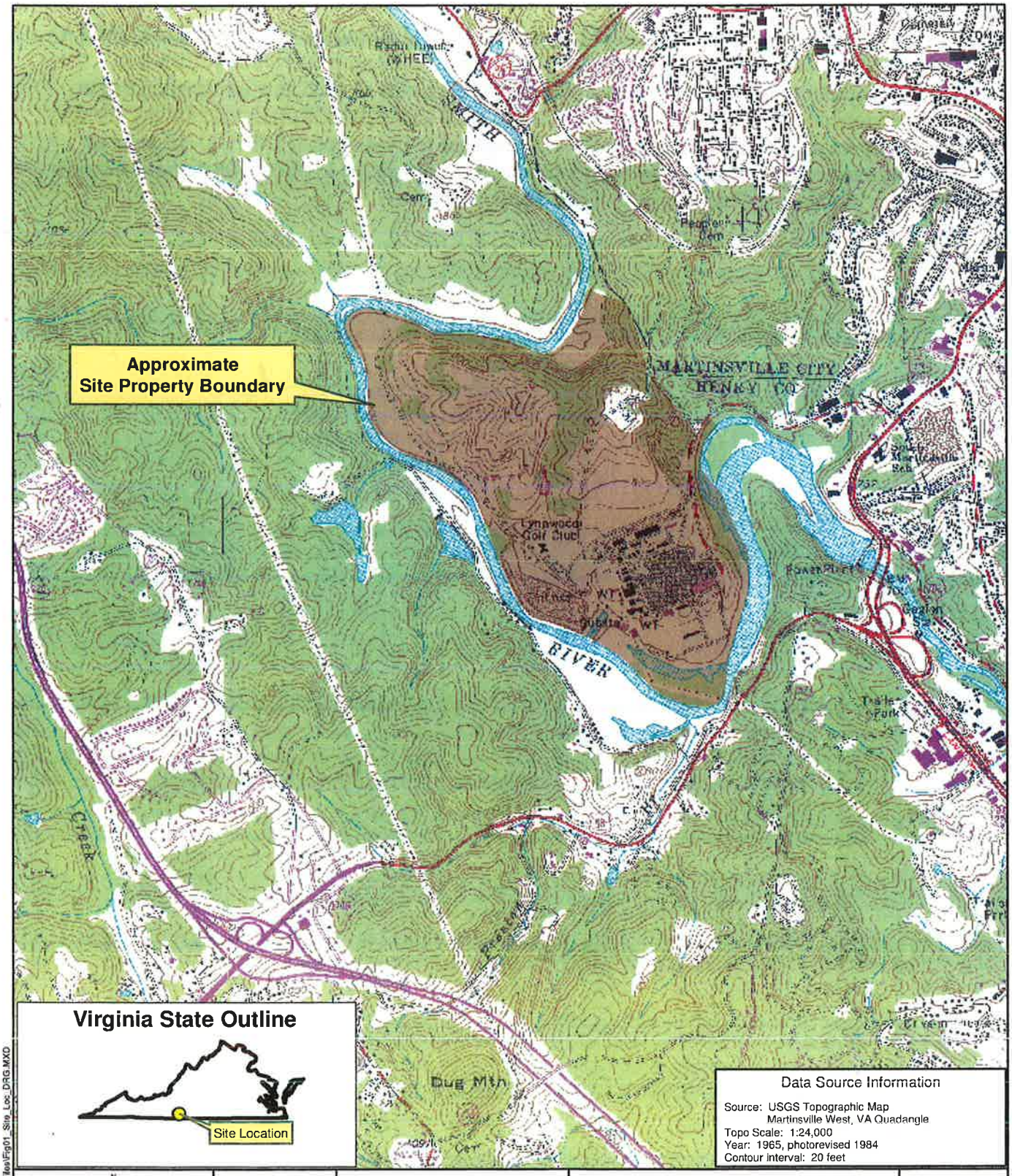
U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103
Contact: Michael Jacobi
Phone: (215) 814-3435
Fax: (215) 814-3113
Email: jacobi.mike@epa.gov

Interested parties are encouraged to review the AR and comment on EPA's proposed remedy. The public comment period will last thirty (30) calendar days from the date that notice is published in the Martinsville Bulletin. Comments may be submitted by mail, fax, e-mail, or phone to Michael Jacobi at the address listed above. EPA will hold a public meeting to discuss this proposed decision upon request. Requests for a public meeting should be made to Michael Jacobi.

EPA will respond to all relevant comments received during the comment period. If EPA determines that new information warrant a modification to the proposed remedy, EPA will modify the proposed remedy or select other alternatives based on such new information and/or public comments. EPA will announce its final decision and explain the rationale for any changes in a document entitled the Final Decision and Response to Comments (FDRTC). All persons who comment on this proposed decision will receive a copy of the FDRTC. Others may obtain a copy by contacting Michael Jacobi at the address listed above.

DATE: 9/13/12

Abraham Ferdas, Director
Land and Chemicals Division
US EPA, Region III




Data Source Information

Source: USGS Topographic Map
Martinsville West, VA Quadangle
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Contour interval: 20 feet

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1:24,000
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SCALE NOT VALID FOR DIFFERENT PAGE SIZE.

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| FILE NUMBER: | |
| DESIGNED BY: | GG |
| DRAWN BY: | KJB |
| DATA QUALITY CHECK BY: | GG |

URS Corporation
325 West Main Street
Suite 1202
Louisville, Kentucky 40202

# Site Location

DuPont Martinsville Virginia Site
Martinsville, Virginia 24112

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|---|---|
| PROJECT NUMBER: | ----- |
| DATE: | September 2012 |
| FIGURE NUMBER: | 1 |

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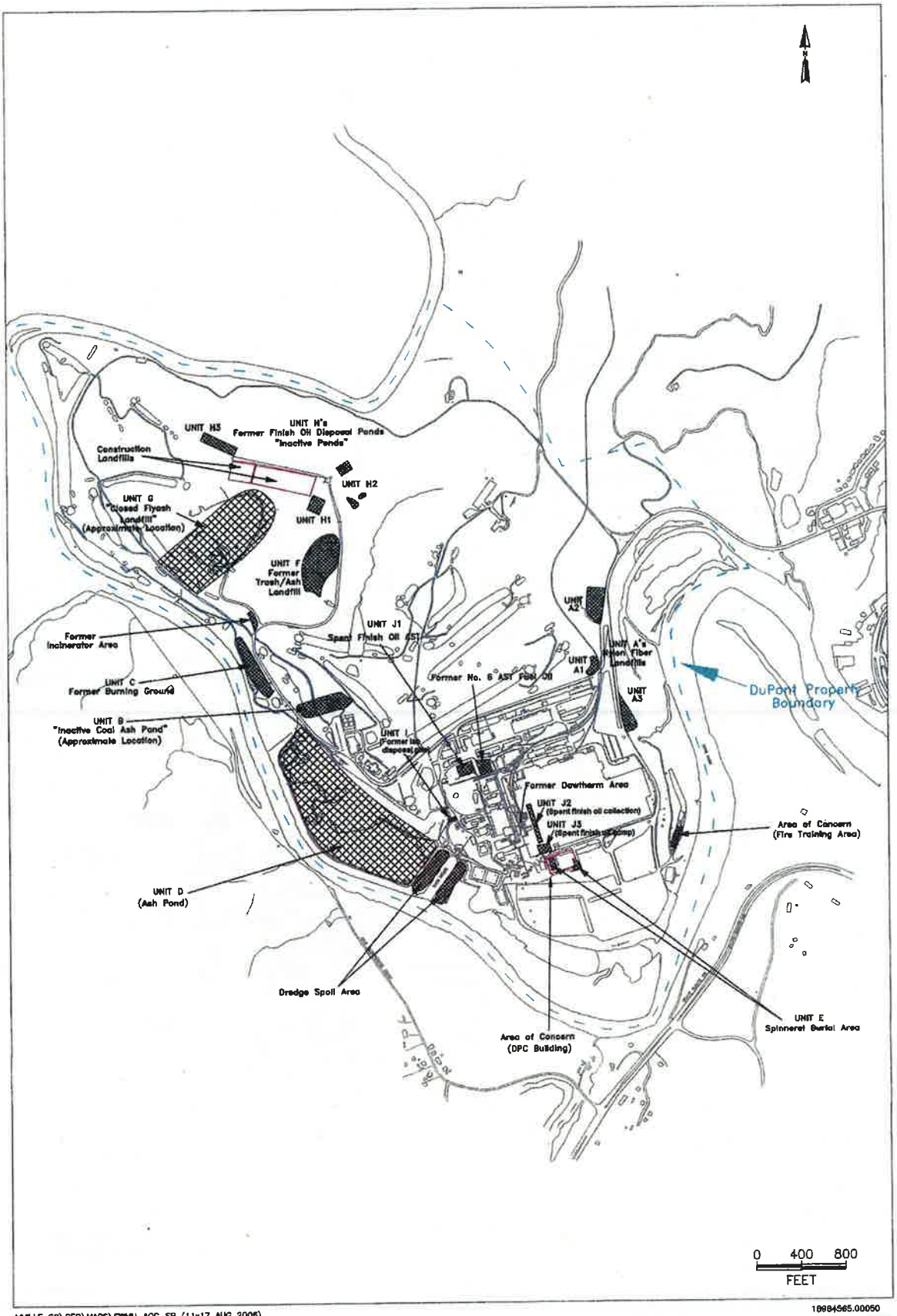


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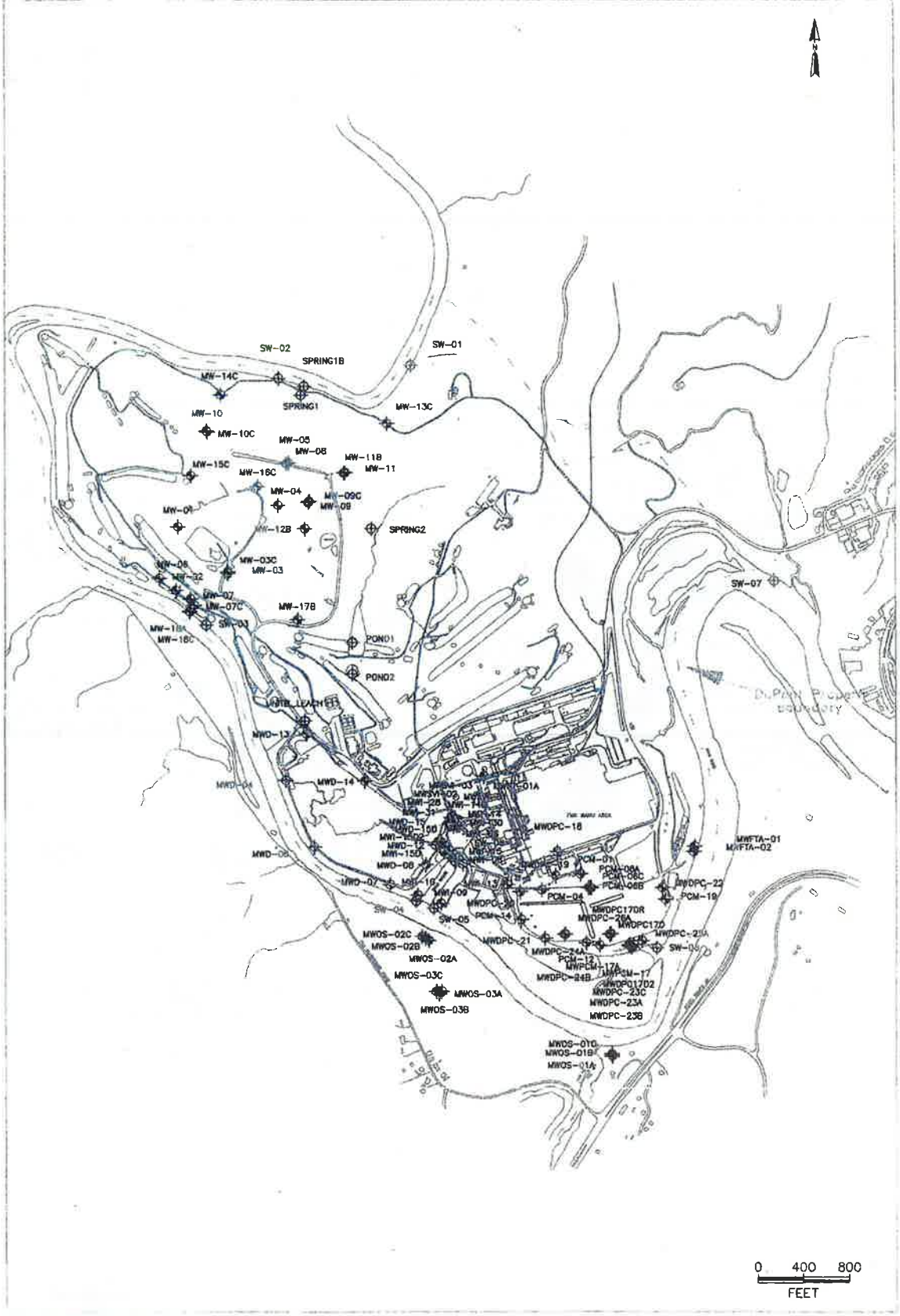
Corporate Remediation Group
An Alliance between DuPont and URS Diamond
160 Cypress Station Drive, Suite 140
Houston, Texas 77090

TITLE:
Site Plan and Unit (SWMU/AOC) Location Map
2007 Comprehensive RFI Report
DuPont Martinsville Plant

| DWN: | DES.: | PROJECT NO.: |
|---|---|---|
| RAH | | 504465 |
| CHKD: | APPD: | FIGURE NO.: |
| DATE: 8/23/06 | REV.: | 2 |

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18884585.00050

Corporate Remediation Group
An Alliance between DuPont and ITRI Diamond
140 Cypress Station Drive, Suite 140
Houston, Texas 77090

TITLE:
Monitoring Wells and Surface Water Sampling Location Map
2007 Comprehensive RFI Report
DuPont Martinsville Plant

| DWN: | DES.: | PROJECT NO.: |
|---|---|---|
| RAH | | 504465 |
| CHKD: | APPD: | FIGURE NO.: |
| | | 3 |
| DATE: 12/8/06 | REV.: | |