

**Virginia Department of Environmental
Quality
DRAFT HAZARDOUS WASTE PERMIT
FOR
Corrective Action
Former DuPont – Waynesboro
Waynesboro, VA
EPA ID No: VAD003114832
XX XX, 2020**



Commonwealth of Virginia
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219
P.O. Box 1105, Richmond, Virginia 23218
(800) 592-5482
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

**Hazardous Waste Management Permit For
Corrective Action**

**Former DuPont - Waynesboro
E.I. du Pont de Nemours and Company
974 Centre Road
Wilmington, DE**

Correspondence to be sent to:
**Corteva Environmental Remediation
974 Centre Road
Chestnut Run Plaza
Wilmington, DE 19805
EPA ID No: VAD003114832**

Pursuant to Chapter 14, Article 4, Title 10.1, Code of Virginia (1950), as amended, and regulations promulgated thereunder by the Virginia Department of Environmental Quality, a Permit is issued to E.I. du Pont de Nemours and Company for the former DuPont Waynesboro facility (hereinafter referred to as the Permittee), to conduct Corrective Action (CA), as necessary to protect human health and the environment, for all releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU) or Area of Concern (AOC). The facility being permitted is located in the City of Waynesboro at latitude 38° 03' 31" North and longitude 78° 53' 12" West.

The Permittee shall comply with all terms and conditions set forth in this Permit including all Permit Attachments II.A through II.E. If the Permit and the Permit Attachments conflict, the wording of the Permit shall prevail. The Permittee shall also comply with all applicable regulations contained in the Virginia Hazardous Waste Management Regulations (VHWMR) as codified in Title 9 of the Virginia Administrative Code, Agency 20, Chapter 60 (9 VAC 20-60), and the *Resource Conservation and Recovery Act (RCRA)* Regulations under 40 CFR Parts 124, 260, 261, 262, 264, 265, 268, and 270 as adopted by reference in the VHWMR. (For convenience, wherever the RCRA regulations are adopted by reference and cited in this Permit and the Permit Attachments, the regulatory citations will be only those from 40 CFR).

The Commonwealth of Virginia has received authorization for its hazardous waste management program under Section 3006(b) of the RCRA, 42 U.S.C. § 6926(b), to administer

and enforce the RCRA under the VHWMR in lieu of the federal hazardous waste management program. Applicable regulations are those under the VHWMR (9 VAC 20-60) and the RCRA which are in effect on the date of final administrative action on this Permit and as well as any self-implementing statutory provisions and related regulations which are automatically applicable to the Permittee's hazardous waste management activities, notwithstanding the conditions of this Permit.

This Permit is based on the administrative record and the assumption that the information submitted by the Permittee and contained in the administrative record is complete and accurate. The Permittee's failure in the application, or during the permit issuance process, to fully disclose all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time, shall be grounds for the modification or termination of this Permit pursuant to 40 CFR § 124.5, § 270.41, §270.42, and §270.43, and shall also be grounds for initiation of an enforcement action. The Permittee shall inform the Department of any deviations from Permit Conditions or changes in the information provided in the application. In particular, the Permittee shall inform the Department of any proposed changes that might affect the ability of the Permittee to comply with applicable regulations and/or Permit Conditions, or which alter any of the conditions of the Permit in any way.

This Permit is effective as of _____, and shall remain in effect until _____ unless revoked and reissued in accordance with 40 CFR §124.5 and § 270.41, terminated in accordance with 40 CFR §270.43, or continued in accordance with 9 VAC 20-60-270.B.15.

Date Signed

Leslie A. Romanchik
Hazardous Waste Program Manager
Office of Financial Responsibility and
Waste Programs

TABLE OF CONTENTS

	PAGE
MODULE I - STANDARD CONDITIONS.....	I-1
I.A. EFFECT OF PERMIT.....	I-1
I.B. PERMIT ACTIONS.....	I-1
I.C. SEVERABILITY.....	I-2
I.D. DUTIES AND REQUIREMENTS.....	I-2
I.E. MONITORING AND RECORDS.....	I-5
I.F. COMPLIANCE NOT CONSTITUTING DEFENSE.....	I-6
I.G. TRANSFER OF PERMITS.....	I-6
I.H. PERMIT EXPIRATION AND CONTINUATION.....	I-7
I.I. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT.....	I-7
I.J. DOCUMENTS TO BE MAINTAINED AT THE FACILITY SITE.....	I-9
I.K. APPROVAL/DISAPPROVAL OF SUBMISSIONS.....	I-10
I.L. DISPUTE RESOLUTION.....	I-11
 MODULE II - SITE-WIDE CORRECTIVE ACTION.....	 II-1
II.A. CORRECTIVE ACTION FOR CONTINUING RELEASES; PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.....	 II-1
II.B. CORRECTIVE MEASURES IMPLEMENTATION.....	II-1
II.C. EVALUATION OF THE SELECTED REMEDY.....	II-6
II.D. EMERGENCY RESPONSE; RELEASE REPORTING.....	II-6
II.E. GUIDANCE DOCUMENTS.....	II-7
II.F. SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT.....	II-7
II.G. FINANCIAL ASSURANCE.....	II-9
II.H. RECORDKEEPING.....	II-10
II.I. ACCESS FOR CORRECTIVE ACTION OVERSIGHT.....	II-10
II.J. COMPLETION OF REMEDY.....	II-10
II.K. ATTACHMENTS TO PERMIT MODULE II.....	II-10

LIST OF ATTACHMENTS

The following Attachments are incorporated, in their entirety, by reference into this Permit. These incorporated attachments are enforceable conditions of this Permit. Some of the documents contain excerpts from the Permittee's Hazardous Waste Permit Application. The Department has, as deemed necessary, modified specific language excerpted from the permit application. Additional modifications are prescribed in the Permit Conditions (Modules I and II), and thereby supersede the language of the attachments. Facility operations shall be in accordance with the contents of the Attachments and this Permit.

ATTACHMENT II.A - FACILITY DESCRIPTION AND ON-SITE CORRECTIVE ACTION

ATTACHMENT II.B - LIST AND DESCRIPTION OF KNOWN ON-SITE SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs)

ATTACHMENT II.C - OFF-SITE CORRECTIVE ACTION (AOC 4)

ATTACHMENT II.D - HEALTH AND SAFETY PLAN REQUIREMENTS

ATTACHMENT II.E - CORRECTIVE MEASURES IMPLEMENTATION SCOPE OF WORK REQUIREMENT

LIST OF FIGURES

Figure II.A-1 - SITE LOCATION MAP

Figure II.B-1 - ON-SITE SWMU LOCATION MAP

Figure II.C-1 - AOC 4 STUDY AREA

Figure II.C-2 - INTEGRATION OF ADAPTIVE MANAGEMENT AND RCRA PROCESS

LIST OF TABLES

Table II.A-1 - SUMMARY OF DOCUMENT SUBMITTALS FOR ON-SITE CORRECTIVE ACTION

Table II.B-1 - ON-SITE SWMU OPERATIONAL SUMMARY

Table II.B-2 - ON-SITE SWMU CORRECTIVE ACTION SUMMARY

Table II.C-1 - KEY PROGRAM DELIVERABLES

Virginia Department of Environmental Quality
Office of Financial Responsibility and Waste Programs
DuPont Waynesboro

EPA ID No. VAD003114832
Expiration Date: XX XX, 202X

DEFINITIONS

All definitions contained in 40 CFR Sections 124.2, 260.10, 270.2, 264.141, 264.1031, 264.1051, 264.1081, and 9 VAC 20-60 are hereby incorporated, in their entirety, by reference into this Permit. Any of the definitions used below, (a) through (n) shall supersede any definition of the same term given in 40 CFR Sections 124.2, 260.10, 270.2, 264.141, 264.1031, 264.1051, 264.1081, and 9 VAC 20-60. Where terms are not defined in the regulations or the Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

Throughout the Permit, all references to 40 CFR Parts 124, 261-266, 268, 270, 273, 279, are as adopted by reference in the Virginia Hazardous Waste Management Regulations, 9 VAC 20-60.

- a. The term “**Permit**” shall mean the Permit issued by the Virginia Department of Environmental Quality, pursuant to Chapter 14, Article 4, Title 10.1, Code of Virginia (1950), as amended, and the Virginia Hazardous Waste Management Regulations (VHWMR) as codified in Title 9 of the *Virginia Administrative Code*, Agency 20, Chapter 60 (9 VAC 20-60).
- b. The term “**Director**” shall mean the Director of the Department of Environmental Quality or his designated representative.
- c. The term “**Department**” shall mean the Virginia Department of Environmental Quality, (with the address as specified in Permit Condition I.I.).
- d. The term “**Release**” shall mean any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous waste or hazardous constituents including abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance, pollutant, or contaminant (40 CFR § 302.2 and CERCLA § 101(22)).
- e. The term “**hazardous waste management unit**” is a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.
- f. The term “**Facility**” or “**site**” shall mean all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. For the purpose of implementing corrective action under 40 CFR § 264.101, “facility” means all contiguous property under the control of the owner or operator under a permit under Subtitle C of RCRA. For purposes of retention of records, reports and all information associated with Corrective Action, “facility” shall mean the

offices of Corteva Environmental Remediation in Wilmington, DE.

- g. The term "**Hazardous waste**" shall mean a hazardous waste as defined in 40 CFR 261.3.
- h. The term "**Hazardous Constituent**" shall mean all constituents that are listed in 40 CFR Part 261, Appendix VIII and 40 CFR, Part 264, Appendix IX (9 VAC 20-60-264.B.6.).
- i. The term "**Area of Concern**" shall mean an area at the facility or an off-site area, which is not at this time known to be a solid waste management unit, where hazardous waste and/or hazardous constituents are present or are suspected to be present as a result of a release from the facility.
- j. The term "**Solid Waste Management Unit**" shall mean any discernable unit at the facility from which hazardous constituents might migrate, irrespective of whether the units were intended for the management of solid and/or hazardous wastes. Such units include any area at a facility which solid wastes have been routinely and systematically released.
- k. The term "**Unit**" refers to containers, container storage areas, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, underground injection wells, and other physical, chemical, and biological units or treatment units.
- l. The term "**Permittee**" shall mean the owner/operator of the facility to which the Permit is issued.
- m. The term "**EPA**" shall mean United States Environmental Protection Agency.
- n. The term "**days**" shall mean calendar days except as otherwise provided therein.

ABBREVIATIONS AND ACRONYMS

For the purposes of this Permit, the following abbreviations and acronyms shall apply:

CFR	Code of Federal Regulations
HW	hazardous waste
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study

MODULE I - STANDARD CONDITIONS

I.A. EFFECT OF PERMIT

I.A.1. This Permit, issued by the Director pursuant to 40 CFR § 270.1(c)(4), authorizes only the management of hazardous waste expressly described in this Permit and in accordance with the conditions of this Permit and with the applicable provisions of the VHWMR under 9 VAC 20-60. Any management of hazardous waste by the Permittee which is not authorized by this Permit or 9 VAC 20-60, and for which a permit is required under Chapter 14, Article 4, Title 10.1, Code of Virginia (1950), as amended, is prohibited (40 CFR §§ 270.30(g) and 270.4(b) and (c)). Compliance with this Permit generally constitutes compliance, for the purposes of enforcement, with Chapter 14, Article 4, Title 10.1-1426, Code of Virginia (1950), as amended. This Permit does not convey any property rights of any sort, or any exclusive privilege. Possession of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of Commonwealth of Virginia or local laws or regulations. Compliance with the terms of this Permit may not constitute a defense to any action brought under Chapter 14, Article 8, Code of Virginia (1950), as amended, or any other Commonwealth law governing protection of public health or the environment.

I.A.2. The CA obligations contained in this Permit shall continue regardless of whether the Permittee continues to operate or ceases operation and closes the facility. The Permittee is obligated to complete facility-wide CA under the conditions of a RCRA Permit regardless of the operational status of the facility. The Permittee must submit an application for a new Permit at least 180-days before this Permit expires pursuant to 40 CFR § 270.10(h), unless the Permit has been modified to terminate the CA schedule of compliance and the Permittee has been released from the requirements for financial assurance for corrective action.

I.B. PERMIT ACTIONS

I.B.1. This Permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR §§ 124.5, 270.30(f), 270.41, 270.42, and 270.43. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance does not stay the applicability or enforceability of any permit condition (40 CFR §270.30(f)).

I.B.2. Permit modifications at the request of the Permittee shall be done as specified by 40 CFR § 270.42.

I.B.3. This permit may be renewed as specified in 9 VAC 20-60-270.B.6, and 40 CFR § 270.10(h), and Permit Condition I.D.2. Review of any application for a permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations.

I.C. SEVERABILITY

I.C.1. The provisions of this Permit are severable, and if any provision of this Permit or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. Invalidation of any Commonwealth or Federal statutory or regulatory provision which forms the basis for any condition of this Permit does not affect the validity of any other Commonwealth or Federal statutory or regulatory basis for said condition (40 CFR § 124.16(a)(2)).

I.C.2. In the event that a condition of this Permit is stayed for any reason, the Permittee shall continue to comply with the conditions of the existing permit which correspond to the to the stayed conditions unless the Director determines compliance with the related applicable and relevant interim status standards would be technologically incompatible with compliance with other conditions of this Permit which have not been stayed (40 CFR §124.16(c)(2)).

I.D. DUTIES AND REQUIREMENTS

I.D.1 Duty to Comply

The Permittee shall comply with all conditions of this Permit, except that the Permittee need not comply with the conditions of this Permit to the extent and for the duration such noncompliance is authorized by an emergency permit under 40 CFR § 270.61. Any other noncompliance with the Permit constitutes a violation of Title 10.1 Code of Virginia (1950), as amended and regulations promulgated thereunder and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. (40 CFR §270.30(a))

I.D.2 Duty to Reapply

- a. If the Permittee wishes to continue or is required to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee shall apply for and obtain a new permit as specified below.
- b. The Permittee shall submit a new and complete application for a new permit at least 180 days before the expiration date of the Permit, unless a later date has been granted by the Director (40 CFR §270.30(b)).
- c. Pursuant to 40 CFR § 270.10(h), the Director shall not grant permission for an application to be submitted later than the expiration date of the existing permit.

I.D.3 Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action to argue that it

would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit (40 CFR §270.30(c)).

I.D.4 Duty to Mitigate

In the event of noncompliance with the Permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment (40 CFR § 270.30(d)).

I.D.5 Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit (40 CFR § 270.30(e)).

I.D.6 Duty to Provide Information

The Permittee shall furnish to the Director within a reasonable time, any pertinent information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit; or to determine compliance with this Permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this Permit (40 CFR § 270.30(h)).

I.D.7 Inspection and Entry

The Permittee shall allow the Director or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under conditions of this Permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

- d. Sample or monitor at reasonable times for the purposes of assuring permit compliance or as otherwise authorized by 9 VAC 20-60, any substances or parameters at any location (40 CFR § 270.30(i)).

I.D.8 Reporting Planned Changes

The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. This notice shall include a description of all incidents of noncompliance reasonably expected to result from the proposed changes. (40 CFR § 270.30(1))

I.D.9 Anticipated Noncompliance

The Permittee shall give advance written notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with Permit requirements (40 CFR § 270.30(1)(2)).

I.D.10 Twenty-four Hour Reporting

The Permittee shall report to the Director any noncompliance which may endanger human health or the environment. Information shall be provided orally within twenty-four (24) hours from the time the Permittee become aware of the circumstances. The information specified in a., b. and c. below shall be included as information that shall be reported orally within 24 hours.

- a. Information concerning the release of any hazardous waste that may cause an endangerment to public drinking water supplies shall be reported.
- b. Any information of a release or discharge of hazardous waste, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility shall be reported.
- c. The description of the occurrence and its cause shall include:
 - i. Name, address, and telephone number of the owner or operator;
 - ii. Name, address, and telephone number of the facility;
 - iii. Date, time, and type of incident;
 - iv. Names and quantities of material(s) involved;
 - v. The extent of injuries, if any;

- vi. An assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and
- vii. Estimated quantity and disposition of recovered material that resulted from the incident (40 CFR § 270.30(1)(6)).
- d. A written submission shall also be provided to the Director within five (5) days of the time the Permittee become aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Director may waive the 5-day notice requirement in favor of a written report within fifteen (15) days (40 CFR § 270.30(1)(6)).

I.D.11 Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise reported pursuant to Permit Conditions I.D.10, I.D.12, and I.E.1 at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition I.D.10 (40 CFR § 270.30(1)(10)).

I.D.12 Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall promptly submit such facts or information to the Director (40 CFR § 270.30(1)(11)).

I.E. MONITORING AND RECORDS

I.E.1. Monitoring Reports

Monitoring shall be performed and results shall be reported at the intervals specified in the Permit.

- I.E.2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity (40 CFR § 270.30(j)(1)). The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method specified in 40 CFR Part 261, Appendix I, or an equivalent method approved by the EPA. Laboratory methods must be those specified in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846* (3rd ed.; November, 1986, as updated), *Standard Methods of Wastewater Analysis* (16th ed.; 1985, as updated), or an equivalent method approved by the EPA. Additionally, the laboratory must be accredited for the analytical method, matrix

and target analyte (where applicable) by the Virginia Environmental Laboratory Accreditation Program (VLAP).

- I.E.3. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this Permit, all certifications required by 40 CFR § 264.73(b)(9), and records of all data used to complete the application for this Permit, for a period of at least 3 years (or longer if specified elsewhere in this Permit) from the date of the sample collection, measurement, report, certification, or application. These retention periods may be extended by the request of the Director at any time and are automatically extended during the course of any unresolved enforcement actions regarding this facility. The Permittee shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations, for the active life of the facility, and for disposal facilities for the post-closure care period as well. (Also see Permit Condition I.J.)

Records of monitoring information shall include at a minimum:

- a. The date, exact place, and time of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The results of such analyses (40 CFR § 270.30(j)).

I.F. COMPLIANCE NOT CONSTITUTING DEFENSE

Compliance with the terms of this Permit does not constitute a defense to any action brought under Chapter 14, Article 8 of Title 10.1, Code of Virginia (1950) as amended or any other Commonwealth law governing protection of the public or the environment.

I.G. TRANSFER OF PERMITS

This Permit is not transferable to any person except after notice to the Director (40 CFR §270.30(l)(3)). The Director may require modification or revocation and reissuance pursuant to 40 CFR §§ 124.5, 270.40, 270.41, 270.42, and 270.43 to change the name of the Permittee and incorporate such other requirements as may be necessary. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of

the requirements of 9 VAC 20-60-264 and 40 CFR Part 264 and 270 and at the same time shall send a copy of such notice to the Director (40 CFR §264.12(c)).

I.H. PERMIT EXPIRATION AND CONTINUATION

Pursuant to 9 VAC 20-60-270 B.15, this Permit will remain in force until the effective date of a new permit if the Permittee has submitted a timely, complete application pursuant to Permit Condition I.D.2.a, and through no fault of the Permittee, the Director has not issued a new permit with an effective date on or before the expiration date of this Permit. All conditions of the continued Permit shall remain fully effective and enforceable (40 CFR §270.51).

I.I. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT

I.I.1. Biennial Report

The Permittee shall submit a biennial report to the Department by March 1 of every even numbered year which covers facility activities during the previous calendar years. At a minimum, this report will include:

- a. The generator biennial report pursuant to 40 CFR § 262.41; and
- b. The hazardous waste management facility biennial report pursuant to 40 CFR § 270.30(l)(9) and § 264.75.

I.I.2. Annual Report

The permittee shall submit an annual monitoring and remedial measures report no later than March 1st of each calendar year containing, at a minimum, annual groundwater and outfall monitoring data in electronic data deliverable (EDD) format.

I.I.3. Groundwater and Land Use Restriction Certifications

On an annual basis and whenever requested by the Department or EPA, the then current owner shall submit to the Department and EPA a written certification stating whether the groundwater and land use restrictions listed in Section II.C.4(c) are in place and being complied with.

I.I.4. Corrective Measures Five Year Assessment Report

The Permittee shall submit Corrective Measures five-year assessment reports that evaluate the effectiveness of the corrective measures in meeting human health and environmental protection objectives. The report shall include, at minimum, review

of the permittee's compliance with any potential covenant requirements, groundwater and land uses on the property, zoning maps or planning documents that may affect future land use in the impacted area, and progress of the remedial measures and of meeting the cleanup targets or remedial goals. The required five (5)-year assessment reports that coincide with annual reports may be compiled with the annual report.

I.I.5. Duty to Submit Certified Documents

All reports, notifications or other submissions which are required by this Permit to be sent or given to the Director should be sent electronically, by postal mail or hand-delivered to:

For Corrective Action

**Department of Environmental Quality
Corrective Action/Groundwater Program Manager
Office of Remediation Programs
P.O. Box 1105
Richmond, VA 23218**

For Permit Modifications

**Department of Environmental Quality
Hazardous Waste Program Manager
Office of Financial Responsibility and Waste Programs
P.O. Box 1105
Richmond, Virginia 23218**

Street address:

**1111 East Main Street, Suite 1400
Richmond, VA 23219**

and one (1) copy of all such correspondence, reports, and submissions shall also be sent to:

**Director, Valley Regional Office
Department of Environmental Quality
4411 Early Road, P.O. Box 3000
Harrisonburg, Virginia 22801
(540) 574-7800**

**Associate Director, Office of Remediation
Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029 (3LC20)**

I.I.6. Signatory Requirements

All applications, reports, or information submitted to the Director shall be signed and certified as specified by 40 CFR § 270.11.

I.J. TRADE SECRET PROTECTION

In accordance with §10.1-1458 of the Code of Virginia (1950, as amended), the permittee may claim any information this permit requires, or is otherwise submitted to the Director as trade secret. In doing so, the permittee shall: 1) assert any such claim at the time of submittal, 2) identify the data or materials for which protection is being sought, and 3) state the reasons why protection is necessary. Further information regarding trade secret protection, the basis for submittal of such a request, the Department's decision process and handling of trade secret protected information is available on the Virginia Regulatory Town Hall website (<http://townhall.virginia.gov/L/ViewGDoc.cfm?gdid=5322>). If no claim is made at the time of submittal, the Director may make the information available to the public without further notice. The permittee has the burden of substantiating that the claimed information is trade secret, and the Department may request further information regarding such claim, and may reasonably determine which such information to treat as trade secret. The Department may disclose trade secret information to the appropriate officials of the Environmental Protection Agency pursuant to the requirements of the federal Solid Waste Disposal Act, 42 U.S.C. § 3251, *et seq.*, or as otherwise required by law.

I.K. DOCUMENTS TO BE MAINTAINED AT THE FACILITY SITE

I.K.1. Current copies of the following documents, as amended, revised, and modified, shall be maintained at Corteva Environmental Remediation office in Wilmington, Delaware, and at the South River Science Team office, 508 W. Main Street, Waynesboro, Virginia 22980. The documents shall be made available to the Department upon request. These documents shall be maintained until corrective action is completed and certified by the Permittee and by an independent, Virginia-registered professional engineer, unless a lesser time is specified in the Permit.

I.K.2.

- a. The Permit, including all attachments;
- b. All Part A and B Permit Applications supporting the Permit;
- c. The facility operating record required by 40 CFR § 264.73;
- d. Inspection schedules and logs required by 40 CFR § 264.15(b)(2) and 264.15(d);
- e. Personnel training documents and records required by 40 CFR § 264.16 and this Permit;

- f. Closure Plans, as required by 40 CFR § 264.112(a) and this Permit;
- g. Corrective Action work plans, reports, and other information and submissions regarding CA, as applicable under this Permit;
- h. Post-Closure Plans, as required by 40 CFR § 264.118(a), as applicable;
- i. Groundwater sampling and analysis plan required by 40 CFR 264.101 and this Permit as described in the Operations and Maintenance Plan;
- j. Groundwater monitoring results required by 40 CFR 264.73(b)(6) and this Permit;
- k. Corrective Action Work Plans, Reports, and other information and submissions regarding corrective action, as applicable under this Permit;
- l. Annually adjusted cost estimate for facility closure as required by 40 CFR § 264.142(d) and this Permit; and
- m. All other documents required by Permit Conditions I.D.8 through I.D.12 and I.E.

I.L. APPROVAL/DISAPPROVAL OF SUBMISSIONS

- I.L.1. The Department will review the plans, reports, schedules and other documents (hereinafter collectively referred to as "submissions") submitted which require the Director's or Department's approval. The Department will notify the Permittee in writing of the Department's approval, conditional approval, or disapproval of each submission.
- I.L.2. Each submission required by this Permit, upon approval by the Director, is incorporated into this Permit. Any noncompliance with a Department-approved submission shall be deemed as noncompliance with this Permit. A conditionally approved submission, including any terms of such conditional approval set forth in Department's decision, shall constitute the Department-approved submission and shall be incorporated into this Permit.
- I.L.3. In the event of the Department's conditional approval of submission, the Department shall specify in writing any deficiencies in the submission and the terms upon which approval of the submission is conditioned. If the Permittee disputes any term upon which approval of the submission was conditioned, the Permittee may initiate Dispute Resolution pursuant to permit condition I.L.
- I.L.4. In the event of the Department's disapproval of a submission, the Director or the Department shall specify the deficiencies in writing. Such disapproval shall not be subject to the Dispute Resolution provision set forth in Permit Condition I.L. The

Permittee shall modify the submission to correct/address the specified deficiencies within a reasonable time period established by the Department taking into account the tasks to be performed, and submit the revised submission to the Department for approval.

- I.L.5. If the revised submission is disapproved, the Director or the Department will notify the Permittee of the deficiencies in writing and specify a schedule for the Permittee to correct the deficiencies and resubmit the submission to the Department. The Permittee shall correct the deficiencies as directed by the Department, and forward the revised submission within the time period specified by Department. In the event the Permittee disagrees with the Department's disapproval of the revised submission, the Permittee shall notify the Department in writing and the disagreement shall be resolved in accordance with the Dispute Resolution provision in Permit Condition I.L of this Permit.

I.M. DISPUTE RESOLUTION

- I.M.1. Except as otherwise provided in this Permit, in the event the Permittee disagrees, in whole or in part, with Department disapproval of any submission required by this Permit, the Permittee shall notify the Department in writing of its objections, and the basis thereof, within fourteen (14) days of receipt of the Department's disapproval. Such notice shall set forth the specific matters in dispute, the position(s) the Permittee asserts which should be adopted as consistent with the requirements of the Permit, the basis for the Permittee's position, and supporting documentation considered necessary for the Department's determination.
- I.M.2. The Department and the Permittee shall have an additional fourteen (14) days from the Department's receipt of the notification to meet or confer to resolve any disagreement/dispute. In the event agreement is reached, the Permittee shall submit the revised submission and implement the same in accordance with such agreement.
- I.M.3. In the event the Permittee and the Department are not able to reach an agreement on the dispute items within the additional 14-day period, the Department will notify the Permittee in writing of its decision on the dispute and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. The Permittee does not waive its right to assert any and all available defenses in a proceeding to enforce this Permit.
- I.M.4. In the event the Permittee disagrees with Department's disapproval of a submission or revised submission and the Department's written decision regarding dispute items, the Permittee may file an appeal with the Director within 30 days of the disapproval (as provided for in Rule 2A:2 of the Supreme Court of Virginia).

MODULE II - SITE-WIDE CORRECTIVE ACTION

II.A. CORRECTIVE ACTION FOR CONTINUING RELEASES; PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

- II.A.1. Section 3004(u) of RCRA, 42 U.S.C. § 6924(u), and regulations codified at 40 CFR §264.101, provide that all permits issued after November 8, 1984 must require corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU), regardless of when waste was placed in the unit.
- II.A.2. Under Section 3004(v) of RCRA, 42 U.S.C. § 6924(v), and 40 CFR §264.101(c), the Department may require that corrective action at a permitted facility be taken beyond the facility boundary where necessary to protect human health and the environment, unless the owner or operator of the facility concerned demonstrates to the satisfaction of the Department that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action.
- II.A.3. Sections 3005(c)(3) of RCRA, 42 U.S.C. § 6925(c)(3), and 40 CFR §270.32(b) provide that each permit shall contain such terms and conditions as the Department determines necessary to protect human health and the environment.
- II.A.4. The Permittee shall prepare a Facility-specific scope of work and report relating to the off-site CMS in accordance with the relevant attachments. The Permittee shall establish specific and appropriate elements of such scopes of work and reports to the Department's satisfaction under Permit Conditions I.I and I.K. of this Permit.
- II.A.5. On February 4, 2014, a revised Permit was issued to add AOC 4 for off-site corrective action. The corrective action timelines for the on-site and off-site areas are proceeding separately. If a particular section of the Permit is applicable to either on-site or off-site areas, but not both, this will be indicated in the section title. If no distinction is made in the section title, the Permit section applies to both on-site and off-site areas.

II.B. CORRECTIVE MEASURES IMPLEMENTATION

This section includes corrective measures implementation requirements for the on-site SWMUs and Areas of Concern (AOCs).

II.B.1. Background

A corrective action permit was issued for the site in 1998. The Permit initially

identified 20 SWMUs. Two AOCs were identified during the RFI. The Permit was modified in 2014 by adding AOC 3 (Storm Sewer System) and AOC 4 (Off-site Area). Because of the scale and complexity of AOC 4, that unit is addressed as a separate program under this permit. AOC 3 is included in the on-site area.

The Permit required DuPont to complete a RCRA Facility Investigation (RFI), implement interim measures (IMs) as necessary, and complete a corrective measures study (CMS). The RFI and CMS for the on-site area have been effectively completed. The Comprehensive RFI Report for the on-site area was submitted in November 2009, and the final revision (dated May 2015) was approved on May 27, 2015. The CMS report for the on-site area was approved in October 2016. Further, DuPont conducted corrective action IMs on-site to address the off-site migration of the mercury.

II.B.2. Final Remedy Selection

- a. Documentation for the completion of site-wide investigation reports and studies has been compiled by the Department, entitled Administrative Record. Based on the CMS results and the Administrative Record, the final remedy for the Site was developed and is described in the Statement of Basis, dated January 2017. The requirements of this permit provide for the operation and maintenance of the remedy described in the Statement of Basis.
- b. The Corrective Action Objective for Facility soils is to attain 40 mg/kg mercury for Industrial Soils and to control exposure to the hazardous constituents remaining in soils by requiring engineering controls and compliance with and maintenance of land use restrictions. Because mercury will remain in Facility soils above levels appropriate for residential uses, under this proposed remedy, ICs are required to restrict the Facility to non-residential uses. ICs are non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination and/or protect the integrity of the remedy by limiting land or resource use.
- c. The Department has determined that restoration of groundwater to drinking water standards known as Maximum Contaminant Levels (MCLs), promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g-1, at the Facility is technically impracticable in the mercury contaminated groundwater areas associated with SWMU 1, SWMU 4 and SWMU 7. Sources of mercury impacts to groundwater include former building foundations, sumps, pits, and abandoned pipelines in the shallow subsurface that contain free mercury. Groundwater monitoring conducted at the site over a ten-year period has shown that areas of impacted groundwater are localized and are limited in extent to the areas around the identified sources. The proposed remedial actions for SWMUs 1, 4, and 7 involve excavation and removal of free mercury sources along with

capping. The removal of these sources will eliminate the majority of mercury that is currently impacting groundwater. Capping of residual soils with mercury at concentrations above the cleanup level will further reduce the impact on groundwater through surface infiltration. The caps will be installed across broad areas of mercury-impacted soils at SWMUs 1, 4, and 7 and will reduce significantly the impact to groundwater pathway. However, mercury in groundwater above the MCL will remain and will be difficult to remove, primarily due to the affinity for mercury to adsorb onto clays in the soil matrix of the shallow groundwater zone.

Therefore, the Department's Corrective Action Objectives for Facility groundwater are to control exposure to the hazardous constituents remaining in the groundwater; protect the current existing receptors, namely bedrock and the South River, from unacceptable concentrations from contaminants of concern (COC) impacts; and ensure that no groundwater discharge concentrations would result in outfall concentrations that are above the Department surface water criteria.

- d. The final remedy is summarized below and was described in detail in the site specific Corrective Measures Implementation (CMI) Work Plan and design documents required by this permit.
 1. SWMU 1: Soil – excavation and off-site disposal of free mercury sources, combined with capping and Institutional Controls (in progress)
 2. SWMU 4: Soil – excavation and off-site disposal of free mercury sources, combined with capping and Institutional Controls (in progress)
 3. SWMU 7: Soil – capping and Institutional Controls (capping complete– to be documented in final CMI Report)
 4. Mercury was found in soils below the industrial screening level at SWMU 2, SWMU 6, SWMU 17 and AOC 1, but above the Residential Screening Level. Therefore, institutional Controls are proposed for these units.
 5. The Department has concluded that it is technically impracticable to attain MCLs in mercury contaminated groundwater associated with SWMU 1, SWMU 4 and SWMU 7. Each of these SWMUs has its own defined Technical Impracticability (TI) zone detailed in the CMS. While source control will be implemented at the 3 SWMUs, including removal of free mercury at SWMU 1 and SWMU 4, residual mercury will remain in the subsurface.

The Department proposed groundwater monitoring in all three TI zones to continually verify that groundwater which exceeds the MCL is contained within the TI zone. The establishment of three Technical Impracticability

Zones (TI Zones) will be the most practical and economical remedy that will continue to be protective of human health and the environment. Each TI zone will define the area that will ensure groundwater contamination stability within the Facility property. A monitoring plan is proposed to require long-term monitoring through performance sampling and gauging of the proposed TI Boundary monitoring well network. (complete)

For SWMU 1, the proposed TI zone will need to be re-evaluated if current production wells are halted. The monitoring plan will include a contingency for increased monitoring at SWMU 1 if production well pumping is halted. This monitoring would include the wells in and around the northeast area groundwater depression at SWMU 1 and selected downgradient wells to evaluate whether the spatial extent or magnitude of detected mercury concentrations increases.

6. For AOC 3, a combination of cleaning and lining impacted sewers of the 001 Outfall system and abandoning sections of sewer in place. The majority of this work was completed under Interim Measures as detailed in Attachment II.A. Continual monitoring of the sewer system and outfalls is required to assess the mercury reduction and effectiveness of the sewer remedial work.
7. Implementation and maintenance of ICs and ECs including property use restrictions for groundwater and soil in accordance with Permit Section II. B.3 below.

II.B.3. Corrective Measures Implementation

- a. The CMI Work Plan was submitted in accordance with the requirements set forth in Attachment II.E of this permit and was approved on May 7, 2018.
- b. The CMI Design and Implementation will be streamlined to include only those elements listed in Attachment II.E that are necessary for the Department to evaluate the effectiveness, operability, and usability of the CMI design. Variations to the requirements of Attachment II.E may be permitted subject to approval by the Department.
- c. The following Institutional Controls (ICs), Engineering Controls (ECs), and additional restrictions shall be used at the site:
 1. Maintenance and monitoring of the impervious capped areas (SWMU 1, SWMU 4 and SWMU 7) via the existing security fence and security cameras.
 2. Groundwater at the Facility shall not be used for any purpose other than to conduct the operation, maintenance, and monitoring activities required by

the Department and/or EPA, unless it is demonstrated to the Department, that such use will not pose a threat to human health or the environment or adversely affect or interfere with the final remedy and the Department provides prior written approval for such use (Current Facility production wells located in the Bedrock Zone are exempt from this provision).

3. No new wells will be installed on Facility property unless it is demonstrated to the Department that such wells are necessary to implement the final remedy and the Department provides prior written approval to install such wells.
4. The Facility property shall not be used for residential purposes unless it is demonstrated to the Department that such use will not pose a threat to human health or the environment or adversely affect or interfere with the final remedy, and the Department provides prior written approval for such use.
5. As part of the approved CMI WP required in Section II.C.4.a of this permit, a Materials Management Plan (MMP) will be submitted for approval to specify protocols for handling and management of soil, groundwater, and surface water will be created for any future earth moving activities in SWMUs 1, 2, 4, 6, 7 and 17 and AOC 1. The Materials Management Plan MMP will detail how soil and groundwater will be managed and sampled to determine appropriate placement or disposal during any future subsurface activities conducted at the SWMUs and AOC listed above. The MMP will be submitted not later than (6) six months after approval of the Construction Completion report approval and will be prepared in conjunction with a Uniform Environmental Covenant Act (UECA) or similar instrument. The submittal timing is reliant upon MMP approval by the Lycra Company which DuPont (Corteva) does not control. If DuPont anticipates an extension to the submittal deadline will be needed a request shall be submitted to the Department no later than 30 days before the end of the 6 month submittal due date.
6. The Facility property will not be used in a way that will adversely affect or interfere with the integrity and protectiveness of the final remedy selected by the Department in the Final Decision and Response to Comments (FDRTC).
7. Access to the Facility property will be restricted through the use and maintenance of fencing and controlled access (security gate).
8. EPA, the Department, and/or their authorized agents and representatives, shall have access to the Facility property to inspect and evaluate the continued effectiveness of the final remedy and if necessary, to conduct additional remediation to ensure the protection of the public health and

safety and the environment based upon the final remedy selected in the FDRTC.

9. Within one month after any of the following events, the Permittee shall submit, to Department and EPA written documentation describing the following: observed noncompliance with the land and/or groundwater use restrictions; transfer of the Facility; changes in use of the Facility; or filing of applications for building permits for the Facility and any proposals for any Site work, if such building or proposed Site work will affect the contamination at SWMUs 1, 2, 4, 6, 7 or 17 or AOC 1.
 10. The Facility owner shall provide VADEQ and EPA with a coordinate survey as well as a metes and bounds survey, of the Facility boundary, the TI zones, and all capped areas (Engineering Controls). The survey will be submitted six months after approval of the Construction Completion report approval. The submittal timing is reliant upon third party professional land surveyors which DuPont (Corteva) does not control. If DuPont anticipates an extension to the submittal deadline will be needed a request shall be submitted to the Department no later than 30 days before the end of the 6 month submittal due date.
- d. Upon completion of construction and upon an initial period of performance of monitoring the corrective measure(s), the Permittee shall prepare and submit copies of the final CMI Report to the Department and the EPA Region 3 which describes the implemented corrective measures, design, operation and maintenance, and performance of the constructed system(s) and complies with the requirements described in Attachment II.E. Final "as built" plans and specifications of the corrective measures systems shall be certified by a Professional Engineer registered with the Commonwealth of Virginia and shall be submitted to the Department and the EPA Region 3 with the final CMI Report.

II.C. EVALUATION OF THE SELECTED REMEDY

Commencing one year from the submittal date of the final CMI Report, the Permittee shall submit an annual progress report on the remedy performance. If the Department determines that the selected remedy will not comply with the media clean-up requirements, the Department may require the Permittee to perform additional studies and/or perform modifications to the existing Corrective Action remedy. If necessary, the Department or the Permittee may seek modification of this Permit pursuant to 40 CFR §270.41 or § 270.42 and § 124.5 to implement modifications to the existing Corrective Measures Remedy.

II.D. EMERGENCY RESPONSE; RELEASE REPORTING

II.D.1. Emergencies

If, at any time during the term of this Permit, the Permittee discovers that a release of hazardous waste or hazardous constituents at or from the Facility is presenting or may present an imminent and substantial endangerment to human health or the environment, the Permittee shall:

- a. Notify the Department as soon as practicable of the source, nature, extent, location and amount of such release, the endangerment posed by such release and the actions taken and/or to be taken, to the extent known, to address such release. Such notification shall be confirmed in writing within five (5) days of discovery of such release (see Permit Condition I.D.10).
- b. Unless otherwise directed by the Department, immediately take such actions as are necessary and appropriate to address such release.

II.D.2. Releases

The Permittee shall notify the Department in writing of the nature, source, extent, location of a release of hazardous waste or hazardous constituents at or from the Facility within five (5) days of discovery if such release:

- a. Is not being addressed by corrective measures at the time of such discovery.
- b. Is not being addressed pursuant to Permit Condition II.D., Emergency Response; Release Reporting.

II.D.3. If, based on the information submitted in Permit Condition II.D.2, a release has not been adequately remediated to be protective of human health and the environment, the Department may require the SWMU and/or AOC to be included in a RCRA Facility Investigation or may require Interim Measures.

II.D.4. Nothing in this Permit shall limit the Department's authority to undertake or require any person to undertake response action or corrective action under any law, including but not limited to, Sections 104 or 106 of CERCLA, 42 USC § 9604 or 9606, and Section 7003 of RCRA, 42 USC § 6973. Nothing in this Permit shall relieve the Permittee of any obligation it may have under any law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at or from the Facility.

II.E. GUIDANCE DOCUMENTS

Any corrective action performed at the facility shall be in accordance with applicable EPA Corrective Action Guidance available at https://www3.epa.gov/reg3wcmd/ca/ca_resources.htm.

II.F. SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT

The RFI at the Waynesboro Site is complete for both on-site and off-site areas, and it is believed that all SWMUs have been identified. However, in the event a new SWMU is identified, the procedures in this section will be implemented.

- II.F.1. The Permittee shall notify the Department and the EPA Region 3, in writing, of any newly identified SWMU at the Facility, no later than thirty (30) days after the date of discovery. The notification shall include, but is not limited to, the following known information:
- a. A description of the SWMUs type, function, dates of operation, location (including a map), design criteria, dimensions, materials of construction, capacity, ancillary systems (e.g., piping), release controls, alterations made to the unit, engineering drawings, and all closure and post-closure information available, particularly whether wastes were left in place.
 - b. A description of the composition and quantities of solid wastes processed by the units with emphasis on hazardous wastes and hazardous constituents.
 - c. A description of any release (or suspected release) of hazardous waste or hazardous constituents originating from the unit. Include information on the date of release, type of hazardous waste or hazardous constituents, quantity released, nature of the release, extent of release migration, and cause of release (e.g., overflow, broken pipe, tank leak, etc.). Also, provide any available data that quantifies the nature and extent of environmental contamination, including the results of soil and/or groundwater sampling and analysis efforts. Likewise, submit any existing monitoring information that indicates releases of hazardous waste or hazardous constituents has not occurred or is not occurring. The Permittee may refer to information regarding releases previously submitted to the Department under II.D. Emergency Response; Release Reporting.
 - d. A discussion of the need for and feasibility of implementing interim measures immediately.
- II.F.2. Upon receipt of the notification of any newly identified SWMU, the Department will determine the need for corrective action at such SWMU. If corrective action is necessary to protect human health or the environment, the Department will determine whether a RCRA Facility Investigation will be performed and the need for and scope of any Interim Measures for a newly identified SWMU.
- II.F.3. Within sixty (60) days after receipt of the Director's determination that a supplemental RCRA Facility Investigation or Interim Measures is necessary, the Permittee shall submit a Supplemental RCRA Facility Investigation Work Plan or Interim Measures Work Plan that meets the applicable guidance.

The Department's determination shall either specify the media and/or parameters

to be investigated or shall require the Permittee to propose and justify the selection of media and/or parameters.

II.F.4. Within the time specified in the approved Supplemental RCRA Facility Investigation Work Plan or Interim Measures Work Plan, the Permittee shall submit the Supplemental RCRA Facility Investigation Report or Interim Measures Report. The reports will provide all data necessary for the Department to determine whether a supplemental Corrective Measures Study or additional Interim Measures Work Plan is required.

II.F.5. In lieu of a separate supplemental RCRA Facility Investigation, the Permittee may propose to incorporate any newly identified SWMU into the ongoing corrective measures. Any such proposal shall be submitted to the Department along with notification of the discovery of the SWMU(s).

II.G. FINANCIAL ASSURANCE

This section includes financial assurance requirements for the on-site SWMUs and AOCs and off-site AOC 4.

II.G.1. Interim Financial Assurance Demonstration for AOC 4

The Permittee has demonstrated compliance with interim financial assurance in the amount of \$1 million to the Department in accordance with 40 CFR 264.143. The interim financial assurance demonstration shall remain in place until all remedies required by this permit have been approved by the Department. Additional financial assurance demonstration may be required upon selection of any final remedy(ies). Permit Conditions II.G.2, II.G.3, and II.G.4 below shall apply upon the Department's approval of any final remedy(ies).

II.G.2. Initial Cost Estimate

The initial cost estimate was developed in the Corrective Measure Study Report and is based on the approved remedies, or other available information. The cost is detailed in Table 10 of the CMS Report.

II.G.3. Cost Estimate Updates

The cost estimate for completing the approved remedy(ies) shall be updated pursuant to the development of more detailed information (e.g., Corrective Measure Design) and any modifications to the approved remedy(ies). Within ninety (90) calendar days of receipt of Department's written approval of modifications to the final remedy, the Permittee shall submit an updated cost estimate to the Department.

II.G.4. Financial Assurance Demonstration

By March 31st following approval of the initial cost estimate for financial assurance (see Permit Condition II.H.1.), the Permittee shall demonstrate compliance with financial assurance to the Department in accordance with 40 CFR 264.143 for completing the approved remedies in accordance with 40 CFR § 264.101(b). By March 31st following approval of any revised cost estimate (see Permit Condition II.G.2.), the Permittee shall demonstrate to the Department financial assurance for the updated cost estimates.

II.H. RECORDKEEPING

Upon completion of closure of any current or future SWMU, the Permittee shall maintain in the Facility operating record, documentation of the closure measures taken.

II.I. ACCESS FOR CORRECTIVE ACTION OVERSIGHT

The Department and its authorized representatives shall have access to the Facility and site at all reasonable times for the purpose of monitoring compliance with the provisions of this Permit. The Permittee shall use its best efforts to obtain access to property beyond the boundaries of the Facility at which corrective action is required by this Permit (see Section 3004(v) of RCRA, 42 USC § 6924(v) and 40 CFR § 264.101(c)); (1) for itself and any contractor of the Permittee for the purpose of taking corrective action required by this Permit, and (2) for Department/EPA and its authorized representatives for the purposes described in this paragraph.

II.J. COMPLETION OF REMEDY

Within ten (10) days of receipt of notification by the Department that the remedy is complete, the Permittee shall submit a written certification to the Department, registered mail, stating that the remedy has been completed in accordance with the requirements of this Permit Modification. The certification must be signed by the Permittee and by an independent registered professional engineer registered in the Commonwealth of Virginia. In cases where no other Permit Conditions remain, the Permit may be modified not only to reflect the completion determination, but also to change the expiration date of the permit to allow earlier permit expiration in accordance with 40 CFR Parts 124, 270.41, and 270.42, as applicable.

II.K. ATTACHMENTS TO PERMIT MODULE II

Table II.C-1 in Attachment II.C lists the deliverables required for the off-site AOC 4. The list may be modified with the approval of the Department. To modify the list, the Permittee shall submit in writing justification requesting a schedule change for the Department's approval. This alternate schedule may be approved

by the Department without requiring a permit modification.

All activities, workplans, reports, and/or other deliverables required by Permit Module II, shall be conducted, and/or prepared in accordance with the applicable parts of the relevant Attachments II.D through II.E. The Permittee may propose to the Director for approval, alternatives to Attachments II.D through II.E by submitting a permit modification pursuant to 40 CFR § 270.42.

ATTACHMENT II.A - FACILITY DESCRIPTION AND ON-SITE CORRECTIVE ACTION

II.A.1. Facility Description

The former DuPont Waynesboro Site is located on approximately 177 acres of flat lying land along the South River in the southeastern corner of Waynesboro, Virginia. The location of the plant is shown on Figure II.A-1. In 1929 DuPont began operations at the Waynesboro site which was originally chosen because of the abundant water supply, railroad access, and an available workforce. Initial operations included the manufacture of acetate flake and yarn from 1929- 1977. This process included the use of mercury from 1929-1950. In 1958, DuPont began producing Orlon®, the plant's second fiber. The flake and yarn process and Orlon® process were discontinued in 1977 and 1990, respectively. In the interim, Lycra® production had begun in 1962, with Permasep® production beginning in 1969 and Bulk Continuous Fiber (BCF) Nylon in 1978. The BCF production facility was idled in 2009 and the buildings have been demolished. Lycra is the only fiber currently manufactured at the site. In 2004, the plant assets were sold to subsidiaries of Koch Industries (INVISTA S. a r. l. or "INVISTA"), which was later purchased by A&AT, LLC and then by the Lycra Company. Upon the completion of the Corrective Action Program, the land will be transferred to the Lycra Company. DuPont intends to maintain a consistent presence in the community due to its long manufacturing history at the Site.

The physical address and facility contact information is provided below and in the Part A Permit Application:

Facility Address

The Lycra Company
400 DuPont Boulevard
Waynesboro, VA 22980

Facility Contact

Mr. Mike Liberati
Corteva Environmental Remediation
133 Blakiston Lane
Warkwick, MD 21912
Phone: (302) 598-9936

The E.I. du Pont de Nemours and Company corporate office is located in Wilmington Delaware, at the following mailing address:

Owner Address

E.I. du Pont de Nemours and Company
Corteva Environmental Remediation

974 Centre Road
Wilmington, DE 19805

II.A.2. Summary of On-Site Corrective Action

Investigations have been conducted to characterize solid waste management units (SWMUs) where hazardous substances may have impacted the environment. The RCRA Facility Investigation (RFI) was completed in three phases:

- Phase I - June 2000 to February 2001
- Phase II – June 2004 to April 2005
- Phase III – January to July 2007

After the first phase of the RFI, it was determined that the groundwater and plant outfall discharges should be monitored on a recurring basis. In addition, a separate investigation of the plant sewer system was initiated. These programs are conducted simultaneously along with the SWMU investigations of the RFI. These focused programs address specific media and pathways and culminate in the Corrective Measures Study. A summary list of all Work Plans and Reports submitted under RCRA Corrective Action is provided in Table II.A-1.

II.A.3. Constituents of Concern

The data available for the former DuPont Waynesboro site indicates that mercury is the primary Constituent of Concern (COC) in the site's soil and groundwater.

II.A.4. RFI Investigations

The Phase I investigation conducted in 2000-2001 consisted of soil and groundwater sampling at 10 SWMUs. Eighty-six soil samples and forty groundwater samples were collected for VOCs, SVOCs, metals, methyl mercury, HMD, DMF, and DMAC. This included water level measurements and slug testing for hydrogeologic evaluations. The Phase I concluded that SWMU 1 (Mercury Recovery Area) and SWMU 4 (Incineration Area) required further evaluation and that the Northeast Area water level depression should be investigated.

During the Phase II investigation (2004-2005) eight SWMUs and two areas of concern (AOCs) were evaluated. This included the collection of 68 soil samples and 65 groundwater samples for the same constituents as in the Phase I. Also in this investigation were a soil gas sampling program SWMU 1 for the presence of mercury vapor and a geologic investigation at the Northeast Area. The Phase II Investigation concluded that groundwater in the deep clastic zone present in Northeast Area was impacted with mercury. Mercury was further characterized at

SWMU 1 and SWMU 4 and benzene and mercury were detected downgradient of SWMU 6/7.

In a February 2006 (revised September 2006) Phase II Investigation Report, no further investigation was recommended for SWMUs 10, 13, 20 and AOCs 1 and 2, however additional investigation was recommended at SWMUs 1, 4, 6/7 and the Northeast Area.

The Phase III Investigation, completed in July 2007, included the collection of 76 soil samples and 5 groundwater samples at three SWMUs for the same constituents as in previous investigations. Soil samples were collected at SWMU 1 to confirm previous soil gas results and the former process ditches at the Chemical Building were sampled for mercury.

Geoprobe soil sampling was performed at SWMU 4 for further delineation of mercury and at SWMU 6/7 (former Sludge Pond) for initial characterization of soils. Two new wells were drilled to assess potential migration of constituents from SWMU 6/7. The Northeast Area was investigated by locating and logging plant Well #1 and conducting a long term water level study. The results of the Phase III investigation were reported in the Phase III RFI Summary Report in March 2008. A summary list of documents submitted for the RFI is presented in Table II.A-1.

The final phase of RFI investigations, Phase IIIA, was completed in the winter of 2008. That phase of investigation focused on delineation of source areas at SWMUs 1, 4 and 7. During Phase IIIA, test pits and soil borings were conducted to delineate mercury source areas. In addition, a long term water level study was conducted to assess the relationship between the pumping of deep bedrock wells and the groundwater in the overburden. The final Comprehensive RFI Investigation Report was submitted in November 2009, and the final revision (dated May 2015) was approved on May 27, 2015.

II.A.5. Groundwater

Following the Phase I RFI investigation, a semiannual groundwater monitoring program was initiated. The monitoring plan submitted in 2004 included the monitoring of 38 wells and 55 water level measurements. Findings from three and a half years of sampling (7 events) show that mercury concentrations are localized at SWMU 1, SWMU 4 and SWMU 6/7 and that downgradient perimeter wells are below VGS criteria. However, water level measurements indicate the Deep Water Table Zone water levels (Northeast Area) fluctuate significantly. A summary list of documents submitted pertaining to the groundwater monitoring program is presented in Table II.A-1.

II.A.6. Outfall Monitoring

Four phases of outfall monitoring have been performed to assess the loading of mercury under base flow and storm flow conditions. The first phase conducted in 2003 sampled one storm and one base flow event at 8 outfalls and 10 upstream locations. No significant mercury was detected in baseflow or first flush storm samples, however mercury was detected in flow weighted composites (up to 1.7 µg/l) during the storm event. Estimated loading rates were low relative to the mass observed in the South River. During the Phase II monitoring in 2004-2005, 10 locations were sampled during 3 base flows and one storm flow event. Also sampled were sediments and water in upstream portions of the sewer. This investigation concluded that the amount of mercury that is bioavailable was 20-29% under base flow conditions and 32-33% for storm flow conditions. The highest concentrations of Hg in sewer sediments and water occurred upstream of 001D near the Chemical Building and SWMU-1.

The Phase III program conducted from 2005-2007 included the sampling of 10 locations over an 18 month program to support the TMDL program. Fifteen base flow and 6 storm events were sampled. The data shows that the highest concentrations occur at outfall 011 but it is in diversion to WWTP and does not discharge to the river. The outfall with the highest loading rate to the river is outfall 001.

The Phase IV program, initiated in June 2007, monitored 10 outfall locations and was completed in December 2008. The program consisted of monthly base flow events and 2 storm events per year. The Phase IV Outfall Monitoring Report was submitted in July 2009. Additional baseflow monitoring will be conducted quarterly and storm events will be monitored semiannually. A summary of documents submitted for the outfall monitoring program is presented in Table II.A-1.

II.A.7. Sewer Investigation

The first phase of the sewer investigation was completed in January 2007. This program consisted of mapping and verifying sewer locations and structures including the identification of structures and confirmation of flow directions. Conventions for the naming of structures were established and a database was developed for the structures and piping sections, including sizes and materials of construction. Key storm sewer sections were identified and recommendations were made for the Phase II investigation which was completed in the summer of 2008. Phase II included closed circuit televiewer inspection of sewer lines that are in proximity to source areas of mercury and which ultimately discharge at the 001 outfall.

Phase III of the sewer investigation focused on source area contributions to and characterization of the 001 outfall system. During the Phase III work, sewers located in the former mercury area were cleaned and inspected by CCTV resulting in the removal of significant amounts of free mercury from the system. Phase III

was completed in December 2010. A summary list of documents submitted for the Sewer Investigation is presented in Table II.A-1.

II.A.8. Interim Measures

Two phases of Interim measures (IMs) have been implemented at the plant to date. The first event was conducted in fall and winter 2010 in conjunction with the Phase III Sewer Investigation. The second event took place the summer of 2014.

The objective of the 2010 IMs was to reduce the impact from the SWMU 1 source area to the site sewer system. To achieve this objective, the IMs included the following:

- Re-directing roof drains from the source area in the vicinity of the L-50 Building
- Cleaning out the steam trap in the vicinity of L-50 Building
- Cleaning out Pumphouse Sewer (PHS) pipe lines and catch basins along Railroad Avenue
- Cleaning out and filling in the former solids collection pit

The 2010 IMs concluded during the fall of 2010, and are described in the Interim Measures Implementation Report (2011).

The objectives of the 2014 IMs were to:

- Reduce mercury loading at Outfall 001:
- Cut off sources of mercury to the PHS and Chemical Sewer (CS).
- Remove mercury impacted sediment and debris from the PHS, CS, and PHS Sump.
- Prevent mercury migration during remediation

Tasks conducted during the 2014 IM included:

- Cleaning and CCTV inspections of the PHS and CS.
- Rehabilitation of the PHS and CS along Railroad Avenue and Fourth Street.
- Abandonment of select pipes and manhole 001D-018

- Clean out of the PHS sump

The results of the 2014 IMs are presented in the Interim Measures Implementation Report, Railroad Avenue IM (2015).

II.A.9. Mercury Inspection and Abatement

In October 2007, DuPont implemented a program to inspect drainage structures near the former Chemical Building for the presence of mercury. Inspections have been conducted on a biweekly basis. Small pellet sized amounts of free mercury that were visible at a drainage box along Rail Road Ave were removed and disposed of in October using hand tools. In December, a mercury vacuum was purchased that is more effective at cleanup. The residual mercury was cleaned up using the vacuum in December. Since removal, no free mercury has been observed. The inspections will continue as described in the work plan. A summary list of documents submitted for the inspection program is presented in Table II.A-1.

II.A.10. Corrective Measures Study

DuPont submitted a Corrective Measures Study (CMS) report in June 2015. The purpose of the CMS was to evaluate and propose corrective action alternatives that are protective of human health and the environment for the CMS SWMUs, AOCs, and groundwater in the former DuPont Waynesboro Plant on-site area.

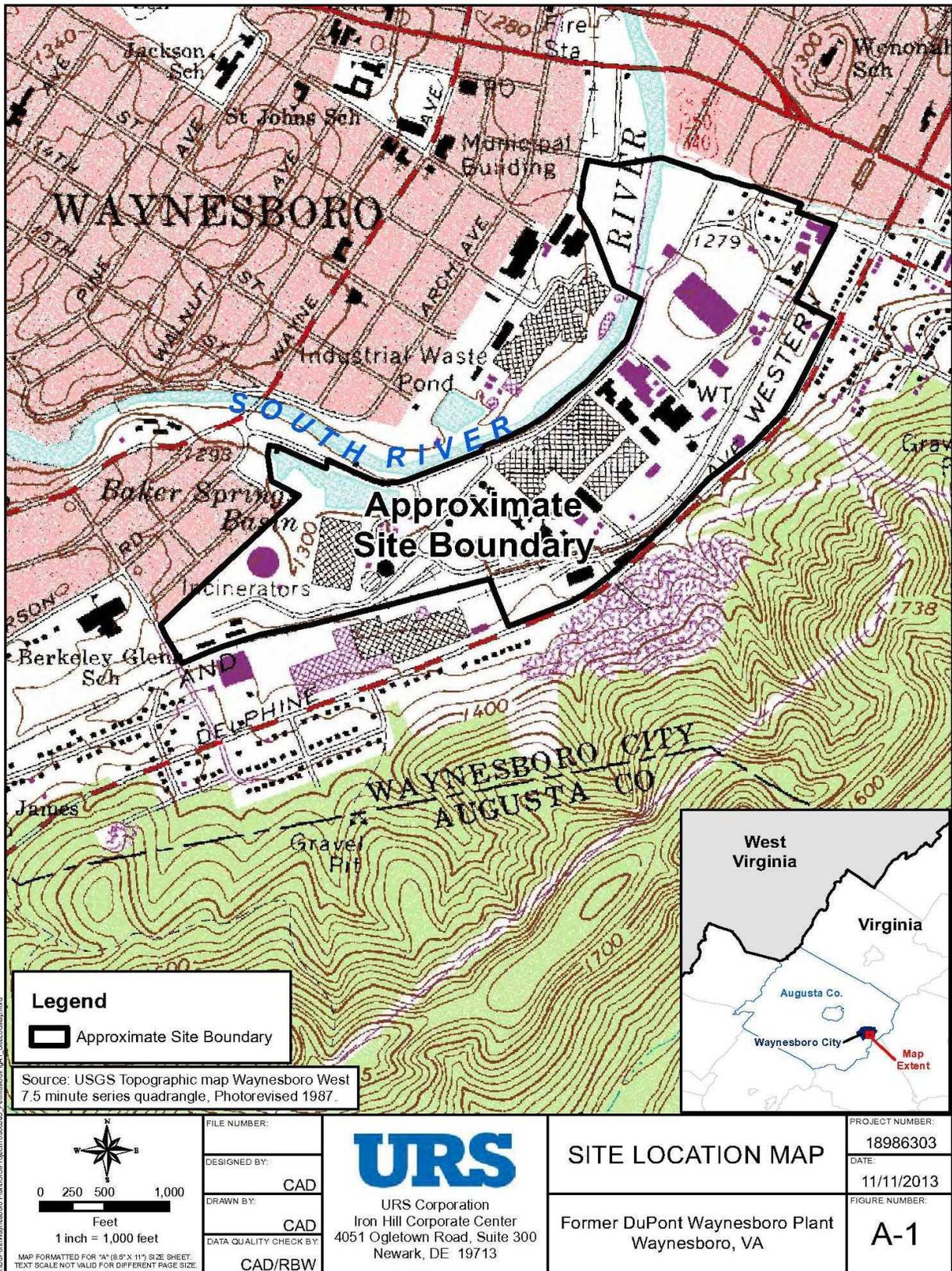
DuPont modified the CMS as requested by EPA and the Department and re-submitted the CMS report in June 2016. The CMS report was approved in October 2016 and the final remedy was incorporated into the Permit in July 2018.

II.A.11. Corrective Measures Implementation

Following remedy selection, DuPont submitted a Corrective Measures Implementation Work Plan (CMI WP) in August 2017 that included a general description of the proposed excavation and capping in SWMUs 1, 4, and 7 and the cleaning and lining for impacted storm sewers in AOC 3. In addition, the work plan detailed Institutional and Engineering Controls (I&ECs) and how the controls would be implemented. The work plan also presented a revised groundwater and outfall sampling program to accommodate the different groundwater data requirements inherent in the change from the remedial investigation phase to implementation of remedial measures. DuPont modified the CMI WP as requested by EPA and the Department and re-submitted in February 2018.

Following CMI WP approval, DuPont submitted streamlined design documents to the Department in October 2018. Upon final approval of the design, DuPont will begin construction of the final remedy.

Figure II.A-1 - SITE LOCATION MAP



**Table II.A-1 - SUMMARY OF DOCUMENT SUBMITTALS FOR ON-SITE
CORRECTIVE ACTION**

Corrective Action Program	Document Title	Date
RFI	<i>Waynesboro Release Assessments/RCRA Facility Investigation Workplan (Revision 02)</i>	June 1, 2000
RFI	<i>Phase I RA/RFI Data Summary Report, DuPont Textiles and Interiors</i>	April 1, 2003
RFI	<i>Phase II RFI Geologic and Hydrogeologic Investigation Workplan</i>	March 1, 2004
RFI	<i>Phase II RA/RFI Workplan, Invista Waynesboro Plant, Waynesboro, Virginia</i>	August 1, 2004
RFI	<i>Phase II RA/RFI Data Summary Report</i>	February 2006 (rev September 2007)
RFI	<i>Phase III RFI Work Plan, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 2006 (rev October 2006)
RFI	<i>Supplemental Work Plan for the Inspection and Abatement of Free Mercury, Waynesboro Invista Plant</i>	October 1, 2007
RFI	<i>Supplemental Work Plan for the Investigation of Mercury at the Former Chemical Building, Invista Waynesboro Plant</i>	November 1, 2007
RFI	<i>Phase III RA/RFI Data Summary Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 1, 2008
RFI	<i>Phase IIIA RFI Workplan, Waynesboro Invista Plant</i>	August 1, 2008
RFI	<i>Comprehensive RFI Report</i>	November 2009 (rev August 2012, October 2013, May
Outfall Monitoring	<i>Stormwater Monitoring Plan, DuPont Textiles and Interiors (DTI), Waynesboro Plant</i>	April 1, 2003

Corrective Action Program	Document Title	Date
Outfall Monitoring	<i>Storm Water Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	December 2003 (rev
Outfall Monitoring	<i>Addendum I – Phase II Monitoring, Storm Water Monitoring Plan, Invista Waynesboro Plant</i>	September 1, 2004
Outfall Monitoring	<i>Addendum II – Phase III Monitoring, Storm Water Monitoring Plan, Invista Waynesboro Plant</i>	December 1, 2005
Outfall Monitoring	<i>Phase II Storm Water Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	June 1, 2006
Outfall Monitoring	<i>Addendum III, Phase IV Storm Water Monitoring Plan, Invista Waynesboro Plant</i>	July 1, 2007
Outfall Monitoring	<i>Phase III Stormwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	December 1, 2007
Outfall Monitoring	<i>Phase IV Outfall Monitoring Report</i>	July 1, 2009
Groundwater	<i>RCRA Routine Groundwater Monitoring Plan, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 1, 2004
Groundwater	<i>2004 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	May 1, 2005
Groundwater	<i>2005 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 2006 (rev December 2006)
Groundwater	<i>2006 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	May 1, 2007

Corrective Action Program	Document Title	Date
Groundwater	<i>2007 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 1, 2008
Groundwater	<i>2008 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	May 1, 2009
Groundwater	<i>2009 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	April 1, 2010
Groundwater	<i>2010 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	May 1, 2011
Groundwater	<i>2011 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	April 1, 2012
Groundwater	<i>2012 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	April 1, 2013
Groundwater	<i>2013 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	April 10, 2014
Groundwater	<i>2014 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 19, 2015
Groundwater	<i>2015 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	March 15, 2016
Groundwater	<i>2016 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	May 3, 2017

Corrective Action Program	Document Title	Date
Groundwater	<i>2017 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	January 23, 2018
Groundwater	<i>2018 Annual Groundwater Monitoring Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	November 27, 2018
Sewer Investigation	<i>Storm Sewer Investigation Work Plan, Invista Waynesboro Plant, Waynesboro, Virginia</i>	August 1, 2006
Sewer Investigation	<i>Sewer Investigation, Phase II Work Plan for Invista Waynesboro Plant</i>	May 1, 2008
Sewer Investigation	<i>Storm Sewer Investigation Phase III Work Plan</i>	July 1, 2010
Sewer Investigation	<i>Sewer Investigation Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	August 1, 2011
Remediation	<i>Interim Measures Workplan, Invista Waynesboro Plant, Waynesboro, Virginia</i>	July 1, 2009
Remediation	<i>Interim Measures Implementation Report, Invista Waynesboro Plant, Waynesboro, Virginia</i>	August 1, 2011
Remediation	<i>Railroad Avenue Interim Measures Work Plan</i>	April 1, 2013
Remediation	<i>Railroad Avenue Interim Measures –Supplemental Work Plan</i>	May 1, 2014
Remediation	<i>Interim Measures Implementation Report, Railroad Avenue IM</i>	April 1, 2015
Remediation	<i>Corrective Measures Implementation(CMI) Work Plan</i>	August 1, 2017
Remediation	<i>Waynesboro-On-Site-CMI-SWMU 7-Design Report</i>	January 2018

Corrective Action Program	Document Title	Date
Remediation	<i>Waynesboro-On-Site-CMI-SWMU 1&4-Design Report</i>	October 2018 (rev June 2019)
CMS	<i>On-Site Corrective Measures Study Report, Former DuPont Waynesboro Plant, Waynesboro, Virginia</i>	June 2015 (rev June 2016)

ATTACHMENT II.B - LIST AND DESCRIPTION OF KNOWN ON-SITE SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs)

II.B.1. Table II.B-1 lists on-site Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that have been investigated and provides a description of the operational history of each unit. Table II.B-2 provides a summary of the current status as it pertains to RCRA Corrective Action. A map showing the location of the SWMUs and AOCs is included as Figure II.B-1.

The Phase I investigation conducted in 2000-2001 consisted of soil and groundwater sampling at 10 SWMUs. The Phase I concluded that SWMU 1 (Mercury Recovery Area) and SWMU 4 (Incineration Area) required further evaluation and that the Northeast Area water level depression should be investigated. During the Phase II investigation (2004-2005) eight SWMUs and two areas of concern (AOCs) were evaluated. Also in this investigation were a soil gas sampling program SWMU 1 for the presence of mercury vapor and a geologic investigation at the Northeast Area. The Phase II Investigation concluded that groundwater in the deep clastic zone present in Northeast Area was impacted with mercury. Mercury was further characterized at SWMU 1 and SWMU 4 and benzene and mercury were detected downgradient of SWMU 6/7.

In a February 2006 (revised September 2006) Phase II Investigation Report no further investigation was recommended for SWMUs 10, 13, 20 and AOCs 1 and 2, however additional investigation was recommended at SWMUs 1, 4, 6/7 and the Northeast Area.

The Phase III Investigation, completed in July 2007, included the collection of 76 soil samples and 5 groundwater samples at three SWMUs for the same constituents as in previous investigations. Soil samples were collected at SWMU 1 to confirm previous soil gas results and the former process ditches at the Chemical Building were sampled for mercury. Geoprobe soil sampling was performed at SWMU 4 for further delineation of mercury and at SWMU 6/7 (former Sludge Pond) for initial characterization of soils. Two new wells were drilled to assess potential migration of constituents from SWMU 6/7. The Northeast Area was investigated by locating and logging plant Well #1 and conducting a long term water level study. The results of the Phase III investigation were reported in the Phase III Summary Report, which was submitted in 2008.

Table II.B-1 - ON- SITE SWMU OPERATIONAL SUMMARY

SWMU	Unit Name	Description of Operation	Type of Operation¹	Dates of Operation
1	Mercury Recovery Area	Mercury-containing sludge was generated during the acetic anhydride process from 1929 to 1950. The sludge was decanted in the Chemical Building and transported in buggies to the mercury recovery area, where it was heated in furnaces until the mercury was evaporated, condensed, and collected in flasks. The mercury recovery area included two buildings, Sludge Recovery and Mercury Recovery, and two adjacent pits.	Other Industrial Furnaces (Closed)	1929-1950
2	Ash Disposal Area	Earthen diked containment area to handle liquid ash slurry from the coal-fired boilers in the Power House. Water from the slurry drained through an outlet manhole into a ditch shared with the neighboring Lime Ponds (SWMU 11). During Closure, the ash was excavated and dewatered, then the area was filled with borrow. The area is currently partially covered. A diked containment system and electrical substation currently exist in this area.	Closed Surface Impoundment Storage	1929-1974
3	Ash Ponds	Used for storage and settling capacity for the liquid ash slurry generated from the Power House. Around 1960, the ash pond was divided into two ponds. In 1974, the ash ponds were dewatered, dredged, and the surrounding soil stabilized for the construction of BCF Nylon Facilities.	Closed Surface Impoundment Storage	1939-1974
4	Incineration Area	Consisted of three operations: the burning grounds, waste byproducts incineration, and the oil burning pits. A variety of trash and wastes were burned in burning pits which were replaced by two teepee incinerators. Prior to	Closed Incinerator	1929-1971

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
		incineration, waste byproducts from the anhydride and acid recovery area were pumped to a 1,200-gallon storage tank located inside a 2-foot tall earthen dike. Three oil-burning pits were used for fire training purposes. The surficial ground cover at this SWMU is asphalt and gravel.		
5	Trade Waste Pond	The triangular shaped pond had an original capacity of 200,000 gallons. Low pH wastewaters consisting primarily of sulfuric and acetic acid were the main wastes stored in the pond. Ether tail waters and clean-out solvents also were retained in the pond. Its contents were pumped to the Wastewater Treatment Plant and the pond was emptied, dredged and backfilled. The area was then graded and stabilized with crushed stone and paved for additional parking.	Closed Surface Impoundment Storage	1955-1966
6	Wastewater Treatment	The wastewater treatment facility was built to manage wastes from Nylon, Lycra, Permasep, Orlon processes. All tanks were installed aboveground. Presently, wastewater from manufacturing is generated at a rate of 200-300 gpm. The wastes are pumped through an above ground line to Waste Treatment. Incoming waste streams are blended in blend tanks (3,000,000 gallon capacity each), and then mixed with the sludge to increase biological activity. Three aeration tanks (250,000 gallon capacity each) are used for aerobic digestion of the wastewater which is sent to a clarifier, treated, and sent to the 10,000,000 gallon tank. The treated water receives a final filtration before being discharged to the South River.	Tank Treatment	1956-present

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
		Wastes managed at this unit include process wastewaters containing dimethylformamide (DMF) dimethylacetamide (DMAC), hexamethylene diamine (HMO) and acrylonitrile.		
7	Sludge Pond	The pond had a concrete liner and drainage ditches that ran along three sides of the pond. The waste managed at this SWMU was limited to excess centrifuge bio-sludge generated from the Wastewater Treatment Plant. The sludge pond was dismantled in 1973, when the fifth clarifier was constructed at Waste Treatment. The concrete liner was also removed, but the sump tank foundation was buried in place.	Closed Surface Impoundment Storage	1956-1973
8	Empty/Used Drum Storage	This unit was originally used for the storage of scrap metal and salvage. Soon after, empty or used drums (which formerly contained residual finish oils, diethanolamine, ethylidene diacetate, and other chemicals) were stored in a partially fenced in area. The drums, which were periodically sold to a drum reconditioner, were stored on an asphalt pad with bungs in place and tightened. A minor spill from an empty amine drum occurred in the mid-1980s but was estimated to be less than a liter in volume. The spill was contained entirely on the asphalt surface of the storage pad. As a precaution, the asphalt and immediately underlying soil were removed in the area of the spill and incinerated. The area is currently paved, but not in use.	Closed Other Storage	1959-1991

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
9	Co-treatment facility and Liquid Vortex Incinerator	<p>In 1960, co-treatment facilities for retention and analysis of liquid wastes were built. After analysis, liquid wastes were released to Waste Treatment. Two 10,000-gallon retention tanks were constructed on compacted crushed stone and 12" macadam. Wastes, not acceptable to waste treatment, were sent to the Liquid Vortex Incinerator. Wastes managed at these units included polytera methylene ether glycol, isocyanate, titanium dioxide, DMF, caustic, acid, oils, amines, deionization regeneration wastes, tar still purses, solvent column waste heads, DMAC, dimethyl amine, cellulose acetate, cellulosic sugars, iron, calcium, sodium ions, nitrate, sulfate, and acetate ions.</p>	Closed Incinerator	1960-1988
10	Hazardous Waste Storage Pad (A/B)	<p>The storage pad consisted of a concrete slab covered with a protective corrosion and crack-resistant coating. Leaks and spills, collected in two 540 gallon in-ground stainless steel sumps were pumped to drums using a portable pump. Concrete curbing around the pad enhanced containment and prevention of surface cracking. The drums were stored on wooden skids to facilitate loading, unloading and inspection for drum leakage. Materials stored on the pad included: DMAC, DMF, dimethylsulfoxide, toluene, formic acid, acetone, phenol, chlorobenzene, paint thinners, methylene chloride, and trichloroethylene. This RCRA permitted drum storage pad was certified clean closed by the Department in 2004.</p>	Closed Drip Pad	?-2004

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
11	Lime Ponds	Lime sludge was piped from the Generator House to a diked containment area across the Norfolk & Western Railroad tracks. When the original ponds became full, an additional lime storage area was located in the southwestern corner of the plant property. By 1946, the original ponds held approximately 90,000 cubic yards, while the remote western pond held 30,000 cubic yards. After the acetic anhydride process was phased out in 1950, lime was no longer produced. After most of the lime had been removed, the area was graded and seeded to prevent erosion.	Closed Surface Impoundment Disposal	1929-1950
12	Waste Loading Dock/Hazardous Waste Pad C	The Waste Loading Dock was built on an existing concrete pad for temporary 90-day storage of wastes prior to shipment offsite for disposal. Wastes from various sources across the plant are brought to the loading dock by WNI Services. These wastes are generated from various sources across the plant including process wastes, laboratory analysis waste, and maintenance waste. The COCs associated with these wastes include DMAC, spandex polymer resin, methanol, ethanol, chlorobenzene, paint residues, oil, and cleaning solvents (hydrocarbon based). The hazardous drum storage building (Waste Pad C) was constructed with a concrete floor that has an 8-inch curb around the perimeter. All joints in the concrete have a water seal and a silicone sealant. A trench runs through the center of the building which drains to a double	Drip Pad	1988-?

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
		walled 1500 gallon above ground tank located outside of the building on a concrete curbed pad. Waste Pad C is a RCRA less than 90-day hazardous waste accumulation pad subject to regulation under 40 CFR part 262.		
13	Oil/Water Separator System	The oil/water separation system is located on the first floor of the Chemical Building next to DM water storage. It consists of a 6000 gallon fiberglass tank and spill collection pans for the hose connections, pumps, filters, etc. The tank is located on a concrete foundation. Sources of waste oil sent to this facility include: Nylon sump, Orlon sump, any oil released into plant sewers, and all used oil from plant maintenance shops.	Other Subpart X	?-present
14	Maintenance Shop Sump	The sump is constructed of reinforced concrete, collects waste oils and greases.	Other Subpart X	1957-present
15	BCF Nylon Sump	The sump is constructed of reinforced concrete and collects finish oils, formaldehyde, and HMD wastes.	Other Subpart X	1957-present
16	Lycra Sump	This sump is constructed of reinforced concrete and collected finish oils and DMAC. This sump is no longer in service	Other Subpart X	1957-?

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
17	Orlon Sump	This sump (currently called the aqueous waste sump) is constructed of reinforced concrete and collects all of the waste streams before pumping them to Waste Treatment.	Other Subpart X	1957-present
18	Acetation Waste Tank	The acetation waste tank was utilized for the impoundment of acidic wastes from acetate manufacture in the Chemical Building. This waste contained dilute acetic acid. Three sumps were constructed as in-ground concrete vaults with walls and floors approximately 8-inches thick. The vaults were lined with acid brick. Waste flowed from these sumps into the retention tank pump pit, which was also constructed of concrete with acid brick lining. The tank foundation consisted of compacted earth base covered with two layers of crushed stone. A compacted earthen dike was built to retain the crushed stone base. The tank, which consisted of coated steel construction, was placed directly on top of the crushed stone.	Closed Tank Storage	1950's-1997
19	Salvage Yard	The salvage yard is surrounded by security fence and is used for the temporary storage of salvage materials. These materials include sheet metal, lamps, scrap wood, boxes, fiber, and tubing. This unit is currently operational and has been paved.	Other Storage	?-present
20	Process Sewer Line	The nylon process sewer is a buried active sewer line that is pressurized. The pressurized portion of this line spans from the process pump station to the Orlon sump. This line is constructed of 8-inch diameter Grade B cement lined iron pipe that is butt welded (and meets ASTM A 53, and	Plant Process Sewer	?-present

SWMU	Unit Name	Description of Operation	Type of Operation ¹	Dates of Operation
		code SP640U). A release occurred in 1997, which resulted in a few hundred gallons of wastewater release. Remedial activities following the leak included the removal of all free liquid from the street and the removal of approximately 5 to 6 yd ³ of clay fill and soil surrounding the sewer line. The excavation was back-filled with clean fill materials. Upstream of the process pump station, the Nylon process sewer is constructed of vitrified clay. There is no record of a release from this section of the process sewer.		
AOC 1 and 2	Drum Storage Pads	The Drum Storage Pads consists of concrete slabs located on the eastern boundary of the plant The slabs are the remnant of former buildings at the site. After removal of the building structures, the remaining concrete slabs were used for long term storage of containerized wastes. In conjunction with the removal of mercury impacted soils from an area within the plant, soils and concrete along with personal protective gear were drummed for disposal and stored on the pads.	Other Storage	1990's-2000's
AOC 3	Sewer System	The storm sewer system is utilized to convey stormwater in a controlled manner from the facility.	Storm Sewer	?-present

Table II.B-2 - ON-SITE SWMU CORRECTIVE ACTION SUMMARY

	Unit Description	Status	Justificati on	Reference
1	Mercury Recovery Area	CMS Complete, Remedy Selected	Mercury in this SWMU is identified as a source that impacts groundwater and storm sewer water quality. Because of the presence of free mercury in the subsurface in this area and the potential for mobilization of mercury via the sewer system, SWMU 1 is recommended for inclusion in the CMS.	Corrective Measures Study Report, revised 2016
2	Ash Disposal Area	NFI	Soil samples collected in the Phase I RFI delineated COCs in this unit. However, no significant release was indicated.	Phase I RA/RFI Report, 2003
3	Ash Ponds	NFI	Soil borings conducted during the Phase I RFI concluded that there was insignificant impact from the former ash ponds.	Phase I RA/RFI Report, 2003

	Unit Description	Status	Justificati on	Reference
4	Incineration Area	CMS Complete, Remedy Selected	Because of the presence of free mercury in the subsurface, the impact of mercury to groundwater and impact to surface water drainage, this SWMU is recommended to be carried forward to the CMS.	Corrective Measures Study Report, revised 2016
5	Trade Waste Pond	NFI	Soil samples collected in the Phase I RFI were adequate for delineation of COC's. This unit is covered by asphalt and no significant exposure or migration pathways were identified at this SWMU.	Phase I RA/RFI Report, 2003
6	Wastewater Treatment	NFI	Soil samples collected in the Phase I RFI were adequate for delineation of COC's.	Phase III RFI Report, 2008
7	Sludge Pond	CMS Complete, Remedy Selected	The source of mercury impact to groundwater has been delineated at this SWMU. Impacted groundwater is limited in extent and is not reaching potential receptors; however, this SWMU is recommended for inclusion in the CMS.	Corrective Measures Study Report, revised 2016

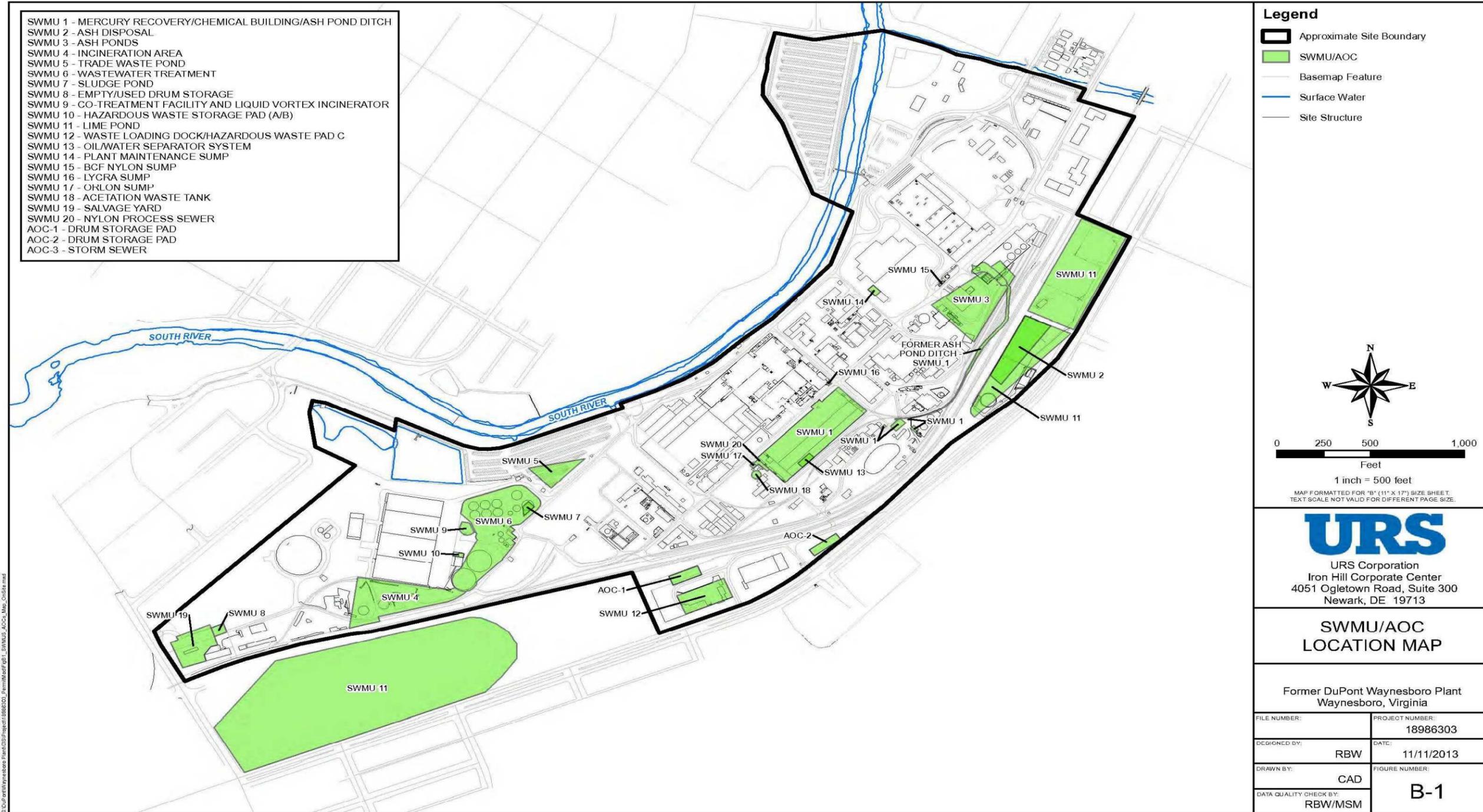
	Unit Description	Status	Justificati on	Reference
8	Empty/Used Drum Storage	NFA	Empty drums are not subject to regulation under 40 CFR parts 261 through 265 or part 268, 270 or 124 (ref. 40 CFR 261.7 (a) (1)).	RI/RFA Workplan, 2000
9	Co-treatment facility and Liquid Vortex Incinerator	NFA	The co-treatment facility included secondary containment and the liquid vortex incinerator was completely enclosed. The units were decommissioned in 1988 and 1970, respectively. There is no record of a release from either of these units.	RI/RFA Workplan, 2000
10	Hazardous Waste Storage Pad (A/B)	NFI	The drum storage pad was clean closed per the RCRA approved closure plan and approved by VADEO in 2004.	Phase II RFI Report, 2007
11	Lime Ponds	NFA	No hazardous waste constituents were placed in this unit.	RI/RFA Workplan, 2000
12	Waste Loading Dock/Hazardous Waste Pad C	NFI	A spill of Lycra polymer in 1996 was contained within the pad and cleaned up. No release to the environment occurred.	Phase IIIA RFI Workplan, 2008

	Unit Description	Status	Justificati on	Reference
13	Oil/Water Separator System	NFI	Soil samples during the Phase II RFI collected in this unit indicate that there was no release at this unit.	Phase II RFI Report, 2007
14	Maintenance Shop Sump	NFI	Soil samples indicate no release from this unit and that no exposure or migration pathways are associated with this unit.	Phase I RA/RFI Report, 2003
15	BCF Nylon Sump	NFI	Soil samples indicate no release from this unit and that no exposure or migration pathways are associated with this unit.	Phase I RA/RFI Report, 2003
16	Lycra Sump	NFI	Soil samples collected in the Phase I RFI indicate no release from this unit and that no exposure or migration pathways are associated with this unit.	Phase I RA/RFI Report, 2003
17	Orlon Sump	NFI	Phase I soil samples indicate no release from this unit and that no exposure or migration pathways are associated with this unit.	Phase I RA/RFI Report, 2003
18	Acetation Waste Tank	NFI	Phase I soil samples indicate no release from this unit and that no exposure or migration pathways are associated with this unit.	Phase I RA/RFI Report, 2003

	Unit Description	Status	Justification	Reference
19	Salvage Yard	NFA	The salvage yard is paved and there is no record of a release from this area. Scrap metal staged in the yard is excluded from the requirements of 40 CFR Part 262 through 266, 268, 270 and 124 (ref. 40 CFR 261.6 (a) (3) (iv)).	Phase I RA/RFI Report, 2003
20	Process Sewer Line	NFI	Soil cleanup and removal activities performed after the sewer leaks were shown to be effective. Soil sampling conducted in the Phase II RFI indicates that remaining soils are not impacted.	Phase II RFI Report, 2007
AOC 1 and 2	Drum Storage Pads	NFI	Soil samples collected in the Phase II RFI indicate no release from this unit and that no exposure or migration pathways are associated with this unit.	Phase II RFI Report, 2007
AOC 3	Sewer System	CMS Complete, Remedy Selected	Phase I of the sewer investigation was completed in January 2007. Key storm sewer sections were identified and recommendations were made for the Phase II investigation.	Corrective Measures Study Report, revised 2016

	Unit Description	Status	Justificati on	Reference
	NFI = No further investigation NFA = No further action COCs = Constituents of Concern			

Figure II.B-1 - ON-SITE SWMU LOCATION MAP



ATTACHMENT II.C - OFF-SITE CORRECTIVE ACTION (AOC 4)

II.C.1. BACKGROUND

In addition to on-site Corrective Action at the former DuPont-Waynesboro facility, DuPont is implementing interim remedial measures (IM) to address off-site mercury (Hg) issues in accordance with the requirements of this permit. In February 2014, the Virginia Department of Environmental Quality (The Department) amended the Permit to incorporate Area of Concern (AOC) 4, which includes off-site aquatic and riparian/floodplain areas extending from South River Relative River Mile (RRM) 0 at the Site, to RRM 25, and continuing through a portion of the South Fork Shenandoah (SFS) River (Figure II.C-1).

This Attachment describes the AOC 4 Resource Conservation and Recovery Act (RCRA) Facilities Investigation (RFI) findings, and the components of the Remedial Strategy.

II.C.2. RCRA FACILITIES INVESTIGATION FINDINGS

Conceptual System Model

A detailed description of the physical setting of AOC 4 is provided in the Ecological Study Report (URS, 2012a) and the Remedial Facilities Investigation Report (URS, 2012b). The conceptual system model, along with the risk assessment, derives from the overall AOC 4 setting and helps define the sources and pathways to be addressed in the AOC 4 remedy. A detailed description of the aquatic and terrestrial mercury conceptual system models is also provided in Section 7.0 of the AOC 4 RFI (URS, 2012b); a summary is provided in the following paragraphs, along with a summary of findings of the risk assessments.

Aquatic Conceptual System Model

The aquatic Mercury Conceptual System Model (HgCSM) supports remedial decision-making by identifying the most critical aspects of mercury movement in AOC 4. The current aquatic HgCSM focuses on the three factors relevant to understanding the need for a remedial action:

1. mercury sources to the South River and the extent to which these sources are controlled;
2. mercury-impacted media—bank soils and in-channel sediments; and
3. the aquatic food web elements.

The aquatic HgCSM depicts the transfer of mercury from sediments to the aquatic

food web (to fish and from fish to piscivores). Mercury movement from the sediments in AOC 4 to higher trophic level organisms is primarily driven by consumption of methylmercury (MeHg) by aquatic invertebrates.

Terrestrial Conceptual System Model

The terrestrial HgCSM differs from the aquatic HgCSM in that loading rates or fluxes of mercury between compartments of soil, vegetation, and tissue were not measured; however, the terrestrial HgCSM is based on field data and is integrated with the risk assessment approach for the South River, so the relationships can be used to plan potential remediation.

The terrestrial HgCSM was designed based on two lines of evidence – the methyl mercury (MeHg) concentration and the delta fifteen n ($\delta^{15}\text{N}$) suggest that the main sources of MeHg to higher trophic levels in the floodplain are via detritivorous invertebrates and emergent aquatic insects from the South River. MeHg concentrations in the organisms that feed on this pathway (e.g., invertivorous mammals) were higher than in strictly herbivorous animals. The influence of MeHg from emergent aquatic insects can be seen in the high $\delta^{15}\text{N}$ values and MeHg concentrations in terrestrial animals that feed on them, such as predatory spiders, aerial insectivorous birds, and mammals.

The influence of these findings on the outcome of the risk assessment, and input to remedial- decision making is discussed in the following paragraphs. Detailed human and ecological risk assessments were performed for AOC 4 (URS, 2015), including development of human health and ecological conceptual site models. The human health CSMs detail both potentially complete and incomplete pathways for each of the possible off-site receptors under both current and future land use and hypothetical future land use.

Human Health Risk Assessment

The Human Health Risk Assessment (HHRA) concluded a limited potential for human health risks at the exposure areas evaluated under current land uses. As part of remedy evaluation, areas that are identified in the risk assessment as being of potential concern under current or reasonably anticipated future land use conditions will be further evaluated to determine appropriate remedial strategies to mitigate potential unacceptable risks.

Ecological Risk Assessment

The results of the Ecological Risk Assessment indicate that potential adverse effects to aquatic and terrestrial ecological receptors are due to trophic transfer of MeHg originating in the South River system—a finding that is consistent with the current understanding of the system on which the proposed remedial strategy is based.

II.C.3. REMEDIAL STRATEGY

The AOC 4 remedial strategy and Corrective Measures Study (CMS) involves a series of IMs that will eliminate or reduce exposure and migration of mercury in the system to protect human health and the environment. The strategy was originally presented in the Remediation Proposal submitted to the Natural Resources Defense Council (NRDC; Anchor QEA et al., 2013), and was subsequently refined in the Interim Measures Design, Implementation, and Monitoring Work Plan (IMWP; Anchor QEA and URS et al., 2015) approved by the Department in March 2015. The IMWP provides the details for Phase 1 of the IM, and elements that will be incorporated into the IMs for other bank areas targeted for remediation.

The iterative remedial strategy follows an enhanced adaptive management framework (EAM), which provides a flexible decision-making process that can be adjusted as monitoring data are collected, remediation action outcomes are better understood, and as landowner and other stakeholder preferences or concerns arise. The EAM is integrated into the RCRA process as shown in Figure II.C-2.

Remedial Action Objectives (RAOs)

Both short- and long-term RAOs are appropriate to address bioaccumulation and food web exposures in the South River. Short-term RAOs are expected to be met following IM construction, while long-term RAOs may require additional corrective actions in other segments or throughout the South River before they are attained. Preliminary RAOs may be refined during interim measure and corrective action design, as well as follow-on adaptive management. Short- and long-term RAOs for AOC 4 are listed below:

Short-term RAOs

- General response objectives: Reduce mercury transport and exposure and improve bank habitat functions within the upper 2 miles of the South River
- Performance objectives: Conduct and/or maintain bank remediation actions in the upper 2 miles of the South River to achieve sustainable reductions in mercury concentrations and improve water quality and bank habitat functions within this reach
- Measurable metrics: Bank erosion rates, measured using detailed topographic surveys, erosion pins, and/or root analysis; establishment of bank vegetation; and mercury concentrations in physical media and biological tissues

Long-term RAOs

- General response objectives: Reduce MeHg exposure and improve habitat

conditions throughout the South River and SFS River

- Performance objectives: Conduct and/or maintain remediation actions that sustain reductions in tissue MeHg concentrations and improve water quality and habitat functions throughout the South River and SFS River
- Measurable metrics: Mercury concentrations in biological tissues and physical media, and bank and in-channel habitat metrics

Appendices to the IMWP include both short-term and long term monitoring plans that incorporate measurable metrics developed collaboratively with the SRST and under the Department's oversight.

Approach

The sources of mercury primarily occur in the first 12 miles of the South River, beginning at the former DuPont Site and include river banks and sediment with total mercury (THg) levels elevated relative to regional background. The main working hypothesis is that reducing or eliminating the loading of inorganic mercury (IHg) within segments of the South River in a stepwise manner will result in improvements in and downstream of that segment.

The EAM approach requires that the river system be divided into manageable segments, beginning with source controls at the former Waynesboro Site, followed by addressing banks and adjacent in-channel bed sediments in a successive upstream-to-downstream sequence.

Targeted bank soil areas that contribute disproportionately to the load are referred to as bank management areas (BMA). The actual sequence of remediation will depend on several factors, including access to private property. The outcome of Phase 1 IMs is informing the scope of subsequent phases of the CMS as part of an iterative learning process within the EAM framework. Since IHg loading to the South River is also linked to its transfer into the terrestrial food web, it is expected that reducing IHg loading to the aquatic portion (South River) will also result in reduced transfer to the semi-aquatic and terrestrial food webs. Efforts to identify approaches to address mercury in the floodplain and terrestrial food web are underway through the collaborative efforts of the SRST.

Design and implementation of Phase 1 of the CMS is being performed as a series of IMs under RCRA within in an EAM framework. Aquatic exposure and migration pathways pose the greatest potential threat to both aquatic and terrestrial receptors. The following paragraphs summarize remedial alternatives being considered to address these pathways, and provide a rationale for future terrestrial consideration. Specific technologies were combined to develop the following BMA alternatives:

- Institutional Controls and Monitoring
- Enhanced Vegetative Stabilization
- Structural Stabilization
- Removal and Disposal

Each of these alternatives is described in detail in the IMWP (Anchor QEA and URS et al., 2015).

Enhanced vegetative stabilization and structural stabilization best meet the RAOs and overall National Contingency Plan evaluation criteria, and are distinct from the other alternatives in achieving greater protectiveness with far less short-term impact on the environment during remedy implementation, less impact on the community, and less impact on sustainability core elements. This has been demonstrated by a Pilot Bank Stabilization project (Pilot Bank Study) that was performed to test the hypothesis that stabilization of mercury-contaminated riverbanks would reduce mercury transport and exposure in near-bank environments. The Pilot Bank Study was implemented in 2009 near RRM 0.1, just downstream from the former DuPont Waynesboro facility. The primary objective of the Pilot Bank Study was to reduce riverbank erosion rates and particle-associated mercury loading to the river through bank stabilization; annual post-stabilization monitoring has indicated that mercury concentrations in near-bank sediment, pore water, and transplanted *Corbicula fluminea* (*Corbicula*) tissue are decreasing as a result of bank stabilization (Anchor QEA and URS, 2013). Enhanced vegetative stabilization may also provide opportunities for habitat restoration of certain BMAs or portions of BMAs.

Additional BMA-specific assessment may be performed to further assess which elements of the technologies are most appropriately applied to a given BMA based on landowner preferences, site characteristics, regulatory requirements, and other factors. The IM design evaluations will further refine the remedy for each BMA, likely including appropriate combinations of technologies for specific situations.

Terrestrial human risk estimates presented in the HHRA provide a conservative yet meaningful basis upon which to evaluate remedial actions for AOC 4. Exposure pathways that were identified as being of potential concern under current or future potential land use conditions will be carried forward for further consideration as appropriate. Remedial options will be considered and remedial measures recommended to insure the protectiveness of the AOC to human health. In addition, a soil assessment strategy has been developed collaboratively with the Department to address potential exposure issues regarding surficial floodplain soils under future use and activities.

The nature and extent of mercury in the floodplain within AOC 4 indicates that mercury uptake (primarily by soil invertebrates), and methylation by soil microbes is the primary concern for ecological exposure. Therefore, the primary goal involving the riparian and terrestrial habitats in AOC 4 is to reduce mercury bioavailability for uptake and methylation. The Floodplain Pilot Study and several ongoing SRST investigations are being conducted in an effort to understand the efficacy of biochar to reduce mercury bioavailability in soils without causing any unintended adverse effects. The use of biochar in the Phase 1 IM was based on these inputs from the SRST.

Lastly, since a significant portion of the ecological exposure on the floodplain is contributed by aquatic migration and exposure pathways, IMs in the river will also contribute to overall improvement of terrestrial exposure areas on the floodplain. Long-term terrestrial exposure monitoring will provide data to evaluate and explain potential trends.

Timeframe for Achieving RAOs

An important element of the EAM is its function to support evaluation of the efficacy of the IMs to achieve the remedial goals over the long-term. Short-term and long-term monitoring plans have been developed as part of the IMWP to evaluate the effectiveness of the remedial actions relative to short- and long-term RAOs. The short-term (2-10 years) and the long-term (>10 years) monitoring plans have similar overall goals, but differ in spatial and temporal aspects. Short-term monitoring is spatially limited (e.g., to specific bank areas and Plant site) and focused on relative rapid reduction of mercury loading locally at individual locations, whereas the long-term monitoring applies to the improvements at the watershed level.

Additional short-term stations will be added to the monitoring effort as IMs progress. Details of each of the plans can be found in Appendices D and E, respectively, of the Phase I IMWP (Anchor QEA and URS et al., 2015).

RCRA Deliverables and Program Schedule

Deliverables

Several major program decisions and directions have been captured in key RCRA documents. Table II.C-1 provides a list of approved program deliverables. Additional key deliverables shared with the Department to date include:

- Final Phase 1A Design Package
- Annual Short-term Monitoring Reports
- Long-term Monitoring Report

- Surficial Soil Strategy
- Remedial Selection Report

Program Schedule

The Pilot Bank BMA was completed in 2009 and subsequent extensive monitoring has shown that remedial objectives have been met. This bank is considered a part of the Phase I Interim Measures, and subject to the Maintenance Plan. Construction of the Constitution Park BMA was completed in February 2017. The City Shops BMA construction commenced in October 2017 and was completed in February 2018. The Allied Ready Mix BMA was completed in November 2018. DuPont will continue to work toward design and follow on IMs at locations providing the greatest load reductions with property owners willing to move forward.

Design, permitting and construction of the remaining Phase 1 BMAs is targeted for 2019- 2021. DuPont and the Department will update the project schedule at least quarterly in the quarterly RCRA updates. Meetings will be scheduled as needed to facilitate progress of ongoing efforts and to resolve any issues that may arise.

The nature of the EAM framework strategy of the remedy can influence the current schedule, particularly in subsequent remedial phases of the CMS as monitoring data are collected and evaluated. Any schedule modifications would be based on direction from the Department.

References

Anchor QEA LLC, URS Corporation, E.I. du Pont de Nemours and Company. 2013.

Remediation Proposal South River and a Segment of the South Fork Shenandoah River, Virginia. Final Remediation Report. October 2013.

Anchor QEA LLC, URS Corporation, E.I. du Pont de Nemours and Company. 2015. Final Interim Measures Design, Implementation, and Monitoring Work Plan. Phase-1 South River Area of Concern 4. February 2015.

URS, 2012a. Final Report: Ecological Study of the South River and a Segment of the South Fork Shenandoah River, Virginia. Fort Washington, Pennsylvania. Final report prepared by URS Corporation. September 2012.

URS, 2012b. Comprehensive Resource Conservation and Recovery Act (RCRA) Facility Investigation Report, Former DuPont Waynesboro Plant. Initial report prepared by URS Corporation in November 2009; revised August 2012.

URS, 2015. Human Health and Ecological Risk Assessment Report. Final report

prepared by URS Corporation. September 2015.

Table II.C-1 - KEY PROGRAM DELIVERABLES

Deliverable	Approval/Final Agency Review
RCRA Permit Modification	02.04.2014
Community Involvement Plan	09.11.2014
Final Interim Measures Design, Implementation, and Monitoring Work Plan, Phase 1	2.2015
Ecological Risk Assessment Report, Volumes I – III	05.01.2015
AOC 4 Short-Term Monitoring Plan: Revised Habitat Metrics	07.17.2015
RCRA Facility Investigation Report, Volumes I – III	8.2015
AOC 4 Proposed Revision to Long-Term Monitoring Plan: Fish Tissue Sampling and Analysis	09.17.2015
Human Health Risk Assessment Report, Volumes I – III	10.2015
2015 AOC 4 Short-Term Monitoring Field Summary Memorandum	01.11.2016
AOC 4 Short-Term Monitoring Station Location Memorandum	05.09.2016
Basis of Design Report, Phase 1A Bank Management Areas – Constitution Park	09.22.2016
2015 Short-Term Monitoring Report	10.2016
2016 AOC 4 Short- and Long-Term Monitoring Field Summary Memorandum	03.01.2017
2016 Short-Term Monitoring Report	6.2017
Basis of Design Report, Phase 1A Bank Management Areas – WWTP	07.24.2017
2017 AOC 4 Spring Short-Term Monitoring Field Summary and Post-Construction Maintenance	08.31.17
AOC 4 Remediation Selection Process: Former DuPont Waynesboro Site, Virginia	09.20.17
Long-Term Monitoring Baseline Report	12.13.17
Fall 2017 Short-Term Monitoring Field Summary Memorandum	01.31.18
Fall 2017 Constitution Park Bank Management Area Maintenance Inspection Memorandum	02.01.18

Deliverable	Approval/Final Agency Review
100% Final Technical Execution Plan for Allied Ready Mix Bank Management Area	02.23.18
Construction Completion Report – Constitution Park Bank Management Area	02.23.18
2017 Short-Term Monitoring Report	03.09.18
Long-Term Monitoring Program Assessment and Recommended Modifications: Former DuPont Waynesboro Site AOC 4	03.23.18
Surficial Soils Evaluation Framework: AOC 4, Former DuPont Waynesboro Site	04.08.18
Final AOC 4 Long-Term Monitoring Plan: South River and a Segment of the South Fork Shenandoah River,	04.24.18
RCRA Corrective Action Permit Modification	07.12.18
Ecological Study of the South River and South Fork Shenandoah Rev.01	08.10.18
Construction Completion Report: Wastewater Treatment Plant Bank Management Areas	09.06.18
AOC 4 Maintenance Plan	09.07.18
Shiloh Baptist Church BMA 100% TEP	11.30.18
Constitution Park BMA Inspection Report – Summer 2018	11.30.18
WWTP BMA Inspection Report – Summer 2018	12.03.18
Fall 2018 Short-term Monitoring Field Summary Memo	01.24.19
2018/2019 Constitution Park Bank Management Area – Leaf-off Maintenance Inspection	03.04.19
2018/2019 City Shops Bank Management Area – Leaf-off Maintenance Inspection	03.04.19
2018/2019 Allied Ready Mix Bank Management Area – Leaf-off Maintenance Inspection	03.04.19
Construction Completion Report: Allied Ready Mix Bank Management Areas	03.12.19
North Park BMA: 2019 Pre-Design Investigation – Soil Sampling Plan	03.15.19
Japanese Knotweed Treatment Pilot Summary of Results	04.17.19

Deliverable	Approval/Final Agency Review
Constitution Park and Allied Ready Mix Bank Management Area - Post-Construction Bank Repair	05.23.19
Constitution Park BMA – 2019 Leaf-on Maintenance Inspection	08.19.19
City Shops BMA – 2019 Leaf-on Maintenance Inspection	08.19.19
Allied Ready Mix BMA – 2019 Leaf-on Maintenance Inspection	08.19.19
2018 Short-Term Monitoring Report	09.05.19

Figure II.C-1 - AOC 4 STUDY AREA

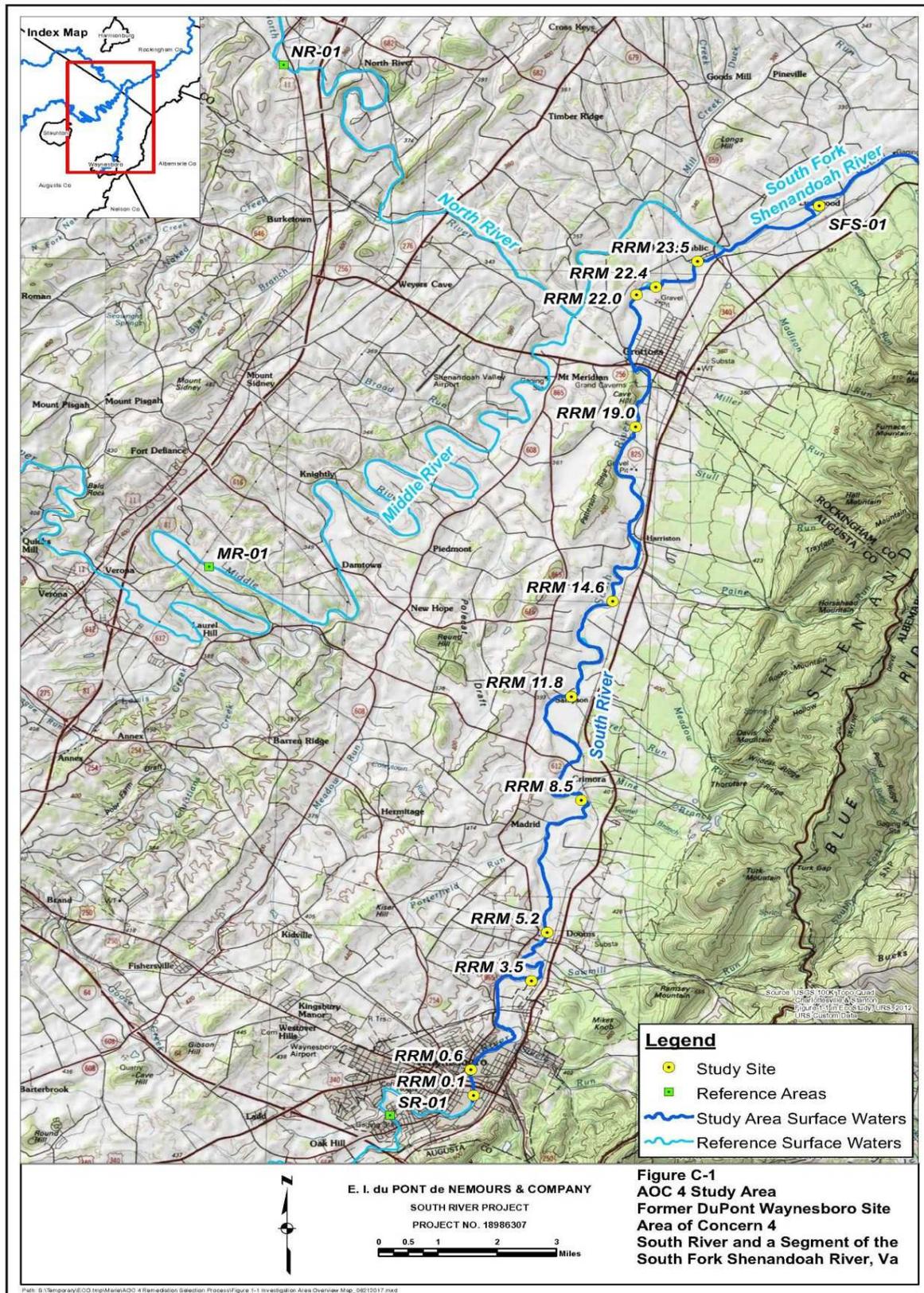
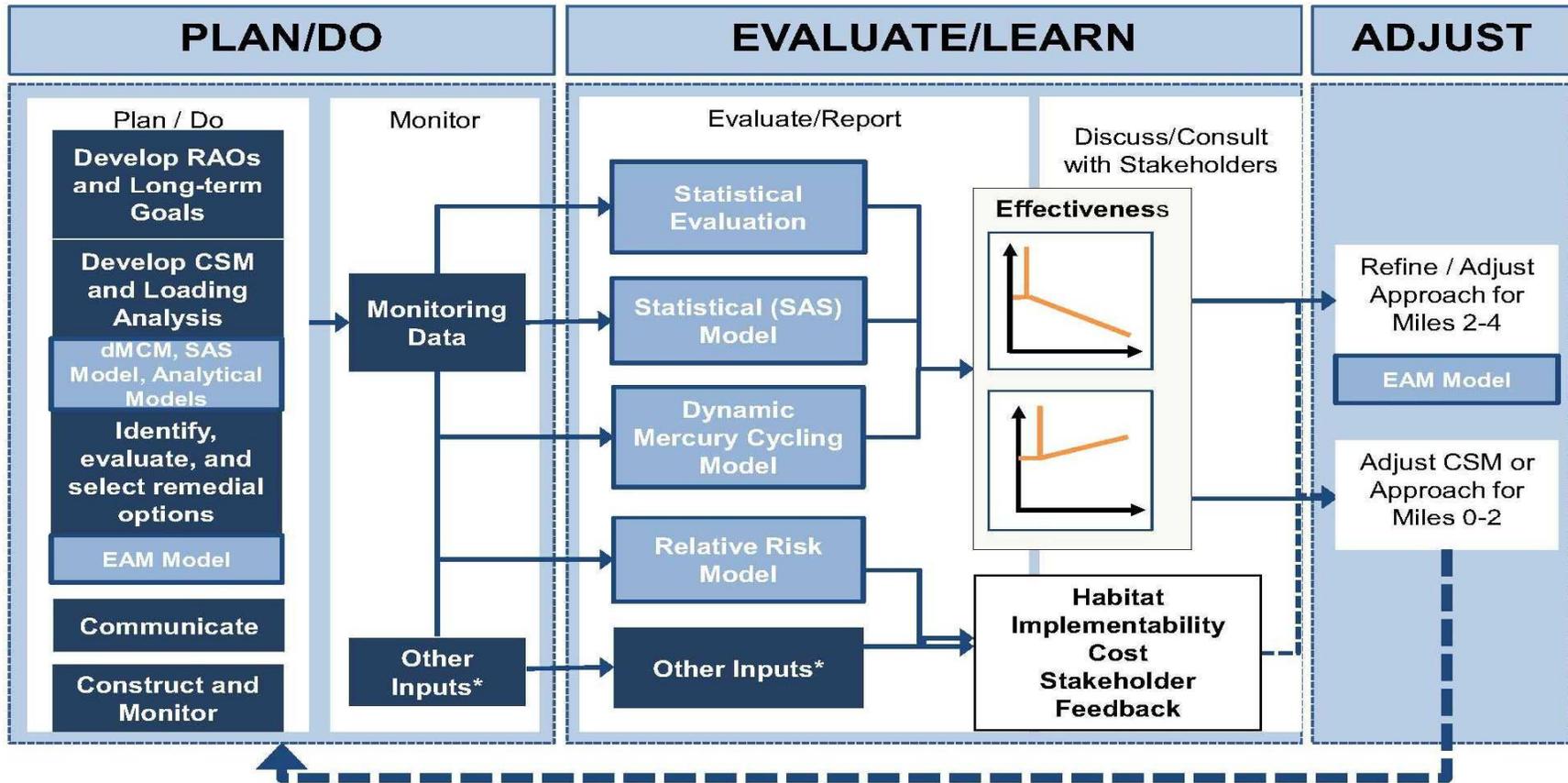


Figure II.C-2 - INTEGRATION OF ADAPTIVE MANAGEMENT AND RCRA PROCESS

Figure C-2

Integration of Adaptive Management and RCRA Process
 Former DuPont Waynesboro Site, Area of Concern 4
 South River and a Segment of the South Fork Shenandoah River, VA



*Other Inputs include: Habitat condition improvements, permitting and implementation issues encountered and actual costs

ATTACHMENT II.D - HEALTH AND SAFETY PLAN REQUIREMENTS

- II.D.1. The Permittee shall prepare a facility Health and Safety Plan for Corrective Measures activities at the Permitted facility and shall submit to the Department and the EPA Region 3. Compliance with the Occupational Safety and Health Administration (OSHA) Regulations is not under the jurisdiction or the authority of the Department or the EPA in the Commonwealth of Virginia. Therefore, the Health and Safety Plan submittal to the Department and the EPA Region 3 is for the administrative record only and the submittal will not receive approval nor disapproval by the Department or the EPA.
- II.D.2. In the Commonwealth of Virginia, compliance and enforcement of the OSHA regulations under 29 C.F.R. 1910.120, falls under the authority of the Virginia Office of Safety and Health, the Virginia Department of Labor and Industry. Therefore, the above office should be contacted to determine the major elements and requirements for a Health and Safety Plan under the OSHA Regulations.

ATTACHMENT II.E - CORRECTIVE MEASURES IMPLEMENTATION SCOPE OF WORK REQUIREMENT

II.E.1. PURPOSE

This Scope of Work (SOW) requirements for the Corrective Measures Implementation (CMI) sets forth the requirements for the implementation of the design, construction, operation, maintenance, and monitoring of the corrective measures implementation in accordance with Permit Module II C. The CMI is required if the Department determines that corrective measures for releases of hazardous waste or hazardous constituents are necessary to protect human health and the environment. The Department will advise the Permittee of a determination that corrective measures for releases of hazardous waste or hazardous constituents are necessary on the basis of the RFI or any other information and the reasons, in writing and any amendments thereto.

If Corrective Measures are deemed necessary to protect human health and the environment, the Permittee will perform work in accordance with the requirements specified in this SOW to implement the corrective measures that have been selected by the Department in the Final Decision and Response to Comments (FDRTC), and any amendments thereto. Variations to the requirements of this attachment may be permitted subject to approval by the Department. The Permittee will furnish all personnel, materials, and services necessary for the implementation of the corrective measure or measures.

II.E.2. SCOPE OF WORK

The Corrective Measure Implementation SOW consists of four tasks:

1. Task I -Corrective Measure Implementation Work Plan:

- i. Management Plan.
- ii. Community Relations Plan.
- iii. Sampling and Analysis Plan.
- iv. Corrective Measures Permitting Plan.
- v. Supplemental Field Investigation Work Plan.

2. Task II - Corrective Measure Design:

- i. Design Plans and Specifications.

- ii. Operation and Maintenance Plan.
 - iii. Cost Estimate.
 - iv. Construction Quality Assurance Objectives.
 - v. Health and Safety Plan.
 - vi. Sampling and Analysis Plan Revision.
 - vii. Design Phases.
3. Task III - Corrective Measure Construction:
- i. Preconstruction Inspection and Meeting.
 - ii. Inspections.
 - iii. CMI Report.
4. Task IV - Reports:
- i. Progress Reports.
 - ii. CMI Work Plan.
 - iii. CMI 30% Design Report.
 - iv. CMI 90% Design Report.
 - v. CMI 100% Design Report.
 - vi. CMI Final Report.

Further specifications of the work outlined in this SOW will be provided in the Corrective Measures Implementation Work Plan and subsequent plans to be approved by the Department. Variations from the SOW will be made, if necessary, to fulfill the objectives of the Corrective Measures set forth in the FDRTC and any amendments thereto.

Additional studies may be needed as part of the Corrective Measures Implementation to supplement the available data. At the direction of the Department for any such studies required, the Respondent shall furnish all services, including field work, materials, supplies, plant, labor, equipment,

investigations, and superintendence. Sufficient sampling, QA/QC procedures, testing and analysis shall be performed to optimize the required treatment and/or disposal operations system.

II.E.3. TASK I - CORRECTIVE MEASURE IMPLEMENTATION WORK PLAN

The Permittee shall prepare a Corrective Measure Implementation (CMI) Work Plan. The Permittee shall submit a CMI Work Plan to the Department for approval. A copy of the CMI Plan shall also be sent to the EPA Region 3.

The CMI Work Plan shall outline the design, construction, operation, maintenance and monitoring of all actions taken to implement the Corrective Measures as defined in the Order and the FDRTC and any amendments thereto. This CMI Work Plan will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as necessary during the performance of this Order. The CMI Work Plan includes the following:

A. Management Plan

The Permittee shall prepare a Management Plan which will include:

1. Documentation of the overall management strategy for performing the design, construction, operation, maintenance, and monitoring of corrective measure(s).
2. Description of the responsibility and authority of all organizations and key personnel involved with the implementation.
3. Description of the qualifications of key personnel directing the CMI, including contractor personnel.
4. Conceptual design of the treatment and/or disposal system or any corrective measures to be installed as set forth in the requirements of the FDRTC.
5. An outline of proposed field activities necessary to complete the CMI Design.
6. Proposed locations of groundwater monitoring wells and a detailed well development plan.
7. Proposed discharge options for treated groundwater, with a proposed option upon which the CMI Design will be based.

8. Proposed detailed performance criteria for groundwater treatment.
9. A description of how the conceptual design is expected to meet the technical requirements of the FDRTC and any amendments thereto.
10. Flow chart and schedule of work to be performed during the CMI.

B. Community Relations Plan

The Permittee shall prepare a Community Relations Plan for the CMI. The Permittee shall submit the Community Relations Plan for the CMI to the Department for approval. A copy of the Community Relations Plan shall also be sent to the EPA Region 3. The Permittee shall submit and/or revise the Community Relations Plan to include any material changes in the level of concern or information needs of the community during design and construction activities.

Specific activities which must be conducted during the design stage are the following:

1. The facility Community Relations Plan is to reflect knowledge of citizen concerns and involvement at this stage of the process.
2. Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design.

C. Sampling and Analysis Plan

The Permittee shall prepare a Sampling and Analysis Plan. The Permittee shall submit the Sampling and Analysis Plan to the Department for approval. A copy of the Sampling and Analysis Plan shall also be sent to the EPA Region 3. The Permittee shall submit and/or revise the Sampling and Analysis Plan describing work to be performed during Corrective Measures Design, which shall be comprised of:

1. Data quality objectives for design phase activities.
2. A Quality Assurance Plan (QAP).
3. A Field Sampling Plan.
4. Data Management Plan describing the steps to be followed in compiling, organizing, and reviewing data collected in accordance with the Sampling and Analysis Plan and identifying the frequency of periodic data reviews and evaluations.

The Sampling and Analysis Plan will include the existing soil and well sampling and analysis program, with appropriate revisions as necessary.

D. Corrective Measures Permitting Plan

The Permittee shall prepare a Corrective Measures Permitting Plan. The Permittee shall submit the Corrective Measures Permitting Plan to Department for approval. A copy of the Corrective Measures Permitting Plan shall also be sent to the EPA Region 3.

The Corrective Measures Permitting Plan shall identify all federal, state, interstate and local permits and approvals required for the implementation of the Corrective Measures required by this Permit, and for the implementation of any institutional controls required by this Permit. The plan shall also identify all agreements or other arrangements with adjoining landowners, if any, known by Permittee to be necessary for the implementation of the Corrective Measures, including, but not limited to, site access and easement agreements. The plan shall include a schedule indicating the time needed to obtain all such approvals and permits and to enter into such agreements and arrangements (this may be integrated with the design/implementation schedule items).

E. Supplemental Field Investigation Work Plan

If any additional hydrogeologic investigations or other field work is necessary for the proper design any proposed remediation system, the Permittee shall prepare and submit to the Department a Supplemental Field Investigation Work Plan setting forth the protocols and methodologies for any additional hydrogeologic investigations or other field work. The Permittee shall submit the Supplemental Field Investigation Work Plan to the Department for approval. A copy of the Supplemental Field Investigation Work Plan shall also be sent to the EPA Region 3. The work plan shall include an expeditious schedule for the completion of any such supplemental fieldwork.

II.E.4. TASK II - CORRECTIVE MEASURE DESIGN

The Permittee shall prepare design plans and specifications to implement construction for the corrective measure at the facility as defined in the Corrective Measures set forth in the FDRTC and any amendments thereto.

The Permittee shall submit the comprehensive design plans and specifications to the Department for approval. A copy of the comprehensive design plans and specifications shall also be sent to the EPA Region 3.

A. Design Plans and Specifications

The Permittee shall develop clear and comprehensive design plans and specifications, which include, but are not limited to, the following:

1. Discussion of the design strategy and the design basis, including:
 - a. Compliance with all applicable or relevant environmental and public health standards.
 - b. Minimization of environmental and public health impacts.
 - c. Update schedules, if necessary, from commencement through completion of construction of the CMI.
2. Discussion of the technical factors of importance including:
 - a. Use of currently accepted environmental control measures and technology.
 - b. The feasibility of constructing the design.
 - c. Use of currently acceptable construction practices and techniques.
3. Description of assumptions made and detailed justification of these assumptions.
4. Discussion of the possible sources of error and references to possible operation and maintenance problems.
5. Detailed drawings of the proposed design including:
 - a. Qualitative flow sheets.
 - b. Quantitative flow sheets.
6. Tables listing equipment and specifications.
7. Tables giving material and energy balances.
8. Appendices including:
 - a. Sample calculations (one example presented and explained clearly for significant or unique design calculations).

- b. Derivation of equations essential to understanding the report.
- c. Results of laboratory or field tests.

B. Operation and Maintenance Plan

The Permittee shall prepare or revise the Operation and Maintenance (O&M) Plan to cover both implementation and long term maintenance of the corrective measure. The O&M Plan is to identify the processes to occur, submissions during O&M, and schedule for O&M activities consistent with remedial objectives set forth in the FDRTC and any amendments thereto.

The Permittee shall submit the O&M Plan to the Department for approval. A copy of the O&M Plan shall also be sent to the EPA Region 3. An initial O&M Plan shall be submitted simultaneously with the Preliminary Design document submissions and the Final O&M Plan with the Final Design documents. The plan shall be composed of the following elements:

1. Description of normal O&M:
 - a. Description of tasks for operation.
 - b. Description of tasks for maintenance.
 - c. Description of prescribed treatment or operation conditions.
 - d. Schedule showing frequency of each O&M task, also to be included in the Management Plan.
2. Description of potential operating problems:
 - a. Description and analysis of potential operation problems.
 - b. Sources of information regarding problems.
 - c. Common and/or anticipated remedies.
3. Description of routine monitoring and laboratory testing:
 - a. Description of monitoring tasks.
 - b. Description of required laboratory tests and their interpretation.
 - c. Required QA/QC.

- d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.
4. Description of alternate O&M:
 - a. Should systems fail, alternate procedures to prevent undue hazard.
 - b. Analysis of vulnerability and additional resource requirements should a failure occur.
5. Safety plan:
 - a. Description of precautions, of necessary equipment, etc., for site personnel.
 - b. Safety tasks required in event of systems failure.
6. Description of equipment:
 - a. Equipment identification.
 - b. Installation of monitoring components.
 - c. Maintenance of site equipment.
 - d. Replacement schedule for equipment and installed components.
7. Records and reporting mechanisms required:
 - a. Daily operating logs.
 - b. Laboratory records.
 - c. Records for operating and maintenance costs.
 - d. Mechanism for reporting emergencies.
 - e. Personnel and maintenance records.
 - f. Contents of periodic progress reports described in Task IV.A and providing details on how Task IV.A. requirements will be met.
 - g. Monthly/annual reports to State agencies.

The O&M Plan requirements listed herein apply to CMI for the on-site area. For Off- Site AOC 4, a Maintenance Agreement will be prepared that includes the following:

1. DuPont maintenance and monitoring responsibilities, including an inspection plan
2. Responsibilities of off-site property owner and when notification must be made to DuPont
3. Allowable activities for remediated areas
4. Management of Change procedures
5. Contact information for DuPont
6. General description of how repairs will be initiated and a template for repair reports

The Permittee shall submit the Maintenance Agreement to the Department for approval. A copy of the Maintenance shall also be sent to the EPA Region 3.

C. Cost Estimate

The Permittee shall develop cost estimates of the Corrective Measures for the purpose of assuring that the Respondent has the financial resources necessary to construct and implement the corrective measure. The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and

operation and maintenance costs. The Permittee shall submit the cost estimates of the Corrective Measures to the Department for approval. A copy of the cost estimates of the Corrective Measures shall also be sent to the EPA Region 3.

D. Construction Quality Assurance Plan

The Permittee shall prepare and submit a Construction Quality Assurance (CQA) Plan to the Department for approval. A copy of the CQA Plan shall also be sent to the EPA Region 3. The CQA Plan shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements, and documentation. The CQA Plan shall be based upon CQA

requirements as specified under 40 CFR Part 264 §264.19, Construction quality assurance program, and other EPA guidance for such CQA activities.

E. Health and Safety Plan

The Permittee shall prepare a Health and Safety Plan or modify the Health and Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the corrective measures. The Health and Safety Plan shall be in accordance with the requirements specified in Attachment II.D of this permit. The Permittee shall prepare and submit a Health and Safety Plan to the Department and to the EPA Region 3.

Compliance with the OSHA Regulations is not under the jurisdiction of the Department. Therefore, the Health and Safety Plan submittal to the Department and the EPA Region 3 is for the administrative record only and the submittal will not receive approval or disapproval by the Department. In the Commonwealth of Virginia, compliance and enforcement of the OSHA regulations under 29 C.F.R. 1910.120, falls under the authority of the Virginia Office of Safety and Health, the Virginia Department of Labor and Industry.

F. Sampling and Analysis Plan Revision

The Permittee shall update the Sampling and Analysis Plan, including the QAPP, during each phase of Design, as appropriate, to reflect changes in the following: responsibility and authority, personnel qualifications, inspection activities, sampling requirements, documentation, and other changes to the sampling and analysis program. The updated Sampling and Analysis Plan, including the QAPP, shall be submitted to the Department for approval. A copy of the updated Sampling and Analysis Plan, including the QAPP, shall also be sent to the EPA Region 3.

G. Design Phases

The design of the corrective measure should include the phases outlined below:

Preliminary (30%) CMI Design

The Permittee shall submit the 30% CMI Design Report when the design effort is approximately 30% complete. At this stage the Permittee shall have field verified the existing conditions of the facility. The 30% design shall reflect a level of effort such that the specifications may be reviewed to determine if the final design will provide effective, operable and usable corrective measures. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The

30% construction drawings shall reflect organization and clarity. The Permittee shall include with the 30% design submission, calculations reflecting the same percentage of completion as the designs they support.

Correlating plans and specifications. The project specifications to be included in the 30% CMI Design Report shall demonstrate that the Permittee has:

Coordinated and crosschecked the specifications and drawings.

Completed the proofing of the edited specifications and required crosschecking of all drawings and specifications.

Equipment start-up and operator training.

The Permittee shall prepare, and include in the technical specifications governing treatment and or disposal systems; contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, training covering appropriate operational procedures once the startup has been successfully accomplished.

Final (90% and 100%) CMI Design

The Permittee shall execute the required revisions and submit the final documents as draft Final (90% complete) CMI Design Report and Final (100% complete) CMI Design Report with reproducible drawings and specifications.

The Final CMI Design submittal shall consist of the Final Design Plans and Specifications (100% complete), the Permittee's Final Cost Estimate, the Final

Draft Operation and Maintenance Plan, Final Quality Assurance Plan, Final Project Schedule, and Final Health and Safety Plan specifications. The quality of the design documents should be such that the Permittee would be able to include them in a bid package and invite contractors to submit bids for the construction project.

II.E.5. TASK III - CORRECTIVE MEASURE CONSTRUCTION

Following the Department's approval of the Final CMI Design Report, the Permittee shall develop and implement construction in accordance with procedures, specifications, and schedules in the Department's approved Final CMI Design Report and the Department's approved CMI Work Plan. During the Construction Phase, Permittee will continue to submit periodic progress reports. The Permittee shall also implement the elements of the approved O&M plan.

The Permittee shall update the Sampling and Analysis Plan, including the QAPP,

during the construction phase, as appropriate, to reflect changes in the following: responsibility and authority, personnel qualification, construction quality assurance, inspection activities, documentation, and other changes affecting quality assurance.

The updated Sampling and Analysis Plan, including the QAPP, shall be submitted to the Department and to the EPA Region 3. The Department's approval of the updated Sampling and Analysis Plan, including the QAPP, during the construction phase, is not required prior to implementation; however, the Department and the EPA must be notified of the updated changes by correspondence prior to implementation of such changes.

If the Department does not concur with changes to the Sampling and Analysis Plan, including the QAPP, then the Department will notify the Permittee and their representative of such non-concurrence and construction will be suspended until the Department formally approves of further changes to the Sampling and Analysis Plan, including the QAP.

The Permittee shall conduct the following activities during construction:

A. Preconstruction Inspection and Meeting

The Permittee shall conduct a preconstruction inspection and meeting to:

1. Review methods for documenting and reporting inspection data.
2. Review methods for distributing and storing documents and reports.
3. Review work area security and safety protocol.
4. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed.
5. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person of the Permittee or their representative and the minutes of the preconstruction inspection and meeting shall be transmitted to all parties in attendance and/or which request the minutes.

B. Inspections

1. The Permittee will conduct inspections to monitor the construction and/or

installation of components of the corrective measure. Inspections shall verify compliance with all environmental requirements and the Construction Quality Assurance Plan and include, but not limited to, review of air quality and emissions monitoring records, waste disposal records (e.g. RCRA transportation manifests), etc, as applicable. Inspections will also ensure compliance with all health and safety procedures. Treatment and/or disposal equipment will be operationally tested by the Permittee. The Permittee will certify that the equipment has performed to meet the purposes and intent of the specifications. Retesting will be completed where deficiencies are revealed.

2. When all construction is complete, the Permittee shall notify the Department for the purposes of conducting a final inspection. The final inspection will consist of a walk through inspection of the project site. The inspection is to determine whether the project is complete and consistent with contract documents and the Department approved corrective measures. Any outstanding construction items will be identified and noted. If necessary, Permittee shall notify the Department upon completion of any outstanding construction items and another final inspection consisting of a walk-through inspection of the project site to confirm all outstanding items have been resolved.

C. CMI Report

Upon completion of construction and also an initial period of performance monitoring after starting, and in accordance with the schedule included in the Management Plan, the Permittee will prepare and submit a CMI Report to the Department for approval. A copy of the CMI Report shall also be sent to the EPA Region 3.

II.E.6. TASK IV- REPORTS

The Permittee shall prepare plans, specifications, and reports as set forth in Tasks I through III to document the design, construction, operation, maintenance, and monitoring of the corrective measure. The documentation shall include, but not be limited to the following:

A. Annual Progress Reports

The Permittee shall provide the Department and the EPA Region 3 with signed Annual Progress Reports. However, Annual Progress Report shall not be required for any year in which the Permittee is required to submit a Corrective Measures Five Year Assessment Report. The Annual Progress Report shall contain:

1. A narrative summary of principal activities conducted during the reporting period.
2. Graphical or tabular presentations of monitoring data, including but not limited to average monthly system pumping rates and throughput, efficiency, groundwater levels and flow direction, and groundwater quality.
3. A schedule of sampling and field activities to be performed in the following year.
4. An O&M Evaluation.

O&M Evaluation shall assess performance of the corrective measure over time and provide one basis for the Department's five-year Evaluation of the corrective measure. Annual O&M Evaluation shall include:

- a. Summarized data representing corrective measure performance during respective two-year intervals.
- b. Any proposed changes to the corrective measure and summary of changes that have been previously made.
- c. Concentration data-post maps for each contaminant of concern listed in the Permit.
- d. Statistical assessment of the progress of the corrective measure towards achievement of media clean-up standards.
- e. When appropriate notification that corrective action media clean-up standards have been achieved.

B. CMI Work Plan

The Permittee shall submit a CMI Work Plan as outlined in Task I. The QAPP, included with the CMI Work Plan, will be revised, as appropriate, throughout the CMI.

C. The 30% CMI Design Report

The 30% CMI Design Report shall include:

1. Draft Design Plans and Specifications reflecting 30% of design work to be completed.

2. A draft O&M Plan.
3. A preliminary cost estimate.
4. A revised project schedule, also to be included in a revised CMI Management Plan.

D. The 90% CMI Design Report

The 90% CMI Design Report shall include:

1. A summary of activities performed and data generated during Corrective Measure Design, including results and interpretation of treatability studies.
2. Draft detailed Corrective Measure Design Plans and Specifications reflecting 90% of design work to be completed.
3. Final performance criteria for the corrective measures, consistent with comments to have been provided by the Department on the Conceptual Design proposed in the Management Plan.
4. Proposal of means to evaluate system performance against media cleanup standards listed in the FDRTC and any amendments thereto.
5. A Final O&M Plan.
6. A revised Cost Estimate.
7. Revision to the Sampling and Analysis Plan, including the QAPP, to address sampling activities to be performed during the Corrective Measures Construction Phase, including the sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specification.
8. Sampling and construction activities to be performed during the Corrective Measure Construction Phase.
9. Proposed changes to the Project Schedule, if appropriate, with emphasis on short- term Construction schedule. These proposed changes in the schedule also will be included in the revised Management Plan.

E. Final (100%) CMI Design Report

The Permittee shall submit a Final (100%) CMI Design Report as outlined in

Task II to this SOW to the Department and the EPA Region 3.

F. CMI Report

The Permittee shall submit the CMI Reports as outlined in Task III of this SOW to the Department and the EPA Region 3. The CMI Report shall describe activities performed during construction, provide actual specifications of implemented remedy, and provide a preliminary assessment of CMI performance. The CMI Report shall include, but not be limited to, the following elements:

1. Synopsis of the corrective measure and certification of the design and construction.
2. Explanation of any modifications to the Department's approved construction and/or design plans and why these were necessary for the project.
3. Listing of the criteria, established in the Department's approved CMI Work Plan, for judging whether the corrective measure is functioning properly, and also explaining any modification to these criteria.
4. Certification by registered professional engineer, registered in the Commonwealth of Virginia, that the construction is complete, consistent with contract documents, and the Department's approved corrective measure, and that the equipment performs to meet the intent of the specifications.
5. Results of Facility monitoring, assessing the likelihood that the Corrective Measure will meet or exceed the media clean-up standards set forth in the FDRTC and any amendment thereto.

The CMI Report should include all of the daily inspection summary reports, inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation), and as-built drawings.