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July 21, 2014

Tom Horan
Manager Environmental
Axiall Corporation
WV State Rte. 2, P.O. Box 191
New Martinsville, WV 26155

RE: RCRA Corrective Action Final Decision and Response to Comments
Axiall Corporation, New Martinsville, West Virginia

Dear Mr. Horan,

This Response to Comments and Final Decision (FDRTC), issued by the West Virginia Department of Environmental Protection (WVDEP), is for the Axiall Corporation facility, located in New Martinsville, West Virginia.

Consistent with public participation provisions under RCRA, WVDEP issued a public notice for the Agency's proposed final decision that began on May 12, 2013 and ended June 13, 2013. All comments received during the public comment period were carefully reviewed by WVDEP and have been addressed and incorporated into the Final Decision.

If you have any questions, feel free to contact Catherine Guynn at (304) 926-0499 ext. 1288 or by email at catherine.n.guynn@wv.gov.

Sincerely,

Patricia Hickman
Interim Director
Division of Land Restoration

cc: RCRA File
Bill Wentworth, USEPA
Charles Armstead, WVDEP
Catherine Guynn, WVDEP


WEST VIRGINIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

# FINAL DECISION AND RESPONSE TO COMMENTS

## AXIALL CORPORATION FACILITY
## (FORMERLY PPG NATRIUM PLANT)

NEW MARTINSVILLE, WEST VIRGINIA
USEPA ID#: WVD004336343

JULY 2014

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## Acronyms and Abbreviations

| | |
|---|---|
| AOC | Area of Concern |
| bgs | below ground surface |
| CA | Corrective Action |
| CAO | Corrective Action Objectives |
| CMS | Corrective Measures Study |
| COC | Constituent of Concern |
| COI | Constituents of Interest |
| COPC | Constituents of Potential Concern |
| DOCC | Description of Current Conditions |
| EC | Environmental Covenant |
| FDTRC | Final Decision Response to Comments |
| GMP | Groundwater Monitoring Plan |
| gpm | gallons per minute |
| HI | Hazard Index |
| HSWA | Hazardous and Solid Waste Amendments |
| IC | Institutional Control |
| IM | Interim Measure |
| MCL | maximum contaminant level |
| NFA | No Further Action |
| RBC | Risk Based Concentrations |
| RCRA | Resource Conservation and Recovery Act |
| RFI | RCRA Facility Investigation |
| SB | Statement of Basis |
| SWMU | Solid Waste Management Unit |
| U.S.C. | United States Code |
| USACE | United State Army Corp of Engineers |
| USEPA | United States Environmental Protection Agency (also EPA) |
| VOC | volatile organic compound |
| WVDEP | West Virginia Department of Environmental Protection |

## I. INTRODUCTION

The West Virginia Department of Environmental Protection (WVDEP) is issuing this Final Decision and Response to Comments (FDRTC or Final Decision) in connection with the Axiall Corporation facility (Facility) located in New Martinsville, West Virginia.

The Facility is subject to the Corrective Action (CA) Program under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. Sections 6901 to 6992k. The CA program is designed to ensure that certain facilities subject to RCRA have investigated and cleaned up any releases of hazardous waste and hazardous constituents that have occurred at their property.

On May 12, 2014, WVDEP issued a Statement of Basis (SB) in which a Final Remedy for the Facility was proposed. The proposed Final Remedy consisted of: a No Further Action component, a groundwater component, and facility-wide Institutional Controls. The proposed No Further Action (NFA) component consisted of no further investigation of SWMUs that the data demonstrated presented no unacceptable risk to human health or the environment and are listed in Attachment B. The groundwater component includes groundwater monitoring until drinking water standards are met and complied with and maintenance of groundwater use restrictions at the Facility. The last component of the proposed Final Remedy is Facility-wide non-engineering Institutional Controls.

On May 12, 2014, consistent with public participation provisions under RCRA, the WVDEP requested comments from the public on the proposed Final Remedy. WVDEP placed an announcement with the Wheeling Intelligencer notifying the public and requesting comments on the proposed Final Remedy. The thirty (30) day public comment period began on May 12, 2013 and ended June 13, 2013. Two additional calendar days were added to the comment period since a State holiday, WV Primary Election, and a Federal holiday, Memorial Day, fell within the thirty (30) day public comment period. All comments received by WVDEP during the public comment period were carefully reviewed by WVDEP and have been addressed in Attachment A and are incorporated into this Final Decision.

Based on comments received during the public comment period, WVDEP has determined that it is not necessary to modify its proposed Final Remedy as set forth in the Statement of Basis. WVDEP is, however, clarifying certain aspects of the proposed Final Remedy as described in more detail in **ATTACHMENT A: PUBLIC COMMENTS AND WVDEP RESPONSES**. The Final Decision as set forth in Section II, "Final Decision," is below.

## II. FINAL DECISION

The Final Remedy for the Facility consists of the following: a No Further Action component, a groundwater component, and facility-wide Institutional Controls.

1. **No Further Action:**

The RCRA Facility Investigation (RFI) concluded that for a number of solid waste management units (SWMUs) investigated, the data demonstrated that the unit presented no unacceptable risk to human health or the environment.

2. **Facility-Wide Groundwater:**

The Facility-wide groundwater pumping and treating program will continue until Corrective Active Objectives (CAOs) are accomplished. The Facility will maintain a groundwater monitoring program to demonstrate that the inward gradient is maintained and to monitor the contaminant mass and concentration of the constituents of concern (COCs). The Facility will continue to identify source areas of contamination and, where possible, apply a remediation technique to reduce the impacts of the source areas. Finally, the Final Remedy for groundwater also includes maintenance of groundwater use restrictions at the Facility.

3. **Institutional Controls:**

Institutional Controls (ICs) are non-engineered instruments, such as administrative and legal controls, that minimize the potential for human exposure to contamination and/or protect the integrity of the decision by limiting land or resource use. Under the Final Remedy, some contaminants remain in the groundwater and soil at the Facility above levels that exceed residential use, as such, the Final Remedy requires the compliance with and maintenance of land and groundwater use restrictions. The ICs shall include, but not be limited to, the following land and groundwater use restrictions:

**a.** Groundwater at the Facility shall not be used for any purpose other than 1) industrial use and non-contact cooling water; and 2) the operation, maintenance, and monitoring activities required by WVDEP and/or the U.S. Environmental Protection Agency (EPA), unless it is demonstrated to WVDEP, in consultation with EPA, that such use will not pose a threat to human health or the environment or adversely affect or interfere with the Final Remedy and WVDEP provides written approval for such use;

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

**c.** All earth moving activities, including excavations, will be managed in accordance with the Soils Management guidelines identified in the Institutional Control Plan for the Natrium Facility, dated June 2, 2000 and approved by EPA on June 13, 2000.

**d.** The Property will not be used in a way that will adversely affect or interfere with the integrity and protectiveness of the Final Remedy;

**e.** Any new production, injection or water wells installed at the Facility will be installed in accordance with the State and Local regulatory and permitting process for the installation of new wells. Additionally, any newly installed wells will be modeled on the Facility's site-wide model to ensure there are no impacts to maintaining ongoing site-wide groundwater hydraulic control.

**f.** Owner agrees to provide WVDEP and EPA with a "Certified, True and Correct Copy" of any instrument that conveys any interest in the Facility property or any portion thereof;

**g.** Owner agrees to allow the WVDEP, EPA and/or their authorized agents and representatives, access to the 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 to be selected by WVDEP in the Final Decision and Response to Comments (FDRTC);

h. A new Groundwater Monitoring Plan (GMP) will be developed for the entire Facility, which will be submitted to the WVDEP for their review and comments within 120 days of final remedy implementation. The plan will include monitoring wells to be sampled, analyses to be performed, and a schedule for implementing the sampling activities. WVDEP will provide guidance to the Facility as to the content and format of the GMP within thirty (30) days of final remedy implementation.

## 4. Implementation of Institutional Controls

Land and groundwater use restrictions necessary to prevent human exposure to contaminants at the Facility will be implement through enforceable Institutional Controls, such as an Order and/or an Environmental Covenant (EC), pursuant to the West Virginia Uniform Environmental Covenants Act. If an EC is to be the Institutional Control mechanism, it will be recorded in the chain of title for the Facility property with the Clerk of the County Commission. In addition, WVDEP acknowledges that the West Virginia Department of Health issues drinking water permits for wells and does not allow the use of contaminated groundwater as a drinking water source.

The continuation of the GMP until groundwater clean-up standards are met will be enforceable through the final enforceable instrument, such as a permit, order, or an EC. If WVDEP determines that additional institutional controls or other corrective actions are necessary to protect human health or the environment, WVDEP has the authority to require and enforce such additional corrective action under that instrument.

## III. FACILITY BACKGROUND AND HISTORY

The Facility began operations in 1943, originally producing chlorine, hydrogen, and caustics using electrolysis, commonly referred to as the chlor-alkali process. In response to the U.S. Government's need for chlorine, PPG determined that a salt deposit beneath the Facility could be solution mined and processed to produce chlorine. Periodic expansions of the Facility occurred during PPG's seventy years of ownership. Axiall acquired the Facility on January 28, 2013 and currently produces chlorine, caustic soda, solid sodium hydroxide pellets (PELS®), hydrochloric acid, and calcium hypochlorite.

In the past, the Facility produced several inorganic and organic chemical products. Some of the products that are no longer produced at the Facility include chlorinated benzene compounds, sodium hydrosulfide, titanium oxide, benzene hexachloride, carbon disulfide, barium compounds, and ammonia.

Part of the Facility known as the Marshall Plant, which was originally owned, developed, and operated by the United States Army Chemical Corps, was built as a sub-tropical bleach plant and manufactured perchloroethylene, tetrachloroethane, trichloroethane, and possibly several other compounds. The Marshall Plant was operated by DuPont for the Army in 1943 and 1944. Glyco operated the plant sporadically between 1944 and 1952 and produced more than 100 specialty compounds including glycols, glycerines, amines, and amides. PPG leased the Marshall plant from the U.S. Government prior to purchasing it in 1964, but never operated the facility. The organic compound manufacturing was phased out in 2008 with chlorine, sodium hydroxide, calcium hypochlorite, and hydrochloric acid currently being the primary products.

## IV. SITE CHARACTERIZATION

The Axiall property consists of approximately 3,600 acres of contiguous land; however, the manufacturing and other developed portions of the Facility encompasses approximately 400 acres. The Facility is situated within the Ohio River Valley at the base of the West Virginia Northern Panhandle in Marshall County, approximately seven miles north of New Martinsville, West Virginia and is located on a series of relatively flat, river terraces known as Wells Bottom and is underlain by up to 90 feet of river alluvium and glacio-fluvial sediments. The topography rises steeply to the east of the plant. The Facility is bounded by an industrial facility (Bayer MaterialScience, LLC) to the south, the Ohio River to the west and north, and steeply sloped terrain to the east (primarily owned by Axiall Corporation, but undeveloped).

Groundwater occurs in three types of deposits at the Facility: sand and gravel outwash, alluvium, and colluvium. The sand and gravel outwash is present beneath most of the facility and is overlain in places by the alluvium and colluvium deposits. The alluvium is primarily composed of silty clay deposits and is limited to the areas immediately adjacent to the Ohio River. The colluvium is comprised of silty to sandy clay and is limited to the areas at the base of the uplands on the eastern portion of the facility. Hydraulic containment of site groundwater has been demonstrated for the sand and gravel outwash based on site measurements and groundwater flow modeling. The colluvium and alluvium also show containment, with the exception of

seasonal measurements in a few wells. Evaluation of groundwater flow near these few wells indicates that the overall annual flow is inward and that the low permeability of the alluvium restricts any significant offsite movement of groundwater.

## V. SUMMARY OF ENVIRONMENTAL INVESTIGATIONS

The Facility is currently conducting corrective action activities under a 1989 EPA-issued RCRA CA Permit (WVD004436343). As part of the RCRA CA process, a number of environmental studies have been performed, including: a Verification Investigation (VI), RCRA Facility Investigation (RFI), Baseline Groundwater Monitoring, Remedial Technology Evaluation, and Pore Water and Sediment Sampling. A summary of the reports completed is provided in **ATTACHMENT C: ENVIRONMENTAL REPORTS**.

A Description of Current Conditions (DOCC) prepared in 1992 summarized key findings of the previous investigations to serve as a baseline for subsequent data gathering and analysis during the RCRA Facility Investigation (RFI). The DOCC identified 82 solid waste management units (SWMUs)/areas of concern (AOCs); however, several of the original SMWUs/AOCs were identified as needing no further action/investigation based on the results of the DOCC and interim actions. The RFI Report, dated October 2000, summarized the investigation of 46 SWMUs and 21 AOCs at the Facility identified in the DOCC for further investigation (see **ATTACHMENT B: SWMU/AOC IDENTIFICATION AND STATUS**). Based on discussions between the Facility and EPA, 45 of the 46 SWMUs required no further action.

A Risk Assessment performed as part of the RFI concluded there were no unacceptable risks associated with the direct exposure pathway for 66 of the 67 SWMUs and AOCs. Only SWMU, 13-3 identified unacceptable risks with the direct exposure pathway, which were addressed through an engineered soil cover with riverbank stabilization and Institutional Controls (ICs). No further action was needed to address the direct exposure pathway for the remaining 66 SWMUs/AOCs. The RFI further concluded that the Corrective Measures Study (CMS) was not required and that the presumptive remedies would address the unacceptable risks at SWMU 13-3. However, a Streamlined CMS was submitted on March 21, 2014 to explain the proposed remedy to address various SWMUs and AOCs at the Facility, to provide a summary of investigation, interim actions, institutional controls, and corrective measures studies used in the remedy selection process.

A pore water and sediment investigation was conducted during August 2012 in the Ohio River adjacent to the Facility to evaluate potential impacts of site-related groundwater contamination on the River. The results of the pore water and sediment investigation revealed that constituents in on-site groundwater at the Facility were significantly higher than in sediment or pore water, or background samples; confirming that the gradient pumping system is effective in capturing and treating groundwater contamination and should be continued. Additionally, in some cases there were no detections, or low detections of constituents in groundwater, but elevated concentrations in either sediment and/or pore water. This scenario suggests there are other point sources contributing to the contaminant load in the Ohio River and does not appear to be the result of the conditions at the Facility. This may also be related to possible legacy or

historical discharge of contaminants (either site-related or non-point sources). Other data indicated that constituent concentrations are present in groundwater, pore-water, and sediment, but at the same or below levels of concentrations reported in background samples

Interim Measures (IMs) were performed at the Facility during the RFI process to address immediate environmental concerns at the following SWMUs and AOCs: SWMUs 2-2 (soil removal), 3-2 (soil removal), 6-7 (asphalt pavement), and 8-6 (soil removal); and AOCs 3-1A (soil removal), 8-7A (soil removal), and 10-2A (tank removal). The results of the IMs were documented in reports presented to EPA and summarized in the RFI report. Additionally, the Facility has also initiated an Institutional Control Plan which includes land use designations and soil excavation requirements (i.e. no dig areas; facility safety permits, etc.).

## VI. SITE-WIDE GROUNDWATER

The Facility currently utilizes eleven wells pumping at an average of 4.5 million gallons per day. This pumping rate maintains an inward hydraulic gradient throughout the plant and due to the long-term pumping, the water table has depressed by over ten feet in places. The Facility replaces wells or augments the groundwater supply system as demand dictates. The EPA and U. S. Army Corps of Engineers (USACE) reviewed the groundwater model utilized to evaluate well placement and to ensure the hydraulic gradient captures site groundwater. The model was also used to evaluate the impact of pumping scenarios on the plume of impacted groundwater, with the goal of maintaining or reducing the footprint of the plume. It is conceivable that pumping rates at the plant will be reduced in the future, if plant processes change or process efficiencies are achieved. The groundwater flow model and groundwater measurements will continue to be utilized to monitor the hydraulic control of the site as the Facility's water demands change

The RFI data indicated organic and inorganic constituent plumes are present above Region III Risk Based Concentrations (RBCs) for tap water and the Maximum Contaminant Limits (MCLs) for drinking water in the sand and gravel outwash and the silty clay (fine grained) alluvium. Although water can be extracted from the alluvium, the unit itself is limited in both thickness and areal extent and groundwater extraction wells are not completed in this unit. The sand and gravel is seen as the primary aquifer in the plant area. Extracted groundwater is utilized within the plant and discharges are regulated under the Facility's National Pollutant Discharge Elimination System (NPDES) Permit.

A Baseline Groundwater Monitoring Program (GMP) was completed to evaluate the plume stability and to determine if the contaminant mass was being effectively reduced. The four-year GMP was completed in 2004 and indicated that the plume was stable and not migrating. The groundwater quality monitoring also indicated that constituent concentrations were being reduced; however, the rate of reduction and time to meet groundwater quality standards could not be readily estimated due to punctuated events that made long-term projections of the decreasing concentration trend difficult.

The GMP also indicated that monitoring wells in suspected residual source areas, principally the Marshall Plant Pond and the BHC Storage Pile areas, have not shown significant

improvement in groundwater quality. It is believed that contributions from these source areas in the fine-grained alluvium, punctuated by precipitation events and groundwater extraction patterns, have resulted in most of the impacts currently seen in the sand and gravel aquifer and are prolonging the attainment of groundwater quality standards. Based on the GMP results through the fourth year, three areas were identified that appears to be continuing sources of groundwater contamination. These three areas were recommended for additional evaluation. The proposed areas included SWMU 4-2, the Marshall Plant Pond (MW-220); groundwater in the area near SWMU 13-3; SWMU 6-7, the BHC Storage Pile (MW-221); and, groundwater in the area near SWMU 6-7 (MW-207). These areas are to be further evaluated and treated to enhance groundwater remediation.

Additionally, the Facility has been voluntarily pursuing source reduction in the Marshall Plant Pond (MW-220) and the BHC Storage Pile (MW-221) areas. A series of five groundwater circulation wells with ozone addition are being used in the Marshall Plant Pond area. The groundwater circulation wells strip volatile organics from the groundwater as well as introducing oxygen into the subsurface. In addition to the mechanical stripping of volatile organic compounds (VOCs), the oxygen stimulates aerobic biological activity near each of the groundwater circulation wells. The oxygen not only travels with the groundwater but also permeates the overlying capillary zone stimulating biological activity in the saturated soils. Almost immediate constituent reductions have been seen in the groundwater circulation wells themselves; however, the groundwater clean-up in this area is expected to take a minimum of several years. Clean-up progress will be periodically evaluated to refine the time to meet clean-up objectives.

The Facility also voluntarily performed pilot testing in the area near the BHC Storage Pile (MW-221). Base-catalyzed persulfate additions have been applied to this area to address the mobile contaminant mass. However, the pilot test was not effective due to the low permeability of the formation and delivery method. An additional voluntary evaluation is being performed in this BHC Storage Pile area to identify additional source reduction approaches to supplement the hydraulic containment approach to site-wide groundwater.

## VII. CORRECTIVE ACTION OBJECTIVES

The Corrective Action Objectives (CAOs) for soils and groundwater at the Facility are:

### 1. Soils

CAOs for soils is the prevention of unacceptable human exposure to contaminated soils at all levels, with "unacceptable exposure" defined as carcinogenic risks > $1x10^{-6}$ and a Hazard Index for non-carcinogenic risks of > 1, by requiring the compliance with and maintenance of land use restrictions at the Facility.

### 2. Groundwater

CAOs for groundwater is to restore groundwater to drinking water standards

established by MCLs or WVDEP acceptable limits; to control the migration of Site-related groundwater contamination at concentration levels that are protective of surface water quality; and to control and reduce the sources of groundwater contamination.

## VIII. EVALUATION OF WVDEP'S FINAL REMEDY

Evaluation of the Final Remedy was consistent with EPA guidance, "*Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities; Proposed Rule,*" 61 Fed. Reg. 19431, May 1, 1996. The evaluation criteria were applied in two phases. In the first phase, WVDEP evaluated three decision threshold criteria as general goals. In the second phase, for those remedies that meet the threshold criteria, WVDEP evaluated seven balancing criteria.

### 1. Threshold Criteria

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

Overall protection of human health and the environment addresses the ability of an alternative to eliminate, reduce or control threats to public health or the environment through institutional controls, engineering controls, removal or treatment. The groundwater pumping and treating technology employed at the Facility has been a primary tool in effectively and reliably protecting public health and the environment during the Facility's years of operation. Minimum pumping rates of 130 to 180 gpm (total of all the wells) have proven effective in containing the groundwater plume on-site.

All contaminated soil is below the surface and contained within Facility property. There is no direct exposure of industrial workers to subsurface soil under current land use, and direct exposure of construction/excavation workers is controlled by existing administrative controls, including the Facility-wide excavation permitting process, and appropriate health and safety plans. With respect to future uses, land use restrictions will minimize the potential for human exposure to contamination.

#### b. Achieve Media Cleanup Objectives

The Facility has achieved non-residential RBCs for industrial soils. The groundwater plume appears to be stable (not migrating), and constituents of potential concern (COPCs), though above MCLs, are either stable or declining over time. In addition, a Groundwater Monitoring Program (GMP) will be implemented and continue until groundwater clean-up standards are met. The Facility meets EPA risk guidelines for human health and the environment. The proposed decision requires the

implementation and maintenance of institutional controls to ensure that Facility property is not used for residential purposes and groundwater beneath Facility property is not used for any purpose except for industrial use and non-contact cooling water and to conduct the operation, maintenance, and monitoring activities required by WVDEP and EPA.

**c. Remediating the Source of Releases**

WVDEP seeks to eliminate or reduce further releases of hazardous wastes and hazardous constituents that may pose a threat to human health and the environment. Groundwater is not used for potable purposes at the Facility or at neighboring facilities. In addition, a GMP will be implemented until groundwater clean-up standards are met. The WV Department of Health issues drinking water permits for wells and does not allow use of contaminated groundwater as a drinking water source. There are no known unaddressed discrete sources of waste from which constituents would be released to the environment.

Laboratory and bench scale testing were previously performed by the Facility for specific SWMUs and COCs. Based on the previous testing performed, additional in-situ testing will be investigated and evaluated for future implementation. The effect of reductions on water quality improvement will be assessed at significant milestones during any in-situ activities.

**2. Balancing/Evaluating Criteria**

**a. Long-Term Effectiveness**

Institutional Controls (ICs) will maintain protection of human health and the environment over time by controlling exposure to the hazardous constituents remaining in soils and groundwater. The Final Remedy requires the compliance with and maintenance of land use and groundwater use restrictions at the Facility. Land use and groundwater use restrictions will be implemented through orders and/or an environmental covenant to be recorded in the chain of title for the Facility property. If the mechanism is to be an environmental covenant, the environmental covenant will run with the land and as such, will be enforceable by WVDEP and/or other stakeholders against future land owners. In addition, the required GMP addressing the entire Facility will provide data to assess the long-term effectiveness of the remedy.

**b. Reduction of Toxicity, Mobility, or Volume of the Hazardous Constituents**

The reduction of toxicity, mobility and volume of hazardous constituents at the Facility has already been achieved, as demonstrated by the data of the groundwater monitoring showing that the plume appears to be stable (not migrating), and concentrations of COPCs are either stable or declining over time. In addition, a groundwater-monitoring program will continue until groundwater clean-up standards are met.

**c. Short-Term Effectiveness**

The Final Remedy does not involve any activities, such as construction or excavation that would pose short-term risks to workers, residents, and the environment. WVDEP anticipates that the land use and groundwater use restrictions will be fully implemented shortly after the issuance of the Final Decision and Response to Comments (FDRTC). In addition, the groundwater-monitoring program will provide data to provide analyses of the effectiveness of the remedy.

**d. Implementability**

The Final Remedy is readily implementable. WVDEP will implement the institutional controls through an enforceable mechanism such as an order or an Environmental Covenant (EC), pursuant to West Virginia Code Chapter 22, Article22, and the Uniform Environmental Covenants Act, West Virginia Code Chapter 22, Article 22B. Groundwater monitoring will be continued through an enforceable mechanism such as an environmental covenant or order. Environmental Covenants are readily implemented. In addition, WVDEP does not anticipate any regulatory constraints in issuing orders.

**e. Cost-Effectiveness**

The Final Remedy is cost effective. The costs to record an EC in the chain of title to the Facility property are minimal. Likewise, the costs associated with issuance of orders are also minimal. The costs to perform any proposed remediation activities for specific areas of contamination at the Facility will be estimated and provided to WVDEP. Additionally, WVDEP might require the Facility to provide a yearly cost estimate for planned activities in advance of each calendar year.

**f. Community Acceptance**

WVDEP evaluated community acceptance of the proposed decision during

the public comment period. Comments received during the public comment period were carefully reviewed by WVDEP and have been addressed in Attachment A. The comments are incorporated into this Final Decision.

**g. EPA Support / Agency Acceptance**

WVDEP has solicited EPA input and involvement throughout the investigation process at the Facility. The Final Remedy has been evaluated and approved by the EPA.

## IX. FINANCIAL ASSURANCE

The Facility will be required to provide Financial Assurance to implement the Final Remedy. WVDEP anticipates that the Final Remedy will be implemented under an enforceable mechanism issued by WVDEP under available legal authorities which will include a financial assurance component.

## X. DECLARATION

Based on the Administrative Record, I have determined that the Final Remedy as set forth in this Final Decision is appropriate and will be protective of human health and the environment.

7-21-14
Date:

Patricia A. Hickman
Interim Director, Division of Land Restoration
WV Department of Environmental Protection

## ATTACHMENT A

## PUBLIC COMMENTS AND WVDEP RESPONSES

**Comment 1**

In section 3.0 Institutional Controls (c.) Axiall requests that all earth moving activities including excavations in site areas included in the Institutional Control Plan will be managed in accordance with the Soils Management guidelines identified in the EPA approved Institutional Control Plan for the Natrium Facility.

**WVDEP Response to Comment 1**

WVDEP acknowledges the EPA-approved Institutional Control Plan and has incorporated this language into Section II.3(c) the Final Decision.

**Comment 2**

In section 3.0 Institutional Controls (e.) In order to maintain operations at the Natrium Facility, Axiall will periodically need to install either new production wells, injection wells or water wells. Please reword this section to allow the installation of wells as needed for the Facility and that any wells installed will follow the State and Local regulatory and permitting process for the installation of new wells. Also, any new water wells to be installed will be modeled on the Plant's site-wide model to ensure there is no impact to maintaining ongoing site-wide groundwater hydraulic control.

**WVDEP Response to Comment 2**

WVDEP agrees with the comment and has incorporated this language into the Section II.3(e) of the Final Decision.

**Comment 3**

In section 3.0 Institutional Controls (h.) Please reword this section to specify that the new Groundwater Monitoring Plan will be developed and will need to be submitted to the WVDEP for review and comments within 90 days of the "final remedy implementation." Also, please specify when the WVDEP will provide guidance on the content and format of the Groundwater Monitoring Plan to Axiall.

**WVDEP Response to Comment 3**

WVDEP agrees with the comment and has incorporated the word implementation into the Final Decision. Additionally, in response to the second part of the comment, thirty (30) days was incorporated into Section II.3(h) as the specified time WVDEP will provide guidance to the Facility concerning the section content and format of the Groundwater Monitoring Plan. Additionally, the time to submit the Groundwater Monitoring Plan to WVDEP for review and comment was revised to 120 days to allow for the change previously referenced.

**Comment 4**

Section XIII.1.c., Remediating the Source of Releases. In this section, it is implied as part the "technology demonstration program", that technology demonstrations are to be performed? Laboratory and bench scale testing were previously performed for specific SWMUs and COCs and implemented at 2 SWMU locations. Based on the previous testing performed, additional in-situ testing will be investigated and evaluated for future implementation.

**WVDEP Response to Comment 4**

WVDEP acknowledges that laboratory and bench testing has been conducted at the Facility and that information is provided in Section VI of the Final Remedy. Therefore, WVDEP agrees with the comment and has incorporated the change in Section VIII.1(c) of the Final Remedy.

ATTACHMENT B

## SWMU/AOC IDENTIFICATION AND STATUS

| SWMU / AOC Number | Name | Description | Status | Institutional Controls Required |
|---|---|---|---|---|
| 2-1 | Bottom/Fly Ash Landfill Units J-3, J-4, and J-5 | Landfill cell Units J-3 and J-4 accepted bottom ash from the power facility until closure in 1975 and covered with six inches of soil and vegetation. Cell J-5 opened in late 1975. | NFA | Yes |
| 2-2 | Oil Storage Tank Area | The two former aboveground steel storage tanks were used from 1966 to 1991 to store oils related to salt cavity development. | NFA | No |
| 3-1 | Oil/Water Separator | This steel vessel used from 1956 to 1995 to separate waste oil and condensate water generated by the liquefied ammonia process. | NFA | No |
| 3-2 | Vehicle Repair Facility | The Vehicle Repair area operated from 1956 to 1995 and consisted of a maintenance building and outside storage areas. | NFA | No |
| 3-3 | Storm Sewers, Trenches and Drains | The storm sewer system was constructed in 1955 in the Ammonia plant area and consists of varying diameters of salt glazed vitrified clay pipe. Storm water runoff collects in this unit and discharges directly to the Ohio River. | NFA | No |
| 3-1A | Acid Storage Tank | This 30-foot long and 6-foot diameter aboveground steel storage tank was used from 1956 to 1993 to store hydrochloric acid (HCl) for acidifying cooling water to reduce calcium buildup in piping. | NFA | No |
| 4-1 | Bottom/Fly Ash Landfill UnitsJ-1 and J-2 | Landfill cell units J-1 and J-2 occupies an area of approximately 10 acres and accepted bottom and fly ash from the facility power plant until 1975. Barium wastes also disposed of in J-1 and J-2. | NFA | No |
| 4-2 | Marshall Plant Waste Pond | This unit was used from 1954 to 1979 as a disposal site for waste streams generated at the chlor-alkali plant, chlorinated benzene plant, and titanium tetrachloride plant. | NFA | No |
| 5-1A | Soil in Area 5 | The soil located in the Marshall Plant Area potentially affected with hazardous waste during routine operations in the Marshall Plant. | NFA | No |
| 5-2 | Used Oil Storage Tank | This former 15,000-gallon above ground metal storage tank that was used until 1992 to store lubricating oil. | NFA | No |
| 5-2A | Above Ground Fuel Oil Storage Facility | This 10,000-gallon aboveground storage tank is currently used to store fuel oil. | NFA | No |
| 5-3A | Former Gasoline Storage Facility | The former gasoline storage tanks were installed during the fuel shortage in World War II and were removed in 1992. | NFA | No |
| 5-5 | Process and Sanitary Sewers | The sewers, which may have historically collected spills or process wash waters, were constructed of varying diameter vitrified clay pipe. | NFA | Yes |

| SWMU / AOC Number | Name | Description | Status | Institutional Controls Required |
|---|---|---|---|---|
| 5-6 | Sanitary Landfill | This Class III landfill operated from 1970 to 1990 and managed waste consisting of paper, paper products, lumber, cement blocks, bricks, and various scrap metal; according to available information, this unit did not receive chemical waste. The landfill is currently covered and vegetated | NFA | No |
| 6-1 | K085 Accumulation Area | The K085 Accumulation Area collects wastes from the production of chlorinated benzenes in-line during process operations. | NFA | No |
| 6-1A | Intermediate and Product Storage Containment and Sump | The MCB system and associated sump temporarily stores intermediate and product material generated in the MCB production area prior to its removal. | NFA | No |
| 6-2A | Soil Beneath Carbon Bisulfide Tank | This 5,000-gallon, 44-foot diameter tank was installed in 1965 and located in a fence-enclosed tank farm along the Ohio River. | NFA | No |
| 6-3 | Organics Treatment Area | This treatment system consists of a steam stripper and carbon adsorption column that is used to treat organic constituents in wastewaters collected in sewers and sumps throughout the MCB process area. | NFA | No |
| 6-3A | Soil Throughout MCB Production Area | The soil throughout the MCB production area, approximately 40,000 feet$^2$ and covered with asphalt and gravel. MCB process equipment was cleaned in a portion of the unpaved area prior to installation of the concrete pad in the clean-out area. | NFA | No |
| 6-4 | MCB Process Sewers | The MCB Process Sewers were originally installed in 1947 during the construction of the MCB facility. All wastewater handled via the MCB process sewers were discharged directly to the Ohio River until the system was upgraded in 1989-1990. The current MCB process sewer system collects pad containment, cooling water, and process wastewaters from the MCB production area. The wastewaters are then treated in an organics treatment system then discharged to the Ohio River. | NFA | Yes |
| 6-5 | MCB Product Tank Car Loading Area | The railcar loading area was installed in 1948 and occupies approximately 8,000 feet$^2$. Mono-, tri-, and para-benzene products are loaded here at seven locations. | NFA | No |
| 6-6 | Clean-out Area for Process Equipment | These two areas were used for cleaning MCB process equipment. | NFA | No |
| 6-7 | Former Location of BHC Pile | The former benzene hexachloride (BHC) waste pile was located in an open area approximately 400 feet north of the MCB production area offices; quantities and removal date unknown. | NFA | Yes |

| SWMU / AOC Number | Name | Description | Status | Institutional Controls Required |
|---|---|---|---|---|
| 7-1 | Laboratory Sewer System | The Laboratory Sewer System was installed in 1955; various constituents were discharged into the sewer then discharged to the Ohio River. | NFA | No |
| 7-1A | R&D Area Northeast of Laboratory | The research and development area is located northeast of the laboratory building. This vacant area is where small buildings and pilot plants were once located. | NFA | Yes |
| 8-1A | Former BHC Production Area | The BHC Production Facility was removed from service in the late 1950's or early 1960's; this location is now the chlorine production area. | NFA | Yes |
| 8-2A | Gasoline Storage Facility | This area consists of a 6,300-gallon capacity aboveground, steel storage tank that contains gasoline. | NFA | No |
| 8-3A | Caustic Tank Car and Truck | This area consists of separate trailer truck and railroad tank car loading facilities. | NFA | No |
| 8-4 | Chlorine Cooling and Drying System | The chlorine cooling/drying system was installed in 1984 and cools saturated chlorine in a staged non-contact cooling process and in the process removes water vapor. | NFA | No |
| 8-4A | Graphite Cell Construction Area | This approximately 1600 feet$^2$ concrete paved area was formerly used for refitting lead/graphite asbestos cells. | NFA | No |
| 8-5 | Lead/Asbestos Treatment System | Lead/graphite electrodes were cleaned and maintained by this system. | NFA | No |
| 8-5A | Chlorine Area (Former) Once Through Sewer | The system consists of concrete and vitrified clay pipes of various diameters. Historically process wastewater from the #6 and #7 chlorine circuits passed through this system and discharged directly to the Ohio River. After removal of the majority of the piping, the storm sewer system now connects to process sewers near the #6 and #7 chlorine circuits. | NFA | Yes |
| 8-6 | Oil Storage Tank Area | The two aboveground steel storage tanks stored a mixture of various oils used for brine well development in the No. 1 brine field area until 1983. The tanks were removed in 1993. | NFA | No |
| 8-6A1 | Caustic Six Pack | These six, 835,000-gallon capacity aboveground storage tanks located near Skyline Drive in the caustic department contain caustic and brine solutions. | NFA | No |
| 8-6A2 | South Caustic Storage Tanks | These thirty aboveground storage tanks, ranging from less than 20,000 to 835,000 gallons, located in the southern portions of the caustic department, contain or were previously used to store caustic solutions. | NFA | No |
| 8-7A | Oil Transformer Storage Tanks | These were two former above ground storage tanks, each with a capacity of 1,250 gallons, that were located north of the #5 chlorine circuit. The 30-year old tanks removed 1994. | NFA; Soil removal after building removed. | No |

| SWMU / AOC Number | Name | Description | Status | Institutional Controls Required |
|---|---|---|---|---|
| 8-8 | Non-mercury Process Sewer, Trenches, and Sumps | The non-mercury process sewer, trenches, and sumps located within the chlorine process area were installed in 1988 prior to the installation of the current sewer system. Wastewaters from this process are treated to remove asbestos and heavy metals in the lead/asbestos treatment system. | NFA | No |
| 8-9 | Brine Treatment System | Installed in 1943, the brine treatment system purifies extracted brine for chlorine production. | NFA | No |
| 8-12 | Mercury Brine Treatment System | The mercury brine treatment system was installed in 1957 and consists of a series of saturators, scrubbers, tanks, and filters, through which brine, used in the mercury cell process, passes to remove impurities and replenish the salt content. | NFA | No |
| 8-14 | Mercury Treatment System | The system consists of two large circular clarifiers (mercury settling tanks) in which the mercury in the wastewaters is removed, treated, and discharged to the Ohio River. | NFA | No |
| 8-15 | Mercury Process Sewer, Trenches and Sumps | Originally constructed in 1957, mercury wastewaters were discharged to the surface impoundment for settling of mercury contaminants prior to discharge to the Ohio River. Upgraded in 1980, wastewaters are now treated to remove mercury before flowing through a carbon adsorption bed and discharged to the Ohio. | NFA | No |
| 8-16 | Ditch Below Mercury Treatment System | This concrete ditch is situated below the mercury treatment system and is approximately 3 feet wide by 190 feet long. | NFA | No |
| 8-17 | Circuit #7 Hydrogen Gas Purifying System | Cools, compresses hydrogen, and extracts mercury vapor. | NFA | No |
| 8-18 | Mercury Wastewater Collection Tanks | A series of rubber lined carbon steel collection tanks for mercury cell wastewater. | NFA | No |
| 8-19 | Weak Caustic Collection Tanks | Large steel tanks located near caustic process area. | NFA | No |
| 8-20 | Process Sewers In Caustic Area | Includes process sump and process wastewater collection system for caustic process building. | NFA | No |
| 9-1 | Bottom / Fly Ash Storage Facility / Hopper | The bottom/fly ash storage facility is utilized as a temporary storage and truck-loading area for bottom/fly ash before final disposal of ash is landfill Cell J5. | NFA | No |
| 9-2 | Former Bottom / Fly Ash Lagoon | This approx. 320 feet by 120 feet former lagoon, south of the powerhouse adjacent to the Ohio River, no longer accepts bottom/fly ash. | NFA | Yes |
| 9-3 | Bottom / Fly Ash Lagoon | This approximatcly 375 feet by 110 feet lagoon is used as a settling pond for fly ash slurry that is pumped from the adjacent power station. | NFA | Yes |

| SWMU / AOC Number | Name | Description | Status | Institutional Controls Required |
|---|---|---|---|---|
| 9-3 | Bottom / Fly Ash Lagoon | This approximately 375 feet by 110 feet lagoon is used as a settling pond for fly ash slurry that is pumped from the adjacent power station. | NFA | Yes |
| 9-4 | Coal Pile Runoff Collection System | The coal pile runoff collection system, installed in 1991, is a clay-lined pond that collects runoff from the adjacent coal piles. After collection, this runoff water is pumped and treated for pH at the lead/asbestos treatment system. | NFA | Yes |
| 10-1 | Inorganics Waste Pond | This approximately 225 feet by 140 feet former settling unit accepted waste sludge from the old barium oxide process from 1962 to 1972. | NFA | No |
| 10-1A | Soil in the Inorganics Area | This includes all of the soil in the Inorganics Process Area | NFA | No |
| 10-2 | Sewer System for Former Barium and $TiCL_4$ Plants | This sewer system, associated with the former Barium and $TiCL_4$ Plants, accepted wastewater generated during the production in this area. | NFA | No |
| 10-2A | Oil/$TiCL_4$ Storage Tanks | These ten, 75 feet long and 10 feet diameter aboveground tanks were used first to store TiCL4 and later for oil storage. All ten tanks were removed in 1993. | NFA | No |
| 10-3 | Process Sewers for Inorganics Area | This process sewer system was installed in 1990 and manages process wastewater from the Inorganics Area. | NFA | No |
| 11-1 | Cal-Hypo Reagent Preparation Area | The Cal-Hypo Reagent Prep Area stores filter cake material containing CaCO3, CaSO4, and elemental sulfur until off-site disposal. | NFA | No |
| 12-1 | PELS® Area Process Sewer | This sump collection system, which was installed in 1990, collects wastewaters that are pumped back to the caustic process area for recovery. | NFA | No |
| 12-2 | PELS® Bulk Loading Area | This area is used for loading PELS® and solid NaOH tablets into railroad hopper cars. | NFA | No |
| 13-1 | Barium Landfill | The approximately 200 feet by 200 feet former landfill was used in 1963 for disposal of solid wastes generated during the operation of the barium carbonate/chloride plant. | NFA | No |
| 13-1A | Drip Gas Drum Storage | Drums of drip gas were stored in this area from 1992 to 1996. | NFA | No |
| 13-2 | $TiO_2$ Ponds | The ponds were a series of settling ponds for inert material from the TiO2 plant. The unit operated from 1968-1971, inactive from 1971, and closed in August 1980. | NFA | No |
| 13-3 | Former BHC (benzene hexachloride) Storage Pile Location | From 1952-1962, approximately 330,000 pounds of BHC isomers and trace amounts of chlorinated organic solvent wastes were stored each year at this location. After approval by EPA, as a corrective measure, impacted soil excavation, cap construction and riverbank stabilization activities were completed in 2001. | NFA | Yes |

| SWMU / AOC Number | Name | Description | Status | Institntional Controls Required |
|---|---|---|---|---|
| 13-4 | Sewers Inside and Surrounding Paint Shop Area | These concrete trenches located inside of the Paint Shop Area collect wash waters and spills. | NFA | No |
| 13-6 | Oil Storage Tank Area | These two former aboveground storage tanks were used to hold well development oil for brine field No. 2. | NFA | No |
| 14-1 | RCRA Carbon Bisulfide (also known as Disulfide) D001 Drum Storage Area | Drums containing D001 waste were stored here. | NFA | No |
| 14-1A | Soil In $CS_2$ Process Area | All soils in the $CS_2$ Process Area | NFA | No |
| 14-2 | $CS_2$ Area Process Sewers | The CS2 process sewer system was installed in 1964 during the construction of the CS2 facility; all wastewaters flow through an internal oil/water underflow weir prior to connecting with the MCB storm sewer system | NFA | No |
| 14-2A | Tank Car Loading Area | Located along the western side of the $CS_2$ process area, railroad tank cars are loaded with finished product from overhead pipes for shipment off-site. | NFA | No |

# ATTACHMENT C
# ENVIRONMENTAL REPORTS

| Report Title | Content | Author / Date Submitted |
|---|---|---|
| **Verification Investigation** | Identified documented releases and/or potential releases that required further investigation under RCRA Corrective Action protocols | IT Corporation, 1992 |
| **Description of Current Conditions** | Facility background, history, SWMUs and history of releases | ICF Kaiser, 1992 |
| **RCRA Facility Investigation Report** | The RFI discussed the nature and extent of releases of hazardous wastes or hazardous constituents from regulated units, solid waste management units, and other source areas at the facility. During investigation, all necessary data was gathered to support the environmental indicator determinations and a Corrective Measures Study. The RFI Report also included a human health risk assessment and/or ecological evaluation | IT Corporation, October 2000, Rev 1. (Revised as requested in USEPA approval letter) |
| **Institutional Control Plan** | The institutional control plans identifies areas where special excavation and soil management procedures are in place to control unacceptable risks to workers | June 2, 2000 |
| **Baseline Groundwater Monitoring Plan** | Provided an evaluation of pumping rates to maintain hydraulic capture of groundwater beneath the Facility | IT Group, May 2000 |
| **Baseline Groundwater Monitoring – 4th Annual Report** | Provided a summary of the Baseline Groundwater Monitoring program | Shaw Group, 2004 |
| **Remedial Action Constrnction Report – SWMU 13-3** | Documented the implementation of corrective measures for SWMU 13-3 (Soil cover and river bank stabilization) | IT Corporation, June 2001 |
| **Remedial Technology Evalnation** | Evaluates in-situ groundwater treatment technologies for MW-207, MW-220, and MW-221 areas | Environmental Resources Management, 2008 |
| **PORE Water and Sediment Sampling** | Summary of Sampling and Analyses | Tetra Tech, Inc. Dec 2012 |
| **Streamlined RCRA Correetive Measures Study** | | Axiall Corporation, March 2014 |