Long-Term Stewardship Assessment Report

Union Carbide Corporation – Technology Park

EPA ID #: WVD060682291

South Charleston, West Virginia 25303

Assessment Date: May 7, 2018

Report Date: May 30, 2018

Introduction: Long-term stewardship (LTS) refers to the activities necessary to ensure that engineering controls (ECs) are maintained and that institutional controls (ICs) continue to be enforced. The purpose of the Environmental Protection Agency (EPA Region 3 LTS program is to periodically assess the efficacy of the implemented remedies (i.e. ECs and ICs) and to update the community on the status of Resource Conservation and Recovery Act (RCRA) Corrective Action facilities. The assessment is conducted in twofold, which consists of a record review and a field inspection, to ensure that the remedies are implemented and maintained in accordance to the final decision.

Site Background: The Union Carbide Corporation – Technology Park consists of approximately 574 acres in South Charleston, West Virginia (Facility). The land use for the area surrounding the Facility is primarily industrial and commercial to the north and residential to the east, south, and west of the Facility. Located downgradient from the Facility to the northwest are two parcels, owned by the West Virginia Department of Transportation (WVDOT) and CSX Transportation, respectively.

Between 1947 and 1974, Union Carbide Corporation (UCC), a wholly owned subsidiary of The Dow Chemical Company, purchased individual parcels of land from the Kanawha Land Company, Westvaco Chemical Company, a dairy farm, and other parties. These parcels collectively comprise the Facility property. Prior to UCC's ownership, the Facility property was undeveloped with the exception of several brine wells which were located on the former Westvaco Chemical Company parcel and were used to extract brine for the manufacture of chlorine bleach.

Current Site Status: UCC has sold or donated 267 acres to other parties and retained the remaining 307 acres of the Facility, which consist largely of former landfills and areas surrounding the former landfills. Approximately 110 acres of the Facility property are developed with laboratory buildings, pilot plant areas (areas where materials developed are manufactured on a small scale), waste packaging, storage facilities, and office buildings. For development purposes, the Facility has been subdivided into four tracts, Tracts A through D. Tracts A and B were donated to the State of West Virginia. In July 2010, a portion of Tract D (shown as "Area D-l" on Figure 2) was sold by UCC to United Disciples of Christ Church which plans to construct a church and other buildings on that property.

On December 17, 2010, EPA issued the Final Decision and Response to Comments (FDRTC). The final remedy consists of the following 3 components: a soils component, groundwater component and Facility-wide Institutional Controls (ICs). The soil remedy consists of capping or excavating former landfills and compliance with and maintenance of ICs. The groundwater remedy consists of groundwater monitoring, continued operation of the leachate collection system and central drain sump pumping system, as well as compliance with and maintenance of ICs. Engineering control components of final remedy detailed in the FDRTC are implemented through a revised RCRA Corrective Action Permit (Permit) between UCC and West Virginia Department of Environmental Protection (WVDEP) dated February 2, 2012. Facility-wide ICs are implemented via multiple Uniform Environmental Covenants Act (UECA) Environmental Covenants between UCC and EPA.

Long-term Stewardship Site Visit: On May 7, 2018, EPA conducted a long-term stewardship site visit with WVDEP, Union Carbide representatives and consultants to discuss and assess the status of the implemented remedies at the site.

The attendees were:

Name	Organization	Email Address	Phone No.
John Hopkins	EPA Region 3	hopkins.john@epa.gov	(215)814-3437
Erich Weissbart	EPA Region 3	weissbart.erich@epa.gov	(410)305-2779
Kenan Cetin	WVDEP	kenan.cetin@wv.gov	(304)238-1220 Ext. 3507
Jerome Cibrik	The Dow Chemical Company	cibrikje@dow.com	304-747-7788
Paul Weber	CH2M Hill	paul.weber@jacobs.com	
Kylie McCord	CH2M Hill	kylie.mccord@jacobs.com	
Sid Stevenson	CH2M Hill	sid.stevenson@jacobs.com	
Matt Boekenhauer	CH2M Hill	matt.boekenhauer@jacobs.com	

Institutional Controls (ICs) Status:

UECA Environmental Covenants: Covenants are the method for implementing institutional controls required as a condition of the Statement of Basis and FDRTC. The following ICs apply to one or more of the four Facility tracts (see Figure 3):

Land Use Restriction: The Property shall not be used for residential or quasi-residential purposes. There were no residential structures or uses of the site at the time of the visit. The Property continues to be used for commercial and light industrial purposes. UCC is currently in compliance with land use restrictions.

Groundwater Use Restriction: Extraction of groundwater for groundwater monitoring and/or remediation approved by WVDEP is permitted. Any other use of groundwater is prohibited. All parties at the Facility are connected to a public water supply and there were no observed uses of groundwater at the time of the visit.

Materials Management Plan: Any construction activities such as excavation, drilling, penetration or any other type of disturbance must be conducted by a contractor who is informed and trained about the

releases and exposure to contaminants known to exist at the site. The contractor is required to perform the work in accordance with a site-specific Health and Safety Plan and the December 2014 Materials Management Plan approved by EPA. Also, existing surface covers shall be maintained over impacted areas to minimize surface water infiltration and prevent direct contact with soils. During the Facility tour no signs of earth-moving activities were observed and asphalt paved surfaces were intact.

Engineering Controls (ECs) Status:

Landfills: The Facility includes three inactive landfills, the Lower Ward Landfill, Ward A Landfill, and Ward B Landfill. The three landfills were constructed primarily to receive fly ash slurry from the Facility. The landfills also received oxide tails from the UCC South Charleston facility's propylene oxide production unit, and municipal sludge from the South Charleston publicly owned treatment works. The landfills were created by constructing upper and lower dikes across a hollow, designated as Ward Hollow. The Lower Ward Landfill is located between the upper and lower dikes, and the Ward A and B Landfills are located south of the upper dike. Use of the landfills was discontinued in 1973, after which the Lower Ward and Ward B Landfills were covered and the Ward A Landfill was turned into a scenic pond. The parking lot cover at Lower Ward Landfill and clay-soil mix cover at Ward Landfill B were properly maintained at the time of the site visit.

Lower Ward Leachate Collection System: The leachate collection system collects leachate from the Lower Ward Landfill and transfers it to the South Charleston wastewater treatment plant via the Holz Impoundment decant line. The system is inspected weekly for overflow conditions, operation of the sump, testing of the telemetry system, and evidence of damaged or ineffective parts. According to the 2017 Operation and Maintenance technical memorandum dated March 16, 2018 (O&M Report), accumulating solids were vacuumed from system, the south pump was rebuilt and the Holz Impoundment decant line was temporarily shut down for maintenance. No overflow events occurred in 2017.

Ward B Central Drain Sump Pumping System: The sump pumping collection system collects leachate from the central drain line in Ward B Landfill during normal soil saturated conditions and transfers it to Holz Impoundment. During rain events, the sump allows stormwater to overflow to Ward A pond. The system was inspected weekly to determine if the system was operational and for possible damages. Inspections were also completed during some of the rain events to verify water was flowing to Ward A pond through the overflow pipe. According to the O&M Report, pumps were cleaned and changed out approximately bimonthly, the discharge line was acid cleaned approximately bimonthly and solids were removed from the sump twice in 2017.

Groundwater Monitoring: Two areas of groundwater contamination are currently monitored; the Ward Hollow area and Greenhouse area. Primary constituents present within the Ward Hollow groundwater plume include 1,4-dioxane, benzene, bis(2-chloroisopropyl)ether and barium. Monitoring wells in this area are sampled quarterly and groundwater flow is consistent with topography, flowing northwest towards the Kanawha River. Barium and 1,4-dioxane were detected in one of the downgradient wells (MW-31) above their respective screening levels. Based on the Mann-Kendall statistical test, 1,4-dioxane has exhibited an increasing trend in MW-31 since 2012 and barium has exhibited increasing

concentrations since 2014. As a result, UCC proposes to install one new monitoring well downgradient of MW-31 to further delineate the leading edge of the Ward Hollow groundwater plume.

The Greenhouse area monitoring network includes two monitoring wells, WVU-MW04 and MW-104A, which are sampled annually for volatile organic compounds (VOCs). Historically, groundwater in this area flows to the north, towards the Kanawha River. During the 2017 sampling event, tetrachloroethylene (PCE) exceeded the EPA maximum contaminant level at well WVU-MW04. No other VOCs exceeded screening levels with stable or decreasing concentration trends in both wells.

Financial Assurance: UCC has satisfied all financial assurance requirements and is currently in compliance.

Reporting Requirements/Compliance: UCC is required to submit annual groundwater monitoring reports. There are no issues of noncompliance regarding reporting requirements as UCC has submitted a report each year, the last of which was received March 27, 2018. Copies of voluntary inspection reports, as well as maintenance, transport and disposal records are kept onsite. No transfer of property, change in use of the property, or work that will affect contamination at the property has been reported.

Mapping: The EPA facility website map is accurate and includes the 574-acre UCC Technology Park Property. The map was field verified and no issues were noted. A downloadable geospatial PDF map is available on EPA's corrective action facility webpage under the "Reports, Documents and Photographs" section, found here.

Conclusions and Recommendations: EPA recommends recording and filing the environmental covenants for Tract C and Tract D with the Kanawha County Clerk. EPA also concurs with UCC's suggestion to install a new monitoring well downgradient of MW-31. No other EC/IC deficiencies were identified. EPA has determined that the remedy institutional and engineering controls have been fully implemented.

Attachments:

Figure 1: Aerial Map of Union Carbide Corporation – Technology Park

Figure 2: Land Tracts

Figure 3: Land and Use Restrictions

Picture 1: Lower Ward Landfill

Picture 2: Ward B Landfill and Central Drain Sump Pumping System

Picture 3: Leachate Collection Tank

Picture 4: Monitoring Well MW-34

Picture 5: Monitoring Well MW-37

Figure 1: Aerial Map of Union Carbide – Technology Park

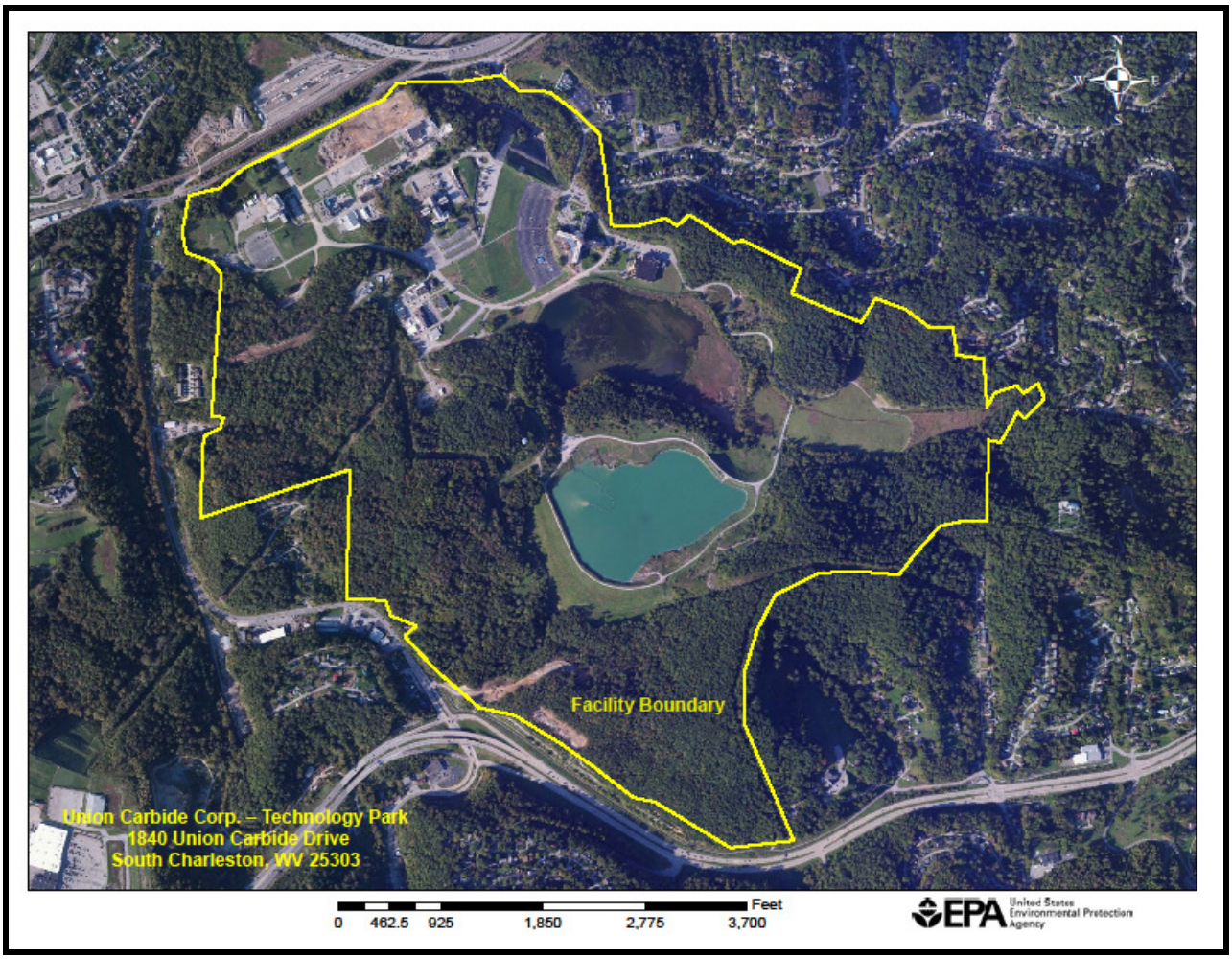


Figure 2: Land Tracts

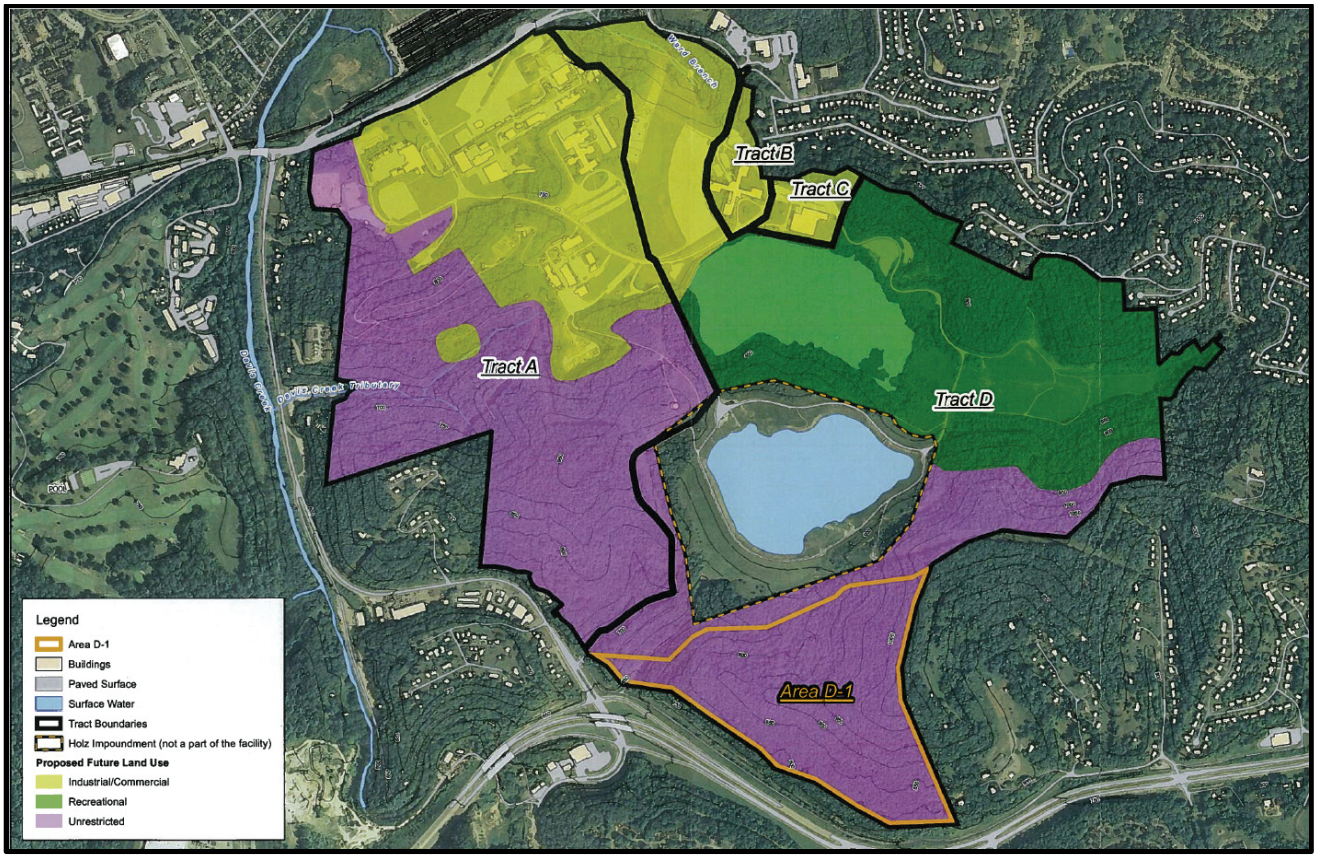
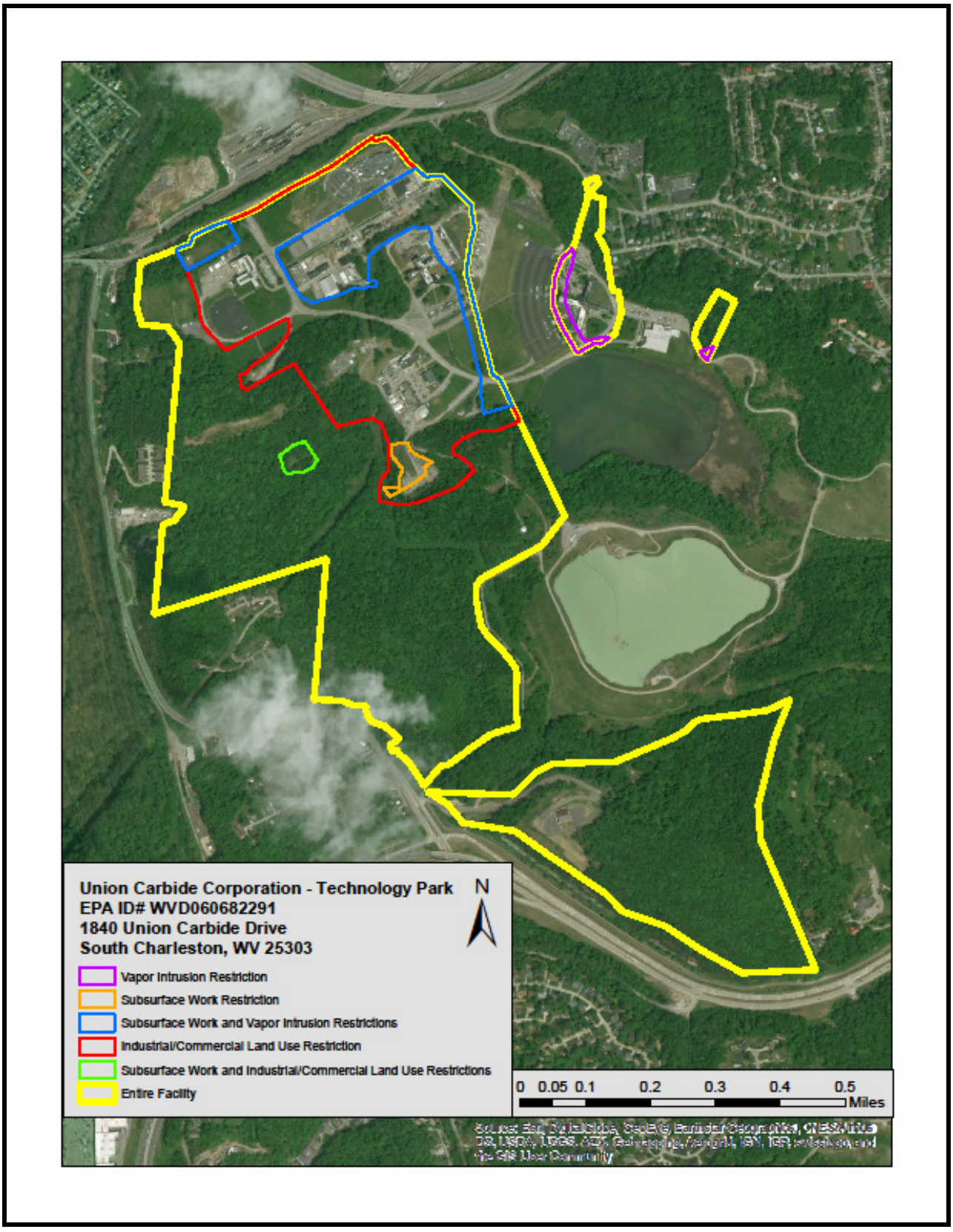


Figure 3: Land and Use Restrictions



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