UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

FINAL DECISION
KOP-FLEX INC. HANOVER, MD

PURPOSE

The United States Environmental Protection Agency (EPA) is issuing this Final Decision and Response to Comments (FDRTC or Final Decision) selecting the Final Remedy for the Kop-Flex Inc. facility located in Hanover, MD (hereinafter referred to as the Facility). The Final Decision is issued pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. Sections 6901, et seq.

On March 16, 2016, EPA issued a Statement of Basis (SB) in which it described the information gathered during environmental investigations at the Facility and proposed a Final Remedy for the Facility. The SB is hereby incorporated into this Final Decision by reference and made a part hereof as Attachment A.

This FDRTC selects the remedy that EPA evaluated under the SB. Consistent with the public participation provisions under RCRA, EPA solicited public comment on its proposed Final Remedy. On March 18, 2016, notice of the SB was published on the EPA website: [http://www.epa.gov/reg3wcmd/publicnotice_ KopFlex.html] and in the Baltimore Sun newspaper. The thirty (30) day comment period ended on April 17, 2016.

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

FINAL DECISION

EPA's Final Remedy for the Facility consists of the following:

- Extraction and treatment of onsite groundwater
- Long term groundwater monitoring
- Compliance with and maintenance of land and groundwater use restrictions
- Engineering controls, and
- Soil management

DECLARATION

Based on the Administrative Record compiled for the corrective action at the Kop-Flex facility, I have determined that the remedy selected in this Final Decision and Response to Comments, which incorporates the March 16, 2016 Statement of Basis, is protective of human health and the environment.

Date: 5.4.16

John A. Armstead, Director
Land and Chemicals Division
U.S. Environmental Protection Agency, Region III

Attachment A: Statement of Basis (March 16, 2016)

Attachment A

UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

REGION III

STATEMENT OF BASIS

KOP-FLEX INC.
HANOVER, MARYLAND

EPA ID NO. MDD 043373935

March 2016

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Figure 1 Facility Location Map
Figure 2 Facility Map

I. Introduction

The United States Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) to solicit public comment on its proposed remedy for the former Kop-Flex, Inc. Facility located in Hanover, Maryland (Facility). EPA's proposed remedy for the Facility includes, but is not limited to, engineering controls consisting of controlled access and prevention of vapor intrusion into newly constructed buildings; land use controls limiting residential development, limiting groundwater use, and managing soil exposure; onsite groundwater extraction and treatment; and both onsite and offsite monitoring programs for groundwater.

The Facility is subject to EPA's Corrective Action program under the Solid Waste Disposal Act, as amended, commonly referred to as the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901, et seq. The Corrective Action program requires that facilities subject to certain provisions of RCRA investigate and address releases of hazardous waste and hazardous constituents, usually in the form of soil or groundwater contamination, that have occurred at or from their properties. Maryland is not authorized for the Corrective Action program under Section 3006 of RCRA; therefore, EPA retains primary authority in the State of Maryland for the Corrective Action program.

EPA is providing a thirty (30) day public comment period on this SB. EPA may modify its proposed remedy based on comments received during this period. EPA will announce its selection of a final remedy for the Facility in a Final Decision and Response to Comments (Final Decision) after the public comment period has ended.

EPA will make a decision after considering all comments received during the comment period, consistent with applicable RCRA requirements and regulations. If the decision is substantially unchanged from the one proposed, EPA will issue a Final Decision and inform all persons who submitted written comments or requested notice of EPA's final determination. If the Final Decision is significantly different from the one proposed, EPA will issue a public notice explaining the new decision and will reopen the comment period. In the Response to Comments section attached to the Final Decision, EPA will respond in writing to each comment received.

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

II. Facility Background

A. Site History

The Facility is located at 7555 and 7565 Harmans Road, Hanover, Anne Arundel County, Maryland. It occupies a total area of approximately 25 acres and contains two buildings – an approximate 220,000-square-foot former manufacturing and office building and an approximate 20,000-square-foot former forge building near the Facility's eastern property boundary. The Facility property is bordered to the north by a Verizon Communications maintenance facility; to the east by the Williams-Scotsman facility followed by railroad tracks; to the south by the Williams-Scotsman facility followed by Maryland State Route 100; and to the west by undeveloped land along Stony Run, a tributary of the Patapsco River, followed by Harmans Road and a residential area.

The Washington Hydraulic Press Brick Company owned the Facility prior to 1943 and may have used portions of the property for mining clay and/or gravel. The Facility was not used from the early 1940s to the late 1960s. Koppers Company purchased the Facility in 1966. The Power Transmission Division of Koppers Company began manufacturing operations at the Facility in 1969. A separate forge building was built ten years later in 1979. In 1986, an employee group purchased the Power Transmission Division from Koppers and formed Kop-Flex, Inc. (Kop-Flex). In 1996, Emerson Electric Company (Emerson) acquired Kop-Flex.

On July 20, 1998, Emerson applied to the Voluntary Cleanup Program (VCP) of the Maryland Department of the Environment (MDE) seeking a Certificate of Completion as a responsible person. MDE reviewed the application in April 1999 and advised the applicant that a response action plan (RAP) must be developed to address environmental contamination at the Facility. The Facility is identified as Brownfield Master Inventory number MD0286 as assigned by the Land Restoration Program of the MDE. In January 2010, Emerson was notified by EPA that the Facility was subject to oversight by the RCRA Corrective Action program and EPA has provided support and oversight to the VCP program since.

Kop-Flex formerly manufactured flexible couplings for the mechanical power transmission industry at the Facility. The forge building produced precision forging of metal parts and included heat treatment and nitriding capabilities. Universal joints, gear spindles, forgings, and power transmission components were produced at the plant from 1979 to 2012. The Facility also provided a repair and maintenance program for the components.

Manufacturing operations at the Facility ceased in late 2012. After shutting down production activities, all equipment and machine lines were decommissioned and removed from the Facility. At present, the onsite buildings are vacant except for the office building which is occupied by a small number of former plant staff. The office operations will be moved to another location in the Baltimore area in the next few months. In December 2014, Emerson transferred the Facility to EMERSUB 16 in preparation of selling it to a third party for future redevelopment.

B. Site Geology

The Facility lies within the Atlantic Coastal Plain physiographic province. In Anne Arundel County, Maryland, this province is characterized by alternating layers of predominately sand and clay sediments of Cretaceous age. Based on regional hydrogeologic cross-sections for these sedimentary deposits, the inter-layered sequence of sand and clay units dips gently to both the south and east from the north part of the county. In Anne Arundel County, the Coastal Plain deposits range in thickness from a few tens of feet along the northwestern boundary with Howard County to as much as 2,500 feet in southeastern Anne Arundel County.

Evaluation of borehole lithologic data obtained from field investigations indicates the coastal plain deposits at the site comprise a complexly inter-bedded sequence of predominately coarse-grained (sand with gravel and fines) and fine-grained (silt and clay) units. Given the spatial and vertical heterogeneity typical of the Atlantic Coastal Plain deposits, the unconsolidated materials have been grouped into three gross stratigraphic units, which are generically termed "upper," "middle," and "lower".

The Upper Stratigraphic Unit is comprised primarily of sand, with variable fines content, to gravelly sand along with occasional discontinuous silt and clay lenses of variable extent and thickness. The upper-most sandy sediments present to a depth of approximately ten feet below ground surface (bgs) in the building area and eastern portion of the site represent fill material emplaced during construction of the facility. Extensive layers of fine-grained (silt and clay) deposits exist in the shallow subsurface in the northern portion of the site and at a depth of approximately ten to 20 feet (bgs) in the eastern portion of the building area. This upper sandy unit appears to be thickest in the eastern portion of the Facility and thins to the west.

The Upper Stratigraphic Unit is underlain by the Middle Stratigraphic Unit, which is characterized by zones of coarse-grained (sand to clayey sand) and fine-grained (silty to sandy clay to clayey to sandy silt to finely inter-laminated sand and clay) sediments exhibiting variable thickness and noticeable lateral and vertical heterogeneity. From northwest to southeast across the site, the lithologic characteristics of this unit transition from a thick (20 to 30-foot) sand interval bounded above and below by silt and clay deposits to an area of inter-bedded and inter-fingering coarse and fine-grained deposits underneath the eastern portion of the manufacturing building to a very thick (approximately 65 feet) sequence of predominately silt and clay deposits in the southern-most portion of the site. Occasional sand zones may be present as isolated lenses or layers within the fine-grained deposits, with the coarser sediments being relatively abundant beneath some areas of the building. The thick sand zone in the northern and western portion of the site occurs between the depths of approximately 30 feet to 60 feet bgs and is underlain by a layer of hard, dense silty clay to clayey silt sediments. A review of the boring logs indicates this fine-grained layer is ubiquitous within the subsurface deposits at the site.

The Lower Stratigraphic Unit is present below the Middle Stratigraphic Unit and consists primarily of sand and gravelly sand deposits with occasional discontinuous layers of inter-mixed clay and silt sediments of variable thickness. Based on correlation of the lithologic data, the top of this unit occurs at depths ranging from approximately 50 feet bgs in the northwest portion of the site to approximately 100 feet bgs near the southeastern corner of the property. Evaluation of the lithologic data indicates the gravelly sand deposits are more spatially extensive than similar lithofacies in the Upper Stratigraphic Unit.

C. Hydrogeology

In Anne Arundel County the upper-most water-bearing unit of the Coastal Plain aquifer system is typically represented by an unconfined surficial aquifer consisting of Quarternary alluvium and terrace deposits. The thickness of the surficial aquifer is highly variable over the area. The surficial aquifer is underlain by several confined aquifers that include the Patuxent, Lower and Upper Patapsco, and Magothy. These aquifers may be considered unconfined over their outcrop areas, although locally less permeable materials may exist at the surface.

The predominately coarse-grained sediments comprising the upper and lower units and the thick sand interval within the middle unit represent the primary zones for groundwater flow at the site. The sand deposits present within the upper and middle units at the site constitute the shallow water-bearing zone, or surficial aquifer, within the hydrogeologic system. The lower unit is inferred to be the upper-most portion of the Lower Patapsco aquifer. Hard silt and clay deposits of the Middle Stratigraphic Unit that occur at depths ranging from approximately 45 feet in the north to 60+ feet in the south form an aquitard that hydraulically separates the surficial and Lower Patapsco aquifers. In the southern-most portion of the site, these fine-grained, low permeability deposits are believed to represent the Patapsco Confining Unit. Overall, flow paths within these clayey deposits of the Middle Stratigraphic Unit are complex and involve predominately vertical (downward) movement of groundwater.

Groundwater occurs under an unconfined condition within the shallow coarse-grained deposits and the fine-grained deposits in the western portion of the site in the surficial aquifer. Given the presence of appreciable clayey deposits in the shallow subsurface in the western portions of the site, groundwater within the sand lenses and thick sand layer within the Middle Stratigraphic Unit occurs locally under a partially, or semi-confined condition within this portion of the surficial zone at the site. The groundwater surface is encountered at depths ranging from 15 feet to18 feet near the eastern site boundary to less than ten feet in areas to the north and west of the building. Groundwater flow within the surficial aquifer is in a generally west to northwest direction toward Stony Run. Flow within the upper-most sand units and deeper (partially confined) sand deposits provide base flow to Stony Run. The consistency in the west to northwest gradient over the entire thickness of the surficial aquifer indicates good hydraulic communication between the permeable sand intervals within this hydrogeologic unit.

Groundwater in the Lower Patapsco aquifer also occurs under semi-confined conditions, with the depth to water in wells screened in this zone ranging from approximately 30 feet in the northwest portion of the site to 45 feet bgs along the southern site boundary. Based on contouring of water level data from site monitoring wells, the direction of groundwater flow in the semi-confined Lower Patapsco aquifer is to the south-southeast. In the southern portion of the site, the significant head differences in monitoring wells completed at depths of less than and greater than 60 feet bgs indicate that the hard silt and clay deposits in the lower portion of the Middle Stratigraphic Unit serve as a confining layer, or aquitard, between the overlying surficial aquifer and deeper Lower Patapsco aquifer in the hydrostratigraphic sequence. However, spatial variations in the lithology and thickness of the sediments comprising the aquitard and associated sedimentary structures within the fine-grained deposits may provide mechanisms for downward leakage of groundwater to the Lower Patapsco sand deposits.

III. Summary of Environmental History

Sampling and analysis in 1996 and 1997 identified volatile organic compounds (VOCs) in the soil at the products storage area, designated as Area of Concern (AOC) 1 and AOC 2, and groundwater in the vicinity of the former drainage field, designated as AOCs 2 and 4. The VOC contamination is attributed to the historic use of degreasing solvents and the on-site discharge of wastewater. VOCs were detected in soil in the vicinity of the product storage area. Groundwater contamination resulted from the discharge of caustic wastewater from a treatment system to an onsite drainage field. The treatment system, which operated from 1969 until 1986, was designed to treat wastewater, which resulted from using sodium hydroxide to remove oxidation from metal parts. The wastewater moved through a series of underground tanks and then discharged to the drainage field.

The following VOCs were detected in groundwater in the vicinity of the product storage area at concentrations that exceed EPA established drinking water standards, known as Maximum Contaminant Levels (MCLs) promulgated pursuant to 42 U.S.C. §§ 300f et seq. of the Safe Drinking Water Act and codified at 40 CFR Part 141: 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethene (1,1-DCE) and vinyl chloride.

The Facility conducted pilot tests to identify appropriate remediation methods to address contamination in three areas of the property: 1) VOC soil contamination in AOCs 1 and 2; 2) VOC groundwater contamination in AOCs 2 and 4; and 3) oil-contaminated soil in the vicinity of a cooling unit (AOC 7).

A. Southwest Portion of Former Manufacturing Building (AOC 1)

Soil sampling conducted in 1998 and early 1999 during the initial site investigation activities detected the presence of chlorinated VOCs and petroleum hydrocarbons in the unsaturated (vadose) zone beneath a former machining area in the southwest portion of the former manufacturing building. Evaluation of the sampling results indicated the zone of VOC-affected soil occurred at depths greater than seven feet bgs over the area. Based on these findings, a dual-phase extraction (DPE)/soil vapor extraction (SVE) system was installed and operated to recover chlorinated VOC mass present in the vadose zone soils.

During late 2012 and early 2013, supplemental sampling activities were performed in AOC 1 to gather updated soil quality data and assess the effectiveness of the DPE/SVE system. A total of 18 boreholes were completed over the area, with single or multiple soil samples collected for VOC analysis. The sampling results indicated the continued presence of elevated VOC concentrations in the subsurface. Based on the sampling data, 1,4-dioxane comprised the majority of the VOC mass at depths of less than eight to nine feet below grade, with chlorinated VOCs becoming more prevalent in the deeper portion of the vadose zone.

Additional source area removal activities were conducted in late 2013 and early 2014 to reduce VOC mass in the unsaturated soil and reduce the potential for constituents of concern (COCs) in soil to migrate to indoor air and groundwater. The removal activities involved the excavation of VOC-containing soils to a depth of 15 feet below the building floor in two rectangular areas.

Based on the supplemental soil sampling data, the remaining vadose zone soil beneath the building floor slab in AOC 1 contains low residual levels of site-related VOCs. Unsaturated material to a depth of less than ten feet below grade has total VOC concentrations of less than 3 mg/kg. In the unexcavated areas, the majority of the VOC mass over this depth interval appears to consist of 1,4-dioxane. Slightly higher VOC levels (greater than 10 mg/kg) may locally exist in the unexcavated areas at depths below ten feet below grade.

B. Outside Area Near East-Central Portion of Former Manufacturing Building (AOC 2)

Soil and shallow groundwater sampling activities were conducted in the area east of the former manufacturing building between 2006 and 2008, and again in 2012, to further characterize the extent of highly impacted, VOC-containing soil material in this portion of the Facility. Samples for VOC analysis were collected from approximately 40 borings located both inside and outside of the building. The soil sampling results indicated the presence of VOC-affected soil at depths of greater than eight feet bgs in the area, and the observed presence of solvent-derived dense non-aqueous phase liquid (DNAPL) at one location immediately adjacent to the east building wall. In addition, concentrations of 1,1,1-TCA indicative of DNAPL were detected in shallow groundwater samples beginning at approximately eight to ten feet bgs near the building wall and extending vertically and laterally from this area to the east away from the building along the upper contact of a clay lens in the upper sand unit, and to the west.

Source area soil removal was conducted in late 2013 to reduce VOC mass in the unsaturated and saturated soils in the area and reduce the potential for COCs to migrate in groundwater. The removal activities involved the excavation of VOC-impacted soils to depths ranging from 18 feet to 23 feet bgs in four shoring cells in the source area. Flowable fill was used to backfill the cells from the terminated depth of the excavations to approximately 15-feet below ground surface to span the interval below the groundwater surface.

The remaining vadose zone soils to a depth of eight feet bgs have non-detect to very low concentrations of 1,1,1-TCA and associated degradation compounds. Soils with 1,1,1-TCA concentrations above 10 mg/kg are locally present at depths below eight feet in the area around the excavation cells to the east of the former manufacturing building. For these samples obtained from the deeper vadose zone (8 to 13 feet bgs), the highest 1,1,1-TCA concentration (250 mg/kg) was detected in the sample collected from eight to nine feet bgs at the SSI-09 location, with lower levels detected in samples from similar depths at borings SSI-05 (44 mg/kg) and WSP-68 (25 mg/kg) outside the building and WSP-07 (30 mg/kg) inside the building. The depth to groundwater is typically less than 13 feet in this portion of the site, therefore the majority of the remaining VOC mass appears to be present in the upper-most portion of the saturated zone.

C. Surficial Aquifer

VOCs of concern are 1,1,1-TCA and its degradation products (e.g., 1,1-DCE and 1,1-DCA), chlorinated ethenes such as trichloroethene and tetrachloroethene, and 1,4-dioxane. The highest VOC levels in shallow groundwater are found in the identified source areas underneath and east of the former manufacturing building, and decrease in the direction of groundwater flow. VOC impacts in shallow groundwater extend from the vicinity of wells MW-02, MW-11, MW-12 and MW-16, which are located to the east of the former manufacturing building, to the area west of the building in the vicinity of MW-38.

No site related VOCs have been detected in samples from upgradient MW-01. VOC concentrations detected in wells near the eastern Facility property boundary (MW-08 and MW-20) are substantially lower than concentrations in wells located in close proximity to the source area to the immediate east of the former manufacturing building (MW-02, MW-11, MW-12, and MW16).

VOCs associated with the source area immediately east of the former manufacturing building have migrated west (downgradient) and commingled with VOCs associated with the source area below the southwest portion of the building. In the area west of the former manufacturing building, the highest VOC concentrations are found in samples collected from the shallow wells screened in the upper, predominately clayey deposits, with trace to non-detect levels in samples from intermediate-depth wells screened in the underlying sand unit (MW-14, MW-18 and MW-39). Typically non-detect levels of site-related VOCs have been found in samples from shallow wells MW-03 and MW-07 northwest of the manufacturing building. No site-related VOCs appear to be migrating offsite at levels of concern in the shallow portion of the surficial aquifer.

D. Lower Patapsco Aquifer

VOCs detected in samples from wells installed in the Lower Patapsco aquifer are consistent with those identified for the shallow water-bearing zone: 1,1,1-TCA and its degradation products, chlorinated ethenes, and 1,4-dioxane. VOC impacts in the deep groundwater extend from the identified source area to the east of the manufacturing building to the offsite areas to the south-southeast of the former Kop-Flex facility. The highest VOC concentrations occur in the vicinity of onsite well MW-17D and offsite well MW-24D, which are located immediately downgradient of the source area. Elevated VOC concentrations were also detected in the samples from well MW-1D along the southern property boundary.

Wells MW-19, MW-23D, and MW-27D are located upgradient of the VOC source areas at the site. Trace to non-detect concentrations of VOCs were detected in samples collected from MW-19 and MW-27D. Well MW-23D, which is located approximately 120 feet north of the former manufacturing building, contained low levels of site-related VOCs, primarily 1,4-dioxane and 1,1-DCE.

During the previous three years, 174 private water supply wells were sampled as part of a water quality investigation of residential wells south of the Facility. Analytical results indicate that 17 well samples contained COCs associated with the Facility-related groundwater contamination. The majority of the impacted wells were located along Twin Oaks Road.

The highest VOC concentrations were detected in samples from the Twin Oaks Road and Old Camp Meade Road areas, with impacted well depths ranging from 170 feet bgs in the northern portion of Twin Oaks and 240 to 250 feet bgs at the south end of Twin Oaks Road and along Old Camp Meade Road. Total site-related VOC concentrations in samples from the wells in this area range from 32.8 micrograms per liter (ug/l) to 344.1 ug/l. Typically, 1,1-DCE and 1,4-dioxane are the site-related COCs detected at levels above EPA groundwater quality standards.

Offsite groundwater monitoring wells were installed to assess and delineate the offsite VOC distribution to the south. Wells were installed to various depths in the Lower Patapsco at various locations centered on the Severn area south of Maryland Route 100 and sampled quarterly through 2015. Analytical data indicates the chlorinated VOCs and 1,4-dioxane are limited to the thick, predominately sand deposits present in deeper semi-confined portion of the aquifer that overlies the Arundel Clay confining unit. Overall, the areal extent of VOC-affected groundwater in the Lower Patapsco Aquifer downgradient of the Facility is generally delineated by the offsite monitoring well locations.

E. Risk Assessment

Current potential receptors include facility office workers, visitors (including child or youth intermittent visitors), or trespassers. Visitors and trespassers would generally access the Facility with much lower frequency and duration, relative to Facility office workers. Among the current potential receptors, Facility office workers are likely to be present with the highest frequency, resulting in the greatest potential exposure. Actual exposure to COCs in soil is minimized by the presence of the buildings and pavement, which prevent contact with soil over much of the Facility property.

The planned redevelopment to a commercial facility will involve the presence of construction workers on the Facility property, with excavation of soil expected to a maximum depth of up to four feet bgs. Over the long term, future uses of the Facility property will be commercial, with the associated presence of commercial Facility workers or visitors inside or outside of the warehouse buildings.

Groundwater containing COCs at concentrations above MCLs has migrated off the Facility property to the south affecting residential wells that use the groundwater from certain portions of the aquifer system as a potable water source. Risks to this receptor category have not been evaluated quantitatively since the risks are known and are managed; though consumption of water with COCs above MCLs is presumed to result in potential risks. In affected areas, an alternative water source has been provided.

The presence of COCs in soil and groundwater could result in the following exposure pathways:

- Exposure to COCs in soil through the ingestion, dermal contact, or inhalation routes may affect current or future facility workers, current or future visitors, and future construction workers.

- Inhalation of COCs originating in soil or groundwater and migrating to indoor air, via vapor intrusion into buildings, may affect current or future facility workers and visitors.

Direct contact with soil by Facility workers and visitors would only be expected to involve soil near the surface. Surface soil (as well as subsurface soil) does not contain VOC concentrations exceeding screening levels for non-residential direct contact (potential exposure to all affected soil [0-15 feet bgs] was considered as a conservative, worst-case assumption.) Although vapor intrusion could be a complete exposure pathway under current site conditions, this pathway will be eliminated by the implementation of engineering controls as part of the site redevelopment. The anticipated controls include a vapor barrier and vapor mitigation system in future site buildings constructed over VOC-containing soil and groundwater.

Exposure pathways involving onsite groundwater are not complete. Groundwater is not used as a source of potable or non-potable water, and the implementation of institutional controls will ensure no future use of groundwater from onsite water supply wells. The water table occurs at depths of ten to 15 feet bgs, which is deeper than any foreseeable construction or utility work; therefore, no direct contact with groundwater will occur during these activities.

A 2015 Site Specific Risk Assessment included a quantitative evaluation of human health risks from the soil direct contact pathway for a Facility worker, child or youth intermittent visitor, or construction worker, and from vapor intrusion for a Facility worker or visitor. The risks were found to be less than the target levels (hazard index of 1 and cancer risk of 1×10^{-5}).

F. Ecological Risk Assessment

The closest body of surface water is Stony Run, which crosses the western portion of the site. The 100-year flood plain of Stony Run includes a portion of the parking lot northwest of the main building. Stony Run flows north across Dorsey Road, located approximately 2,000 feet north of the Kop-Flex property, through the Baltimore Commons Business Park and Patapsco State Park before discharging into the Patapsco River, seven miles to the north. Wetlands (other than areas along Stony Run) are not present on the Facility.

COCs in the shallow groundwater zone could potentially migrate with groundwater flow to the west-northwest and discharge into Stony Run. Another potential transport mechanism that could affect the stream is erosion of surface soil containing COCs. The transport of COCs into

Stony Run and its sediments could result in an exposure pathway involving freshwater aquatic organisms such as benthic macro-invertebrates or fish present in the stream. Terrestrial fauna (reptiles, amphibians, birds, and mammals) may also use the stream area as a source of food and water, or habitat, and could also potentially be exposed to COCs reaching the stream ecosystem. However, the main COCs present (e.g., chlorinated VOCs) have a low potential for bio-concentration and have not been detected in surface water samples collected from the stream area.

Soil containing COCs is primarily located at depths of greater than five feet beneath or to the east of the former manufacturing building. Based on current and planned future development, the property consists mostly of areas covered by buildings, paved parking lots and roadways, and grass or other landscaping. Releases to soil on the property have not occurred in locations that serve as a habitat for terrestrial plants and animals. The VOC-affected soil will be predominantly beneath buildings and surface pavement for currently planned development. Exposure to VOC-containing groundwater by ecological receptors does not occur.

IV. Corrective Action Objectives (CAO)

Based on the results of the site-specific risk assessment, constituents in groundwater and soil do not pose an unacceptable risk to human health or the environment under current and anticipated future land-use scenarios. Potential risks are within the EPA target risk range of 1×10^{-4} to 1×10^{-6}, assuming that the future land-use is industrial. However, potential risks associated with exposure to groundwater, soil, and vapor exist.

A. Soils

EPA has determined that direct contact with soils do not pose an unacceptable risk for current industrial exposure scenarios for the entire Facility. However, potential risk of exposure to residual contaminants in vadose zone soils through direct contact and vapor intrusion is possible. Therefore EPA's CAO for Facility soils is to control exposure to the hazardous constituents remaining in the soils by requiring the compliance with and maintenance of land use restrictions and the implementation of engineering controls and a soil management plan.

B. Groundwater

EPA expects final remedies to return usable groundwater to its maximum beneficial use, where practicable, within a timeframe that is reasonable. Until groundwater is restored to 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, EPA expects facilities to prevent or minimize the further migration of a plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction.

Therefore, EPA's CAOs for Facility groundwater are to restore groundwater to MCLs, and until such time that MCLs are achieved, to control exposure to the hazardous constituents remaining in the groundwater and to control the migration of impacted groundwater.

V. Proposed Remedy

Contaminated groundwater will be positively affected by the recent excavation of impacted soil and the injection of Zero Valent Iron (ZVI) into the subsurface to the east of the building where excavation was not practical. Subsequently, EPA determined that the following provides the best relative combination of attributes as the proposed remedy for the Facility:

1) Extraction and treatment of onsite groundwater

2) Long term groundwater monitoring

3) Land and groundwater use restrictions

4) Engineering controls

5) Soil Management Plan

A. Groundwater Extraction and Treatment

Groundwater extraction and treatment is designed to remove COCs from groundwater in order to meet the groundwater cleanup standards, i.e., MCLs, and discharge permit limits. Groundwater extraction and removal of the VOC mass prior to discharge to a surface water body will also prevent migration of groundwater containing VOCs exceeding their applicable MCLs beyond the Facility property boundary. The proposed groundwater extraction and treatment system is a proven technology for hydraulic containment. Groundwater flow modeling using site-specific data from the pumping tests was conducted to optimize extraction well locations and pumping rates to provide adequate capture of the VOC plumes. Potential contingency measures and equipment have been evaluated should unexpected conditions occur. The extraction well placement and water extraction rates were proposed in accordance with modeled conditions, and will be achieved using submersible pumps.

B. Long Term Groundwater Monitoring

Performance groundwater monitoring will be conducted periodically onsite to gather data to evaluate the effectiveness of the groundwater extraction and treatment system. The primary monitoring objective is to ensure the hydraulic control of the VOC-affected area by limiting further potential migration of VOCs in the groundwater system to offsite receptors. As part of the data analysis to determine achievement of the CAO, the observed heads, or water levels, from the site will be compared to the modeled heads generated from predictive flow simulations. The groundwater monitoring program will be conducted in accordance with an EPA/MDE approved Groundwater Monitoring Plan.

Offsite groundwater monitoring will be performed in accordance with an EPA/MDE approved Offsite Groundwater Monitoring Plan. Eleven deep monitoring wells installed in the Lower Patapsco aquifer south of the Facility will be monitored periodically; initially quarterly for new wells but eventually semiannually for all offsite wells. The wells will be monitored for changes in the VOC distribution to ensure the safety of offsite private wells.

C. Land and Groundwater Use Restrictions

Because COCs remain in the groundwater at the Facility above levels appropriate for workers and in subsurface soils at levels that may result in risks of adverse health effects above EPA's target risk levels if used for residential purposes, EPA's proposed remedy requires land and groundwater use restrictions for activities that may result in exposure to those contaminants.

EPA is proposing the following land and groundwater use restrictions be implemented at the Facility:

a) The Facility property may not be used for residential purposes;
b) All earth moving activities, including excavation, drilling and construction activities, shall be conducted in compliance with Facility-specific health and safety protocols and an MDE in consultation with EPA-approved Soil Management Plan (that includes appropriate Personal Protective Equipment requirements sufficient to meet EPA's acceptable risk and complies with all applicable OSHA requirements);
c) A vapor intrusion control system, the design of which shall be approved in advance by MDE in consultation with EPA, shall be installed in each new structure constructed above the contaminated groundwater plume or within 100-foot around the perimeter of the contaminated groundwater plume, unless it is demonstrated to MDE that vapor intrusion does not pose a threat to human health and MDE provides prior written approval that no vapor intrusion control system is needed; and
d) Groundwater at the Facility shall not be used for any purpose, including, but not limited to, use as a potable water source, other than to conduct the maintenance and monitoring activities required by EPA.

The land and groundwater use restrictions necessary to prevent human exposure to contaminants at the Facility will be implemented through an order and/or an Environmental Covenant pursuant to the Maryland Environmental Covenant Act (Maryland Environment Code Annotated § 1-800). If EPA determines that additional maintenance and monitoring activities, land use controls, or other corrective actions are necessary to protect human health or the environment, EPA has the authority to require and enforce such additional corrective actions through an enforceable mechanism which may include an order or Environmental Covenant, provided any necessary public participation requirements are met.

D. Engineering Controls

The future development of the Facility property will involve the demolition of the existing manufacturing building and construction of two (north and south) warehouse buildings separated by a truck loading area. The concrete floor slab for the planned south warehouse building will serve as a cap for the VOC-containing soils in this portion of the Facility. Annual inspections of the south warehouse concrete floor slab will be conducted following completion of the site development. Procedures (including recordkeeping) for the inspection and repair of the building floor slab, as deemed necessary, will be specified in a Site Management Plan, which will be provided to EPA and MDE for review and approval with documentation supporting the implementation of the soil response activities.

The construction plans for the Facility property will include the implementation of engineering controls to prevent vapor intrusion, including incorporation of a passive vapor mitigation system into the construction of the floor slabs for both the north and south warehouse buildings. The passive vapor mitigation system will prevent vapor intrusion by collecting VOC vapors that may potentially accumulate in the gravel sub-base under a polyethylene vapor barrier. Annual inspections will be conducted of the passive vapor mitigation systems in accordance with the Site Management Plan. Inspection documentation and regular maintenance requirements for the passive vapor mitigation systems will be provided with the final building plans, which will be included in the Site Management Plan.

E. Soil Management Plan

All soil excavation activities in the area of the southwestern portion of the former manufacturing building shall be conducted in a manner that minimizes the exposure of potentially contaminated soil to precipitation and the flow of potentially contaminated storm water runoff to surrounding areas. If excavations are backfilled, clean soil shall be used from an off-site borrow area. Geotextile fabric or composite shall be placed on the bottom and side walls of excavations to serve as a marker and barrier between clean soil/fill and impacted soil. Soil will be disposed of at a properly permitted disposal facility licensed to accept the waste. The procedures described in the plan may be revised, as necessary, to ensure that all soil disturbance activities are conducted in accordance with applicable laws and regulations.

VI. Evaluation of Proposed Remedy

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

A. Threshold Criteria

1. <u>Protect Human Health and the Environment</u> - EPA's proposed remedy for the Facility protects human health and the environment by adequately eliminating, reducing, or controlling unacceptable risk through a combination of active remedies to remediate contaminated groundwater and soil from the Facility, and through the implementation of institutional controls to prevent potential current and future exposure. These controls prevent the use of the Facility property for residential purposes and the use of impacted groundwater at the Facility. The controls also prevent or control the exposure to impacted soil where contamination above residential and/or industrial screening levels remains in place.

2. <u>Achieve Media Cleanup Objectives</u> - EPA's proposed remedy meets the appropriate cleanup objectives based on assumptions regarding current and reasonably anticipated land and groundwater use. The anticipated future land use for the areas of the Facility undergoing remediation is industrial. The majority of Facility soils contain contaminant concentrations that are below the EPA residential or industrial screening levels. For those areas where contaminant concentrations are above the EPA residential and/or industrial soil screening levels, ICs will be implemented to control potential direct contact. Similarly, the proposed remedy for groundwater meets appropriate cleanup objectives for current and future use until the active groundwater remedy achieves MCLs.

3. <u>Control the Source of Releases</u> - In its RCRA Corrective Action proposed remedies, EPA seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. Controlling the sources of contamination relates to the ability of the proposed remedy to reduce or eliminate, to the maximum extent possible, further releases. Wherever possible and practical at the Facility shallow and intermediate soils excavation and offsite disposal of contaminated soil has occurred. At units where contamination is left in place, i.e. deeper soils, controls will be put into place to control earth moving activities and to restrict use at these units.

B. Balancing/Evaluation Criteria

1. **<u>Long-Term Reliability and Effectiveness</u>** - The proposed remedy will maintain protection of human health and the environment over time by controlling exposure to the hazardous constituents remaining in soils and groundwater. The long term effectiveness is high, as use restrictions are readily implementable and easily maintained. Given the historical industrial uses of the Facility groundwater, use restrictions are expected to continue in the long term.

2. **<u>Reduction of Toxicity, Mobility, or Volume of Waste</u>** - The completion of the soil excavation and injection of ZVI has reduced toxicity, mobility, and the volume of soil COCs. The proposed remedy will actively further reduce the toxicity, mobility, or volume of the groundwater COCs by extracting and removing the VOC mass.

3. **<u>Short-Term Effectiveness</u>** – EPA's proposed remedy will not immediately affect groundwater. However upon startup of the groundwater extraction, beneficial effects will eventually be seen downgradient. Contamination in soil is largely at a greater depth so that potential exposure to construction workers is slight. Protective controls will be in place so short-term effectiveness is high. Once the groundwater use restrictions and Facility-specific Soil Management Plan are in place, the proposed remedy's short-term effectiveness is high.

4. **<u>Implementability</u>** - EPA's proposed remedy is readily implementable. Groundwater extraction and treatment is a well proven technology and easily implementable. Some of the control measures included in the proposed remedy, including State groundwater use restrictions where a public water supply is available, Facility-specific health and safety protocols, and a Soil Management Plan are routinely used as part of the remedy in cases such as this. The proposed control measures are compatible with current Facility uses and operations and can be implemented, maintained, and monitored effectively with a well-designed control plan.

5. **<u>Cost</u>** - The major cost components for the proposed remedy include the installation of pumping wells and purchase of water treatment technologies. Implementation of a monitoring and reporting program and implementation and maintenance of control programs have minimal cost. Emerson will develop a cost estimate for the EPA-approved corrective measures for the Facility as part of the design for Corrective Measures Implementation and to provide a basis for demonstrating financial assurance compliance. Based on EPA's best professional judgment, the proposed remedy is cost effective for the Facility.

6. **<u>Community Acceptance</u>** - There have been no known issues raised by the community regarding RCRA investigation efforts. Community acceptance of the proposed remedy will be evaluated based on comments received during the public comment period and will be described in EPA's Final Decision and Response to Comments.

7. **<u>State/Support Agency Acceptance</u>** - MDE has been involved throughout the Facility investigation and remedy selection process and generally has led the process. The proposed use restrictions included in the proposed remedy are generally recognized as commonly employed measures for long-term stewardship. Ultimately State/MDE support will be evaluated based on comments received during the public comment period.

VII. Environmental Indicators

Under the Government Performance and Results Act (GPRA), EPA has set national goals to address RCRA corrective action facilities. Under GPRA, EPA evaluates two key environmental clean-up indicators for each facility: (1) Migration of Contaminated Groundwater Under Control and (2) Current Human Exposures Under Control. The Facility met these indicators on September 24, 2015, and October 7, 2015, respectively. The environmental indicators are available at http://www.epa.gov/reg3wcmd/ca/md/webpages/mdd043373935.html.

VIII. Financial Assurance

Emerson will be required to demonstrate and maintain financial assurance for completion of the remedy pursuant to the standards contained in Federal regulations found at 40 C.F.R. § 264.145 and 40 C.F.R. § 264.143.

IX. Public Participation

Interested persons are invited to comment on EPA's proposed remedy. The public comment period will last thirty (30) calendar days from the date that notice of the start of the comment period is published in a local newspaper. Comments may be submitted by mail, fax, e-mail, or phone to Mr. Erich Weissbart at the address listed below.

A public hearing will be held upon request. Requests for a public hearing should be made to Mr. Erich Weissbart of the EPA Region III Office (410-305-2779). A hearing will not be scheduled unless one is requested.

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

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

U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103
Contact: Mr. Erich Weissbart (3LC20)
Phone: (410) 305-2779
Fax: (215) 814-3113
Email: weissbart.erich@epa.gov

Signature: [signature]

John Armstead, Director

Date: 3.16.16

Land and Chemicals Division
USEPA, Region III

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

ATTACHMENT 1

KOP-FLEX INC
HANOVER, MARYLAND
STATEMENT OF BASIS
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1. Environmental Strategies Corporation (ESC), 1999a, Summary of the Phase II Investigations for the Kop-Flex Facility, Hanover, Maryland.

2. Environmental Strategies Corporation (ESC), 1999b, Human Health Risk Assessment for the Kop-Flex Facility, Hanover, Maryland.

3. Environmental Strategies Corporation (ESC). 2001a. Response Action Plan, Areas 1 & 7, Emerson Electric Co., Kop-Flex Facility, Hanover, Maryland.

4. Environmental Strategies Corporation (ESC). 2001b. Response Action Plan, Areas 2 & 4, Emerson Electric Co., Kop-Flex Facility, Hanover, Maryland.

5. WSP Environment & Energy. 2009. Risk Assessment Report, Kop-Flex, Hanover, Maryland.

6. WSP USA Corp. 2013a. Response Action Plan Addendum Voluntary Cleanup Program Site #31, Kop-Flex Facility, Hanover, Maryland.

7. WSP USA Corp. 2013b. Conceptual Site Model for the On-property Area, Kop-Flex Voluntary Cleanup Program (VCP) Site #31, Hanover, Maryland.

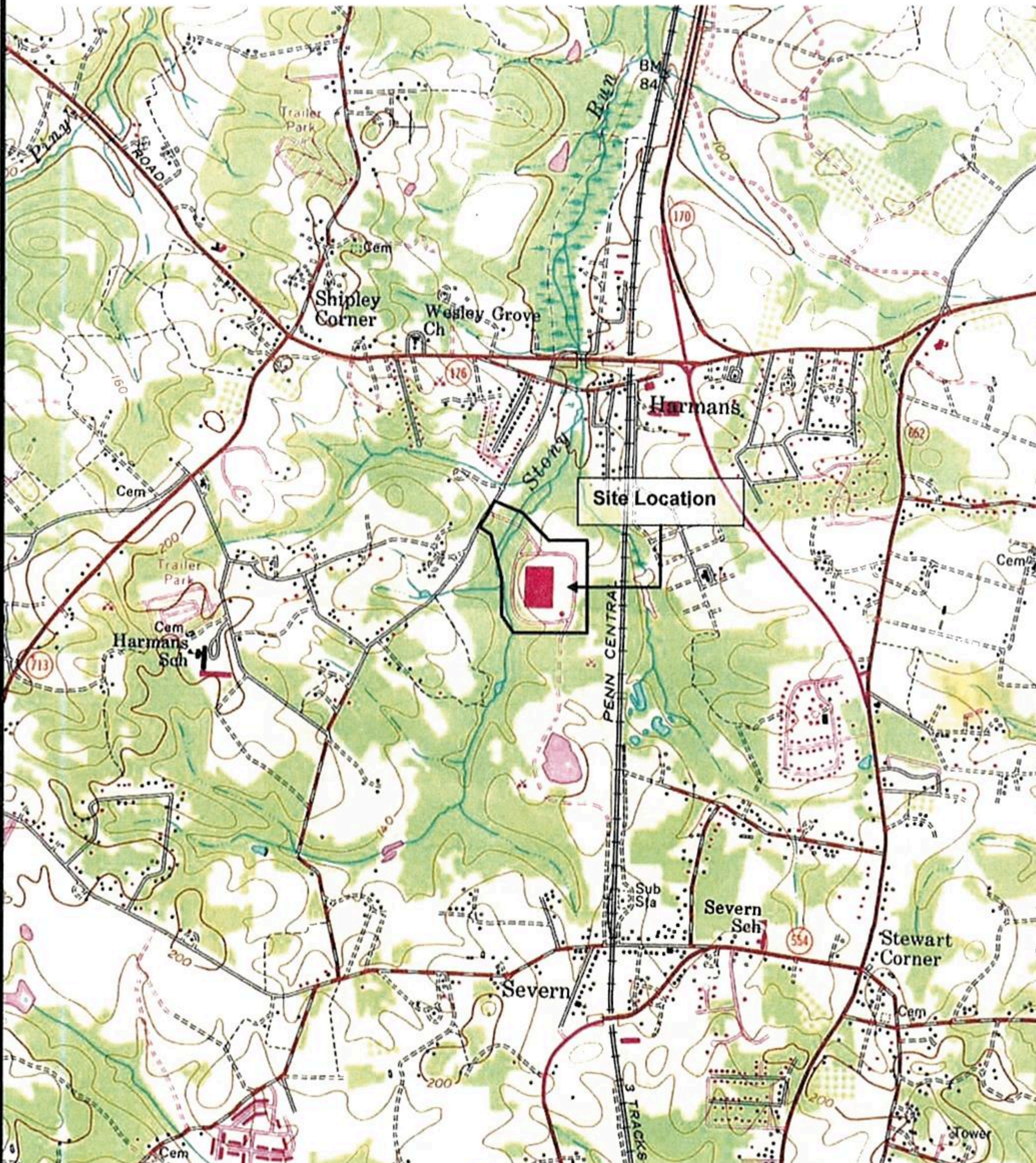
8. WSP USA Corp. May 12, 2014. Response Action Completion Report.

9. WSP USA Corp. March 2015. Site-Specific Risk Assessment, Former Kop-Flex Facility, Hanover, Maryland.

10. WSP USA Corp. October 2, 2015. Response Action Plan Former Kop-Flex Facility, Hanover, Maryland.

11. USEPA. September 2015. Documentation of Environmental Indicator Determination. Migration of Contaminated Groundwater Under Control.

12. USEPA. October 2015. Documentation of Environmental Indicator Determination. Current Human Exposures Under Control.



REFERENCE:
7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE
RELAY, MARYLAND
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SCALE, FEET

WSP

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500

FIGURE 1

SITE LOCATION MAP

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

A | Drawn By: | Checked: | Approved: | DWG Name: