DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: F. Bowie Smith
Facility Address: 4500 East Lombard Street Baltimore, Maryland 21244
Facility EPA ID #: MDD003100336

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

☒ If yes - check here and continue with #2 below.

☐ If no - re-evaluate existing data, or

☐ if data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	x			See below.
Air (indoors)[2]				
Surface Soil (e.g., <2 ft)				
Surface Water				
Sediment				
Subsurf. Soil (e.g., >2 ft)	x			See below.
Air (outdoors)				

☐ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

☒ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

☐ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

The former F. Bowie Smith & Sons wood preserver site is an approximately 10 acre parcel of land located in a heavily industrialized mixed use area in the City of Baltimore, Maryland. The site is owned by Birchwood Realty Company, Inc. and is currently undeveloped, containing foundations from some of the former F. Bowie Smith facilities.

The site is located approximately 0.2 miles west of the Lombard Street interchange with Interstate 895 (Harbor Tunnel Throughway). The site is bound to the east, north and west by CSX railroad track rights of way and to the south by Lombard Street. Industrial properties are located north, northwest, east and south of the site. The nearest residences are row homes located on North Kristen Street approximately 500 feet west of the site.

The site was a stove, bathtub and sink foundry from the late 1800s to 1945. In 1952 F. Bowie Smith & Sons Inc. purchased the property and redeveloped the site into a wood treatment facility. F. Bowie Smith operated on the site until the late 1980s.

According to the Maryland Department of the Environment (MDE) fact sheet, the wood preserving process at this site involved using pressure vessels to saturate wood with the preserving chemicals. Pentachlorophenol (PCP) was used as the preserving chemical until 1961, fluorochrome arsenate phosphate was used until 1976, creosote was used until 1983 and copper chromate arsenate was used from 1976 until 1988.

Drip areas were located in the north-central portion of the site to allow excess preservatives to drain from the wood. Two concrete collection tanks were used to capture solution not absorbed during the treatment process. In 1983, a closed treatment system was installed, allowing reuse of excess solution. Several storage tanks for holding the treatment chemicals and diesel fuel, used as a solvent during the creosote treatment process, were also located on the site, including along the northwest property boundary.

Four ground water monitoring wells were installed during the initial site investigation in 1986. These wells are located on the north, east, west and south of the contaminated areas and are identified as the North, South, East and West wells. Groundwater flow was determined to be towards the northwest. The south well became the up gradient well, or background well, for the analysis.

Twenty-one ground water sampling events were performed on the site from August 13, 1986 through February 14, 2003. The data showed concentrations of arsenic, chromium, naphthalene and pentachlorophenol (PCP) from the four monitoring wells above MCLs or Risk Based Screening Levels.

Since 2006 East Star has performed four on-site groundwater sampling events and one off-site groundwater sampling event. The on-site sampling was performed in July 2006, November 2007, May 2010 and December 2010. The November 2007 sampling event included installation and sampling of five temporary monitoring wells along the northwest property boundary to better define the groundwater gradient and delineate the conditions along the down gradient property line.

In December 2010, high concentrations of PCP (MCL of l ug/l) were found in the east and west wells which are near the location of the previous chemical storage tanks surrounding the wood treatment building. Well concentrations were at 290 ug/l (East well) and 1,200 ug/l (West well).

Concentrations of Naphthalene (RSL of .17 ug/l) also exist in the east and west wells. Well concentrations were at 54 ug/l (East well) and 27 ug/l (West well).

The east well also had concentrations of arsenic (38 ug/l) and chromium (790 ug/l) exceeding MCLs (arsenic MCL of 10 ug/l and chromium MCL of 100 ug/l).

Soil sampling was done in 1990. The soil analysis results showed some contamination at various locations on the site. The highest measured concentrations exceed the current MDE Non-residential cleanup standards for benzo(a)anthracene with the highest concentration at 52 mg/kg (MDE nonresidential standard of 3.9 mg/kg), benzo(b)fluoranthene with the highest concentration at 31 mg/kg (MDE nonresidential standard of 3.9 mg/kg), benzo(a)pyrene with the highest concentration at 42 mg/kg (MDE nonresidential standard of .39 mg/kg), dibenz(a,h)anthracene with the highest concentration at 21 mg/kg (MDE nonresidential standard of .39 mg/kg) and indeno(1,2,3-c,d)pyrene with the highest concentration at 19 mg/kg (MDE nonresidential standard of 3.9 mg/kg). Also Pentachlorophenol with the highest concentration at 93 mg/kg exceeded EPA nonresidential standard of 4 mg/kg.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No	No	No	No
~~Air (indoors)~~							
~~Soil (surface, e.g., <2 ft)~~							
~~Surface Water~~							
~~Sediment~~							
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

☒ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

☐ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

☐ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

A deed restriction on the property to limit construction and excavation was recorded on December 18, 1989.

The MDE's Hazardous Waste Enforcement Division (HWED) has been the lead group working with Birchwood Realty to finalize the remediation process that began in 1989. As stated by a MDE fact sheet for the site at http://mde.maryland.gov/assets/document/brownfields/F_Bowie_Smith.pdf, Birchwood performed removal and remedial activities on the site during the 1990s, including removing contaminated tanks, equipment, buildings and soil. A detailed soil investigation was performed to delineate the contaminated soil areas. Contaminated soil was removed from the site. In

July 2000, MDE approved the final phase of the remediation plan. Two areas, a 0.15 acre area and a 1.1 acre area overlying the contaminated groundwater, were capped with compacted fill, covered by an MDE approved geomembrane and topped with soil-cement. This work was completed by the end of 2000.

Groundwater sampling at the edge of the property has shown the contaminants are not leaving the site. It is anticipated for this facility that the final remedy will consist of ongoing groundwater monitoring of the existing well network for site related constituents including naphthalene, pentachlorophenol and related constituents exceeding risk based standards. The proposed monitoring program would include annual monitoring of facility wells. It is also noted that Baltimore city does not allow groundwater to be used as drinking water.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

☐ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

☐ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

☐ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

☐ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

☐ If no - (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

☐ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI (event code CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

☒ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the F. Bowie Smith facility, EPA ID # **MDD003100336**, located at **4500 East Lombard Street Baltimore, Maryland 21244** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

☐ NO - "Current Human Exposures" are NOT "Under Control."

☐ IN - More information is needed to make a determination.

Completed by (signature) -s- Date 9/1/2015
(print) Leonard E. Hotham
(title) Environmental Engineer

Supervisor (signature) -s- Date 9/1/2015
(print) Luis Pizarro
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Locations where References may be found:

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