

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action

Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Bethlehem Apparatus Company, Inc.

Facility Address: 935 Bethlehem Drive, Bethlehem, PA 18017

Facility EPA ID #: PA0000453084

- I. 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 #6 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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale/Key Contaminants</u>
Groundwater	_____	<u>X</u>	_____	No known or reported releases.
Air (indoors) ²	_____	<u>X</u>	_____	Normal operations include air handling and filtration equipment to ensure safe mercury vapor levels while inspecting, sorting, and crushing or otherwise preparing materials for retort.
Surface Soil (e.g., <2 ft)	_____	<u>X</u>	_____	No known or reported releases.
Surface Water	_____	<u>X</u>	_____	No surface water media on site.
Sediment	_____	<u>X</u>	_____	No sediment media on site.
Subsurf. Soil (e.g., >2 ft)	_____	<u>X</u>	_____	No known or reported releases.
Air (outdoors)	_____	<u>X</u>	_____	Facility does not operate under an air permit.

X 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):

Bethlehem Apparatus Company, Inc (Bethlehem Apparatus, BAB or facility) operates two facilities in Eastern Pennsylvania which use various methods for the recovery and resale of mercury. The original Bethlehem Apparatus Company, Hellertown (BAH) facility is located at 890 Front Street, Hellertown, Pennsylvania (PAD002390961) and commenced operations in 1948. The newer sister facility is the Bethlehem Apparatus Company, Bethlehem (BAB) facility located at 935 Bethlehem Drive, Bethlehem, Northampton County, Pennsylvania (PA0000453084 – Bethlehem Lamp Recycling)

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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which opened in 1994 and is the subject of this report. The BAB facility recycles/reclaims mercury from mercury bearing hazardous waste and sends it to BAH for further refining by distillation for sale to commercial and industrial users.

The facility is an approximately 38,400-square foot facility on a 2.88 acre parcel, which includes an office area, a paved receiving lot, a material sorting and preparation area with various safety and handling equipment, an enclosed and covered container storage area, six high vacuum mercury retorts and associated equipment, a high vacuum auto-feed retort system, a calomel (mercurous chloride) process area and a research and development laboratory. All hazardous and non-hazardous waste, raw material, and product handling and storage activities are conducted within the enclosed building. The facility does not make use of hazardous waste disposal, waste piles, land treatment or application, or surface impoundments. A mercury amalgamation area (for mercury retirement) was under development as noted in the Hazardous Waste Recycling Permit Application (August 2007).

Site activities at the facility are conducted in a large, well-lit, warehouse-like structure constructed of cement block, a steel roof frame, and concrete floors that are bisected by a wall and swinging doors. The floor has been coated with epoxy and the floor is contoured to provide over 59,000 gallons of secondary containment capacity in the event of a release. No releases have been recorded. Concrete is impermeable to mercury and provides a safe containment surface for mercury recovery and recycling operations. There are isolated and covered sump pits in the floor that serve as release collection points that may be pumped out as necessary. There is a ceiling-mounted sprinkler system. The facility has fire extinguishers and fire alarms, no smoking signs, restricted entry signs and spill cleanup kits throughout the building. The receiving and storage activities occur primarily in the western side of the building. The processing activities occur primarily in the eastern side of the building. The offices are located in the front eastern corner of the building. There is a laboratory attached to the rear of the office area where computers monitor the auto feed system on a real-time basis. Other activities conducted in the laboratory include the single batch retort preparation of most compounds and solutions and appropriate waste analysis.

The facility has twenty four hour electronic surveillance maintained by using entry sensors, motion detectors, and heat rise and smoke detectors. All equipment is designed to automatically shutdown if any operational parameter is exceeded.

Adjacent sites are commercial/light industrial properties. Beyond the adjacent commercial/light industrial properties are some scattered enclaves of residential houses.

The facility operated under permit-by-rule (PBR) until permitted. A Hazardous Waste Recycling Permit Application for hazardous waste treatment and storage was prepared and submitted on behalf of the facility by RT Environmental Services, Inc. (RT) on September 23, 2007 to Pennsylvania Department of Environmental protection (PADEP). On June 16, 2011, PADEP issued the facility Permit No. PA0000453084 for hazardous waste storage and treatment.

The facility is a mercury recycling facility, which accepts waste for retort and chemical processing for the purpose of recovery and resale of mercury. This facility receives hazardous waste material in steel 55 gallon drums or box quantities from waste generators representing a wide range of industries and agencies. Materials are delivered to the facility in company vehicles or by outside contractors and stored in containers until they are processed. The wastes managed are composed primarily of characteristic D009 (mercury) or U151 (mercury) waste. Some wastes also have secondary characteristic waste codes other than D009 and U151 because of the chemical composition of the material, typically D001 (ignitable), D002 (corrosive), D003 (reactive), D004 (arsenic), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D010 (selenium) and D011 (silver). Additional mercury bearing wastes include waste codes K071 (brine purification muds from mercury cells) and K106 (wastewater treatment sludge from mercury cells). Typical secondary characteristic codes are for other metals contained in the waste such as selenium, lead or cadmium. A D002 waste code is also accepted and found on many solutions and batteries because of their corrosivity. Typical materials accepted for processing include, but are not limited to: thermometers, switches (glass and steel), controls, relays, ignitron tubes, high pressure quartz lamps, mercury vapor lamps, mercury dental amalgams, mercury oil sludges, mercury spill kits, mercury compounds, mercury batteries, fluorescent lamps, mercury on carbon, cinnabar (mercuric sulfide) and mercury in soil

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(Hazardous Waste Permit Application, 2007).

SWMUs identified in the June 2011 permit, and confirmed during the 2011 site visit are as follows:

Facility Operation Area – Physical Treatment	Hazardous Waste Code
Retorts 1 through 6	Primary codes: D009, K071, K106 Secondary codes: U151, D001, D002, D003, D004, D005, D006, D007, D008, D010, D011
Lamp Recycling Area	
Battery Crushers	
Drum Crushers	
Centrifugal Separation System	
Amalgamation Process	
Facility Operation Area – Chemical Treatment	
Calomel Process	
Reaction Vessel for Reduction or Precipitation	

The aboveground storage tank (AST) information associated with the calomel process is summarized the following table.

ASTs				
Tank No.	Installed	Size (gallons)	Contents	Status/Owner
001A	7/22/1997	1,500	sodium hydroxide	Basic Chemical
002A	removed	100	hydrochloric acid	removed
003A				replaced in 2010 with tank 004A
004A		540	hydrochloric acid	Basic Chemical
4A		2,550	hazardous wastewater from the calomel process (D009 mercury/D010 selenium)	emptied in 90 days (disposed by DuPont)/BAH
4B		2,550	hazardous wastewater from the calomel process (D009 mercury/D010 selenium)	emptied in 90 days (disposed by DuPont)/BAH
4C		2,550	hazardous wastewater from the calomel process (D009 mercury/D010 selenium)	emptied in 90 days (disposed by DuPont)/BAH
4D		2,550	hazardous wastewater from the calomel process (D009 mercury/D010 selenium)	removed – sent for disposal in February 2011

On February 3, 1999, the facility was notified that the permit expired on November 6, 1997. On March 17, 1999, the facility submitted the stormwater permit renewal by completing a Notice of Intent (NOI) Under the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Associated with Industrial Activities form. Two outfalls were identified that discharge ultimately to the Lehigh River (Outfalls 01 and 02). Outfall 01 drains the paved parking area and roof drains; Outfall 02 drains an unimproved area. An outfall is located west of the building in the tree line. PADEP reissued NPDES Permit No. PAR232228 on April 15, 1999.

On March 29, 2004 and February 25, 2009 (renewal), PADEP issued a letter stating they had received the facility's No Exposure Certification for Discharges of Stormwater Associated with Industrial Activities form (NNOEX013-02) for the

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facility. The form certifies that a condition of no exposure exists at the facility, and that the facility must maintain a condition of no exposure to remain eligible for permit exemption. This exemption will expire on March 28, 2014.

The facility receives its water supply from the City of Bethlehem. The City of Bethlehem's water comes entirely from surface water sources, namely the Wild Creek Reservoir, Towamensing Township, Carbon County, in a watershed that covers 22 square miles and the Penn Forest Reservoir, Penn Forest Township, Carbon County and Polk Township, Monroe County, in a watershed that covers 17 square miles. This primary water supply is located 22 miles north of the City. The Tunkhannock Creek, Tunkhannock Township, Monroe County provides a supplemental supply to the Penn Forest Reservoir. Dual transmission mains can carry up to 47 million gallons of water per day to the city's water filtration plant in Lehigh Township and from there to the distribution system (2009 Bethlehem Consumer Confidence Report).

Information obtained from the Pennsylvania Department of Conservation and Natural Resources (DCNR) Groundwater Information System (PaGWIS) accessed on March 31, 2011 provided information regarding six groundwater wells located within a 0.5 mile radius of the facility. The open holed wells were installed between 1936 and 1967 and ranged in depth of 335 to 433 feet below ground surface (bgs) based on available data. Five of the six wells were listed as withdraw wells for industrial use, located southwest of the facility, and one well was used for air conditioning, located to the north of the facility.

Groundwater: There have been no known or reported releases that occurred on the interior portion of the property that would indicate groundwater had been impacted; therefore, there have been no groundwater investigations conducted at the facility. The neighboring properties are connected to the public water supply.

Air (outdoors): The facility does not maintain any air permits. However, the facility uses several models of dust collection/mercury vapor filtration units at the facility. The units incorporate particle and carbon filtration to capture mercury material and vapor. The facility maintains air emission control devices including: cyclonic separator, bag house filters, high efficiency particulate air (HEPA) filters and charcoal filters. Air is circulated through the building. There have been no reported releases.

Within the facility, the sorting and preparation equipment area includes air handling and filtration equipment to ensure safe mercury vapor levels while inspecting, sorting, and crushing or otherwise preparing materials for retort. Crushing and processing equipment incorporate safety interlocks and filtration to provide safe operation and maintain a healthy work environment. The six batch retorts and the auto-feed retort operate within a narrow range of parameters and are designed to safely shutdown if any parameter is exceeded.

No information regarding investigations or remedial actions for environmental media was located during the regulatory file review for the facility. No incidents of any releases have been reported by the facility. Therefore, considering the available information about the facility, there are no chemicals documented in soils and/or groundwater at this facility that are identified as sufficiently volatile and toxic to warrant evaluation of potential subsurface vapor to indoor air.

Soil: There have been no reported releases or investigation of soil contamination at this facility.

Surface Water/Sediment: Not relevant as there is no surface water on or near the facility.

Air (indoors): Not relevant as there is no indication of groundwater or soil contamination at this facility.

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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

Contaminated Media	Potential <u>Human Receptors</u> (Under Current Conditions)						
	<u>Residents</u>	<u>Workers</u>	<u>Day-Care</u>	<u>Construction</u>	<u>Trespassers</u>	<u>Recreation</u>	<u>Food</u> ³
Groundwater							
Air (indoors)							
Soil (surface, e.g., <2 ft.							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft.							
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):

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):

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):

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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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 (and 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 Bethlehem Apparatus Company, Inc. facility, EPA ID # PA0000453084, located at 935 Bethlehem Drive, Bethlehem, PA 18017 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) [Signature] Date 10/25/12
(print) KHA. M. DAO
(title) EPA PROJECT MANAGER

Supervisor (signature) [Signature] Date 10-26-12
(print) Paul Gotthold
(title) Associate Director, LCD
(EPA Region or State) EPA R3

Locations where References may be found:

USEPA Region III
Waste and Chemical Mgmt. Division
1650 Arch Street
Philadelphia, PA 19103

PADEP
North East Regional Office
2 Public Square
Wilkes-Barre, PA 18701

Contact telephone and e-mail numbers

(signature) _____
(print) _____
(title) _____

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Facility Name: Bethlehem Apparatus Company, Inc.
EPA ID# PA0000453084
City/State Bethlehem, PA 18017

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