DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	U.S. Bronze Foundry & Machine, Inc.
Facility Address:	18649 Brake Shoe Road; Woodcock Township, PA 16335-0458
Facility EPA ID #:	004 318 416

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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?

   X 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 nonhuman (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Controls" 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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants withingroundwater (e.g., non aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

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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Facility Background

The U.S. Bronze facility is located in the southwest corner of Woodcock Township in Crawford County, approximately 2.5 miles north of Meadville, PA. The facility is bordered on the north and south by residential areas, on the west by French Creek and on the east by Conrail tracks and U.S. Route 19.

The Property has been operated since 1947 by several organizations for the production of non-ferrous brass and bronze castings. The facility was first operated by ABEX from 1947-1987, then ABC Rail Company from 1987 to 1988, and finally US Bronze has operated at the facility since 1988. Prior to US Bronze's occupancy of the Property, various material management practices were used at the Property, including disposal of solid waste in an on-site landfill, reclamation of liquid wastes in lagoons and basins, use of foundry sand for fill material in the south parking lot, and placement of foundry sand on the ground surface in various areas.

U.S. Bronze currently operates as a foundry and machine shop producing non-ferrous castings, and semi-finished and finished machined products. The products consist mostly of bearings and bushings used in the mining, sugar, steel and other heavy industries. The general operations of the plant consist of melting alloys and casting metal into sand or metal-chilled molds. The castings go through a general cleaning operation and then are machined and inspected. Wastes generated during plant operations include waste silica foundry sands, dust collected from the sand reclamation operation, waste material generated from the shell sand operation and stoddard solvent. Discharges from air pollution control systems (baghouses) generated from the melting operation of brass and bronze and containing hazardous concentrations of lead and cadmium are shipped to an accepted destination.

In the early 1960s ABEX began utilizing a 3.1 acre portion of their property southwest of the main building and South Parking Area for the storage and disposal of various types of high metals content wastes. Baghouse dusts and lagoon sludges containing hazardous levels of lead were deposited in the landfill. The landfill, which contains approximately 31,600 cubic yards of waste, was successfully closed in 1985 in compliance with PADEP and USEPA regulations.

ABEX also operated two wastewater treatment lagoons west of the North Parking Area as part of their industrial waste treatment facility. The lagoons were identified as containing hazardous wastes in ABEX's Part A Application. The impoundments were clay-lined and operated from an unknown date until 1984 when alternate methods of processing and recycling wastewater eliminated the wastewater discharge to the lagoons. Under approval of the ABEX's NPDES permit, the plant properly closed both lagoons in 1985.

Results of previous investigations indicate that portions of the Property contain inorganic constituents, primarily metals such as lead, copper, and zinc, at concentrations of potential concern. A Site Characterization (SC), implemented between 2003 and 2006 divided the site into five distinct areas.

- Fuel Tank Area

  This area located on the northeastern side of the Facility contains four decommissioned 20,000-gallon above ground storage tanks (ASTs). Historically, the tanks were used from 1947 through 1984 and contained No. 1 and No. 2 fuel oil. One of the tanks was also used to store facility generated waste oils occasionally. Based on data collected during the SC and subsequent rounds of groundwater attainment sampling, the concentrations of regulated substances related to petroleum compounds in subsurface soils or groundwater were below applicable statewide health standards (SHSs). Therefore, no remedial activities are required to address this area.

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- South Parking Lot Area

  At the time of the SC, the South Parking Lot Area was a one-acre area that included an asphalt parking lot located southwest of the main building. This area also included a steep grass-covered slope extending from the parking area to the field in the southwestern portion of the property. Spent foundry sands and limited quantities of other fill materials from Facility operations were used to bring the parking lot to grade between 1959 and 1969. The spent foundry sands are known to contain elevated levels of metals, primarily lead, which exceed the applicable PADEP SHSs. In Fall 2008, an asphalt cover system was placed over the existing parking lot and a composite and geocomposite cover system was placed on the western slope of the area. These covers, along with institutional controls designed to maintain the engineered components and limit future site activities in this area effectively eliminated potential future exposure pathways.
- Slag Reclamation/Bank Area

  This area is comprised of a former wastewater management basin and the adjacent bank, located in the north central portion of the property, and extending onto an adjacent unused portion of a residential property to the north. The Slag Reclamation Basis (SRB) was used to manage solids from the reclamation process. These solids were periodically excavated and placed on the adjoining Bank Area. At the time of the SC, the SRB had been filled to grade with sludge, debris, and soils that contained elevated concentrations of metals, primarily lead. Waste materials consisting of dried sludge and foundry sand were also seen in the Bank Area and the adjacent residential property. Approximately 4,500 cubic yards of waste materials are believed to have been deposited in this area.
- Metals Impacted Soils and Sediment (MISS) Area

  This area includes the entire property, except the closed on-site landfill, Fuel Tank Area, South Parking Lot Area and SRB Area. The area also includes the sediments in the adjacent surface water bodies. Most of the surface and subsurface soil samples collected from most of the MISS area did not exhibit contaminant concentrations above the applicable SHSs. However, metals (primarily lead) were detected at elevated concentrations compared to SHSs at the following locations: a 2-acre area surrounding the SRB area, a 0.5-acre area in the Equipment Storage Area north of the foundry building, a 0.1-acre area in the center of the field north of the entrance road and sediments in a portion of the unnamed tributary adjacent to the Bank Area and in drainage features adjacent to stormwater outfalls on the western portion of the site.
- Facility Groundwater

  Groundwater from 12 monitoring wells, theFacility production well and one temporary monitoring well was sampled as part of the SC activities. The results of the groundwater monitoring indicated slightly elevated total lead concentrations at three locations; however, corresponding dissolved phase lead concentrations were not detected above the applicable SHSs in any of the samples.

U.S. Bronze Foundry & Machine, Inc. is seeking a release of environmental liability under the Pennsylvania Department of Environmental Protection's (PADEP) Act II Land Recycling Program and has enrolled in PADEP's and U.S. EPA Region 3's "One Cleanup Program" initiative. This program assures that the Facility's RCRA Corrective Action obligations are satisfied concurrently with the PADEP Act II requirements. The Facility has already received Act II releases of liability for the South Parking Lot and Fuel Tank Areas.

2. Is **groundwater** 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 anywhere at, or from, the facility?

_____	If yes – continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.
X	If no – skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."
_____	If unknown (for any media)– skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The Facility is located within the Appalachian Plateau physiographic province and is underlain by the Mississippian Age Bedford Shale. The shale is overlain by Pleistocene Age Kent Till, which ranges in thickness from 25 feet to 50 feet and consists of poorly sorted silt, sand, gravel and clay. The uppermost water bearing zone occurs in the till under unconfined conditions and the depth to water is typically between 5 feet and 25 feet below the ground surface (bgs). This aquifer is used for water supply on site and potentially in the surrounding residential areas. Groundwater levels and the local topography both indicate that groundwater in the unconfined aquifer discharges into the adjacent French Creek and/or its unnamed tributary and groundwater flow direction is generally to the west/northwest across the site.

For the 2006 SC, a Facility-wide groundwater monitoring network including 12 on-site monitoring wells, the Facility production well and one on-site temporary monitoring well was established. The network included five existing wells used to monitor the closed landfill, three existing wells in the vicinityof the Slag Reclamation Basin, and four new wells (two installed in the South Parking Lot Area, one downgradient from the Fuel Tank Area and one downgradient from the contaminated soils in the field on the northern and western portion of the Facility.

Groundwater data associated with two rounds of sampling collected as part of the SC indicated several samples slightly exceeding the PADEP Statewide Health Standard (SHS) for total lead. However, corresponding dissolved phase lead results at these locations were below the practical quantitation limit (PQL), and the total suspended solids concentration was elevated at each location where an exceedance for lead was observed. This suggests that the higher total lead concentrations were due to biases introduced during the sampling procedure and that the dissolved phase data are more representative of actual aquifer conditions. No other groundwater contaminants were detected in excess of their respective SHSs during the SC sampling events or subsequent attainment sampling events.

Ref.: Site Characterization Report, U.S. Bronze Foundry and Machine, Inc., Meadville, Pennsylvania, prepared by GeoSyntec Consultants, September 2006; Final Report– Fuel Tank Area Site, U.S. Bronze Foundry and Machine, Inc., Meadville, Pennsylvania, prepared by GeoSyntec Consultants, September 2009; Final Report, South Parking Lot Site, U.S. Bronze Foundry and Machine, Inc., Meadville, Pennsylvania, prepared by GeoSyntec Consultants, October 2009; Risk Assessment Report, Metals ImpactedSoils and Sediments Site, U.S. Bronze Foundry and Machine, Inc., Meadville, Pennsylvania, prepared by GeoSyntec Consultants, October 2009; Final Environmental Indicator Inspection Report, U.S. Bronze Foundry & Machine, Woodcock Twp., PA, prepared by Foster Wheeler Environmental Corporation, December 2002.

[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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[1] as defined by the monitoring locations designated at the time of this determination)?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2])

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

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[1] "Existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determinaton, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): _____

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "in**significant**" (i.e., the maximum concentration[2] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate "level(s)," and if estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing. .

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

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[2] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be **"currently acceptable"** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[3])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[4] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be **"currently acceptable"**) – skip to #8 and enter a "NO" status, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems..

_____ If unknown – skip to 8 and enter "IN" status code.

Rationale and Reference(s): _____

[3] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[4] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): _____

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), 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).

X YE - Yes, "Migration of contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the U.S. Bronze Foundry & Machine facility, EPA ID# PAD, 004 318 416, located at 18649 Brake Shoe Road, Woodcock Township, PA. Specifically, this determination indicates that the migration of "contaminated" groundwater isunder control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

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

Completed by: (signature) Andrew Clibanoff Date 7/30/10
(print) Andrew Clibanoff (EPA Region 3)
(title) RCRA Project Manager

Supervisor: (signature) Paul Gotthold Date 8-3-2010
(print) Paul Gotthold
(title) Associate Director, Office of Pennsylvania Remediation
EPA Region 3

Locations where References may be found:

All reference documents can be found at the USEPA Region III Office in Philadelphia.

Contact telephone and e-mail numbers:

(name)	Andrew Clibanoff
(phone #)	215-814-3391
(e-mail)	Clibanoff.andrew@epa.gov