DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 6/30/03
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **Benton Creosoting Works**
Facility Address: **6695 Highway 3, Benton, Louisiana 71006**
Facility EPA ID #: **LAD008056632**

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?

   X 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.

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).

Facility Information

Benton Creosoting Works (Benton) is located on the west side of Louisiana State Highway 3 in the City of Benton in Bossier Parish, Louisiana, approximately two miles north of Benton and 15 miles north-northwest of Bossier City. The geographic coordinates of the Benton site are 32° 40' 30" North Latitude and 93° 45' 0" West Longitude.

The facility conducts wood preserving activities, yielding products such as pilings, telephone poles, and railroad ties. The primary wood treating preservative used at the facility is creosote, but pentachlorophenol may have been used in the past. Benton has been in operation since August 1948. The facility ceased operation in November 7, 1985. Benton resumed operation in the spring of 1987 and currently consists of an office building, process building, and storage yard area. The solid management waste units (SWMUs), areas of concern (AOCs), and an area of interest (AOI) identified at the Benton site include the three former ponds (SWMU 1, 2, and 3), former drum storage area (SWMU 4), distillation unit (SWMU 5), dike and oil separator (SWMU 6), freshwater pond/borrow pit (SWMU 7), spoil pile (SWMU 8), treating cylinders cleaning area (SWMU 9), new hazardous waste storage area (SWMU 10), two biotreatment tanks (SWMU 11), facility roads (AOC 1), loading area (AOC 2), storage and wood products area (AOC 3), and drainage ditches (AOI 1). A detailed summary of SMWUs, AOCs, AOI, and site conditions is presented in the Draft Conceptual Site Model Report (Booz Allen, 2003a).

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	___	Below RECAP screening standards
Air (indoors)[2]	___	X	___	No impact to indoor air
Surface Soil (e.g., <2 ft)	X	___	___	**Above RECAP screening standards / SVOCs**
Surface Water	___	X	___	No Impact to surface waters
Sediment	X	___	___	**Above RECAP screening standards / SVOCs**
Subsurf. Soil (e.g., >2 ft)	X	___	___	**Above RECAP screening standards / SVOCs**
Air (outdoors)	___	X	___	No impact to outdoor air

___ 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.

__X__ 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):

No further action for former drum storage area (SWMU 4), distillation unit (SWMU 5), dike and oil separator (SWMU 6), spoil pile (SWMU 8), facility roads (AOC 1), and loading area (AOC 2) was recommended by EPA in the RCRA Facility Assessment (EPA, 1989). The Louisiana Department of Environmental Quality (LDEQ) approved no further action subsequent to remedial action at Pond 2 (SWMU 2) and Pond 3 (SWMU 3) in September 1995 (LDEQ, 1996). Closure activities were conducted at Pond 1 (SWMU 1) and LDEQ issued a Final Modified Post-closure Permit in October 1997 (LDEQ, 1997). In 2000, LDEQ approved no further action for biotreatment tanks (SWMU 11). The remaining areas, which include the borrow pit/freshwater pond (SWMU 7), treating cylinder cleaning area (SWMU 9), hazardous waste storage area (SWMU 10), wood products storage area (AOC 3), and drainage ditches (AOI 1), have not received No further action designations (Booz Allen, 2003a).

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[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.

Groundwater: The post-closure permit issued for SWMU 1 required groundwater be monitored (LDEQ, 1997) and a monitoring well network was installed to fulfill this requirement. The most recent groundwater sampling conducted by the facility was in July 2000 (C-K, 2000). However, an EPA contractor sampled the monitoring wells in April 2003 (Booz Allen, 2003b). In addition, groundwater was collected from two deep soil borings during this sampling event. The groundwater samples were analyzed for semivolatile organic compounds (SVOCs) and SVOCs were detected in groundwater collected from the monitoring wells and deep soil borings. LDEQ has classified the aquifers beneath the Benton site as Groundwater Class 3B (GW3B), which is a non-potable water unit that is sufficiently permeable to transmit water to a well at a maximum sustainable yield of less than 800 gallons per day (LDEQ, 2003). LDEQ has also indicated that the closest surface water body downgradient of the Benton site (south) is non-drinking water and provided an acceptable dilution and attenuation factor (DAF3) value of 110 (LDEQ, 2003). The DAF3 accounts for dilution due to migration (vertical and horizontal) from the contaminant source to the closest surface water body. The groundwater class 3 non-drinking water (GW3NDW) values were multiplied by the DAF3 to attain the applicable site-specfic Risk Evaluation /Corrective Action Program (RECAP) screening standard (GW3ss). The SVOC concentrations detected in groundwater were compared to the RECAP screening standards; these concentrations were below the RECAP standards. The maximum detected groundwater concentrations at the site were as follows: 0.43 mg/l of acenaphthene (GW3ss = 59.4 mg/l), 0.21 mg/l of dibenzofuran (GW3ss = 1.65 mg/l), 3.7 mg/l of 2,4-dimethlyphenol (GW3ss = 49.5 mg/l), 0.53 mg/l of 2-methylnaphthalene (GW3ss = 2.97 mg/l), 8.6 mg/l of 2-methylphenol (GW3ss = 4,290 mg/l), 25 mg/l of 4-methylphenol (GW3ss = 429 mg/l), 9.1 mg/l of naphthalene (GW3ss = 24.2 mg/l), 0.76 mg/l of pentachlorophenol (GW3ss = 0.11 mg/l), 0.35 mg/l of phenanthrene (GW3ss = 23.1 mg/l), and 33 mg/l of phenol (GW3ss = 18,700 mg/l).

Indoor Air: Since there is currently no media impacted with volatile organic compounds (VOCs), indoor is not expected to be of concern.

Surface/Subsurface Soil: No soil investigation was conducted at AOC 3, SWMU 9, and SWMU 10 prior to April 2003. Soil samples were collected from various depths (0-8 feet below ground surface [bgs]) at AOC 3, SWMU 9, and SWMU 10 during the April 2003 sampling event and analyzed for SVOCs. SVOCs were detected in soil at AOC 3, SWMU 9, and SWMU 10. The SVOC concentrations were compared to the RECAP screening standards under the Screening Option (SO) for industrial use (SOIL_SSi); these concentrations exeeded the RECAP standards (Booz Allen, 2003b). The maximum detected concentrations in soil across the site were as follows: 64 mg/kg of benzo(a)anthracene (SOIL_SSi = 2.9 mg/kg), 50 mg/kg of benzo(b)fluoranthene (SOIL_SSi = 2.9 mg/kg), 45 mg/kg of benzo(k)flouranthene (SOIL_SSi = 29 mg/kg), 28 mg/kg of benzo(a)pyrene (SOIL_SSi = 0.33 mg/kg), 1.1 mg/kg of dibenz(a,h)anthracene (SOIL_SSi = 0.33 mg/kg), and 200 mg/kg of naphthalene (SOIL_SSi = 43 mg/kg).

SWMU 7

Surface Water: One surface water sample was collected at the southern end of the freshwater pond/borrow pit, which is the closest point to the facility's process area and where contamination would most likely occur. This sample was analyzed for SVOCs and no contaminants were detected (Booz Allen, 2003b). In addition, no SVOCs were detected in sediment collected from SWMU 7. Thus, surface water at SWMU 7 is not currently impacted and not expected to be of concern.

Sediment: Sediment samples were collected from SWMU 7 and AOI 1 in April 2003 and analyzed for SVOCs. SVOCs were not detected in sediment samples collected from SWMU 7; however, SVOCs were detected in sediment samples collected from AOI 1 (Booz Allen, 2003b). Since the drainage ditch is intermittent (i.e., only water-filled during rain events), the sediment sample concentrations were compared to the soil RECAP screening standards. In addition, since the location of AOI extends outside of the facility's fence, the sediment sample concentrations were conservatively evaluated under the Screening Option (SO) for non-industrial use (SOIL_SSni). SVOC concentrations exceeded RECAP screening standards. The maximum detected concentrations of SVOCs in sediment at AOI 1 were as follows: 4.6 mg/kg of benzo(a)anthracene (SOIL_SSni = 0.62 mg/kg), 45 mg/kg of benzo(b)fluoranthene (SOIL_SSni = 0.62 mg/kg), 20 mg/kg of benzo(a)pyrene (SOIL_SSni = 0.33 mg/kg), and 7.4 mg/kg of indeno(1,2,3-cd)pyrene (SOIL_SSni = 0.65 mg/kg).

Outdoor Air: No outdoor air investigation has been conducted at the site. However, since VOCs have not been detected in groundwater, migration of VOCs from groundwater into outdoor air via volatile emissions is not expected to be of concern. Although contaminated particulates may potentially be present at the site, inhalation of particulates are not expected to be a significant exposure pathway for several reasons. Due to the decrease in marketplace demand for treated wood products, the Benton facility does not operate near capacity. It is unlikely that new construction projects would be initiated at the Benton site; thus, significant intrusive activities that may emit potentially contaminated particles to the air are also unlikely. The surface soil at AOC 3, SWMU 9, and SWMU 10 consists of hard-packed clay, which is less likely to disperse potentially contaminated particulates. In addition, the reduced production capacity also minimizes the vehicular traffic that occurs at the site that, in turn, minimizes the amount of particulates in outdoor air at the site. Plus, natural dispersion may also reduce the amount of particulates in outdoor air at the site. Given the aforementioned reasons, the inhalation of potentially contaminated particulates is not currently considered to be a significant exposure pathway at the site. Thus, the inhalation of potentially contaminated particulates and/or volatile emissions are not currently expected to be a significant exposure pathway at the site.

References:

EPA, 1998. "RCRA Facility Assessment (RFA), Benton Creosoting Works, Benton, Louisiana." U.S. Environmental Protection Agency (EPA), Region VI, December 1988.

LDEQ, 1996. "General Inspection Form, Benton Creosoting Works, Benton, Louisiana." Louisiana Department of Environmental Quality (LDEQ), April 1, 1996.

LDEQ, 1997. "Final Modified Post-closure Permit, Benton Creosoting Works, Benton, Louisiana." Louisiana Department of Environmental Quality (LDEQ), October 1997.

C-K, 2000. "Second Quarter Groundwater Monitoring Report, Benton Creosoting Works, Benton, Louisiana." C-K Associates, Inc. (C-K), July 2000.

Booz Allen, 2003a. "Draft Conceptual Site Model, Benton Creosoting Works, Benton, Louisiana." Booz Allen Hamilton (Booz Allen), February 5, 2003.

Booz Allen, 2003b. " Soil, Sediment, groundwater and Surface Water Sampling Investigation Report, Benton Creosoting Works, Benton, Louisiana." Booz Allen Hamilton (Booz Allen), June 30, 2003.

LDEQ, 2003. "Email correspondence from Doug Bradford, LDEQ to Nancy Fagan, EPA, re: Groundwater RECAP Standards, Benton Creosoting Works, Benton, Louisiana." Louisiana Department of Environmental Quality (LDEQ), July 3, 2003.

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~~							
~~Air (indoors)~~							
Soil (surface, e.g., <2 ft)	no	yes	no	yes	no	no	no
~~Surface Water~~							
Sediment	no	no	no	no	no	no	no
Soil (Subsurface, e.g., >2 ft)	no	yes	no	yes	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.

__X__ 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

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

Rationale and Reference(s):

The Benton site is an industrial facility and no residents or day-care centers are currently present. Thus, residential and day-care exposure to contaminated surface/subsurface and sediment are not considered complete exposure pathways. The Benton facility is not used for agriculture; thus the exposure to contaminated surface/subsurface soil and sediment via food intake is also not considered a complete exposure pathway.

Surface/Subsurface soil: The Benton site has a fence located on three sides (southern, eastern, and western portions) of the facility that restrict access to trespassers at the site. Also, signs are posted at northern portion of the facility, south of the freshwater pond, that clearly state that no trespassing is allowed and that hazardous substances are present at the site. Thus, the trespasser exposure pathway was not currently considered complete. Recreators may potentially fish or wade at the freshwater pond/borrow pit (SWMU 7) located north of the facility's process areas. However, since no surface soil contamination has been detected at SWMU 7, there is no potentially complete exposure pathway. On-site workers and construction workers may potentially be exposed to contaminated surface/subsurface soil at the AOC 3, SWMU 9, and SWMU 10. Thus, worker and construction worker exposure to contaminated surface/subsurface soil was considered a completed exposure pathway.

Sediment: The drainage ditch is located to the west of the active process area at the Benton site and east of Saint Louis Railway. The only access to the drainage ditch for trespassers/recreators is along the railroad tracks, where freight trains frequently travel, and down a steep slope. In addition, since the surface water is present intermittently, the drainage ditch is not an attractive area for recreational use (e.g, wading). It is unlikely that a trespasser would frequent the area due to risk involved with access to the site and lack of suitable recreational areas. Therefore, trespasser exposure to sediment in the drainage ditch is not currently considered a completed exposure pathway.

Considering the drainage ditch is not located within the Benton facility's active process areas, it is unlikely that on-site workers or construction activities would occur at the drainage ditch. In addition, it is unlikely that railroad maintenance workers would access the drainage ditch given the slope from the railroad tracks to the drainage ditch (or vise versa). Therefore, on-site workers, railroad worker, and construction worker exposure to sediment in the drainage ditch is not currently considered a completed exposure pathway.

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)?

__X__ 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):

Surface/Subsurface Soil: Although worker and construction worker exposure to contaminated surface/subsurface soil is considered a completed exposure pathway, the exposure is not currently expected to be significant due to institutional controls at the Benton facility. Worker safety procedures (e.g., personal protective equipment) have been established for on-site workers, in accordance with applicable Occupational Health and Safety Administration (OSHA) regulations and guidance, to mitigate potential exposures to contaminated surface/subsurface soil. In addition, construction workers performing intrusive activities at the Benton facility are required to implement a health and safety plan, in accordance with applicable OSHA regulations and guidance, to mitigate potential exposure to contaminated surface/subsurface soil.

[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.

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):

Not Applicable

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):

X 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 **Benton Creosoting Works** facility, EPA ID # **LAD008056632**, located at Benton, Louisiana 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 _____ Date 6/30/2003
Dennis Piper
Geologist

Supervisor _____ Date 6/30/2003
Douglas Bradford
La. DEQ

EPA: Larry Brumley 6PD-N 4/16/04

Locations where References may be found:

LDEQ Public Records.

Contact telephone and e-mail numbers

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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.