DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 6/30/03
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater 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 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.

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 EIs 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 objectives of the RCRA Corrective Action program, the EIs 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 within groundwater (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 Determination status codes should remain in the 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. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., 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 - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The site is underlain by Quaternary and Tertiary age sediments. Logs for soil borings advanced at the site indicate gray to orange clay to a depth of approximately 8 feet below ground surface (bgs), orange to red clay with calcareous nodules from approximately 8 to 15 feet bgs, and red silty sand and brown fine to medium grained sand to depths of approximately 60 feet to 71 feet bgs. A lignite layer lies below these sands (EMI, 1987).

Water level measurements collected in April 2003 indicate that shallow groundwater at the Benton site occurs in the silty sand unit at depths of between approximately 16 and 19 feet bgs (Booz Allen, 2003b). Groundwater flow direction based on these measurements is south - southwest, as shown in Figure 1. According to the Louisiana Department of Environmental Quality (LDEQ), groundwater in the silty sand unit above the lignite layer is designated under the Risk Evaluation Corrective Action Program (RECAP) as Groundwater Class 3B, which is a non-potable water standard for a 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).

Concentrations of semi-volatile organic compounds (SVOCs) in groundwater in excess of the LDEQ RECAP screening standards (SS) for Class 3B groundwater have been reported at the site. The maximum concentrations in groundwater from the most recent sampling event in April,003 (Booz Allen, 2003b) are summarized in Table 1. LDEQ evaluated these exceedances using Management Option 3B (MO-3B) and, according the RECAP procedures, developed site-specific standards for the evaluation of exposure and environmental fate and transport (LDEQ, 2003). Comparison of the maximum concentrations reported in the April 2003 sampling event with these site-specific standards, presented in Table 1, indicate no exceedance of standards.

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

Table 1. Maximum SVOC Groundwater Concentrations Compared to MO-3B (Φg/L)

Constituent	Well I.D.	Concentration[1]	Site-Specific Management Option 3B[2]
Acenaphtene	DB-1(60')	430	59,400
Dibenzofuran	DB-1(60')	210	1,650
2,4-Dimethyphenol	DB-1(20')	3,700	49,500
2-methynaphthalene	DB-1(60')	530	2,970
2-methyphenol	DB-1(20')	8,600	4,290,000
4-methyphenol	DB-1(20')	25,000	429,000
Naphthalene	DB-1(40')	9,100	24,200
Pentachlorophenol	MW-11	76	110
Phenanthrene	DB-1(60')	350	23,100
Phenol	DB-1(20')	33,000	18,700,000

1. Samples collected and laboratory analyzed in April, 2003 (Booz Allen, 2003b).
2. Criteria listed are the Risk Evaluation Corrective Action Program (RECAP) Screening Standard (GW_{SS}) and the RECAP site-specific standards using Management Option 3B (MO-3B) (LDEQ, 2003).
3. N/A - No standard presented in RECAP.

References:

EMI, 1987. "Final Report of Site Assessment, Benton Creosoting Works, Benton, Louisiana". Environmental Management, Inc. (EMI), August 24, 1987.

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. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] 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):

Not Applicable

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[2] "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 determination, 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):

Not Applicable

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] 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 ecosystems 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 judgement/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 ecosystem.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) continue after documenting: 1) the maximum known or reasonably suspected concentration[3] 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 groundwater "levels," the 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):

Not Applicable

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[3] 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 ecosystems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

___ 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 ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[5], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialist, including an ecologist) adequately protective of receiving surface water, sediments, and ecosystems, 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 "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or ecosystem.

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

Rationale and Reference(s):

Not Applicable

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[4] 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.

[5] 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):

Not Applicable

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 Benton Creosoting Works, EPA ID #LAD 008056632, located at 6695 Louisiana Highway No. 3, Benton, Louisiana. Specifically, this determination indicates that the migration of "contaminated" groundwater is under 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 _____ Date 6/30/2003
Dennis Piper
Geologist

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

EPA Larry Bandy GPD-M 4/15/04

Locations where References may be found:

LDEQ Public Records.

Contact telephone and e-mail numbers

(name) Dennis Piper
(phone #) (225) 219-3406
(e-mail)) Dennis.Piper@LA.GOV

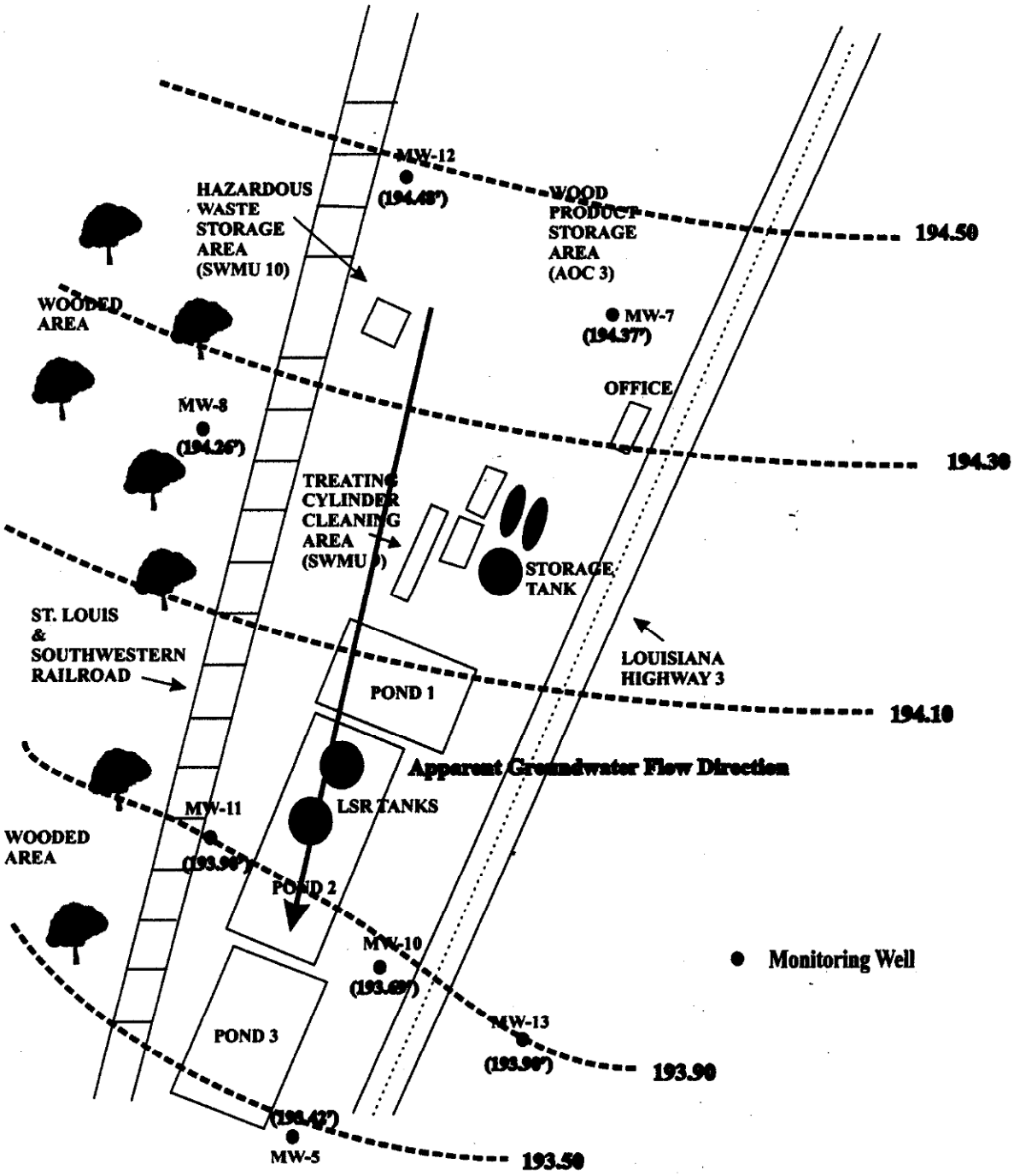
Attachments

The following attachments have been provided to support this EI determination.

< Figure 1 - Benton Potentiometric Map

EPA Contract: 68-W-02-018
WA Number: R06804

Site sketch is not to scale.



N

NOT TO SCALE

Figure 1

Benton Potentiometric Map

Benton Creosoting Works

Benton, Louisiana

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:
Booz | Allen | Hamilton