

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: Borden Chemical & Plastics, OLP
Facility Address: P.O. Box 427, Geismar, LA 70734
Facility EPA ID #: LAD 003913449

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RCRA PERMITS PROGRAM

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?

- 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 "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 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 ground water 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 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. 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.

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):

As the result of extensive investigative activities in the mid-1980s and extending to the present day, the geology, hydrogeology, and contaminant distribution at BCP's Geismar site are well-understood. In terms of contaminant distribution, sampling on the site has indicated the presence of ethylene dichloride (EDC), the key contaminant, and a few other chemicals at levels exceeding their Maximum Contaminant Levels (MCLs) level within some of the shallow transmissive zones beneath the site. However, none of these transmissive zones is used for drinking water purposes. Further, as described more fully in response to Question No. 3 of this survey, sampling off-site and within the Norco Aquifer (the shallowest drinking water aquifer beneath the site) has resulted in uniformly non-detect samples. Finally, as described more fully in response to Question No. 3 of this survey, all of the groundwater contamination is contained on-site as a result of several remediation systems currently operating at the site.

Documentation of this can be found in the Groundwater Recharge Units 1998 Annual Demonstration (Feb. 1999), Groundwater Recharge Units 1999 Annual Demonstration (Feb. 2000), Annual Groundwater Report 2000 (Feb. 2001), Remediation Investigation and Remediation Measures Study (Oct. 1998) and Consent Decree for Borden Chemicals & Plastics Operating Limited Partnership, v. Carol Browner as Administrator of, and The United States Environmental Protection Agency, Civil Action No. 94-440-A-2, consolidated with, United States v. Borden Chemicals & Plastics Operating Limited Partnership; Borden Chemicals and Plastics Management, Inc. Civil Action No. 94-2592-A-M2 in the United States District Court for the Middle District of Louisiana.

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

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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)?

 X 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):

The EDC found in the shallow groundwater at the BCP site is the result of incidents that occurred prior to this decade. Thus, the source of the EDC's entry into the subsurface has been abated.

With regard to the shallower transmissive zones (i.e., the zones above the Norco Aquifer), there will be no further lateral migration of contaminants. BCP's Shallow Groundwater Recharge and Recovery System maintains a capture zone that encompasses a major portion of the contaminated area.

With regard to the Norco Aquifer, every sample taken during the past twenty years has been non-detect for contamination. However, even if chemical constituents were to reach the Norco Aquifer at some point in the future, they would not be able to migrate off-site because BCP's Norco Aquifer Monitoring and Containment System maintains a capture zone within the Norco Aquifer that encompasses the entire area of contamination at the site.

Documentation of this can be found in the Groundwater Recharge Units 1998 Annual Demonstration (Feb. 1999), Groundwater Recharge Units 1999 Annual Demonstration (Feb. 2000), Annual Groundwater Report 2000 (Feb. 2001), Remediation Investigation and Remediation Measures Study (Oct. 1998) NORCO Aquifer Well System Installation, Hydrogeology, and Groundwater Modeling (Aug. 1998) and Consent Decree for Borden Chemicals & Plastics Operating Limited Partnership, v. Carol Browner as Administrator of, and The United States Environmental Protection Agency, Civil Action No. 94-440-A-2, consolidated with, United States v. Borden Chemicals & Plastics Operating Limited Partnership; Borden Chemicals and Plastics Management, Inc. Civil Action No. 94-2592-A-M2 in the United States District Court for the Middle District of Louisiana.

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.

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

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

X 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):

The only surface water bodies on or adjacent to the site are the Mississippi River and the related back swamp areas (which serve as the headwaters to the New River Canal) to the west of the BCP facility. Potentiometric maps of the shallow water bearing units prepared since 1985 and water levels taken in all wells (including those in the Norco Aquifer) for almost three years demonstrate that the flow of groundwater from the contaminated areas is away from these surface water bodies.

Documentation of this can be found in the Groundwater Recharge Units 1998 Annual Demonstration (Feb. 1999), Groundwater Recharge Units 1999 Annual Demonstration (Feb. 2000), Annual Groundwater Report 2000 (Feb. 2001), and Remediation Investigation and Remediation Measures Study (Oct. 1998). Also see attached survey responses by Borden Chemicals & Plastics, OLP.

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5. Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant" (i.e., the maximum concentration³ 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 concentration³ 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 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 concentration³ 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 concentrations³ 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): _____

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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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 implemented⁴)?

_____ 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,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 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 “NO” status code, 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): _____

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.

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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?"

X 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):

BCP has been involved in a groundwater monitoring and recovery program since 1981. Since that time, the program has evolved to include 43 wells for monitoring water-bearing zones at the site, seven withdrawal wells, and five withdrawal trenches. As discussed, BCP also monitors the uppermost drinking water aquifer (the Norco Aquifer) in order to provide the earliest detection possible should any contamination migrate to this aquifer. BCP submits groundwater annual and quarterly reports to the LDEQ, which provide information on contaminant removal, historical trends in contamination at each well, and potentiometric surface (groundwater movement). BCP samples its monitor wells on a quarterly basis. Water level measurements and sampling of withdrawal points are performed on a monthly basis. Sampling and recovery are ongoing efforts; information obtained from these efforts is used to evaluate site conditions and, if necessary, to revise the existing system. The shallow monitoring wells (i.e., wells located above the Norco Aquifer) will continue to be sampled on a quarterly basis, with quarterly and annual reports submitted to the LDEQ.

Documentation of this can be found in the Groundwater Recharge Units 1998 Annual Demonstration (Feb. 1999), Groundwater Recharge Units 1999 Annual Demonstration (Feb. 2000), Annual Groundwater Report 2000 (Feb. 2001), Remediation Investigation and Remediation Measures Study (Oct. 1998). and Consent Decree for Borden Chemicals & Plastics Operating Limited Partnership, v. Carol Browner as Administrator of, and The United States Environmental Protection Agency, Civil Action No. 94-440-A-2, consolidated with, United States v. Borden Chemicals & Plastics Operating Limited Partnership; Borden Chemicals and Plastics Management, Inc. Civil Action No. 94-2592-A-M2 in the United States District Court for the Middle District of Louisiana. Also see attached survey responses by Borden Chemicals & Plastics, OLP.

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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).

- 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 Borden Chemical & Plastics, OLP Geismar facility, EPA ID # LAD 003913449, located at P.O. Box 427, Geismar LA. 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 (signature) [Signature] Date 3/30/01
(print) GARY A. FULTON JR.
(title)

Supervisor (signature) [Signature] Date 3/30/01
(print) Narendra M. Dave
(title) Geological Manager
(EPA Region or State) LA DEQ

Locations where References may be found:

All references are on file with regulatory agencies (LDEQ and USEPA)

Contact telephone and e-mail numbers

(name) _____
(phone #) _____
(e-mail) _____

Attachments
Available
Upon Request