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: ExxonMobil Refining & Supply Company, Baton Rouge Refinery
Facility Address: 4045 Scenic Highway, Baton Rouge, Louisiana 70805
Facility EPA ID #: LAD 062 662 887

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 #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 "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?

___X___ 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): In June 1987, the U.S. Environmental Protection Agency (EPA) completed a RCRA Facility Assessment (RFA) for the ExxonMobil Refining & Supply Company (ExxonMobil) Baton Rouge Refinery (Refinery). As a result of RFA activities, EPA, in accordance with the provisions of the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA, identified a number of Solid Waste Management Units (SWMUs) requiring a RCRA Facility Investigation (RFI).

The SWMUs and the RUs were evaluated in accordance with the environmental indicator RCRIS code (CA 725) for Current Human Exposures Under Control, and details are provided in Appendix A. As part of the evaluation, it was determined that the RUs have not impacted ground water. Therefore, only the SWMUs will be addressed in this environmental indicator determination for Migration of Contaminated Groundwater Under Control (CA 750). Available data indicate that only one SWMU has impacted ground water (e.g., the SFZ). However, there is an LDEQ-approved remediation program in place to address the presence of LNAPL in the localized impacted areas of this unit. Available information regarding historic waste management activities at other SWMU areas, as well as data from proximally located assessment/monitoring activities, does not indicate ground water impact above associated risk-based concentrations. Table 750-1 presents the SWMUs that are evaluated in this CA 750. The location of the SWMUs is shown in Figure 1.

Descriptions of the SWMUs, including primary COCs, well locations, potentiometric surface maps, and recent analytical data are provided in Appendices A and B. Relevant ground water reports and associated correspondence for the SWMUs and RUs are on file at the Refinery and at the LDEQ.

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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TABLE 750-1

SWMUs with Current/Potential Ground Water Impact

ExxonMobil Refinery & Supply Company
Baton Rouge Refinery

System	Component	Status
Solid Waste Management Units (SWMUs)	North Batture Burning Pit / Landfill	I
	API Oil/Water Separators and Aerobic Digester	A
	Corrugated Plate Separator	A
	Clean Construction Rubble Pile / South Batture Landfill	I
	Propane Storage Area Landfill	I
	Sandblasting Area / Schulkll Yard	I
	TEL Weathering Strip / Landfill	I
	Ethyl Ditch / Sewer (*)	I
	Shallow Fill Zone	I
	Sewer System	A

Notes:

Status Codes:
A = Active Operating Unit
I = Inactive

(*) Also included in Ethyl Corporation RCRA Corrective Action Program

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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): **There are two major geologic zones present in the shallow subsurface beneath the Refinery. These consist of the Pleistocene-age Prairie Terrace deposits and Recent-age Mississippi River alluvium deposits, both comprised primarily of clay- and silt- sized sediments. Fill material is also present at variable locations, with the thickest accumulations (up to 30 feet bgs) occurring in the SFZ on the western side of the facility. A map of the general geology beneath the Refinery is included in Figure 3. In general, shallow ground water flows from east to west, in the direction of the Mississippi River. Available data indicate that a conservative estimate of ground water flow velocity is less than 0.1 feet/year. Therefore, affected ground water is unlikely to leave the site before natural attenuation has reduced constituent levels to below risk-based levels. Additionally, site-specific ground water data from monitoring and assessment activities at the Refinery, including monitoring data from a perimeter well network, support that potentially impacted ground water in SWMU areas is not migrating offsite.**

ExxonMobil will be conducting a RFI for the SWMUs listed in Table 750-1. Current ground water monitoring data for the SWMUs indicates that there is impact to ground water at one location (e.g., SFZ). However, corrective measures were implemented (e.g., recovery system), as approved by LDEQ, to limit ground water migration of constituents of concern. Evaluation of downgradient well data and site hydrogeology indicate that concentrations are not migrating off-site. Additional ground water data will be collected, as necessary, for other SWMUs during RFI Phase I activities.

Additional information for the SWMUs is presented in Appendix A. Relevent ground water reports and associated correspondence are on file at the Refinery and at the LDEQ.

[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): As noted in the response to Question #3, there are two major geologic zones present in the shallow subsurface beneath the Refinery. These consist of the Pleistocene-age Prairie Terrace deposits and Recent-age Mississippi River alluvium deposits, both comprised primarily of clay- and silt- sized sediments. A map of the general geology beneath the Refinery is included in Figure 3. In general, shallow ground water flows from east to west, in the direction of the Mississippi River. Available data indicate that a conservative estimate of ground water flow velocity is less than 0.1 feet/year. Therefore, affected ground water is unlikely to leave the site before natural attenuation has reduced the constituent levels to below risk-based levels. Additionally, site-specific ground water data from monitoring and assessment activities at the Refinery, including monitoring data from a perimeter well network, support that potentially impacted ground water in SWMU areas is not migrating offsite.

ExxonMobil will be conducting a RFI for the SWMUs listed in Table 750-1. Current ground water monitoring data for the SWMUs indicates that there is impact to ground water at one location (e.g., SFZ). However, corrective measures were implemented (e.g., recovery system), as approved by LDEQ, to limit ground water migration of constituents of concern. Evaluation of available well data, as well as knowledge of the extensive hydrogeologic data from the site, support that constituent concentrations above risk-based levels are not discharging into surface water bodies.

Additional information for the SWMUs is presented in Appendix A. Relevant ground water reports and associated correspondence are on file at the Refinery and at the LDEQ.

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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 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 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 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):_____

[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 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 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): Ground water monitoring, fluid recovery, and fluid level information will be collected in accordance with respective LDEQ-approved work plans for each ground water program at the facility, which includes monitoring and fluid recovery activities proximal to most of the SWMUs. In addition, the SFZ monitoring and recovery program will continue to include scheduled fluid gauging and evacuation events (3 times per week) and semi-annual sampling.

ExxonMobil will be conducting a RFI for the SWMUs listed in Table 750-1. The first step in the RFI process will be to determine if a release has occurred from any of the SWMUs requiring an RFI. In order to make this determination, release investigations (Phase I activities) will be performed as necessary at the listed SWMUs. Phase I activities will consist of collecting waste characterization samples (where possible) and sampling various media in locations where releases are most likely to have occurred. For those SWMUs located within the SFZ, Phase I activities will not be performed because waste characterization sampling would not be indicative of a release from the unit. In those instances, the SFZ recovery program will serve to address the SWMU area.

If it is determined through Phase I activities that no release has occurred from a SWMU, ExxonMobil will propose no further action at that SWMU. If it is determined that a release has occurred, ExxonMobil plans to perform preliminary risk assessment activities in accordance with RECAP (June 20, 2000) to evaluate the risk to human health or the environment resulting from the release. If it is determined by preliminary risk assessment activities that a release does not pose unacceptable risks, no further action will be required at that SWMU. If it is determined that unacceptable risks do exist, additional investigations (Phase II activities) may be performed to provide data for a more rigorous assessment (if needed), or for the evaluation of appropriate response actions.

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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__ 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 ExxonMobil Refining & Supply Company facility, EPA ID # LAD 062 662 887, located at Baton Rouge, 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 (signature) _____ Date 6/28/02
(print) Carey Dicharry Jr.
(title)

Supervisor (signature) _____ Date 6/28/02
(print) Doug Bradford
(title)
(EPA Region or State) VI

Locations where References may be found:

LDEQ Hazardous Waste Division Files
LDEQ Solid Waste Division Files
LDEQ Ground Water Protection Division Files
On-site facility records and correspondence files

Contact telephone and e-mail numbers

(name) Carey Dicharry Jr
(phone #) 225 765 0624
(e-mail) "Dicharry, Carey" <carey_d@ldeq.org>