DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

**RCRA Corrective Action**
**Environmental Indicator (EI) RCRIS code (CA725)**

**Current Human Exposures Under Control**

**Facility Name:** Ethyl Corporation
**Facility Address:** Gulf States Road, Baton Rouge, La. 70805
**Facility EPA ID #:** LAD 079460895

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.

## 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 "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).

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 | | | Groundwater impact/chlorinated hydrocarbons |
| Air (indoors)[2] | X | | | Suspected impacts in buildings over gw contamination |
| Surface Soil (e.g., <2 ft) | X | | | Surface soil impact/chlorinated hydrocarbons, lead |
| Surface Water | X | | | Suspected contaminated gw to surface water release |
| Sediment | X | | | Sediment impact/lead |
| Subsurf. Soil (e.g., >2 ft) | X | | | Subsurface soil impact/chlorinated hydrocarbons |
| Air (outdoors) | | X | | Plant and units are closed; no impact suspected from soil particulate emissions or volatile emissions from shallow groundwater to ambient 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):

**Groundwater:** In 1979, Ethyl Corporation installed RCRA monitoring wells at its Baton Rouge facility. Concentrations of chlorinated hydrocarbons (volatile organic compounds (VOCs)) were detected in some of the groundwater samples. In 1982, water samples from deep process and potable wells (400-foot Aquifer) also indicated the presence of chlorinated hydrocarbons. A pump and treat groundwater remediation system was initiated for the 400-foot Aquifer and shallower water-bearing zones (60-foot, 100-foot, 120-foot and 190-foot) in the early 1980's. Additional monitoring and recovery wells have been installed for the shallower zones over the years. Chlorinated hydrocarbons, some semi-volatile organic compounds, lead, and lindane are consistently detected in wells installed in the 30-foot, 60-foot, 100-foot, 120-foot, and 190-foot water bearing zones and the 400-foot Aquifer. Ethyl Corporation conducts semi-annual sampling of the RCRA monitoring wells and quarterly sampling of its process water wells (deeper wells) and shallow recovery wells. Key VOC contaminants include ethylene dichloride, perchloroethene, and trichloroethene. Attachment 1 contains tables providing information on the monitoring and recovery well construction and concentrations of detected compounds for groundwater samples collected from the RCRA point of compliance wells and other wells during the second half of 2004 (RCRA Semi-annual Groundwater Monitoring Report, dated March 2005). A facility site location map, monitoring/recovery well location map, and potentiometric maps for the 30-foot and 60-foot water-bearings and deeper water-bearing zones are also provided in the attachment.

**Air (indoors):** It is suspected that indoor air may be impacted in structures (library, medical, engineering building and the Research and Development (R&D) office building) located over VOC contaminated soil and groundwater plumes. However, the highest VOC levels are indicated at depths greater than 15 feet below grade.

**Surface Soil:** As part of the RCRA Facility Investigation (RFI), surface soils (<2 ft) were evaluated and found to be impacted with VOCs and lead above the Louisiana Risk Evaluation and Corrective Action Program (RECAP), October 20, 2003 screening standards-industrial. Refer to the attachment 2 for tables summarizing concentrations detected in surface soil samples and figures indicating sample locations.

A map indicating the RFI areas (SWMU and AOC locations) is provided in attachment 2.

**Surface Water:** It is suspected that shallow groundwater contaminated with VOCs may be discharging into the Monte Sano Bayou. Surface water samples are collected from the current permitted outfalls 001 and 002 and analyzed for parameters (refer to attachment 3 for table and map showing outfall locations). The shallow groundwater-surface water interaction has not been evaluated to determine if groundwater impacted by VOCs are discharging into the Monte Sano Bayou.

**Sediment:** Samples of sediment collected where Ethyl's outfall 001 intercepts Monte Sano Bayou and 50 feet downstream of outfall 001 were analyzed for lead as part of the RFI (June 1999). Refer to the map showing outfall locations in attachment 3. The lead concentration detected in the sediment sample collected at the outfall 001 location was 922 ppm, and in the sediment sample collected 50 feet downstream the lead level was 484 ppm. It should be noted that sediment samples were not collected where the historical outfall (prior to Clean Water Act) was located (which is now the current outfall 002 location). The second map in attachment 3 shows the discharge location into Monte Sano Bayou prior to the Clean Water Act. Additional evaluation of sediments in the historical discharge area and downstream of the area is needed. A freshwater sediment screening concentration (threshold effects level) for lead is 35 ppm (Buchman, M.F., 1999. NOAA Screening Quick Reference Tables).

**Subsurface Soil:** Contaminated soils (>2 ft) have been identified in many areas of the plant. The main contaminants include chlorinated hydrocarbons (VOCs), lindane and lead. Refer to the attachment 2 for table and figures describing subsurface soil data.

**Air (outdoors):** Because the facility has been shut down and dismantled, waste management units are closed and under post-closure care, and there are concreted and/or vegetated areas covering much of the site, outdoor air impacts are not likely at the facility. Activities that could generate high dust levels such as high truck traffic and construction activities are not likely to occur in areas of lead contaminated soils.

**References:**


Ethyl Corporation (as prepared by SEMS, Inc.) RCRA Semi-annual Groundwater Monitoring Report, March 2005

Ethyl Corporation (as prepared by SEMS, Inc.), RFI Submittal Reports -

Area 1 - Hydrocarbons Area, Dec. 1999

Area 2 - Closed Facilities, Sept. 1999

Area 3 - Former Sandbeds, Sept. 1999

Area 4 - Lindane Area, June 1999

Area 5 - Red Mud Area, Nov. 1999

Area 6 - Alkyl Lead Production, Dec. 1999

Area 7 - Miscellaneous Areas, Dec. 1999

Surface Water and Sediment Investigation, Dec. 1999

Buchman, M.F., 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pages.)

Louisiana Department of Environmental Quality, Risk Evaluation and Corrective Action Program Document, October 20, 2003


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 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.

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

_____ 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).

__X__ 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

Rationale and Reference(s): The residents pathway is incomplete because there are no residential areas located in the areas of contaminated media. The 400-foot Aquifer, which is contaminated with VOCs, is probably defined as a groundwater classification 1B under RECAP and could potentially provide drinking water to a public water supply. There are no known public or domestic water wells screened in the 400-foot Aquifer within a one-mile radius of the facility. The day-care pathway is also incomplete due to the lack of a day-care facility located within or near the Ethyl site. The Ethyl site is enclosed within a fence or by the Monte Sano Bayou ravine, which would prevent trespassers from entering the facility site. The potential human receptors associated with recreation and food are also incomplete for all media due to a lack of swimming, fishing, boating, and other recreation activities in the Monte Sano Bayou. The Ethyl site and Monte Sano Bayou are located in an industrial area and activities such as farming, dairy animal

grazing, fishing, hunting, and trapping are not likely to occur in the area. Therefore, the indirect pathway/receptor (e.g. vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.) is not present. The worker and construction exposure pathways are complete for all contaminated media. There is potential worker exposure to contaminated groundwater during sampling activities. For the construction worker, the potential exposure to contaminated groundwater is higher during construction or maintenance activities involving excavations and trenches. Indoor air exposures to VOC vapors is possible to the workers and construction workers in structures located over impacted groundwater and soils. The potential for exposure to contaminated soil (< 2 ft), surface water, sediment, and subsurface soil (>2 ft) exist to the worker and construction worker at the site.

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

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): Because the facility is closed, routine construction and maintenance activities do not occur, except for the areas of the site occupied by Albemalre Corporation. Proper safety measures and personal protection equipment used during sampling, construction, and maintenance activities would limit exposures to soils, shallow groundwater, surface water, and sediments. Exposures to the other contaminated media (indoor air) are not reasonably expected to be significant to the worker and construction worker due to lower exposure magnitude and contaminant concentrations.

[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.

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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):

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 **Ethyl Corporation, Baton Rouge** facility, EPA ID # **LAD 079460895**, located at **Gulf States Road, Baton Rouge** 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 (signature) Celeste Bonnecaze Date 4-8-05
(print) Celeste Bonnecaze
Geologist 3

Supervisor (signature) Douglas Bradford Date 4-8-05
(print) Douglas Bradford
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9/14/05

Locations where References may be found:

Ethyl Corporation, Baton Rouge , La. Office

Louisiana Department of Environmental Quality
602 N. Fifth Street, Baton Rouge, La.
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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.**

# ATTACHMENT 1

## Tables

Well Construction Details
Analytical Summary for Wells (2nd Half of 2004)

## Figures

Facility Site Location Map
Well Location Map
Potentiometric Map for 30-foot Zone, (October 2004)
Potentiometric Map for 60-foot Zone, (October 2004)
Potentiometric Map for 100-foot Zone, (October 2004)
Potentiometric Map for 120-foot Zone, (October 2004)
Potentiometric Map for 190-foot Zone, (October 2004)
Potentiometric Map for 400-foot Aquifer, (October 2004)

# ATTACHMENTS AVAILABLE UPON REQUEST