

ADEM



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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JAMES W. WARR
DIRECTOR

BOB RILEY
GOVERNOR

September 9, 2003

CERTIFIED MAIL # 7003 0500 0001 2706 9127
RETURN RECEIPT REQUESTED

Mr. Joseph J. McFalls
Plant Manager, McIntosh Plant
P.O. Box 28
Industrial Road
McIntosh, Alabama 36553

Facsimiles: (334)
Administration: 271-7350
General Counsel: 394-4332
Air: 279-3044
Land: 279-3050
Water: 279-3051
Groundwater: 270-5631
Field Operations: 272-8131
Laboratory: 277-6718
Mining: 394-4326
Education/Outreach: 394-4383

Re: Environmental Indicator Evaluations
Olin Chlor-Alkali Products
U.S. EPA I. D. No. ALD 008 188 708

Dear Mr. McFalls:

The Alabama Department of Environmental Management (ADEM) has recently completed a qualitative evaluation of the environmental conditions at Olin Chlor-Alkali Products in McIntosh, Alabama, and ADEM is pleased to provide you with a copy of the evaluation for your information.

While implementing the permitting requirements of the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) and the Resource Conservation and Recovery Act (RCRA), as amended by the 1984 Hazardous and Solid Waste Amendments (HSWA), at Olin, ADEM is always cognizant of its role in protecting human health and limiting further migration of groundwater contamination. As such, the enclosed evaluation covers two specific issues regarding environmental contamination applicable to the facility and local community:

- 1) Plausible human exposure to soil, groundwater, air and surface water contamination at or from the facility, and;
- 2) The continuing migration of contaminated groundwater, both on and offsite.

Please note that the purpose of the environmental indicator evaluation is solely to evaluate the status of the two environmental indicators discussed, and that it does not reduce or limit in any way the facility's obligation to perform any monitoring, maintenance, investigation, remediation, or other activity required pursuant to any applicable regulations, permits, or orders.

The enclosed environmental indicator evaluation should not be viewed as somehow separate and distinct from the corrective action activities taken at Olin. Rather, it is an evaluation of current environmental conditions and a focusing of efforts on potential concerns that ADEM, the facility and interested members of the public must work toward satisfying through implementation of the corrective action process at Olin. Therefore, every evaluation should conclude with a projection or outline of future actions to move the facility toward the point where human exposures and/or groundwater releases are controlled.

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Mr. Joseph J McFalls
September 9, 2003
Page 2

- It should be understood that the evaluations operate at the "facility level." In other words, **every area** at the facility must meet the control definition before human exposures or groundwater releases can be considered controlled.

Because many different corrective action documents frequently exist at a facility, ADEM has tried to select the most pertinent documents from which to make its evaluation. The utilized source documents (titles and dates) are explicitly referenced in the evaluation to provide clarity and reproducibility. ADEM recognizes that the potential exists for current conditions at the facility to be somewhat different to that represented in the evaluation. Such discrepancies can be administratively managed during implementation of the ongoing corrective action process and subsequent reevaluations.

In summary, the evaluation represents a "snap-shot" of the facility's environmental conditions at a particular point in time, and it is a dynamic document subject to revision. Because of the evaluation's focus on current environmental conditions, ADEM views the evaluation as an excellent resource for members of the public as well as the facility. ADEM hopes you find the evaluation useful and informative.

If questions or comments arise regarding this evaluation, please contact Ms. Sonja B. Favors of my staff at (334) 279-3067.

Sincerely,



Phillip D. Davis, Chief
Industrial Hazardous Waste Branch
Land Division

PDD/SBF/set:OLINEIM

Encl.: Environmental Indicator Memo

cc w/ encl: Narindar Kumar, EPA Region 4

File



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JAMES W. WARR
DIRECTOR

BOB RILEY
GOVERNOR

September 9, 2003

To: Phillip D. Davis, Chief
Industrial Hazardous Waste Branch
Land Division *PD*

Through: Vernon H. Crockett, Chief *VHC*
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

From: Sonja B. Favors *SBF 9/9/03*
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

RE: Evaluation of Olin Chlor-Alkali Plant status under the RCRAInfo Corrective Action
Environmental Indicator Event Codes (CA725 and CA750)
EPA I.D. No. ALD 008 188 708

Facsimiles: (334)

Administration: 271-7950
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Water: 279-3051
Groundwater: 270-5631
Field Operations: 272-8131
Laboratory: 277-6718
Mining: 394-4326
Education/Outreach: 394-4383

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of Olin Chlor-Alkali Plant's (Olin) status in relation to the following corrective action event codes defined in the in the RCRAInfo database:

- 1) Current Human Exposures Under Control (CA725),
- 2) Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the Industrial Hazardous Waste Branch Chief is required prior to entering these event codes into RCRAInfo. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate locations within Attachments 1 and 2.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the **third evaluation** for Olin. The second evaluation concluded that CA725 (Human Exposures Controlled) had not been satisfactorily addressed, and thus a **NO** status code was entered for the event code. In addition, that evaluation concluded that CA750 (Groundwater Releases Controlled) had been satisfactorily addressed. Therefore a status code of **YE** was entered. The second evaluation, finalized by the Alabama Department of Environmental Management on March 20, 2000, is attached to this document as Attachment No. 3.



III. FACILITY SUMMARY

The Olin Chlor-Alkali Plant is located approximately one mile east-southeast of the town of McIntosh in Washington County, Alabama. The facility began operation in 1952 as a chlorinated organics plant owned by Calabama Chemical Company. In 1954, Olin acquired Calabama and constructed a pentachloronitrobenzene (PCNB) plant on the property in 1955-1956. The plant expanded in 1973 to include production of trichloroacetonitrile (TCAN) and 5-ethoxy-3-trichloromethyl-1,2,4-thiadiazole (Terrazole®). In 1978, Olin began operation of a diaphragm cell caustic soda/chlorine plant, which is still in operation. Production of PCNB, TCAN and Terrazole® was discontinued in 1982. The facility currently produces chlorine, caustic soda, sodium hypochlorite and sodium chloride, and blends and stores hydrazine compounds. Olin owns approximately 1500 total acres of property, with the active production plant occupying approximately 60 acres. The Olin plant is bounded on the north by the Ciba plant property, on the east by the Tombigbee River, on the south by River Road and on the west by U.S. Highway 43. Olin owns property to the west of U.S. Hwy 43, but this property is not associated with plant activities.

Olin was issued a Hazardous Waste Post-Closure Permit under the Resource Conservation and Recovery Act (RCRA) in August 1986. The permit addressed contamination that was left in place after the closure of the Weak Brine Pond. The Weak Brine Pond was used from 1952 until December 1982 in the mercury cell chlorine/caustic soda production process at the site. Groundwater remediation using extraction wells and treatment of the recovered groundwater has been ongoing since 1987. Constituents of concern in the groundwater include mercury, chloroform, chloride and organic constituents. The post-closure permit also contained provisions, pursuant to the Hazardous and Solid Waste Amendments (HSWA), for addressing Solid Waste Management Units (SWMUs) that managed wastes prior to the inception of RCRA. The original RCRA permit was renewed on January 5, 2000.

In 1984, the Olin facility was placed on the National Priorities List (NPL) to address past contamination under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The site was divided into two Operable Units (OUs). OU-1 consists of the plant site and surrounding areas and OU-2 consists of the Olin Basin and associated floodplain. The Olin Basin is an oxbow lake located in the Tombigbee River floodplain that receives National Pollutant Elimination Discharge System (NPDES) discharge and stormwater runoff from the plant area. The Olin Basin also formerly received process wastewater from the plant. The Olin Basin, as well as the Round Pond and Cypress Swamp (two other permanent water bodies in the floodplain) received wastewater and stormwater from the neighboring Ciba plant as well as from Olin.

Remedial activities for OU-1 have been approved and implemented. Remedial activities included upgrading the protective cap over some previously closed units, performing additional monitoring of other closed units, enhancing the current groundwater recovery system by installing two extraction wells (one vertical and one a horizontal extraction well), and constructing a new centralized water treatment system for extracted groundwater. These activities were completed in March 2002. The Record of Decision (ROD) for OU-2 is currently pending.

In 2003, the Alabama Department of Public Health (ADPH) lifted the mercury and DDT fish advisory from the Olin basin. ADPH stated that because the basin was located on private property with institutional controls in place deter trespassers, the advisory could be removed. Olin has posted warning signs around the perimeter of the Olin basin as well as placed a levy at the river access point of the Olin Basin

IV. CONCLUSION FOR CA725

Based on the analysis provided in Attachment 1, the appropriate event code to be entered is 'CA725YE' (Current Human Exposures Under Control).

V. CONCLUSION FOR CA750

Based on the analysis provided in Attachment 2, the appropriate event code to be entered is 'CA750YE' (Migration of Groundwater Under Control).

VI. SUMMARY OF FOLLOW-UP ACTIONS

OU-1

Continue operation and maintenance monitoring activities. The groundwater contamination is contained on facility property by the current system. The enhancements are allowing for faster remediation of the plume. Monitoring activities are also being performed on other closed areas at the facility.

OU-2

Future activities for OU-2 include the selection of a remedy for addressing the contamination in the Olin Basin and the issuance of a Record of Decision (ROD). The issuance of the ROD will be followed by the design of the remedy and implementation. The remedy is expected to be in place by 2004 at the earliest.

▪ Sanitary Landfills

There are two closed sanitary landfills located at the Olin facility. In recent years the monitoring data has indicated the presence of some organics and mercury. Currently the Department and EPA are reviewing a plan to further investigate the source of these contaminants.

- Attachments:
1. CA725: Current Human Exposures Under Control
 2. CA750: Migration of Contaminated Groundwater Under Control
 3. Previous EI Evaluation dated March 20, 2000
 4. Map of Facility

SBF/set:Z:OLIN 3EI final

File: Olin/ALD 008 188 708/Washington Co./Haz. Waste Correspondence

ATTACHMENT I
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control**

Facility Name: Olin Chlor-Alkali Products
Facility Address: McIntosh, Washington County, Alabama
Facility EPA ID #: ALD 008 188 708

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?

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

Status codes for EI Determinations 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).

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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Mercury, Chloroform, Chloride, Organics
Air (indoors) ²		X		---
Surface Soil (e.g., <2 ft)	X			Pesticides, Mercury
Surface Water	X			Mercury, Chloroform, Hexachlorobenzene, DDT
Sediment	X			Mercury, Hexachlorobenzene, DDT
Subsurface Soil (e.g., >2 ft)	X			Mercury, Hexachlorobenzene, Organics, Pesticides
Air (outdoors)		X		---

_____ 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: Groundwater—The groundwater has been shown to contain contamination above MCLs for several constituents, including those listed in the table above. Groundwater contamination has been under remediation since 1987.

Surface Soil—The constituents shown above have been found in surface soils.

Surface Water—Data summarized in the 1996 Feasibility Study for OU-2 indicate that the constituents listed above exceeded the applicable MCLs/Region III Risk Based Concentrations (RBCs) in surface water samples collected in the Olin Basin. It should be noted that DDT was never produced or used at the Olin site.

Sediment—Data summarized in the 1996 Feasibility Study for OU-2 indicates that the constituents listed above exceeded the applicable RBCs in sediments in the Olin Basin.

Subsurface Soil—Constituents found in subsurface soils during previous investigations include organics and mercury at the closed sanitary landfills.

Air – Through past monitoring data there has been no indication of air contamination. In addition air pollution control devices strategically located throughout the facility capture any air emission associated with facility operation. All regulated units containing volatile organics has been closed and capped.

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).

²Recent 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.

References: Semi-Annual Groundwater Monitoring Report dated October 22, 1999.
 Hazardous Waste Post-Closure Renewal Permit/Application dated January 5, 2000.
 Feasibility Study Report for Operable Unit 2 dated February 1996.
 Final Remedial Design Report for Operable Unit 1 dated May 15, 1998.

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)							
<u>"Contaminated"</u> <u>Media</u>	<u>Residents</u>	<u>Workers</u>	<u>Day-Care</u>	<u>Construction</u>	<u>Trespassers</u>	<u>Recreation</u>	<u>Food</u> ³
<u>Groundwater</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
<u>Soil (surface, e.g., <2 ft)</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
<u>Surface Water</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Yes</u>
<u>Sediment</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Yes</u>
<u>Soil (subsurface, e.g., >2 ft)</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not "contaminated" as identified in #2, please strike-out specific Media, including Human Receptors' spaces, or enter "N/C" for not contaminated.
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 assigned spaces in the above table. 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: Groundwater—The only expected exposure to groundwater would be by facility employees and/or contractors responsible for groundwater sampling or maintenance of the groundwater monitoring wells and treatment system.
Surface Water/Sediment—There is not a complete pathway to trespassers, workers or construction workers for surface water and sediment. The Olin Basin is located on private property with provisions in place to prevent access to any contamination. However there is a

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

complete pathway for the consumption of fish. Bass and catfish caught in the basin in 2001 exceeded the RBC levels for mercury. During the flood season, the fish from the Olin basin have an outlet to the Tombigee River which is located to the east of the facility. Therefore exposure to hazardous constituents could occur to boaters and/or others who consume fish caught in the Tombigee River.

The remaining receptors would not have a complete pathway due to the industrial nature of the facility. In addition, the facility does not allow any recreational activities to take place in the Olin basin.

References: Semi-Annual Groundwater Monitoring Report dated October 22, 1999.
Feasibility Study Report for Operable Unit 2 dated February 1996.
Final Remedial Design Report for Operable Unit 1 dated May 15, 1998
OU-2 RGO Support Sampling Report dated April 15, 2002

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: Groundwater—The only expected exposure to groundwater would be by facility employees and/or contractors responsible for groundwater sampling or maintenance of the groundwater monitoring wells and treatment system. However, all personnel are properly trained and use the appropriate Personal Protective Equipment (PPE).

Surface Water/ Sediment — The Alabama Department of Public Health has issued a advisory against the consumption of fish on the Tombigee River due to mercury contamination. This advisory is intended to limit the exposure to hazardous constituents through the fish consumption.

References: Feasibility Study Report for Operable Unit 2 dated February 1996.
Final Remedial Design Report for Operable Unit 1 dated May 15, 1998.
OU-2 RGO Support Sampling Report dated April 15, 2002
Alabama Dept. of Public Health 2003 Fish Advisory Report

⁴If 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:

References:

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 Olin Chlor-Alkali Plant, McIntosh, Alabama. EPA ID # ALD 008 188 708 under current and reasonably expected conditions. This determination will be re-evaluated when the Department 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) Sonja B. Favors (date) 9/9/2003

Sonja B. Favors
Environmental Engineer II
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Supervisor: (signature) Vernon H. Crockett (date) 9/9/2003

Vernon H. Crockett, Chief
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Branch Chief: (signature) Phillip D. Davis (date) 9-SEP-03

Phillip D. Davis, Chief
Industrial Hazardous Waste Branch Chief
Land Division

Location where references may be found:

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ATTACHMENT 2
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Olin Chlor-Alkali Products
Facility Address: McIntosh, Washington County, Alabama
Facility EPA ID #: ALD 008 188 708

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.

BACKGROUND

Definition of Environmental Indicators (for 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 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 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

Status codes for EI Determinations should remain in the RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”⁵ 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: The groundwater has been shown to contain concentrations of several constituents exceeding the MCL for mercury, chloride, chloroform and organic constituents. Groundwater contamination has been under remediation since 1987.

References: Semi-Annual Groundwater Monitoring Report dated October 22, 1999.
Hazardous Waste Post-Closure Renewal Permit/Application dated January 5, 2000.

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within the “existing area of contaminated groundwater”⁶ 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”⁶.

 If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”⁶) - skip to #8 and enter “NO” status code, after providing an explanation.

⁵“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).

⁶“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.

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

Rationale: Review of past monitoring data indicates that the groundwater contamination plume at the facility has stabilized and is contained on Olin's property. The areas of the four groundwater contamination plumes (mercury, chloride, chloroform and total organics) have decreased over the 13 years that groundwater remediation has been occurring. The plumes will continue to be addressed under the current remediation system and the planned improvements to the pump and treat system will allow for even more effective remediation of groundwater.

References: Semi-Annual Groundwater Monitoring Report dated October 22, 1999.
Hazardous Waste Post-Closure Renewal Permit/Application dated January 5, 2000.
Final Remedial Design Report for OU-1 dated May 15, 1998.

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: There is currently no evidence that contaminated groundwater discharges into the river. Monitoring data have historically indicated that the groundwater at the facility flows toward the extraction wells and does not discharge into any surface water body. In addition Olin uses groundwater from the Miocene aquifer as production water.

References: Hazardous Waste Post-Closure Renewal Permit/Application dated January 5, 2000.
Final Remedial Design Report for OU-1 dated May 15, 1998.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration^s 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^s 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) providing 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 concentration⁷ 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 concentrations⁷ greater than 100 times their appropriate groundwater "levels," providing 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 identifying if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale:

References:

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 implemented⁸)?

_____ 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,⁹ appropriate to the potential for impact, that shows that 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 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.

⁷As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

⁸Note, 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.

⁹The 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.

_____ 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:

References:

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: The groundwater contamination will continue to be addressed under the RCRA post-closure renewal permit and the CERCLA ROD. The planned improvements to the pump and treat system will allow for even more effective remediation of groundwater. RCRA requires that a hazardous waste post-closure permit be renewed as long as there is groundwater contamination at the site. Under the permit, the facility must remediate the groundwater until it is below acceptable cleanup levels (background, MCLs or RBCs). Monitoring of the groundwater at the site must be conducted until the groundwater has consistently met the groundwater protection standards. Also, the ROD for OU-1 provides for improvements to the existing groundwater remediation system to more effectively address the contamination.

References: Semi-Annual Groundwater Monitoring Report dated June 2003.
Hazardous Waste Post-Closure Renewal Permit/Application dated January 5, 2000.
Final Remedial Design Report for OU-1 dated May 15, 1998.

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 Olin Chlor-Alkali Plant, McIntosh, Alabama, EPA ID # ALD 008 188 708. 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 Department 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) Sonja B. Favors (date) 9/9/2003

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Environmental Engineer II
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Supervisor: (signature) Vernon H. Crockett (date) 9/9/2003

Vernon H. Crockett, Chief
Engineering Services Section
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Branch Chief: (signature) Phillip D. Davis (date) 9-SEP-03

Phillip D. Davis, Chief
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