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: Georgia Gulf Corporation
Facility Address: PO Box 629, Plaquemine, Louisiana 70765-0629
Facility EPA ID #: LAD 057 117 434

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

X* 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. AD 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 be 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., nonaqueous 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).

* NOTE: This revision was made on the basis of continuing corrective action work at the facility. The two (2) RCRA units - the EDC/Vcm manufacturing Complex and the Phenol plant are undergoing or will be undergoing an RFI + CMS. The work plans were vaunterily submitted by the facility, and now the RFI and CMS are requirements under the Final modified Hazardous Waste Storage Permit's HSWA section. The modified permit became effective on 08/07/99 Since the RFIs are ongoing, this CA750 determination cannot be made at this time.

2. Is groundwater known or reasonably suspected to be "contaminated" 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):

Georgia Gulf currently has two Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plans submitted to the Louisiana Department of Environmental Quality (LDEQ); one for the EDC/VCM Plant and one for the Phenol Plant. However, neither RFI Work Plan has been implemented. There has been extensive site assessment work performed in the EDC/VCM Plant and the Phenol Plants to identify areas of concern (AOCs) and corrective actions have been implemented in both plants.

Phenol Plant - The listed Solid Waste Management Units (SWMUs) for the Phenol Plant are as follows: (1) Heavy Ends Tanks, Light Ends Tank, and Heavy Ends Transfer Area Ditch; (2) Gravity Separator; (3) Phenol Drain Drum; (4) CHP Drain Drum; (5) Underground Phenol Lines; and (6) Underground CHP Lines. At present, the known chemicals of concern (COCs) at the Phenol Plant are cumene, acetone, phenol, cumyl phenol, and alpha-methyl styrene in the groundwater and the COCs for the soil media are cumene and acetone.

Comparison of these COCs to appropriate industrial levels is premature at this time due to the RFI not yet being implemented. Site-specific levels will be derived thereafter.

EDC/VCM Plant - The RFI activities will address subsurface soil and groundwater conditions for the following areas: (1) EDC/VCM Plant; (2) Sump 301; (3) EDC and VCM tank farms; (4) VCM Wastewater Ponds; (5) Muriatic acid facility; (6) OHC Unit; (7) Furnace Unit; (8) E-401 Structure; and (9) 409 Structure.

The constituents of concern (COCs) at the EDC/VCM Plant are 1,2-Dichloroethane (EDC concentrations), vinyl chloride, chloroform and 1,12-Dichloroethane in the soils and the COCs in the groundwater are 1,2-Dichloroethane, vinyl chloride, chloroform and 1,1-Dichloroethene.

Comparison of these COCs to appropriate industrial risk-based levels is premature at this time due to the RFI not yet being implemented. Site-specific levels will be derived thereafter.

An additional AOC in the EDC/VCM Plant, but not being handled in the RFI, is the EDC Emergency Retention Basin and the associated ditches. These areas have been addressed under the Georgia-Pacific Closure Permit along with extensive corrective actions. A final report is forthcoming. It is Georgia Gulf's intention to implement the RFI in Fall of 1999 once final approval from LDEQ is granted.

North/South Pond - The North/South Organic Pond is a Closed Hazardous Waste Regulated Unit. The key contaminants are acetone, cumene, and total phenols. Post-Closure groundwater monitoring has been conducted since mid-1995, under the direction of Georgia-Pacific.

References: Revised *Preliminary Report and Revised RCRA Facility Investigation Work Plan*, December 1997; *RCRA Facility Investigation - Task 1 , Current Conditions at Georgia Gulf*, January 1996; *RFI Work Plan for the Phenol Plant at Georgia Gulf*, January 1996; *Preliminary Report and RCRA Facility Investigation Work Plan for the EDC/VCM Manufacturing Complex*, January 1996; *Site Assessment of the EDC Basin and Associated Ditches*, April 1997; *Report of Groundwater Certification Assessment Proposed Phenol Plant Expansion Project for Georgia Gulf Corporation*, June 30, 1995; *North/South Pond Plume Investigation Work Plan*, January 1996; *Report of Groundwater Certification Assessment Proposed Phenol Plant Phase II Expansion Project for Georgia Gulf Corporation*, February 26, 1999; *Findings of the April 1998 Plume Investigation and Supplement to the Plume Investigation Work Plan*, August 20, 1998.

★ NOTE: Addressing Item 2 is not required or applicable, since Item 1 has been revised to "IN" - "more information needed". Also, the Georgia-Pacific units - the EDC Emergency Retention Basin and the Associated

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).

★ See NOTE bottom page 2

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").

____ **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): Phenol Plant - There have been several groundwater certification investigation reports that document current soil and groundwater conditions in the Phenol Plant. In addition, a RFI Work Plan was developed and has been submitted to the LDEQ since January 1996. The investigation proposes to define the vertical and horizontal extent for both soil and groundwater in the AOCs within the Phenol Plant. Therefore, definition of any potential plumes are undetermined at this time. However, the process for the RFI is moving forward for the EDC/VCM Plant which is known to be of greater environmental concern the low levels at the Phenol Plant.

EDC/VCM Plant - Georgia Gulf currently has plume defining monitor wells on-site to ensure no off-site migration and in addition to the already existing monitor wells, additional monitor wells have been installed under the Georgia-Pacific's Closure Permit.

Georgia Gulf has performed a complex fate and transport model (MODFLOW and MT3D) for COCs in four groundwater strata at the facility. Under the RFI, soil, and groundwater sampling locations are proposed in an around the impacted areas and locations have been approved by the LDEQ. Once this data has been collected, the determination of the need for any further corrective action measures will be decided. This site-specific groundwater model will be used when determining the fate and transport of COCs in the four groundwater strata.

North/South Pond - Georgia-Pacific currently has a three-stratum monitor well system in place that demonstrates that the contaminated groundwater remains within the dimensions of the "existing area of groundwater contamination".

References: Revised *Preliminary Report and Revised RCRA Facility Investigation Work Plan*, December 1997; *RCRA Facility Investigation - Task 1 , Current Conditions at Georgia Gulf*, January 1996; *RFI Work Plan for the Phenol Plant at Georgia Gulf*, January 1996; *Preliminary Report and RCRA Facility Investigation Work Plan for the EDC/VCM Manufacturing Complex*, January 1996; *Site Assessment of the EDC Basin and Associated Ditches*, April 1997; *Report of Groundwater Certification Assessment Proposed Phenol Plant Expansion Project for Georgia Gulf Corporation*, June 30, 1995; *North/South Pond Plume Investigation Work Plan*, January 1996; *Report of Groundwater Certification Assessment Proposed Phenol Plant Phase II Expansion Project for Georgia Gulf Corporation*, February 26, 1999; *Findings of the April 1998 Plume Investigation and Supplement to the Plume Investigation Work Plan*, August 20, 1998.

[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 determined 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.

★ see NOTE bottom page 4

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

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

____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

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

Rationale and Reference(s):

Areas of groundwater impacts are situated within the property boundaries of the Georgia Gulf, Plaquemine facility. No surface water bodies are located within the Georgia Gulf complex. Impacted groundwater is not currently migrating beyond property boundaries, nor is it expected in the future. Storm water run-off will drain to the East Ditch, where the water is sampled, treated, and discharged through a permitted NPDES permit. Therefore, there is no possibility for impacted groundwater to discharge into a surface water body.

References: Revised *Preliminary Report and Revised RCRA Facility Investigation Work Plan*, December 1997; *RCRA Facility Investigation - Task I , Current Conditions at Georgia Gulf*, January 1996; *RFI Work Plan for the Phenol Plant at Georgia Gulf*. January 1996; *Preliminary Report and RCRA Facility Investigation Work Plan for the EDC/VCM Manufacturing Complex*, January 1996; *Site Assessment of the EDC Basin and Associated Ditches*, April 1997; *Report of Groundwater Certification Assessment Proposed Phenol Plant Expansion Project for Georgia Gulf Corporation*, June 30, 1995; *North/South Pond Plume Investigation Work Plan*, January 1996; *Report of Groundwater Certification Assessment Proposed Phenol Plant Phase II Expansion Project for Georgia Gulf Corporation*, February 26, 1999; *Findings of the April 1998 Plume Investigation and Supplement to the Plume Investigation Work Plan*, August 20, 1998.

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 judgment/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.

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')?

_____ 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.

* see NOTE bottom page 2

7. Will groundwater monitoring measurement data (and surface water sediment ecological data, as necessary) be collected in be future to verify that contaminated groundwater has remained within be horizontal (or vertical, as necessary) dimensions of be "existing area of contaminated groundwater?"

* If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #Y.

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

Rationale and Reference(s):

Phenol Plant - Once the RFI has been implemented and monitor wells are installed, they will be sampled routinely and reported to the LDEQ.

EDC/VCM Plant - Routine semiannual groundwater monitoring is on-going at the EDC/VCM Plant. The monitoring system that is currently in place is as follows:

LR-1, LR-2, LR-3, 8-A, 8-B, EDC-7, EDC-5, EDC-14, EDC-13, EDC-9R, EDC-1, EDC-6, 10-A, 10-B

Once the RFI is implemented, eight additional monitor wells will be installed and added to the groundwater monitor network. An additional 23 soil and groundwater sample locations are proposed at the EDC/VCM complex to confirm the horizontal and vertical extent of contamination.

The Revised Preliminary Report and Revised RCRA Facility Investigation Work Plan, December 1997, documents the proposed activities for further delineation and includes a copy of the Quarterly Groundwater Monitoring Report.

North/South Pond - Routine semiannual groundwater monitoring and a reporting program is already on-going at Georgia-Pacific's Closed North/South Organic Pond. This program will continue to ensure the constituents will not migrate horizontally or vertically beyond the "existing area of groundwater contamination".

References: Revised *Preliminary Report and Revised RCRA Facility Investigation Work Plan*, December 1997; *RCRA Facility Investigation - Task 1, Current Conditions at Georgia Gulf*, January 1996; *RFI Work Plan for the Phenol Plant at Georgia Gulf*, January 1996; *Preliminary Report and RCRA Facility Investigation Work Plan for the EDC/VCM Manufacturing Complex*, January 1996; *Site Assessment of the EDC Basin and Associated Ditches*, April 1997; *Report of Groundwater Certification Assessment Proposed Phenol Plant Expansion Project for Georgia Gulf Corporation*, June 30, 1995; *North/South Pond Plume Investigation Work Plan*, January 1996; *Report of Groundwater Certification Assessment Proposed Phenol Plant Phase II Expansion Project for Georgia Gulf Corporation*, February 26, 1999; *Findings of the April 1998 Plume Investigation and Supplement to the Plume Investigation Work Plan*, August 20, 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).

____ 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 _____ _____facility , EPA ID # _____, located at_____. 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. EDC/VCM manufacturing Complex and Phenol Plant are undergoing RFIs.

Completed by (signature) Karen P. Laurent Date 03/21/00
(print) Karen P. Laurent
(title) Geologist

Supervisor (signature) _____ Date _____
(print) Narendra M. Dave
(title) Geologist Supervisor
(EPA Region or State) Louisiana

Locations where References may be found:

_____
_____
_____
_____
_____

Contact telephone and e-mail numbers

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See NOTE on bottom of Page 1 the facility's answer to Item 8 was "YE". We have changed the response to "IN".