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:	COOK COMPOSITES AND POLYMERS CO.
Facility Address:	Hwy 29, Tight Squeeze Industrial Park, Chatham, VA 24531
Facility EPA ID #:	VAD 055046049

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).

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):
KEY CONTAMINANTS:
Benzene, toluene, ethylbenzene, xylene, and acetone are the primary constituents of concern. Several other volatile organic compounds and semivolatile organic compounds have also been detected in the groundwater on the facility.

REFERENCES:
Verification Investigation Report, June 1999
Phase II RCRA Facility Investigation Work Plan, November 2002
Fact Sheet, July 2003

RATIONALE:
Groundwater monitoring activities since 1982 have identified elevated concentrations of organic constituents in the groundwater on the facility. The concentrations during the past two years have indicated that a release had occurred near Clean-Up Area No. 2, which is approximately 40 feet west of the boiler room. Concentrations of acetone, toluene, benzene, ethylbenzene, and total xylenes have been detected above the Maximum Contaminant Level (MCL) or Virginia Department of Environmental Quality Alternate Concentration Limits (ACL) in monitoring well PZ-8 and its replacement well PZ-8R. The deep well at this location, PZ-8D, has historically shown signs of contamination.

See Attached Table 1 with Groundwater VOC/SVOC Results from 1998-2001

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).

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):
REFERENCES:
Phase II RCRA Facility Investigation Work Plan, November 2002

RATIONALE:
Groundwater monitoring wells and piezometers have been installed across the facility over the last 21 years in response to monitoring and investigation requirements under both RCRA and Clean Water Act permitting programs. The monitoring system has shallow and deep wells dispersed downgradient from and around the plant to evaluate any releases from the facility. Groundwater has been sampled and analyzed at least four times since the Verification Report (March & Sept. 2001, June 2002, and July 2003). Concentrations of contaminants in the groundwater have decreasing in all areas of the facility, except at monitoring well PZ-8R. PZ-8R is upgradient from two extraction wells (SW-1 and SW-6) which have displayed low concentrations of the same contaminants.

The facility has installed two groundwater control features at the site to contain any contamination on the facility. The two groundwater control features at the site, a shallow groundwater pumping system and the tank farm drain system and sump, help to stabilize any contamination on the main plant area. The shallow well pumping system consists of six (6) extraction wells screened primarily in the saprolite and weathered bedrock zone. The water is routed to granular activated carbon vessels for treatment prior to use as non-contact cooling water. The system works to capture all groundwater flow from the main facility area. The tank farm drain and sump consists of perforated drain tile that collects infiltration water and groundwater in the tank farm area. The primary intent of this system is to control the water level in the tank farm to prevent the tanks from moving due to buoyancy effects. The water is delivered by gravity drain to the sump. Both of these systems working together minimize the amount of groundwater that flows downgradient towards the Banister River.

Footnotes:

[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.

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

__X__ 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):
REFERENCES:
Phase II RCRA Facility Investigation Work Plan, November 2002

RATIONALE:
Runoff from the facility eventually enters the flood plain to the south. Two ditches are located along the southern edge of the site and converge in the flood plain 100 feet south of the tank farm sump. Ultimately the two ditches discharge to the Banister River which is located approximately 1,200 feet south of the facility. Groundwater may discharge to the ditch system in the low lying flood plain south of the site.

Contaminants have not been detected in surface water samples collected from the drainage ditches. However, acetone, xylenes, carbon disulfide, ethylbenzene, and methyl ethyl ketone have all been detected historically in soil samples collected from the drainage ditches. Further sampling of the surface water and sediment is planned in the RFI Work Plan.

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)?

Rationale and Reference(s):

__X__ 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 – skip to #8 and enter "IN" status code.

Rationale and Reference(s):
REFERENCES:
Phase II RCRA Facility Investigation Work Plan, November 2002

RATIONALE:

Surface water samples from the drainage ditch have not detected any contamination during historical events and are therefore designated insignificant. In the RFI workplan additional evaluation of surface water and a stormwater sampling event will confirm the absence of contamination. If contamination is detected the concentrations will be compared to the values detected in the groundwater.

Footnotes:

[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[4])?

NOT APPLICABLE

_____ 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 ecosystems), 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 into surface water is potentially significant) continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> 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 – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Footnotes:

[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.

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. 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):
REFERENCES:
Phase II RCRA Facility Investigation Work Plan, November 2002

RATIONALE:
The Phase II RFI has a sitewide groundwater investigation planned. Included in the work are:
1. The installation of a deep well on the south of the sump area and on the floodplain in order to confirm or deny the presence of deeper groundwater contamination
2. Collect water levels from all monitoring wells and piezometers
3. Collect water samples from the main monitoring wells and deep well (DW-1) at the facility
4. Collect surface water samples around the facility
5. Evaluate the effectiveness of the treatment systems
6. Perform a storm water sampling event.

All of this work will determine the current status of the groundwater at the facility and will assist in verifying the data presented in the Environmental Indicator forms.

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 Cook Composites and Polymers Co. facility, EPA ID # VAD 055046049 , located at Hwy 29, Tight Squeeze Industrial Park, Chatham, VA 24531. 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	(Original Signed)		Date 9/25/03
	(Print)	Richard C. Doucette	
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Supervisor	(Original Siged)		Date 9/25/03
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