

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: ENVIRITE CORPORATION
Facility Address: Old Waterbury Road, Thomaston, CT
Facility EPA ID #: CTD093616613

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?

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 the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

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

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2. Is **groundwater** known or reasonably suspected to be “contaminated”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

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):

Much of the contamination at the site can be attributed to the “Pre-Envirite Waster Materials” (PEWM). Based on the available information, the PEWM appears to be a release of still bottom sludges and is comprised of a gamut of contaminants including halogenated and aromatic VOCs and metals, among others. The available information suggests that this release may be the result of the now defunct Solvents Recovery Service (SRS) as the waste pre-dates Envirite’s presence on the site. Envirite is currently considering the excavation and removal of all or part of this waste pile as the presence of portions of the waste in the vadose zone is contrary to CTDEP groundwater policy. Another source of contamination may be Envirite’s metal hydroxide/sulfide sludges wastes (a.k.a. landfilled treatment residues (LTR)). The future impact of the LTR on the site is currently under consideration although Synthetic Precipitation Leaching Procedure (SPLP) data from the RCRA Facility Investigation (RFI) and quarterly post-closure groundwater monitoring data collected since January of 1991 indicate no increasing trend in dissolved-phase contaminant concentrations. See June 2001 draft report entitled, *Statistical Trend Analysis of COPCs in Groundwater and Conceptual Source Model for PEWM*. Finally, an acid spill which occurred in the late 1980s or early 1990s caused the release of metals to groundwater. In general, it would appear that metals concentrations are decreasing. Finally, Envirite has completed its risk assessment: although the proposed Media Protection Standards (MPS) have not yet been approved by EPA, it would appear that human health (and ecological) risks have been adequately delineated.

Footnotes:

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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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)?

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):

The site has been extensively investigated to understand whether and to what extent contamination may be migrating on and off the site. This information has culminated in an understanding of the behavior of those wastes which constitute the main concerns at the site: namely, the "Pre-Envirite Waster Materials" (PEWM) and the landfilled treatment residues (LTR).

PEWM: Physical Nature; Diffusion Limited Source

With respect to the PEWM, the data has shed light on both its nature and behavior. The physical nature of the PEWM itself is such that it will not migrate. See EPA letter to Dave Nash of the Connecticut Department of Environmental Protection entitled, Pre-Envirite Waste Materials, dated December 1, 1998 [sic], In EPA December 2, 1997 Draft Comments on Final RFI Report. VOCs which may migrate from the PEWM are diffusion-limited as a result of the low permeability of the PEWM. With respect to the PEWM located in the saturated zone, this diffusion-limited transfer has reached a low-level steady state as a result of its presence in the saturated zone for over 40 years. See June 2001 draft report entitled, *Statistical Trend Analysis of COPCs in Groundwater and Conceptual Source Model for PEWM*. And so, although the information indicates the PEWM in the saturated zone will continue to be a source to the aquifer for a long time, these impacts have reached a steady state and will decline with time. With respect to the PEWM located near Old Waterbury Road which exists in the vadose zone, periodic 'releases' to the aquifer could be anticipated to occur as a function of precipitation events and changes in groundwater elevation. However, the data indicates that (a) such releases caused by precipitation events are generally infrequent and sporadic and (b) based on the hydrological conceptual model, dissolved-phase constituents migrate preferentially in a southwest direction across the site and away from the Naugatuck River so that, by the time these concentrations reached the southwest property boundary, they would not be of significant risk to surface water at Branch Brook located to the west and southwest of the site.

LTR

The future impact of the LTR on the site is currently under consideration for the Corrective Measures Study phase. With respect to current impact, Synthetic Precipitation Leaching Procedure (SPLP) data from the RCRA Facility Investigation (RFI) and quarterly post-closure groundwater monitoring data collected since January of 1991 do not indicate an increasing trend in dissolved-phase contaminant concentrations. See June 2001 draft report entitled, *Statistical Trend Analysis of COPCs in Groundwater and Conceptual Source Model for PEWM*.

Acid Spill. An acid spill which occurred in the late 1980s or early 1990's caused the release of metals to groundwater. Again, the groundwater monitoring data suggest that dissolved-phase metal concentrations are decreasing.

Summary

The very well documented behavior of the sources of contamination at the site have shed significant light on the current and future behavior of these sources. The data suggests the PEWM has generally reached a low-level steady state which is anticipated to continue to attenuate with time. Although the PEWM which is located in the unsaturated zone can potentially impact the aquifer, its behavior is understood and such impacts have been qualified. Currently, the LTR is not impacting groundwater as the monitoring data generally confirms PEWM and LTR findings by revealing no significant increasing trends in dissolved-phase concentrations. The hydrogeological conceptual model suggests that on-site constituents will not likely impact the Naugatuck River or Branch Brook. Although concentrations in excess of the federal maximum contaminant levels (MCL) are present at the downgradient property boundary and hence, the extent of contamination likely extends onto the downgradient property (Town of Thomaston POTW), these concentrations will behave in accordance with on-site findings: (1) they will decrease with time and (2) their extent is not increasing. From a current perspective at least, the scope and physical extent of contamination has reached a manageable steady-state behavior.

² "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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

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

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):

Based on the revised hydrological conceptual model, there is a remote possibility that VOCs could periodically migrate to the Naugatuck River at the southeastern part of the site. Such migration would most likely occur in the winter/spring under conditions where the hydraulic head from the northwest portion of the site dominates the site potentiometric flow. Such a flow regime, however, would be of limited duration because the data indicates that whatever northwestern to southeastern flow component may exist would be countered by the hydraulic head of the Naugatuck. Also, from a physical standpoint, the data indicates that a hydraulic 'connection' with the Naugatuck would be a narrow band in the vicinity of the southeastern-most portion of the site and the MW-41 monitoring well cluster.

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ 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)?

 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 concentration³ 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 concentration³ 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 concentrations³ 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):

The VOC constituents which may be said to characterize the diffusion-limited migration from the PEWM are: PCE, TCE, vinyl chloride (VC) and ethylbenzene (EB). The State of Connecticut’s Surface Water Protection Criteria (SWPC) for these constituents are: 88, 2340, 15,750 and 580,000 ug/l respectively. Quarterly groundwater monitoring data for MW-41 dates back to January 1991. The highest concentrations of VOCs measured at MW-41 are:

<u>Well</u>	<u>VOC</u>	<u>Conc. (ug/l)</u>	<u>Date</u>	<u>CTDEP SWPC (ug/l)</u>
MW-41S:	PCE	16	Oct. '98	88
	TCE	15	Jul '97	2,340
	VC	0.1 (detection limit)	n/a	15,750
	EB	0.1 (detection limit)	n/a	580,000
MW-41D:	PCE	150 ug/l	Apr '97	
	TCE	26	Apr '97	
	VC	0.1 (detection limit)	n/a	
	EB	0.1 (detection limit)	n/a	
MW-41B:	PCE	18 ug/l	Jan '99	
	TCE	37	Jan '97	
	VC	28	Jul '97	
	EB	0.1 (detection limit)	n/a	

From the data, PCE was detected at a concentration in exceedence of the SWPC at MW-41D in April of 1997. The data for MW-41D indicates consistent concentrations of 0.1 ug/l (detection limit) from Jan 1991 until April of 1994 when PCE was detected at 2.7 ug/l. The PCE data for MW-41D is presented below for the period of April 1994 to October of 2001:

<u>Well</u>	<u>VOC</u>	<u>Conc. (ug/l)</u>	<u>Date</u>	<u>CTDEP SWPC (ug/l)</u>
MW-41D	PCE	2.7	Oct '94	88
		0.1	Jan '95	
		0.1	Apr '95	
		0.1	Jul '95	
		0.1	Oct '95	
		0.1	Jan '96	
		10	Apr '96	
		11	Jul '96	
		11	Oct '96	
		0.1	Jan '97	
		150	Apr '97	
		0.1	Jul '97	
		10	Oct '97	
		0.1	Jan '98	
		14	Apr '98	
		15	Jul '98	
		0.1	Oct '98	
		0.1	Jan '99	
		11	Apr '99	
		14	Jul '99	
		0.1	Oct '99	
		0.1	Jan '00	
		14	Apr '00	
		11	Jul '00	
		<u>12</u>	Oct '00	
	Avg.	11.5		

From the data, if the occurrence of 150 ug/l of PCE in April of 1997 is not an outlier, then it is the result of an unusually high groundwater table and therefore reflects contact of the PEWM located in the vadose zone under Old Waterbury Road. Although a remedy assumption for the site includes removal of this PEWM waste pile in total or in part, even now, the data indicates that an exceedence of the SWPC is an unusual occurrence from a statistical standpoint.

Moreover, compared to 10 times the SWPC of 88 ug/l (i.e., 880), even the 150 ug/l outlier is acceptable according to the EI guidance. There are no other conditions which are likely to alter the trend established by the data except for the extremely rare case where the groundwater table elevates to contact the PEWM located under Old Waterbury Road. In such a case - and assuming that the MW-41D data may be extrapolated to concentrations entering the Naugatuck River - the dissolved-phase concentrations resulting from groundwater contact with the PEWM will dissipate quickly so that the occurrence as well as the mass flux of PCE to the Naugatuck will be spatially and temporally limited. Based on the available data, including the physical chemical and risk behavior science for VOCs in surface water, in the professional judgment of this RCRA Facility Manager, the discharge of contaminated groundwater to the Naugatuck River is considered to be insignificant.

References

The following references were used for this Stabilization determination:

- RCRA Facility Investigation, Phase I Report, Envirite Corporation, Thomaston, CT, dated March 1995;
- USEPA Final Comments on the Phase I Interim Report and Phase II Proposal, including the First Interim Deliverable of the Public Health and Environmental Risk Evaluation (PHERE), dated April 25, 1996;
- UST Removal Workplan, dated June 11, 1996;
- Response to EPA Comments, RCRA Facility Investigation, Phase I Report, Envirite Corporation, Thomaston, Connecticut, dated May 30, 1997;
- Response to EPA Comments, RCRA Facility Investigation, Phase I Report, Envirite Corporation, Thomaston, Connecticut, dated June 1997;
- Work Plan to Assess Potential Impacts to Groundwater from Metals and VOCs at the Envirite Landfill in Thomaston, CT, dated October 21, 1997;
- USEPA Draft Comments on Final RFI Report; Pre-Envirite Waste Materials, Envirite Facility, Thomaston, CT, dated December 2, 1997;
- LTR Study Report, dated December 21, 1998;
- Public Health and Environmental Risk Evaluation (PHERE), Envirite Corporation, Thomaston, Connecticut, dated May 1997 (revised February 2000);
- Draft Report: Statistical Trend Analysis of COPCs in Groundwater and Conceptual Model for Source Impact to Groundwater, dated June 2001.

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the discharge of “contaminated” groundwater into surface water be shown to be “currently acceptable” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of “contaminated” groundwater can not be shown to be “currently acceptable”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s): _____

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

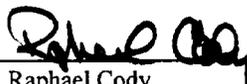
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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting 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 **Envirite Corporation** facility, EPA ID #CTD093616613, located at **Old Waterbury Road, Thomaston, CT**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by	(signature) <u></u>	Date <u>8/22/01</u>
	(print) <u>Raphael Cody</u>	
	(title) <u>RCRA Facility Manager</u>	
Supervisor	(signature) <u></u>	Date <u>9/4/01</u>
	(print) <u>Matt Hoagland</u>	
	(title) <u>Chief, RCRA Corrective Action</u>	
	(EPA Region or State) <u>Region I</u>	

Locations where References may be found:

See facility files

STATE contact telephone and e-mail numbers

(name) _____
(phone #) _____
(e-mail) _____