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: Kendro Laboratory Products
Facility Address: 31 Pecks Lane
Facility EPA ID #: Newtown, CT 06470-2337

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 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): A volatile organic compound (VOC) groundwater plume exists at the site and the suspected source is the former waste coolant tank. Extensive soil sampling around this and other potential source areas suggest that there is no remaining source. Primary constituents of the plume include 1,1,1-trichloroethane, trichloroethylene, 1,2-dichloroethane, and 1,1-dichloroethylene. Based on the most recent groundwater monitoring conducted in 1997, levels of these constituents exceed Connecticut Remediation Standard Regulation (RSR) GA/GAA Groundwater Protection Criteria in the gravel and bedrock aquifers immediately downgradient of the facility building. The maximum concentrations detected during the most recent round of sampling were at well DP-10 in the shallow and deep bedrock. DP-10 is located downgradient of the facility property and immediately upgradient of Loma Pond, a man-made pond that exists as a result of sand and gravel excavation . These concentrations are presented below (GZA, 1998):

	DP-10-82 (shallow bedrock) -μg/l	DP-10-134 (deep bedrock) -μg/l	CT RSR GA/GAA GWPC (μg/l)
1,1,1-Trichloroethane	320	310	200
1,1-Dichloroethene	96	110	7
1,2-Dichloroethane	1	4.6	1
Trichloroethene	18	18	5

Groundwater sampling has shown concentrations of VOCs declining over time in all areas of the plume. There are no drinking water wells in the area of the plume and CT DEP has changed the groundwater classification in the area of the plume from GA to GB (DuPont, 2000).

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): Several rounds of groundwater monitoring have been conducted since the 1980s, when the plume was discovered. The most recent monitoring was conducted in 1997 (GZA, 1998). Results show that concentrations have been decreasing over time. In addition, the "existing area of contaminated groundwater" has been shrinking over time. Results of groundwater monitoring performed in 1991 showed concentrations in the gravel and bedrock aquifers in excess of CT RSR GA/GAA Groundwater Protection Criteria extending approximately 1500 feet downgradient of the southeast corner of the facility building (ERM, 1992). Groundwater monitoring performed in 1997did not detect VOC in excess of CT RSR GA/GAA Groundwater Protection Criteria downgradient of Loma Pond, which is 400 feet downgradient of the southeast corner of the facility building (GZA, 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 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): Groundwater leaving the site in the surficial sand aquifer discharges into Loma Pond. Further downgradient, groundwater in the gravel aquifer discharges into the Pootatuck River.

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)?

__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 - enter "IN" status code in #8.

Rationale and Reference(s): Groundwater concentrations in wells immediately upgradient of the Pootatuck River are well below the CT RSR GA/GAA Groundwater Protection Criteria (GZA, 1998). The well immediately upgradient from Loma Pond which is screened in the surficial sand aquifer (DP-10-19) was sampled most recently in 1991, as it could not be sampled in 1997. The 1991 results showed that VOC concentrations were within 10 times of the CT RSR GA/GAA Groundwater Protection Criteria for all constituents except 1,1-dichloroethylene which was 12 times the CT RSR GA/GAA Groundwater Protection Criteria (ERM, 1992). It is expected that groundwater concentrations in this well would have been lower in 1997, as results from wells sampled in 1997were generally substantially lower than results from 1991. Surface water sampling was performed in Loma Pond in 1991 and 1997. The results from 1997 showed the following concentrations (μg/l) (GZA, 1998):

1,1-dichloroethane	0.40 J
1,1-dichloroethene	0.34 J
N-propylbenzene	0.33 J
tetrachloroethene	0.06 J
1,1,1-trichloroethane	2
trichloroethene	0.14

All of these results are an order of magnitude or more below the Great Lakes Water Quality Initiative Tier II values.

Loma Pond is man-made pond in a pit created by the removal of sand and gravel. It is located in an area which is an active gravel pit, and does not does not appear to be a likely habitat for wildlife. Based on the

VOC concentrations in the upgradient well, the VOC concentrations in the water column, and the nature of the pond, it appears that any impacts to the pond from contaminated groundwater discharging are likely to be insignificant.

[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])?

_____ 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.

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 and Reference(s): Only one round of groundwater monitoring was conducted in 1997. Therefore, the facility should conduct at least one year of quarterly monitoring in the same wells sampled in 1997 to confirm the groundwater results observed in 1997. If this groundwater monitoring shows higher concentrations than those observed in 1997, additional years of monitoring may be necessary.

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 Kendro Laboratory Products facility , EPA ID # CTD072115793, located at 31 Pecks Lane, Newtown, 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) Stephanie Carr Date 8/31/00
(print)Stephanie Carr
(title) RCRA Facility Manager

Supervisor (signature) Matt Hoagland Date 9/14/00
(print)
(title)
(EPA Region or State)

Locations where References may be found:

- Phase III Hydrogeologic Investigation and Engineering Evaluation for the DuPont Newtown Site, prepared by ERM Inc. dated 7/31/92 (available in EPA - New England files)
- Letter report dated January 12, 1998 from Tom Stark, GZA to Craig Bartlett, DuPont (available in EPA - New England files)
- Letter dated May 8, 2000 from Craig Bartlett, GZA to Stephanie Carr, EPA (available in EPA New England files)

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