DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action Revised 11/8/00

Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Dymon Corporation
Facility Address: 3401 Fairbanks Avenue, Kansas City, Kansas
Facility EPA ID #: KSD067952994

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?

   Yes 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 ("YES" 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 (GPRA) of 1993. 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, ecological receptors).

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 release subject to RCRA Corrective Action, anywhere at, or from, the facility?

Yes — 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):

The Dymon Site is located in Kansas City, Kansas and was located on property leased from Sinclair Oil Company. Dymon leased facilities from Sinclair from 1974 to 1997. Dymon produced primarily janitorial cleaning supplies. Some chemical solvents, pesticides, and herbicides were used as constituents in the finished products produced by Dymon. The constituents were stored in tanks, barrels, and dispensers either on an inside concrete floor or on outside concrete aprons until shipment. Prior to its departure from the site in 1997, Dymon terminated its lease, vacated the premises, decontaminated the operation areas, and closed the materials storage vessels. The southern portion of the building leased by Dymon contained the operational portion of the chemical blending. The building was razed in 2001 and no longer exists. Contaminated soil generated from Dymon activities has been excavated, treated, and placed into a landfill that is regulated by the Kansas Department of Health and Environment. Monitoring wells were placed around the landfill unit and are monitored on a quarterly basis by the state of Kansas.

Releases of petroleum-related compounds from the former Sinclair refinery and the Dymon-related compounds have occurred at the facility and are co-mingled. Groundwater monitoring is conducted at the facility by the Sinclair and BP Amoco companies. A summary of compounds identified in groundwater in June 2003 above relevant screening criteria is presented in Table 1. Figure 1 presents an isocontour map of Benzene in groundwater at the Site developed from groundwater data collected in August 2003. The August data was received just as this form was finalized so it was included only on the isocontour map for benzene.

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)?

Yes — 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):

Groundwater containing constituents above KDHE standards could potentially migrate off of the Site and discharge to the Kansas River. Several monitoring wells close to the river and downgradient of the Site contain benzene above relevant screening levels as shown in the attached Table 1 (June 2003 data) and Figure 1. Groundwater isoconcentration maps for the benzene plume at the Site from January 1999 (Figure 2) and August 2003 were completed to evaluate potential changes over that time period (Figure 1). These maps show the groundwater plume has not changed significantly and comprises the same areal extent. Additional piezometers and monitoring wells were installed after 1999, providing a refinement of the plume shape in the northern portion of the facility. Groundwater piezometric surface maps are also included in Attachment 1 that indicate the groundwater flow direction is consistently toward the Kansas River.

The estimated dissolved benzene plume in 2003 is essentially the same size as the plume identified in 1999. The presence of the Kansas River could potentially keep the plume from expanding downgradient. However, surface water and sediment sampling in the river has not identified compounds from Site groundwater.

[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?

Yes 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 containing COPC above screening levels could potentially migrate off-site and discharge to the Kansas River. However, sampling has been conducted in the Kansas River upgradient and downgradient of the Site since 1996. These sampling data are included as Attachment 2. While it is possible that impacted groundwater from the Site is discharging to the river, the river data do not show detectable concentrations of Site COPC and therefore indicate that the river is not being impacted by Site groundwater. In addition, a sediment sample was collected from the river bank in August 2003 in accordance with an EPA approved work plan. The location is shown as B-1 (Figure 1) and no COPC above screening criteria were detected in this sample. The analytical data for this sediment sample are included as Attachment 3.

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 re 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.

No 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)

The most recent groundwater sampling event was conducted in August 2003. The monitoring wells located closest to the Kansas River including ERM-10, ERM-11, and ERM-14 were sampled. Benzene was detected in Well ERM-10 at 500 µg/l (the KDHE Tier 2 standard for Benzene is 5 µg/l and the USEPA Region IX PRG for benzene is 0.34 µg/l). At Well ERM-11, benzene was detected at 70 µg/l and at ERM-14 benzene was detected at 59 µg/l. With 3 of the 5 wells closest to the river exhibiting concentrations of benzene between 10 and 100 times the applicable standard of 5 µg/l, this discharge to the river would not be considered insignificant if it is occurring based on criteria described above. However, based on the sediment data, the river water data collected upstream and downstream of the Site, and as further discussed on page 6, the discharge, if it is occurring, can be considered "acceptable," especially with the installation of the Site groundwater boundary treatment system planned for late 2004.

[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])?

Yes 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):

River sampling has been conducted both upgradient and downgradient of the Site. The results of this sampling are presented in Attachment 2. Only a few heavy metals have been detected in these surface water samples and the results from upgradient and downgradient of the Site have been consistent. As discussed on page 4, river sediment sampling has detected no COPC above screening criteria. A study was performed in August 2004 to evaluate ecological receptors that may be in direct contact with surface water or sediments (Attachment 4). Results indicated that benzene in groundwater adjacent to the Kansas River does not pose any significant risk. These data indicate that while there is potentially a discharge of groundwater to the river, the

[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.

groundwater is not causing a detectable effect or unacceptable short-term impact to the surface water, sediment or eco-systems. In addition, the installation of a groundwater boundary treatment system is planned to initiate in late 2004.

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?"

Yes 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):

Sinclair is committed to ongoing groundwater monitoring at the Site as negotiated with EPA and KDHE. Annual sampling of on-site groundwater will likely be conducted for a period of time after installation of the groundwater stabilization system. Groundwater samples will be analyzed for BTEX compounds since benzene has been identified as the indicator compound for Site groundwater. This monitoring will also be used to document that plume migration remains under control in the future. The attached Figure 1 shows the monitoring wells at the Site that are currently being sampled. These monitoring wells will be sampled annually to evaluate future Site groundwater. The number of wells monitored and the constituents to be analyzed will be refined to provide sufficient data to evaluate the groundwater conditions at the facility.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA: 750)

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 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 Dymon Inc. facility, EPA ID # KSD067952994, located at 3401 Fairbanks Avenue., Kansas City, Kansas. 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) _____ Date 9/30/04
(print) Gayle Hubert
(title) Project Manager

Supervisor (signature) _____ Date 9/30/04
(print) Jody Hudson
(title) Associate Director RCAP
(EPA Region or State) Region 7

Locations where References may be found:
US EPA Records Center
913-551-7166

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Facility Name _____

EPA ID# _____

City/State _____

MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL (CA 750)