

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: General Chemical Corporation (Delaware Valley Works)
Facility Address: 6300 Philadelphia Pike, Claymont, Delaware
Facility EPA ID #: DED154576698

I. 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?

- X yes - check here and continue with #2 below.
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 "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" 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 of 1993, GPRA). 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, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRJS 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. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated" ¹ above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RVs or AOCs)?

| | <u>Yes</u> | <u>No</u> | <u>I</u> | <u>Rationale / Key Contaminants</u> |
|-------------------------------|------------|-----------|----------|-------------------------------------|
| Groundwater | X | | | |
| Air (indoors) ² | | X | | |
| Surface Soil (e.g., <2 ft) | X | | | |
| Surface Water | | X | | |
| Sediment | X | | | |
| Subsurface Soil (e.g., >2 ft) | X | | | |
| Air (outdoors) | | X | | |

If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

- X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation .

If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

The Delaware Valley Works facility ("Facility") was a chemical manufacturing plant which once consisted of approximately 100 acres. It is divided, by Route 13, into two separate plants, referred to as the "DVW North Plant" and "DVW South Plant," respectively. Approximately two-thirds of the DVW North Plant is located in Pennsylvania with the remainder situated in Delaware. Virtually all of the DVW South Plant is located in Delaware. A variety of inorganic chemicals and pesticides were manufactured at the Facility during different periods since it began operation in the very late 1890's. A corporate predecessor of General Chemical Corporation (GCC) acquired part of the Facility from Allied Signal, now Honeywell International Inc. (Honeywell) in 1986. Allied Signal retained ownership of several contiguous parcels of property in the DVW North Plant upon which chemical operations were conducted and continue today, and one inactive parcel known as Solid Waste Management Unit-9 (SWMU-9) in the DVW South Plant. In 2004, Honeywell re-acquired the DVW North Plant from GCC.

There are multiple Solid Waste Management Units and Areas of Concern being investigated through the RCRA Corrective Action process at the General Chemical facility. Media known or reasonably suspected to be contaminated above appropriately protective risk-based levels are summarized below:

Groundwater - Exceedances of EPA's drinking water Maximum Contaminant Levels (MCLs) and/or Region 3's Risk Screening Levels (RSLs) for Tap Water have been observed for Metals, SVOCs (pesticides) and VOCs. Specific constituents exceeding their respective MCL and/or RBC include but are not limited to: Arsenic, Antimony, Cadmium, Chromium, Lead, Thallium, alpha-BHC, beta-BHC, gamma-BHC (Lindane), Vinyl chloride, Benzene, Trichloroethene and Tetrachloroethene.

Surface Soils - Surface Soil samples collected at the General Chemical facility were screened against Region 3's RSLs for soils in industrial settings. Exceedances of Region 3's RBCs for industrial soils have been observed for Metals, SVOCs (PAHs & pesticides) and VOCs. Specific constituents exceeding their respective industrial soil RBC include but are not limited to: Arsenic, Mercury, Lead, Benzo (a) pyrene, 4,4'-DDT, 4,4'-DDE, 4,4'DDD, alpha-BHC, beta-BHC, gamma-BHC and Trichloroethene.

Subsurface Soils - Subsurface soil samples collected at the General Chemical facility were screened against Region 3's RSLs for soils in industrial settings. Exceedances of Region 3's RSLs for industrial soils have been observed for Arsenic, Benzo (a) pyrene, Benzene and Trichloroethene.

Sediments: Sediment samples were collected from the facility's storm water sewers, including the sluiceway in the South Plant, the cove area in the Delaware River between SWMU 9 and the General Chemical Pier and the area contiguous to SWMU 9. The analytical results of these samples were screened against BTAG Screening Benchmarks, (Marine Sediment Screening Benchmarks). Exceedances were observed for 4,4'-DDT, 4,4'-DDE, 4,4DDD, arsenic and lead.

References include:

"RFI Work Plan, Delaware Valley Works Facility" dated December 2000 (Revised May 2002) by Earth Sciences Consultants, Inc.

"Summary of Presentation Items, General Chemical Corporation, Delaware Valley Works Facility, Claymont, Delaware, dated November 7, 2003

Cummings Riter Consultants Inc. Letter Report, Subject: "Sediment, Soil and Groundwater Data" dated September 27, 2010

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 appropriately protective risk-based ' levels" (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there complete pathways between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

| "Contaminated" Media | Residents | Workers | Day-Care | Construction | Trespassers | Recreation | Food |
|-------------------------------|-----------|---------|----------|--------------|-------------|------------|------|
| Groundwater | No | No | No | No | | | No |
| Air (indoors) | | | | | | | |
| Soil (surface, e.g., <2 ft) | No | No | No | No | | | No |
| Surface Water | | | | | | | |
| Sediment | No | No | No | No | | | No |
| Soil (subsurface e.g., >2 ft) | No | No | No | No | | | No |
| Air (outdoors) | | | | | | | |

Instructions for Summary Exposure Pathway Evaluation Table:

- 1 . Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.
- 2 Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("_"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

X If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Groundwater: There are no groundwater receptors on or downgradient of the facility property. Groundwater discharges to either the Delaware River or to Naamens Creek at or near the property boundaries. Potential exposure to workers/construction workers will be addressed via facility policy and procedures. (e.g. construction management plans and health and safety plans, work permits, etc.)

Surface Soils: Currently there are no active production units on the DVW South Plant. The facility monitored and fenced to minimize the potential for trespassers. Potential exposure to workers/construction workers will be addressed via facility policy and procedures, (e.g. construction management plans and health and safety plans, work permits etc.).

Sediment: EPA has identified a potential food ingestion pathway for humans based on approximately 10 acres of known Delaware River surficial sediments contaminated with bioaccumulative chemicals contiguous to the General Chemical Delaware Valley Works (facility) property and the possibility that fishermen could crab in this general vicinity. However, the combination of a limited area of contamination, great mobility in the target crab species which reduces the likelihood of bioaccumulation from this 10 acres, and the unlikely nature of the Delaware Valley Works offshore area as a prime or commonly used fishing area makes this pathway de minimis. EPA is also working with representatives of the facility to expedite the remediation of the contaminated sediments which will eliminate any potential for future crab exposure.

Subsurface Soils: Potential exposure to workers/construction workers will be addressed via facility policy and procedures, (e.g. construction management plans and health and safety plans, work permits etc.). Soils at this facility are not used for growing any fruits, vegetables, crops, etc.

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, e t c .)

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4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant"⁴ (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

If no (exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

⁴ if there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

If no - (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

Rationale and Reference(s):

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- 6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI (event code CA725), 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 YES - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the General Chemical Delaware Valley Works facility, EPA ID # DED154576698 located at 6300 Philadelphia Pike, Claymont, DE 19703 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

Completed by (signature)  Date: August 18, 2016
(print) Russell H. Fish
(title) Remedial Project Manager

Supervisor (signature)  Date: August 18, 2016
(print) Luis Pizarro
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Locations where References may be found:

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