

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:** Dupont Seaford  
**Facility Address:** 400 Woodland Road, Seaford, Delaware 19973  
**Facility EPA ID #:** DED002348845

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?

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 ("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 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. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**<sup>1</sup> 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, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>x</u>	<u>---</u>	<u>---</u>	<u>---SWMUs 1, 6, 10/11, 12, 13/17, PW2A, PW12</u>
Air (indoors) <sup>2</sup>	<u>---</u>	<u>x</u>	<u>---</u>	<u>-----</u>
Surface Soil (e.g., <2 ft)	<u>---</u>	<u>x</u>	<u>---</u>	<u>-----</u>
Surface Water	<u>---</u>	<u>x</u>	<u>---</u>	<u>-----</u>
Sediment	<u>---</u>	<u>x</u>	<u>---</u>	<u>---</u>
Subsurf. Soil (e.g., >2 ft)	<u>x</u>	<u>---</u>	<u>---</u>	<u>---Flyash in landfills and on golf course</u>
Air (outdoors)	<u>---</u>	<u>x</u>	<u>---</u>	<u>---</u>

----- 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):

See 1995 RFI Report, revised through 1999.

In addition to the limited soil data in the RFI report (2 samples at SWMU 2- one sample 0-1 foot and the second sample 2 to 4 feet), soil data for the “Drummed Waste Storage Area, SWMU 8” and “Closed Spray Irrigation Field, SWMUs 10 and 11” from the 1986 Site Investigation Report Prepared by AT Kearney was reviewed. For soil and sediment, contaminant levels were compared to industrial Region III RBCs for soil. For arsenic in soil, Regional background values were considered (Shacklette, H.T. and J.G. Boerngen, 1984. Element Concentrations in Soils and other Surficial Materials of the Conterminous United States. United States Geological Survey Professional Paper 1270). For arsenic in sediment, levels of arsenic in the Nanticoke River Above Seaford were considered (See “Chemical Contaminants of Sediments of the Nanticoke River” prepared by Delaware Department of Natural Resources and Environmental Control, Division of Water Resources, Watershed Assessment Branch, November 1997, Table 18, Page 42). The level of arsenic in SD-9 and SD-10 in the drainage ditch sediment samples were reported biased low (1.3 ppm and 1.8 ppm, respectively) and exceeded the average level of arsenic in the Nanticoke River Above Seaford (0.9479 ppm). However, the level of arsenic in the sediment at the most downgradient sample location in the Nanticoke River Above Seaford exceeded the level of arsenic in SD-9 and SD-10. Therefore, the concentration of sediment at locations SD-9 and SD-10 in the drainage ditch are interpreted to be less than background concentrations.

For surface water, contaminant levels were compared to fish ingestion Ambient Water Quality Criteria (AWQC) - as the surface water is not a drinking water source. Surface water was evaluated in the portion of the drainage ditch from the fish barrier to the confluence of the drainage ditch with the Nanticoke River (locations SW-9 and SW-10). As fish ingestion AWQC do not exist for lead in surface water, the level of lead in surface water was compared to the EPA Office of Water Treatment Technology Action Level (TTAL) for lead (15 ug/l), the State of Delaware primary maximum contaminant level (MCL) for lead (20 ug/l), and the AWQC for chronic exposure in fresh water (2.5 ug/l).

The following information is reported in "Wetlands Investigation and Flora and Fauna Communities Assessment at Dupont Seaford Facility, Seaford, Delaware Report" prepared for EPA by Dyanamac Corporation, January 13, 1992:

Dynamac personnel detected particulates of mercury in the air at 0.003 mg/m<sup>3</sup> (this reading was sustained for over one minute and above the background level which according to the Dynamac Health and Safety Plan required field personnel to evacuate the area) with the Mercury Vapor Analyzer while investigating the wetlands along the perimeter of the landfill in a drainage pathway near Woodlane Road.

Based on a comparison of the contractor's field measurement reported in 1992 (3 ug/cubic meter) with OSHA and NIOSH exposure limits (both 10 ug/cubic meter if organic mercury - the form of mercury with the most stringent exposure limits), the reported level was less than the OSHA and NIOSH exposure limit for organic mercury.

Footnotes:

<sup>1</sup> "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).

<sup>2</sup> 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)

<b>“Contaminated” Media</b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	_N_	_N_	_N_	_N_			_N_
Air (indoors)	_x_	_x_	_x_				
Soil (surface, e.g., <2 ft)	_x_	__x	_x_	_x_	__x	__x	__x
Surface Water	_x_	_x_			_x _x	_x	
Sediment	_x__	_x_			__x_	x__	_x__
Soil (subsurface e.g., >2 ft)				_N_			_N__
Air (outdoors)	_x_	_x_	_x__	_x_	_x_		

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

Assumptions:

The groundwater drinking water supply at the Dupont facility excludes contaminated groundwater (as implemented by a cutoff valve installed and managed by Dupont).

There is no active construction where by construction workers are exposed to contaminated groundwater.

Assumptions continued:

Exposure to flyash at the landfill is controlled and prevented via a solid waste permit issued by DNREC.

Exposure to flyash at the golf course is controlled and prevented by golf course management.

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (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 can not 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):

<sup>4</sup> 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 (and attach appropriate supporting documentation as well as a map of the facility):

YE - 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 Dupont Seaford Facility, EPA ID # DED 00 234 8845, located at Seaford, Delaware, 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: 02-07-02  
(print) Diane Schott  
(title) Remedial Project Manager

Supervisor (signature) \_\_\_\_\_ Date: 02-14-02  
(print) Robert E. Greaves  
(title) Chief, General Operations Branch  
(EPA Region or State) EPA Region 3

Locations where References may be found:

  Diane Schott, (Cubicle 416, 11th Floor)  
  US EPA Region III (3WC23) \_\_\_\_\_  
  1650 Arch Street \_\_\_\_\_  
  Philadelphia, PA 19103-2029 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contact telephone and e-mail numbers

(name)   Diane Schott \_\_\_\_\_  
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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**