DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: Atlantic Bulk Carrier Corporation
Facility Address: 1901 Roxbury Road, Roxbury, Virginia
Facility EPA ID #: VAD000799379

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?

   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 "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"**[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, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Constituents of Concern in water table aquifer exceed MCLs and RSLs in one or more monitoring wells (see below).
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Subsurf. 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):

A "*Follow-up Site Characterization Report*" submitted in 2011 identified eight constituents of concern that exceeded applicable standards in groundwater beneath the site. Two follow-up investigations conducted later in 2011 augmented data submitted in the original report. The detected constituents appear related to industrial solvents evidently spilled or released on site in the distant past. These chemicals include:

- 1,1-dichloroethane
- Cis-1,2-dichloroethene
- Chloroform
- Ethylbenzene
- Tetrachloroethylene
- Trans-1,2-dichloroethylene
- Trichloroethylene, and
- Vinyl Chloride.

These constituents occur in groundwater beneath two areas of ABC's maintenance and storage yard located east of Roxbury Road and south of the adjacent CSX Railroad tracks. The impacted water table aquifer beneath the site extends from depths of approximately four to 15 feet below grade and is underlain by a clay confining unit. There is no indication the above constituents have moved off site or into deeper aquifers including that from which ABC withdraws water for non-potable purposes. No off-site groundwater supplies are threatened.

Surface and subsurface soils have been evaluated and are not in excess of applicable screening and/or background standards for organic and inorganic compounds and metals. Since the impacts occur below grade and do not underlie occupied on-site structures there are no unacceptable risks arising from human exposure to these constituents in outdoor and/or indoor air. Likewise, the absence of these constituents in the on-site water supply well indicates no measurable health risks for site

workers. The presence of residual solvent-related constituents in on-site groundwater indicates potential risks to future construction workers disturbing groundwater below four feet. These risks can be mitigated by proper health and safety measures implemented during construction activities in impacted areas of the site.

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[3]
Groundwater	No	No	No	Yes			No
~~Air (indoors)~~							
~~Soil (surface, e.g., <2 ft)~~							
~~Surface Water~~							
~~Sediment~~							
~~Soil (subsurface e.g., >2 ft)~~							
~~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.

☐ 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).

X 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):
RATIONALE:

Residents/Workers

No – On-site groundwater is not used for potable purposes but is used for washing and sanitation. Institutional controls will be implemented to prevent the future use of groundwater for consumption by site workers at the facility. The facility's water supply will be monitored annually for the constituents of concern as long as follow-up monitoring indicates regulated substances remain in site groundwater above screening limits. In the event site related constituents are detected in the non-potable water supply a replacement well will be installed in an alternate

location and connected to the facility. The existing well will be abandoned in compliance with the state well regulations. Groundwater monitoring would be addressed by the facility's health and safety plan.

Day-Care

No – There is no indication of the presence of a day care on the facility

Construction

Yes – Construction workers at the facility may be potentially exposed to groundwater if their activities require the exposure and/or handling of site groundwater in impacted areas. Exposure would occur in the event of excavations below four feet below grade. Potential exposures during construction activities would be addressed in the facility's health and safety plan.

Trespassers

No – In the event the site is accessed by unauthorized persons there are no opportunities for exposure to impacted groundwater. Any future construction activities would be fenced off to prevent access to trespassers.

Recreation

No – The facility is used exclusively for industrial maintenance and storage activities and is not used for recreation.

Food

No – The facility is not used for agricultural or food production activities.

[3] 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"**[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)?

X 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):

Based on the occurrence of chemicals indicating the natural decay of the constituents of concern, it is expected that the concentration of solvent-related constituents will decline over time. Moreover, there is no indication the groundwater plume is expanding or migrating off site or into deeper aquifers. ABC has proposed annual groundwater monitoring at selected locations to verify site conditions remain stable or improving. A site health and safety plant will address potential exposures for construction workers involved in any sub-grade work extending below the water table. A groundwater use restriction recorded on the property deed will insure future lands use will acknowledge existing site conditions and address and potential for future human or ecological exposure.

[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):

N/A

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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).

YE — 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 Atlantic Bulk Carrier Corporation facility, EPA ID # VAD000799379, located at 1901 Roxbury Road, Roxbury, Virginia 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) -s- Date 09/11/12
Erich Weisbart, P.G.
Land and Chemicals Division
US EPA Region III
1650 Arch Street
Philadelphia, PA 19103

Supervisor (signature) -s- Date 09/11/12
Luis Pizarro
Associate Director
Land and Chemicals Division
US EPA Region III
1650 Arch Street
Philadelphia, PA 19103

Locations where References may be found:

US EPA Region III
Waste & Chemicals Management Division
1650 Arch Street
Philadelphia, PA 19103

Contact telephone and e-mail numbers:
(name) Erich Weissbart
(phone #) (215) 814-3284
(email) weissbart.erich@epa.gov