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: IBM - Kingston
Facility Address: Enterprise Drive, Kingston, New York
Facility EPA ID #: NYD01359694

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 #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).

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			See Below
Air (indoors)[2]		X		See Below
Surface Soil (e.g., <2 ft)		X		See Below
Surface Water		X		See Below
Sediment		X		See Below
Subsurf. Soil (e.g., >2 ft)	X			See Below
Air (outdoors)		X		See Below

_____ 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):**Groundwater:** Groundwater monitoring data collected under the site's Part 373 Permit indicate exceedance of New York State Part 703 Groundwater Protection Standards as well as site specific groundwater protection standards specified in the Part 373 Permit, Module V, Table V-2. **Key Contaminants:** Tetrachloroethene, Trichloroethene, 1,1,1-Trichloroethane, 1,2-Dichloroethene, Vinyl Chloride, 1,1-Dichloroethane 1,1-Dichloroethene. **References:** NYSDEC Permit # 3-5154-00067/00090, Facility Annual Groundwater Monitoring Reports, RCRA Facility Investigation Report for the Industrial Waste Sludge Lagoon.

Indoor Air: Based on soil concentrations existing beneath site buildings, the Johnson and Ettinger Vapor Intrusion model was recently run by a qualified risk assessor. This model was run under the conservative assumption that the isolated, high concentrations detected adjacent to building B003, which represents a worst case, were present beneath the entire building. Modeled indoor air concentrations exceeded risk-based levels for four (4) constituents. All modeled indoor air concentrations exceedances occurred in B003. An inhalation exposure/risk model was run using these calculated indoor air concentrations for B003. The risk model was run by a qualified risk assessor. The risk model assumed a body weight of 70 Kg, breathing rate of 20 m^3 /day, exposure time of 8hrs/day, exposure frequency of 250 days/year and exposure duration of 25 years. Based on these risk modeling results, none of the risks from Building 003 are unacceptable. Furthermore, Building currently vacant and is expected to remain so for the foreseeable future. Therefore, there are currently no human receptors exposed to unacceptable indoor air quality in Building B003 with the exposure time, frequency and duration noted above. **Key Contaminants:** 1,1-Dichloroethylene, 1,2-Dichloroethane, Tetrachloroethene, Trichloroethene. **References:** Data Evaluation - Risk Assessment

Surface Soil (e.g.<2 ft): Comparison of all available surface soils (≤2 ft below ground surface) data to Recommended Soils Cleanup Objective Values from NYSDEC's "TAGM 4046 - Determination of Soils Cleanup Objectives and Cleanup Levels", shows no soils data for this depth interval exceed the values presented in the TAGM. Known releases at this site were primarily from subsurface structures (e.g., piping and tanks) typically at a burial depth of greater than two (2) feet. **Key Contaminants:** Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Bis-2-ethyl hexyl phthalate, Chrysene, Phenanthrene, Pyrene. **References:** Annual Groundwater Monitoring Reports, RCRA Facility

Assessments and Investigations, Contained-in Requests.

Surface Water: An extensive surface water sampling program was conducted during the early 1980s through the early 1990s at this site. Since that time data for groundwater to surface water discharges that are regulated under SPDES indicate compliance with SPDES outfall limits. Most recent surface water sampling conducted at the former Industrial Waste Sludge Lagoon area shows no detections above New York State surface water quality standards. **Key Contaminants:** Trichloroethene, 1,1,1-Trichloroethane, 1,2-Dichloroethylene. **References:** Annual Groundwater Monitoring Reports, RCRA facility Assessments and Investigation Reports. SPDES Discharge Monitoring Reports.

Sediment: Contamination of sediment is not reasonably suspected. Discharge data meets SPDES limits. Sediment is coarse textured and the key contaminants do not typically sorb to this medium.

Subsurface Soil (e.g., >2 ft.): Comparisons were made of all available subsurface soils data (> 2 ft. below ground surface) to the NYSDEC recommended soil cleanup objectives, presented in TAGM 4046 - Determination of Soil Cleanup Objectives and Cleanup Levels. These comparisons show samples collected at below 2 feet outside the north end of Building B003 exceed these levels. **Key Contaminants:** 2-Cresol, Benzo (B) Fluoranthene, Chrysene, 1,1,1-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethane, 1,2- Dichloroethene, Acetone, Ethylbenzene, Tetrachloroethene, Trichloroethene, Toluene, Xylenes **References:** Subsurface soils data is presented in numerous reports and transmittals including: Annual Groundwater Monitoring Reports, RCRA Facility Assessments and Investigation Reports and Contained-in Requests

Air (Outdoor): Prevailing winds and an uncontained volume of air would result in contaminant concentrations in the ambient outdoor air significantly less than that calculated for indoor air. It is therefore not reasonable to expect that this medium is contaminated above risk-based levels.

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.

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	No			No
~~Air (indoors)~~	___	___	___				
~~Soil (surface, e.g., <2 ft)~~	___	___	___	___	___	___	___
~~Surface Water~~	___	___			___	___	___
~~Sediment~~	___	___			___	___	___
Soil (subsurface e.g., >2 ft)				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): Based on current land and groundwater use, there are no reasonably expected human exposures. Groundwater in the contaminated areas is not used as either a potable or non-potable source and exposure to contaminated sub-surface soils would be only through excavation work of which none is either ongoing or planned for the immediate future. In the event that excavation work is planned in the future, the use of appropriate personal protective equipment (ppm), through an approved Health and Safety Plan would prevent worker exposure.

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

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 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):_____

[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.

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):_____

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):

__X__ 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 IBM - Kingston facility, EPA ID # NYD 001359694, located at Kingston, New York 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 9/27/99
(print) Gary D. Casper
(title) Senior Engineering Geologist

Supervisor (signature) _____ Date 9/27/99
(print) Edward C. Miles
(title) Associate Engineering Geologist
(EPA Region or State) New York

Locations where References may be found:

NYSDEC, 50 Wolf Road, Albany, New York Room 462

Contact telephone and e-mail numbers

(name) Gary D. Casper
(phone #) 518-457-9253
(e-mail) gdcasper@gw.dec.state.ny.us

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.