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 Electric Company
Facility Address:	1000 Dupont Road, Morgantown Industrial Park, Morgantown, WV 26505
Facility EPA ID #:	North Plant: WVD980552384; South Plant: WVD061776977

	its (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in ation?
<u>X</u>	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.

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

BACKGROUND

1.

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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Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be 2. "contaminated" 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>	?	Rationale / Key Contaminants
Groundwater	X			organic chemicals, metals
Air (indoors) ²		X		
Surface Soil (e.g., <2 ft)	X			PAHs, metals, dioxin
Surface Water	X			organic chemicals, metals
Sediment	X			PAHs, metals
Subsurf. Soil (e.g., >2 ft)	X			PAHs, metals, 1,2 dichloroethane
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.

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):

This document addresses both the North Plant and South Plant Facilities as well as a Laboratory located between the facilities.

Groundwater in specific areas contains organic compounds and metals at concentrations exceeding the human health risk assessment screening levels.

Screening studies assessing the potential for vapor intrusion into buildings in proximity to groundwater contaminant plumes reveal no estimated indoor air contaminant concentrations exceeding either NIOSH Recommended Exposure Limits (where available) or OSHA Permissible Exposure Limits

Soils in specific areas contain PAHs, metals, and dioxin at concentrations exceeding the human health risk assessment screening levels.

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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Surface water and surface seeps contain organic chemicals and metals at concentrations exceeding the human health risk assessment screening levels.

Sediments contain various PAHs and metals at concentrations that exceed the human health risk assessment screening levels.

The potential for releases from the waste water treatment plant operations to impact human health was evaluated by Crompton. The evaluation indicates that there is no estimated unacceptable current human health impact resulting from contaminants known and estimated to be released to outdoor air from the waste water treatment plant operations.

The potential for radiation to be present was evaluated by GE. The investigation yielded no evidence of radiological contamination.

From November 20 through 25, 2003, Crompton excavated soil from the 1,2 DCA Area of Concern and placed the soil first by the 1, 2 DCA area of concern at the North Plant, and, then, on December 4 and 5, 2003, moved the soil to near SWMU 2.11, which is located south of the South Plant fence where other soil piles are stored. Samples collected January 20, 2004, confirmed the presence of elevated concentrations of 1,2-dichloroethane ("1,2 DCA") in the excavated soil placed by the SWMU 2.11 area. The excavated soil was placed in lined and covered "roll off" dumpsters on February 26, 2004, and appropriately moved to a solid waste landfill on April 2, 2004. While EPA has requested sampling confirmation that no residual contamination remains where the 1,2 DCA contaminated soil was stored by SWMU 2.11, and Crompton collected confirmation soil samples on September 9, 2004, to respond to EPA's request, EPA believes it is unlikely there exists any potential risk to human health resulting from any remaining concentrations of 1,2 DCA at the area.

The Former Ammonia Storage Sphere Structure Area of Concern (AOC B) was identified when representatives of EPA visited the facility in May 2003. A June 2003 Property Boundary Map indicates that a portion of this AOC, including the remaining portions of five ammonia storage spheres and an ammonia storage compressor, is located on property which is part of the South Plant Facility. Available information indicates the area was used from the early 1940's to the late 1950's to store and transfer ammonia. The area is a flat overgrown area located partially down a vegetated wooded steep hillside east of the South plant. While there is no current work activity or anticipated work activity or construction plans at this location and while the location is a remote and generally inaccessible location where trespassing is unlikely, a corrective action investigation has been implemented at this location to identify any releases which may be present.

References:

The plant was sold from GE to Crompton in 2003. As a result of the sale, GE retained responsibility for most of the RCRA corrective action investigation, while Crompton took on some of the responsibility. Therefore the documents referenced below include documents generated by or for GE and documents generated by or for Crompton.

Site Wide Evaluation:

- -Final RCRA Facility Assessment Report, Borg Warner Chemicals, North and South Plants, prepared by Geoscience Consultants, contractors to EPA, dated June 28, 1989
- -RFI Bimonthly Progress Reports to Date several from the early 1990's provide early groundwater and sediment information
- -Draft Report on Remedial Investigation Activities, Morgantown Ordnance Works, OU-2, prepared by ICF Kaiser Engineers, Inc. contractors to EPA, dated November 1, 1995

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- -RCRA Facility Investigation Report, Prepared by Baker Environmental contractors to General Electric Specialty Chemicals, dated September 19, 1996
- -Draft Report "GE Specialty Chemicals Morgantown West Virginia Facility Coal Tar Tanks (SWMU 2.9) Interim Measures Report prepared by Baker contractors to GE, dated December 2000
- -Submissions from GE to EPA/WVDNR 's NPDES Programs located in EPA Region III NPDES files
- -CDs provided to EPA by contractors to GE containing Laboratory Data on the Phase II RFI 2003 Sampling Event
- -Letter dated November 12, 2003 from Stephen F. Urschel, of GE Plastics Global Environmental Programs to Diane Schott regarding "Environmental Indicators, Phase II Scope of Work, Adjacent Parcels & Air Emissions from Wastewater Treatment Systems Former GE Specialty Chemicals Morgantown, WV"
- -Letter dated December 15, 2003 from Diane Schott, of EPA, to Stephen Urschel, of GE Plastics Global Environmental Programs regarding Environmental Indicators and RCRA Corrective Action Consent Order, Former GE Specialty Chemicals Morgantown, WV
- -Letter dated May 19, 2004, from Stephen Urschel, GE, to Diane Schott regarding "Preliminary Review of [Phase II] RFI Data"
- -Draft Radiation Survey Report, Former Specialty Chemicals Plant, Morgantown, West Virginia, August 2004 Prepared by Michael Baker, Jr., Inc., for General Electric Advance Materials, Pittsfield, Massachusetts
- -Letter dated August 11, 2004, from James S. Culp, of Michael Baker Jr., Inc. to Mr. Michael O'Donnell, Remedial Projects Leader, General Electric Company regarding Indoor Air Evaluation Using the USEPA Guidance, Former GE Specialty Chemicals Plant, Morgantown, West Virginia
- -Letter dated September 13, 2004 from Mark D. Pettegrew, Crompton, to Diane Schott providing responses to questions regarding soil management activities
- -E-mail dated September 16, 2004, from Patricia Flores to Elizabeth Quinn regarding GE Morgantown Groundwater Indoor Air Modeling Analysis
- -E-mails dated 9/22/04 from Patricia Flores to Elizabeth Quinn regarding GE Morgantown Construction Worker Scenarios, one at 12:25 pm and one at 3:49 pm
- -Draft Phase II RCRA Facility Investigation Report, Former General Electric Specialty Chemicals, Morgantown, West Virginia, September 2004, Volumes 1, 2, and 3, Prepared by Michael Baker, Jr., Inc., for General Electric Advance Materials, Pittsfield, Massachusetts
- -Memo dated September 30, 2004, from Diane Schott, RCRA Project Manager, to RCRA Files for Former GE Specialty Chemicals Facilities in Morgantown, West Virginia, WVD980552384 (North Plant) and WVD061776977 (South Plant) Re: Current Human Exposures Under Control Environmental Indicator

Open Topped Waste Water Treatment Unit Evaluation:

-Electronic submission with an attachment dated 3/25/04 from Craig Ramich, Environmental Strategies Consulting LLC on behalf of Crompton, to Diane Schott transmitting results of air

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dispersion modeling for the WWTP at the Morgantown North and South Plants. The attachment is a five page letter report also dated 3/25/04 from Craig Ramich to Diane Schott with enclosures.

- -Handwritten note dated March 30, 2004, with attachment, from Jim Lovell, Crompton, to Dianne providing aerator information
- -Electronic submission dated 4/2/04 from Craig Ramich, Environmental Strategies Consulting LLC on behalf of Crompton, to Patricia Flores providing supporting documentation
- -Letter dated April 27, 2004, from Craig Ramich, Environmental Strategies Consulting LLC on behalf of Crompton, to Diane Schott regarding "Preliminary Screening of Chemical Constituents in Wastewater Treatment Plan[t] Components, Crompton Corporation, Morgantown, West Virginia"
- -Electronic submission dated 6/2/04 from Mark Pettegrew to Elizabeth Quinn, EPA, regarding SAR Notes
- -Letter dated June 15, 2004, from Craig Ramich, Environmental Strategies Consulting LLC on behalf of Crompton, to Diane Schott regarding "Supplemental Screening of Chemical Constituents in Wastewater Treatment Plant Components Crompton Corporation, Morgantown, West Virginia"
- -Letter dated July 22, 2004, from Craig Ramich, Environmental Strategies Consulting LLC on behalf of Crompton, to Diane Schott regarding "Response to U.S. Environmental Protection Agency Air-Related Comments Regarding Supplemental Screening of Chemical Constituents in Wastewater Treatment Plant Components Crompton Corporation, Morgantown, West Virginia"
- -Reviews by Patricia Flores, EPA Region III Air Modeling Expert, dated 4/12/04 (memo to Diane Schott), 4/14/04 (e-mail to Diane Schott), 6/29/04 (e-mail to Diane Schott), 7/6/2004 (e-mail to Elizabeth Quinn, cc to Diane Schott), and 8/3/04 (e-mail to Diane Schott))
- -Reviews by Elizabeth Quinn, EPA Region III RCRA Human Health Toxicologist, dated 6/4/2004 (e-mail to Diane Schott) and 7/1/04 (e-mail to Diane Schott),
- -Letter report dated September 15, 2004, from Craig Ramich, Environmental Strategies Consulting LLC on behalf of Crompton, to Diane Schott regarding "Response to U.S. Environmental Protection Agency Air-Related Comments Regarding Supplemental Screening of Chemical Constituents in Wastewater Treatment Plant Components Crompton Corporation, Morgantown, West Virginia"

Soil Excavated in November 2003 from the 1,2 DCA Area of Concern:

- -E-mail dated January 16, 2004, from Stephen Urschel of GE to Diane Schott of EPA transmitting photographs of soil piles and a letter written to Mr. Urschel from Baker Environmental. The letter dated January 14, 2004 addresses the DCA Area of Concern Excavated Soil Stockpiles
- -Letter dated February 27, 2004, from Tom Biksey, Director of Risk Assessment, Environmental Strategies Consulting LLC on behalf of Crompton Corporation regarding "Excavation, Stockpiling, and Removal of Soil Piles at South Plant"
- -Letter dated April 8, 2004, from Mark D. Pettegrew, Crompton Corporation, to Diane Schott regarding "Former GE Specialty Chemicals RCRA Corrective Action EI and Related Issues"

Former Ammonia Storage Sphere Structure Area of Concern (AOC B)

-BEACON Report No. EM1663, Preliminary EMFLUX ® Passive Soil-Gas Survey, Ammonia Storage Spheres, Morgantown, WV, prepared for Michael Baker Corporation by Beacon Environmental Services dated May 14, 2004.

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- -Letter dated June 2, 2004 from James S. Culp of Michael Baker Jr., Inc. to Diane Schott of EPA summarizing the results of the soil gas survey, based on the May 14, 2004 Report.
- -BEACON Report No. EM1663, Preliminary EMFLUX ® Passive Soil-Gas Survey, Ammonia Storage Spheres, Morgantown, WV, prepared for Michael Baker Corporation by Beacon Environmental Services dated June 2, 2004.

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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

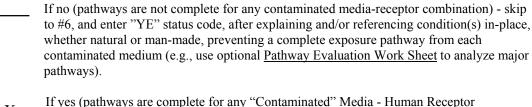
Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media Groundwater	Residents No	Workers No	Day-Care No	Construction Yes	Trespassers	Recreation	Food ³ No
Air (indoors)							
Soil (surface, e.g., <2 ft)	No	Yes	No	Yes	Lab only	No	No
Surface Water	No	No		No	No	Yes	No
Sediment	No	No		No	No	Yes	No
Soil (subsurface e.g., >2 ft)		No		Yes			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.



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):

Currently, there is no use of groundwater on site or and there is no known use of groundwater down gradient of the facility to the Monongehela River.

While there exists potential exposure to residents drinking water from the north flowing Monongehela River potable intake- located immediately across from the North Plant, the large size of the River and its flow rate makes it unlikely that any contaminated groundwater which reaches the River will be drawn into the potable intake. In addition, treatment of the public water supply prior to distribution would likely eliminate any potential contamination resulting from releases from the site - most notably any volatile organic contamination.

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

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On site workers may be exposed to contaminated surface soil.

While there is no current or planned soil disturbance at the 1,2 DCA Area of Concern (reference September 13, 2004 letter from Crompton) or at the Laboratory (see September 30, 2004 memo to the file), construction workers at other areas may be exposed to contaminated surface and subsurface soil, and contaminated groundwater.

With respect to trespassing, trespassers have access to contaminated surface areas at the laboratory. Trespassers do not have access to the North Plant or portions of the South Plant. Other portions of the South Plant, as well as potentially contaminated seep and surface water locations outside of the North Plant, are accessible; however, trespassing in these areas is judged to be unlikely. Access by trespassers at the North plant and portions of the South plant is prevented by an electronic security system, security personnel, and a maintained and locked fence. Trespassing through or at any potentially contaminated seeps or surface water outside of the North plant is unlikely due to their remote and generally inaccessible location. Trespassing through or at any potentially contaminated areas outside of the fence at the South plant is unlikely as the areas also are located in remote locations that are generally inaccessible. With respect to potential human health risk concerns for trespassers at the SWMU 2.9 area, trespassers have not been observed at that location by Crompton's security personnel.

Persons recreating in the Monongehela River may be exposed to contamination in sediment and surface water that is released from contaminated sediment, surface water, and groundwater at the facility.

References:

- -E-mail dated 7/22/04 from Eileen Mahoney, contractor either directly or indirectly to GE for human health risk assessments, to Diane Schott and Elizabeth Quinn of EPA regarding "Response to Priority Questions"
- -Human Health Risk Assessment Workplan, GE Specialty Chemicals Facility, Morgantown, West Virginia, Prepared by Eileen Mahoney Associates, Inc. for General Electric Specialty Chemical, Morgantown, West Virginia Dated August 2003
- -Memo dated September 30, 2004, from Diane Schott, RCRA Project Manager, to RCRA Files for Former GE Specialty Chemicals Facilities in Morgantown, West Virginia, WVD980552384 (North Plant) and WVD061776977 (South Plant) Re: Current Human Exposures Under Control Environmental Indicator

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be "**significant**" (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):

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.

Results of the Human Health Risk Assessment prepared by GE for this site reveal no unacceptable risks to commercial or construction workers as a result of exposure to contaminated soil and/or groundwater at the North Plant and the Laboratory areas. The risk assessment utilized worst case exposure assumptions to provide conservative estimates of risk. Risks estimated for construction workers at SWMU 2.9 and for commercial workers at SWMUs 2.9 and 2.12 at the South Plant exceed EPA risk targets using hypothetical worst case exposure assumptions. However, risks estimated for these SWMUs using current actual worker exposure frequencies reported by representatives of the Crompton facility, as opposed to worst case estimates of 250 days per year, are within EPA risk targets. All other risks estimated for commercial and construction workers at the South plant are within acceptable EPA risk ranges. As a layer of protection, Crompton is implementing a soil management plan for the entire facility that evaluates and implements health and safety plans for disturbed soil.

Risks estimated for potential trespasser exposure to contaminated surface areas at the laboratory are within acceptable EPA risk ranges.

Releases from the facility to the Monangehela River will not result in significant human exposure via direct recreational contact or fish consumption. Direct contact with on-site surface waters and seeps were not estimated to pose unacceptable risks via direct contact by trespassers. Groundwater contaminants that may be released to the Monangehela River are subject to significant dilution and attenuation. Moreover, the most significant groundwater contaminants are VOCs such as 1,2-DCA, PCE, and TCE, which do not bioaccumulate in fish tissue to any significant degree.

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References:

- -E-mail dated 7/22/04 from Eileen Mahoney, contractor either directly or indirectly to GE for human health risk assessments, to Diane Schott and Elizabeth Quinn of EPA regarding "Response to Priority Questions"
- -Human Health Risk Assessment contained in Section 5.0, Volume 2, Draft Phase II RCRA Facility Investigation Report, Former General Electric Specialty Chemicals, Morgantown, West Virginia, September 2004, Prepared by Michael Baker, Jr., Inc., for General Electric Advance Materials, Pittsfield, Massachusetts
- -Memo dated September 30, 2004, from Diane Schott, RCRA Project Manager, to RCRA Files for Former GE Specialty Chemicals Facilities in Morgantown, West Virginia, WVD980552384 (North Plant) and WVD061776977 (South Plant) Re: Current Human Exposures Under Control Environmental Indicator

5.	Can the "signific	ant" 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 <u>and</u> 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 R	Reference(s):

Rationale and Reference(s):

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(CA725), and ol	priate RCRIS status codes for the Current Human Exposures Under Control EI event code otain Supervisor (or appropriate Manager) signature and date on the EI determination beloopriate supporting documentation as well as a map of the facility):					
X	review of the inform are expected to be " WVD980552384 ar current and reasona	t Human Exposures Undenation contained in this El Under Control" at the Gend WVD061776977, located by expected conditions. To becomes aware of significant	Determination, "neral Electric Conted in Morgantow This determination	Current Human Exposing facilities, EPA In, West Virginia, und naill be re-evaluated		
	NO - "Current Hui	man Exposures" are NOT	"Under Control."	,		
	IN - More informa	ation is needed to make a	determination.			
Completed by	(signature)	/s/	Date	9/30/04		
1		e Schott				
	(title) RCR	A Project Manager				
Supervisor	(signature)	/s/	Date	9/30/04		
	(print) Bob l	E. Greaves				
	(title) Chief	(title) Chief, General Operations Branch				
	(EPA Region or St	ate) EPA, Region 3				
EPA Region II	files on this facility co	e found: 1650 Arch Street, Philade ontained in the RCRA file				
Contact telepho	one and e-mail numb	ers:				
(name	Diane Schott					
(phone	· ·	0				
(e-mai	il) schott.diane@	nena gov				

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.