Documentation of Environmental Indicator Determination
in accordance with EPA Interim Final Guidance 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRA Info code (CA725)

Current Human Exposures Under Control

Facility Name: **Solutia Inc. J.F. Queeny Plant**
Facility Address: **201 Russell Blvd., St. Louis, MO 63104**
Facility EPA ID #: **MOD 004 954111**

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?

   ___ü_ 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.

   The following SWMUs and AOCs were considered in completing this EI.

SWMUs	AOCs
WW Building Area	KK Building Area
Former Boiler Slag Accumulation Area	Former Lab Waste Filtration Unit
Former FF Building Area	
VV Building Area	
Former Acetanilides Production Area	
Former Quarry Area	
Former Coal Storage Yard	
Former Bulk Chemical Storage Area	

These areas are identified in the attached **Figure A-1 (Appendix A)**. The SWMUs/AOCs are also further described in **Appendix A**. The primary source of information concerning these SWMUs/AOCs can be found in the report, "RFI Data Gap Investigation Report", Solutia Inc., dated July 2002. **Appendix B** includes a list of other relevant site investigation reports.

BACKGROUND

Definition of Environmental Indicators (for 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 EIs 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 EIs 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 is 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 the RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info 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 [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action (from SWMUs, RUs or

AOCs)?

	Yes	No	?	Rationale/Key Contaminants
Groundwater	ü			Appendix C, Table C-1
Air (indoors)		ü		See Rationale and References section below
Surface Soil (e.g., <2 ft)	ü			Appendix C, Tables C-2 through C-10
Surface Water	ü			Appendix C, Table C-11
Sediment		ü		See Rationale and References section below
Subsurf. Soil (e.g., >2 ft)	ü			Appendix C, Tables C-2 through C-10
Air (outdoors)		ü		See Rationale and References section 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.

__ü__ 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):

Appendix C contains tables revised from the RFI Data Gap Investigation Report (July 2002) and Human Health Risk Assessment Report (July 2002) that summarize the results of media screening for the ten SWMUs and AOCs identified in Question 1. These tables summarize Constituents of Potential Concern (COPCs) for groundwater, soil, and surface water (**Tables C-1, C-2** through **C-10, and C-11,** respectively). **Table C-1** contains sitewide groundwater information grouped by hydrostratigraphic zone. **Tables C-2** through **C-10** contain soil information grouped by SWMU/AOC. The rationale for COPC selection is included in **Appendix C**.

Currently, there are no significant groundwater impacts under existing buildings to cause an indoor air concern, however this pathway was evaluated in the human health risk assessment under a future scenario of a new building being constructed over an area of impacted groundwater. Groundwater impacts are described in Section 4.5 of the RFI Data Gap Investigation Report. VOCs in groundwater were modeled for volatilization into indoor air. Outdoor air does not currently pose a concern because of surface cover materials and plant exposure controls. However, this pathway was evaluated in the risk assessment under a hypothetical future excavation scenario, and this pathway is further discussed in the response to Question 4.

Sediment is not known to be impacted as a result of releases from the facility. The constituents most likely to migrate to the Mississippi River are VOCs, which are highly biodegradable and are not expected to bioaccumulate in sediment. Modeling has been conducted that predicts VOC concentrations to be low and, as such, not expected to result in significant, if any, concentrations in sediment. In addition, there are no applicable standards for human exposure to sediment. The designated uses for this portion of the Mississippi River include: irrigation; livestock & wildlife watering; protection of warm water aquatic life and human health – fish consumption; boating and canoeing; drinking water supply; and industrial (10 CSR 20-7.031, Table H – Stream Classifications and Use Designations, 10/31/01). However, the area near the facility is primarily used for barge staging and loading/unloading, and is otherwise not conducive to human activities. As such, the exposure potential is low.

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) suggests 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	Excavation/ Construction	Trespassers	Recreation	Food
Groundwater	No	No	No	Yes	No	No	No
Soil (surface, e.g., <2 ft)	No	No	No	Yes	No	No	No
Surface Water	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	Yes	No	No	No

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).

__ü__ 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, and for the foreseeable future, there are no complete exposure pathways for receptors of concern. The facility is located within a heavily industrialized and commercialized area. The closest residential areas are at least ¼ mile from the facility boundaries. The nearest day care facilities are over ½ mile from the facility. The nearest park is over ¼ mile from the facility. Food crops (commercial scale) are not grown in this area. The frequency of trespassing is expected to be very low. The site is completely fenced and there is 24 hr/day security. Also, there are no special land features, water bodies or wildlife that would cause the facility to be attractive to trespassers. General workers are not potential receptors because most of the areas are covered and there are exposure controls in place (e.g., "no-dig" policy). Further, any emanated vapor or particulates are expected to be extremely low in concentration, if even measurable, due to the significant atmospheric mixing. For the excavation/construction worker, there is no construction currently planned or anticipated, however this pathway could be complete in the near future (e.g., excavation to repair broken water line). The pathway was quantitatively evaluated in the risk assessment and was considered as a potential "current" scenario for the purposes of this EI. The significance of this pathway is discussed in the response to Question 4.

A Site Conceptual Exposure Model (SCEM) was included in the Human Health Risk Assessment Report (July 2002). The SCEM depicts the potentially complete exposure pathways and the sources and mechanisms by which a receptor might be exposed. The SCEM was developed in coordination with the Missouri Department of Natural Resources (the Department) and U.S. EPA. The SCEM reflects current and hypothetical future use scenarios. Most pathways are currently incomplete based on exposure controls. Hypothetical future use scenarios were quantitatively evaluated in the risk assessment under the assumption that the existing exposure controls were removed.

The SCEM indicates that releases to groundwater currently have the potential to migrate to the Mississippi River and pose a potential concern for ecological receptors. Although there are general recreation activities in the river, under current conditions, humans are not receptors of concern for this segment. The area is primarily used for barge staging and loading/unloading, and is otherwise not conducive to human activities. In addition, there are no drinking water intakes in the area.

[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)?

__ü__ 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):

The results of the Human Health Risk Assessment (July 2002) indicated that risks and hazards are acceptable for current uses of the site. The results indicated that a potentially unacceptable hazard exists for a hypothetical future construction/ excavation scenario in the VV Building Area. In addition, shallow soils pose a potential lead concern in the former Bulk Chemical Storage Area in the absence of current site controls. However, these results do not affect the CA725 evaluation, which reflects current conditions. The site is located in an area that has been industrialized for over 100 years and is expected to remain so for the foreseeable future. Exposure controls are in place which protect workers from potential exposures (e.g., surface cover over impacted areas, security fences, plant safety procedures, etc.). There is a "no dig" policy to minimize or prevent exposure. All physical changes at the plant are subjected to a process hazard analysis prior to approval. Excavation permits are required for any intrusive activity. Copies of relevant plant policies are included in **Appendix D**. **Table E-1** in **Appendix E** summarizes the risks and hazards for the areas evaluated. The risk assessment was performed by competent risk assessment professionals in close cooperation with the Department and U.S. EPA through meetings, communications, and interim deliverables.

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[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? Not Applicable.

_____ 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 RCRA Info 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):

_ü__ 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 Solutia J.F. Queeny facility, EPA ID # MOD 004 954111, located at 201 Russell Blvd., St. Louis, MO 63104 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)Original signed by Vin Journey Date September 30, 2002
(Print) Vin Journey, R.G.
(Title) Environmental Engineer II

Supervisor: (Signature)Original signed by Richard A. Nussbaum Date September 30, 2002
(Print) Rich Nussbaum, P.E.., R.G.
(Title) Corrective Action Unit Chief
(EPA Region or State) State of Missouri

Locations where References may be found: RCRA Facility Investigation, Data Gap Investigation Report, July, 2002 (includes Human Health Risk Assessment), and Hazardous Waste Program: Solutia Inc. (Queeny) TSD Files located at 1738 E. Elm Street, Jefferson City, MO 65101.

Contact telephone and e-mail numbers

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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.