DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Current Human Exposures Under Control

Facility Name:	**Safety-Kleen (Baton Rouge), Inc.**
Facility Address:	**13351 Scenic Highway, Baton Rouge, LA 70807-1021**
Facility EPA ID #:	**LAD010395127**

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).

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
a)	Groundwater	X			
b)	Air (indoors)[2]		X		not contaminated above risk-based levels [1a]
c)	Surface Soil (e.g., <2 ft)	X			
d)	Surface Water		X		discharges from the site are controlled and closely monitored
e)	Sediment	X			
f)	Subsurf. Soil (e.g., >2 ft)	X			
g)	Air (outdoors)		X		not contaminated above risk-based levels [1a]

_____ 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) (References included in Appendix A Attachments):

Key contaminants (see Appendix A, Table C-1 from Ecology and Environment 1997):

a) Groundwater: benzene, cadmium, 1,2-dichloropropane, methylene chloride, and tetrachloroethylene.
b) Indoor Air: not applicable.
c) Surface soil: acenaphthylene and aroclor 1254.
d) Surface water: not applicable.
e) Sediment: Acenaphthylene, phenanthrene, 2-methyl naphthalene, mercury, nickel, silver, zinc, aroclor 1242, aroclor 1248, aroclor 1254, aroclor 1260.
f) Subsurface soil: barium, manganese, and nickel.
g) Outdoor air: not applicable.

Comparison to appropriate levels:

a) LDEQ CO/MO-1 levels and USEPA Region 3 RBCs (see Appendix A, Tables A-2 and A-3 from Ecology and Environment, 1997)

b) through g): A concentration/toxicity screen was developed according to USEPA guidance and used to select chemicals of concern in the 1993 *Risk Assessment* (Terra, 1993). The two primary factors used to select chemicals for inclusion in the 1993 *Risk Assessment* were the maximum concentration of each chemical at the site and the toxicity factor (reference dose or slope factor). Chemicals which contributed less than 1% of the total toxicity score were not considered further in the *Risk Assessment* (Appendix D, Terra, 1993).

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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[1a] Air (indoors)/Air (outdoors): The average depth to groundwater in the shallowest water bearing unit (Unit 3) is 23.6 feet. The overlying confining unit (Unit 2) is composed of low-conductivity clay with an average thickness of 25.7 feet. The vertical migration of volatiles from groundwater is unlikely given the low vertical conductivity of the clay (measurements obtained during the remedial investigation range from 9.0×10^{-8} to 2.0×10^{-10} cm/sec) and its substantial thickness. Measured outdoor air concentrations are below risk-based levels (Terra 1993,1995).

[2a] Surface water: Surface water bodies at the site are controlled by drainage ditches and rainwater holding ponds and are monitored to prevent the discharge of contamination from the site. Groundwater from the site does not come into contact with the drainage ditches. Detectable levels of key contaminants in groundwater dissipate before reaching the western/downgradient edge of the facility where they discharge to surface water bodies.

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[1a]	NO[1a]	NO[3a]	NO[2a]	NO[4a]	NO[5a]	NO[6a]
Air (indoors)	--	--	--	--	--	--	--
Soil (surface, e.g., <2 ft)	NO[1a]	YES[2b]	NO[3a]	YES[2b]	NO[4a]	NO[5a]	NO[6a]
Surface Water	--	--	--	--	--	--	--
Sediment	NO[1a]	NO[2a]	NO[3a]	NO[2a]	NO[4a]	NO[5a]	NO[6a]
Soil (subsurface e.g., >2 ft)	NO[1a]	NO[2a]	NO[3a]	NO[2a]	NO[4a]	NO[5a]	NO[6a]
Air (outdoors)	--	--	--	--	--	--	--

-- = media are not contaminated, as identified in #2 above

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).

__√__ 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

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

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Rationale and Reference(s):

[1a] The nearest residential area, the Alsen Community, is upgradient of the site and would therefore not be impacted by groundwater from the site. Groundwater at the site is not used by workers for drinking or for personal hygiene. However, hypothetical use of groundwater by workers or off-site residents was addressed in a site-specific human health risk assessment conducted for the site (Terra, 1993,1995; Ecology and Environment, 1997). Therefore, consideration of the potential human health hazards due to this exposure pathway is included in this EI determination. Off-site residents would not have access to on-site surface or subsurface soils.

[2a] Surface water bodies at the site are limited to rain water collection ponds and drainage ditches and, therefore, general site workers are not exposed to any potential contaminants in surface water or sediments. A general site worker is also not reasonably expected to have routine contact with subsurface soils greater that 2 feet bgs. In addition, exposure to subsurface soils and groundwater are not reasonably expected to occur for a construction worker for the following reasons: 1) the average depth to groundwater in the shallowest water bearing unit (Unit 3) recorded during the quarterly measurements taken from December 1987 to April 1999 is 23.6 feet; 2) the only anticipated trenching at the site (an off-site groundwater mitigation measure) is planned in an area where contaminant levels are near detection limits; and 3) personal protective equipment will be worn by construction workers during any trenching activities.

[2b] A general site worker is also not reasonably expected to have routine contact with subsurface soils greater that 2 feet bgs. In addition, exposure to subsurface soils and groundwater are not reasonably expected to occur for a construction worker for the following reasons: 1) the average depth to groundwater in the shallowest water bearing unit (Unit 3) recorded during the quarterly measurements taken from December 1987 to April 1999 is 23.6 feet; 2) the only anticipated trenching at the site (an off-site groundwater mitigation measure) is planned in an area where contaminant levels are near detection limits; and 3) personal protective equipment will be worn by construction workers during any trenching activities.

[3a] Applies to categories a) through g). Exposures to an off-site child resident of the nearest residential community that were included in the site-specific human health risk assessment overestimate the exposures associated with day-care attendance near the site. There are no day care facilities on-site.

[4a] The site is fenced and access is through a monitored security gate; therefore, trespassers are not reasonably expected to access the site.

[5a] There are no recreational areas on-site, and access to potential off-site recreational areas is prohibited.

[6a] Food crops are not grown on-site, nor are there any fishing activities on-site (Safety-Kleen (Baton Rouge), Inc., July 1999, personal communication).

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):

Risk assessments for the site are representative of reasonable maximum exposure (RME), which overestimates the most likely exposure for the majority of the population (Ecology and Environment, 1997). The results of the 1993 *Risk Assessment* are that potential carcinogenic risks and noncarcinogenic hazards for both on-site and off-site populations during baseline conditions are within EPA's acceptable levels. The 1993 *Risk Assessment* was approved along with the CMS by the Louisiana Department of Environmental Quality on October 1, 1998. The reference documentation is provided in the Appendix A Attachments.

The results of site-specific human health *Risk Assessments* (Terra 1993,1995) for the Laidlaw Environmental Services (Baton Rouge), Inc. facility are summarized as follows:

The December 1993 *Risk Assessment* report (Terra 1993) quantified the risks associated with the removal of waste (by excavation) from the South Landfill and Landfill Cells 619/719, the pre-RCRA era landfills still present on-site that are potential sources of on- and off-site contaminants. Interim measure activities in the form of groundwater recovery and treatment have been ongoing at the site since the early 1980's. In addition, Safety-Kleen (Baton Rouge), Inc. is a RCRA Part B permitted facility, with future access and usage limited by deed-restriction to hazardous waste processing and compatible activities (Terra, 1993).

In the 1993 *Risk Assessment* (Terra, 1993), the risks of exhuming waste were compared to the "baseline" or current conditions across the entire site. The results of the baseline scenario are provided as supporting documentation for this EI determination. Potential receptors and exposure pathways identified in the 1993 *Risk Assessment* report for the baseline scenario are described in Table 2-1. Potential receptors for the baseline scenario include on-site general workers and off-site adults and children. The results of the 1993 *Risk Assessment* are that potential carcinogenic risks and noncarcinogenic hazards for both on-site and off-site populations during baseline conditions are within EPA's acceptable levels.

An 1995 addendum to the 1993 *Risk Assessment* report was prepared (Terra, 1995) to: (1) incorporate more recent (1994) groundwater sampling data, (2) re-calculate risks for baseline conditions by including an assessment of chemical volatilization from the South Landfill and Cells 619/719, and (3) quantify the risks of a corrective measures condition that assumed various types of recovery wells and capping. The results of this additional evaluation are that potential carcinogenic risks and noncarcinogenic hazards of corrective measures conditions to be within EPA-accepted levels and below the risks of the re-calculated baseline conditions, which were also within EPA-accepted levels. Tables I and II in the executive summary of the 1995 Addendum Report present the results of the 1995 risk assessment update.
Appendix A of the 1997 response document (Ecology and Environment, 1997) to comments on the *Draft Corrective Measures Study* (Encotec, 1995) includes an evaluation of the risks of hypothetical ingestion and dermal contact with groundwater by off-site adult and child residents using 1996 groundwater data for Unit 8. Unit 8 groundwater has the greatest potential to be continuous in the vicinity of the site and exhibits the highest yield of the four permeable units (Ecology and Environment, 1997). Chemicals of concern were selected by comparison with USEPA Region 3 risk-based concentrations and LDEQ CO-1 groundwater corrective action levels. The results of this evaluation are that potential carcinogenic risks and noncarcinogenic hazards of off-site exposure to site-derived groundwater do not exceed EPA's acceptable levels. Table A-7 of the 1997 response to comments document on the draft CMS presents the results of the hypothetical exposure to site-derived groundwater.
Table C-1 in Appendix C of the 1997 response document (Ecology and Environment, 1997) provides a listing of the complete exposure pathways and the noncarcinogenic and carcinogenic chemicals of concern, as reported in the 1993 risk assessment for which cleanup standards were determined. Tables C-2, C-4 and C-5 present media-specific cleanup standards for general workers, off-site child, and off-site adult residents, respectively. These cleanup standards are compared to the 95% upper confidence limit on the arithmetic mean concentration and the maximum concentration for all chemicals of concern in groundwater, soil and air.

[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?

(skip to#6) If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing ~ 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):

___√___ 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 Safety-Kleen (Baton Rouge), Inc. facility, EPA ID # LAD 010395127, located at 13351 Scenic Highway, Baton Rouge, LA 70807-1021 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 9-28-01
(print) Dennis Piper
(title) Geologist 3

Supervisor (signature) _____ Date 9-28-01
(print) Douglas Bradford
(title) Geological Supervisor
(EPA Region or State) State of Louisiana

Locations where References may be found:

All references are available from Safety-Kleen or Louisiana Department of Environmental Quality's files for the site.

Encotec, 1992. *RCRA Facility Investigation at Rollins Environmental Services (LA) Inc.*, Baton Rouge, Louisiana. September 1992.
Terra, 1993. *Risk Assessment for the Rollins Environmental Services (LA) Site*, Baton Rouge, Louisiana. December 2, 1993.
Encotec, 1995. *Draft Corrective Measures Study*. August 1995.
Terra, 1995. *Addendum to the Risk Assessment for the Rollins Environmental Services (LA) Site*, Baton Rouge, Louisiana. July 31, 1995.
Ecology and Environment, 1997. *Responses to Louisiana Department of Environmental Quality's Comments for the Risk Assessment Prepared for the Laidlaw Environmental Services (Baton Rouge), Inc.* (Formerly, Rollins Environmental Services [LA], Inc.) Facility. November 1997.
Aquaterra, 1998. *1997 Annual Groundwater Monitoring Report*, February 1998.
Personal communication with Safety-Kleen, (Baton Rouge), Inc., July 1999.
Safety-Kleen, 2001. 2000 *Annual Groundwater Monitoring Report*, February 2001.

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