

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action  
Environmental Indicator (EI) RCRAInfo code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Safety-Kleen Systems, Inc  
Facility Address: 3811 Interstate 40E, Amarillo, Potter County, TX 79104  
Facility EPA ID #: TXD000747410 SWR61018

- 1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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, GPRRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be “**contaminated**”<sup>1</sup> above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

\_\_\_\_\_ If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

  **X**   If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

**FACILITY DESCRIPTION**

In 1985, the Safety-Kleen Systems, Inc. Amarillo Service Center (SK) began operation as a solvent handling and storage center for clean and used mineral spirits. The facility was surrounded by vacant lots, residential properties, and businesses. The facility consisted of two office buildings, a warehouse, and two 10,000 gallon underground storage tanks (USTs). The tanks were located in the same pit and were constructed of steel with an inner liner and internal leak detection system. The system was protected by a cathodic protection system. One tank was used for clean mineral spirits and the other for used mineral spirits. SK operated under Permit No. HW-50252 (Ref. 2).

The site is underlain by sand/silt and clay to 70 feet. Groundwater is at 180 feet in the Ogallala Aquifer (Ref. 2).

**Rationale:**

In September 1994, SK conducted a RCRA Facility Investigation (RFI) to investigate petroleum hydrocarbons. The RFI report indicated that detectable concentration of petroleum hydrocarbons were found in the soil. SK installed a soil vapor extraction (SVE) system in March 1996. SK proposed to close the USTs by December 1998 under the TNRCC Risk Reduction Standard 2 in a CMI Work Plan dated October 27, 1997 (Ref. 2). A CMI report, dated August 16, 2001, indicated that the samples collected showed no detection of the chemicals of concern or were not statistically different from background concentrations and therefore the site met the requirements for a Risk Reduction Standard 1 closure (Ref. 4). The site was decommissioned in February 2003 with all equipment removed and the site restored to pre-SK conditions (Ref. 5). On January 28, 2004, TCEQ certified the facility as closed with no outstanding corrective action or post-closure care requirements and, as SK requested, revoked SK’s Permit No. HW-50252 (Ref. 7).

During the RFI, VOCs, naphthalene, and 2-methnaphthalene, lead, cadmium and total petroleum hydrocarbons (TPH) were the target analytes of concern. Cadmium was detected in all samples, at ranges from 0.06 mg/kg to 2.9 mg/kg depending on the depth of the soil sample. Lead was detected in 11 of the 30 samples, ranging from 10 mg/kg to 50 mg/kg. These sample results were not statistically above background (Ref. 2).

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<sup>1</sup> “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 appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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Three VOC and Semi-VOC were detected during the RFI. The constituents detected included: Tetrachloroethene at maximum sample concentrations (MSC) of 0.077 mg/kg, Xylene at a MSC of 0.460 mg/kg, Ethylbenzene at a MSC of 0.077 mg/kg, Naphthalene at a MSC of 3.9 mg/kg and 2-methylnaphthalene at a MSC of 3.7 mg/kg (Ref. 2).

All constituents were below Risk Reduction Standard 1, although there is an indication in the Work Plan that, even at these low concentrations, the facility proceeded with determining a potential exposure pathway for risk.

**Files Referenced:**

1. Texas Natural Resource Conservation Commission (TNRCC). Compliance Evaluation Inspection (CEI) Report for CEI Conducted on October 10, 1995. October 30, 1995
2. Fluor Daniel GTI. Corrective Measure Implementation Workplan. October 27, 1997
3. Safety-Kleen Systems, Inc. (Safety-Kleen). Letter from Mr. Ricardo Saucedo to Mr. Jeff Saitas (TNRCC) re: the Annual Site Activity Report—2000. January 22, 2001.
4. Safety-Kleen. Letter from Mr. Gerhardt L. Risse to Ms. Eleanor Wehner (TNRCC) re: the Corrective Measure Implementation Report. August 16, 2001.
5. ATC Associates Inc. Letter from Mr. Hal G. Kuntz II to Ms. Eleanor Wehner (TNRCC) re: Site Decommissioning Activities. February 7, 2003.
6. Texas Commission on Environmental Quality (TCEQ). Letter to Mr. Gerhard Risse (Safety-Kleen) re: Closure Activities. September 18, 2003.
7. TCEQ. Letter from Ms. Katherine Nelson to Ms. Karen Dobias (Safety-Kleen) re: Voluntary Revocation of Permit HW-50252. January 28, 2004.
8. Site Plan

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

- If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”<sup>2</sup>.
- If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - skip to #8 and enter “NO” status code, after providing an explanation.
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

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<sup>2</sup> “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

\_\_\_\_\_ If yes - continue after identifying potentially affected surface water bodies.

\_\_\_\_\_ If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

\_\_\_\_\_ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

\_\_\_\_\_ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

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<sup>3</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>4</sup>)?

\_\_\_\_\_ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR  
2) providing or referencing an interim-assessment,<sup>5</sup> appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_\_ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

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<sup>4</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>5</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”
- \_\_\_\_\_ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”
- \_\_\_\_\_ If no - enter “NO” status code in #8.
- \_\_\_\_\_ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

8. Check the appropriate RCRAInfo status codes for the Migration of Contaminated Groundwater



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Under Control EI (event code CA750), 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, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Safety-Kleen facility, EPA ID # TXD000747410, located at Amarillo, Texas. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

\_\_\_ NO - Unacceptable migration of contaminated groundwater is observed

\_\_\_ IN - More information is needed to make a determination.

Completed by (signature) Eleanor T. Wehner Date 10/13/2011  
(print) Eleanor T. Wehner  
(title) CA Program Specialist (TCEQ)

Researched by (signature) Stephen Phillips, P.C. Date May 18, 2006  
(print) Stephen Phillips  
(title) TechLaw, Inc. (U.S. EPA Contractor)

Supervisor (signature) Geoffrey A. Meyer Date 10/20/11  
(print) Geoffrey A. Meyer  
(title) Supervisor  
(EPA Region or State) TCEQ

Locations where References may be found:

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