A-302

ATTACHMENT 1
CORRECTIVE ACTION PLAN

1.0 INTRODUCTION

Safety-Kleen Systems, Inc. (S-K) has been working with the Maryland Department of the Environment (MDE) to address residual impacts at the former S-K service center located at 12164 Tech Road, Silver Spring, Maryland (Figure 1). This Corrective Action Plan is being submitted in support of the permit renewal application for Controlled Hazardous Substances Permit Number A-302 (Regulation COMAR 26.13.05.07 C).

2.0 SITE BACKGROUND/HISTORY

The former Safety-Kleen facility functioned as a storage and distribution center for product and spent mineral spirits. The product mineral spirits were distributed to local customers for parts degreasing applications. Spent mineral spirits were later returned to the facility for short-term storage and transported to a Safety-Kleen solvent recycling facility. The Silver Spring service center operated between 1982 and 1996.

During operation, product and spent mineral spirits were stored in separate 12,000-gallon underground storage tanks (USTs). These USTs were located east of the main building beneath a concrete tank pad near Tech Road. The mineral spirits tanks were removed in April 1996. During removal of the USTs, a total of 444 tons of soil was excavated and disposed off-site at an authorized facility. The current site plan and layout is shown on Figure 2.

A total of eight (8) monitoring wells (MW-1 through MW-8) have been installed at and adjacent to the site during several phases of investigative activities. A summary of the monitoring well construction is included as Table 1. Site monitoring wells have been inspected and sampled on a quarterly basis since installation. Fluid levels have been gauged since 1992. A copy of the January 2005 potentiometric surface contour map has been included in Figure 3. Groundwater samples have been analyzed for total petroleum hydrocarbons as mineral spirits (TPH-MS) and target volatile organic compounds (VOCs).

A SVE remediation system was installed at the site in August 1993. The remediation system consists of a network of ten (10) SVE points (VEP-1 through VEP-10), a 10 horsepower regenerative blower, 2 water knock-out tanks, 2 - 1,000-pound granular activated carbon (GAC) units, and appurtenant gauges, pipes, and valves. The SVE system has operated nearly continuously since installation, except when shut down for maintenance activities, blower repair, or during periodic power outages. From July 2004 through July 2005, the SVE has operated under a pulsing scenario, to evaluate whether the system had attained asymptotic recovery rates.

Groundwater quality is influenced by an off-site (up-gradient) source of tetrachloroethene (PCE). Releases from the up-gradient facility are well documented, as are releases into and out of the sanitary sewer that wraps around the S-K site on the north, east, and south. S-K believes that the off-site source has resulted in the presence of PCE in up-gradient wells and other wells at the former S-K site. PCE is typically only a trace constituent of mineral spirits. Recent detected PCE concentrations in wells at the up-gradient and side-gradient facilities have ranged from 0.002 milligrams per liter (mg/L) to 11.9 mg/L (Arcadis, 2005).

A groundwater remediation system has reportedly been in operation at the up-gradient facility since 1998. Groundwater drawdown from this system has historically affected groundwater levels in the vicinity, including the shallow water-bearing zone underlying the former S-K site (Table 2a & 2b). According to available information, the system was shut down on April 7, 2003.

In August 2004, S-K voluntarily implemented pilot test activities to evaluate the potential of in situ chemical oxidation as an alternative remedial technique. A pilot test consisting of the injection of modified Fenton's reagent was conducted. Post-injection groundwater monitoring was subsequently performed to evaluate the effectiveness of the technology. S-K retained Isotec to provide the modified Fenton's reagent, and to perform the injection of the material. A detailed evaluation of the pilot test was provided in the March 2005 quarterly report.

3.0 UNDERSTANDING OF NATURE AND EXTENT OF GROUNDWATER IMPACTS

Groundwater sampling has been conducted on a quarterly basis at the former S-K site since 1996. In June 2005, S-K reported the most recent results from the April 2005 monitoring event (Trihydro, June 2005). Operation of the SVE system appears to have successfully reduced the concentrations of TPH-MS in both the site soil and groundwater. As of April 2005, the SVE had removed a cumulative hydrocarbon mass of 1,851.27 lbs, and concentrations in groundwater have decreased from historical pre-remediation levels of 318 mg/L to 0.16 mg/L (e.g., Well MW-1). In addition, no site-related constituents other than TPH-MS have been detected above permit-specified clean-up objectives since November 1999. As of April 2005, TPH-MS was present in groundwater above the clean-up objective of 0.1 mg/L in four on-site wells (MW-1, MW-2, MW-4 and MW-7), at concentrations ranging from 0.12 mg/L in well MW-7 to 0.45 mg/L in well MW-2. TPH-MS has never been detected in off-site well MW-8, and the residual TPH-MS in groundwater appears to be stable and contained on site.

As noted above, in order to determine the technical feasibility of further reducing residual TPH-MS concentrations in groundwater, S-K voluntarily conducted a Fenton's reagent pilot test in August 2004. Following injection, concentrations of TPH-MS in three of the four wells with historical elevated TPH-MS concentrations (MW-1, MW-4, and MW-7), decreased to non-detect, indicating a short-term effect on the residual concentrations. However, TPH-MS concentrations subsequently have rebounded to at, or near pre-injection levels.

All other constituents of concern (COCs) are below the cleanup objectives (CUOs) established in the facility permit (Table 3a & 3b) including tetrachloroethene (PCE). The neighboring IFI (International Fabricare Institute) site has recently reported PCE concentrations ranging from 0.002 mg/L to 11.9 mg/L at near side/up-gradient wells (Arcadis, January 2005). Concentrations of PCE in wells located at the former S-K Silver Spring Facility site PCE results have never exceeded 0.592 mg/L (MW-8, Feb 1996) (Table 3a & 3b).

4.0 REMEDIAL ACTIVITIES

Under Permit A-302, S-K has implemented an approved Corrective Action Program (CAP) consisting of operation of a SVE system, monthly and quarterly system checks, and quarterly groundwater monitoring. The SVE system attained asymptotic recovery rates in early 2002. Therefore, from July 2004 through July 2005, S-K operated the SVE under a quarterly pulsing scenario to further evaluate the system effectiveness. Quarterly pulsing of the SVE has resulted in no further recovery of volatile organic or petroleum hydrocarbon vapors, indicating that the SVE system has attained technically feasible limits of recovery. Based on this demonstration, no further operation of the SVE system is warranted, and S-K proposes to permanently cease operation of the SVE system.

5.0 PROPOSED CORRECTIVE ACTION

In order to demonstrate that S-K has achieved post-closure criteria, and to accomplish the corrective action objectives, S-K proposes to monitor the eight site wells on a schedule to be proposed by Safety-Kleen and approved by the MDE for TPH, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver), and target VOCs and SVOCs (benzene, cresol, 2,4-dinitrotoluene, hexachlorobenzene, hexachlorobutadiene, nitrobenzene, tetrachloroethene, trichloroethene, 1,2-dichloroethene (cis and trans), and vinyl chloride). The following ten constituents were removed from the target analyte list due to S-K's demonstration of three consecutive years of compliance below the Cleanup Objectives: chloroform, 1,1-dichloroethene, methyl ethyl

ketone, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, ethylbenzene, toluene, 1,1,1-trichloroethane, and xylenes (total).

As noted above, only TPH in groundwater currently exceeds the specified CUO, and feasibility testing using in situ chemical oxidation did not demonstrate that chemical oxidation is an appropriate long term technology. According to the guidance document published by the MDE, *Cleanup Standards for Soil and Groundwater*, dated August 1, 2001, groundwater standards are applicable to type I and II groundwater in groundwater use areas, with several exceptions. The listed exceptions are noted below:

1. It is technically impractical to complete a remedial action to a groundwater standard;
2. The applicant can demonstrate that there is no current or projected future use of groundwater within one half mile of the property, contaminant concentrations are at asymptotic levels and do not exceed a standard by an order of magnitude, risk assessment shows no risk considering current and future use, and a groundwater management zone has been implemented to restrict or prohibit groundwater use at the property;
3. An applicant can demonstrate that the hazardous substance(s) will not migrate off the property;
4. Natural groundwater concentrations for metal exceed the groundwater standards.

S-K believes that the current site conditions meet several of the criteria for supporting an exception to the groundwater standards, and may propose to evaluate the site using these criteria. If alternative cleanup objectives are to be calculated, S-K will evaluate the site using Risk Assessment Guidance for Superfund (RAGS), as specified in the State of Maryland, Department of Environment, *Cleanup Standards for Soil and Groundwater, Interim Final Guidance* dated August 2001.

The groundwater monitoring program will continue until the sampling and analysis data indicates that the concentrations do not exceed the permit-specific CUOs. Alternatively, S-K may propose risk-based concentrations (RBCs) established by USEPA Region III, or alternative risk-based cleanup objectives. A risk assessment may also be completed in conjunction with the risk-based demonstrations that have been prepared for the adjacent International Fabricare Institute facility (Arcadis, March 2005), and approved by the MDE, to demonstrate that current site conditions at the S-K facility are protective of human health and the environment.

6.0 REFERENCES

Arcadis, Analysis of Interim Shutdown Data, International Fabricare Institute Facility, Silver Spring, Maryland (Reference # MD752.0102), March 2005.

MDE, Cleanup Standards for Soil and Groundwater, Interim Final Guidance, August 2001.

USEPA, Risk Assessment Guidance for Superfund, EPA/540/1-89/002, December 1989.