

Hazardous Waste Facility Permit
Safety-Kleen Barre Service Center
EPA ID NO. VTD000791699
Air Emissions
March 2022

APPENDIX M
AIR EMISSIONS

APPENDIX M

AIR EMISSION STANDARDS COMPLIANCE PLAN

M – 1.0 AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS (40 CFR Part 264 Subpart BB)

Tank #3 and its ancillary equipment (i.e., HWMU #1 tank system) are subject to the requirements of Subpart BB of 40 CFR Part 264. 40 CFR §§ 264.1052 through 264.1055, § 264.1057, and § 264.1060 do not apply to the HWMU #1 tank system because there are no compressors in waste service, no equipment in gas/vapor service, no sampling connection systems, and no closed-vent systems or control devices in use at the Barre Service Center (BSC).

Tank #3 is used to store spent Safety-Kleen hydrocarbon-based parts washer solvent, which has a vapor pressure of approximately 0.11 kPa at 20 degrees C and is classified as a heavy liquid as defined in 40 CFR § 264.1031. Safety-Kleen's procedure and data supporting its spent hydrocarbon-based parts washer solvent vapor pressure determination are provided in **Attachment M-1**. Additionally, data and documentation support that the total concentration of the pure organic components of the spent parts washer solvent having a vapor pressure greater than 0.3 kilopascals (kPa) at 20 °C is less than 20 percent by weight and that the fluid is a liquid at operating conditions. Light liquids, as defined in 40 CFR § 264.1031, are not stored or managed in the HWMU #1 tank system.

Pursuant to 40 CFR § 264.1050, each piece of equipment subject to Subpart BB requirements is identified with a tag bearing a unique identification number to distinguish it from non-subject equipment. **Figure L-2** shows the piping schematic of the HWMU #1 tank system and identifies each piece of subject equipment and its corresponding identification number.

Pursuant to 40 CFR § 264.1056, the tank system's single open-ended transfer line is equipped with a check valve, gate valve, and cam lock seal that are kept closed except during waste transfer operations.

Pursuant to 40 CFR § 264.1058, each pump, valve, flange, and pressure relief device is inspected daily and repaired as necessary (see the CO Tank Sys BB Equipment inspection log contained in **Appendix E**). Pumps, valves, flanges, and pressure relief devices in heavy liquid service shall be monitored within 5 days by the method specified in § 264.1063(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method. 40 CFR § 264.1058 defines a leak as a reading of

10,000 ppm or greater when measured using a portable organic vapor analyzer. Since Safety-Kleen hydrocarbon-based parts washer solvent has a maximum vapor phase concentration in air of approximately 2,700 ppm (i.e., < 10,000 ppm), a portable organic vapor analyzer cannot be used for leak detection. As such, all subject equipment is monitored visually for leaks. Inspections conducted pursuant to this section are documented as a part of the facility operating record.

Pursuant to 40 CFR § 264.1064, if a leak is detected, the piece of equipment is marked with a leak tag that indicates the unique equipment identification number and date of initial leak detection. All repairs shall comply with the recordkeeping requirements outlined in 40 CFR § 264.1064. The first attempt at repairing the leaking equipment shall be made within five calendar days of initial leak detection, and all leaking equipment shall be repaired within 15 calendar days of initial leak detection (see 40 CFR § 264.1058). If repairs are delayed due to unforeseen circumstances, the reasons shall be documented in the facility operating record. **Attachment M-2** is a copy of the Safety-Kleen document used to record this information. In accordance with 40 CFR § 264.1065, a semiannual report shall be submitted to the Agency if any equipment is not repaired as required.

M – 2.0 AIR EMISSION STANDARDS FOR TANKS, SURFACE IMPOUNDMENTS, AND CONTAINERS (40 CFR PART 264 SUBPART CC)

The HWMU #1 tank system and certain containers are subject to the requirements of 40 CFR § 264 Subpart CC. The BSC does not manage waste in surface impoundments.

M – 2.1 Waste Determination Procedures

Pursuant to 40 CFR § 264.1083, waste determinations are made according to the Waste Analysis Plan in **Appendix C**. Safety-Kleen has determined that all organic wastes managed at the BSC in the HWMU #1 tank system and certain organic wastes managed in containers display an average volatile organic concentration of greater than 500 ppmw at the point of waste origination.

The point of waste origination (defined in 40 CFR § 265.1081), for all wastes generated off-site and transported to the facility in sealed containers, which are subsequently managed in tanks or containers at the facility, is the facility boundary at the entrance gate. For hazardous wastes generated on-site, the point of waste origination is the location in the facility where generation occurs.

M – 2.2 Tanks

Pursuant to 40 CFR § 264.1084, Tank #3 (HWMU #1) is used to store organic hazardous wastes as described in **Appendix L**. Tank #3 is a fixed roof, non-pressurized unit. Based on the volume of the tank (i.e., 15,000 gallons), the maximum organic vapor pressure of the waste stored in the tank (i.e., less than 11.1 psi), the actual vapor pressure of the waste managed in the tank (i.e., approximately 0.2 psi), and the fact that no stabilization activities occur, this tank is managed under Level 1 controls (i.e., fixed roof and documentation of maximum organic vapor pressure ≤ 76.6 kPa). The maximum organic vapor pressure is determined using knowledge of the waste pursuant to 40 CFR § 264.1083.

The tank is designed so that all openings can be closed with no visible gaps, holes, cracks, or other open spaces into the interior of the tank. The cover and all cover openings operate with no detectable emissions when in a closed position. All openings in the tank system are kept closed except when waste is being added to or removed from the system, when sampling occurs, or repairs and maintenance are performed. A visual inspection of all tank system closure devices will be performed annually using the CO Subpart CC Visual Tank Inspection log included in **Appendix E**.

The tank is equipped with a pressure/vacuum vent that is designed to operate with no detectable organic emissions when in the closed position. The vent is included in the annual Subpart CC inspection (see **Appendix E**).

M – 2.3 Containers

Containers subject to Subpart CC are stored in HWMUs #3, #4, and #5. The types of containers used to hold/store hazardous wastes at the facility are described in **Appendix K**. Since these containers are all less than 0.46 m³ (119 gallons) in volume, and the waste stored in them is not treated by stabilization, emissions from containers between 0.1 m³ (26 gallons) and 0.46 m³ (119 gallons) in size are controlled in accordance with the Container Level 1 standards specified in 40 CFR § 264.1086. Container Level 2 and 3 standards are not applicable.

Containers received and/or stored at the facility shall be equipped with covers and closure devices so that there are no visible holes, gaps, or other open spaces into the container when the closure devices are in place and secured. When the BSC receives containers of hazardous waste, and the containers are not

emptied immediately, a visual inspection of the containers shall be performed within 24 hours of receipt. The container, cover, and closure devices shall be inspected for visible cracks, holes, gaps, or other open spaces. If a defect is observed, the container shall be emptied into the wet dumpster, repackaged, or overpacked into a larger container. Inspections of containers are documented using the CO CSA Inspection Log found in **Appendix E**.

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ATTACHMENT M-1

RCRA Subpart AA and BB Air Emission Standards for Equipment Leaks
In Heavy Liquid Service Determination



Safety-Kleen Waste Parts Washer Solvent Heavy Liquid Determination

Objective

Determine whether waste parts washer solvent stored in bulk storage tanks or containers at Safety-Kleen branches and recycle centers is in “light liquid service” or “heavy liquid service” per definitions provided in 40 CFR Subpart AA and BB regulations.

Applicable Definitions Per 40 CFR 264.1031

- *In light liquid service* means that the piece of equipment contains or contacts a waste stream where the vapor pressure of one or more of the organic components in the stream is greater than 0.3 kilopascals (kPa) at 20 °C, the total concentration of the pure organic components having a vapor pressure greater than 0.3 kilopascals (kPa) at 20 °C is equal to or greater than 20 percent by weight, and the fluid is a liquid at operating conditions.
- *In heavy liquid service* means that the piece of equipment is not in gas/vapor service or in light liquid service.

Objectives

- Five samples were pulled from a Safety-Kleen branch’s outbound tanker truckloads of bulked waste solvent over an eight-day period consisting of approximately 25,570 gallons of bulked waste parts washer solvent. See Table 1.
- Samples were analyzed for volatile (SW846 8260D) and semi-volatile (SW846 8270E) analysis by gas chromatography, gas, diesel, and oil-range organic constituents contaminant concentrations, GRO, DRO, and ORGO (EPA Method 8015D to characterize the six carbon chain (C6) to 36 carbon chain (C36) aliphatic organic constituent contaminants potentially resulting from SK customer’s parts washer use).
- Table 2 lists the results of the five referenced samples and additional historical vapor pressure analysis ran in 2017 and 2019 using an isoteniscope using American Society for Testing and Materials (ASTM) D2879-19. The average **vapor pressure for Safety-Kleen parts washer solvent is 0.11 kPa at 20°C.**
- Tables 3, 4, 5, 6, and 7 provide a summary of the analysis results for each sample taken. Contaminants that have a vapor pressure that exceeds 0.3 kPa at 20°C are identified within each table. Vapor pressures of individual solvents were obtained from the Royal Society of Chemistry’s “[ChemSpider](#)” website.

- The samples were analyzed to characterize the water and percent solids content using SW846 Methods 9000 and 1311, respectively.
- Table 8 provides the **percentage of constituents in light liquid service** on a dry waste solvent basis for each sample and an **average percentage** of 15,077 mg/kg or **1.51%** in all tested samples.

Conclusion

Since the total concentration of organic components with a vapor pressure > 0.3 kPa at 20°C is less than 20% by weight of the total process stream, and the vapor pressure analysis of the bulk solvent commingled waste stream is < 0.3 kPa at 20°C , Safety-Kleen's parts washer solvent stored in bulk storage tanks meets the RCRA definition of "In heavy liquid service."

Table 1

Safety-Kleen Systems, Inc.

Waste Solvent Volume Characterized

Sample ID	Sample Collection Date	Composite Waste Solvent Sample Volume Characterized ¹ (gals)
SK-AC-1	6-Oct-2021	6,440
SK-AC-2	6-Oct-2021	6,020
SK-AC-3	6-Oct-2021	2,800
SK-AC-4	14-Oct-2021	6,230
SK-AC-5	14-Oct-2021	4,270
Total Waste Volume Solvent Characterized		25,760

Table 2

Safety-Kleen Systems, Inc.

Waste Solvent Vapor Pressure by Isotenoscope - ASTM D2879 Sampling Results

Sample ID	Sample Collection Date	SPL Sample ID	Vapor Pressure at 20 °C (torr) ¹	Vapor Pressure at 20 °C (kPa) ²	Light Liquid Service (Y/N) ³
SK-AC-1	6-Oct-2021	A211019015 Rev1 ⁴	1.2	0.16	N
SK-AC-2	6-Oct-2021	A211019016 Rev2 ⁵	0.6	0.08	N
SK-AC-3	6-Oct-2021	A211019017 Rerun ⁶	1.0	0.13	N
SK-AC-4	14-Oct-2021	A211019018 Rev1	1.4	0.18	N
SK-AC-5	14-Oct-2021	A211019019 Rerun	0.5	0.06	N
A210614017	17-Jun-2021	A210614017	0.8	0.11	N
P171211A-1	15-Dec-2017	P171211A-1	0.95	0.13	N
P171206A-2	15-Dec-2017	P171206A-2	0.73	0.10	N
P171206A-3	15-Dec-2017	P171206A-3	0.7	0.09	N
A190530008	1-Jul-2019	A190530008	0.81	0.11	N
A190612013	1-Jul-2019	A190612013	0.88	0.12	N
Average Vapor Pressure			0.9	0.11	N

Notes:

1.) torr - A unit of pressure used in measuring partial vacuums on an absolute scale. Equal to 1/760 of a standard atmosphere or 133.32 pascals.

2.) kPa - kilopascals

3.) Light liquid service vapor pressure threshold is 0.3 kPa.

4.) Rev1 - Southern Petroleum Laboratory (SPL) initially reported vapor pressures at 25 Deg C intervals. SPL was asked to revise their initial analytical reports to provide vapor pressures at 20 Deg C.

5.) Rev2 - SPL was asked to review sample SK-AC-2's initial results and to reanalyze the sample because initially reported results were two orders of magnitude higher than 2019 Annual Recharacterization vapor pressure test values. SPL discovered there were matrix interferences affecting degassing of the sample resulting in initially inaccurate results.

6.) Rerun - After learning there were matrix interferences affecting sample SK-AC-2's degassing and associated vapor pressure results, SPL was asked to also reanalyze samples SK-AC-3 and SK-AC-5 because their initially reported vapor pressure results were 3 to 5.5 times greater than average 2019 annual recharacterization vapor pressure results. During the reanalysis of these two samples, SPL again observed matrix interferences affected sample degassing and associated vapor pressure results.

Table 3

Safety-Kleen Systems

Sample SK-AC-1 Waste Solvent Heavy Liquid Determination Sampling Results

Analytical Method and Detected Chemical Constituents	CAS Number	Vapor Pressure at 20 °C ¹ (kPa) ²	Constituent in Light Liquid Service (Y/N)	SK-AC-1			
				Concentration (mg/kg)	Data Qualifiers	Tentatively Identified Constituent Retention Time (mins)	Concentration (%)
Method 8260C VOCs by GC/MS							
No Method 8270C Volatile Constituents Detected							
VOCs by GC/MS							
Undecane	1120-21-4	0.053	N	1,100	TJN ³	13.11	0.11
17-Pentatriacontene	6971-40-0	0.093	N	530	TJN	13.29	0.05
3,7-Dimethyl-octa-1,6-diene	1000190-46-4	0.270	Y	330	TJN	13.57	0.03
(2-Methylbutyl)cyclohexane	54105-77-0	0.060	N	430	TJN	13.72	0.04
Undecane, 2-methyl-	7045-71-8	0.093	N	460	TJN	13.83	0.05
Heptacosane, 1-chloro-	62016-79-9	4.330E-09	N	520	TJN	13.91	0.05
Dodecane	112-40-3	0.031	N	940	TJN	14.21	0.09
Undecane, 2,6-dimethyl-	17301-23-4	0.064	N	390	TJN	14.36	0.04
2(1H)-Naphthalenone, octahydro-4a-methyl-, cis-	938-06-7	0.005	N	290	TJN	14.42	0.03
Cyclopentane, 1,1,3-trimethyl-	4516-69-2	0.014	N	330	TJN	14.51	0.03
EPA 8270D - Semivolatile Organic Compounds (GC/MS)							
No Method 8270D Semivolatile Constituents Detected							
Organic Compounds (GC/MS)							
Unknown			N ⁴	10,000	TJ ⁵	6.12	1.00
Unknown			N	9,000	TJ	6.16	0.90
Unknown			N	8,100	TJ	6.26	0.81
Unknown			N	21,000	TJ	6.29	2.10
Unknown			N	15,000	TJ	6.33	1.50
Undecane	1120-21-4	0.053	N	54,000	TJN	6.38	5.40
Unknown			N	17,000	TJ	6.40	1.70
Cyclooctene, 1,2-dimethyl-	54299-96-6	0.153	N	15,000	TJN	6.46	1.50
Unknown			N	20,000	TJ	6.48	2.00
Unknown			N	36,000	TJ	6.55	3.60
Cyclododecane	294-62-2	0.003	N	14,000	TJN	6.60	1.40
Unknown			N	32,000	TJ	6.65	3.20
Unknown			N	9,900	TJ	6.70	0.99
Unknown			N	19,000	TJ	6.72	1.90
Unknown			N	13,000	TJ	6.75	1.30
Unknown			N	20,000	TJ	6.79	2.00
Unknown			N	17,000	TJ	6.83	1.70
Unknown			N	10,000	TJ	6.90	1.00
Unknown			N	8,900	TJ	6.96	0.89
Undecane, 2,6-dimethyl-	17301-23-4	0.064	N	10,000	TJN	7.08	1.00
Method 8015D - Gasoline Range Organics (GRO) (GC)							
Gasoline Range Organics [C6 -C10]		6.380	Y ⁶	8,400			0.84
Method: 8015D - Diesel Range Organics (DRO) (GC)							
Diesel Range Organics [C10 - C28]		1.115E-04	N ⁷	1,000,000			100.00
Oil Range Organics (C28-C36)							0.00
Percent Moisture							1.0
Percent Solids							1.9
Total Concentration of Waste Solvent in Light Liquid Service				8,730			0.87

Notes:

1.) Vapor pressures from The Royal Society of Chemistry's ChemSpider website at: <http://www.chemspider.com/Default.aspx>. And, and all vapor pressure estimates are in kPa at 25 Deg Centigrade thereby resulting in a more conservative heavy liquid determination.

2.) kPa = kilopascals

3.) TJN = Tentatively identified compound with an estimated value and presumptive evidence of material.

4.) TJ = Tentatively identified compound with an estimated value.

5.) Since all heavier molecular weight and higher boiling point tentatively identified volatile organics are in heavy liquid service and all lower boiling point and shorter retention time tentatively identified semivolatile organics are also in heavy liquid service, it is assumed that all

6.) Vapor pressure for gasoline range organics for C6 to C8 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

7.) Vapor pressure for diesel range organics for C16 to C21 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

Table 4

Safety-Kleen Systems

Sample SK-AC-2 Waste Solvent Heavy Liquid Determination Sampling Results

Analytical Method and Detected Chemical Constituents	CAS Number	Vapor Pressure at 20 °C ¹ (kPa) ²	Constituent in Light Liquid Service (Y/N)	SK-AC-2			
				Concentration (mg/kg)	Data Qualifiers	Tentatively Identified Constituent Retention Time (mins)	Concentration (%)
Method 8260C VOCs by GC/MS							
No Method 8260C Volatile Constituents Detected							
Tentatively Identified 8260C VOCs by GC/MS							
Undecane	1120-21-4	0.053	N	780	TJN ³	13.11	0.08
Cyclohexane, 1,2-diethyl-1-methyl-	61141-79-5	0.194	N	190	TJN	13.19	0.02
Triallylmethylsilane	1112-91-0	0.079	N	570	TJN	13.29	0.06
Decane, 3,7-dimethyl-	17312-54-8	0.165	N	200	TJN	13.43	0.02
Bicyclo[2.2.2]octane, 2-methyl-	766-53-0	0.752	Y	230	TJN	13.57	0.02
trans-Decalin, 2-methyl-	1000152-47-3	0.042	N	210	TJN	13.66	0.02
3-Acetoncyclopentanone	75359-72-7	0.017	N	370	TJN	13.72	0.04
Undecane, 2-methyl-	7045-71-8	0.093	N	350	TJN	13.82	0.04
Heptacosane, 1-chloro-	62016-79-9	4.33E-09	N	470	TJN	13.91	0.05
Dodecane	112-40-3	0.018	N	710	TJN	14.21	0.07
EPA 8270D - Semivolatile Organic Compounds (GC/MS)							
No Method 8270D Semivolatile Constituents Detected							
EPA 8270D - Tentatively Identified Semivolatile Organic Compounds (GC/MS)							
Naphthalene, decahydro-, trans-	493-02-7	0.163	N	11,000	TJN	6.12	1.10
Unknown			N ⁴	10,000	TJ ⁵	6.16	1.00
Unknown			N	8,400	TJ	6.23	0.84
Unknown			N	31,000	TJ	6.29	3.10
Unknown			N	17,000	TJ	6.33	1.70
Undecane	1120-21-4	0.053	N	66,000	TJN	6.38	6.60
Unknown			N	18,000	TJ	6.40	1.80
Cyclooctene, 1,2-dimethyl-	54299-96-6	0.153	N	20,000	TJN	6.46	2.00
Unknown			N	20,000	TJ	6.48	2.00
Naphthalene, decahydro-2-methyl-	2958-76-1	0.091	N	42,000	TJN	6.55	4.20
Unknown			N	16,000	TJ	6.60	1.60
Unknown			N	39,000	TJ	6.65	3.90
Unknown			N	9,800	TJ	6.70	0.98
Unknown			N	22,000	TJ	6.72	2.20
Unknown			N	15,000	TJ	6.76	1.50
Unknown			N	25,000	TJ	6.79	2.50
Unknown			N	20,000	TJ	6.83	2.00
Unknown			N	11,000	TJ	6.91	1.10
Unknown			N	8,800	TJ	7.05	0.88
Undecane, 2,6-dimethyl-	17301-23-4	0.064	N	11,000	TJN	7.09	1.10
Method 8015D - Gasoline Range Organics (GRO) (GC)							
Gasoline Range Organics [C6 -C10]		6.380	Y ⁶	11,000			1.10
Method: 8015D - Diesel Range Organics (DRO) (GC)							
Diesel Range Organics [C10 - C28]		1.115E-04	N ⁷	940,000			94
Oil Range Organics (C28-C36)				ND			
Percent Moisture							1.0
Percent Solids							1.7
Total Percent of Waste Solvent in Light Liquid Service				11,230			1.12

Notes:

- Vapor pressures from The Royal Society of Chemistry's ChemSpider website at: <http://www.chemspider.com/Default.aspx>. And, all vapor pressure estimates are in kPa at 25 Deg Centigrade thereby resulting in a more conservative heavy liquid determination.
- kPa = kilopascals
- TJN = Tentatively identified compound with an estimated value and presumptive evidence of material.
- Since all heavier molecular weight and higher boiling point tentatively identified volatile organics are in heavy liquid service and all lower boiling point and shorter retention time tentatively identified semivolatile organics are also in heavy liquid service, it is assumed that all unknown tentatively identified semivolatile organic constituents are also in heavy
- TJ = Tentatively identified compound with an estimated value.
- Vapor pressure for gasoline range organics for C6 to C8 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.
- Vapor pressure for diesel range organics for C16 to C21 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

Table 5

Safety-Kleen Systems

Sample SK-AC-3 Waste Solvent Heavy Liquid Determination Sampling Results

Analytical Method and Detected Chemical Constituents	CAS Number	Vapor Pressure at 20 °C ¹ (kPa) ²	Constituent in Light Liquid Service (Y/N)	SK-AC-3			
				Concentration (mg/kg)	Data Qualifiers	Tentatively Identified Constituent Retention Time (mins)	Concentration (%)
Method 8260C VOCs by GC/MS							
No Method 8260C Volatile Constituents Detected							
Tentatively Identified 8260C VOCs by GC/MS							
Undecane	1120-21-4	0.053	N	490	TJN ³	13.11	0.049
Cyclohexane, 1,2-diethyl-1-methyl-	61141-79-5	0.194	N	130	TJN	13.19	0.013
Octadecane, 1-(ethenoxy)-	930-02-9	0.000	N	360	TJN	13.29	0.036
Undecane, 4-methyl-	2980-69-0	0.093	N	140	TJN	13.44	0.014
9-Methylbicyclo[3.3.1]nonane	25107-01-1	0.259	Y	140	TJN	13.58	0.014
trans-Decalin, 2-methyl-	1000152-47-3	0.042	N	130	TJN	13.66	0.013
Undecane, 4-cyclohexyl-	13151-79-6	0.001	N	230	TJN	13.71	0.023
1-Methyldecahydronaphthalene	2958-75-0	0.091	N	200	TJN	13.86	0.02
Decane, 3,8-dimethyl-	17312-55-9	0.165	N	250	TJN	13.91	0.025
Dodecane	112-40-3	0.031	N	360	TJN	14.21	0.036
EPA 8270D - Semivolatile Organic Compounds (GC/MS)							
2-Methylnaphthalene	91-57-6	0.005	N	5.5	J ⁴		0.00055
EPA 8270D - Tentatively Identified Semivolatile Organic Compounds (GC/MS)							
9-Borabicyclo[3.3.1]nonane, 9-hydroxy-	63366-65-4	0.002	N	11,000	TJN	6.12	1.10
Decane, 3-methyl-	13151-34-3	0.121	N	9,400	TJN	6.16	0.94
Unknown			N ⁵	22,000	TJ ⁶	6.29	2.20
Unknown			N	17,000	TJ	6.33	1.70
Undecane	1120-21-4	0.053	N	59,000	TJN	6.37	5.90
Unknown			N	18,000	TJ	6.40	1.80
Unknown			N	16,000	TJ	6.45	1.60
2,6-Dimethyldecane			N	21,000	TJ	6.48	2.10
Unknown			N	39,000	TJ	6.55	3.90
Unknown			N	15,000	TJ	6.60	1.50
Cyclohexane, pentyl-	4292-92-6	0.0578	N	35,000	TJN	6.65	3.50
Unknown			N	11,000	TJ	6.69	1.10
Unknown			N	20,000	TJ	6.72	2.00
Unknown			N	14,000	TJ	6.75	1.40
Unknown			N	21,000	TJ	6.79	2.10
Unknown			N	18,000	TJ	6.83	1.80
Unknown			N	8,500	TJ	6.87	0.85
Unknown			N	11,000	TJ	6.90	1.10
Unknown			N	8,300	TJ	7.05	0.83
Unknown			N	11,000	TJ	7.09	1.10
Method 8015D - Gasoline Range Organics (GRO) (GC)							
Gasoline Range Organics [C6 -C10]		6.380	Y ⁷	12,000			1.20
Method: 8015D - Diesel Range Organics (DRO) (GC)							
Diesel Range Organics [C10 - C28]		1.115E-04	N ⁸	980,000			98
Oil Range Organics (C28-C36)				ND			
Percent Moisture							1.0
Percent Solids							2.2
Total Percent of Waste Solvent in Light Liquid Service				12,140			1.21

Notes:

1.) Vapor pressures from The Royal Society of Chemistry's ChemSpider website at: <http://www.chemspider.com/Default.aspx>. And, all vapor pressure estimates are in kPa at 25 Deg Centigrade thereby resulting in a more conservative heavy liquid determination.

2.) kPa = kilopascals

3.) TJN = Tentatively identified compound with an estimated value and presumptive evidence of material.

4.) J = Estimated value.

5.) Since all heavier molecular weight and higher boiling point tentatively identified volatile organics are in heavy liquid service and all lower boiling point and shorter retention time tentatively identified semivolatile organics are also in heavy liquid service, it is assumed that all unknown tentatively identified semivolatile organic constituents are also in heavy

6.) TJ = Tentatively identified compound with an estimated value.

7.) Vapor pressure for gasoline range organics for C6 to C8 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

8.) Vapor pressure for diesel range organics for C16 to C21 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

Table 6

Safety-Kleen Systems
Sample SK-AC-4 Waste Solvent Heavy Liquid Determination Sampling Results

Analytical Method and Detected Chemical Constituents	CAS Number	Vapor Pressure at 20 °C ¹ (kPa) ²	Constituent in Light Liquid Service (Y/N)	SK-AC-4			
				Concentration (mg/kg)	Data Qualifiers	Tentatively Identified Constituent Retention Time (mins)	Concentration (%)
Method 8260C VOCs by GC/MS							
Ethylbenzene	100-41-4	0.950	Y	0.43			0.0004
Xylenes, Total	1330-20-7	1.116	Y ³	2.4			0.0002
Methylcyclohexane	108-87-2	6.132	Y	0.95			0.0001
Tentatively Identified 8260C VOCs by GC/MS							
Unknown			Y ⁴	36	TJ ⁵	16.24	0.00
Unknown			Y	45	TJ	16.29	0.00
trans-Decalin, 2-methyl-	1000152-47-3	0.163	N	47	TJN ⁶	16.65	0.00
Unknown			Y	35	TJ	16.73	0.00
1-Methyldcahydronaphthalene	2958-75-0	0.091	N	30	TJN	16.87	0.00
Dodecane	112-40-3	0.031	N	32	TJN	17.01	0.00
Bicyclo[2.2.2]octane, 2-methyl-	766-53-0	0.752	Y	42	TJN	17.12	0.00
Method 8260C Volatile Organic Compounds by GC/MS - RADL⁷							
Toluene	108-88-3	2.930	Y	220			0.02
Tetrachloroethene	127-18-4	1.867	Y	160			0.02
Tentatively Identified 8260C VOCs by GC/MS - RADL							
Naphthalene, decahydro-, trans-	493-02-7	0.163	N	1,700	TJN	12.83	0.17
Undecane	1120-21-4	0.053	N	2,100	TJN	12.96	0.21
Cyclohexane, 1-ethyl-2-propyl-	62238-33-9	0.117	N	840	TJN	13.02	0.08
Cyclohexane, 1,4-dimethyl-, trans-	2207-04-7	3.026	Y	1,200	TJN	13.12	0.12
Benzene, 1-methyl-2-(1-methylethyl)-	527-84-4	0.199	N	1,500	TJN	13.17	0.15
Cyclohexane, 1,6-dimethyl-	1759-64-4	1.559	Y	760	TJN	13.29	0.08
Cyclohexane, 1-butyl-	3282-53-9	0.167	N	1,300	TJN	13.40	0.13
Naphthalene, decahydro-2-methyl-	2958-76-1	0.091	N	1,000	TJN	13.49	0.10
n-Amylcyclohexane	29949-27-7	0.058	N	790	TJN	13.56	0.08
1-Phenyl-1-butene	824-90-8	0.051	N	780	TJN	14.05	0.08
EPA 8270D - Semivolatile Organic Compounds (GC/MS)							
No Method 8270D Semivolatile Constituents Detected							
Compounds (GC/MS)							
Naphthalene, decahydro-, trans-	493-02-7	0.163	N	9,600	TJN	6.14	0.96
Unknown			N ⁸	8,700	TJ	6.18	0.87
Unknown			N	26,000	TJ	6.30	2.60
Unknown			N	13,000	TJ	6.34	1.30
Undecane	1120-21-4	0.053	N	60,000	TJN	6.38	6.00
Unknown			N	15,000	TJ	6.41	1.50
cis-Decalin, 2-syn-methyl-	1000155-85-6	0.091	N	15,000	TJN	6.46	1.50
Unknown			N	18,000	TJ	6.49	1.80
Naphthalene, decahydro-2-methyl-	2958-76-1	0.091	N	38,000	TJN	6.55	3.80
Unknown			N	12,000	TJ	6.60	1.20
Unknown			N	33,000	TJ	6.65	3.30
Unknown			N	8,700	TJ	6.70	0.87
Unknown			N	19,000	TJ	6.73	1.90
Unknown			N	12,000	TJ	6.75	1.20
Unknown			N	20,000	TJ	6.78	2.00
Unknown			N	17,000	TJ	6.83	1.70
Unknown			N	8,600	TJ	6.91	0.86
Unknown			N	8,700	TJ	6.96	0.87
Unknown			N	7,500	TJ	7.04	0.75
Unknown			N	8,800	TJ	7.08	0.88
Method 8015D - Gasoline Range Organics (GRO) (GC)							
Gasoline Range Organics [C6 -C10]		6.38	Y ⁹	9,300			0.93
Method: 8015D - Diesel Range Organics (DRO) (GC)							
Diesel Range Organics [C10 - C28]		1.11E-04	N ¹⁰	1,800,000			180.00
Oil Range Organics (C28-C36)				ND			
Percent Moisture							1.0
Percent Solids							1.9
Total Percent of Waste Solvent in Light Liquid Service							1.19

Notes:
1.) Vapor pressures from The Royal Society of Chemistry's ChemSpider website at: <http://www.chemspider.com/Default.aspx>. And, all vapor pressure estimates are in kPa at 25 Deg Centigrade thereby resulting in a more conservative heavy liquid determination.
2.) kPa = kilopascals
3.) Xylene vapor pressure the average of o, m, and p Xylene vapor pressures.
4.) Assume all Unknown tentatively identified Method 8260C volatile organic compounds are in light liquid service.
5.) TJ = Tentatively identified compound with an estimated value.
6.) TJN = Tentatively identified compound with an estimated value and presumptive evidence of material.
7.) GC/MS - RADL = Indicates a dilution, re-analysis, re-extraction, or additional initial metals/anion analysis of the sample
8.) Since most heavier molecular weight and higher boiling point tentatively identified volatile organics are in heavy liquid service and lower boiling point and shorter retention time tentatively identified semivolatile organics are also in heavy liquid service, it is assumed that all unknown tentatively identified semivolatile
9.) Vapor pressure for gasoline range organics for C6 to C8 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.
10.) Vapor pressure for diesel range organics for C16 to C21 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

Table 7

Safety-Kleen Systems

Sample SK-AC-5 Waste Solvent Heavy Liquid Determination Sampling Results

Analytical Method and Detected Chemical Constituents	CAS Number	Vapor Pressure at 20 °C ¹ (kPa) ²	Constituent in Light Liquid Service (Y/N)	SK-AC-5			
				Concentration (mg/kg)	Data Qualifiers	Tentatively Identified Constituent Retention Time (mins)	Concentration (%)
Method 8260C VOCs by GC/MS							
No Method 8270C Volatile Constituents Detected							
Tetrachloroethene	127-18-4	1.867	Y	290			0.03
Methylcyclohexane	108-87-2	6.132	Y	30	J ³		0.003
Tentatively Identified 8260C VOCs by GC/MS							
Cyclodecene, 1-methyl-	66633-38-3	0.066	N	3,400	TJN ⁴	13.02	0.34
Undecane	1120-21-4	0.053	N	4,400	TJN	13.14	0.44
Cyclohexane, 1,2,4,5-tetraethyl-, (1.alpha.,2.alpha.,4.alpha.)	61142-24-3	0.538	Y	2,700	TJN	13.20	0.27
1-Eicosanol	629-96-9	6.660E-08	N	5,500	TJN	13.31	0.55
Cyclohexanol, 5-methyl-2-(1-methylethyl)-, (1.alpha.,2.alpha.)	491-01-0	0.001	N	3,300	TJN	13.45	0.33
Cyclooctene, 1,2-dimethyl-	54299-96-6	0.153	N	2,200	TJN	13.59	0.22
cis-Decalin, 2-syn-methyl-	1000155-85-6	0.091	N	200	TJN	13.68	0.02
Cyclohexane, 2-propenyl-	2114-42-3	0.491	Y	2,700	TJN	13.73	0.27
1-Methyldecahydronaphthalene	2958-75-0	0.091	N	1,500	TJN	13.88	0.15
Naphthalene, decahydro-2-methyl-	2958-76-1	0.091	N	2,700	TJN	13.95	0.27
EPA 8270D - Semivolatile Organic Compounds (GC/MS)							
No Method 8270D Semivolatile Constituents Detected							
EPA 8270D - Tentatively Identified Semivolatile Organic Compounds (GC/MS)							
Naphthalene, decahydro-, trans-	493-02-7	0.163	N	17,000	TJN	6.14	1.70
Unknown			N ⁵	17,000	TJ ⁶	6.18	1.70
Unknown			N	46,000	TJ	6.30	4.60
Unknown			N	28,000	TJ	6.34	2.80
Undecane	1120-21-4	0.053	N	110,000	TJN	6.38	11.00
Unknown			N	33,000	TJ	6.41	3.30
Cyclooctene, 1,2-dimethyl-	54299-96-6	0.153	N	29,000	TJN	6.46	2.90
Unknown			N	30,000	TJ	6.48	3.00
Naphthalene, decahydro-2-methyl-	2958-76-1	0.091	N	71,000	TJN	6.55	7.10
Unknown			N	23,000	TJ	6.61	2.30
Unknown			N	59,000	TJ	6.65	5.90
Unknown			N	15,000	TJ	6.70	1.50
Unknown			N	31,000	TJ	6.72	3.10
Unknown			N	20,000	TJ	6.76	2.00
Unknown			N	35,000	TJ	6.79	3.50
Unknown			N	29,000	TJ	6.83	2.90
Bicyclo[2.2.2]octane, 2-methyl-	766-53-0	0.752	Y	15,000	TJN	6.87	1.50
Unknown			N	1,400	TJ	6.91	0.14
Dodecane	112-40-3	0.031	N	52,000	TJN	7.00	5.20
Undecane, 2,6-dimethyl-	17301-23-4	0.064	N	13,000	TJN	7.08	1.30
Method 8015D - Gasoline Range Organics (GRO) (GC)							
Gasoline Range Organics [C6 -C10]		6.38	Y ⁷	8,500			0.85
Method: 8015D - Diesel Range Organics (DRO) (GC)							
Diesel Range Organics [C10 - C28]		1.11E-04	N ⁸	2,000,000			200
Oil Range Organics (C28-C36)				ND			
Percent Moisture							
							1.0
Percent Solids							
							1.9
Total Percent of Waste Solvent in Light Liquid Service				29,220			2.92

Notes:

- 1.) Vapor pressures from The Royal Society of Chemistry's ChemSpider website at: <http://www.chemspider.com/Default.aspx>. And, all vapor pressure estimates are in kPa at 25 Deg Centigrade thereby resulting in a more conservative heavy liquid determination.
- 2.) kPa = kilopascals
- 3.) J = Estimated value.
- 4.) TJN = Tentatively identified compound with an estimated value and presumptive evidence of material.
- 5.) Since most heavier molecular weight and higher boiling point tentatively identified volatile organics are in heavy liquid service and lower boiling point and shorter retention time tentatively identified semivolatile organics are also in heavy liquid service, it is assumed that all unknown tentatively identified semivolatile organic constituents are also in heavy liquid service.
- 6.) TJ = Tentatively identified compound with an estimated value.
- 7.) Vapor pressure for gasoline range organics for C6 to C8 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.
- 8.) Vapor pressure for diesel range organics for C16 to C21 compounds at approximately 21 Degrees Centigrade from the Agency for Toxic Substances and Disease Registry's Table 2 at: <https://www.atsdr.cdc.gov/ToxProfiles/tp123-c2.pdf>.

Table 8**Safety-Kleen Systems, Inc.****Percentage of Safety-Kleen Systems, Inc. Waste Solvent In Light Liquid Service On A Dry Waste Solvent Basis**

Sample ID	Light Liquid Constituent As-Is Concentration (mg/kg)	Moisture (%)	Light Liquid Constituent Dry Weight Basis Concentration (mg/kg)	Total Solids (%)	Light Liquid Constituents Dry Solvent Basis Concentration (mg/kg)	Percent of Waste Stream in Light Liquid Service On A Dry Solvent Basis (%)	Light Liquid Service (Y/N)
SK-AC-1	8,730	1.00	8,818	1.90	8,989	0.90	N
SK-AC-2	11,230	1.00	11,343	1.70	11,563	1.16	N
SK-AC-3	12,140	1.00	12,263	2.20	12,500	1.25	N
SK-AC-4	11,892	1.00	12,012	1.90	12,245	1.22	N
SK-AC-5	29,220	1.00	29,515	1.90	30,087	3.01	N
Averages	14,642	1.0	14,790	1.92	15,077	1.51	N

Hazardous Waste Facility Permit
Safety-Kleen Barre Service Center
EPA ID NO. VTD000791699
Air Emissions
March 2022

ATTACHMENT M-2

Subpart BB Repair Record

REPAIR RECORD FOR EQUIPMENT IN HEAVY LIQUID SERVICE

In Compliance With 40 CFR 264.1064

Date of Potential Leak _____

Equipment Identification Number _____

Date Leak Was Detected _____

Date(s) of Each Attempt to Repair the Leak _____

Date of Delay for Repair and Reason for Delay
(required if repairs are delayed by more than 15 days) _____

Method of Repair _____

Date of Repair _____

Signature of Inspector/Repairer _____

This form must be completed for each time a leak is discovered in any piece of equipment in hazardous waste liquid service.

Additional Requirements

If a leak is detected, the following additional steps must be taken:

1. Attach a waterproof and readily visible tag to the piece of leaking equipment. This tag must be marked with the equipment ID number.
2. Make an attempt to repair the equipment within 5 days of detection.
3. If the leaking equipment is a valve, the tag must be left in place for 2 months after repair. The tag may be removed from other types of equipment immediately after repair.