UCOR
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UCOR-5588

FEDERAL FACILITY AGREEMENT APPENDIX I-5 INFORMATION ASSESSMENT FOR EAST TENNESSEE TECHNOLOGY PARK, OAK RIDGE, TENNESSEE

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UCOR-5588

FEDERAL FACILITY AGREEMENT APPENDIX I-5 INFORMATION ASSESSMENT FOR EAST TENNESSEE TECHNOLOGY PARK, OAK RIDGE, TENNESSEE

Date Issued—November 2022

Prepared for the
U.S. Department of Energy
Oak Ridge Office of Environmental Management

United Cleanup Oak Ridge LLC
under contract 89303322DEM000067

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APPROVALS

Federal Facility Agreement Appendix I-5 Information Assessment for East Tennessee Technology Park, Oak Ridge, Tennessee	UCOR-5588
	November 2022

USQD Review Determination	☐ USQD ☐ UCD ■ CAT X ☐ Exempt (select criteria 1–3 below) USQD/UCD/CAT X No.:
Exemption Criteria	☐ (1) Non-intent change ☐ (2) DOE-approved safety basis document ☐ (3) Per criteria in PROC-NS-1001 (e.g., Chief Financial Officer, Internal Audit, Labor Relations, General Counsel, Community Outreach, or Project Integration & Business Services) OR ■ (4) Document identified in USQD-MS-CX-REPORTS-1074
USQD Preparer:	Daniel Theisen Digitally signed by Daniel Theisen Date: 2022.11.30 10:49:21 -05'00' Daniel Theisen — Date
Exhibit L Mandatory Contractor Document	■ No (No Proforma Change Control Board [PCCB] reviewer signature required.) ☐ Yes (Requires review by the PCCB.)
PCCB Reviewer:	Name — Date

Prepared by:

SIDNEY GARLAND (Affiliate) Digitally signed by SIDNEY GARLAND (Affiliate) Date: 2022.11.29 13:40:41 -05'00'

Sid Garland, FFA Management Support
UCOR/RSI EnTech, Inc.

Date

Approved by:

SAMANTHA PACK (Affiliate) Digitally signed by SAMANTHA PACK (Affiliate) Date: 2022.11.30 09:19:07 -05'00'

Samantha Pack, Environmental Services and Regulatory Manager
UCOR/RSI EnTech, Inc.

Date

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FEDERAL FACILITY AGREEMENT
APPENDIX I-5 INFORMATION ASSESSMENT FOR
EAST TENNESSEE TECHNOLOGY PARK, OAK RIDGE, TENNESSEE

Appendix I-5 to the *Federal Facility Agreement for the Oak Ridge Reservation* (DOE/OR-1014) (Attachment 1) describes how classified information is evaluated on the Oak Ridge Reservation for the purpose of environmental restoration. Operations at the East Tennessee Technology Park (ETTP) were evaluated in accordance with Appendix I-5, and the following chemicals were identified as being used in classified operations:

- acetone
- aluminum
- calcium acetate
- calcium acetate monohydrate
- calcium fluoride
- calcium formate
- calcium hydroxide
- calcium perfluorobutyrate
- cellulose acetate
- chlorine trifluoride
- copper
- demineralized water
- epoxylite resin
- fluorine
- glacial acetic acid
- hydrated lime
- hydrochloric acid
- hydrofluoric acid – anhydrous
- hydrogen perfluorobutyric acid
- ion exchange resin
- nickel
- polyphenyl ether
- sodium chloride
- sodium fluoride
- stearic acid (octadecanoic acid)
- sulfuric acid

These chemicals were identified in site-level documents and through interviews with individuals possessing knowledge of historical and present operations within the ETTP boundaries.

A summary of these chemicals, including common analysis types and comparative analytical criteria, is included in Attachment 2. Comparative criteria include regional screening levels, Safe Drinking Water Act of 1974 standards, and ambient water quality criteria. As some of these chemicals do not have comparative criteria, Table 1 summarizes those that do.

Table 1. Summary of Appendix I-5 chemicals with comparative criteria

Chemical	Regional screening level	Drinking water standard	Ambient water quality criteria
Acetone	Yes	No	No
Aluminum	Yes	No	Yes
Copper	Yes	Yes	Yes
Fluorine	Yes	Yes	Yes
Nickel	Yes	Yes	Yes
Sodium chloride	Yes	No	No
Sodium fluoride	Yes	No	Yes
Sulfuric acid	Yes	No	No

Attachment 3 summarizes characterization data (approximately last 10 years) for all chemicals with comparative criteria, showing the minimum, average, maximum, and 95% upper confidence limit (UCL95) data and indicating any exceedances. Note that only chemicals with characterization data are evaluated against the comparative criteria in Attachment 3. While some of the maximum concentrations exceed the comparative criteria, none of the UCL95 data do. All these chemicals either are being addressed in the environmental restoration effort or are not of concern. This information has been discussed with the Tennessee Department of Environment and Conservation and the U.S. Environmental Protection Agency, and completion documents will indicate the requirements of Appendix I-5 have been met.

ATTACHMENT 1
APPENDIX I-5 (OPERABLE UNIT INFORMATION ASSESSMENT OPERATING INSTRUCTIONS) TO THE *FEDERAL FACILITY AGREEMENT FOR THE OAK RIDGE RESERVATION* (DOE/OR-1014)

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I-5. OPERABLE UNIT INFORMATION ASSESSMENT OPERATING INSTRUCTIONS[1]

In order to document the process by which all classified information is identified and handled on the Oak Ridge Reservation and to insure the Federal Facility Agreement (FFA) parties of the completeness of the information used for the development of the Record of Decision, a Operable Unit Information Assessment document will be developed as a secondary document for each operable unit (OU). This document will, in some cases, contain classified information and in all cases be developed for every OU (excluding Interim RODs for OUs completed prior to October 30, 1993).

The OU activities are as follows:

I. REQUIREMENTS

Upon approval of this operating instruction or the initiation of CERCLA activities at an OU, the OU project manager will make the project team aware of the requirement for the generation of the Operable Unit Information Assessment document that contains, as a minimum, the following information:

A. Selection Process and Criteria

1. An explanation of the process used to identify all related OU information: classified and unclassified. This includes the project team involved in the information search, how interviewees were identified, where literature searches were performed, etc.

2. An explanation of the process used by the project team to identify and select the relevant OU information to be used to support the activities leading to the Record of Decision (ROD).

B. Classified Document/Material list

1. The project team will perform interviews of any individuals with knowledge of historical and present operations within the boundaries of the OU. The person(s) and nature of all interviews will be recorded for potential use at the Remedial Investigation (RI) scoping workshop or at routine project working meetings. Any classified interviews will be included in the Operable Unit Information Assessment document list.

2. The project team will perform an exhaustive literature search for documents/materials related to the OU. All classified and unclassified documents/materials containing information related to the OU will be identified in the Operable Unit Information Assessment document list. All information determined to be pertinent is to be identified for potential use at the RI scoping workshop.

C. Relevance of the Classified Information to CERCLA

1. Provide rationale for any item in the Operable Unit Information Assessment document list (see I.B.) determined to be unnecessary or irrelevant to the performance of the OU Remedial Investigation/Feasibility Study activities. For classified compounds of concern eliminated from consideration, provide detailed information, including

[1]Amended June 23, 1994, FFA-PM/94-008

analytical analysis processes and the pathway screening steps (including location(s), potential for release, quantities, material accountability procedures, and applicable references/interviewees) followed to support removal of the compound as a concern to the environment.

2. For relevant classified compounds of concern in the Operable Unit Information Assessment document, identified during the C.1 screening process, provide detailed information including analytical analysis processes and the pathway screening steps (including location(s), potential for release, quantities, material accountability procedures, and applicable references/interviewees) followed to support the CERCLA required objectives.

3. For any item in the Operable Unit Information Assessment document list determined to be necessary and relevant to the CERCLA activities performed at the OU, provide an explanation of how this classified information will be addressed in the documents generated and whether a sanitized version or an abstracted version of the primary documents will be provided for unclassified review purposes.

4. Relevant information from classified sources used in FFA primary or secondary documents will comply with the Referencing Classified Documents Operating Instructions.

II. IMPLEMENTATION

A. For new OU activities (prior to RI scoping workshop), the unclassified documentation generated in the performance of steps I.A. and I.B. above will be provided to the FFA parties prior to the workshop along with the environmental monitoring data summary as required in step 2 of the Remedial Investigation Scoping Workshop Operating Instructions. During the RI scoping workshop, the classified information in the Operable Unit Information Assessment document will be made available, at an appropriate location, to those personnel with the proper clearance level and determined to have a 'need to know'. The Operable Unit Information Assessment document will be maintained and updated until the signing of the ROD.

B. For OUs past the RI scoping workshop phase, the Operable Unit Information Assessment document will be developed, in accordance with the requirements in I. above pertaining to classified information, and will be maintained and updated until the signing of the ROD.

III. AVAILABILITY

A. The maintained Operable Unit Information Assessment document for each OU will be available at the site upon request by the FFA parties' staff with appropriate level of clearance. The Operable Unit Information Assessment document will be incorporated into the OU Administrative Record file.

ATTACHMENT 2
SUMMARY OF APPENDIX I-5 CHEMICALS, ANALYSIS TYPE, AND AVAILABLE COMPARATIVE CRITERIA

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Attachment 2. Summary of Appendix I-5 chemicals, analysis type, and available comparative criteria

Chemical	Direct analysis	Indirect analysis	Optional analysis	Comments	Comparative criteria		
					Regional Screening Level	Drinking water standard	Ambient Water Quality Criteria
Acetone	Volatiles			The current analysis was performed for volatiles by SW-846 8260.	Yes	No	No
Aluminum	Metals			The current analysis was performed for metals by SW-846 6010 or 6020.	Yes	No	Yes
Calcium acetate		Calcium	Acetate by ion chromatography	This chemical is very hygroscopic, very soluble in water (374 g/L), hydrates rapidly, becomes calcium acetate monohydrate, and then dissolves.	No	No	No
Calcium acetate monohydrate		Calcium	Acetate by ion chromatography	This solid is the most common form of calcium and is readily soluble in water. The current analysis for calcium is performed by SW-846 6010 or 6020. Acetate could be analyzed by ion chromatography (organic acids) using a common analytical method. The analysis is similar to EPA 300.0 but uses a different column and mobile phase.	No	No	No
Calcium fluoride		Calcium/fluoride		This solid is slightly soluble in water (0.015 g/L). The anion (fluoride) could be an indicator of calcium fluoride. Fluoride is typically analyzed by EPA 300 or SW-846 9056 (ion chromatography) or ion selective electrode.	No	No	No
Calcium formate		Calcium	Formate by ion chromatography	This solid is readily soluble in water (16 g/L). Formate could be analyzed by ion chromatography (organic acids) using a common analytical method. The analysis is similar to EPA 300.0 but uses a different column and mobile phase.	No	No	No
Calcium hydroxide		Calcium/pH		This is a relatively insoluble solid unless the pH is very low. It is not expected to be present in water and it may be associated with soils or clays. It can also be referred to as hydrated lime.	No	No	No

Attachment 2. Summary of Appendix I-5 chemicals, analysis type, and available comparative criteria (cont.)

Chemical	Direct analysis	Indirect analysis	Optional analysis	Comments	Comparative criteria		
					Regional Screening Level	Drinking water standard	Ambient Water Quality Criteria
Calcium perfluorobutyrate	EPA Method 537.1			The anion is a PFAS chemical—perfluorobutanoate—that can be analyzed using current EPA methodology. It is not possible to distinguish between a salt or the acid form, and it is reported as the acid form—perfluorobutanoic acid (PFBA, CAS 375-22-4).	No	No	No
Cellulose acetate				The acetate is derived from degradation, which is relatively slow. This solid is insoluble in water, but is readily biodegradable. It is not expected to be present in any measurable quantity in surface water or groundwater.	No	No	No
Chlorine trifluoride		Chloride/fluoride		This highly reactive gas is not expected to be present in groundwater, surface water, or soil. Chloride and fluoride anions would result from reactions, which can be picked up by EPA 300.0 or SW-846 9056 (ion chromatography).	No	No	No
Copper	Metals			The current analysis was performed for metals by SW-846 6010 or 6020.	Yes	Yes	Yes
Demineralized water				A non-issue because it is water.	No	No	No
Epoxylite resin				This solid is not expected to be soluble in water. It is more likely associated with soils or clays and more likely to adhere to soil or other solids. The SDSs are for concentrates.	No	No	No
Fluorine		Fluoride		This highly reactive gas is not expected to be present in groundwater, surface water, or soil. Fluoride anions and possibly elevated pH would result from reactions.	Yes	Yes	Yes
Glacial acetic acid		pH	Acetate by ion chromatography	This acid will ionize and leave acetate. Acetate could be analyzed by ion chromatography (organic acids) using a common analytical method. The analysis is similar to EPA 300.0 but uses a different column and mobile phase.	No	No	No
Hydrated lime		Calcium		This is another name for calcium hydroxide.	No	No	No

Attachment 2. Summary of Appendix I-5 chemicals, analysis type, and available comparative criteria (cont.)

Chemical	Direct analysis	Indirect analysis	Optional analysis	Comments	Comparative criteria		
					Regional Screening Level	Drinking water standard	Ambient Water Quality Criteria
Hydrochloric acid		Chloride/pH		This acid is highly reactive and is not expected to be present in groundwater, surface water, or soil. Chloride anions and possibly elevated pH, in water, would result from reactions.	No	No	No
Hydrofluoric acid – anhydrous		Fluoride/pH		This acid is highly reactive (anhydrous or otherwise) and is not expected to be present in groundwater, surface water, or soil. Fluoride anions and possibly elevated pH, in water, would result from reactions.	No	No	No
Hydrogen perfluorobutyric acid	EPA Method 537.1			This is a listed PFAS chemical—perfluorobutanoic acid (PFBA, CAS 375-22-4)—that can be analyzed using current EPA methodology. It is not possible to distinguish between a salt or the acid form.	No	No	No
Ion exchange resin				This solid is not expected to be soluble in water. It is more likely to be associated with soils or clays.	No	No	No
Nickel	Metals			The current analysis was performed for metals by SW-846 6010 or 6020.	Yes	Yes	Yes
Polyphenyl ether				This chemical is included in a class of compounds with low water solubility; some are solids. It is not particularly susceptible to degradation and has an extremely high radiation resistance. It is not likely to be in water at significant levels and is more likely to be associated with soils or solid surfaces. It has high viscosity due to high surface tension and may show up in oil and grease analysis if the concentration is high enough.	No	No	No
Sodium chloride		Sodium/chloride		This solid readily dissolves in water. The anion (chloride) could be an indicator of sodium chloride. Chloride is typically analyzed by EPA 300 or SW-846 9056 (ion chromatography).	Yes	No	No

Attachment 2. Summary of Appendix I-5 chemicals, analysis type, and available comparative criteria (cont.)

Chemical	Direct analysis	Indirect analysis	Optional analysis	Comments	Comparative criteria		
					Regional Screening Level	Drinking water standard	Ambient Water Quality Criteria
Sodium fluoride		Sodium/fluoride		This solid readily dissolves in water. The anion (fluoride) could be an indicator of sodium fluoride. Fluoride is typically analyzed by EPA 300 or SW-846 9056 (ion chromatography) or ion selective electrode.	Yes	No	Yes
Stearic acid (octadecanoic acid)			HPLC	Commonly found in fats from plants and animals, this is one of the most common long-chain fatty acids. Sodium and calcium salts are common releasing agents for plastics. It can be analyzed by HPLC and there is no standard EPA method; however, industry methods are available.	No	No	No
Sulfuric acid		Sulfate/pH		This is a reactive acid. The anion (sulfate) and pH could be indicators of this potential source. Sulfate is typically analyzed by EPA 300 or SW-846 9056 (ion chromatography).	Yes	No	No

CAS = Chemical Abstracts Service
EPA = U.S. Environmental Protection Agency
HPLC = high-performance liquid chromatography
PFAS = per- and polyfluorinated alkyl substances
PFBA = perfluorobutanoic acid
SDS = Safety Data Sheet

ATTACHMENT 3
APPENDIX I-5 CHARACTERIZATION DATA SUMMARY

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Attachment 3 Table 1. Characterization data and comparative Appendix I-5 criteria evaluation

Media type	Chemical	Analysis type/method			Characterization data						Comparative criteria										
											RSLs and exceedances		DWS and exceedances		AWQC and exceedances						
		Direct	Indirect	Optional	Number of samples	Minimum	Maximum	Average	UCL95	Units	Screening level	Number of screening exceedances	TDEC DWS	Number of TDEC DWS exceedances	TN WQC REC-WO	Number of WQC REC-WO exceedances	TN WQC REC-OO	Number of WQC REC-OO exceedances	TN WQC FAL-CMC	Number of TN WQC FAL-CMC exceedances	TN WQC FAL-CCC	Number of TN WQC FAL-CCC exceedances
WS	Acetone	Volatiles			273	1.5	100	7.04	8.82	µg/L	83300											
WS	Aluminum	Metals			454	3	57200	578.51	1189.00	µg/L	92400								750	68	87	310
WS	Copper	Metals			536	0.16	87.2	4.44	5.63	µg/L	3700		1300									
WS	Fluorine		Fluoride		99	30	500	326.61	407.50	µg/L	3700		4000									
WS	Nickel	Metals			536	0.4	941	8.68	15.38	µg/L	1770		100	5	610		4600	2	470	2	52	6
WG	Acetone	Volatiles			1885	1.5	69000	101.61	266.60	µg/L	83300											
WG	Aluminum	Metals			1549	19.3	200000	1454.57	4714.00	µg/L	92400	2										
WG	Copper	Metals			1554	0.3	2800	14.57	49.03	µg/L	3700		1300	3								
WG	Fluorine		Fluoride		431	30	3100	472.13	552.40	µg/L	3700		4000									
WG	Nickel	Metals			1554	0.6	1840	34.57	67.09	µg/L	1770	1	100	101								
SO	Acetone	Volatiles			163	0.0016	190	1.21	6.29	mg/kg	1050000											
SO	Aluminum	Metals			372	842	69200	12259.60	13765.00	mg/kg	1120000											
SO	Copper	Metals			374	2.28	37600	151.13	594.60	mg/kg	46700											
SO	Nickel	Metals			374	3.48	1180	25.59	41.62	mg/kg	22400											
SE	Aluminum	Metals			8	3000	17600	10042.50		mg/kg	1120000											
SE	Copper	Metals			13	11	222	59.06		mg/kg	46700											
SE	Nickel	Metals			13	9.05	220	69.90		mg/kg	22400											

No data available

Calcium acetate	Calcium	Acetate by ion chromatography
Calcium acetate monohydrate	Calcium	Acetate by ion chromatography
Calcium fluoride	Calcium/Fluoride	
Calcium formate	Calcium	Formate by ion chromatography
Calcium hydroxide	Calcium/pH	
Calcium perfluorobutyrate	PFAS by EPA 537.1	
Chlorine trifluoride	Calcium/Fluoride	
Cellulose acetate		
Demineralized water		
Epoxylite resin		
Glacial acetic acid	pH	Acetate by ion chromatography
Hydrated lime	Calcium	
Hydrochloric acid	Chloride/pH	
Hydrofluoric acid - anhydrous	Fluoride/pH	
Hydrogen perfluorobutyric acid	PFAS by EPA 537.1	
Ion exchange resin		
Polyphenyl ether		
Sodium chloride	Sodium/Chloride	
Sodium fluoride	Sodium/Fluoride	
Stearic acid		HPLC
Sulfuric acid	Sulfate/pH	

Notes:

(1) Oak Ridge Environmental Information System (OREIS) data downloaded on 03/11/2020. Data used for comparison above have "Collection Date" > 06/01/2011. Samples identified in OREIS as excavated were not used. Only records with "Sample Type" = REG were used. Soil depths are < 10 ft for soils.

(2) Minimum, maximum, and average were calculated with detects only.

(3) Fluoride data and its applicable screening level were used for the fluorine comparison in water. No fluoride data were available for soils/sediment.

(4) The screening levels listed are derived from the composite worker scenario for soil (RSLs) and the indoor worker scenario for water (RSLs). See Attachment 3 Tables 2 through 5.

(5) Aluminum WQC values are 1988 federal levels-based (pH 6.5 to 9.0, across all total hardness and dissolved organic carbon ranges).

AWQC = Ambient Water Quality Criteria
DWS = drinking water standard
EPA = U.S. Environmental Protection Agency
HPLC = high-performance liquid chromatography
PFAS = per- and polyfluorinated alkyl substances
RSL = Regional Screening Level
SE = sediment
SO = soil
TDEC DWS = TDEC Chapter 0400-40-03-.03, Criteria for Water Uses. Criterion is for domestic water supply
TN WQC FAL-CCC = Tennessee water quality criteria for use of fish and aquatic life-criterion continuous concentration
TN WQC FAL-CMC = Tennessee water quality criteria for use of fish and aquatic life-criterion maximum concentration
TN WQC REC-OO = Tennessee water quality criteria for use in recreation-organisms only
TN WQC REC-WO = Tennessee water quality criteria for use in recreation-water and organisms
UCL95 = 95% upper confidence limit as derived using EPA's ProUCL software, version 5.1
WG = groundwater
WS = surface water

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Attachment 3 Table 2. Default indoor worker risk-based RSLs for tap water
January 2022, https://rais.ornl.gov/cgi-bin/prg/PRG_search?select=chem

Chemical	CAS number	Chronic RfD (mg/kg-day)	RfD reference	Noncancer-adult absorbed dose per event (µg/cm^2-event)	Ingestion RSL HQ=1 (µg/L)	Dermal RSL HQ=1 (µg/L)	Noncarcinogenic RSL HI=1 (µg/L)
Acetone	67-64-1	9.00E-01	IRIS (current)	5.35E+00	8.41E+04	9.05E+06	8.33E+04
Aluminum	7429-90-5	1.00E+00	PPRTV (current)	5.94E+00	9.34E+04	8.37E+06	9.24E+04
Copper	7440-50-8	4.00E-02	HEAST (current)	2.38E-01	3.74E+03	3.35E+05	3.70E+03
Fluoride	16984-48-8	4.00E-02	Cal EPA (current)	2.38E-01	3.74E+03	3.35E+05	3.70E+03
Nickel soluble salts	7440-02-0	2.00E-02	IRIS (current)	4.75E-03	1.87E+03	3.35E+04	1.77E+03

CAS = Chemical Abstracts Service
Cal EPA = California Environmental Protection Agency
HEAST = Health Effects Assessment Summary Table
HI = hazard index
HQ = hazard quotient
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer-Reviewed Toxicity Value
RfD = reference dose
RSL = Regional Screening Level

Attachment 3 Table 3. Default indoor worker tap water inputs
January 2022, https://rais.ornl.gov/cgi-bin/prg/PRG_search?select=chem

Variable	Value
ED_{iw} (exposure duration - indoor worker), year	25
THQ (target hazard quotient), unitless	1
LT (lifetime - indoor worker), year	70
EF_{iw} (exposure frequency - indoor worker), day/year	250
ET_{iw} (exposure time - indoor worker), hr/day	8
$ET_{iw\text{-}event}$ (exposure time - indoor worker showering), hr/event	0.71
EV_{iw} (events - indoor worker), event/day	1
BW_{iw} (body weight - indoor worker), kg	80
SA_{iw} (skin surface area - indoor worker), cm^2	19652
IRW_{iw} (water intake rate - indoor worker), L/day	1.25
AT_{iw} (averaging time - indoor worker), day/year	365
TR (target cancer risk), unitless	0.00001

Attachment 3 Table 4. Default composite worker risk-based Regional Screening Levels for soil
January 2022, https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Chemical	CAS number	IUR ($\mu g/m^3)^{-1}$	IUR reference	RfD (mg/kg-day)	RfD reference	RfC (mg/m^3)	RfC reference	Carcinogenic SL TR=1E-05 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)	SL (mg/kg)
Acetone	67-64-1	-		9.00E-01	I (current)	-		-	1.05E+06	-	-	1.05E+06	1.05E+06 nc sat max
Aluminum	7429-90-5	-		1.00E+00	P (current)	5.00E-03	P	-	1.17E+06	-	2.98E+07	1.12E+06	1.12E+06 nc max
Copper	7440-50-8	-		4.00E-02	H (current)	-		-	4.67E+04	-	-	4.67E+04	4.67E+04 nc
Fluoride	16984-48-8	-		4.00E-02	C (current)	1.30E-02	C	-	4.67E+04	-	7.74E+07	4.67E+04	4.67E+04 nc
Nickel soluble salts	7440-02-0	2.60E-04	C	2.00E-02	I (current)	9.00E-05	A	6.41E+05	2.34E+04	-	5.36E+05	2.24E+04	2.24E+04 nc

Note: No oral slope factors were available to calculate ingestion or dermal SLs. The total carcinogenic SL only includes inhalation.

A = Agency for Toxic Substances and Disease Registry

C = California Environmental Protection Agency

CAS = Chemical Abstracts Service

H = Health Effects Assessment Summary Table

I = Integrated Risk Information System

IUR = inhalation unit risk

max = ceiling limit exceeded

nc = noncancer

P = Provisional Peer-Reviewed Toxicity Value

RfC = reference concentration

RfD = reference dose

sat = concentration of saturation exceeded

SL = screening level

THQ = target hazard quotient

THI = target hazard index

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Attachment 3 Table 5. Default composite worker soil inputs

January 2022, https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Variable	Value
THQ (target hazard quotient), unitless	1
TR (target risk), unitless	0.00001
AT_w (averaging time - composite worker)	365
EF_w (exposure frequency - composite worker), day/year	250
ED_w (exposure duration - composite worker), year	25
ET_w (exposure time - composite worker), hr	8
LT (lifetime), year	70
BW_w (body weight - composite worker)	80
IRS_w (soil ingestion rate - composite worker), mg/day	100
SA_w (surface area - composite worker), cm^2/day	3527
AF_w (skin adherence factor - composite worker), mg/cm^2	0.12

Notes: Default particulate emission and volatilization factor parameters were used.

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