

US EPA ARCHIVE DOCUMENT

11.0 SULFUR COMPLEX SLUDGE

Tables 11.1 through 11.4 summarizes the risk results of sulfur complex sludge for onsite land treatment units. The pathway and media tables for the high-end risk for sulfur complex sludge treated in an onsite land treatment unit (close receptor/ long exposure duration) are presented in Tables 11.5 through 11.12. Results for offsite land treatment units are summarized in Tables 11.13 through 11.16. The pathway and media tables for the high-end risk for sulfur complex sludge treated in an offsite land treatment unit (close receptor/ long exposure duration) are presented in Tables 11.17 through 11.24.

**Table 11.1. Individual Risk for Sulfur Complex Sludge Managed in Onsite Land Treatment Unit
Subsistence Fisher**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	2e-15	6e-15	4e-13	4e-10	4e-10
	Small Area	2e-15	6e-15	6e-13	7e-10	7e-10
	Met Location	2e-16	6e-16	1e-13	2e-10	2e-10
	Quantity	4e-14	1e-13	8e-12	8e-09	8e-09
	Distance to Receptor	2e-15	6e-15	7e-13	6e-10	6e-10
	Maximum Conc.	3e-15	1e-14	7e-13	2e-09	2e-09
	30 yr Exposure	5e-15	2e-14	1e-12	1e-09	1e-09
Small Area	Met Location	2e-16	6e-16	2e-13	3e-10	3e-10
	Quantity	4e-14	1e-13	1e-11	1e-08	1e-08
	Distance to Receptor	2e-15	6e-15	1e-12	1e-09	1e-09
	Maximum Conc.	3e-15	1e-14	1e-12	2e-09	2e-09
	30 yr Exposure	5e-15	2e-14	2e-12	2e-09	2e-09
Met Location	Quantity	4e-15	1e-14	3e-12	4e-09	4e-09
	Distance to Receptor	2e-16	6e-16	4e-13	3e-10	3e-10
	Maximum Conc.	3e-16	1e-15	2e-13	8e-10	8e-10
	30 yr Exposure	6e-16	2e-15	4e-13	7e-10	7e-10
Quantity	Distance to Receptor	4e-14	1e-13	2e-11	1e-08	1e-08
	Maximum Conc.	6e-14	3e-13	2e-11	3e-08	3e-08
	30 yr Exposure	1e-13	4e-13	3e-11	3e-08	3e-08
Distance to Receptor	Maximum Conc.	3e-15	1e-14	1e-12	2e-09	2e-09
	30 yr Exposure	5e-15	2e-14	2e-12	2e-09	2e-09
Maximum Conc.	30 yr Exposure	9e-15	4e-14	2e-12	5e-09	5e-09

**Table 11.2. Individual Risk for Sulfur Complex Sludge Managed in Onsite Land Treatment Unit
Subsistence Farmer**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	3e-17	2e-15	2e-13	7e-10	7e-10
	Small Area	3e-17	2e-15	2e-13	7e-10	7e-10
	Met Location	4e-17	3e-15	2e-13	6e-10	6e-10
	Quantity	6e-16	3e-14	3e-12	1e-08	1e-08
	Distance to Receptor	1e-16	7e-15	6e-13	1e-09	1e-09
	Maximum Conc.	4e-17	3e-15	3e-13	2e-09	2e-09
	30 yr Exposure	1e-16	7e-15	7e-13	3e-09	3e-09
Small Area	Met Location	5e-17	3e-15	2e-13	7e-10	7e-10
	Quantity	7e-16	4e-14	4e-12	1e-08	1e-08
	Distance to Receptor	2e-16	1e-14	9e-13	2e-09	2e-09
	Maximum Conc.	5e-17	4e-15	3e-13	2e-09	2e-09
	30 yr Exposure	1e-16	8e-15	8e-13	3e-09	3e-09
Met Location	Quantity	9e-16	6e-14	4e-12	1e-08	1e-08
	Distance to Receptor	2e-16	1e-14	7e-13	2e-09	2e-09
	Maximum Conc.	6e-17	5e-15	3e-13	2e-09	2e-09
	30 yr Exposure	2e-16	1e-14	8e-13	3e-09	3e-09
Quantity	Distance to Receptor	3e-15	2e-13	1e-11	2e-08	2e-08
	Maximum Conc.	1e-15	7e-14	6e-12	4e-08	4e-08
	30 yr Exposure	3e-15	2e-13	1e-11	6e-08	6e-08
Distance to Receptor	Maximum Conc.	2e-16	2e-14	1e-12	4e-09	4e-09
	30 yr Exposure	6e-16	3e-14	3e-12	5e-09	5e-09
Maximum Conc.	30 yr Exposure	2e-16	1e-14	1e-12	1e-08	1e-08

**Table 11.3. Individual Risk for Sulfur Complex Sludge Managed in Onsite Land Treatment Unit
Home Gardener**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	9e-18	6e-16	6e-13	2e-09	2e-09
	Small Area	1e-17	7e-16	1e-12	2e-09	2e-09
	Met Location	1e-17	8e-16	2e-13	8e-10	8e-10
	Quantity	2e-16	1e-14	1e-11	3e-08	3e-08
	Distance to Receptor	4e-17	2e-15	1e-12	2e-09	2e-09
	Maximum Conc.	1e-17	1e-15	1e-12	5e-09	5e-09
	30 yr Exposure	3e-17	2e-15	2e-12	5e-09	5e-09
Small Area	Met Location	1e-17	9e-16	3e-13	1e-09	1e-09
	Quantity	2e-16	2e-14	2e-11	4e-08	4e-08
	Distance to Receptor	6e-17	4e-15	2e-12	4e-09	4e-09
	Maximum Conc.	2e-17	1e-15	2e-12	8e-09	8e-09
	30 yr Exposure	3e-17	2e-15	3e-12	8e-09	8e-09
Met Location	Quantity	3e-16	2e-14	5e-12	2e-08	2e-08
	Distance to Receptor	5e-17	3e-15	7e-13	1e-09	1e-09
	Maximum Conc.	2e-17	2e-15	4e-13	3e-09	3e-09
	30 yr Exposure	4e-17	3e-15	7e-13	3e-09	3e-09
Quantity	Distance to Receptor	9e-16	5e-14	3e-11	4e-08	4e-08
	Maximum Conc.	3e-16	3e-14	3e-11	1e-07	1e-07
	30 yr Exposure	6e-16	4e-14	5e-11	1e-07	1e-07
Distance to Receptor	Maximum Conc.	6e-17	5e-15	2e-12	8e-09	8e-09
	30 yr Exposure	1e-16	8e-15	4e-12	8e-09	8e-09
Maximum Conc.	30 yr Exposure	5e-17	4e-15	4e-12	2e-08	2e-08

**Table 11.4. Individual Risk for Sulfur Complex Sludge Managed in Onsite Land Treatment Unit
Adult Resident**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	4e-20	2e-18	4e-13	4e-10	4e-10
	Small Area	4e-20	2e-18	5e-13	6e-10	6e-10
	Met Location	5e-20	2e-18	1e-13	2e-10	2e-10
	Quantity	8e-19	3e-17	8e-12	8e-09	8e-09
	Distance to Receptor	2e-19	6e-18	7e-13	6e-10	6e-10
	Maximum Conc.	6e-20	3e-18	7e-13	1e-09	1e-09
	30 yr Exposure	1e-19	5e-18	1e-12	1e-09	1e-09
Small Area	Met Location	6e-20	2e-18	2e-13	3e-10	3e-10
	Quantity	9e-19	4e-17	1e-11	1e-08	1e-08
	Distance to Receptor	3e-19	1e-17	1e-12	1e-09	1e-09
	Maximum Conc.	7e-20	4e-18	1e-12	2e-09	2e-09
	30 yr Exposure	1e-19	6e-18	2e-12	2e-09	2e-09
Met Location	Quantity	1e-18	5e-17	3e-12	4e-09	4e-09
	Distance to Receptor	2e-19	8e-18	4e-13	3e-10	3e-10
	Maximum Conc.	8e-20	4e-18	2e-13	7e-10	7e-10
	30 yr Exposure	2e-19	7e-18	4e-13	7e-10	7e-10
Quantity	Distance to Receptor	4e-18	1e-16	1e-11	1e-08	1e-08
	Maximum Conc.	1e-18	7e-17	1e-11	3e-08	3e-08
	30 yr Exposure	3e-18	1e-16	3e-11	3e-08	3e-08
Distance to Receptor	Maximum Conc.	3e-19	1e-17	1e-12	2e-09	2e-09
	30 yr Exposure	6e-19	2e-17	2e-12	2e-09	2e-09
Maximum Conc.	30 yr Exposure	2e-19	1e-17	2e-12	5e-09	5e-09

**Table 11.5. Media Concentrations for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Fisher**

Constituent	CAS	Soil Conc. (mg/kg)	Fish Conc. (mg/kg)	Combined Air Conc. (ug/m3)
Benzene	71432	1.59e-10	1.16e-08	5.80e-06
Isophorone	78591	2.04e-07	1.22e-06	1.59e-05
Chrysene	2e+05	1.40e-03	5.95e-08	2.36e-06
Arsenic	7440382	2.92e-02	4.30e-06	4.37e-07

**Table 11.6. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Fisher**

Constituent	CAS	Soil Ingestion	Fish Ingestion	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	3e-18	1e-13	2e-11	2e-11
Isophorone	78591	1e-16	4e-13	NA	4e-13
Chrysene	2e+05	3e-11	7e-13	NA	3e-11
Arsenic	7e+06	3e-08	2e-09	8e-10	3e-08
				Total Risk	3e-08

**Table 11.7. Media Concentrations for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Farmer**

Constituent	CAS	Soil Conc. (mg/kg)	Above-ground Veg Conc. (mg/kg)	Below-ground Veg Conc. (mg/kg)	Beef Conc. (mg/kg)	Milk Conc. (mg/kg)	Air Conc. (ug/m3)
Benzene	71432	2.10e-10	5.23e-10	6.16e-11	1.42e-13	6.88e-14	5.80e-06
Isophorone	78591	2.19e-07	8.90e-07	1.14e-07	2.13e-11	1.10e-11	1.59e-05
Chrysene	218-01-9	3.78e-05	1.16e-06	1.16e-06	NA	NA	2.36e-06
Arsenic	7440382	1.47e-03	5.36e-05	4.05e-09	4.58e-06	1.84e-05	4.37e-07

**Table 11.8. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Farmer**

Constituent	CAS	Soil Ingestion	Fruit and Vegetable Ingestion	Below-ground Vegetable Ingestion	Beef Ingestion	Milk Ingestion	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	5e-18	2e-15	4e-16	2e-18	3e-18	3e-11	3e-11
Isophorone	78591	2e-16	1e-13	2e-14	9e-18	1e-17	NA	2e-13
Chrysene	218019	9e-13	6e-12	8e-12	NA	NA	NA	1e-11
Arsenic	7e+06	2e-09	1e-08	1e-12	3e-09	4e-08	1e-09	6e-08
							Total Risk	6e-08

**Table 11.9. Media Concentrations for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Home Gardener**

Constituent	CAS	Soil Conc. (mg/kg)	Above-ground Veg Conc. (mg/kg)	Below-ground Veg Conc. (mg/kg)	Air Conc. (ug/m3)
Benzene	71432	1.59e-10	4.09e-10	4.68e-11	5.80e-06
Isophorone	78591	2.04e-07	8.07e-07	1.04e-07	1.59e-05
Chrysene	218019	1.40e-03	4.21e-06	6.30e-06	2.36e-06
Arsenic	7440382	2.92e-02	1.05e-03	8.05e-08	4.37e-07

**Table 11.10. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Home Gardener**

Constituent	CAS	Soil Ingestion	Fruit and Vegetable Ingestion Home Gardener	Below-ground Vegetable Ingestion Home Gardener	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	3e-18	5e-16	9e-17	2e-11	2e-11
Isophorone	78591	1e-16	4e-14	6e-15	NA	4e-14
Chrysene	218019	3e-11	6e-12	1e-11	NA	5e-11
Arsenic	7e+06	3e-08	7e-08	8e-12	8e-10	1e-07
					Total Risk	1e-07

**Table 11.11. Media Concentrations for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Adult Resident**

Constituent	CAS	Soil Conc. (mg/kg)	Air Conc. (ug/m3)
Benzene	71432	1.59e-10	5.80e-06
Isophorone	78591	2.04e-07	1.59e-05
Chrysene	2e+05	1.40e-03	2.36e-06
Arsenic	7440382	2.92e-02	4.37e-07

**Table 11.12. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an
Onsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Adult Resident**

Constituent	CAS	Soil Ingestion	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	3e-18	2e-11	2e-11
Isophorone	78591	1e-16	NA	1e-16
Chrysene	218019	3e-11	NA	3e-11
Arsenic	7440382	3e-08	8e-10	3e-08
			Total Risk	3e-08

**Table 11.13. Individual Risk for Sulfur Complex Sludge Managed in Offsite Land Treatment Unit
Subsistence Fisher**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	7e-15	2e-14	8e-13	9e-10	9e-10
	Small Area	7e-15	2e-14	4e-12	4e-09	4e-09
	Met Location	9e-16	3e-15	3e-13	4e-10	4e-10
	Quantity	1e-14	4e-14	1e-12	2e-09	2e-09
	Distance to Receptor	7e-15	2e-14	1e-12	9e-10	9e-10
	Maximum Conc.	1e-14	5e-14	1e-12	3e-09	3e-09
	30 yr Exposure	2e-14	8e-14	3e-12	3e-09	3e-09
Small Area	Met Location	9e-16	3e-15	9e-13	2e-09	2e-09
	Quantity	1e-14	4e-14	6e-12	6e-09	6e-09
	Distance to Receptor	7e-15	2e-14	8e-12	7e-09	7e-09
	Maximum Conc.	1e-14	5e-14	7e-12	1e-08	1e-08
	30 yr Exposure	2e-14	8e-14	1e-11	1e-08	1e-08
Met Location	Quantity	2e-15	5e-15	5e-13	7e-10	7e-10
	Distance to Receptor	9e-16	3e-15	6e-13	4e-10	4e-10
	Maximum Conc.	1e-15	6e-15	6e-13	1e-09	1e-09
	30 yr Exposure	3e-15	9e-15	1e-12	1e-09	1e-09
Quantity	Distance to Receptor	1e-14	4e-14	2e-12	2e-09	2e-09
	Maximum Conc.	2e-14	9e-14	3e-12	6e-09	6e-09
	30 yr Exposure	4e-14	1e-13	5e-12	5e-09	5e-09
Distance to Receptor	Maximum Conc.	1e-14	5e-14	2e-12	3e-09	3e-09
	30 yr Exposure	2e-14	8e-14	3e-12	3e-09	3e-09
Maximum Conc.	30 yr Exposure	4e-14	2e-13	5e-12	1e-08	1e-08

**Table 11.14. Individual Risk for Sulfur Complex Sludge Managed in Offsite Land Treatment Unit
Subsistence Farmer**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	8e-17	5e-15	5e-13	3e-09	3e-09
	Small Area	2e-16	9e-15	8e-13	3e-09	3e-09
	Met Location	1e-16	7e-15	5e-13	2e-09	2e-09
	Quantity	2e-16	9e-15	9e-13	5e-09	5e-09
	Distance to Receptor	3e-16	1e-14	1e-12	4e-09	4e-09
	Maximum Conc.	1e-16	1e-14	9e-13	9e-09	9e-09
	30 yr Exposure	4e-16	2e-14	2e-12	1e-08	1e-08
Small Area	Met Location	2e-16	2e-14	1e-12	3e-09	3e-09
	Quantity	3e-16	2e-14	1e-12	4e-09	4e-09
	Distance to Receptor	1e-15	7e-14	6e-12	8e-09	8e-09
	Maximum Conc.	3e-16	2e-14	2e-12	9e-09	9e-09
	30 yr Exposure	7e-16	4e-14	4e-12	1e-08	1e-08
Met Location	Quantity	2e-16	1e-14	9e-13	4e-09	4e-09
	Distance to Receptor	3e-16	2e-14	1e-12	4e-09	4e-09
	Maximum Conc.	2e-16	1e-14	9e-13	7e-09	7e-09
	30 yr Exposure	5e-16	3e-14	2e-12	9e-09	9e-09
Quantity	Distance to Receptor	5e-16	3e-14	2e-12	7e-09	7e-09
	Maximum Conc.	2e-16	2e-14	2e-12	2e-08	2e-08
	30 yr Exposure	7e-16	4e-14	4e-12	2e-08	2e-08
Distance to Receptor	Maximum Conc.	4e-16	3e-14	2e-12	1e-08	1e-08
	30 yr Exposure	1e-15	6e-14	6e-12	2e-08	2e-08
Maximum Conc.	30 yr Exposure	6e-16	4e-14	4e-12	4e-08	4e-08

**Table 11.15. Individual Risk for Sulfur Complex Sludge Managed in Offsite Land Treatment Unit
Home Gardener**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	3e-17	2e-15	1e-12	3e-09	3e-09
	Small Area	5e-17	4e-15	6e-12	1e-08	1e-08
	Met Location	3e-17	2e-15	5e-13	1e-09	1e-09
	Quantity	5e-17	3e-15	2e-12	5e-09	5e-09
	Distance to Receptor	8e-17	4e-15	2e-12	3e-09	3e-09
	Maximum Conc.	4e-17	3e-15	2e-12	1e-08	1e-08
	30 yr Exposure	9e-17	5e-15	4e-12	9e-09	9e-09
Small Area	Met Location	7e-17	5e-15	2e-12	8e-09	8e-09
	Quantity	1e-16	7e-15	1e-11	2e-08	2e-08
	Distance to Receptor	4e-16	2e-14	1e-11	3e-08	3e-08
	Maximum Conc.	9e-17	8e-15	1e-11	5e-08	5e-08
	30 yr Exposure	2e-16	1e-14	2e-11	5e-08	5e-08
Met Location	Quantity	6e-17	4e-15	9e-13	3e-09	3e-09
	Distance to Receptor	8e-17	5e-15	1e-12	2e-09	2e-09
	Maximum Conc.	5e-17	4e-15	1e-12	5e-09	5e-09
	30 yr Exposure	1e-16	7e-15	2e-12	5e-09	5e-09
Quantity	Distance to Receptor	1e-16	8e-15	3e-12	5e-09	5e-09
	Maximum Conc.	8e-17	6e-15	4e-12	2e-08	2e-08
	30 yr Exposure	2e-16	1e-14	8e-12	2e-08	2e-08
Distance to Receptor	Maximum Conc.	1e-16	9e-15	3e-12	1e-08	1e-08
	30 yr Exposure	3e-16	1e-14	6e-12	9e-09	9e-09
Maximum Conc.	30 yr Exposure	1e-16	1e-14	8e-12	3e-08	3e-08

**Table 11.16. Individual Risk for Sulfur Complex Sludge Managed in Offsite Land Treatment Unit
Adult Resident**

High End Parameters	High End Parameters	Benzene	Isophorone	Chrysene	Arsenic	Total Carcinogen Risk
None	Central Tendency	1e-19	4e-18	7e-13	7e-10	7e-10
	Small Area	2e-19	1e-17	4e-12	4e-09	4e-09
	Met Location	1e-19	5e-18	3e-13	4e-10	4e-10
	Quantity	2e-19	8e-18	1e-12	1e-09	1e-09
	Distance to Receptor	3e-19	1e-17	1e-12	7e-10	7e-10
	Maximum Conc.	2e-19	9e-18	1e-12	3e-09	3e-09
	30 yr Exposure	4e-19	1e-17	2e-12	2e-09	2e-09
Small Area	Met Location	3e-19	1e-17	9e-13	2e-09	2e-09
	Quantity	4e-19	2e-17	6e-12	6e-09	6e-09
	Distance to Receptor	2e-18	6e-17	8e-12	7e-09	7e-09
	Maximum Conc.	4e-19	2e-17	7e-12	1e-08	1e-08
	30 yr Exposure	7e-19	4e-17	1e-11	1e-08	1e-08
Met Location	Quantity	2e-19	1e-17	5e-13	7e-10	7e-10
	Distance to Receptor	3e-19	1e-17	6e-13	4e-10	4e-10
	Maximum Conc.	2e-19	1e-17	5e-13	1e-09	1e-09
	30 yr Exposure	4e-19	2e-17	1e-12	1e-09	1e-09
Quantity	Distance to Receptor	6e-19	2e-17	2e-12	1e-09	1e-09
	Maximum Conc.	3e-19	2e-17	3e-12	5e-09	5e-09
	30 yr Exposure	7e-19	3e-17	4e-12	4e-09	4e-09
Distance to Receptor	Maximum Conc.	5e-19	3e-17	2e-12	3e-09	3e-09
	30 yr Exposure	1e-18	4e-17	3e-12	2e-09	2e-09
Maximum Conc.	30 yr Exposure	6e-19	3e-17	5e-12	8e-09	8e-09

**Table 11.17. Media Concentrations for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Fisher**

Constituent	CAS	Soil Conc. (mg/kg)	Fish Conc. (mg/kg)	Combined Air Conc. (ug/m3)
Benzene	71432	4.37e-11	2.33e-09	1.52e-06
Isophorone	78591	6.33e-08	2.44e-07	4.16e-06
Chrysene	218019	6.34e-04	1.27e-08	6.11e-07
Arsenic	7440382	1.40e-02	8.22e-07	1.08e-07

**Table 11.18. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Fisher**

Constituent	CAS	Soil Ingestion	Fish Ingestion	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	7e-19	2e-14	5e-12	2e-14
Isophorone	78591	4e-17	8e-14	NA	8e-14
Chrysene	218019	1e-11	1e-13	NA	1e-11
Arsenic	7440382	1e-08	4e-10	2e-10	1e-08
				Total Risk	1e-08

**Table 11.19. Media Concentrations for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Farmer**

Constituent	CAS	Soil Conc. (mg/kg)	Above-ground Veg Conc. (mg/kg)	Below-ground Veg Conc. (mg/kg)	Beef Conc. (mg/kg)	Milk Conc. (mg/kg)	Air Conc. (ug/m3)
Benzene	71432	4.62e-11	1.15e-10	1.36e-11	3.06e-14	1.48e-14	1.28e-06
Isophorone	78591	6.34e-08	2.58e-07	3.31e-08	6.14e-12	3.17e-12	4.59e-06
Chrysene	218019	1.08e-05	3.20e-07	3.31e-07	NA	NA	6.19e-07
Arsenic	7440382	1.13e-03	4.09e-05	3.11e-09	3.25e-06	1.30e-05	2.37e-07

**Table 11.20. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Subsistence Farmer**

Constituent	CAS	Soil Ingestion	Fruit and Vegetable Ingestion	Below-ground Vegetable Ingestion	Beef Ingestion	Milk Ingestion	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	1e-18	5e-16	9e-17	4e-19	6e-19	6e-12	6e-16
Isophorone	78591	5e-17	4e-14	7e-15	3e-18	4e-18	NA	4e-14
Chrysene	218019	3e-13	2e-12	2e-12	NA	NA	NA	4e-12
Arsenic	7440382	1e-09	9e-09	1e-12	2e-09	3e-08	6e-10	4e-08
							Total Risk	4e-08

**Table 11.21. Media Concentrations for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Home Gardener**

Constituent	CAS	Soil Conc. (mg/kg)	Above-ground Veg Conc. (mg/kg)	Below-ground Veg Conc. (mg/kg)	Air Conc. (ug/m3)
Benzene	71432	4.37e-11	1.12e-10	1.28e-11	1.52e-06
Isophorone	78591	6.17e-08	2.51e-07	3.22e-08	4.16e-06
Chrysene	218019	9.46e-05	1.84e-06	2.89e-06	6.11e-07
Arsenic	7440382	1.40e-02	5.02e-04	3.85e-08	1.08e-07

**Table 11.22. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Home Gardener**

Constituent	CAS	Soil Ingestion	Fruit and Vegetable Ingestion Home Gardener	Below-ground Vegetable Ingestion Home Gardener	Direct Inhalation	All Oral Pathways Combined
Benzene	71432	7e-19	2e-16	2e-17	5e-12	2e-16
Isophorone	78591	3e-17	1e-14	2e-15	NA	1e-14
Chrysene	218019	2e-12	3e-12	6e-12	NA	1e-11
Arsenic	7440382	1e-08	3e-08	4e-12	2e-10	5e-08
					Total Risk	5e-08

**Table 11.23. Media Concentrations for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Adult Resident**

Constituent	CAS	Soil Conc. (mg/kg)	Air Conc. (ug/m3)
Benzene	71432	4.37e-11	1.52e-06
Isophorone	78591	6.33e-08	4.16e-06
Chrysene	218019	6.34e-04	6.11e-07
Arsenic	7440382	1.40e-02	1.08e-07

**Table 11.24. Individual Risk by Pathway for Sulfur Complex Sludge Managed in an
Offsite Land Treatment Unit
Large Quantity/Long Exposure Duration
Adult Resident**

Constituent	CAS	Soil Ingestion	Direct Inhalation	All Pathways Combined
Benzene	71432	7e-19	5e-12	5e-12
Isophorone	78591	4e-17	NA	4e-17
Chrysene	218019	1e-11	NA	1e-11
Arsenic	7440382	1e-08	2e-10	1e-08
			Total Risk	1e-08