

Sudbury Area Risk Assessment Volume II

Appendix J:

Bioaccessibility Testing of Soil and House Dust Samples

**SUDBURY AREA RISK ASSESSMENT
VOLUME II**

**APPENDIX J: BIOACCESSIBILITY TESTING OF SOIL AND
HOUSE DUST SAMPLES**

The following appendix is composed of four distinct documents:

- The summary of bioaccessibility testing conducted on soil and house dust samples for both phases of bioaccessibility testing conducted during the Sudbury Soils Study.
- A report from Golder Associates titled “Final Draft Report for Peer Review – Bioaccessibility Testing of Soil and Dust Samples from the Sudbury Soils Study”. June 2006.
- Technical memorandum from Golder Associates on Bioaccessibility Testing of Soil and Dust Samples. February 13, 2007.
- Bioaccessibility Testing of Soil and House Dust Samples by Dr. John Drexler at the Laboratory of Environment and Geological Sciences (LEGS), University of Colorado, Boulder, Colorado. This is not a formal report. Rather it is a collection of bench sheets, data results and charts used by the SARA Group in the development of site-specific bioaccessibility values.

Refer to Chapter 3 for a detailed discussion of the bioaccessibility testing and interpretation conducted as part of the HHRA.

SUMMARY OF BIOACCESSIBILITY RESULTS													
GOLDER 2006					GOLDER 2007				DREXLER 2007				
	N	Mean	95UCLM	ProUCL recommended statistic	N	Mean	95UCLM	ProUCL recommended statistic	N	Mean	95UCLM	ProUCL recommended statistic	
<u>Gastric Bioaccessibility</u>													
SOIL													
Arsenic*	10	28.7	32.8	Student's-t	32	23.7	26.1	Student's-t	44	31	39.2	Chebyshev	
Cobalt	10	34.2	38.2	Student's-t	37	25.9	27.9	Student's-t	44	26	27.6	Student's-t	
Copper	10	62.6	72.1	Student's-t	36	49.6	53.7	Student's-t	44	69	74.25	approximate gamma	
Lead	10	60.9	68.2	Student's-t	37	62.2	65.6	Student's-t	42	69	78.4	Chebyshev	
Nickel	5	41.7	47.6	Student's-t	37	35.0	38.7	gamma UCL	44	40	43.5	Student's-t	
Selenium*	10	29.5	42.9	approximate gamma	6	7.4	12.2	Student's-t	12	15	26.2	Chebyshev	
DUST													
Arsenic					10	38.6	42.8	Student's-t	27	41	44.9	Student's-t	
Cobalt					10	28.2	32.2	Student's-t	27	28	30.3	Student's-t	
Copper					10	43.9	49.9	Student's-t	27	46	49.4	Student's-t	
Lead					8	79.1	83.2	Student's-t	27	83	94.7	Chebyshev	
Nickel					10	31.5	36.4	Student's-t	27	29	30.9	Student's-t	
Selenium*					3	23.6	NC	NC	22	43	66.8	Chebyshev	
<u>Intestinal Bioaccessibility</u>													
SOIL													
Arsenic*	72	34	41	Chebyshev	33	30.2	33.1	Student's-t					
Cobalt	72	25	27	Student's-t	37	22.9	24.5	Student's-t					
Copper	72	62	65	Student's-t	36	61.0	65.2	Student's-t					
Lead	72	14	16	Student's-t	37	14.4	15.8	gamma UCL					
Nickel	72	35	38	Chebyshev	37	34.7	38.1	Student's-t					
Selenium*	72	22	35	Chebyshev	4	21.1	32.6	Student's-t					
DUST													
Arsenic	10	2.6	3.8	Student's-t	10	40.8	45.2	Student's-t					
Cobalt	10	1.3	2.1	Student's-t	10	31.9	38.0	Student's-t					
Copper	10	3.4	4.6	Student's-t	10	57.6	67.4	Student's-t					
Lead	10	2.2	3.5	Student's-t	10	18.0	21.2	Student's-t					
Nickel	10	0.07	2	Chebyshev	10	37.1	42.7	Student's-t					
Selenium*					0		NC	NC					

RECOMMENDED BIOACCESSIBILITY VALUES			
	SARA DRAFT 1	SARA FINAL	Drexler/Brattin adjustment
	95UCL	95UCL	
SOIL			
Arsenic	41	39	
Cobalt	27	28	
Copper	65	74	
Lead	16	78	66
Nickel	38	44	
Selenium	35	26	
DUST			
Arsenic	3.8	45	
Cobalt	2.1	30	
Copper	4.6	49	
Lead	3.5	95	83
Nickel	2	31	
Selenium	100	67	