

Tables

TABLE 1
SOIL AND GROUNDWATER SAMPLING SUMMARY
 Sampling and Analysis Plan, Phase II Investigation Work Plan, SOC's 1-3 and 6-8
 Umore Mining Area
 Dakota County, Minnesota

Site of Concern & Rationale	Sampling Location ID	Target Depth ¹ (feet bgs)	Soil Sampling Plan ³									Groundwater Sampling Plan ³									Comment	
			Sample Interval ² (feet bgs)	Parameters (Number of samples)					Depth ⁸ (feet bgs)	Parameters (Number of samples)												
				VOCs ⁴	SVOCs	PPL Metals	Nitrocellulose ⁵	List 1&2 - Pest ⁶		OC-Pest ⁷	Asbestos	Arsenic	VOCs	SVOCs	PPL Metals	Nitrocellulose ⁵	List 1&2 - Pest ⁶	OC-Pest ⁷	Nitrogen ⁹	Perchlorate		
SOC#1 Former Rilraod "Y" (#6001)																						
Potential release to low areas	GP1	80	0-4	1	1	1	1	1				75	1	1	1	0	1		1		Continuous soil sample to groundwater	
	GP2	20	0-4	1	1	1	1	1														
	GP3	20	0-4	1	1	1	1	1				75	1	1	1	1	1		1		1	Soil sample to 20'; blind advance to WT
Potential surface impacts along RR tracks	SS-1A	0.5	0-0.5		1																	
	SS-1B	0.5	0-0.5		1																	
	SS-1C	0.5	0-0.5		1																	
	SS-2A	0.5	0-0.5		1																	
	SS-2B	0.5	0-0.5		1																	
	SS-2C	0.5	0-0.5		1																	
	SS-3A	0.5	0-0.5		1																	
	SS-3B	0.5	0-0.5		1																	
SS-3C	0.5	0-0.5		1																		
SOC#2 Forestry Research/Former GOW Storage																						
Former building/storage areas and observed debris	TT1	12	0-4	1	1	1	1															
	TT2	12	0-4	1	1	1	1															
	TT3	12	0-4	1	1	1	1															
	TT4	12	0-4	1	1	1	1															
	TT5	12	0-4	1	1	1	1															
	TT6	12																				
	TT7	12																				
	TT8	12																				
	TT9	12																				
	TT10	12																				
	TT11	12																				
	TT12	12																				
	TT13	12																				
	TT14	12																				
	TT15	12																				
SOC8 pile	TT15	12																				
SOC#3 Former "K" Street Dump Area and Age Engineering Complex																						
Former lagoons	TT1	12	0-4	1	1	1	1	1	1	*												
	TT2	12	0-4	1	1	1	1	1	1	*												
Buried debris	TT3	12	0-4	1	1	1	1	1	1	*												
	TT4	12	0-4	1	1	1	1	1	1	*												
	TT5	12	0-4	1	1	1	1	1	1	*												
	TT6	12	0-4	1	1	1	1	1	1	*												
	TT7	12	0-4	1	1	1	1	1	1	*												
	TT8	12	0-4	1	1	1	1	1	1	*												
	TT9	12								*												
	TT10	12								*												
	TT11	12								*												
	TT12	12								*												
	TT13	12								*												
	TT14	12								*												
	TT15	12								*												
	TT16	12								*												
Fuel AST	GP1	20	0-4	1	0	1		1	1		1											
GW Quality	GP2	55		0	0	0		0	0			50	1	1	1		1	1	1		Continuous soil sample to groundwater	
	GP3	55									1	50	1	1	1	1	1	1	1	1	Continuous soil sample to groundwater	
	GP4	20										50	1	1	1	1	1	1	1	1	Soil sample to 20'; blind advance to WT	
	WSW-207605	NA										50	1	1	1	1	1	1	1	1		
SOC#6 Southern Complex Storage Buildings and Wash Pads																						
Potential Ag. Chemical impacts	GP1	20						0	0			55					1	1	1	1	Soil sample to 20'; blind advance to WT	
	GP2	20						0	0			55					1	1	1	1	Soil sample to 20'; blind advance to WT	
	GP3	20						0	0			55					1	1	1	1	Soil sample to 20'; blind advance to WT	
	GP4	60						0	0			55					1	1	1	1	Continuous soil sample to groundwater	
	GP5	20	0-4					1	1													
	GP6	60	0-4					1	1			55					1	1	1	1	Continuous soil sample to groundwater	
	GP7	20	0-4					1	1													
	GP8	20	0-4					1	1													
SOC#7 Dairy Complex Suspected Dump Area (#5152)																						
Observed Debris	TT1	12	0-4	0	0	0																
	TT2	12	0-4	0	0	0																
	TT3	12	0-4	0	0	0																
	TT4	12	0-4	0	0	0																
	TT5	12	0-4	1	1	1																

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Site of Concern & Rationale	Sampling Location ID	Target Depth ¹ (feet bgs)	Soil Sampling Plan ³								Groundwater Sampling Plan ³								Comment		
			Sample Interval ² (feet bgs)	Parameters (Number of samples)							Depth ⁸ (feet bgs)	Parameters (Number of samples)									
				VOCs ⁴	SVOCs	PPL Metals	<i>Nitrocellulose</i> ⁵	List 1&2 - Pest ⁶	OC-Pest ⁷	Asbestos		<i>Arsenic</i>	VOCs	SVOCs	PPL Metals	<i>Nitrocellulose</i> ⁵	List 1&2 - Pest ⁶	OC-Pest ⁷		Nitrogen ⁹	<i>Perchlorate</i>
	TT6	12	0-4	0	0	0															
	TT7	12	0-4	1	1	1															
SOC#8 Undetermined Use Area West of Patrol Road (South of CR 46)																					
Stockpiles (1945)	TT1	4																			
	TT2	4																			
	TT3	4																			
	TT4	4																			
	TT5	4																			
	TT6	4																			
	TT7	4																			
Background Sampling																					
	SS1	0.5	0-0.5	0	1	1		1	1												
	SS2	0.5	0-0.5	0	1	1		1	1												
	SS3	0.5	0-0.5	0	1	1		1	1												
	SS4	0.5	0-0.5	0	1	1		1	1												
	SS5	0.5	0-0.5	0	1	1		1	1												
	MW-B1-001	NA									65	1	1	1		1	1	1	1		
	MW-E2-009	NA									60	1	1	1		1	1	1	1		
	MW-E2-209	NA									60	1	1	1		1	1	1	1		
Estimated Minimum # of Samples:				19	32	24	16	21	18	0	11		9	9	9	2	14	12	14	6	

Notes:
 1- Continuous soil sampling conducted in borings to target depth for soil description and screening purposes. Test trenches to extend 2 feet into unimpacted geologic deposit below modern soil or filled material, if possible.
 2- **Default soil sample collection depths for chemical analysis. Metals sample default will be from 2 to 6 inches below ground surface. If impacted soils are encountered an additional metals sample will be collected.**
 If contamination/debris is encountered, additional samples will be collected (if possible) as indicated in the table below:

Haz. Material Release	Impacted soil, unimpacted soil
Buried Debris	Native soil below debris

- 3 - Individual compounds and analytical methods for each parameter list are included in the Sampling and Analysis Plan (SAP)
 - 4 - VOC samples will be collected where soil exhibits evidence that VOCs are present. For example, elevated headspace, staining and strong odor.
 - 5 - **Formerly included as "Explosives." SVOC analyte list includes the following compounds considered as "Explosives": 2,4-dinitrotoluene, 2,6-dinitrotoluene and dipheylamine.**
 - 6 - List1&2-Pest - includes Minnesota Department of Agriculture Pesticides List 1 (neutral) and List 2 (acid) pesticides
 - 7 - OC-Pest - includes organochlorine pesticides listed in EPA method # 8081A
 - 8 - Approximate depth to groundwater. Actual depth to be determined in the field.
 - 9 - Nitrogen analysis include Nitrate+Nitrite (As N) and Total Kjeldahl Nitrogen (TKN)
- VOCs - Volatile organic compounds
 SVOCs - Semi-volatile organic compounds
 PPL Metals - Priority Pollutant List metals
 WT - Water table
- Bold and italics font indicates addition/revision from original WP scope**
 * indicates that a sample will be collected if potential Asbestos Containing Material is observed during test trenching

Table 2
Analytical Parameters, Methods and Reporting Limits
Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
Metals										
Antimony	7440-36-0	Soil/Solid	6010B	0.0055	0.50	mg/kg	--	2.7	12	60
Arsenic	7440-38-2	Soil/Solid	6010B	0.10	0.50	mg/kg	--	15.1	5	70
Beryllium	7440-41-7	Soil/Solid	6010B	0.011	0.25	mg/kg	--	1.4	55	600
Cadmium	7440-43-9	Soil/Solid	6010B	0.025	0.25	mg/kg	--	4.4	25	--
Chromium	7440-47-3	Soil/Solid	6010B	0.012	0.50	mg/kg	--	--	--	--
Copper	7440-50-8	Soil/Solid	6010B	0.070	1.0	mg/kg	--	400	11	3000
Lead	7439-92-1	Soil/Solid	6010B	0.034	1.0	mg/kg	--	525	300	700
Nickel	7440-02-0	Soil/Solid	6010B	0.014	0.25	mg/kg	--	88.0	560	1400
Selenium	7782-49-2	Soil/Solid	6010B	0.11	1.0	mg/kg	--	1.5	160	1400
Silver	7440-22-4	Soil/Solid	6010B	0.0090	0.25	mg/kg	--	3.9	160	1400
Thallium	7440-28-0	Soil/Solid	6010B	0.13	2.0	mg/kg	--	--	3	230
Zinc	7440-66-6	Soil/Solid	6010B	0.22	1.0	mg/kg	--	1500	8700	85000
Metals										
Antimony	7440-36-0	Water/Liquid	6020	0.046	0.500	ug/L	6	--	--	--
Arsenic	7440-38-2	Water/Liquid	6010B	2	10.000	ug/L	--	--	--	--
Beryllium	7440-41-7	Water/Liquid	6020	0.027	0.5000	ug/L	0.08	--	--	--
Cadmium	7440-43-9	Water/Liquid	6010B	0.099	1.0000	ug/L	4	--	--	--
Chromium	7440-47-3	Water/Liquid	6010B	0.24	10.000	ug/L	100 (5)	--	--	--
Copper	7440-50-8	Water/Liquid	6010B	1.4	20.000	ug/L	--	--	--	--
Lead	7439-92-1	Water/Liquid	6010B	0.68	3.0000	ug/L	--	--	--	--
Nickel	7440-02-0	Water/Liquid	6010B	0.28	5.0000	ug/L	100	--	--	--
Selenium	7782-49-2	Water/Liquid	6010B	2.2	20.000	ug/L	30	--	--	--
Silver	7440-22-4	Water/Liquid	6010B	0.18	5.0000	ug/L	30	--	--	--
Thallium	7440-28-0	Water/Liquid	6020	0.0081	0.500	ug/L	0.6	--	--	--
Zinc	7440-66-6	Water/Liquid	6010B	4.4	20.000	ug/L	2000	--	--	--
Mercury										
Mercury	7439-97-6	Soil/Solid	7471A	0.0031	0.10	mg/kg	--	1.6 C	0.5	--
Mercury	7439-97-6	Water/Liquid	7470A	0.000031	0.00020	mg/L	--	--	--	--
Nitrate+Nitrite Nitrogen as N *										
N+N Nitrogen as N	NA	Water/Liquid	9056M	0.27	2	mg/L	10	--	--	--
Total Kjeldahl Nitrogen										
TKN as N	NA	Water/Liquid	351.2	0.27	1	mg/L	--	--	--	--
Perchlorate (TA)										
Perchlorate	NA	Water/Liquid	314	0.339	4	ug/L	--	--	--	--
Nitrocellulose (TA)										
Nitrocellulose	NA	Soil/Solid	353.2Mod	0.78	40 ug/kg	mg/kg	--	--	--	--
Nitrocellulose (TA)										
Nitrocellulose	NA	Water/Liquid	353.2Mod	0.124	0.5	mg/L	--	--	--	--
Organochlorine Pesticides										
4,4'-DDD	72-54-8	Soil/Solid	8081A	0.0015	0.040	mg/kg	--	--	56	125
4,4'-DDE	72-55-9	Soil/Solid	8081A	0.0014	0.040	mg/kg	--	--	40	80
4,4'-DDT	50-29-3	Soil/Solid	8081A	0.0020	0.040	mg/kg	--	--	15	88
a-Chlordane	5103-71-9	Soil/Solid	8081A	0.0015	0.040	mg/kg	--	--	--	--
Aldrin	309-00-2	Soil/Solid	8081A	0.0012	0.040	mg/kg	--	--	1	2
alpha-BHC	319-84-6	Soil/Solid	8081A	0.0011	0.040	mg/kg	--	--	2	3.5
beta-BHC	319-85-7	Soil/Solid	8081A	0.0015	0.040	mg/kg	--	--	7	15
delta-BHC	319-86-8	Soil/Solid	8081A	0.0015	0.040	mg/kg	--	--	--	--
Dieldrin	60-57-1	Soil/Solid	8081A	0.0014	0.040	mg/kg	--	--	0.8	2
Endosulfan I	959-98-8	Soil/Solid	8081A	0.0013	0.040	mg/kg	--	--	--	--
Endosulfan II	891-86-1	Soil/Solid	8081A	0.0016	0.040	mg/kg	--	--	--	--
Endosulfan sulfate	1031-07-8	Soil/Solid	8081A	0.0016	0.040	mg/kg	--	--	--	--
Endrin	72-20-8	Soil/Solid	8081A	0.0014	0.040	mg/kg	--	--	8	56
Endrin aldehyde	7421-93-4	Soil/Solid	8081A	0.0041	0.040	mg/kg	--	--	--	--
Endrin ketone	53494-70-5	Soil/Solid	8081A	0.0016	0.040	mg/kg	--	--	--	--
gamma-BHC (Lindane)	58-89-9	Soil/Solid	8081A	0.0012	0.040	mg/kg	--	--	9	15
gamma-Chlordane	5566-34-7	Soil/Solid	8081A	0.0017	0.040	mg/kg	--	--	--	--
Heptachlor	76-44-8	Soil/Solid	8081A	0.0014	0.040	mg/kg	--	--	2	3.5
Heptachlor epoxide	1024-57-3	Soil/Solid	8081A	0.0012	0.040	mg/kg	--	--	0.4	3
Methoxychlor	72-43-5	Soil/Solid	8081A	0.0019	0.040	mg/kg	--	--	11	50
Toxaphene	8001-35-2	Soil/Solid	8081A	0.015	0.080	mg/kg	--	--	13	28
Organochlorine Pesticides										
4,4'-DDD	72-54-8	Water/Liquid	8081A	0.026	0.40	ug/L	1	--	--	--
4,4'-DDE	72-55-9	Water/Liquid	8081A	0.037	0.40	ug/L	1	--	--	--
4,4'-DDT	50-29-3	Water/Liquid	8081A	0.031	0.40	ug/L	1	--	--	--

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UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
a-Chlordane	5103-71-9	Water/Liquid	8081A	0.030	0.40	ug/L	--	--	--	--
Aldrin	309-00-2	Water/Liquid	8081A	0.036	0.40	ug/L	--	--	--	--
alpha-BHC	319-84-6	Water/Liquid	8081A	0.028	0.40	ug/L	--	--	--	--
beta-BHC	319-85-7	Water/Liquid	8081A	0.026	0.40	ug/L	--	--	--	--
delta-BHC	319-86-8	Water/Liquid	8081A	0.023	0.40	ug/L	--	--	--	--
Dieldrin	60-57-1	Water/Liquid	8081A	0.031	0.40	ug/L	0.006 (4)	--	--	--
Endosulfan I	959-98-8	Water/Liquid	8081A	0.032	0.40	ug/L	--	--	--	--
Endosulfan II	891-86-1	Water/Liquid	8081A	0.035	0.40	ug/L	--	--	--	--
Endosulfan sulfate	1031-07-8	Water/Liquid	8081A	0.034	0.40	ug/L	--	--	--	--
Endrin	72-20-8	Water/Liquid	8081A	0.029	0.40	ug/L	--	--	--	--
Endrin aldehyde	7421-93-4	Water/Liquid	8081A	0.044	0.40	ug/L	--	--	--	--
Endrin ketone	53494-70-5	Water/Liquid	8081A	0.031	0.40	ug/L	--	--	--	--
gamma-BHC (Lindane)	58-89-9	Water/Liquid	8081A	0.024	0.40	ug/L	--	--	--	--
gamma-Chlordane	5566-34-7	Water/Liquid	8081A	0.030	0.40	ug/L	--	--	--	--
Heptachlor	76-44-8	Water/Liquid	8081A	0.028	0.40	ug/L	0.08	--	--	--
Heptachlor epoxide	1024-57-3	Water/Liquid	8081A	0.030	0.40	ug/L	0.04	--	--	--
Methoxychlor	72-43-5	Water/Liquid	8081A	0.032	0.40	ug/L	--	--	--	--
Toxaphene	8001-35-2	Water/Liquid	8081A	0.069	1.00	ug/L	0.3	--	--	--
MDA List 1 Pesticides (Braun)										
EPTC	759-94-4	Soil/Solid	8270C	0.0060	0.04	mg/kg	--	--	--	--
Propachlor	1918-16-7	Soil/Solid	8270C	0.0090	0.04	mg/kg	--	--	--	--
Ethalfuralin	5523-68-6	Soil/Solid	8270C	0.014	0.04	mg/kg	--	--	--	--
Deisopropylatrazine	1007-28-9	Soil/Solid	8270C	0.0080	0.04	mg/kg	--	--	--	--
Trifluralin	1582-09-8	Soil/Solid	8270C	0.014	0.04	mg/kg	--	--	--	--
Desethylatrazine	6190-65-4	Soil/Solid	8270C	0.011	0.04	mg/kg	--	--	--	--
Phorate	298-02-2	Soil/Solid	8270C	0.0060	0.04	mg/kg	--	--	--	--
Prometon	1610-18-0	Soil/Solid	8270C	0.0060	0.04	mg/kg	--	--	--	--
Simazine	122-34-9	Soil/Solid	8270C	0.0090	0.04	mg/kg	--	--	--	--
Atrazine	1912-24-9	Soil/Solid	8270C	0.0100	0.04	mg/kg	--	--	--	--
Propazine	139-40-2	Soil/Solid	8270C	0.0070	0.04	mg/kg	--	--	--	--
Terbufos	13071-79-9	Soil/Solid	8270C	0.0090	0.04	mg/kg	--	--	0.6	3.5
Fonofos	944-22-9	Soil/Solid	8270C	0.0040	0.04	mg/kg	--	--	--	--
Triallate	2303-17-5	Soil/Solid	8270C	0.0050	0.04	mg/kg	--	--	--	--
Metribuzin	21087-64-9	Soil/Solid	8270C	0.0090	0.04	mg/kg	--	--	--	--
Dimethenamid	87674-68-8	Soil/Solid	8270C	0.0060	0.04	mg/kg	--	--	--	--
Acetochlor	34256-82-1	Soil/Solid	8270C	0.010	0.04	mg/kg	--	--	--	--
Alachlor	15972-60-8	Soil/Solid	8270C	0.0070	0.04	mg/kg	--	--	--	--
Cyanazine	21725-46-2	Soil/Solid	8270C	0.0080	0.04	mg/kg	--	--	--	--
Metolachlor	51218-45-2	Soil/Solid	8270C	0.0030	0.04	mg/kg	--	--	435	3300
Chlorpyrifos	2921-88-2	Soil/Solid	8270C	0.0070	0.04	mg/kg	--	--	--	--
Pendimethalin	40487-42-1	Soil/Solid	8270C	0.016	0.04	mg/kg	--	--	--	--
MDA List 1 Pesticides (Braun)										
EPTC	759-94-4	Water/Liquid	8270C	0.22	0.50	ug/L	200	--	--	--
Propachlor	1918-16-7	Water/Liquid	8270C	0.14	0.50	ug/L	--	--	--	--
Ethalfuralin	5523-68-6	Water/Liquid	8270C	0.47	0.50	ug/L	300 (1)	--	--	--
Deisopropylatrazine	1007-28-9	Water/Liquid	8270C	0.26	0.50	ug/L	--	--	--	--
Trifluralin	1582-09-8	Water/Liquid	8270C	0.21	0.50	ug/L	5 (1)	--	--	--
Desethylatrazine	6190-65-4	Water/Liquid	8270C	0.29	0.50	ug/L	--	--	--	--
Phorate	298-02-2	Water/Liquid	8270C	0.58	1.00	ug/L	1 (1)	--	--	--
Prometon	1610-18-0	Water/Liquid	8270C	0.29	0.50	ug/L	100	--	--	--
Simazine	122-34-9	Water/Liquid	8270C	0.32	0.50	ug/L	4	--	--	--
Atrazine	1912-24-9	Water/Liquid	8270C	0.24	0.50	ug/L	3	--	--	--
Propazine	139-40-2	Water/Liquid	8270C	0.21	0.50	ug/L	10 (1)	--	--	--
Terbufos	13071-79-9	Water/Liquid	8270C	0.54	1.00	ug/L	0.2 (1)	--	--	--
Fonofos	944-22-9	Water/Liquid	8270C	0.30	0.50	ug/L	10 (1)	--	--	--
Triallate	2303-17-5	Water/Liquid	8270C	0.34	0.50	ug/L	9 (1)	--	--	--
Metribuzin	21087-64-9	Water/Liquid	8270C	0.35	0.50	ug/L	200	--	--	--
Dimethenamid	87674-68-8	Water/Liquid	8270C	0.24	0.50	ug/L	40 (1)	--	--	--
Acetochlor	34256-82-1	Water/Liquid	8270C	0.25	0.50	ug/L	9 (4)	--	--	--
Alachlor	15972-60-8	Water/Liquid	8270C	0.19	0.50	ug/L	5 (4)	--	--	--
Cyanazine	21725-46-2	Water/Liquid	8270C	0.48	0.50	ug/L	1	--	--	--
Metolachlor	51218-45-2	Water/Liquid	8270C	0.28	0.50	ug/L	100	--	--	--
Chlorpyrifos	2921-88-2	Water/Liquid	8270C	0.34	0.50	ug/L	20 (1)	--	--	--

Table 2
Analytical Parameters, Methods and Reporting Limits
Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
Pendimethalin	40487-42-1	Water/Liquid	8270C	0.25	0.50	ug/L	--	--	--	--
MDA List 2 Pesticides (Braun)										
Dicamba	1918-00-9	Soil/Solid	8270C	0.008	0.50	mg/kg	--	--	--	--
M.P.C.A.	94-74-6	Soil/Solid	8270C	0.014	0.50	mg/kg	--	--	16	110
2,4-D	94-75-7	Soil/Solid	8270C	0.012	0.50	mg/kg	--	--	285	2200
Trichlopyr	55336-06-3	Soil/Solid	8270C	0.006	0.50	mg/kg	--	--	--	--
Pentachlorophenol	87-66-5	Soil/Solid	8270C	0.007	0.50	mg/kg	--	--	6	120
2,4,5-T.P.	93-72-1	Soil/Solid	8270C	0.007	0.50	mg/kg	--	--	--	--
2,4,5-T	93-76-5	Soil/Solid	8270C	0.009	0.50	mg/kg	--	--	290	2150
Dinoseb	88-85-7	Soil/Solid	8270C	0.005	0.50	mg/kg	--	--	--	--
2,4-D.B.	94-82-6	Soil/Solid	8270C	0.011	0.50	mg/kg	--	--	226	1750
Bentazon	25057-89-0	Soil/Solid	8270C	0.009	0.50	mg/kg	--	--	--	--
Picloram	1918-02-1	Soil/Solid	8270C	0.011	0.50	mg/kg	--	--	2000	15000
MDA List 2 Pesticides (Braun)										
Dicamba	1918-00-9	Water/Liquid	8270C	0.38	0.50	ug/L	200	--	--	--
M.P.C.A.	94-74-6	Water/Liquid	8270C	0.29	0.30	ug/L	--	--	--	--
2,4-D	94-75-7	Water/Liquid	8270C	0.26	0.50	ug/L	70	--	--	--
Trichlopyr	55336-06-3	Water/Liquid	8270C	0.41	0.50	ug/L	300 (1)	--	--	--
Pentachlorophenol	87-66-5	Water/Liquid	8270C	0.39	0.50	ug/L	1	--	--	--
2,4,5-T.P.	93-72-1	Water/Liquid	8270C	0.28	0.50	ug/L	50	--	--	--
2,4,5-T	93-76-5	Water/Liquid	8270C	0.31	1.00	ug/L	--	--	--	--
Dinoseb	88-85-7	Water/Liquid	8270C	0.34	0.50	ug/L	7 (1)	--	--	--
2,4-D.B.	94-82-6	Water/Liquid	8270C	0.15	0.50	ug/L	60 (1)	--	--	--
Bentazon	25057-89-0	Water/Liquid	8270C	0.22	0.50	ug/L	200 (1)	--	--	--
Picloram	1918-02-1	Water/Liquid	8270C	0.25	0.50	ug/L	500	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	630-20-6	Soil/Solid	8260B	0.019	0.25	mg/kg	--	1.4	31	51
1,1,1-Trichloroethane	71-55-6	Soil/Solid	8260B	0.0098	0.25	mg/kg	--	3.5	140	472
1,1,2,2-Tetrachloroethane	79-34-5	Soil/Solid	8260B	0.012	0.25	mg/kg	--	0.005	3.5	6.5
1,1,2-Trichloroethane	79-00-5	Soil/Solid	8260B	0.022	0.25	mg/kg	--	0.010	9	14
1,1,2-Trichlorotrifluoroethane	76-13-1	Soil/Solid	8260B	0.052	0.25	mg/kg	--	2580	3745	5430
1,1-Dichloroethane	75-34-3	Soil/Solid	8260B	0.013	0.25	mg/kg	--	0.18	34	55
1,1-Dichloroethene	75-35-4	Soil/Solid	8260B	0.016	0.25	mg/kg	--	0.025	20	60
1,1-Dichloropropene	563-58-6	Soil/Solid	8260B	0.021	0.25	mg/kg	--	--	--	--
1,2,3-Trichlorobenzene	87-61-6	Soil/Solid	8260B	0.063	0.50	mg/kg	--	--	--	--
1,2,3-Trichloropropane	96-18-4	Soil/Solid	8260B	0.017	0.25	mg/kg	--	0.35	--	--
1,2,4-Trichlorobenzene	120-82-1	Soil/Solid	8260B	0.052	0.50	mg/kg	--	0.31	200	985
1,2,4-Trimethylbenzene	95-63-6	Soil/Solid	8260B	0.013	0.25	mg/kg	--	--	8	25
1,2-Dibromo-3-chloropropane	96-12-8	Soil/Solid	8260B	0.079	0.50	mg/kg	--	0.001	--	--
1,2-Dibromoethane (EDB)	106-93-4	Soil/Solid	8260B	0.0056	0.25	mg/kg	--	0.00001	0.3	0.5
1,2-Dichlorobenzene	95-50-1	Soil/Solid	8260B	0.0055	0.25	mg/kg	--	8.1	26	75
1,2-Dichloroethane	107-06-2	Soil/Solid	8260B	0.030	0.25	mg/kg	--	0.010	4	6
1,2-Dichloropropane	78-87-5	Soil/Solid	8260B	0.016	0.25	mg/kg	--	0.011	4	6
1,3,5-Trimethylbenzene	108-67-8	Soil/Solid	8260B	0.0077	0.25	mg/kg	--	--	3	10
1,3-Dichlorobenzene	541-73-1	Soil/Solid	8260B	0.015	0.25	mg/kg	--	4.2	26	200
1,3-Dichloropropane	142-28-9	Soil/Solid	8260B	0.017	0.25	mg/kg	--	--	--	--
1,4-Dichlorobenzene	106-46-7	Soil/Solid	8260B	0.017	0.25	mg/kg	--	0.13	30	50
2,2-Dichloropropane	594-20-7	Soil/Solid	8260B	0.034	0.50	mg/kg	--	--	--	--
2-Butanone	78-93-3	Soil/Solid	8260B	0.069	2.0	mg/kg	--	--	5500	19000
2-Chlorotoluene	95-49-8	Soil/Solid	8260B	0.015	0.25	mg/kg	--	--	436	436
4-Chlorotoluene	106-43-4	Soil/Solid	8260B	0.015	0.25	mg/kg	--	--	--	--
Acetone	67-64-1	Soil/Solid	8260B	0.16	2.0	mg/kg	--	0.7	340	1000
Allyl chloride	107-05-1	Soil/Solid	8260B	0.016	0.50	mg/kg	--	0.032	--	--
Benzene	71-43-2	Soil/Solid	8260B	0.0070	0.25	mg/kg	--	0.034	6	10
Bromobenzene	108-86-1	Soil/Solid	8260B	0.017	0.25	mg/kg	--	--	--	--
Bromochloromethane	74-97-5	Soil/Solid	8260B	0.021	0.25	mg/kg	--	0.15	--	--
Bromodichloromethane	75-27-4	Soil/Solid	8260B	0.020	0.25	mg/kg	--	0.013	10	17
Bromoform	75-25-2	Soil/Solid	8260B	0.015	0.50	mg/kg	--	0.14	370	650
Bromomethane	74-83-9	Soil/Solid	8260B	0.012	0.50	mg/kg	--	0.5	0.7	2
Carbon tetrachloride	56-23-5	Soil/Solid	8260B	0.018	0.25	mg/kg	--	0.023	0.3	0.9
Chlorobenzene	108-90-7	Soil/Solid	8260B	0.011	0.25	mg/kg	--	1.1	11	32
Chloroethane	75-00-3	Soil/Solid	8260B	0.045	0.25	mg/kg	--	--	1000	3000
Chloroform	67-66-3	Soil/Solid	8260B	0.017	0.25	mg/kg	--	0.17	2.5	4
Chloromethane	74-87-3	Soil/Solid	8260B	0.017	0.25	mg/kg	--	0.006	8	23
cis-1,2-Dichloroethene	156-59-2	Soil/Solid	8260B	0.016	0.25	mg/kg	--	0.14	--	--
cis-1,3-Dichloropropene	10061-01-5	Soil/Solid	8260B	0.0098	0.25	mg/kg	--	0.005 M	--	--
Dibromochloromethane	124-48-1	Soil/Solid	8260B	0.014	0.25	mg/kg	--	0.03	12	20

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UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
Dibromomethane	74-95-3	Soil/Solid	8260B	0.021	0.25	mg/kg	--	--	260	1860
Dichlorodifluoromethane	75-71-8	Soil/Solid	8260B	0.035	0.50	mg/kg	--	38	16	50
Dichlorofluoromethane	75-43-4	Soil/Solid	8260B	0.014	0.25	mg/kg	--	--	--	--
Ethyl ether	60-29-7	Soil/Solid	8260B	0.017	0.50	mg/kg	--	1.2	--	--
Ethylbenzene	100-41-4	Soil/Solid	8260B	0.011	0.25	mg/kg	--	4.7	200	200
Hexachlorobutadiene	87-68-3	Soil/Solid	8260B	0.11	1.0	mg/kg	--	25	6	37
Isopropylbenzene	98-82-8	Soil/Solid	8260B	0.019	0.25	mg/kg	--	18	30	87
m,p-Xylene	108-38-3/ 106-42-3	Soil/Solid	8260B	0.024	0.50	mg/kg	--	45 M	45 M	130 M
Methyl isobutyl ketone	108-10-1	Soil/Solid	8260B	0.031	0.50	mg/kg	--	0.42	1700	9000
Methyl tert-butyl ether	1634-04-4	Soil/Solid	8260B	0.018	0.25	mg/kg	--	0.027	--	--
Methylene chloride	75-09-2	Soil/Solid	8260B	0.043	1.0	mg/kg	--	0.068	97	158
Naphthalene	91-20-3	Soil/Solid	8260B	0.060	0.50	mg/kg	--	7.5	10	28
n-Butylbenzene	104-51-8	Soil/Solid	8260B	0.012	0.25	mg/kg	--	--	30	92
n-Propylbenzene	103-65-1	Soil/Solid	8260B	0.013	0.25	mg/kg	--	--	30	93
o-Xylene	95-47-6	Soil/Solid	8260B	0.015	0.25	mg/kg	--	45 M	45 M	130 M
p-Isopropyltoluene	99-87-6	Soil/Solid	8260B	0.014	0.25	mg/kg	--	--	--	--
sec-Butylbenzene	135-98-8	Soil/Solid	8260B	0.012	0.25	mg/kg	--	--	25	70
Styrene	100-42-5	Soil/Solid	8260B	0.012	0.25	mg/kg	--	1.9	210	600
tert-Butylbenzene	98-06-6	Soil/Solid	8260B	0.0073	0.25	mg/kg	--	--	30	90
Tetrachloroethene	127-18-4	Soil/Solid	8260B	0.016	0.25	mg/kg	--	0.068	72	131
Tetrahydrofuran	109-99-9	Soil/Solid	8260B	0.068	2.0	mg/kg	--	0.16	--	--
Toluene	108-88-3	Soil/Solid	8260B	0.0063	0.25	mg/kg	--	6.4	107	305
trans-1,2-Dichloroethene	156-60-5	Soil/Solid	8260B	0.016	0.25	mg/kg	--	0.27	11	33
trans-1,3-Dichloropropene	10061-02-6	Soil/Solid	8260B	0.013	0.25	mg/kg	--	0.005 M	--	--
Trichloroethene	79-01-6	Soil/Solid	8260B	0.013	0.25	mg/kg	--	0.14	29	46
Trichlorofluoromethane	75-69-4	Soil/Solid	8260B	0.035	0.25	mg/kg	--	22	67	195
Vinyl chloride	75-01-4	Soil/Solid	8260B	0.031	0.25	mg/kg	--	0.001	0.8	2.2
VOCs - Water/Liquid										
1,1,1,2-Tetrachloroethane	630-20-6	Water/Liquid	8260B	0.083	1.0	ug/L	70	--	--	--
1,1,1-Trichloroethane	71-55-6	Water/Liquid	8260B	0.098	1.0	ug/L	9000 (4)	--	--	--
1,1,2,2-Tetrachloroethane	79-34-5	Water/Liquid	8260B	0.084	1.0	ug/L	2	--	--	--
1,1,2-Trichloroethane	79-00-5	Water/Liquid	8260B	0.15	1.0	ug/L	3	--	--	--
1,1,2-Trichlorotrifluoroethane	76-13-1	Water/Liquid	8260B	0.10	1.0	ug/L	200000	--	--	--
1,1-Dichloroethane	75-34-3	Water/Liquid	8260B	0.094	1.0	ug/L	70	--	--	--
1,1-Dichloroethene	75-35-4	Water/Liquid	8260B	0.10	1.0	ug/L	6	--	--	--
1,1-Dichloropropene	563-58-6	Water/Liquid	8260B	0.099	1.0	ug/L	--	--	--	--
1,2,3-Trichlorobenzene	87-61-6	Water/Liquid	8260B	0.40	5.0	ug/L	--	--	--	--
1,2,3-Trichloropropane	96-18-4	Water/Liquid	8260B	0.13	2.5	ug/L	40	--	--	--
1,2,4-Trichlorobenzene	120-82-1	Water/Liquid	8260B	0.52	5.0	ug/L	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	Water/Liquid	8260B	0.052	1.0	ug/L	--	--	--	--
1,2-Dibromo-3-chloropropane	96-12-8	Water/Liquid	8260B	1.2	5.0	ug/L	--	--	--	--
1,2-Dibromoethane (EDB)	106-93-4	Water/Liquid	8260B	0.10	2.5	ug/L	0.004	--	--	--
1,2-Dichlorobenzene	95-50-1	Water/Liquid	8260B	0.12	1.0	ug/L	600	--	--	--
1,2-Dichloroethane	107-06-2	Water/Liquid	8260B	0.084	1.0	ug/L	4	--	--	--
1,2-Dichloropropane	78-87-5	Water/Liquid	8260B	0.13	1.0	ug/L	5	--	--	--
1,3,5-Trimethylbenzene	108-67-8	Water/Liquid	8260B	0.066	1.0	ug/L	100 (4) (6)	--	--	--
1,3-Dichlorobenzene	541-73-1	Water/Liquid	8260B	0.094	1.0	ug/L	--	--	--	--
1,3-Dichloropropane	142-28-9	Water/Liquid	8260B	0.074	1.0	ug/L	2	--	--	--
1,4-Dichlorobenzene	106-46-7	Water/Liquid	8260B	0.053	1.0	ug/L	10	--	--	--
2,2-Dichloropropane	594-20-7	Water/Liquid	8260B	0.23	5.0	ug/L	--	--	--	--
2-Butanone	78-93-3	Water/Liquid	8260B	0.58	20	ug/L	4000	--	--	--
2-Chlorotoluene	95-49-8	Water/Liquid	8260B	0.077	1.0	ug/L	--	--	--	--
4-Chlorotoluene	106-43-4	Water/Liquid	8260B	0.059	1.0	ug/L	--	--	--	--
Acetone	67-64-1	Water/Liquid	8260B	0.89	20	ug/L	700	--	--	--
Allyl chloride	107-05-1	Water/Liquid	8260B	0.28	5.0	ug/L	30	--	--	--
Benzene	71-43-2	Water/Liquid	8260B	0.047	1.0	ug/L	2 (4)	--	--	--
Bromobenzene	108-86-1	Water/Liquid	8260B	0.084	1.0	ug/L	--	--	--	--
Bromochloromethane	74-97-5	Water/Liquid	8260B	0.075	1.0	ug/L	--	--	--	--
Bromodichloromethane	75-27-4	Water/Liquid	8260B	0.13	1.0	ug/L	6	--	--	--
Bromoform	75-25-2	Water/Liquid	8260B	0.074	5.0	ug/L	40	--	--	--
Bromomethane	74-83-9	Water/Liquid	8260B	0.26	5.0	ug/L	10	--	--	--
Carbon tetrachloride	56-23-5	Water/Liquid	8260B	0.074	1.0	ug/L	3	--	--	--
Chlorobenzene	108-90-7	Water/Liquid	8260B	0.025	1.0	ug/L	100	--	--	--
Chloroethane	75-00-3	Water/Liquid	8260B	0.26	2.5	ug/L	--	--	--	--
Chloroform	67-66-3	Water/Liquid	8260B	0.098	1.0	ug/L	30 (4) (6)	--	--	--
Chloromethane	74-87-3	Water/Liquid	8260B	0.098	2.5	ug/L	--	--	--	--
cis-1,2-Dichloroethene	156-59-2	Water/Liquid	8260B	0.12	1.0	ug/L	50 (4)	--	--	--

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UMore Mining Area
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Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
cis-1,3-Dichloropropene	10061-01-5	Water/Liquid	8260B	0.11	1.0	ug/L	--	--	--	--
Dibromochloromethane	124-48-1	Water/Liquid	8260B	0.084	2.5	ug/L	10	--	--	--
Dibromomethane	74-95-3	Water/Liquid	8260B	0.14	2.5	ug/L	--	--	--	--
Dichlorodifluoromethane	75-71-8	Water/Liquid	8260B	0.39	5.0	ug/L	1000	--	--	--
Dichlorofluoromethane	75-43-4	Water/Liquid	8260B	0.070	1.0	ug/L	--	--	--	--
Ethyl ether	60-29-7	Water/Liquid	8260B	0.10	5.0	ug/L	1000	--	--	--
Ethylbenzene	100-41-4	Water/Liquid	8260B	0.055	1.0	ug/L	700	--	--	--
Hexachlorobutadiene	87-68-3	Water/Liquid	8260B	0.58	10	ug/L	1	--	--	--
Isopropylbenzene	98-82-8	Water/Liquid	8260B	0.068	1.0	ug/L	300	--	--	--
m,p-Xylene	108-38-3 106-42-3	Water/Liquid	8260B	0.14	2.0	ug/L	10000 M	--	--	--
Methyl isobutyl ketone	108-10-1	Water/Liquid	8260B	0.13	5.0	ug/L	300	--	--	--
Methyl tert-butyl ether	1634-04-4	Water/Liquid	8260B	0.079	1.0	ug/L	--	--	--	--
Methylene chloride	75-09-2	Water/Liquid	8260B	0.29	5.0	ug/L	5	--	--	--
Naphthalene	91-20-3	Water/Liquid	8260B	0.38	5.0	ug/L	300	--	--	--
n-Butylbenzene	104-51-8	Water/Liquid	8260B	0.094	2.5	ug/L	--	--	--	--
n-Propylbenzene	103-65-1	Water/Liquid	8260B	0.079	1.0	ug/L	--	--	--	--
o-Xylene	95-47-6	Water/Liquid	8260B	0.074	1.0	ug/L	10000M	--	--	--
p-Isopropyltoluene	99-87-6	Water/Liquid	8260B	0.087	2.5	ug/L	--	--	--	--
sec-Butylbenzene	135-98-8	Water/Liquid	8260B	0.030	1.0	ug/L	--	--	--	--
Styrene	100-42-5	Water/Liquid	8260B	0.072	1.0	ug/L	--	--	--	--
tert-Butylbenzene	98-06-6	Water/Liquid	8260B	0.046	1.0	ug/L	--	--	--	--
Tetrachloroethene	127-18-4	Water/Liquid	8260B	0.10	1.0	ug/L	5	--	--	--
Tetrahydrofuran	109-99-9	Water/Liquid	8260B	0.76	20	ug/L	--	--	--	--
Toluene	108-88-3	Water/Liquid	8260B	0.036	1.0	ug/L	1000	--	--	--
trans-1,2-Dichloroethene	156-60-5	Water/Liquid	8260B	0.14	1.0	ug/L	100	--	--	--
trans-1,3-Dichloropropene	10061-02-6	Water/Liquid	8260B	0.082	1.0	ug/L	--	--	--	--
Trichloroethene	79-01-6	Water/Liquid	8260B	0.097	1.0	ug/L	5	--	--	--
Trichlorofluoromethane	75-69-4	Water/Liquid	8260B	0.17	1.0	ug/L	2000	--	--	--
Vinyl chloride	75-01-4	Water/Liquid	8260B	0.10	1.0	ug/L	0.2 (4)	--	--	--
SemiVolatile Organics										
1,2,4-Trichlorobenzene	120-82-1	Soil/Solid	8270C	0.020	0.33	mg/kg	--	0.31	200	985
1,2-Dichlorobenzene	95-50-1	Soil/Solid	8270C	0.012	0.33	mg/kg	--	8.1	26	75
1,2-Diphenylhydrazine as Azobenzene	103-33-3	Soil/Solid	8270C	0.039	0.33	mg/kg	--	--	--	--
1,3-Dichlorobenzene	541-73-1	Soil/Solid	8270C	0.014	0.33	mg/kg	--	4.2	26	200
1,4-Dichlorobenzene	106-46-7	Soil/Solid	8270C	0.013	0.33	mg/kg	--	0.13	30	50
2,3,4,6-Tetrachlorophenol	58-90-2	Soil/Solid	8270C	0.072	0.67	mg/kg	--	--	636	3700
2,4,5-Trichlorophenol	95-95-4	Soil/Solid	8270C	0.039	0.67	mg/kg	--	--	1920	10600
2,4,6-Trichlorophenol	88-06-2	Soil/Solid	8270C	0.081	0.67	mg/kg	--	0.21	595	1060
2,4-Dichlorophenol	120-83-2	Soil/Solid	8270C	0.046	0.67	mg/kg	--	0.076	48	230
2,4-Dimethylphenol	105-67-9	Soil/Solid	8270C	0.079	0.67	mg/kg	--	0.34	390	1925
2,4-Dinitrophenol	51-28-5	Soil/Solid	8270C	0.064	0.67	mg/kg	--	0.014	--	--
2,4-Dinitrotoluene	121-14-2	Soil/Solid	8270C	0.044	0.33	mg/kg	--	0.001	50	355
2,6-Dichlorophenol	87-65-0	Soil/Solid	8270C	0.042	0.67	mg/kg	--	--	--	--
2,6-Dinitrotoluene	606-20-2	Soil/Solid	8270C	0.040	0.33	mg/kg	--	0.001	25	175
2-Chloronaphthalene	91-58-7	Soil/Solid	8270C	0.018	0.33	mg/kg	--	--	--	--
2-Chlorophenol	95-57-8	Soil/Solid	8270C	0.029	0.67	mg/kg	--	0.26	--	--
2-Methylnaphthalene	91-57-6	Soil/Solid	8270C	0.021	0.33	mg/kg	--	--	100	--
2-Methylphenol	95-48-7	Soil/Solid	8270C	0.019	0.67	mg/kg	--	0.064	75	352
2-Nitroaniline	88-74-4	Soil/Solid	8270C	0.041	0.33	mg/kg	--	--	--	--
2-Nitrophenol	88-75-5	Soil/Solid	8270C	0.040	0.67	mg/kg	--	0.60	--	--
3,3'-Dichlorobenzidine	91-94-1	Soil/Solid	8270C	0.21	1.6	mg/kg	--	0.36	25	50
3-Nitroaniline	99-09-2	Soil/Solid	8270C	0.041	0.33	mg/kg	--	--	--	--
4,6-Dinitro-2-methylphenol	534-52-1	Soil/Solid	8270C	0.097	0.67	mg/kg	--	--	--	--
4-Bromophenyl phenyl ether	101-55-3	Soil/Solid	8270C	0.044	0.33	mg/kg	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	Soil/Solid	8270C	0.075	0.67	mg/kg	--	--	--	--
4-Chloroaniline	106-47-8	Soil/Solid	8270C	0.022	0.67	mg/kg	--	--	--	--
4-Chlorophenyl phenyl ether	7005-72-3	Soil/Solid	8270C	0.024	0.33	mg/kg	--	--	--	--
4-Methylphenol	106-44-5	Soil/Solid	8270C	0.017	0.67	mg/kg	--	0.033	10	59
4-Nitroaniline	100-01-6	Soil/Solid	8270C	0.044	0.33	mg/kg	--	--	--	--
4-Nitrophenol	100-02-7	Soil/Solid	8270C	0.081	0.67	mg/kg	--	--	--	--
Acenaphthene	83-32-9	Soil/Solid	8270C	0.020	0.33	mg/kg	--	50	1200	5260

Table 2
Analytical Parameters, Methods and Reporting Limits
Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
Acenaphthylene	208-96-8	Soil/Solid	8270C	0.031	0.33	mg/kg	--	--	--	--
Aniline	62-53-3	Soil/Solid	8270C	0.034	0.67	mg/kg	--	--	--	--
Anthracene	120-12-7	Soil/Solid	8270C	0.043	0.33	mg/kg	--	942	7880	45400
Benzidine	92-87-5	Soil/Solid	8270C	0.71	2.5	mg/kg	--	--	--	--
Benzo (a) anthracene	56-55-3	Soil/Solid	8270C	0.045	0.33	mg/kg	--	10.2 T	--	--
Benzo (a) pyrene	50-32-8	Soil/Solid	8270C	0.049	0.33	mg/kg	--	10.2 T	2	3
Benzo (b) fluoranthene	205-99-2	Soil/Solid	8270C	0.048	0.33	mg/kg	--	10.2 T	--	--
Benzo (g,h,i) perylene	191-24-2	Soil/Solid	8270C	0.050	0.33	mg/kg	--	--	--	--
Benzo (k) fluoranthene	207-08-9	Soil/Solid	8270C	0.053	0.33	mg/kg	--	10.2 T	--	--
Benzoic acid	65-85-0	Soil/Solid	8270C	0.036	0.33	mg/kg	--	30	50000	100000
Benzyl alcohol	100-51-6	Soil/Solid	8270C	0.11	0.67	mg/kg	--	--	8700	56000
Bis(2-chloroethoxy)methane	111-91-1	Soil/Solid	8270C	0.021	0.33	mg/kg	--	--	--	--
Bis(2-chloroethyl)ether	111-44-4	Soil/Solid	8270C	0.013	0.33	mg/kg	--	0.001	2.5	5
Bis(2-chloroisopropyl)ether	39638-32-9	Soil/Solid	8270C	0.017	0.33	mg/kg	--	--	--	--
Bis(2-ethylhexyl)phthalate	117-81-7	Soil/Solid	8270C	0.046	0.33	mg/kg	--	40	570	2100
Butyl benzyl phthalate	85-68-7	Soil/Solid	8270C	0.047	0.33	mg/kg	--	28	580	3700
Carbazole	86-74-8	Soil/Solid	8270C	0.044	0.33	mg/kg	--	--	700	1310
Chrysene	218-01-9	Soil/Solid	8270C	0.049	0.33	mg/kg	--	10.2 T	--	--
Dibenz (a,h) anthracene	53-70-3	Soil/Solid	8270C	0.053	0.33	mg/kg	--	10.2 T	--	--
Dibenzofuran	132-64-9	Soil/Solid	8270C	0.022	0.33	mg/kg	--	--	104	810
Diethyl phthalate	84-66-2	Soil/Solid	8270C	0.045	0.33	mg/kg	--	18	--	--
Dimethyl phthalate	131-11-3	Soil/Solid	8270C	0.043	0.33	mg/kg	--	172	--	--
Di-n-butyl phthalate	84-74-2	Soil/Solid	8270C	0.054	0.33	mg/kg	--	23	2440	16300
Di-n-octyl phthalate	117-84-0	Soil/Solid	8270C	0.056	0.33	mg/kg	--	--	520	3700
Fluoranthene	206-44-0	Soil/Solid	8270C	0.047	0.33	mg/kg	--	295	1080	6800
Fluorene	86-73-7	Soil/Solid	8270C	0.011	0.33	mg/kg	--	47	850	4120
Hexachlorobenzene	118-74-1	Soil/Solid	8270C	0.041	0.33	mg/kg	--	0.32	5	9
Hexachlorobutadiene	87-68-3	Soil/Solid	8270C	0.035	0.33	mg/kg	--	25	6	37
Hexachlorocyclopentadiene	77-47-4	Soil/Solid	8270C	0.030	0.33	mg/kg	--	4.4	2	6
Hexachloroethane	67-72-1	Soil/Solid	8270C	0.018	0.33	mg/kg	--	0.050	--	--
Indeno (1,2,3-cd) pyrene	193-39-5	Soil/Solid	8270C	0.042	0.33	mg/kg	--	10.2 T	--	--
Isophorone	78-59-1	Soil/Solid	8270C	0.018	0.33	mg/kg	--	0.16	--	--
Naphthalene	91-20-3	Soil/Solid	8270C	0.015	0.33	mg/kg	--	7.5	10	28
Nitrobenzene	98-95-3	Soil/Solid	8270C	0.014	0.33	mg/kg	--	--	--	--
N-Nitrosodimethylamine	62-75-9	Soil/Solid	8270C	0.028	0.33	mg/kg	--	0.82	--	--
N-Nitrosodi-n-propylamine	621-64-7	Soil/Solid	8270C	0.014	0.33	mg/kg	--	--	0.7	1.2
N-Nitrosodiphenylamine ***	86-30-6	Soil/Solid	8270C	0.045	0.33	mg/kg	--	0.88	1950	3720
Diphenylamine ***	122-39-4	Soil/Solid	8270C	--	--	--	--	--	--	--
Pentachlorophenol	87-86-5	Soil/Solid	8270C	0.081	0.67	mg/kg	--	0.034	6	120
Phenanthrene	85-01-8	Soil/Solid	8270C	0.026	0.33	mg/kg	--	--	--	--
Phenol	108-95-2	Soil/Solid	8270C	0.027	0.67	mg/kg	--	7.8	1100	20203
Pyrene	129-00-0	Soil/Solid	8270C	0.046	0.33	mg/kg	--	272	890	5800
2,4-Dinitrotoluene (DNT)	121-14-2	Soil/Solid	8270C	0.063	3.0	mg/kg	--	0.001	50	355
2,6-Dinitrotoluene (DNT)	606-20-2	Soil/Solid	8270C	0.13	3.0	mg/kg	--	0.001	25	175
SemiVolatile Organics										
1,2,4-Trichlorobenzene	120-82-1	Water/Liquid	8270C	0.28	10	ug/L	--	--	--	--
1,2-Dichlorobenzene	95-50-1	Water/Liquid	8270C	0.21	10	ug/L	600	--	--	--
1,2-Diphenylhydrazine as Azobenzene	103-33-3	Water/Liquid	8270C	0.20	10	ug/L	--	--	--	--
1,3-Dichlorobenzene	541-73-1	Water/Liquid	8270C	0.21	10	ug/L	--	--	--	--
1,4-Dichlorobenzene	106-46-7	Water/Liquid	8270C	0.18	10	ug/L	10	--	--	--
2,3,4,6-Tetrachlorophenol	58-90-2	Water/Liquid	8270C	1.0	10	ug/L	--	--	--	--
2,4,5-Trichlorophenol	95-95-4	Water/Liquid	8270C	0.85	10	ug/L	--	--	--	--
2,4,6-Trichlorophenol	88-06-2	Water/Liquid	8270C	0.89	10	ug/L	30	--	--	--
2,4-Dichlorophenol	120-83-2	Water/Liquid	8270C	0.78	10	ug/L	20	--	--	--
2,4-Dimethylphenol	105-67-9	Water/Liquid	8270C	0.76	10	ug/L	100	--	--	--
2,4-Dinitrophenol	51-28-5	Water/Liquid	8270C	0.50	10	ug/L	10	--	--	--
2,4-Dinitrotoluene	121-14-2	Water/Liquid	8270C	0.49	10	ug/L	0.5 (2)	--	--	--
2,6-Dichlorophenol	87-65-0	Water/Liquid	8270C	0.78	10	ug/L	--	--	--	--
2,6-Dinitrotoluene	606-20-2	Water/Liquid	8270C	0.39	10	ug/L	0.5 (2)	--	--	--
2-Chloronaphthalene	91-58-7	Water/Liquid	8270C	0.20	10	ug/L	--	--	--	--
2-Chlorophenol	95-57-8	Water/Liquid	8270C	0.66	10	ug/L	30	--	--	--
2-Methylnaphthalene	91-57-6	Water/Liquid	8270C	0.32	10	ug/L	--	--	--	--

Table 2
Analytical Parameters, Methods and Reporting Limits
Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
2-Methylphenol	95-48-7	Water/Liquid	8270C	0.77	10	ug/L	30	--	--	--
2-Nitroaniline	88-74-4	Water/Liquid	8270C	0.92	10	ug/L	--	--	--	--
2-Nitrophenol	88-75-5	Water/Liquid	8270C	1.0	10	ug/L	--	--	--	--
3,3'-Dichlorobenzidine	91-94-1	Water/Liquid	8270C	7.1	25	ug/L	0.8	--	--	--
3-Nitroaniline	99-09-2	Water/Liquid	8270C	0.95	10	ug/L	--	--	--	--
4,6-Dinitro-2-methylphenol	534-52-1	Water/Liquid	8270C	0.90	10	ug/L	--	--	--	--
4-Bromophenyl phenyl ether	101-55-3	Water/Liquid	8270C	0.19	10	ug/L	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	Water/Liquid	8270C	0.79	10	ug/L	--	--	--	--
4-Chloroaniline	106-47-8	Water/Liquid	8270C	1.0	10	ug/L	--	--	--	--
4-Chlorophenol	106-48-9	Water/Liquid	8270C	NA	NA	ug/L	--	--	--	--
4-Chlorophenyl phenyl ether	7005-72-3	Water/Liquid	8270C	0.15	10	ug/L	--	--	--	--
4-Methylphenol	106-44-5	Water/Liquid	8270C	0.82	10	ug/L	3	--	--	--
4-Nitroaniline	100-01-6	Water/Liquid	8270C	0.83	10	ug/L	--	--	--	--
4-Nitrophenol	100-02-7	Water/Liquid	8270C	1.2	10	ug/L	--	--	--	--
Acenaphthene	83-32-9	Water/Liquid	8270C	0.15	10	ug/L	400	--	--	--
Acenaphthylene	208-96-8	Water/Liquid	8270C	0.17	10	ug/L	--	--	--	--
Aniline	62-53-3	Water/Liquid	8270C	0.97	10	ug/L	--	--	--	--
Anthracene	120-12-7	Water/Liquid	8270C	0.18	10	ug/L	2000	--	--	--
Benidine	92-87-5	Water/Liquid	8270C	23	100	ug/L	--	--	--	--
Benzo (a) anthracene	56-55-3	Water/Liquid	8270C	0.18	10	ug/L	--	--	--	--
Benzo (a) pyrene	50-32-8	Water/Liquid	8270C	0.22	10	ug/L	--	--	--	--
Benzo (b) fluoranthene	205-99-2	Water/Liquid	8270C	0.18	10	ug/L	--	--	--	--
Benzo (g,h,i) perylene	191-24-2	Water/Liquid	8270C	0.24	10	ug/L	--	--	--	--
Benzo (k) fluoranthene	207-08-9	Water/Liquid	8270C	0.21	10	ug/L	--	--	--	--
Benzoic acid	65-85-0	Water/Liquid	8270C	0.75	10	ug/L	30000	--	--	--
Benzyl alcohol	100-51-6	Water/Liquid	8270C	0.66	10	ug/L	--	--	--	--
Bis(2-chloroethoxy)methane	111-91-1	Water/Liquid	8270C	0.21	10	ug/L	--	--	--	--
Bis(2-chloroethyl)ether	111-44-4	Water/Liquid	8270C	0.21	10	ug/L	0.3	--	--	--
Bis(2-chloroisopropyl)ether	39638-32-9	Water/Liquid	8270C	0.14	10	ug/L	--	--	--	--
Bis(2-ethylhexyl)phthalate	117-81-7	Water/Liquid	8270C	0.45	10	ug/L	6	--	--	--
Butyl benzyl phthalate	85-68-7	Water/Liquid	8270C	0.33	10	ug/L	100	--	--	--
Carbazole	86-74-8	Water/Liquid	8270C	0.24	10	ug/L	--	--	--	--
Chrysene	218-01-9	Water/Liquid	8270C	0.15	10	ug/L	--	--	--	--
Dibenz (a,h) anthracene	53-70-3	Water/Liquid	8270C	0.25	10	ug/L	--	--	--	--
Dibenzofuran	132-64-9	Water/Liquid	8270C	0.27	10	ug/L	--	--	--	--
Diethyl phthalate	84-66-2	Water/Liquid	8270C	0.32	10	ug/L	6000	--	--	--
Dimethyl phthalate	131-11-3	Water/Liquid	8270C	0.26	10	ug/L	70000	--	--	--
Di-n-butyl phthalate	84-74-2	Water/Liquid	8270C	0.33	10	ug/L	700	--	--	--
Di-n-octyl phthalate	117-84-0	Water/Liquid	8270C	0.42	10	ug/L	--	--	--	--
Fluoranthene	206-44-0	Water/Liquid	8270C	0.23	10	ug/L	300	--	--	--
Fluorene	86-73-7	Water/Liquid	8270C	0.16	10	ug/L	300	--	--	--
Hexachlorobenzene	118-74-1	Water/Liquid	8270C	0.15	10	ug/L	0.2	--	--	--
Hexachlorobutadiene	87-68-3	Water/Liquid	8270C	0.34	10	ug/L	1	--	--	--
Hexachlorocyclopentadiene	77-47-4	Water/Liquid	8270C	0.22	10	ug/L	--	--	--	--
Hexachloroethane	67-72-1	Water/Liquid	8270C	0.30	10	ug/L	--	--	--	--
Indeno (1,2,3-cd) pyrene	193-39-5	Water/Liquid	8270C	0.19	10	ug/L	--	--	--	--
Isophorone	78-59-1	Water/Liquid	8270C	0.23	10	ug/L	100	--	--	--
Naphthalene	91-20-3	Water/Liquid	8270C	0.19	10	ug/L	300	--	--	--
Nitrobenzene	98-95-3	Water/Liquid	8270C	0.26	10	ug/L	--	--	--	--
N-Nitrosodimethylamine	62-75-9	Water/Liquid	8270C	0.30	10	ug/L	--	--	--	--
N-Nitrosodi-n-propylamine	621-64-7	Water/Liquid	8270C	0.28	10	ug/L	--	--	--	--
N-Nitrosodiphenylamine ***	86-30-6	Water/Liquid	8270C	0.27	10	ug/L	70	--	--	--
Diphenylamine ***	122-39-4	Water/Liquid	8270C	--	--	--	--	--	--	--
Pentachlorophenol	87-86-5	Water/Liquid	8270C	0.99	10	ug/L	1	--	--	--
Phenanthrene	85-01-8	Water/Liquid	8270C	0.13	10	ug/L	--	--	--	--
Phenol	108-95-2	Water/Liquid	8270C	0.59	10	ug/L	4000	--	--	--
Pyrene	129-00-0	Water/Liquid	8270C	0.24	10	ug/L	200	--	--	--

Notes:

- M - the values with this notation indicate the limit is for all combined isomers of this compound
- T - the values with this notation represent the limit for the total carcinogenic PAHs as BaP
- C - Mercury as mercuric chloride

Table 2
Analytical Parameters, Methods and Reporting Limits
Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota

Parameter	CAS Number	Matrix	Method (EPA unless noted otherwise)	Method Detection Limit	Reporting Limit	Test Unit	MDH Health Risk Limits ³	Minnesota Tier SLV ⁴	Minnesota SRV ⁵	Minnesota Tier II Industrial SRV ⁶
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(TA) - Legend Technical Services, Inc. will subcontract this analysis to Test America, West Sacramento, California.

(Braun) - Legend Tedhncal Services, Inc. will subcontract this analysis to Braun Intertec, in Minneapolis, MN.

- (1) Not a HRL but a Health Based Value (HBV)
- (2) (SRL)-Specific Risk Level (water concentration which corresponds to a riskof 1E-5.
- (3) Not a HRL but an EPA Maximum Contaminant Level (MCL).
- (4) Value is representative of the lowest exposure duration published in the 2008 Health Risk Limits.
- (5) Value represents the criteria for Chromium, hexavalent.
- (6) Set at short-term MRL.

³ - Minnesota Department of Health, Health Risk Limit (HRL) unless noted otherwise.

⁴ - Minnesota Pollution Control Agency's Risk-based guidance for Soil - Soil Leaching Value (SLV)

⁵ - Minnesota Pollution Control Agency's Risk-based guidance for Soil - Soil Reference Value (SRV)

⁶ - Minnesota Pollution Control Agency's Risk-based guidance for Soil - Tier II Industrial SRV.

**Table 3
Sample Preservation and Holding Times**

**Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota**

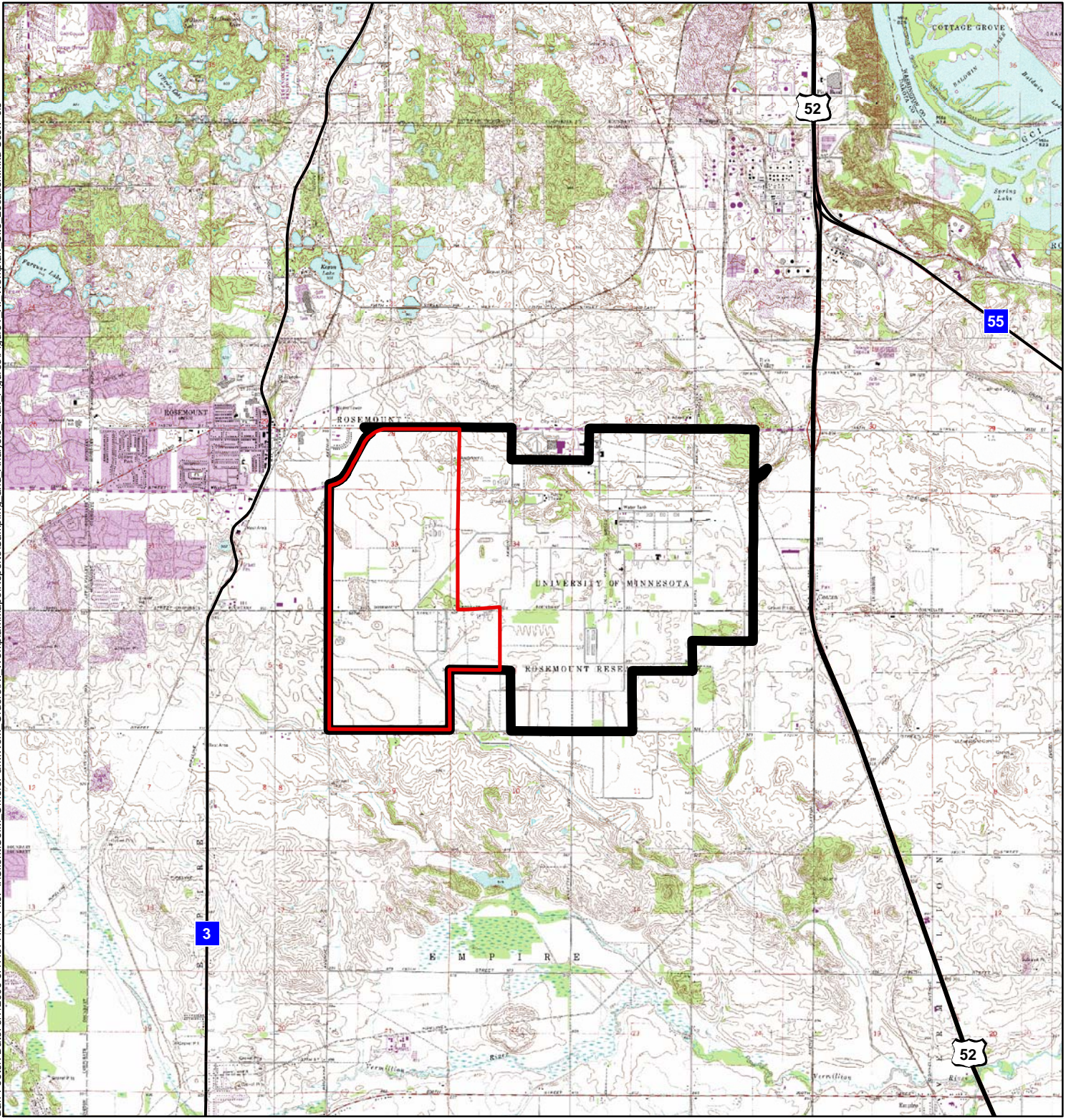
Parameter	Preservative/Container Type & Volume	EPA Recommended Holding Time
Soil		
Metals	Cool to $\leq 6^{\circ}\text{C}$, plastic or glass (2-oz)	180 days Mercury = 28 days
SVOCs	Cool to $\leq 6^{\circ}\text{C}$, glass (2-oz)	14 days to extraction; 40 days to analysis
VOCs	Cool to $\leq 6^{\circ}\text{C}$, 1:1 ratio soil:methanol (MeOH), glass (10 g to 10 ml solvent) 40 ml vial	14 days to extraction; 40 days to analysis
Pesticides (All lists)	Cool to $\leq 6^{\circ}\text{C}$, glass (2-oz)	14 days
Water		
Metals	NHO_3 to pH<2; Cool to $\leq 6^{\circ}\text{C}$, plastic (250 ml)	6 months Mercury = 28 days
SVOCs	Cool to $\leq 6^{\circ}\text{C}$, amber glass (1-liter)	7 days to extraction; 40 days to analysis
VOCs	Cool to $\leq 6^{\circ}\text{C}$, HCl to pH <2, glass (set of 2-40 ml vials)	14 days
Total Kjeldahl Nitrogen	H_2SO_4 to pH<2; Cool to $\leq 6^{\circ}\text{C}$, plastic (250 ml)	28 days
Nitrate Nitrogen and Nitrite Nitrogen as N	Cool to $\leq 6^{\circ}\text{C}$, plastic (250 ml)	48 hours
Pesticides	Cool to $\leq 6^{\circ}\text{C}$, glass (1-liter)	7 days to extraction; 40 days to analysis

**Table 4
Frequency of Quality Assurance Samples**

**Sampling and Analysis Plan, Phase II Investigation, SOCs 1-3 and 6-8
UMore Mining Area
Dakota County, Minnesota**

Parameter	Frequency	Comments
Field Blanks	1 collected every 20 samples	
Field Replicates	1 collected every 20 samples	Analyzed with field equipment only (i.e., replicate temp, pH or headspace readings to confirm instrument precision)
Field Duplicates	1 collected every 20 samples	Blind laboratory sample submittal
Methanol Blanks	1 collected every 20 samples	Made up in the laboratory, only analyzed with associated VOCs soil samples. (a soil trip blank)
Trip Blanks	1 placed in every shipping container containing VOC water samples.	Made up in the laboratory, only analyzed with associated VOCs water samples.
Matrix Spike, Matrix Spike Duplicates	1 collected every 20 samples to provide the laboratory with necessary QA/QC volume.	Batch MS/MSD samples are required for this project and will be performed on each matrix sampled. Since these batches should be representative of each matrix, project specific MS/MSD samples are not required for this project. Extra volume will be provided to the laboratory so that project samples may be used as MS/MSD samples.

Figures





-  UMore Mining Area (UMA)
-  UMore Park Boundary

Figure 1

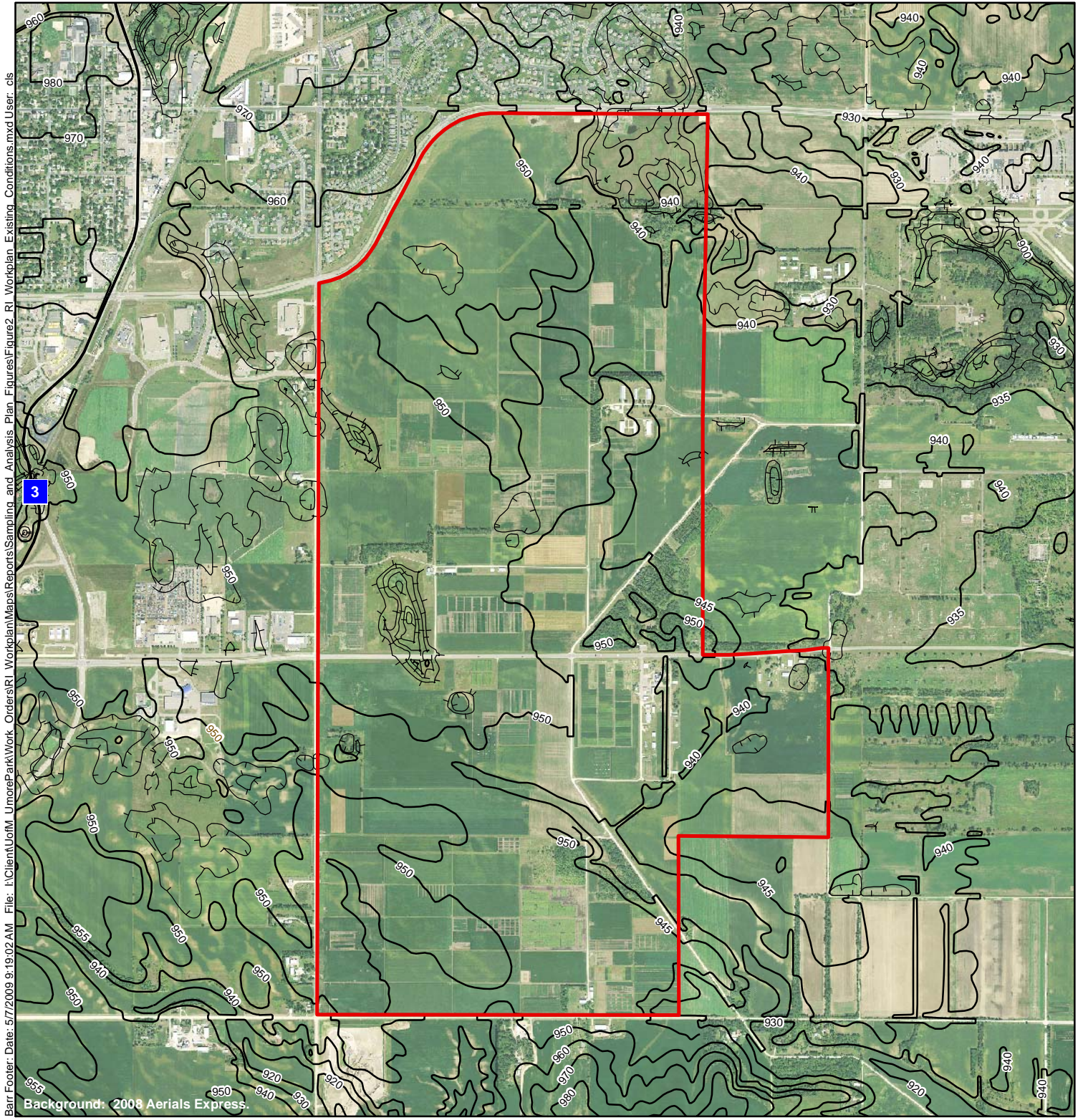
SITE LOCATION

Sampling and Analysis Plan
Phase II Investigation
Dakota County, MN



Source: MnDOT, MN DNR, Dakota County, Barr, SEH, HKGi.
USGS topographic map background downloaded from the U.S.
Department of Agriculture, Natural Resources Conservation Service.





Barr Footer: Date: 5/7/2009 9:19:02 AM File: I:\Client\JoM_UmorePark\Work_Orders\RI_Workplan\Maps\Reports\Sampling_and_Analysis_Plan_Figures\Figure2_RI_Workplan_Existing_Conditions.mxd User: cjs

- UMore Mining Area (UMA)
- Ground Surface Contour
- Depressional Ground Surface Contour

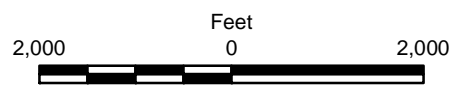


Figure 2

EXISTING CONDITIONS
 Sampling and Analysis Plan
 Phase II Investigation
 Dakota County, MN



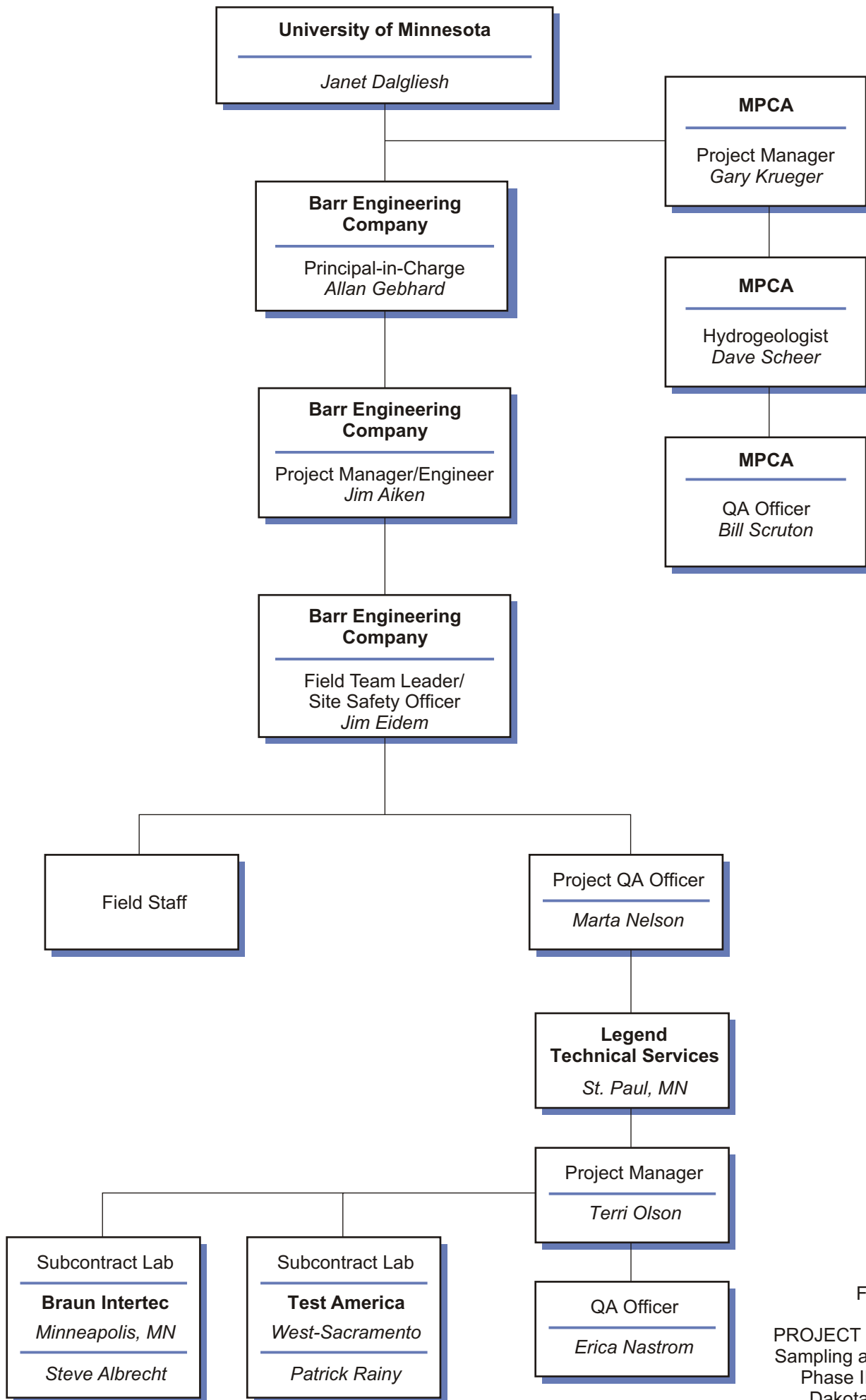
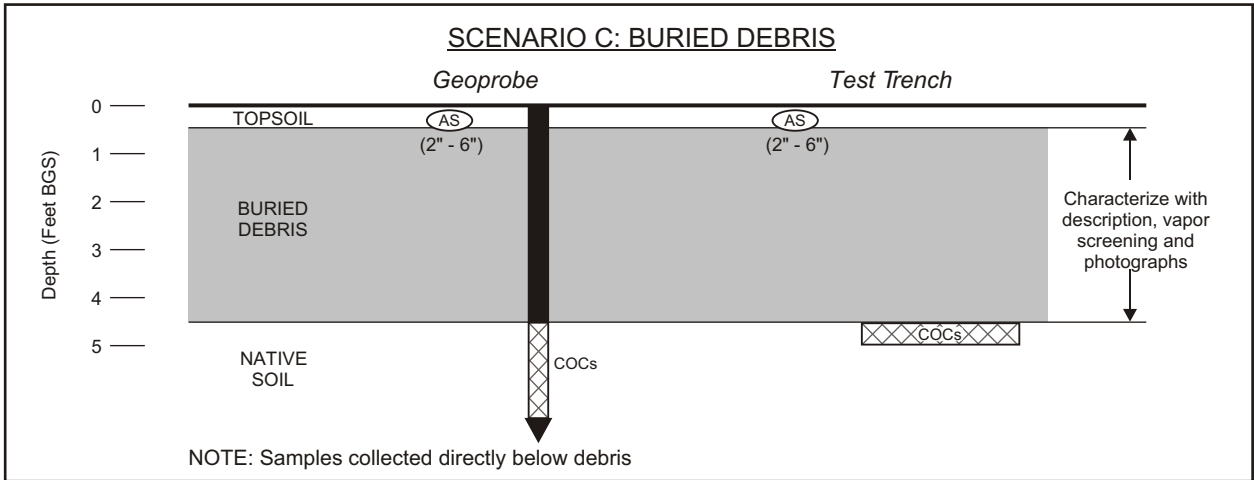
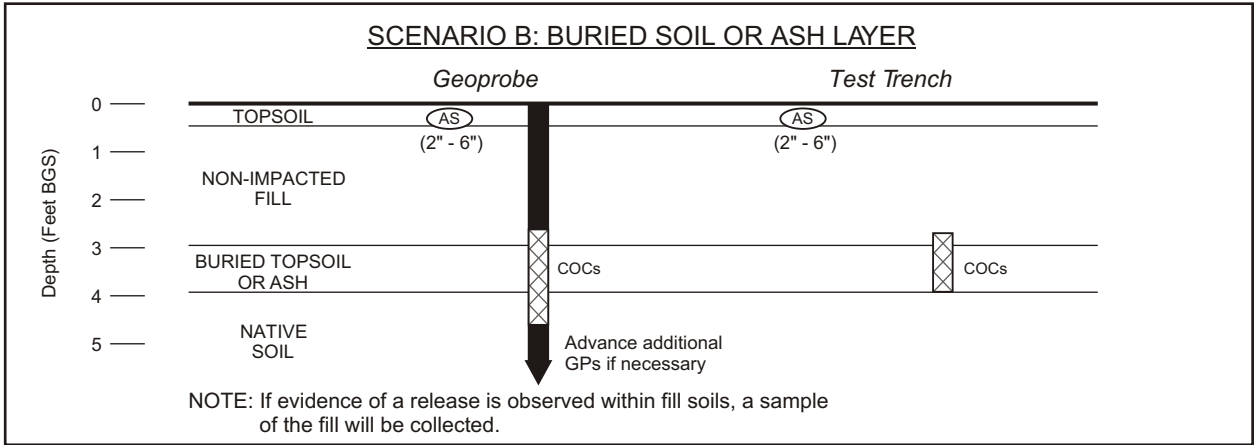
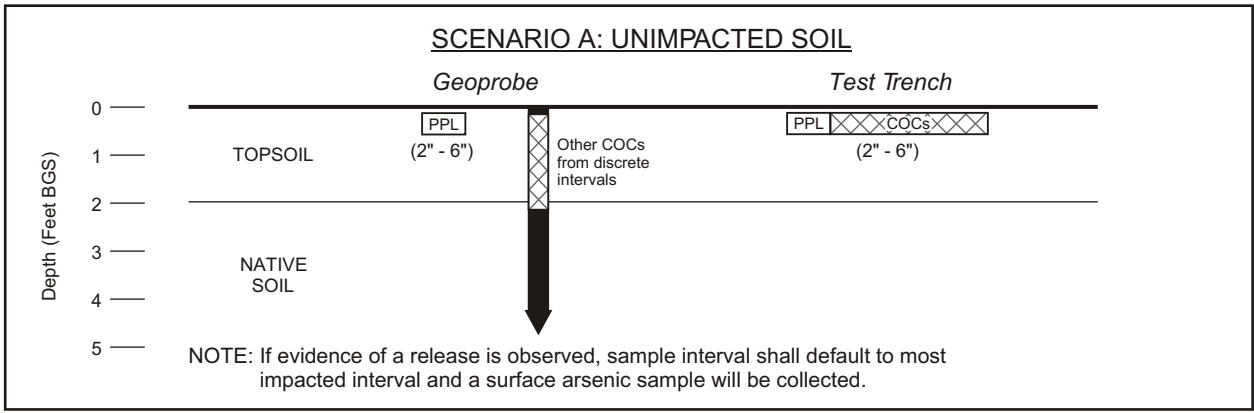


Figure 3
PROJECT ORGANIZATION
Sampling and Analysis Plan
Phase II Investigation
Dakota County, MN



SAMPLE EXPLANATION

- PPL Priority Pollutant Metals only Sample
- AS Arsenic only Sample
- XCOCsX SOC Specific Constituents of Concern Sampling Interval
- (2" - 6") Typical Sample Interval

SURFACE SOIL SAMPLING

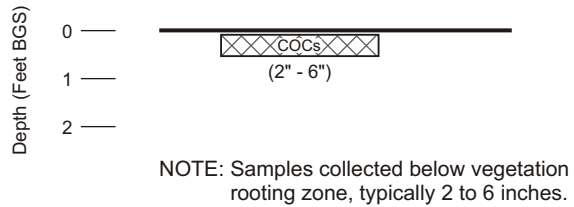


Figure 4