Trinity TA4 Legacy Tailings & River Rehab Geochemistry & Soil Science Study: Result Tables

1.0 Nyakabingo Result Tables

1.1 Sludge Waste Assessment Results

Table 1-1: Total Concentration Screening Results

Analyses	Units	TCT0	TCT1	TCT2	Sludge D3	Sludge BV8
As, Arsenic	mg/kg	5.8	500	2000	8388	728
B, Boron	mg/kg	150	1500	6000	14	23
Ba, Barium	mg/kg	62.5	6250	25000	507	101
Cd, Cadmium	mg/kg	7.5	260	1040	5.48	2.41
Co, Cobalt	mg/kg	50	5000	20000	132	41
CrTotal, Chromium Total	mg/kg	46000	800000	N/A	108	<10
Cu, Copper	mg/kg	16	19500	78000	804	245
Hg, Mercury	mg/kg	0.93	160	640	2.09	<0.400
Mn, Manganese	mg/kg	1000	25000	100000	1337	1026
Mo, Molybdenum	mg/kg	40	1000	4000	<10	<10
Ni, Nickel	mg/kg	91	10600	42400	159	46
Pb, Lead	mg/kg	20	1900	7600	32	2.71
Sb, Antimony	mg/kg	10	75	300	<0.400	<0.400
Se, Selenium	mg/kg	10	50	200	<0.400	0.457
V, Vanadium	mg/kg	150	2680	10720	50	<10
Zn, Zinc	mg/kg	240	160000	640000	342	111
Cr(VI), Chromium (VI) Total	mg/kg	6.5	500	2000	<2	<2
Total Fluoride	mg/kg	100	10000	40000	<0.5	12.58
Total Cyanide as CN	mg/kg	14	10500	42000	<1.55	<1.55

Table 1-2: Leachable Concentration Screening Results

Analyses	Units	LCT0	LCT1	LCT2	LCT3	Sludge D3	Sludge BV8
As, Arsenic	mg/l	0.01	0.5	1	4	0.254	0.004
B, Boron	mg/l	0.5	25	50	200	<0.025	<0.025
Ba, Barium	mg/l	0.7	35	70	280	0.039	3.11
Cd, Cadmium	mg/l	0.003	0.15	0.3	1.2	<0.001	<0.001
Co, Cobalt	mg/l	0.5	25	50	200	<0.025	<0.025
CrTotal, Chromium Total	mg/l	0.1	5	10	40	<0.025	<0.025
Cr(VI), Chromium (VI)	mg/l	0.05	2.5	5	20	<0.010	<0.010
Cu, Copper	mg/l	2	100	200	800	<0.010	<0.010
Hg, Mercury	mg/l	0.006	0.3	0.6	2.4	<0.001	<0.001
Mn, Manganese	mg/l	0.5	25	50	200	<0.025	<0.025
Mo, Molybdenum	mg/l	0.07	3.5	7	28	<0.025	<0.025
Ni, Nickel	mg/l	0.07	3.5	7	28	<0.025	<0.025
Pb, Lead	mg/l	0.01	0.5	1	4	<0.001	<0.001
Sb, Antimony	mg/l	0.02	1	2	8	<0.001	<0.001
Se, Selenium	mg/l	0.01	0.5	1	4	0.003	0.004
V, Vanadium	mg/l	0.2	10	20	80	<0.025	<0.025
Zn, Zinc	mg/l	5	250	500	2000	<0.025	<0.025
Total Dissolved Solids*	mg/l	1000	12500	25000	100000	436	1678
Chloride as Cl	mg/l	300	15000	30000	120000	<2	3
Sulphate as SO4	mg/l	250	12500	25000	100000	260	<2
Nitrate as N	mg/l	11	550	1100	4400	0.300	<0.1
Fluoride as F	mg/l	1.5	75	150	600	0.200	0.700
Total Cyanide as CN [o]	mg/l	0.07	3.5	7	28	<0.07	<0.07
pH		**NA**				11.10	12.70

Table 1-1: Waste Type Assessment Results

Sample Name	Waste Type	Reason for Classification	Landfill Disposal Requirement
Sludge D3	Type 0	Leachable concentration of As and SO_4^{2-} exceeds the LCT0 limit and the total concentrations of Ba, Co, Cu, Hg, Mn, Ni, Pb and Zn exceeds the TCT0 limits as well as As which exceeds the TCT2 limit. (LC>LCT3 or TC>TCT2)	Cannot be disposed before being treated and re-assessed
Sludge BV8	Type 1	Leachable concentration of Ba and TDS exceeds the LCT0 limit and the total concentrations of Ba, Cu and Mn exceeds the TCT0 limits as well as As which exceeds the TCT1 limit. (LCT2<LC≤LCT3 or TCT1<TC≤TCT2)	Class A landfill

1.2 River Sediment Results

Table 1-4: Particle Size Distribution

Mine	Sample ID	Stream Position	Gravel (2 - 75 mm)	Sand (0.05 - 2 mm)	Silt (0.002 - 0.05 mm)	Clay (< 0.002 mm)	Classification
			%	%	%	%	
Nyakabingo	NYKSED-48	Mid-stream	4	62	31	3	Silty Sand
	NYKSED-49	Downstream	2	60	37	1	
	NYKSED-50	Upstream	5	33	40	22	Sandy Silt

Table 1-5: XRD Mineralogy

Mineral	Formula	Mine		
		Nyakabingo		
		Sample ID		
		NYKSED-48	NYKSED-49	NYKSED-50
		Stream Position		
		Mid-stream	Downstream	Upstream
		Composition(%)		
Quartz	SiO_2	80.53	84.82	48.36
Hematite	Fe_2O_3	0.8	0.71	1.92
Kaolinite	$Al_2Si_2O_5(OH)_4$	3.11	2.29	10.74
Muscovite	$KAl_3Si_3O_{10}(OH)_2$	15.56	12.18	38.97

Table 1-6: Synthetic Precipitation Leaching Procedure (SPLP) Screening Results

Mine	Stream Position	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cr(VI)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)			**0.01**		**2.4**	**1.3**				**0.003**			**0.05**		**2**						
		2. WHO: Recreational Use (2021)		**18**	**0.2**										**1**		**40**						
		3. IFC: Mining Effluent			**0.1**							**0.05**						**0.3**				**2**	
		4. RS 109 of 2009: Effluent Standards				**0.01**												**3**				**3.5**	
		5. RS 188 (2013): Irrigation Use			**5**	**0.1**			**0.1**			**0.01**		**0.05**	**0.1**			**0.2**				**5**	
		6. RS 190 (2013): Livestock Watering			**5**	**2**					**200**	**0.5**		**1**	**1**			**0.5**				**0.3**	
	Mid-stream	NYKSED-48	**0.001**	8.63	0.034	**0.001**	**0.013**	0.056	**0.013**	**0.001**	23.63	**0.001**	0.098	0.213	0.013	**0.005**	**0.005**	0.584	**0.001**	**0.001**	**0.001**	0.287	0.004
	Downstream	NYKSED-49	**0.001**	2.11	0.004	**0.001**	**0.013**	0.087	**0.013**	**0.001**	12.03	**0.001**	0.029	0.123	0.013	**0.005**	**0.005**	0.517	**0.001**	**0.001**	**0.001**	0.040	0.007
Nyakabingo	Upstream	NYKSED-50	**0.001**	5.20	0.010	**0.001**	**0.013**	0.392	**0.013**	**0.001**	5.19	**0.001**	0.096	**0.013**	**0.013**	**0.005**	**0.005**	0.039	**0.001**	**0.001**	**0.001**	7.18	0.034

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)				**0.006**									**0.08**		**50**			**0.07**		
		2. WHO: Recreational Use (2021)													**8**					**1.4**		
		3. IFC: Mining Effluent				**0.002**														**0.5**		
		4. RS 109 of 2009: Effluent Standards				**0.002**														**3**		
		5. RS 188 (2013): Irrigation Use										**2.5**			**0.2**	**0.01**	**3**			**0.2**		
		6. RS 190 (2013): Livestock Watering				**0.05**				**20**				**80**	**0.5**		**100**			**1**		**1**
	Mid-stream	NYKSED-48	0.011	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	1.41	0.048	0.004	**0.001**	6.17	5.31	**0.013**	**0.500**	**0.001**	0.050	0.217	**0.001**	**0.001**
	Downstream	NYKSED-49	0.003	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	0.863	0.012	0.003	**0.001**	2.20	1.48	**0.013**	**0.500**	**0.001**	0.015	0.158	**0.001**	**0.001**
Nyakabingo	Upstream	NYKSED-50	0.004	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	1.92	0.042	0.001	**0.001**	2.19	0.740	**0.013**	**0.500**	**0.001**	0.030	**0.013**	**0.001**	0.146

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)	**0.01**							**0.02**		**0.04**										
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent	**0.2**																			
		4. RS 109 of 2009: Effluent Standards	**0.1**									**0.02**										
		5. RS 188 (2013): Irrigation Use	**5**									**0.02**										
		6. RS 190 (2013): Livestock Watering	**0.05**									**0.5**										
	Mid-stream	NYKSED-48	**0.001**	**0.001**	0.012	**0.001**	0.007	**0.001**	**0.001**	**0.001**	**0.001**	0.004	1.28	0.010	**0.001**	0.080	**0.001**	0.002	**0.001**	**0.001**	**0.001**	**0.001**
	Downstream	NYKSED-49	**0.001**	**0.001**	0.003	**0.001**	0.002	**0.001**	**0.001**	**0.001**	**0.001**	0.006	1.48	0.003	**0.001**	0.060	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**
Nyakabingo	Upstream	NYKSED-50	0.016	**0.001**	0.008	**0.001**	0.005	**0.001**	**0.001**	**0.001**	0.002	0.001	8.65	0.005	**0.001**	0.061	**0.001**	**0.001**	**0.001**	0.002	0.109	**0.001**

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr	pH	EC	TDS	Tot Alk	Cl	SO4	NO3	NO2	F	Free NH3	Ortho-P	Total Cn
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*		*mS/m*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)		**0.03**													**50**	**3**	**1.5**			
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent							**0.5**		**6-9**											**1**
		4. RS 109 of 2009: Effluent Standards							**5**		**5-9**		**2000**									
		5. RS 188 (2013): Irrigation Use			**0.1**				**2**				**450**				**5**		**1**			
		6. RS 190 (2013): Livestock Watering		**0.2**	**0.1**				**25**		**6-9**		**1000**	**500**	**100**	**250**	**25**	**10**				
	Mid-stream	NYKSED-48	**0.001**	0.003	**0.013**	**0.001**	0.037	0.004	0.475	**0.001**	3.50	42.80	287	3	2	180	**0.050**	**0.025**	0.200	0.700	**0.050**	**0.035**
	Downstream	NYKSED-49	**0.001**	0.001	**0.013**	**0.001**	0.013	0.001	0.363	**0.001**	3.90	18.60	125	3	1	67	0.400	**0.025**	0.200	0.100	**0.050**	**0.035**
Nyakabingo	Upstream	NYKSED-50	**0.001**	0.001	**0.013**	**0.001**	0.008	**0.001**	**0.013**	**0.001**	6.40	6.40	17	16	4	5	0.100	**0.025**	0.200	**0.050**	**0.050**	**0.035**

Note: Values in grey bold text represent below detection limit values.

Table 1-7: Total Concentration Screening Results

Mine	Stream Position	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)			**5.8**							**7.5**		**300**			**16**					
	Mid-stream	NYKSED-48	0.200	25288	542	0.200	90	130	5	1.037	200	0.200	1.00	5	72	0.200	38	0.200	0.200	0.200	37701	15
	Downstream	NYKSED-49	0.200	25886	417	0.200	101	175	5	1.271	200	0.200	5.87	5	159	0.541	49	0.200	0.200	0.200	45347	16
Nyakabingo	Upstream	NYKSED-50	0.200	41159	127	0.200	130	102	5	0.471	200	0.200	0.91	5	90	0.471	32	0.200	0.200	0.200	52507	23

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)				**1**									**740**					**91**		
	Mid-stream	NYKSED-48	0.200	1.76	0.71	3.32	0.200	0.200	0.200	11652	0.200	9.6	0.200	487	213	5	448	20.4	0.200	13.4	0.200	1543
	Downstream	NYKSED-49	0.200	2.03	0.200	5.79	0.200	0.200	0.200	10295	0.472	8.2	0.200	413	252	5	646	30.4	0.629	16.8	0.200	1567
Nyakabingo	Upstream	NYKSED-50	0.200	1.96	9.57	0.200	0.200	0.200	0.200	20589	0.200	10.3	0.200	0.200	224	5	2176	32.9	0.200	28.4	0.200	1381

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)	**20**																			
	Mid-stream	NYKSED-48	29.75	0.200	0.200	0.200	20.9	0.200	0.200	0.200	4.2	1.959	219222	0.200	3.5	5	3.63	0.200	0.200	3.81	9247	0.538
	Downstream	NYKSED-49	38.33	0.200	0.200	0.200	25.4	0.200	0.200	0.200	6.9	1.59	225221	0.200	3.3	11.5	5.30	0.200	0.578	8.26	15295	0.564
Nyakabingo	Upstream	NYKSED-50	30.09	0.200	0.200	0.200	39.4	0.200	0.200	0.200	8.7	0.200	175713	0.200	3.0	5	4.86	0.200	0.579	4.59	10704	1.04

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)			**150**				**240**	
	Mid-stream	NYKSED-48	0.200	3.46	70.23	687	0.200	0.200	23.2	161
	Downstream	NYKSED-49	0.200	4.46	79.21	1076	0.200	0.200	38.4	166
Nyakabingo	Upstream	NYKSED-50	0.200	3.37	137.62	8.41	0.200	0.200	29.0	190

Note: Values in grey bold text represent below detection limit values.

1.3 Legacy tailings Results

Table 1-8: XRD Mineralogy Results

Mineral	Formula	Mine		
		Nyakabingo		
		Sample ID		
		NYK-LT-45	NYK-LT-46	NYK-LT-47
		Rock Type		
		Shale	Quartz Vein	Meta Sandstone
Quartz	SiO_2	36.5	100	87.2
Muscovite	$KAl_3Si_3O_{10}(OH)_2$	60.73	-	5.65
Kaolinite	$Al_2Si_2O_5(OH)_4$	2.77	-	7.15

Table 1-9: Sulphur Speciation Results

Mine	Rock Type	Sample ID	Total Sulphur	Sulphide S	Sulphate Sulphur
			%	%	%
Nyakabingo	Shale	NYK-LT-45	<0.010	<0.010	<0.010
	Quartz Vein	NYK-LT-46	0.011	<0.010	0.010
	Meta Sandstone	NYK-LT-47	<0.010	<0.010	<0.010

Table 1-10: Acid Base Accounting (ABA) Screening Results

Mine	Rock Type	Sample ID	Paste pH	Total S	Sulphide Acid Potential (AP)	Neutralization Potential (NP)	Neutralisation potential ratio (NPR)	Nett Neutralization Potential (NNP)	Classification
			-	%	kg/t $CaCO_3$	kg/t $CaCO_3$		Kg/t $CaCO_3$	
		Non-PAG	**>5.5**	**<0.3**			**>4**	**>20**	
		Intermediate	**3.5-5.5**				**1 to 4**	**-20 to 20**	
		PAG/AG	**<3.5**	**>0.3**			**<1**	**<-20**	
Nyakabingo	Shale	NYK-LT-45	8.1	<0.010	0.313	-0.988	3.16	-1.30	Non-PAG
	Quartz Vein	NYK-LT-46	6.5	0.011	0.344	1.24	3.61	0.896	Non-PAG
	Meta Sandstone	NYK-LT-47	6.1	<0.010	0.313	-0.493	1.58	-0.805	Intermediate

Table 1-11: Synthetic Precipitation Leaching Procedure (SPLP) Screening Results

Mine	Rock Type	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cr(VI)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)			**0.01**		**2.4**	**1.3**				**0.003**			**0.05**		**2**						
		2. WHO: Recreational Use (2021)		**18**	**0.2**										**1**		**40**						
		3. IFC: Mining Effluent			**0.1**							**0.05**						**0.3**				**2**	
		4. RS 109 of 2009: Effluent Standards				**0.01**												**3**				**3.5**	
		5. RS 188 (2013): Irrigation Use			**5**	**0.1**			**0.1**			**0.01**		**0.05**	**0.1**			**0.2**				**5**	
		6. RS 190 (2013): Livestock Watering			**5**	**2**					**200**	**0.5**		**1**	**1**			**0.5**				**0.3**	
Nyakabingo	Shale	NYK-LT-45	**0.0005**	**0.0005**	0.004	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	**0.0005**	**0.013**	**0.005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**
	Quartz Vein	NYK-LT-46	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.36	**0.0005**	**0.0005**	**0.013**	**0.005**	**0.013**	0.002	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**
	Meta Sandstone	NYK-LT-47	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	2.83	**0.0005**	**0.0005**	**0.013**	**0.005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.125	**0.0005**

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)				**0.006**									**0.08**		**50**			**0.07**		
		2. WHO: Recreational Use (2021)													**8**					**1.4**		
		3. IFC: Mining Effluent				**0.002**														**0.5**		
		4. RS 109 of 2009: Effluent Standards				**0.002**														**3**		
		5. RS 188 (2013): Irrigation Use										**2.5**			**0.2**	**0.01**	**3**			**0.2**		
		6. RS 190 (2013): Livestock Watering				**0.05**				**20**				**80**	**0.5**		**100**			**1**		**1**
Nyakabingo	Shale	NYK-LT-45	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	3.93	**0.0005**	**0.0005**	**0.0005**	**0.500**	**0.013**	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.058
	Quartz Vein	NYK-LT-46	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.25**	**0.0005**	**0.0005**	**0.0005**	**0.500**	0.42	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.194
	Meta Sandstone	NYK-LT-47	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.22	**0.0005**	**0.0005**	**0.0005**	**0.500**	0.275	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)	**0.01**							**0.02**		**0.04**										
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent	**0.2**																			
		4. RS 109 of 2009: Effluent Standards	**0.1**									**0.02**										
		5. RS 188 (2013): Irrigation Use	**5**									**0.02**										
		6. RS 190 (2013): Livestock Watering	**0.05**									**0.5**										
Nyakabingo	Shale	NYK-LT-45	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.011	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.136	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartz Vein	NYK-LT-46	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.211	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Meta Sandstone	NYK-LT-47	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.004	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.481	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr	pH	EC	TDS	Tot Alk	Cl	SO4	NO3	NO2	F	Free NH3	Ortho-P	Total Cn
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*		*mS/m*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	
		1. WHO: Drinking Water (2022)		**0.03**													**50**	**3**	**1.5**			
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent							**0.5**		**6-9**											**1**
		4. RS 109 of 2009: Effluent Standards							**5**		**5-9**		**2000**									
		5. RS 188 (2013): Irrigation Use			**0.1**				**2**				**450**				**5**		**1**			
		6. RS 190 (2013): Livestock Watering		**0.2**	**0.1**				**25**		**6-9**		**1000**	**500**	**100**	**250**	**25**	**10**				
Nyakabingo	Shale	NYK-LT-45	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	7.10	1.30	38	20	**1**	**1**	1.1	**0.025**	**0.1**	0.3	**0.05**	**0.035**
	Quartz Vein	NYK-LT-46	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.00	1.50	**5**	30	**1**	**1**	**0.05**	**0.025**	**0.1**	**0.05**	0.1	**0.035**
	Meta Sandstone	NYK-LT-47	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.80	4.00	14	20	**1**	**1**	2.6	**0.025**	**0.1**	0.3	**0.05**	**0.035**

Note: Values in grey bold text represent below detection limit values.

1.4 Downstream Soil Results

Table 1-12: Physicochemical Parameters

Soil physicochemical parameters									
Mine	Sample ID	Particle size (%)			Soil Texture Class	Density (g/cm^3)	Organic Carbon (%)	pH (H_2O)	EC (µS/cm)	Cation Exchange Capacity ($cmol_c/kg$)
		Sand	Silt	Clay						
Nyakabingo	NYKSS-02	55	22	23	Sandy clay loam	1.09	1.00	5.72	52	5.56

Table 1-13: Plant Available Results

Mine	Sample ID	Nutrient Status (mg/kg)													
		Ca	Mg	K	P	S	Fe	Mn	Zn	Cu	B	Mo	Co	Si	Ni
Nyakabingo	NYKSS-02	418	107	29	6.00	7.84	192.96	112.19	2.18	3.74	0.6	0.13	0.11	78.1	0.10

Table 1-13: Heavy Metal Screening Results

Mine	Analytes	Ag	As	B	Ba	Be	Bi	Cd	Co	Cr (total)	Cu	Ge	Hg	Mn	Mo	Nb	Ni
	Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
	SSV1 (All Land Uses Protective of the Water Resource)		**5.8**					**7.5**	**300**		**16**		**1**	**740**			**91**
Nyakabingo	NYKSS-02	4.50	<0.01	0.71	65.12	0.48	<0.01	<0.01	6.91	22.05	23.79	4.80	<0.01	564	<0.01	12.04	5.24

Mine	Analytes	Pb	Pd	Sb	Se	Si	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	Zn	Zr
	Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
	SSV1 (All Land Uses Protective of the Water Resource)	**20**													**150**	**240**	
Nyakabingo	NYKSS-02	1.99	315	<0.01	<0.01	111	<0.01	10.91	<0.01	<0.01	19.47	321	<0.01	93.41	33.66	42.08	2.4

2.0 Rutongo Result Tables

2.1 River Sediment Results

Table 2-1: Particle Size Distribution

Mine	Sample ID	Stream position	Gravel (2 - 75 mm)	Sand (0.05 - 2 mm)	Silt (0.002 - 0.05 mm)	Clay (< 0.002 mm)	Classification
			%	%	%	%	
Nyanyumba	NYASED-02	Downstream	10	82	7	1	Gravelly Sand
	NYASED-03	Upstream	36	58	5	1	Gravelly Sand
Masoro	MASED-09	Downstream	41	55	4	-	Gravelly Sand
	MASED-31	Upstream	5	81	10	4	Silty Sand
Gasambya	GASED-13	Upstream	57	36	5	2	Sandy Gravel
	GASED-14	Downstream	29	70	1	-	Gravelly Sand
Mahaza	MAHSED-15	Upstream	-	45	40	15	Silty Sand
	MAHSED-19	Downstream	-	25	60	15	Sandy Silt
Gisanze	GSED-20	Upstream	-	63	30	7	Silty Sand
	GSED-24	Downstream	-	25	64	11	Sandy Silt
Karambo	KSED-25	Upstream	2	84	13	1	Silty Sand
	KSED-26	Downstream	51	32	16	1	Sandy Gravel

Table 2-2: XRD Mineralogy

Mineral	Formula	Mine											
		Nyanyumba		Masoro		Gasambya		Mahaza		Gisanze		Karambo	
		Sample ID											
		NYASED-02	NYASED-03	MASED-09	MASED-31	GASED-13	GASED-14	MAHSED-15	MAHSED-19	GSED-20	GSED-24	KSED-25	KSED-26
		Stream Position											
		Downstream	Upstream	Downstream	Upstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
		Composition (%)											
Quartz	SiO_2	90.35	91.85	90.92	84.92	80.48	96.99	69.61	59.98	78.33	48.95	91.86	86.76
Hematite	Fe_2O_3	0.5	2	0.45	0.49	4.45	0.93	-	-	0.43	0.53	0.15	0.05
Kaolinite	$Al_2Si_2O_5(OH)_4$	2.1	3.06	1.76	2.81	9.13	1.17	7.21	10.97	2.07	8.5	1.23	0.77
Muscovite	$KAl_3Si_3O_{10}(OH)_2$	5.38	2.35	4.16	8.53	4.15	0.65	23.18	28.12	15.82	36.82	2.16	9.03
Schorl	$NaFe_3Al_6(BO_3)_3(Si_6O_{18})(OH)_4$	1.67	0.73	2.7	3.25	1.79	0.26	-	0.94	3.35	5.2	4.6	3.39

Table 2-3: Synthetic Precipitation Leaching Procedure Screening Results

Mine	Stream Position	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cr(VI)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)			**0.01**		**2.4**	**1.3**				**0.003**			**0.05**		**2**						
		2. WHO: Recreational Use (2021)		**18**	**0.2**										**1**		**40**						
		3. IFC: Mining Effluent			**0.1**							**0.05**						**0.3**				**2**	
		4. RS 109 of 2009: Effluent Standards				**0.01**												**3**				**3.5**	
		5. RS 188 (2013): Irrigation Use			**5**	**0.1**			**0.1**			**0.01**		**0.05**	**0.1**			**0.2**				**5**	
		6. RS 190 (2013): Livestock Watering			**5**	**2**					**200**	**0.5**		**1**	**1**			**0.5**				**0.3**	
Nyanyumba	Downstream	NYASED-02	0.009	1.07	0.004	0.001	0.013	0.013	0.013	0.001	1.48	0.001	0.006	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	1.51	0.002
	Upstream	NYASED-03	0.005	0.103	0.002	0.001	0.013	0.085	0.013	0.001	4.02	0.001	0.001	0.031	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.101	0.007
Masoro	Downstream	MASED-09	0.003	1.09	0.012	0.001	0.013	0.030	0.013	0.001	1.60	0.001	0.009	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	5.84	0.003
	Upstream	MASED-31	0.016	0.050	0.001	0.001	0.013	0.013	0.013	0.001	0.997	0.001	0.001	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.058	0.001
Gasambya	Upstream	GASED-13	0.007	0.428	0.002	0.001	0.013	0.013	0.013	0.001	1.34	0.001	0.002	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.307	0.001
	Downstream	GASED-14	0.005	0.050	0.003	0.001	0.013	0.013	0.013	0.001	1.17	0.001	0.001	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.013	0.001
Mahaza	Upstream	MAHSED-15	0.002	0.050	0.003	0.001	0.013	0.052	0.013	0.001	6.74	0.001	0.001	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.088	0.004
	Downstream	MAHSED-19	0.001	0.050	0.002	0.001	0.013	0.060	0.013	0.001	11.27	0.001	0.001	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.093	0.005
Gisanze	Upstream	GSED-20	0.001	2.34	0.007	0.001	0.013	0.132	0.013	0.001	3.75	0.001	0.018	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	25.8	0.011
	Downstream	GSED-24	0.023	1.92	0.010	0.001	0.013	0.033	0.013	0.001	2.50	0.001	0.008	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	4.33	0.005
Karambo	Upstream	KSED-25	0.010	0.303	0.002	0.001	0.013	0.013	0.013	0.001	1.40	0.001	0.002	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.403	0.001
	Downstream	KSED-26	0.006	0.279	0.019	0.001	0.013	0.013	**0.013**	0.001	1.33	0.001	0.002	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.497	0.002

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)				**0.006**									**0.08**		**50**			**0.07**		
		2. WHO: Recreational Use (2021)													**8**					**1.4**		
		3. IFC: Mining Effluent				**0.002**														**0.5**		
		4. RS 109 of 2009: Effluent Standards				**0.002**														**3**		
		5. RS 188 (2013): Irrigation Use										**2.5**			**0.2**	**0.01**	**3**			**0.2**		
		6. RS 190 (2013): Livestock Watering				**0.05**				**20**				**80**	**0.5**		**100**			**1**		**1**
Nyanyumba	Downstream	NYASED-02	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.678	0.003	0.001	0.001	0.500	0.140	0.013	0.500	0.001	0.002	0.013	0.001	0.001
	Upstream	NYASED-03	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.00	0.001	0.002	0.001	1.21	3.14	0.013	0.500	0.001	0.001	0.013	0.001	0.001
Masoro	Downstream	MASED-09	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.602	0.004	0.001	0.001	0.500	0.179	0.013	0.500	0.001	0.003	0.013	0.001	0.001
	Upstream	MASED-31	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.250	0.001	0.002	0.001	0.500	0.076	0.013	0.500	0.001	0.001	0.013	0.001	0.001
Gasambya	Upstream	GASED-13	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.732	0.001	0.001	0.001	0.500	0.044	0.013	0.500	0.001	0.001	0.013	0.001	0.001
	Downstream	GASED-14	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.250	0.001	0.001	0.001	0.500	0.096	0.013	0.500	0.001	0.001	0.013	0.001	0.001
Mahaza	Upstream	MAHSED-15	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.54	0.001	0.002	0.001	2.48	1.92	0.013	0.500	0.001	0.001	0.013	0.001	0.001
	Downstream	MAHSED-19	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.99	0.001	0.003	0.001	4.13	2.81	0.013	0.500	0.001	0.001	0.013	0.001	0.001
Gisanze	Upstream	GSED-20	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.29	0.007	0.001	0.001	0.951	1.74	0.013	0.500	0.001	0.006	0.013	0.001	0.346
	Downstream	GSED-24	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.02	0.004	0.001	0.001	0.500	0.314	0.013	0.500	0.001	0.003	0.013	0.001	0.034
Karambo	Upstream	KSED-25	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.250	0.001	0.001	0.001	0.500	0.056	0.013	0.500	0.001	0.001	0.013	0.001	0.001
	Downstream	KSED-26	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.950	0.001	0.003	0.001	0.500	0.153	0.013	0.500	0.001	0.001	0.013	0.001	0.001

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)	**0.01**							**0.02**		**0.04**										
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent	**0.2**																			
		4. RS 109 of 2009: Effluent Standards	**0.1**									**0.02**										
		5. RS 188 (2013): Irrigation Use	**5**									**0.02**										
		6. RS 190 (2013): Livestock Watering	**0.05**									**0.5**										
Nyanyumba	Downstream	NYASED-02	0.004	**0.001**	**0.001**	**0.001**	0.002	**0.001**	**0.001**	**0.001**	**0.001**	0.004	1.67	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.001**	0.012	**0.001**
	Upstream	NYASED-03	**0.001**	**0.001**	**0.001**	**0.001**	0.003	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	1.36	**0.001**	**0.001**	0.041	**0.001**	**0.001**	**0.001**	**0.001**	0.002	**0.001**
Masoro	Downstream	MASED-09	0.005	**0.001**	**0.001**	**0.001**	0.001	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	1.94	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	0.001	0.021	**0.001**
	Upstream	MASED-31	**0.001**	**0.001**	**0.001**	**0.001**	0.001	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	1.10	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	0.002	0.003	**0.001**
Gasambya	Upstream	GASED-13	0.001	**0.001**	**0.001**	**0.001**	0.001	**0.001**	**0.001**	**0.001**	**0.001**	0.002	2.09	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	0.001	**0.001**	**0.001**
	Downstream	GASED-14	**0.001**	**0.001**	**0.001**	**0.001**	0.002	**0.001**	**0.001**	**0.001**	**0.001**	0.006	1.09	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**
Mahaza	Upstream	MAHSED-15	**0.001**	**0.001**	**0.001**	**0.001**	0.002	**0.001**	**0.001**	**0.001**	**0.001**	0.001	3.05	**0.001**	**0.001**	0.069	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**
	Downstream	MAHSED-19	**0.001**	**0.001**	**0.001**	**0.001**	0.003	**0.001**	**0.001**	**0.001**	**0.001**	0.003	3.43	**0.001**	**0.001**	0.112	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**
Gisanze	Upstream	GSED-20	0.016	**0.001**	0.002	**0.001**	0.006	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	6.01	0.001	**0.001**	0.037	**0.001**	**0.001**	**0.001**	0.004	0.053	**0.001**
	Downstream	GSED-24	0.008	**0.001**	**0.001**	**0.001**	0.004	**0.001**	**0.001**	**0.001**	**0.001**	0.001	2.47	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	0.002	0.016	**0.001**
Karambo	Upstream	KSED-25	0.001	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	0.001	1.16	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.001**	0.002	**0.001**
	Downstream	KSED-26	0.008	**0.001**	**0.001**	**0.001**	0.002	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	1.15	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.001**	0.002	**0.001**

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr	pH	EC	TDS	Tot Alk	Cl	SO4	NO3	NO2	F	Free NH3	Ortho-P	Total Cn
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*		*mS/m*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	
		1. WHO: Drinking Water (2022)		**0.03**													**50**	**3**	**1.5**			
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent							**0.5**		**6-9**											**1**
		4. RS 109 of 2009: Effluent Standards							**5**		**5-9**		**2000**									
		5. RS 188 (2013): Irrigation Use			**0.1**				**2**				**450**				**5**		**1**			
		6. RS 190 (2013): Livestock Watering		**0.2**	**0.1**				**25**		**6-9**		**1000**	**500**	**100**	**250**	**25**	**10**				
Nyanyumba	Downstream	NYASED-02	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	6.00	1.20	**5**	12	2	2	0.200	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
	Upstream	NYASED-03	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.00	6.20	42	12	**1**	17	**0.050**	**0.025**	**0.100**	0.100	**0.050**	**0.035**
Masoro	Downstream	MASED-09	**0.001**	**0.001**	**0.013**	**0.001**	0.001	**0.001**	**0.013**	**0.001**	5.70	1.20	**5**	16	3	**1**	**0.050**	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
	Upstream	MASED-31	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.20	1.30	**5**	16	**1**	**1**	0.100	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
Gasambya	Upstream	GASED-13	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.80	1.20	**5**	8	2	**1**	0.100	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
	Downstream	GASED-14	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.20	1.70	11	12	**1**	**1**	0.100	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
Mahaza	Upstream	MAHSED-15	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.20	8.10	54	12	**1**	28	**0.050**	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
	Downstream	MAHSED-19	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.00	13.20	88	8	**1**	59	**0.050**	**0.025**	**0.100**	0.100	**0.050**	**0.035**
Gisanze	Upstream	GSED-20	**0.001**	**0.001**	**0.013**	**0.001**	0.002	**0.001**	0.025	**0.003**	6.00	2.80	19	12	2	5	0.100	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
	Downstream	GSED-24	**0.001**	**0.001**	**0.013**	**0.001**	0.001	**0.001**	**0.013**	**0.005**	5.50	1.80	12	16	2	3	**0.050**	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
Karambo	Upstream	KSED-25	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	6.10	1.10	**5**	12	2	**1**	0.100	**0.025**	**0.100**	**0.050**	**0.050**	**0.035**
	Downstream	KSED-26	**0.001**	**0.001**	**0.013**	**0.001**	**0.001**	**0.001**	**0.013**	**0.001**	5.60	1.70	11	12	**1**	2	0.200	**0.025**	**0.100**	0.100	**0.050**	**0.035**

Note: Values in grey bold text represent below detection limit values.

Table 2-4: Total Concentration Screening Results

Mine	Stream Position	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)			**5.8**							**7.5**		**300**			**16**					
Nyanyumba	Downstream	NYASED-02	0.200	15020	226	0.200	440	111	5	0.818	664	0.200	5.39	5	130	1.94	12	0.200	0.200	0.200	27618	18
	Upstream	NYASED-03	0.200	15543	401	0.200	207	82	5	10.151	200	0.200	2.39	5	115	1.22	11	0.200	0.200	0.200	61397	17
Masoro	Downstream	MASED-09	0.200	13059	165	0.200	860	38	5	0.796	200	0.200	1.38	5	44	0.578	12	0.200	0.200	0.200	28214	12
	Upstream	MASED-31	0.200	15839	326	0.200	776	41	5	0.894	200	0.200	2.32	5	65	1.53	22	0.200	0.200	0.200	39724	16
Gasambya	Upstream	GASED-13	0.200	18382	1443	0.200	368	45	5	0.810	200	0.200	5.49	5	261	0.799	25	0.200	0.200	0.200	104466	19
	Downstream	GASED-14	0.200	8128	296	0.200	632	28	5	1.787	200	0.200	0.200	5	211	1.34	7	0.200	0.200	0.200	35108	6
Mahaza	Upstream	MAHSED-15	0.200	29588	60	0.200	608	96	5	0.647	200	0.200	0.200	5	694	0.733	15	0.200	0.200	0.200	28168	16
	Downstream	MAHSED-19	0.200	51258	66	0.200	582	162	5	0.696	200	0.200	0.200	5	126	0.774	19	0.200	0.200	0.200	33481	16
Gisanze	Upstream	GSED-20	0.200	24758	67	0.200	1463	64	5	1.971	200	0.200	0.200	5	83	4.22	12	0.200	0.200	0.200	37815	14
	Downstream	GSED-24	0.200	32209	93	0.200	1418	44	5	1.448	200	0.200	0.200	5	138	4.76	12	0.200	0.200	0.200	34147	20
Karambo	Upstream	KSED-25	0.200	13625	61	0.200	2051	61	5	0.620	200	0.200	0.200	5	158	1.12	7	0.200	0.200	0.200	22354	9
	Downstream	KSED-26	5.761	16414	376	0.200	1707	135	5	3.079	200	0.200	0.644	5	238	4.43	17	0.200	0.200	0.200	33764	16

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)				**1**									**740**					**91**		
Nyanyumba	Downstream	NYASED-02	0.200	2.71	5.69	0.200	0.200	0.200	0.200	5466	0.200	30.6	0.200	732	384	5	200	14.5	0.576	5	0.200	1149
	Upstream	NYASED-03	0.200	2.79	5.32	0.200	0.200	0.200	0.200	3894	0.404	20.7	0.200	0.200	92	5	200	9.8	0.480	5	0.200	1307
Masoro	Downstream	MASED-09	0.200	2.60	7.80	0.200	0.200	0.200	0.200	3758	0.200	15.5	0.200	519	100	5	200	18.3	0.200	5	0.200	1237
	Upstream	MASED-31	0.200	3.59	6.26	0.200	0.200	0.200	0.200	6129	0.200	33.8	0.200	460	122	5	200	24.0	0.200	11.4	0.200	1184
Gasambya	Upstream	GASED-13	0.200	2.16	4.52	0.200	0.200	0.200	0.200	3839	0.843	14.0	0.200	0.200	46	5	200	13.1	0.809	5	0.200	1297
	Downstream	GASED-14	0.200	1.87	4.84	0.200	0.200	0.200	0.200	1582	0.200	12.6	0.200	0.200	76	5	200	6.2	0.200	14.7	0.200	1148
Mahaza	Upstream	MAHSED-15	0.200	2.28	13.00	0.200	0.200	0.200	0.200	14927	0.200	31.7	0.200	677	204	5	773	22.3	0.200	19.3	0.200	1266
	Downstream	MAHSED-19	0.200	2.12	12.56	0.200	0.200	0.200	0.200	18519	0.200	34.9	0.200	739	283	5	906	27.7	0.200	12.3	0.200	1368
Gisanze	Upstream	GSED-20	0.200	1.59	6.50	0.200	0.200	0.200	0.200	11467	0.200	24.7	0.200	663	276	5	702	17.3	0.200	12.1	0.200	1453
	Downstream	GSED-24	0.200	2.31	11.06	0.200	0.200	0.200	0.200	24143	0.200	73.9	0.200	472	105	5	905	23.2	0.200	14.7	0.200	1255
Karambo	Upstream	KSED-25	0.200	1.60	6.23	0.200	0.200	0.200	0.200	4501	0.200	31.1	0.200	626	133	5	772	9.0	0.200	5	0.200	1242
	Downstream	KSED-26	0.200	2.67	5.95	0.200	0.200	0.200	0.200	7370	0.200	61.5	0.200	599	121	5	415	6.8	0.700	13.2	0.200	1473

Note: Values in grey bold text represent below detection limit values.

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)	**20**																			
Nyanyumba	Downstream	NYASED-02	23.70	0.200	0.200	0.200	14.4	0.200	0.200	0.200	5.5	6.08	283524	0.200	20.1	11.7	1.86	0.200	0.200	3.98	3768	0.200
	Upstream	NYASED-03	25.71	0.200	0.200	0.200	12.5	0.200	0.200	0.200	5.3	2.54	275132	0.200	12.2	5	1.24	0.200	0.200	6.00	2611	0.200
Masoro	Downstream	MASED-09	16.86	0.200	0.200	0.200	6.0	0.200	0.200	0.200	4.2	0.200	278116	0.200	17.3	5	1.91	0.200	0.200	3.93	5384	0.200
	Upstream	MASED-31	23.54	0.200	0.200	0.200	13.9	0.200	0.200	0.200	4.9	6.16	261608	0.200	26.9	5	2.16	0.200	0.200	2.83	5927	0.200
Gasambya	Upstream	GASED-13	86.62	0.200	0.200	0.200	11.9	0.200	0.200	0.793	6.7	0.200	223532	0.200	10.4	5	1.24	0.200	0.200	6.59	2549	0.200
	Downstream	GASED-14	16.61	0.200	0.200	0.200	8.6	0.200	0.200	0.200	3.3	1.43	255569	0.200	7.9	5	5.63	0.200	0.200	3.83	1973	0.200
Mahaza	Upstream	MAHSED-15	37.93	0.200	0.200	0.200	20.0	0.200	0.200	0.200	5.7	0.200	218393	0.200	12.7	5	6.37	0.200	0.200	2.13	7673	0.734
	Downstream	MAHSED-19	36.43	0.200	0.200	0.200	23.3	0.200	0.200	0.200	6.1	0.200	185855	0.200	15.6	10.6	6.67	0.200	0.200	1.93	7531	0.899
Gisanze	Upstream	GSED-20	26.66	0.200	0.200	0.200	46.5	0.200	0.200	0.200	3.6	0.200	222090	0.200	43.8	5	9.62	0.200	0.200	1.97	5531	1.19
	Downstream	GSED-24	35.37	0.200	0.200	0.200	47.4	0.200	0.200	0.200	6.1	0.67	180677	0.200	62.2	5	8.33	0.200	0.200	1.18	7376	1.51
Karambo	Upstream	KSED-25	40.17	0.200	0.200	0.200	9.1	0.200	0.200	0.200	3.1	0.200	272563	0.200	16.2	5	4.24	0.200	0.200	2.82	4589	0.200
	Downstream	KSED-26	142.66	2.26	0.200	0.200	27.3	0.200	0.200	0.200	7.3	0.200	231278	0.200	34.9	16.6	5.33	0.200	0.200	3.62	2060	0.617

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)			**150**				**240**	
Nyanyumba	Downstream	NYASED-02	0.200	2.09	67.65	2.51	0.200	0.200	25.8	143
	Upstream	NYASED-03	0.200	1.98	134.55	2.59	0.200	0.200	17.5	142
Masoro	Downstream	MASED-09	0.200	2.42	51.16	2.05	0.200	0.200	28.5	218
	Upstream	MASED-31	0.200	2.40	98.81	2.85	0.200	0.200	37.0	174
Gasambya	Upstream	GASED-13	0.200	3.81	212.33	2.43	0.200	0.200	27.5	126
	Downstream	GASED-14	0.200	1.36	80.31	0.99	0.200	0.200	5.9	78
Mahaza	Upstream	MAHSED-15	0.200	3.30	102.64	6.63	0.200	0.200	32.6	241
	Downstream	MAHSED-19	0.200	3.43	113.03	12.54	0.200	0.200	43.5	234
Gisanze	Upstream	GSED-20	0.200	2.50	65.19	7.32	0.200	0.200	32.3	118
	Downstream	GSED-24	0.200	2.64	127.05	4.90	0.200	0.200	28.6	211
Karambo	Upstream	KSED-25	0.200	1.82	47.79	4.26	0.200	0.200	19.7	111
	Downstream	KSED-26	0.200	2.48	56.34	9.56	0.200	0.200	36.7	55

Note: Values in grey bold text represent below detection limit values.

2.2 Legacy Tailings Results

Table 2-5: XRD Mineralogy Results

Mineral	Formula	Mine																
		Nyanyumba		Masoro			Gasambya			Mahaza			Gisanze			Karambo		
		Sample ID																
		NYA-SN-01 &03	NYA-SN-02&04	MAS-BV-05	MAS-BV-06	MAS-BV-07	GA-TS-10	GA-TS-11	GA-TS-12	MAH-TS-16	MAH-TS-17	MAH-TS-18	GS-TS-21	GS-TS-22	GS-TS-23	KE-LT-27	KE-LT-28	KE-LT-29	KE-LT-30
		Rock type																
		Quartz Vein	Quartzite	Schist	Quartz Vein	Quartzite	Schist	Quartzite	Quartz Vein	Quartz Vein	Quartzite	Phylite	Quartzite	Phyllite	Quartz Vein	Fe rich Quartz Vein	Quartz Vein	Phylitte	Quartzite
		Composition (%)																
Quartz	SiO_2	100	83.21	34.26	100	96.98	29.05	98.08	100	100	80.99	19.22	71.93	28.92	100	35.3	100	7.11	96.14
Muscovite	$KAl_3Si_3O_{10}(OH)_2$	-	16.79	57.74	-	0.23	63.17	0.89	-	-	4.88	66.04	23.56	67.77	-	-	-	82.95	1.72
Kaolinite	$Al_2Si_2O_5(OH)_4$	-	-	6.98	-	2.78	3.79	-	-	-	10.42	7.67	1.09	-	-	-	-	9.94	2.14
Goethite	$Fe_2O_3.H_2O$	-	-	-	-	-	-	-	-	-	3.71	-	-	-	-	64.7	-	-	-
Palygorskite	$Mg_5Si_8O_{20}(OH)_2{\cdot}8H_2O$	-	-	-	-	-	3.99	-	-	-	-	-	2.81	1.71	-	-	-	-	-
Dravite	$NaMg_3Al_6(BO_3)_3Si_6O_{18}(OH)_4$	-	-	1.01	-	-	-	1.03	-	-	-	-	0.62	1.6	-	-	-	-	-
Hematite	Fe_2O_3	-	-	-	-	-	-	-	-	-	-	7.07	-	-	-	-	-	-	-

Table 2-6: Sulphur Speciation Results

Mine	Rock Type	Sample ID	Total Sulphur	Sulphide S	Sulphate Sulphur
			%	%	%
Nyanyumba	Quartz Vein	NYA-SN-01 &03	0.011	<0.010	<0.010
	Quartzite	NYA-SN-02&04	0.014	<0.010	<0.010
Masoro	Schist	MAS-BV-05	0.010	0.010	<0.010
	Quartz Vein	MAS-BV-06	0.118	<0.010	0.112
	Quartzite	MAS-BV-07	<0.010	<0.010	<0.010
Gasambya	Schist	GA-TS-10	0.010	<0.010	<0.010
	Quartzite	GA-TS-11	0.057	0.041	0.016
	Quartz Vein	GA-TS-12	0.021	0.013	<0.010
Mahaza	Quartz Vein	MAH-TS-16	<0.010	<0.010	<0.010
	Quartzite	MAH-TS-17	0.071	0.011	0.060
	Phyllite	MAH-TS-18	0.068	<0.010	0.059
Gisanze	Quartzite	GS-TS-21	<0.010	<0.010	<0.010
	Phyllite	GS-TS-22	<0.010	<0.010	<0.010
	Quartz Vein	GS-TS-23	0.047	0.024	0.023
Karambo	Fe rich Quartz Vein	KE-LT-27	0.012	<0.010	<0.010
	Quartz Vein	KE-LT-28	0.012	<0.010	<0.010
	Phyllite	KE-LT-29	0.010	<0.010	<0.010
	Quartzite	KE-LT-30	0.010	<0.010	<0.010

Table 2-7: Acid Base Accounting Screening Results

Mine	Rock Type	Sample ID	Paste pH	Total S	Sulphide Acid Potential (AP)	Neutralization Potential (NP)	Neutralisation potential ratio (NPR)	Nett Neutralization Potential (NNP)	Classification
			-	%	kg/t $CaCO_3$	kg/t $CaCO_3$		Kg/t $CaCO_3$	
		Non-PAG	**>5.5**	**<0.3**			**>4**	**>20**	
		Intermediate	**3.5-5.5**				**1 to 4**	**-20 to 20**	
		PAG/AG	**<3.5**	**>0.3**			**<1**	**<-20**	
Nyanyumba	Quartz Vein	NYA-SN-01 &03	6.6	0.011	0.344	0.250	0.727	-0.094	PAG
	Quartzite	NYA-SN-02&04	7.8	0.014	0.438	0.002	0.006	-0.435	PAG
Masoro	Schist	MAS-BV-05	5.6	0.010	0.313	-1.48	4.74	-1.80	PAG
	Quartz Vein	MAS-BV-06	6.2	0.118	3.69	0.497	0.135	-3.19	Intermediate
	Quartzite	MAS-BV-07	6.5	<0.010	0.313	-0.493	1.58	-0.81	Intermediate
Gasambya	Schist	GA-TS-10	7.8	0.010	0.313	-0.493	1.58	-0.81	Intermediate
	Quartzite	GA-TS-11	7.2	0.057	1.78	-0.245	0.14	-2.03	PAG
	Quartz Vein	GA-TS-12	7.5	0.021	0.656	-0.245	0.373	-0.901	PAG
Mahaza	Quartz Vein	MAH-TS-16	6.7	<0.010	0.313	0.002	0.008	-0.310	PAG
	Quartzite	MAH-TS-17	6.3	0.071	2.22	-0.740	0.334	-2.96	PAG
	Phyllite	MAH-TS-18	7.2	0.068	2.13	0.002	0.001	-2.12	PAG
Gisanze	Quartzite	GS-TS-21	8.3	<0.010	0.313	0.002	0.008	-0.310	PAG
	Phyllite	GS-TS-22	7.6	<0.010	0.313	-0.493	1.58	-0.805	Intermediate
	Quartz Vein	GS-TS-23	6.2	0.047	1.47	-0.740	0.504	-2.21	PAG
Karambo	Fe rich Quartz Vein	KE-LT-27	6.0	0.012	0.375	0.250	0.667	-0.125	PAG
	Quartz Vein	KE-LT-28	6.9	0.012	0.375	0.002	0.007	-0.373	PAG
	Phyllite	KE-LT-29	7.0	0.010	0.313	0.497	1.59	0.185	Intermediate
	Quartzite	KE-LT-30	6.8	0.010	0.313	0.745	2.38	0.432	Non-PAG

Table 2-8: Synthetic Precipitation Leaching Procedure Screening Results

Mine	Rock Type	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cr(VI)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)			**0.01**		**2.4**	**1.3**				**0.003**			**0.05**		**2**						
		2. WHO: Recreational Use (2021)		**18**	**0.2**										**1**		**40**						
		3. IFC: Mining Effluent			**0.1**							**0.05**						**0.3**				**2**	
		4. RS 109 of 2009: Effluent Standards				**0.01**												**3**				**3.5**	
		5. RS 188 (2013): Irrigation Use			**5**	**0.1**			**0.1**			**0.01**		**0.05**	**0.1**			**0.2**				**5**	
		6. RS 190 (2013): Livestock Watering			**5**	**2**					**200**	**0.5**		**1**	**1**			**0.5**				**0.3**	
Nyanyumba	Quartz Vein	NYA-SN-01 &03	0.015	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.09	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	0.018	**0.005**	**0.005**	**0.005**	**0.005**	0.14	**0.0005**
	Quartzite	NYA-SN-02&04	0.005	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	0.137	**0.0005**
Masoro	Schist	MAS-BV-05	**0.0005**	**0.050**	0.009	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.57	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.013**	**0.0005**
	Quartz Vein	MAS-BV-06	**0.0005**	**0.050**	0.002	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	0.021	**0.005**	**0.005**	**0.005**	**0.005**	0.11	**0.0005**
	Quartzite	MAS-BV-07	**0.0005**	**0.050**	0.003	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	0.984	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	0.171	**0.0005**
Gasambya	Schist	GA-TS-10	0.019	**0.050**	0.002	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.01	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.013**	**0.0005**
	Quartzite	GA-TS-11	0.005	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.34	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	0.261	**0.0005**
	Quartz Vein	GA-TS-12	0.002	**0.050**	0.025	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.06	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	0.003	**0.005**	**0.005**	**0.005**	**0.005**	0.367	**0.0005**
Mahaza	Quartz Vein	MAH-TS-16	**0.0005**	**0.050**	0.001	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	0.002	**0.013**	**0.013**	**0.005**	0.010	**0.005**	**0.005**	**0.005**	**0.005**	0.157	**0.0005**
	Quartzite	MAH-TS-17	**0.0005**	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.013**	**0.0005**
	Phylite	MAH-TS-18	**0.0005**	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.32	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.013**	**0.0005**
Gisanze	Quartzite	GS-TS-21	**0.0005**	0.21	0.002	**0.0005**	**0.013**	**0.013**	**0.013**	0.001	1.10	**0.0005**	0.001	**0.013**	**0.013**	**0.005**	0.001	**0.005**	**0.005**	**0.005**	**0.005**	0.1	**0.0005**
	Phyllite	GS-TS-22	**0.0005**	**0.050**	0.004	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	0.002	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	0.1	**0.0005**
	Quartz Vein	GS-TS-23	**0.0005**	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	0.006	**0.005**	**0.005**	**0.005**	**0.005**	0.16	**0.0005**
Karambo	Fe rich Quartz Vein	KE-LT-27	**0.0005**	**0.050**	0.011	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	**0.50**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	0.036	**0.0005**
	Quartz Vein	KE-LT-28	0.018	**0.050**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.10	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	0.008	**0.005**	**0.005**	**0.005**	**0.005**	0.201	**0.0005**
	Phylitte	KE-LT-29	0.005	**0.050**	0.002	0.0005	**0.013**	**0.013**	**0.013**	<0.001	1.023	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.013**	**0.0005**
	Quartzite	KE-LT-30	0.002	**0.050**	0.006	0.0005	**0.013**	**0.013**	**0.013**	<0.001	1.089	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.0005**	**0.005**	**0.005**	**0.005**	**0.005**	0.048	**0.0005**

Note: Values in grey bold text represent below detection limit values.

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)				**0.006**									**0.08**		**50**			**0.07**		
		2. WHO: Recreational Use (2021)													**8**					**1.4**		
		3. IFC: Mining Effluent				**0.002**														**0.5**		
		4. RS 109 of 2009: Effluent Standards				**0.002**														**3**		
		5. RS 188 (2013): Irrigation Use										**2.5**			**0.2**	**0.01**	**3**			**0.2**		
		6. RS 190 (2013): Livestock Watering				**0.05**				**20**				**80**	**0.5**		**100**			**1**		**1**
Nyanyumba	Quartz Vein	NYA-SN-01 &03	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	0.0005	0.004	**0.0005**	0.500	0.478	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
	Quartzite	NYA-SN-02&04	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.9	**0.0005**	0.005	**0.0005**	0.500	0.17	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.019
Masoro	Schist	MAS-BV-05	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.667	0.0005	0.001	**0.0005**	0.500	**0.013**	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.308
	Quartz Vein	MAS-BV-06	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	0.009	**0.0005**	0.500	0.431	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.016
	Quartzite	MAS-BV-07	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	**0.0005**	**0.0005**	0.500	0.190	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.102
Gasambya	Schist	GA-TS-10	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.853	**0.0005**	**0.0005**	**0.0005**	0.500	**0.013**	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
	Quartzite	GA-TS-11	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	0.002	**0.0005**	0.500	0.433	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
	Quartz Vein	GA-TS-12	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	0.003	**0.0005**	0.500	0.577	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.018
Mahaza	Quartz Vein	MAH-TS-16	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	0.010	**0.0005**	0.500	0.409	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.006
	Quartzite	MAH-TS-17	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	**0.0005**	**0.0005**	0.500	0.066	**0.013**	0.500	**0.0005**	0.001	**0.013**	**0.0005**	**0.0005**
	Phyllite	MAH-TS-18	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.631	**0.0005**	**0.0005**	**0.0005**	0.500	**0.013**	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.080
Gisanze	Quartzite	GS-TS-21	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	3.558	**0.0005**	0.002	**0.0005**	0.500	**0.013**	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
	Phyllite	GS-TS-22	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.09	**0.0005**	**0.0005**	**0.0005**	0.500	0.03	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.055
	Quartz Vein	GS-TS-23	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	**0.0005**	**0.0005**	**0.0005**	0.500	0.51	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
Karambo	Fe rich Quartz Vein	KE-LT-27	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	0.0005	**0.0005**	**0.0005**	0.500	0.11	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.055
	Quartz Vein	KE-LT-28	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.250	0.0005	0.011	**0.0005**	0.500	0.672	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.044
	Phyllite	KE-LT-29	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	2.260	0.0005	**0.0005**	**0.0005**	0.500	**0.013**	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.006
	Quartzite	KE-LT-30	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.621	**0.0005**	0.001	**0.0005**	0.500	0.149	**0.013**	0.500	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.057

Note: Values in grey bold text represent below detection limit values.

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)	**0.01**							**0.02**		**0.04**										
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent	**0.2**																			
		4. RS 109 of 2009: Effluent Standards	**0.1**									**0.02**										
		5. RS 188 (2013): Irrigation Use	**5**									**0.02**										
		6. RS 190 (2013): Livestock Watering	**0.05**									**0.5**										
Nyanyumba	Quartz Vein	NYA-SN-01 &03	**0.0005**	0.001	**0.0005**	**0.0005**	0.002	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.002	0.26	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartzite	NYA-SN-02&04	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.007	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.34	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Masoro	Schist	MAS-BV-05	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.008	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.71	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartz Vein	MAS-BV-06	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.003	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.26	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartzite	MAS-BV-07	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.001	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.46	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Gasambya	Schist	GA-TS-10	**0.0005**	0.001	**0.0005**	**0.0005**	0.008	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.008	0.68	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartzite	GA-TS-11	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.003	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.27	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartz Vein	GA-TS-12	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.002	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.008	0.41	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Mahaza	Quartz Vein	MAH-TS-16	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.001	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.39	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.003	**0.0005**
	Quartzite	MAH-TS-17	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.002	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.75	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Phyllite	MAH-TS-18	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.005	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.99	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Gisanze	Quartzite	GS-TS-21	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.017	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.44	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.007	**0.0005**
	Phyllite	GS-TS-22	0.001	**0.0005**	**0.0005**	**0.0005**	0.006	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.37	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.029	**0.0005**
	Quartz Vein	GS-TS-23	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.001	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.24	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Karambo	Fe rich Quartz Vein	KE-LT-27	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.003	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.22	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartz Vein	KE-LT-28	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.007	0.33	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Phyllite	KE-LT-29	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.004	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.49	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartzite	KE-LT-30	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.003	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.005	0.41	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**

Note: Values in grey bold text represent below detection limit values.

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr	pH	EC	TDS	Tot Alk	Cl	SO4	NO3	NO2	F	Free NH3	Ortho-P	Total Cn
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*		*mS/m*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)		**0.03**													**50**	**3**	**1.5**			
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent							**0.5**		**6-9**											**1**
		4. RS 109 of 2009: Effluent Standards							**5**		**5-9**		**2000**									
		5. RS 188 (2013): Irrigation Use			**0.1**				**2**				**450**				**5**		**1**			
		6. RS 190 (2013): Livestock Watering		**0.2**	**0.1**				**25**		**6-9**		**1000**	**500**	**100**	**250**	**25**	**10**				
Nyanyumba	Quartz Vein	NYA-SN-01 &03	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.00	1.90	**5**	10	2	**1**	**0.05**	**0.025**	0.1	0.05	**0.05**	**0.035**
	Quartzite	NYA-SN-02&04	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.20	1.40	20	20	**1**	**1**	**0.05**	**0.025**	**0.1**	**0.05**	**0.05**	**0.035**
Masoro	Schist	MAS-BV-05	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.80	1.50	**5**	20	**1**	**1**	**0.05**	**0.025**	**0.1**	0.1	**0.05**	**0.035**
	Quartz Vein	MAS-BV-06	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.90	1.80	**5**	30	2	**1**	**0.05**	**0.025**	**0.1**	0.1	**0.05**	**0.035**
	Quartzite	MAS-BV-07	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.20	1.30	**5**	10	**1**	**1**	**0.05**	**0.025**	0.7	0.1	**0.05**	**0.035**
Gasambya	Schist	GA-TS-10	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.10	1.50	**5**	30	**1**	**1**	**0.05**	**0.025**	**0.1**	0.2	**0.05**	**0.035**
	Quartzite	GA-TS-11	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.80	1.30	**5**	30	**1**	**1**	**0.05**	**0.025**	**0.1**	0.2	**0.05**	**0.035**
	Quartz Vein	GA-TS-12	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.30	1.40	**5**	20	**1**	**1**	**0.05**	**0.025**	**0.1**	**0.05**	**0.05**	**0.035**
Mahaza	Quartz Vein	MAH-TS-16	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.30	1.80	22	30	3	**1**	**0.05**	**0.025**	**0.1**	**0.05**	**0.05**	**0.035**
	Quartzite	MAH-TS-17	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.60	1.30	14	20	**1**	**1**	**0.05**	**0.025**	**0.1**	0.200	**0.05**	**0.035**
	Phyllite	MAH-TS-18	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.00	1.50	14	20	**1**	**1**	**0.05**	**0.025**	**0.1**	0.200	**0.05**	**0.035**
Gisanze	Quartzite	GS-TS-21	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	7.20	2.20	38	10	**1**	**1**	**0.05**	**0.025**	**0.1**	0.300	**0.05**	**0.035**
	Phyllite	GS-TS-22	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.50	1.80	32	20	**1**	**1**	0.4	**0.025**	**0.1**	0.200	**0.05**	**0.035**
	Quartz Vein	GS-TS-23	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.90	1.60	24	20	2	**1**	**0.05**	**0.025**	**0.1**	0.200	**0.05**	**0.035**
Karambo	Fe rich Quartz Vein	KE-LT-27	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.50	1.40	24	10	**1**	**1**	**0.05**	**0.025**	**0.1**	0.2	**0.05**	**0.035**
	Quartz Vein	KE-LT-28	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.30	1.400	32	20	**1**	**1**	**0.05**	**0.025**	**0.1**	**0.05**	**0.05**	**0.035**
	Phyllite	KE-LT-29	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	6.40	2.100	24	20	**1**	**1**	**0.05**	**0.025**	0.8	**0.05**	**0.05**	**0.035**
	Quartzite	KE-LT-30	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**	5.90	1.300	20	20	**1**	**1**	**0.05**	**0.025**	**0.1**	**0.05**	**0.05**	**0.035**

Note: Values in grey bold text represent below detection limit values.

2.3 Downstream Soil Results

Table 2-8: Physicochemical Parameters

Mine	Sample ID	pH (H_2O)	EC (µS/cm)	Cation Exchange Capacity ($cmol_c/kg$)	Particle size (%)			Soil Texture Class	Density (g/cm^3)	Organic Carbon (%)
					Sand	Silt	Clay			
Nyanyumba	NYAS-02	5.01	74	3.08	65	20	15	Sandy Loam	1.13	1.10
Masoro	MAS-02	5.31	62	2.97	60	17	23	Sandy Clay Loam	1.09	1.10
Gasambya	GAS-02	5.1	36	2.84	63	26	11	Sandy Loam	1.25	0.80
Mahaza	MHS-02	4.78	38	2.05	66	23	11	Sandy Loam	1.12	0.90
Gisanze	GSS-02	4.88	41	2.78	53	24	11	Sandy Loam	1.01	1.40
Karambo	KSS-02	5.29	66	2.24	71	14	15	Sandy Loam	1.17	0.70

Table 2-9: Plant Available Results

Mine	Sample ID	Nutrient Status (mg/kg)													
		Ca	Mg	K	P	S	Fe	Mn	Zn	Cu	B	Mo	Co	Si	Ni
Nyanyumba	NYAS-02	195	54	19	2.00	8.99	87.82	26.63	2.86	1.64	0.17	0.06	0.02	75.6	0.06
Masoro	MAS-02	281	66	23	5.00	7.87	118.76	21.34	1.93	1.21	0.53	0.01	0.01	48.9	0.04
Gasambya	GAS-02	101	31	22	2.00	8.63	75.39	26.73	1.98	1.34	0.14	0.07	0.03	49.6	0.03
Mahaza	MHS-02	149	39	28	2.00	7.53	121.96	20.73	1.06	1.46	0.33	0.22	0.01	50.9	0.04
Gisanze	GSS-02	167	33	19	14.00	10.53	410.5	122.48	3.7	3.51	1.29	0.07	0.04	67.6	0.10
Karambo	KSS-02	172	67	22	6.00	12.77	122.58	26.61	1.82	1.42	0.42	0.04	0.02	39.7	0.04

Table 2-10: Heavy Metal Screening Results

Mine	Analytes	Ag	As	B	Ba	Be	Bi	Cd	Co	Cr (total)	Cu	Ge	Hg	Mn	Mo	Nb	Ni
	Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
	SSV1 (All Land Uses Protective of the Water Resource)		**5.8**					**7.5**	**300**		**16**		**1**	**740**			**91**
Nyanyumba	NYAS-02	1.40	<0.01	0.79	19.62	0.64	<0.01	<0.01	1.34	25.89	12.23	2.30	<0.01	189	<0.01	9.01	3.20
Masoro	MAS-02	0.80	<0.01	0.12	27.57	0.33	<0.01	<0.01	2.77	24.20	10.35	3.80	<0.01	208	<0.01	7.88	3.31
Gasambya	GAS-02	1.50	<0.01	0.68	14.47	0.49	<0.01	<0.01	1.21	33.53	8.67	2.20	<0.01	158	<0.01	7.11	0.53
Mahaza	MHS-02	1.30	<0.01	0.15	14.94	0.29	<0.01	<0.01	0.96	17.02	9.69	1.90	<0.01	87	<0.01	4.77	1.32
Gisanze	GSS-02	0.70	<0.01	0.97	165.34	1.38	<0.01	<0.01	10.54	24.14	23.48	8.00	<0.01	1427	<0.01	17.18	12.89
Karambo	KSS-02	4.80	<0.01	0.65	22.74	0.54	<0.01	<0.01	1.62	15.85	12.56	2.60	<0.01	276	<0.01	7.10	3.13

Mine	Analytes	Pb	Pd	Sb	Se	Si	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	Zn	Zr
	Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
	SSV1 (All Land Uses Protective of the Water Resource)	**20**													**150**	**240**	
Nyanyumba	NYAS-02	3.25	211	<0.01	<0.01	101	<0.01	5.43	<0.01	<0.01	13.49	213	<0.01	37.96	37.96	25.35	2.5
Masoro	MAS-02	5.93	270	<0.01	<0.01	121	<0.01	6.91	<0.01	<0.01	12.44	272	<0.01	61.04	39.38	25.33	5.4
Gasambya	GAS-02	2.28	169	<0.01	<0.01	85	<0.01	2.52	<0.01	<0.01	10.62	169	<0.01	59.20	52.17	8.41	1.7
Mahaza	MHS-02	0.27	139	<0.01	<0.01	96	<0.01	4.47	<0.01	<0.01	9.23	140	<0.01	40.45	17.00	16.76	2.3
Gisanze	GSS-02	5.16	178	<0.01	<0.01	102	<0.01	6.76	<0.01	<0.01	29.68	183	<0.01	157.06	33.27	73.32	3.4
Karambo	KSS-02	6.10	209	<0.01	<0.01	94	<0.01	4.95	<0.01	<0.01	8.99	210	<0.01	46.60	24.05	21.74	1.8

3.0 Musha Result Tables

3.1 River Sediment Results

Table 3-1: Particle Size Distribution

Mine	Sample ID	Stream Position	Gravel (2 - 75 mm)	Sand (0.05 - 2 mm)	Silt (0.002 - 0.05 mm)	Clay (< 0.002 mm)	Classification
			%	%	%	%	
Musha	MUSED-35	Upstream	3	46	29	22	Silty Sand
	MUSED-36	Downstream	-	29	50	21	Sandy Silt
Ntunga	NTUSED-41	Downstream	25	70	4	1	Gravelly Sand

Table 3-2: XRD Mineralogy Results

Mineral	Formula	Mine		
		Musha		Ntunga
		Sample ID		
		MUSED-35	MUSED-36	NTUSED-41
		Stream Position		
		Upstream	Downstream	Downstream
Quartz	SiO_2	55.05	43.43	86.95
Hematite	Fe_2O_3	8.77	1.12	0.57
Kaolinite	$Al_2Si_2O_5(OH)_4$	20.87	34.17	2.11
Muscovite	$KAl_3Si_3O_{10}(OH)_2$	13.9	19.08	4.33
Schorl	$NaFe_3Al_6(BO_3)_3(Si_6O_{18})(OH)_4$	1.42	2.19	6.04

Table 3-3: Synthetic Precipitation Leaching Procedure Screening Results

Mine	Stream Position	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cr(VI)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)			**0.01**		**2.4**	**1.3**				**0.003**			**0.05**		**2**						
		2. WHO: Recreational Use (2021)		**18**	**0.2**										**1**		**40**						
		3. IFC: Mining Effluent			**0.1**							**0.05**						**0.3**				**2**	
		4. RS 109 of 2009: Effluent Standards				**0.01**												**3**				**3.5**	
		5. RS 188 (2013): Irrigation Use			**5**	**0.1**			**0.1**			**0.01**		**0.05**	**0.1**			**0.2**				**5**	
		6. RS 190 (2013): Livestock Watering			**5**	**2**					**200**	**0.5**		**1**	**1**			**0.5**				**0.3**	
	Upstream	MUSED-35	0.002	8.82	0.004	0.001	0.013	0.608	0.013	0.001	11.53	0.001	0.131	0.013	0.013	0.020	0.005	0.047	0.001	0.001	0.001	12.4	0.050
Musha	Downstream	MUSED-36	0.001	0.176	0.012	0.001	0.013	0.032	0.013	0.001	2.75	0.001	0.001	0.013	0.013	0.005	0.005	0.005	0.001	0.001	0.001	0.379	0.003
Ntunga	Downstream	NTUSED-41	0.001	2.24	0.001	0.001	0.013	0.143	0.013	0.001	4.52	0.001	0.025	0.013	0.013	0.020	0.001	0.005	0.001	0.001	0.001	2.85	0.016

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)				**0.006**									**0.08**		**50**			**0.07**		
		2. WHO: Recreational Use (2021)													**8**					**1.4**		
		3. IFC: Mining Effluent				**0.002**														**0.5**		
		4. RS 109 of 2009: Effluent Standards				**0.002**														**3**		
		5. RS 188 (2013): Irrigation Use										**2.5**			**0.2**	**0.01**	**3**			**0.2**		
		6. RS 190 (2013): Livestock Watering				**0.05**				**20**				**80**	**0.5**		**100**			**1**		**1**
	Upstream	MUSED-35	0.006	0.001	0.001	0.001	0.001	0.001	0.001	0.495	0.053	0.005	0.001	2.15	1.46	0.013	0.500	0.001	0.039	0.013	0.001	0.097
Musha	Downstream	MUSED-36	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.618	0.001	0.002	0.001	0.500	0.210	0.013	0.500	0.001	0.000	0.013	0.001	0.001
Ntunga	Downstream	NTUSED-41	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.50	0.008	0.006	0.001	1.46	1.08	0.013	0.500	0.001	0.007	0.013	0.001	0.001

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)	**0.01**							**0.02**		**0.04**										
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent	**0.2**																			
		4. RS 109 of 2009: Effluent Standards	**0.1**									**0.02**										
		5. RS 188 (2013): Irrigation Use	**5**									**0.02**										
		6. RS 190 (2013): Livestock Watering	**0.05**									**0.5**										
	Upstream	MUSED-35	0.045	0.001	0.011	0.001	0.012	0.001	0.001	0.001	0.003	0.001	15.04	0.007	0.001	0.136	0.001	0.001	0.001	0.001	0.011	0.001
Musha	Downstream	MUSED-36	0.000	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	6.21	0.001	0.001	0.029	0.001	0.001	0.001	0.001	0.001	0.001
Ntunga	Downstream	NTUSED-41	0.017	0.001	0.002	0.001	0.007	0.001	0.001	0.001	0.001	0.001	4.36	0.001	0.001	0.041	0.001	0.001	0.001	0.001	0.008	0.001

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr	pH	EC	TDS	Tot Alk	Cl	SO4	NO3	NO2	F	Free NH3	Ortho-P	Total Cn
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*		*mS/m*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)		**0.03**													**50**	**3**	**1.5**			
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent							**0.5**		**6-9**											**1**
		4. RS 109 of 2009: Effluent Standards							**5**		**5-9**		**2000**									
		5. RS 188 (2013): Irrigation Use			**0.1**				**2**				**450**				**5**		**1**			
		6. RS 190 (2013): Livestock Watering		**0.2**	**0.1**				**25**		**6-9**		**1000**	**500**	**100**	**250**	**25**	**10**				
	Upstream	MUSED-35	0.001	0.003	0.013	0.001	0.018	0.002	0.059	0.001	6.30	3.10	21	20	8	13	0.050	0.025	0.100	0.050	0.050	0.035
Musha	Downstream	MUSED-36	0.001	0.001	0.013	0.001	0.001	0.001	0.013	0.001	6.30	5.20	35	16	8	7	0.050	0.025	0.200	0.050	0.050	0.035
Ntunga	Downstream	NTUSED-41	0.001	0.001	0.013	0.001	0.003	0.001	0.013	0.001	7.00	3.60	24	12	8	4	0.200	0.025	0.200	0.050	0.050	0.035

Note: Values in grey bold text represent below detection limit values.

Table 3-4: Total Concentration Screening Results

Mine	Stream Position	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)			**5.8**							**7.5**		**300**			**16**					
	Upstream	MUSED-35	0.200	10170	190	0.200	385	151	5	0.615	693	0.200	5.87	5	121	4.76	22	0.200	0.200	0.200	30074	23
Musha	Downstream	MUSED-36	0.200	48163	209	0.200	532	51	5	1.087	200	0.200	0.55	5	74	1.76	21	0.200	0.200	0.200	58579	24
Ntunga	Downstream	NTUSED-41	0.200	23790	57	0.200	1644	91	5	1.260	200	0.200	1.04	5	94	2.89	9	0.200	0.200	0.200	39023	16

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)				**1**									**740**					**91**		
	Upstream	MUSED-35	0.200	3.13	11.40	0.200	0.200	0.200	0.200	6983	0.409	46.2	0.200	0.200	363	5	973	34.2	0.551	25.3	0.200	1452
Musha	Downstream	MUSED-36	0.200	2.64	15.73	0.200	0.200	0.200	0.200	9209	0.200	140.8	0.200	491	333	5	780	58.1	0.200	23.6	0.200	1434
Ntunga	Downstream	NTUSED-41	0.200	2.84	5.32	0.200	0.200	0.200	0.200	4943	0.200	182.7	0.200	905	276	5	870	18.6	0.200	15.8	0.200	1398

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)	**20**																			
	Upstream	MUSED-35	43.87	0.200	0.200	0.200	30.7	0.200	0.200	0.200	1.8	1.47	152401	0.200	12.8	22.6	5.03	0.200	0.200	2.97	8019	0.647
Musha	Downstream	MUSED-36	40.49	0.200	0.200	0.200	12.0	0.200	0.200	0.200	5.6	0.200	160459	0.200	38.8	5	8.56	0.200	0.200	3.68	8965	0.992
Ntunga	Downstream	NTUSED-41	34.50	0.200	0.200	0.200	24.4	0.200	0.200	0.200	3.2	1.04	240125	0.200	38.2	5	23.60	0.200	0.200	2.42	3543	1.23

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr
		Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
		SSV1 (All Land Uses Protective of the Water Resource)			**150**				**240**	
	Upstream	MUSED-35	0.200	3.03	214.60	4.47	0.200	0.200	48.9	240
Musha	Downstream	MUSED-36	0.200	3.39	150.68	6.16	0.200	0.200	39.6	331
Ntunga	Downstream	NTUSED-41	0.200	1.57	78.73	2.12	0.200	0.200	34.4	94

Note: Values in grey bold text represent below detection limit values.

3.2 Legacy Tailings Results

Table 3-5: XRD Mineralogy Results

Mineral	Formula	Mine						
		Musha				Ntunga		
		Sample ID						
		MU-LT-37	MU-LT-32 & MU-LT-39	MU-LY-33 & MU-LT-40	MU-LT-34 & MU-LT-38	NTU-LT-42	NTU-LT-43	NTU-LT-44
		Rock Type						
		Schist	Sandstone	Quartz Vein	Quartzite	Pegmatite	Quartz Vein	Metased Sandstone
Quartz	SiO_2	63.09	94.34	97.44	99.16	58.82	100	68.21
Muscovite	$KAl_3Si_3O_{10}(OH)_2$	15.96	2.39	2.56	0.84	37.28	-	24.66
Kaolinite	$Al_2Si_2O_5(OH)_4$	-	-	-	-	2.68	-	7.13
Goethite	$Fe_2O_3.H_2O$	-	3.28	-	-	-	-	-
Palygorskite	$Mg_5Si_8O_{20}(OH)_2{\cdot}8H_2O$	0.72	-	-	-	1.21	-	-
Dravite	$NaMg_3Al_6(BO_3)_3Si_6O_{18}(OH)_4$	20.23	-	-	-	-	-	-
Hematite	Fe_2O_3	-	-	-	-	-	-	-

Table 3-6: Sulphur Speciation Results

Mine	Rock Type	Sample ID	Total Sulphur	Sulphide S	Sulphate Sulphur
			%	%	%
Musha	Schist	MU-LT-37	0.023	0.019	<0.010
	Sandstone	MU-LT-32 & MU-LT-39	0.018	0.014	<0.010
	Quartz Vein	MU-LY-33 & MU-LT-40	0.011	<0.010	0.011
	Quartzite	MU-LT-34 & MU-LT-38	0.013	<0.010	<0.010
Ntunga	Pegmatite	NTU-LT-42	<0.010	<0.010	<0.010
	Quartz Vein	NTU-LT-43	0.012	<0.010	0.011
	Metased Sandstone	NTU-LT-44	0.035	<0.010	0.032

Table 3-6: Acid Base Accounting Screening Results

Mine	Rock Type	Sample ID	Paste pH	Total S	Sulphide Acid Potential (AP)	Neutralization Potential (NP)	Neutralisation potential ratio (NPR)	Nett Neutralization Potential (NNP)	Classification
			-	%	kg/t $CaCO_3$	kg/t $CaCO_3$		Kg/t $CaCO_3$	
		Non-PAG	**>5.5**	**<0.3**			**>4**	**>20**	
		Intermediate	**3.5-5.5**				**1 to 4**	**-20 to 20**	
		PAG/AG	**<3.5**	**>0.3**			**<1**	**<-20**	
Musha	Schist	MU-LT-37	8.3	0.023	0.719	-0.25	0.341	-0.964	PAG
	Sandstone	MU-LT-32 & MU-LT-39	6.3	0.018	0.563	0.002	0.004	-0.560	PAG
	Quartz Vein	MU-LY-33 & MU-LT-40	7.2	0.011	0.344	-0.740	2.150	-1.080	Non-PAG
	Quartzite	MU-LT-34 & MU-LT-38	7.1	0.013	0.406	-0.493	1.210	-0.899	Intermediate
Ntunga	Pegmatite	NTU-LT-42	8.3	<0.010	0.313	0.002	0.008	-0.310	PAG
	Quartz Vein	NTU-LT-43	7.3	0.012	0.375	0.497	1.330	0.122	Intermediate
	Metased Sandstone	NTU-LT-44	7.9	0.035	1.09	-0.493	0.450	-1.590	PAG

Table 3-7: Synthetic Precipitation Leaching Procedure Screening Results

Mine	Rock Type	Analytes	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr (total)	Cr(VI)	Cs	Cu	Dy	Er	Eu	Fe	Ga
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)			**0.01**		**2.4**	**1.3**				**0.003**			**0.05**		**2**						
		2. WHO: Recreational Use (2021)		**18**	**0.2**										**1**		**40**						
		3. IFC: Mining Effluent			**0.1**							**0.05**						**0.3**				**2**	
		4. RS 109 of 2009: Effluent Standards				**0.01**												**3**				**3.5**	
		5. RS 188 (2013): Irrigation Use			**5**	**0.1**			**0.1**			**0.01**		**0.05**	**0.1**			**0.2**				**5**	
		6. RS 190 (2013): Livestock Watering			**5**	**2**					**200**	**0.5**		**1**	**1**			**0.5**				**0.3**	
Musha	Schist	MU-LT-37	**0.0005**	0.207	0.006	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	0.50	**0.0005**	0.004	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	0.132	**0.0005**
	Sandstone	MU-LT-32 & MU-LT-39	0.002	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.00	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**
	Quartz Vein	MU-LY-33 & MU-LT-40	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.00	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	0.179	**0.0005**
	Quartzite	MU-LT-34 & MU-LT-38	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	1.00	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	0.136	**0.0005**
Ntunga	Pegmatite	NTU-LT-42	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	0.50	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**
	Quartz Vein	NTU-LT-43	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	0.50	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	0.2	**0.0005**
	Metased Sandstone	NTU-LT-44	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.013**	**0.0005**	0.50	**0.0005**	**0.0005**	**0.013**	**0.013**	**0.005**	**0.005**	**0.005**	**0.0005**	**0.0005**	**0.0005**	**0.013**	**0.0005**

Mine	Stream Position	Analytes	Gd	Ge	Hf	Hg	Ho	In	Ir	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Os	P
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)				**0.006**									**0.08**		**50**			**0.07**		
		2. WHO: Recreational Use (2021)													**8**					**1.4**		
		3. IFC: Mining Effluent				**0.002**														**0.5**		
		4. RS 109 of 2009: Effluent Standards				**0.002**														**3**		
		5. RS 188 (2013): Irrigation Use										**2.5**			**0.2**	**0.01**	**3**			**0.2**		
		6. RS 190 (2013): Livestock Watering				**0.05**				**20**				**80**	**0.5**		**100**			**1**		**1**
Musha	Schist	MU-LT-37	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	2.80	0.002	0.030	**0.0005**	**0.500**	0.040	**0.013**	**0.500**	**0.0005**	0.002	**0.013**	**0.0005**	0.058
	Sandstone	MU-LT-32 & MU-LT-39	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.250**	**0.0005**	**0.0005**	**0.0005**	**0.500**	0.086	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
	Quartz Vein	MU-LY-33 & MU-LT-40	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.250**	**0.0005**	0.007	**0.0005**	**0.500**	0.390	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.006
	Quartzite	MU-LT-34 & MU-LT-38	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.250**	**0.0005**	0.003	**0.0005**	**0.500**	0.364	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**
Ntunga	Pegmatite	NTU-LT-42	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.49	**0.0005**	0.011	**0.0005**	**0.500**	**0.013**	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.032
	Quartz Vein	NTU-LT-43	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.250**	**0.0005**	0.008	**0.0005**	**0.500**	0.42	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.008
	Metased Sandstone	NTU-LT-44	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.34	**0.0005**	0.035	**0.0005**	**0.500**	**0.013**	**0.013**	**0.500**	**0.0005**	**0.0005**	**0.013**	**0.0005**	0.045

Mine	Stream Position	Analytes	Pb	Pd	Pr	Pt	Rb	Rh	Ru	Sb	Sc	Se	Si	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)	**0.01**							**0.02**		**0.04**										
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent	**0.2**																			
		4. RS 109 of 2009: Effluent Standards	**0.1**									**0.02**										
		5. RS 188 (2013): Irrigation Use	**5**									**0.02**										
		6. RS 190 (2013): Livestock Watering	**0.05**									**0.5**										
Musha	Schist	MU-LT-37	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.019	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	1.187	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Sandstone	MU-LT-32 & MU-LT-39	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.401	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartz Vein	MU-LY-33 & MU-LT-40	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.004	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.195	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartzite	MU-LT-34 & MU-LT-38	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.001	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.241	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Ntunga	Pegmatite	NTU-LT-42	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.046	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.430	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Quartz Vein	NTU-LT-43	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.002	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.251	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
	Metased Sandstone	NTU-LT-44	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.024	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.005	0.532	**0.0005**	**0.0005**	**0.013**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**

Note: Values in grey bold text represent below detection limit values.

Mine	Stream Position	Analytes	Tm	U	V	W	Y	Yb	Zn	Zr	pH	EC	TDS	Tot Alk	Cl	SO4	NO3	NO2	F	Free NH3	Ortho-P	Total Cn
		Unit	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*		*mS/m*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
		1. WHO: Drinking Water (2022)		**0.03**													**50**	**3**	**1.5**			
		2. WHO: Recreational Use (2021)																				
		3. IFC: Mining Effluent							**0.5**		**6-9**											**1**
		4. RS 109 of 2009: Effluent Standards							**5**		**5-9**		**2000**									
		5. RS 188 (2013): Irrigation Use			**0.1**				**2**				**450**				**5**		**1**			
		6. RS 190 (2013): Livestock Watering		**0.2**	**0.1**				**25**		**6-9**		**1000**	**500**	**100**	**250**	**25**	**10**				
Musha	Schist	MU-LT-37	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	7.10	2.20	42	30	**1**	**1**	**0.05**	**0.025**	0.1	0.05	0.05	0.035
	Sandstone	MU-LT-32 & MU-LT-39	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	6.40	1.40	24	30	**1**	**1**	**0.05**	**0.025**	0.1	0.05	0.05	0.035
	Quartz Vein	MU-LY-33 & MU-LT-40	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	5.70	1.20	10	20	**1**	**1**	**0.05**	**0.025**	0.1	0.05	0.05	0.035
	Quartzite	MU-LT-34 & MU-LT-38	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	6.10	1.30	10	40	**1**	**1**	**0.05**	**0.025**	0.1	0.05	0.05	0.035
Ntunga	Pegmatite	NTU-LT-42	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	6.40	1.30	24	10	**1**	**1**	**0.05**	**0.025**	0.1	0.05	0.05	0.035
	Quartz Vein	NTU-LT-43	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	6.30	1.50	22	20	**1**	**1**	**0.05**	**0.025**	0.1	0.05	0.05	0.035
	Metased Sandstone	NTU-LT-44	**0.0005**	**0.0005**	0.013	**0.0005**	**0.0005**	**0.0005**	0.013	**0.0005**	7.10	3.10	10	20	**1**	**1**	**0.05**	**0.025**	0.1	0.900	0.05	0.035

Note: Values in grey bold text represent below detection limit values.

3.3 Downstream Soil Results

Table 3-8: Physicochemical Parameters

Mine	Sample ID	Particle size (%)			Soil Texture Class	Density (g/cm^3)	Organic Carbon (%)	pH (H_2O)	EC (µS/cm)	Cation Exchange Capacity ($cmol_c/kg$)
		Sand	Silt	Clay						
Musha	MUS-01	50	11	39	Sandy clay	1.2	1.40	4.67	32	2.64
Ntunga	NTUS-02	67	18	17	Sandy loam	0.98	1.40	6.06	121	5.45

Table 3-9: Plant Available Concentrations

Mine	Sample ID	Nutrient Status (mg/kg)												
		Ca	Mg	K	P	S	Fe	Mn	Zn	Cu	B	Mo	Co	Si	Ni
Musha	MUS-01	274	48	22	3.00	16.43	69.33	56.22	0.8	2.85	0.32	0.2	0.03	76.9	0.06
Ntunga	NTUS-02	445	131	21	3.00	9.15	91.28	80.79	2.31	2.09	0.17	0.09	0.02	78.5	0.06

Table 3-10: Heavy Metal Screening Results

Mine	Analytes	Ag	As	B	Ba	Be	Bi	Cd	Co	Cr (total)	Cu	Ge	Hg	Mn	Mo	Nb	Ni
	Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
	SSV1 (All Land Uses Protective of the Water Resource)		**5.8**					**7.5**	**300**		**16**		**1**	**740**			**91**
Musha	MUS-01	0.10	<0.01	0.90	23.26	1.34	<0.01	<0.01	5.95	50.17	19.34	5.90	<0.01	553	<0.01	14.61	8.86
Ntunga	NTUS-02	1.70	<0.01	0.19	40.15	1.33	<0.01	<0.01	2.80	15.70	13.78	2.40	<0.01	381	<0.01	6.35	4.30

Mine	Analytes	Pb	Pd	Sb	Se	Si	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	Zn	Zr
	Unit	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
	SSV1 (All Land Uses Protective of the Water Resource)	**20**													**150**	**240**	
Musha	MUS-01	9.50	356	<0.01	<0.01	174	<0.01	8.07	<0.01	<0.01	26.89	358	<0.01	117.38	68.39	21.79	10.0
Ntunga	NTUS-02	4.35	175	<0.01	<0.01	105	<0.01	11.15	<0.01	<0.01	9.52	178	<0.01	47.26	28.61	13.27	2.0