Quality Analysis ... *Innovative Technologies*

Report No.: **A21-21699**
Report Date: **12-Jan-22**
Date Submitted: **18-Nov-21**
Your Reference: **Sheep Creek**

U.S. CRITICAL MATERIALS
4190 SOUTH HIGHLANDS DRIVE, SUITE 230, S
SALT LAKE CITY UTAH
United States

CERTIFICATE OF ANALYSIS

20 Rock samples were submitted for analysis.

The following analytical package(s) were requested:		Testing Date:
8-REE Assay Package	QOP WRA/ QOP WRA 4B2 (Major/Trace Elements Fusion ICPOES/ICPMS)	2021-12-07 11:43:03

REPORT **A21-21699**

Notes:

Total includes all elements in % oxide to the left of total.

Footnote: Zr/Nb/Ta/Hf results are semi-quantitative for samples with P2O5Ga/Ge/As semi-quantitative for samples with high REE. >0.3%.

SCC Accredited LAB LAB Accrédité CCN TM

LabID: 266

CERTIFIED BY:

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Quality Control Coordinator

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Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	1	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	GRAV	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
21001	10.39	2.32	7.03	0.658	4.53	32.22	0.21	0.48	0.335	2.06	28.95	89.18	47	2	210	30	10	< 20	< 10	30	14	< 1	< 5
21003	12.06	3.44	8.98	0.535	8.00	20.77	0.25	0.24	0.278	1.92	23.41	79.88	53	1	166	110	16	30	< 10	50	70	9	23
21004	21.12	8.22	10.83	0.458	6.14	22.30	0.57	0.26	0.190	1.34	19.60	91.03	138	2	378	40	11	30	40	40	43	< 1	< 5
21006	4.60	0.35	3.75	0.584	2.49	35.90	0.21	0.29	0.072	3.78	31.41	83.43	61	2	113	< 20	6	< 20	30	40	93	11	38
21007	5.67	0.09	1.34	0.267	0.42	28.64	0.01	0.07	0.010	0.13	28.30	64.94	37	5	22	< 20	2	< 20	< 10	< 30	10	< 1	< 5
21008	0.41	0.11	1.39	0.242	1.00	34.11	0.02	0.45	0.011	0.69	35.44	73.87	36	3	24	< 20	3	< 20	< 10	< 30	137	15	46
21013	13.63	2.05	4.96	0.401	2.08	32.27	1.28	0.18	0.082	1.04	28.59	86.57	58	< 1	142	40	4	< 20	10	< 30	47	5	16
21014	5.48	0.78	5.20	0.435	1.49	33.42	0.13	0.09	0.135	2.09	30.66	79.92	43	3	102	< 20	27	60	90	< 30	21	< 1	< 5
21015	8.76	1.14	6.16	0.490	5.60	31.19	0.13	0.15	0.064	3.50	29.49	86.67	33	< 1	79	< 20	10	< 20	< 10	< 30	42	5	16
21018	3.17	0.26	6.51	0.680	6.00	36.03	0.14	0.02	0.084	4.19	32.85	89.93	28	< 1	48	< 20	16	30	30	< 30	4	< 1	< 5
21019	5.51	1.26	4.61	0.391	3.76	24.09	0.53	0.14	0.234	2.39	23.32	66.24	47	2	98	30	10	< 20	10	< 30	10	< 1	< 5
21020	41.00	12.01	10.12	0.186	5.69	10.18	4.37	2.21	0.796	0.36	9.92	96.85	40	2	225	120	39	60	20	100	14	2	< 5
21023	6.80	1.48	6.90	0.537	8.25	29.94	0.19	0.35	0.160	4.57	30.27	89.43	49	< 1	120	20	12	< 20	< 10	40	45	5	17
21025	7.89	1.50	6.65	0.570	8.13	31.32	0.21	0.18	0.116	3.43	31.91	91.91	36	< 1	85	30	17	20	10	40	31	4	13
21029	7.83	1.75	7.11	0.526	8.88	31.38	0.06	0.20	0.116	5.33	29.39	92.58	35	< 1	92	< 20	19	< 20	50	40	46	6	18
21033	7.76	1.72	4.51	0.410	2.14	28.83	0.32	0.53	0.178	2.42	29.09	77.90	57	3	94	50	9	< 20	< 10	< 30	132	15	58
21034	4.32	0.91	6.19	0.570	6.27	24.15	0.14	0.15	0.136	3.27	26.20	72.30	37	1	95	< 20	11	< 20	< 10	< 30	11	< 1	< 5
21036	13.52	2.37	6.95	0.371	1.09	33.10	0.05	0.30	0.088	1.51	26.35	85.70	44	2	362	< 20	8	< 20	< 10	40	103	14	36
21038	11.40	2.44	5.78	0.419	4.94	23.42	0.81	0.13	0.163	2.86	22.62	74.98	65	2	140	30	11	30	< 10	< 30	15	< 1	< 5
21039	7.38	1.60	6.38	0.601	5.90	30.85	0.57	0.26	0.136	4.29	29.58	87.55	39	< 1	109	< 20	14	30	90	40	43	5	15

Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	Bi	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	2	2	2	4	1	2	0.5	0.2	1	0.5	0.5	3	0.4	0.1	0.1	0.05	0.1	0.1	0.05	0.1	0.1	0.1	0.1
Method Code	FUS-MS	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
21001	12	9269	126	9	1400	4	< 0.5	0.2	2	< 0.5	< 0.5	22920	< 0.4	18700	25200	2030	5600	397	69.7	127	11.3	41.2	5.7
21003	< 2	6050	86	68	366	< 2	< 0.5	0.2	2	< 0.5	< 0.5	59250	< 0.4	22200	29900	2430	6620	411	71.7	93.6	8.3	28.8	3.7
21004	5	3610	358	5	450	< 2	< 0.5	0.4	4	< 0.5	< 0.5	659	< 0.4	28000	34500	2650	7200	491	102	170	17.8	87.6	15.4
21006	< 2	4519	105	13	1150	23	< 0.5	< 0.2	4	< 0.5	< 0.5	30680	< 0.4	31900	41000	3330	8970	578	102	145	11.1	39.9	4.7
21007	< 2	22710	107	6	101	3	< 0.5	< 0.2	< 1	< 0.5	< 0.5	67010	< 0.4	54800	68800	5480	14600	937	148	249	18.1	50.9	5.7
21008	< 2	46450	107	7	189	7	< 0.5	< 0.2	< 1	< 0.5	< 0.5	24030	< 0.4	52400	67000	5350	14200	898	157	205	14.0	48.3	5.0
21013	< 2	14390	81	42	239	< 2	< 0.5	< 0.2	3	< 0.5	< 0.5	45410	1.8	16100	20200	1590	4310	278	49.5	70.7	6.4	24.5	3.3
21014	< 2	26450	103	10	1980	23	< 0.5	< 0.2	1	< 0.5	< 0.5	22810	0.9	41800	52700	4170	11200	746	125	210	15.4	47.0	5.2
21015	< 2	3978	92	88	217	< 2	< 0.5	< 0.2	1	< 0.5	< 0.5	42480	< 0.4	13000	17300	1400	3870	251	44.6	70.3	6.9	26.4	3.8
21018	< 2	5820	74	51	4730	3	< 0.5	< 0.2	1	< 0.5	< 0.5	37060	< 0.4	3840	5230	451	1350	127	25.1	55.4	5.8	23.9	3.3
21019	3	12350	93	12	1710	2	< 0.5	< 0.2	1	< 0.5	< 0.5	142000	< 0.4	23400	30700	2460	6690	438	69.0	130	10.8	37.0	4.6
21020	52	967	29	105	297	3	< 0.5	< 0.2	2	< 0.5	1.7	17040	< 0.4	369	559	52.4	163	18.8	4.76	10.3	1.3	6.4	1.1
21023	5	8200	90	81	2830	< 2	< 0.5	< 0.2	2	< 0.5	< 0.5	20040	< 0.4	15200	18700	1470	3960	258	48.8	76.8	6.9	28.4	3.8
21025	2	7808	97	155	456	< 2	< 0.5	< 0.2	1	< 0.5	< 0.5	14410	< 0.4	9660	12200	988	2650	188	36.5	62.2	6.3	26.5	3.9
21029	2	7248	117	51	919	< 2	< 0.5	< 0.2	1	< 0.5	< 0.5	8437	< 0.4	14100	17800	1420	3950	295	56.4	94.3	8.9	33.8	4.7
21033	2	20230	89	27	912	< 2	< 0.5	< 0.2	1	< 0.5	< 0.5	7434	< 0.4	46700	62300	5140	13600	810	131	167	13.2	40.0	4.4
21034	2	11670	82	14	1210	14	< 0.5	< 0.2	1	< 0.5	< 0.5	113800	< 0.4	22100	27700	2170	5900	390	62.2	113	9.0	32.4	4.1
21036	2	3728	99	12	327	2	< 0.5	0.3	6	< 0.5	< 0.5	10010	< 0.4	34000	42500	3400	8960	541	83.2	124	10.2	34.7	4.3
21038	3	11750	80	17	590	7	< 0.5	< 0.2	3	< 0.5	< 0.5	93820	< 0.4	23100	30700	2480	6770	444	69.5	125	10.0	31.4	3.9
21039	3	6216	83	22	1290	30	< 0.5	< 0.2	1	< 0.5	< 0.5	36010	< 0.4	14200	17900	1440	3910	274	51.2	82.1	7.2	27.9	3.5

Analyte Symbol	Er	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.1	0.05	0.1	0.04	0.2	0.1	1	0.1	5	0.1	0.1
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
21001	12.1	1.50	9.1	1.45	0.5	3.5	11	< 0.1	18	216	1.2
21003	7.1	0.86	5.3	0.81	1.4	0.8	6	< 0.1	13	407	5.6
21004	39.3	4.86	28.2	4.02	0.6	1.4	7	< 0.1	9	242	50.0
21006	8.6	0.90	4.7	0.72	0.8	3.2	3	< 0.1	58	317	9.6
21007	9.0	0.96	5.3	0.80	0.4	0.7	4	< 0.1	207	342	0.6
21008	< 0.1	0.77	3.5	0.53	0.3	0.1	< 1	< 0.1	118	326	0.2
21013	7.0	0.83	4.9	0.78	1.2	0.5	4	< 0.1	53	115	2.2
21014	8.1	0.87	4.6	0.69	0.5	3.6	1	< 0.1	88	418	1.1
21015	7.5	0.87	4.9	0.69	1.4	1.2	13	< 0.1	6	103	5.6
21018	6.7	0.72	3.7	0.54	1.1	10.2	1	< 0.1	14	64.4	6.1
21019	8.6	1.05	6.1	0.89	0.7	5.0	7	< 0.1	78	240	4.9
21020	2.6	0.36	2.3	0.38	2.2	0.4	< 1	0.3	11	3.5	0.3
21023	7.6	0.85	4.5	0.66	1.4	12.8	2	< 0.1	27	131	15.0
21025	8.3	0.97	5.6	0.81	2.0	2.1	3	< 0.1	27	85.1	14.1
21029	9.3	1.16	6.1	0.92	0.7	4.4	3	< 0.1	19	130	20.7
21033	< 0.1	0.74	4.2	0.59	0.8	2.5	4	< 0.1	112	332	1.8
21034	7.4	0.86	4.5	0.68	0.6	5.4	3	< 0.1	34	196	10.9
21036	8.7	1.04	6.2	0.87	0.3	0.9	19	< 0.1	31	198	13.2
21038	7.1	0.87	4.8	0.77	1.0	1.8	10	< 0.1	12	200	1.3
21039	6.3	0.71	3.7	0.51	0.6	3.7	5	< 0.1	23	139	8.4