

We are committed to providing [accessible customer service](#).

If you need accessible formats or communications supports, please [contact us](#).

Nous tenons à améliorer [l'accessibilité des services à la clientèle](#).

Si vous avez besoin de formats accessibles ou d'aide à la communication, veuillez [nous contacter](#).

Technical Report for Lackner Township, Lackner Carbonatite

Work Type: Taking Samples for Purposes of Geoscience Work / Prospecting

By Maurice Labelle, author of this report

For: Maurice Labelle, owner of the patents

Date of Completion of the report: March 18, 2023

The property includes:

10 Mining Patents: S54097, S54098, S54101, S53643, S53644, S53645, S58584, S58585, S58586, S58587 also described as: PAT-28531, PAT-28532, PAT-28533, PAT-28534, PAT-28535, PAT-28536, PAT-28537, PAT-28538, PAT-28539, PAT-28540

These mining patents are situated approximately 32 km from Chapleau, Ontario. They are accessed from a southern heading logging road approximately 22 km from Chapleau going east on Hwy 101 between Chapleau and Timmins. This logging road leads directly to the Portage Complex and to the east side of the Lackner Carbonatite Complex. The distance from Hwy 101 to the complexes is about 10 km. The patents cover most of Pole Lake and extend all the way down to the east of Longwell Lake. On this photo, since it is facing south, the sampling was performed on patents covering the east gorge (the left gorge on the photo) and on patents north of Pole Lake. These Patents, in Ron Sage's OGS Study No. 32 p.46 , correspond to the MacDonnell-LeBrasseur-Derraugh claims.



Date of Work performed: August 25-27, 2022

Work performed by: Maurice Labelle and Eric Labelle with Visitors: Dr. Zeinab Azadbakht and Edwin Morelli

Purpose of work performed: Sampling for Rare Earth Minerals, including Niobium and Tantalum

No exploration permits were issued or needed.

Location of Work performed: Lackner Township, Patented Claim: PAT-28534 and PAT-28535



(Right photo: Edwin Morelli, Eric Labelle, Dr. Zeinab Azadbakht)

Work Description

Exploration – Sampling 1, August 24-26, 2022

August 24, 2022

Finished loading up the gear in the truck along with the ATV on the utility trailer and travelled from Manitoulin Island to Chapleau. We stayed in town and reviewed the following day's plan for sampling.

August 25, 2022

At break of dawn, we proceeded to the east entrance to the Carbonatite just off Hwy 101 approximately 20 kms from Chapleau, ON. Not knowing the condition of the logging road, we unloaded the ATVs just off the Highway and proceeded on ATV all the way to the Portage Complex and shortly after, to the east side of the Lackner Carbonatite Complex. We drove as far as it was comfortable on the former road leading to Longwell Lake, and then proceeded on foot. Arriving at the South entrance of the East Pole Lake gorge, using the Terraplus RS-120 for radiometrics, we were able to establish a base reading. As we moved further north up the gorge, we were able to register higher readings. Samples were chosen according to their higher CPS levels. We walked all the way to the east end of Pole Lake and turned back using a different path to return to the ATVs. Among the samples taken were: 1-S2, 2-S3, 3-S4 and 4-S5. The guided sampling using the scintillometer was absolutely essential to the gathering of better samples as the lab results demonstrate at the end of this report. Samples taken on this day are indicated in yellow on the map.

August 26, 2022

Left Chapleau and returned to Manitoulin.



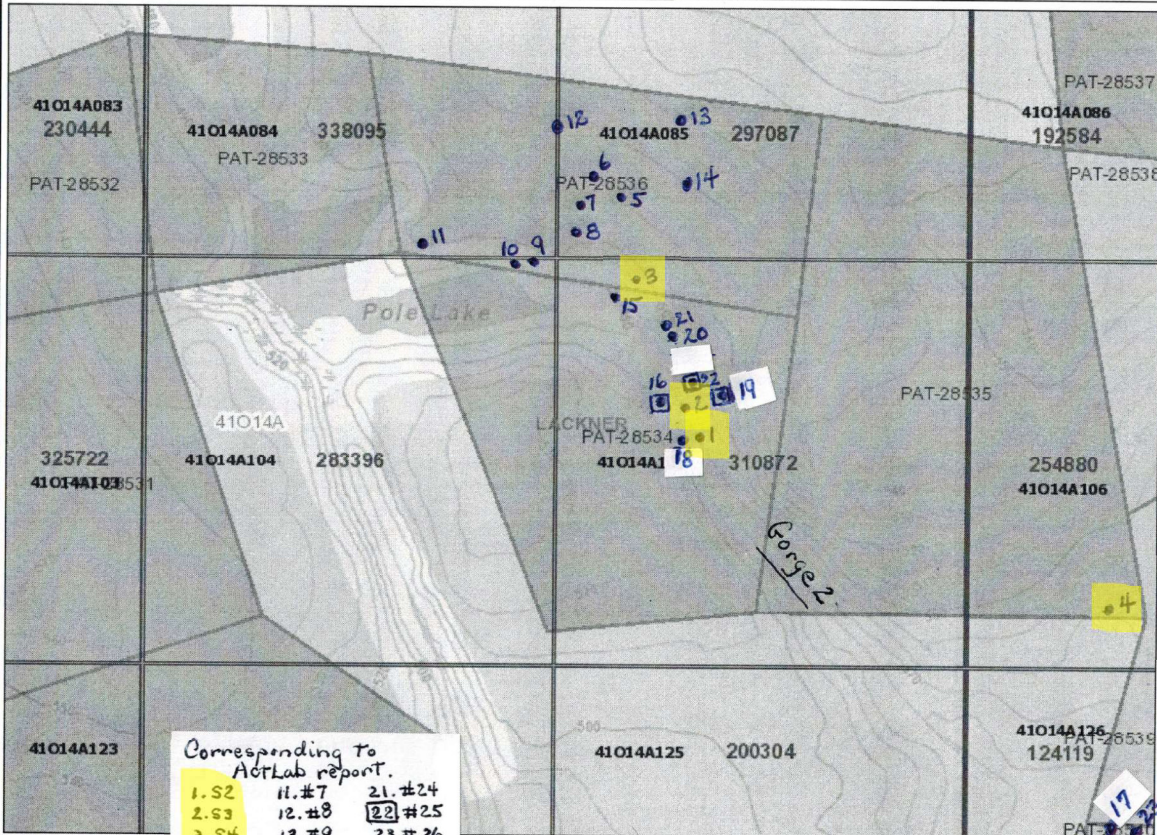
Ministry of Mines (MINES)

MLAS Map Viewer

MLAS Map - REM Exploration

Notes:

Sample Location August - September 2022



Legend

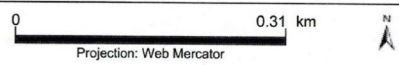
- Provincial Grid Cell**
 - Available
 - Pending
 - Unavailable
- Mining Claim**
 - Mining Claim
 - Boundary Claim
- Alienation**
 - Withdrawal
 - Notice
- MINES Administrative Boundaries**
 - MINES Townships and Areas
 - Geographic Lot Fabric
 - UTM Grid 1K
 - UTM Grid 10K
 - Mining Division
 - Mineral Exploration and Development Region
 - CLUPA Protected Area - Far North
 - Resident Geologist District
 - Federal Land Other
 - Native Reserves
- AMIS Sites**
 - AMIS Sites
 - AMIS Features
 - Drill Hole
 - Mineral Occurrences
- MLAS Mining History**
 - Withdrawal - History
 - Notice - History
 - Mining Claim - History
 - Mining Land Tenure - History
 - Legacy Claim
- Provincial Grid**
 - Provincial Grid 250K
 - Provincial Grid 50K
 - Provincial Grid Group
- Land Tenure**
 - Surface Rights
 - Mining Rights
 - Mining and Surface Rights
 - Order-in-Council

Corresponding to ActLab report.

1. #2	11. #7	21. #24
2. #3	12. #8	22. #25
3. #4	13. #9	23. #26
4. #5	14. #10	
5. #1	15. #11	
6. #2	16. #13 → Highest Nb	
7. #3	17. #20	
8. #4	18. #21	
9. #5	19. #22	
10. #6	20. #23	

Those wishing to register in the Ministry of Mines (MINES) are not intended for navigation. This map is compiled from information also compiled from the Ministry of Natural Resources and Forestry (MNR) and the Provincial Mining Recorder site.

The Mining Recorders' Office of the Ministry of Mines (MINES) is shown hereon. This map is not guaranteed. Additional information may be obtained from the Ministry of Natural Resources and Forestry (MNR) or the Ministry of Mines (MINES) web site.

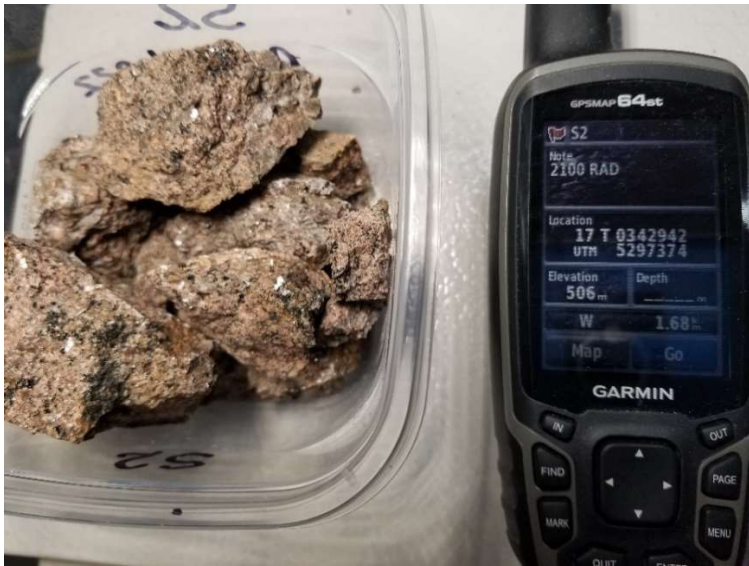


Imagery Copyright Notices: Ministry of Natural Resources and Forestry (MNR); NASA Landsat Program; First Base Solutions Inc.; Aéro-Photo (1961) Inc.; DigitalGlobe Inc.; U.S. Geological Survey.) web site.
© King's Printer for Ontario, 2023



Sample No.1, S2, Aug25, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM coordinates: 17, 0342942, 5297374
Porcupine Mining Division



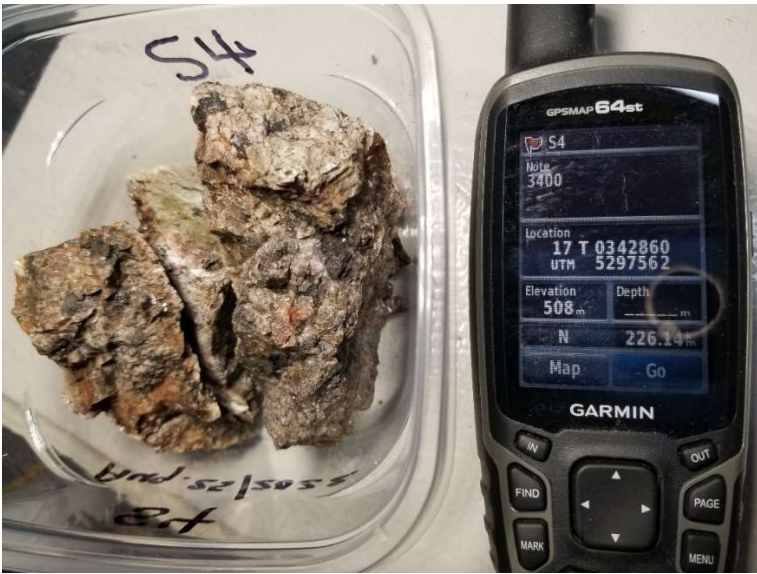
Sample No.2, S3, Aug25, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM coordinates: 17, 0342930, 5297411
Porcupine Mining Division



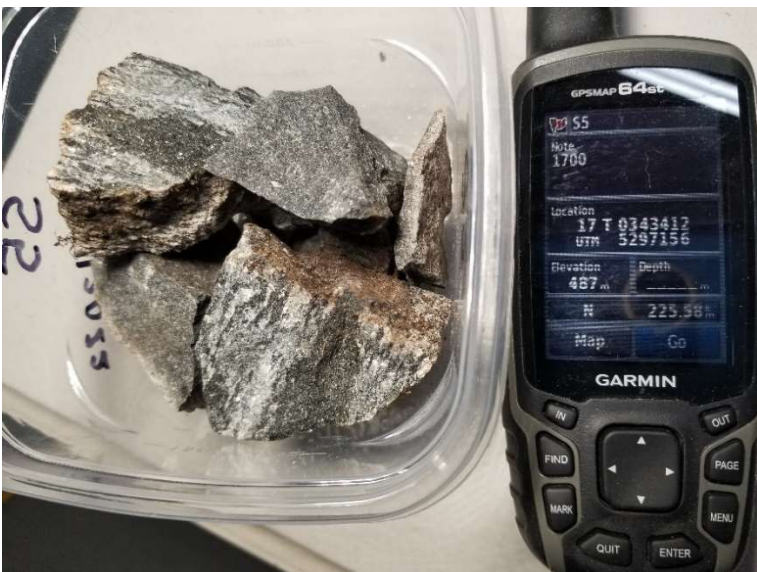
Sample No.3, S4, Aug25 Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342860, 5297562
Porcupine Mining Division



Sample No.4, S5, Aug25 Job Ref.: A22-14273

Mining Patent: PAT-28535
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0343412, 5297156
Porcupine Mining Division



Date of Work performed: September 8-11, 2022

Work performed by: Maurice Labelle and Eric Labelle

Purpose of work performed: Sampling for Rare Earth Minerals, Niobium and Tantalum

No exploration permits were issued or needed.

Location of Work performed: Lackner Township, Patented Claim: PAT-28534, PAT-28536 and PAT-28540

Work Description

Exploration – Sampling 2, September 8-11, 2022



September 8, 2022

After completing the usual preparations, we left Manitoulin Island at 11:00 am in the direction of Timmins with the goal of getting a Scintillometer. From Timmins, we headed to the Chapleau property and arrived at the entrance to the logging road from Hwy 101 at 9:30 pm. Since we had the camper van, we were able to stay there overnight saving us the 30-45 minute travel time from Chapleau.

September 9, 2022

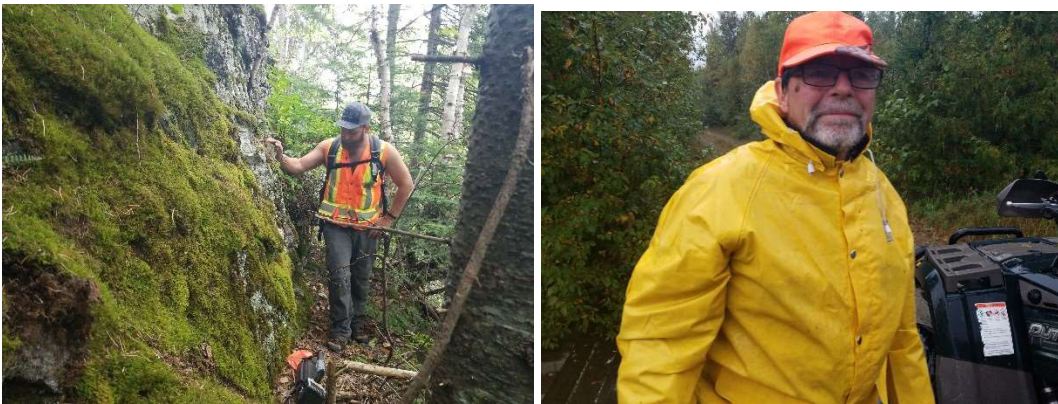
We unloaded the ATV and headed directly to the Gorge with the intention of reaching an area north of Pole Lake known to host a Carbonatite boulder. This boulder is indicated on the Map associated to Dr. Sage's OSG Study No.32. As usual, we went as far as possible along the east entrance trail leading to Longwell Lake by ATV, then continued on foot. Using the Terraplus scintillometer RS-120, we identified and collected samples of interest numbered #1, #2, #3, #4, #5, #6, #7, #8, #9, #10, #11 and #13. The last sample of the day was #13. The objective was to get to the Carbonatite Boulder and we did. Just north of Pole Lake, at the east end of the lake, there was a clearing where the CPS showed higher values (#7). We noted that location, but the very best sample of the day was the very last one, #13. It was taken on the west bank of the east Gorge. Assay results from ActLabs showed Niobium content, using the XRF method, of 17,300 ppm or 1.73 percent and Tantalum reading of 1290 ppm. Details are indicated below. We got back to the camper van at 7pm. That is when I placed all the samples in the back of the trailer and used the scintillometer on each sample individually. I then noticed that many of the samples, even though the area was showing relatively high readings, the samples themselves did not have very high CPS readings. The exception was sample #13. As indicated on the Actlab results, the sample had a Uranium content of .12%. That is consistent with our findings for the area, and also is consistent with Fred Breaks, "Rare Earth Element and Scandium Mineralization in the Lackner Lake Alkaline Complex, North-East Ontario, 2016" findings of the area, that higher relative concentrations of Uranium are usually associated to higher values of Niobium, while higher relative concentrations of Thorium are usually associated to higher concentrations of Rare Earth

mineralization. Note that these higher concentrations of radioactivity, from my knowledge, are still considered relatively “low levels”. They however serve as very good indicators for promising levels of Niobium and REEs.



September 10, 2022

Eric and I returned to the East gorge, but this time with the intention of progressively following larger circles around the #13 location. Also, we were a lot more careful to get samples that showed higher CPS readings. Those samples correspond to #20 to #26. Note that those samples took a lot more time to gather simply because it was often necessary to dig among and verify many rocks until a satisfactory sample was found. From the Actlab results we see that most of those samples are better than most all samples that we have discovered up to now and over the years. Samples #22 and #25 showed Niobium contents of 9600 ppm and 12,900 ppm and Tantalum at 670 ppm and 870 ppm. Many of the other samples also showed better REE levels. Note that all these three mentioned samples were taken in the middle of the gorge and as an after thought, we should have been better checking the east vertical wall of the gorge. The thought is that possibly, much of what is found in the gorge itself has come from the erosion of the walls of the gorge.



September 11, 2022

Loaded up the equipment and returned to Manitoulin Island.



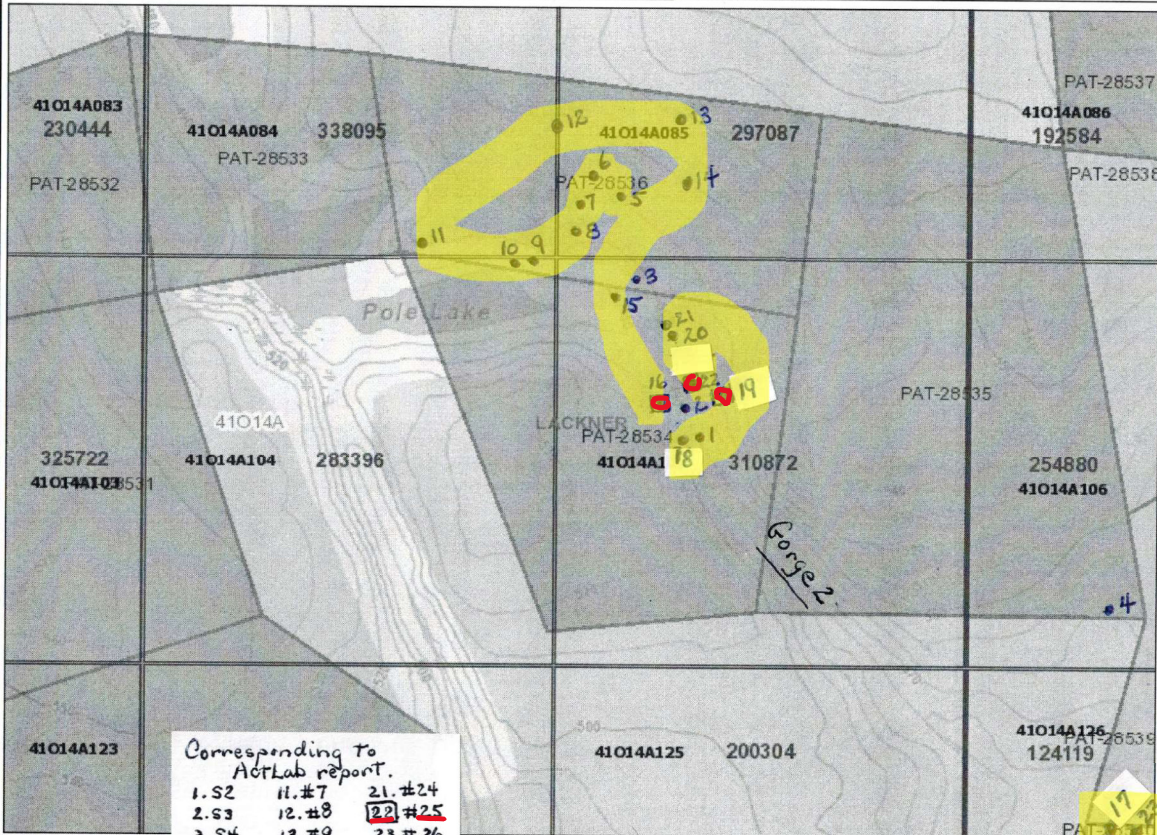
Ministry of Mines (MINES)

MLAS Map Viewer

MLAS Map - REM Exploration

Notes:

Sample Location August - September 2022



Legend

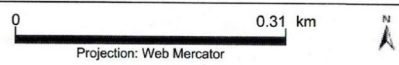
- Provincial Grid Cell**
 - Available
 - Pending
 - Unavailable
- Mining Claim**
 - Mining Claim
 - Boundary Claim
- Alienation**
 - Withdrawal
 - Notice
- MINES Administrative Boundaries**
 - MINES Townships and Areas
 - Geographic Lot Fabric
 - UTM Grid 1K
 - UTM Grid 10K
 - Mining Division
 - Mineral Exploration and Development Region
 - CLUPA Protected Area - Far North
 - Resident Geologist District
 - Federal Land Other
 - Native Reserves
- AMIS Sites**
 - AMIS Sites
 - AMIS Features
 - Drill Hole
 - Mineral Occurrences
- MLAS Mining History**
 - Withdrawal - History
 - Notice - History
 - Mining Claim - History
 - Mining Land Tenure - History
 - Legacy Claim
- Provincial Grid**
 - Provincial Grid 250K
 - Provincial Grid 50K
 - Provincial Grid Group
- Land Tenure**
 - Surface Rights
 - Mining Rights
 - Mining and Surface Rights
 - Order-in-Council

Corresponding to ActLab report.

1. #2	11. #7	21. #24
2. #3	12. #8	<u>22. #25</u>
3. #4	13. #9	23. #26
4. #5	14. #10	
5. #1	15. #11	
6. #2	<u>16. #13</u>	→ Highest Nb
7. #3	17. #20	
8. #4	18. #21	
9. #5	<u>19. #22</u>	
10. #6	20. #23	

Those wishing to register in the Ministry of Mines (MINES) are not intended for navigation. This map is compiled from information also compiled from the Ministry of Natural Resources and Forestry (MNR) and the Provincial Mining Recorder site.

The Mining Recorders' Office of the Ministry of Mines (MINES) is shown hereon. This map is not guaranteed. Additional information is available in the Ministry of Mines (MINES) web site.



Imagery Copyright Notices: Ministry of Natural Resources and Forestry (MNR/F); NASA Landsat Program; First Base Solutions Inc.; Aéro-Photo (1961) Inc.; DigitalGlobe Inc.; U.S. Geological Survey web site.
© King's Printer for Ontario, 2023



Sample No.5, #1, Sep9 Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342842, 5297684
Porcupine Mining Division



Sample No.6, #2, Sep9 Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342830, 5297668
Porcupine Mining Division



Sample No.7, #3, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342819, 5297645
Porcupine Mining Division



Sample No.8, #4, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342806, 5297615
Porcupine Mining Division



Sample No.9, #5, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342765, 5297583
Porcupine Mining Division



Sample No.10, #6, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342745, 5297585
Porcupine Mining Division



Sample No.11, #7, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342641, 5297609
Porcupine Mining Division



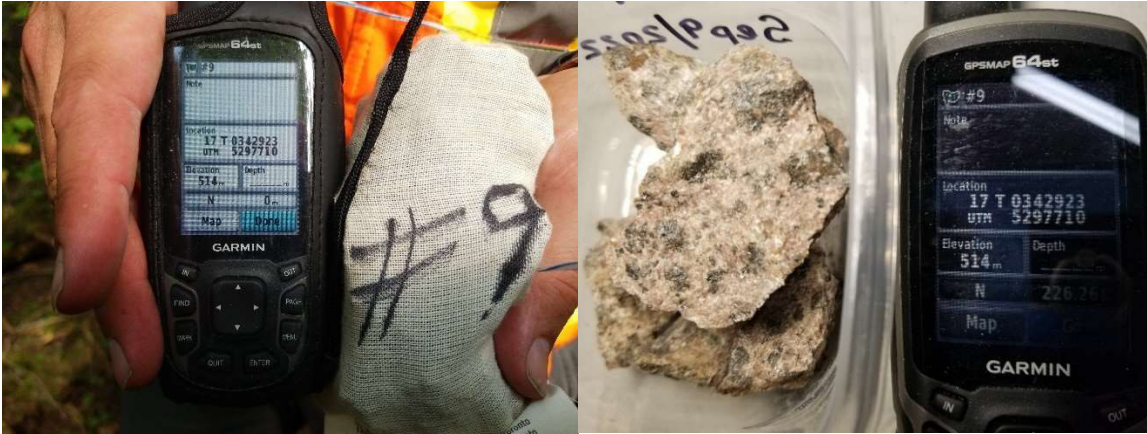
Sample No.12, #8, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342791, 5297725
Porcupine Mining Division



Sample No.13, #9, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342923, 5297710
Porcupine Mining Division



Sample No.14, #10, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28536
Provincial Grid Cell: 41O14A085
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342929, 5297666
Porcupine Mining Division



Sample No.15, #11, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342859, 5297549
Porcupine Mining Division



Sample No.16, #13, Sep9, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342929, 5297399
Porcupine Mining Division



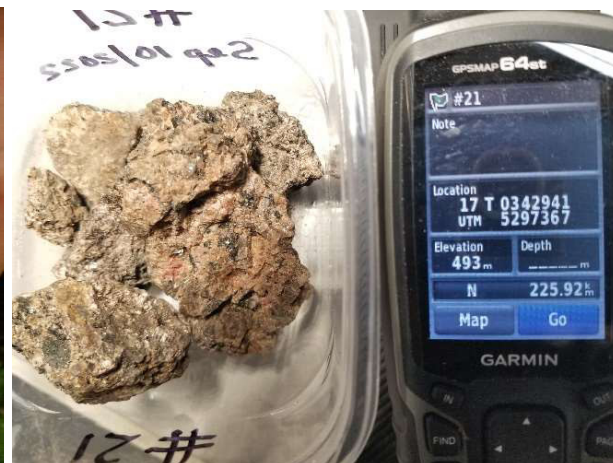
Sample No.17, #20, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28540
Provincial Grid Cell: 41O14A126
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0343441, 5296893
Porcupine Mining Division



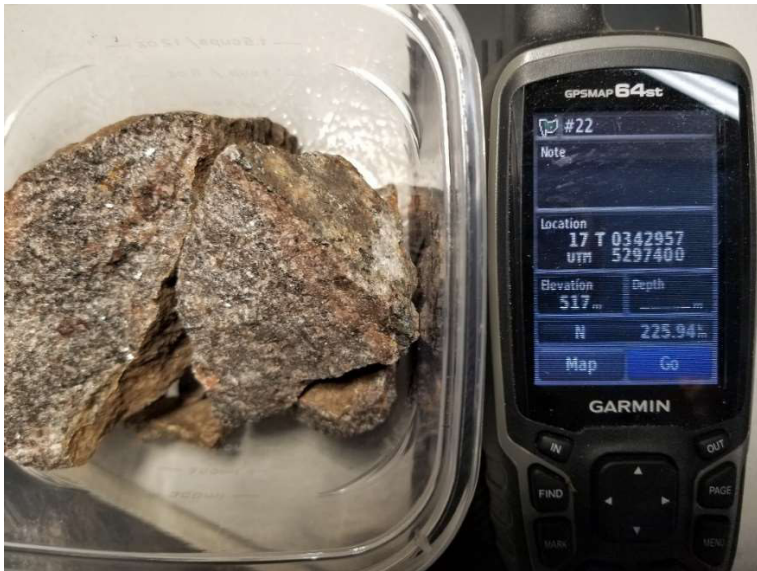
Sample No.18, #21, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342941, 5297367
Porcupine Mining Division



Sample No.19, #22, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342957, 5297400
Porcupine Mining Division



Sample No.20, #23, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342914, 5297474
Porcupine Mining Division



Sample No.21, #24, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342918, 5297477
Porcupine Mining Division



Sample No.22, #25, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28534
Provincial Grid Cell: 41O14A105
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0342920, 5297417
Porcupine Mining Division



Sample No.23, #26, Sep10, Job Ref.: A22-14273

Mining Patent: PAT-28540
Provincial Grid Cell: 41O14A126
Provincial Grid Group: 41O14A
MNDM Townships and Areas: LACKNER
UTM Grid 1K: 17, 0343460, 5296886
Porcupine Mining Division





Report No.: A22-14273
Report Date: 28-Nov-22
Date Submitted: 03-Oct-22
Your Reference: LACKNER CARBONATITE

REM Exploration
75 Honora Lakeshore Rd.
Little Current On
Canada

ATTN: Maurice Labelle

CERTIFICATE OF ANALYSIS

23 Rock samples were submitted for analysis.

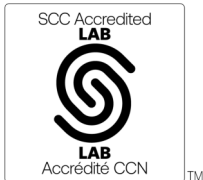
Table with 3 columns: Analytical package requested, Method, and Testing Date. Includes rows for XRF and REE Assay packages.

REPORT A22-14273

This report may be reproduced without our consent. If only selected portions of the report are reproduced, permission must be obtained.

Notes:

Total includes all elements in % oxide to the left of total.
Footnote: Zr/Nb/Ta/Hf results are semi-quantitative for samples with P2O5 >0.3%.



LabID: 266

ACTIVATION LABORATORIES LTD.
41 Bittern Street, Ancaster, Ontario, Canada, L9G 4V5
TELEPHONE +905 648-9611 or +1.888.228.5227 FAX +1.905.648.9613
E-MAIL Ancaster@actlabs.com ACTLABS GROUP WEBSITE www.actlabs.com

CERTIFIED BY:

Handwritten signature of Mark Vandergeest

Mark Vandergeest
Quality Control Coordinator

Results

Activation Laboratories Ltd.

Report: A22-14273

Analyte Symbol	ZrO2	Nb	Ta	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga
Unit Symbol	%	ppm	ppm	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.003	30	30	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.001	0.01	0.01	1	1	5	20	1	20	10	30	1
Method Code	FUS-XRF	FUS-XRF	FUS-XRF	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
S2	0.050	2370	220	53.67	20.70	6.72	0.183	0.84	2.11	4.34	8.87	0.366	0.01	99.78	1	5	14	< 20	7	< 20	10	100	20
S3	0.063	460	40	50.89	20.75	8.40	0.258	0.91	3.63	5.18	7.17	0.382	0.23	100.2	2	5	18	< 20	7	< 20	10	110	18
S4	0.056	3460	140	52.45	15.21	17.93	0.445	0.36	0.85	4.15	7.03	0.664	0.04	99.38	< 1	7	62	< 20	13	< 20	< 10	460	21
S5	0.100	1370	50	53.10	14.19	13.06	0.351	1.98	3.62	5.56	4.40	0.666	0.25	97.75	6	11	74	30	14	< 20	20	320	23
#1	0.064	1400	120	46.63	14.74	14.58	0.542	1.64	8.05	5.56	4.18	0.518	0.68	97.20	3	7	22	30	13	< 20	< 10	230	23
#2	0.231	1630	70	45.48	11.52	16.69	0.956	1.06	11.84	4.35	3.84	0.485	0.49	97.29	< 1	18	15	< 20	7	< 20	< 10	430	23
#3	0.082	910	40	46.33	18.28	9.54	0.325	1.28	6.34	8.05	5.87	0.353	0.31	97.47	7	4	22	30	7	< 20	< 10	110	24
#4	0.100	550	< 30	46.37	14.33	12.81	0.500	4.33	8.07	7.09	4.64	0.442	0.47	100.0	27	5	47	40	11	30	< 10	220	22
#5	0.050	610	< 30	51.11	18.23	9.36	0.235	0.34	4.62	7.09	6.63	0.224	0.09	98.86	< 1	21	< 5	< 20	3	< 20	< 10	120	20
#6	0.132	2970	130	49.33	12.27	18.01	0.586	1.87	6.15	3.04	5.78	0.523	0.13	99.26	4	13	95	< 20	16	< 20	110	350	21
#7	0.260	5090	220	39.89	11.13	28.23	0.858	3.53	6.67	3.51	3.00	1.278	0.17	99.24	4	16	180	40	27	40	140	650	29
#8	0.014	1260	< 30	35.69	11.56	10.76	0.748	0.60	21.14	2.12	5.49	0.221	1.11	97.98	2	< 1	< 5	< 20	3	< 20	< 10	140	27
#9	0.184	1650	50	44.79	14.97	13.16	0.772	0.12	13.69	5.05	4.69	0.411	0.85	99.41	2	8	10	30	< 1	< 20	< 10	120	22
#10	0.090	910	< 30	52.74	18.06	11.36	0.389	0.44	2.51	5.23	7.80	0.232	0.16	99.41	1	8	35	< 20	5	< 20	100	270	21
#11	0.596	1380	< 30	53.20	17.75	6.33	0.506	1.67	4.12	5.17	7.25	0.225	0.09	98.19	3	44	30	< 20	9	< 20	10	380	29
#13	0.068	17100	1290	51.11	21.50	4.55	0.177	1.10	1.76	3.80	9.10	0.325	0.01	96.67	< 1	2	8	< 20	4	< 20	< 10	80	22
#20	0.072	390	< 30	48.05	16.51	12.09	0.411	2.07	7.76	6.72	4.64	0.726	0.65	100.2	4	8	50	20	14	< 20	10	180	17
#21	0.058	2490	220	51.34	19.94	9.26	0.263	1.30	1.89	3.83	8.33	0.493	0.04	99.51	1	5	16	< 20	10	< 20	20	150	22
#22	0.094	9600	670	51.69	20.23	6.18	0.206	0.62	3.43	7.06	7.29	0.246	< 0.01	97.65	1	2	15	< 20	5	< 20	10	70	21
#23	0.368	1590	40	34.74	10.71	18.55	1.446	2.85	16.28	4.85	1.99	0.437	3.87	97.17	9	44	25	< 20	15	< 20	< 10	890	34
#24	0.440	2520	50	33.22	8.70	26.86	1.604	2.01	14.59	3.41	2.41	0.376	4.43	97.56	7	32	22	< 20	16	< 20	30	1000	42
#25	0.066	12900	870	50.28	19.00	8.64	0.260	1.24	3.00	4.55	8.14	0.534	0.06	98.20	2	2	16	< 20	9	< 20	20	110	21
#26	0.065	940	60	53.92	21.67	6.09	0.179	0.70	2.02	7.04	7.32	0.347	0.10	99.38	1	9	22	< 20	9	< 20	40	120	20

Results

Activation Laboratories Ltd.

Report: A22-14273

Analyte Symbol	Ge	As	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	Bi	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb
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	1	5	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
Method Code	FUS-MS	FUS-MS	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
S2	< 1	< 5	231	1691	6	382	2090	< 2	< 0.5	< 0.2	2	< 0.5	1.9	1555	< 0.4	37.0	74.4	8.04	26.9	3.8	1.16	2.2	0.3
S3	< 1	< 5	175	1970	12	491	443	< 2	< 0.5	< 0.2	3	< 0.5	1.3	2012	< 0.4	73.0	161	17.4	60.7	9.8	2.50	5.8	0.7
S4	< 1	< 5	207	2283	18	405	2890	< 2	< 0.5	< 0.2	10	< 0.5	4.7	2869	< 0.4	94.8	197	19.6	61.4	9.0	2.63	5.5	0.8
S5	1	< 5	111	2348	14	769	1100	< 2	< 0.5	< 0.2	8	< 0.5	1.7	3309	< 0.4	67.3	140	15.6	53.3	8.8	2.45	6.0	0.8
#1	2	< 5	114	1311	76	433	1100	< 2	< 0.5	< 0.2	9	< 0.5	0.6	3001	< 0.4	380	859	94.4	325	50.0	12.8	33.3	4.4
#2	2	< 5	128	1458	367	1460	1150	< 2	< 0.5	< 0.2	19	< 0.5	1.6	2396	< 0.4	188	556	71.3	329	95.6	31.8	89.0	14.2
#3	< 1	< 5	261	1289	149	594	827	< 2	< 0.5	< 0.2	7	< 0.5	3.7	412	< 0.4	664	1310	142	495	83.2	22.2	55.1	7.3
#4	< 1	< 5	181	1514	80	777	541	< 2	< 0.5	0.2	9	< 0.5	2.3	324	< 0.4	465	925	106	370	60.1	15.3	38.5	4.7
#5	< 1	< 5	206	1367	62	380	604	< 2	< 0.5	< 0.2	8	5.5	1.9	1865	< 0.4	25.0	92.0	8.85	40.8	10.8	3.54	10.6	2.0
#6	1	< 5	179	2919	18	972	2430	2	< 0.5	< 0.2	13	< 0.5	1.4	5492	< 0.4	115	230	23.2	74.7	10.9	2.87	6.5	0.9
#7	2	< 5	88	1763	28	1838	3970	2	< 0.5	< 0.2	26	< 0.5	0.9	2425	< 0.4	133	307	33.9	115	18.1	4.75	11.5	1.5
#8	1	12	250	8596	149	140	1030	< 2	< 0.5	< 0.2	5	4.2	4.5	7022	< 0.4	327	3610	95.6	376	74.1	22.3	54.9	7.8
#9	2	12	187	1631	378	1078	1130	< 2	< 0.5	< 0.2	10	0.7	3.4	2805	< 0.4	257	745	95.9	441	118	38.4	102	14.9
#10	< 1	< 5	226	3110	20	695	825	< 2	< 0.5	< 0.2	7	< 0.5	2.2	2651	< 0.4	101	210	25.3	86.8	13.1	3.38	7.8	1.0
#11	2	6	309	2572	57	4732	1250	< 2	1.0	< 0.2	21	0.8	12.1	7484	0.5	166	362	33.4	107	18.0	4.84	12.3	2.0
#13	< 1	< 5	214	1853	9	572	15000	< 2	< 0.5	< 0.2	7	< 0.5	1.5	1786	< 0.4	93.0	225	23.9	73.7	9.4	2.36	4.4	0.6
#20	1	< 5	92	2081	34	550	393	< 2	< 0.5	< 0.2	3	< 0.5	0.8	2100	< 0.4	175	362	41.2	144	21.8	5.86	13.7	1.8
#21	< 1	< 5	233	1892	8	445	2230	2	< 0.5	< 0.2	4	< 0.5	2.7	1895	< 0.4	52.6	99.5	10.2	32.8	5.2	1.37	3.0	0.4
#22	< 1	< 5	196	1481	7	559	8310	< 2	< 0.5	< 0.2	4	< 0.5	0.9	1779	< 0.4	53.0	132	15.7	52.1	7.3	1.84	3.8	0.5
#23	< 1	9	63	3892	533	255	385	< 2	< 0.5	< 0.2	3	< 0.5	0.9	936	0.4	2460	6210	655	2380	389	97.8	247	31.1
#24	1	11	74	4337	566	699	1460	< 2	< 0.5	< 0.2	18	0.6	0.8	2268	< 0.4	2770	7090	735	2570	409	104	271	34.8
#25	< 1	< 5	222	1556	17	558	11200	< 2	< 0.5	< 0.2	5	< 0.5	1.6	1521	< 0.4	120	287	30.7	101	14.4	3.57	7.9	0.9
#26	< 1	< 5	194	2210	14	524	941	2	< 0.5	< 0.2	5	< 0.5	1.9	3151	< 0.4	82.3	159	16.3	52.7	7.8	2.26	4.8	0.7

Analyte Symbol	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.1	0.1	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	FUS-MS	FUS-MS
S2	1.4	0.2	0.6	0.10	1.0	0.18	4.7	227	< 1	0.3	145	26.9	233
S3	3.2	0.5	1.5	0.25	1.9	0.36	5.9	27.6	< 1	0.2	16	10.6	22.0
S4	3.9	0.7	2.0	0.30	2.0	0.32	4.5	141	1	0.4	126	91.2	139
S5	3.6	0.6	1.5	0.24	1.7	0.29	11.4	50.3	< 1	0.3	43	78.9	46.5
#1	21.1	3.5	8.9	1.25	7.9	1.34	5.7	86.3	< 1	0.2	74	132	108
#2	82.1	15.0	40.1	5.40	29.9	3.91	20.8	55.6	< 1	0.4	48	165	50.5
#3	34.8	5.8	15.1	2.01	11.6	1.68	6.5	43.3	< 1	0.4	17	98.6	21.9
#4	20.7	3.3	8.4	1.03	6.1	0.94	8.8	24.2	< 1	0.3	10	78.7	13.4
#5	13.0	2.6	7.2	1.04	6.4	0.93	7.8	25.0	4	0.5	10	84.6	1.9
#6	4.5	0.8	2.3	0.38	3.1	0.66	12.3	118	1	0.3	119	90.9	148
#7	7.8	1.3	3.7	0.56	4.5	0.85	21.3	192	2	0.2	146	213	190
#8	39.8	6.6	16.7	2.06	10.9	1.32	2.6	19.3	< 1	0.9	52	236	2.1
#9	81.8	14.5	38.0	5.07	29.2	3.91	13.3	47.9	< 1	0.6	42	136	24.0
#10	4.9	0.8	2.2	0.36	2.6	0.49	7.3	38.6	< 1	0.6	51	57.9	45.2
#11	11.1	2.2	6.9	1.12	8.1	1.42	44.4	30.1	4	0.9	93	248	17.1
#13	2.5	0.4	1.0	0.15	1.2	0.22	6.8	1170	3	0.3	774	137	1200
#20	8.3	1.4	3.7	0.53	4.0	0.74	6.3	18.3	< 1	0.2	13	36.8	14.3
#21	1.9	0.3	0.9	0.15	1.2	0.25	5.5	228	2	0.3	137	34.0	217
#22	2.1	0.3	1.0	0.17	1.4	0.30	7.5	632	1	0.3	411	52.4	602
#23	146	23.2	57.9	6.99	36.6	4.69	2.9	19.1	< 1	0.4	64	1310	50.3
#24	159	25.1	64.2	7.48	39.5	5.01	18.0	37.8	< 1	0.5	107	1680	82.3
#25	4.2	0.7	1.8	0.28	2.0	0.37	7.9	814	6	0.3	475	86.9	744
#26	3.3	0.6	1.6	0.22	1.5	0.25	5.8	59.9	1	0.3	73	68.8	91.6

Analyte Symbol	Ta2O5	Nb2O5	ZrO2	Nb	Ta	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	Sc	Be	V	Cr	Co	Ni	Cu	Zn
Unit Symbol	%	%	%	ppm	ppm	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.003	0.003	0.003	30	30	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.001	0.01	1	1	5	20	1	20	10	30
Method Code	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
NIST 694 Meas						10.91	1.78	0.70	0.013	0.33	42.21	0.76	0.50	0.110	29.78								
NIST 694 Cert						11.2	1.80	0.790	0.0116	0.330	43.6	0.860	0.510	0.110	30.2								
GBW 07113 Meas						70.54	13.15	3.23	0.134	0.15	0.59	2.46	5.53	0.285	0.04	5	4	< 5					
GBW 07113 Cert						72.8	13.0	3.21	0.140	0.160	0.590	2.57	5.43	0.300	0.0500	5.00	4.00	5.00					
SY-4 Meas						50.77	21.68	7.17	0.104	0.52	7.89	7.30	1.79	0.296	0.13	1	3	7					
SY-4 Cert						49.9	20.69	6.21	0.108	0.54	8.05	7.10	1.66	0.287	0.131	1.1	2.6	8.0					
BIR-1a Meas						47.97	15.94	11.77	0.164	9.89	13.73	1.81	0.02	0.990	0.02	44	< 1	321	380	51	170	130	70
BIR-1a Cert						47.96	15.50	11.30	0.175	9.700	13.30	1.82	0.030	0.96	0.021	44	0.58	310	370	52	170	125	70
ZW-C Meas																			60				1000
ZW-C Cert																			56.0				1050
OREAS 101b (Fusion) Meas																				43	< 20	400	
OREAS 101b (Fusion) Cert																				47	9	420	
NCS DC86318 Meas																							
NCS DC86318 Cert																							
SX18-01 Meas	0.007	0.678	0.086	4740																			
SX18-01 Cert	0.005	0.695	0.093	4860.000																			
SX18-04 Meas	0.006	1.278	0.160	8940																			
SX18-04 Cert	0.005	1.32	0.146	9230.000																			
SX18-05 Meas	0.004	0.946	0.209	6610																			
SX18-05 Cert	0.004	0.973	0.218	6800.000																			
USZ 25-2006 Meas																				34	70		630
USZ 25-2006 Cert																				32.5	70.8		600
DNC-1a Meas						46.39	18.31	10.30	0.139	10.30	11.61	1.86	0.22	0.477	0.07	31		146					
DNC-1a Cert						47.15	18.34	9.97	0.150	10.13	11.49	1.890	0.234	0.480	0.07	31		148					
USZ 42-2006 Meas																							480
USZ 42-2006 Cert																							469
SX18-03 Meas	0.256	60.53	0.880	423000	2100																		
SX18-03 Cert	0.273	60.62	0.847	423920.000	2240.000																		
MA-N (2011) Meas	0.035	0.026	0.005	180	280																		
MA-N (2011) Cert	0.035	0.025	0.003	173	290.000																		
REE-1 Meas																				280	20	90	
REE-1 Cert																				277	24.7	79.7	
W-2b Meas						52.27	15.46	11.28	0.160	6.45	11.30	2.17	0.62	1.103	0.12	35	< 1	261	90	42	70	110	80
W-2b Cert						52.4	15.4	10.7	0.163	6.37	10.9	2.14	0.626	1.06	0.140	36.0	1.30	262	92.0	43.0	70.0	110	80.0
OREAS 149 (Fusion XRF) Meas		0.923																					
OREAS 149 (Fusion XRF) Cert		0.915																					
AMIS 0449 Meas	0.021	0.154		1080	170																		
AMIS 0449 Cert	0.024	0.157		1100	200																		

Analyte Symbol	Ta2O5	Nb2O5	ZrO2	Nb	Ta	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	Sc	Be	V	Cr	Co	Ni	Cu	Zn
Unit Symbol	%	%	%	ppm	ppm	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.003	0.003	0.003	30	30	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.001	0.01	1	1	5	20	1	20	10	30
Method Code	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
#26 Orig	0.008	0.133	0.064	930	60																		
#26 Dup	0.006	0.136	0.065	950	50																		
Method Blank						< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.001	< 0.01	< 1	< 1	< 5	< 20	< 1	< 20	< 10	< 30
Method Blank	< 0.003	< 0.003	< 0.003	< 30	< 30																		

Analyte Symbol	Ga	Ge	As	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	Bi	La	Ce	Pr	Nd	Sm	Eu	Gd
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	1	1	5	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
Method Code	FUS-MS	FUS-MS	FUS-MS	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
NIST 694 Meas																							
NIST 694 Cert																							
GBW 07113 Meas					42	51	417								497								
GBW 07113 Cert					43.0	43.0	403								506								
SY-4 Meas					1229	134									357								
SY-4 Cert					1191	119									340								
BIR-1a Meas	15				109	16	14	< 1					0.5		7		0.7	1.8		2.4	1.1	0.50	1.9
BIR-1a Cert	16				110	16	18	0.6					0.58		6		0.63	1.9		2.5	1.1	0.55	2.0
ZW-C Meas	92			7820				217	4			1250	4.5	248			30.4	102	9.30	24.1	6.5		4.4
ZW-C Cert	99			8500				198	4.30			1300	4.2	260			30.0	97	9.5	25.0	6.6		4.70
OREAS 101b (Fusion) Meas									18								745	1240	119	362	46.0	7.19	
OREAS 101b (Fusion) Cert									21								789	1331	127	378	48	7.77	
NCS DC86318 Meas				383										11.8			1890	417	697	3140	1610	18.1	2090
NCS DC86318 Cert				369.42										11.88			1960	432	737	3429	1725	18.91	2168
SX18-01 Meas																							
SX18-01 Cert																							
SX18-04 Meas																							
SX18-04 Cert																							
SX18-05 Meas																							
SX18-05 Cert																							
USZ 25-2006 Meas																	17900	28400	2550	7950	835	194	
USZ 25-2006 Cert																	19300	29000	2800	8800	900	211.00	
DNC-1a Meas					144	18	36								102								
DNC-1a Cert					144	18.0	38.0								118								
USZ 42-2006 Meas			240	60				34	36								20400	27800	2250	6210	514	86.0	
USZ 42-2006 Cert			224	67.12				31.00	34.40								21100	27600	2300	6500	539	87.22	
SX18-03 Meas																							
SX18-03 Cert																							
MA-N (2011) Meas																							
MA-N (2011) Cert																							
REE-1 Meas			112	1020				3900				523		1.1			1680	3970	445	1490	400	24.0	440
REE-1 Cert			124	1050				4050				498		1.07			1661	3960	435	1456	381	23.5	433
W-2b Meas	17			20	192	22	92	7					0.8		173		10.8	24.0		12.8	3.1	1.00	
W-2b Cert	17.0			21.0	190	24.0	94.0	7.90					0.790		182		10.0	23.0		13.0	3.30	1.00	
OREAS 149 (Fusion XRF) Meas																							
OREAS 149 (Fusion XRF) Cert																							
AMIS 0449 Meas																							
AMIS 0449 Cert																							
#26 Orig																							
#26 Dup																							
Method Blank	< 1	< 1	< 5	< 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
Method Blank																							

Analyte Symbol	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.1	0.1	0.1	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	FUS-MS	FUS-MS	FUS-MS
NIST 694 Meas														
NIST 694 Cert														
GBW 07113 Meas														
GBW 07113 Cert														
SY-4 Meas														
SY-4 Cert														
BIR-1a Meas						1.7	0.27	0.6				< 5		
BIR-1a Cert						1.7	0.3	0.60				3		
ZW-C Meas			1.9		1.50	14.4	2.24	9.1	80.9	310	33.2	78	44.9	18.8
ZW-C Cert			2.0		1.60	14	2.20	9.7	82	320	34	80	43	20.0
OREAS 101b (Fusion) Meas	5.1	30.8	6.0	18.2	2.54	17.2	2.43						36.3	377
OREAS 101b (Fusion) Cert	5.37	32.1	6.34	18.7	2.66	17.6	2.58						37.1	396
NCS DC86318 Meas	464	2980	559	1640	261	1710	251						69.6	
NCS DC86318 Cert	468	3224	560	1750	271	1844	264						67.0	
SX18-01 Meas														
SX18-01 Cert														
SX18-04 Meas														
SX18-04 Cert														
SX18-05 Meas														
SX18-05 Cert														
USZ 25-2006 Meas						51.3						1140		
USZ 25-2006 Cert						54.5						1100		
DNC-1a Meas														
DNC-1a Cert														
USZ 42-2006 Meas		54.0	7.9			18.4						1650	931	
USZ 42-2006 Cert		57.63	7.86			17.85						1600	946	
SX18-03 Meas														
SX18-03 Cert														
MA-N (2011) Meas														
MA-N (2011) Cert														
REE-1 Meas	115	909	211	729	112	708		480					786	147
REE-1 Cert	106	847	208	701	106	678		479					719	137
W-2b Meas	0.6	3.7	0.8	2.3	0.33	2.0	0.32	2.5	0.5				2.3	0.5
W-2b Cert	0.630	3.60	0.760	2.50	0.380	2.10	0.330	2.60	0.500				2.40	0.530
OREAS 149 (Fusion XRF) Meas														
OREAS 149 (Fusion XRF) Cert														
AMIS 0449 Meas														
AMIS 0449 Cert														
#26 Orig														
#26 Dup														
Method Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05	< 0.1	< 0.04	< 0.2	< 0.1	< 1	< 0.1	< 5	< 0.1	< 0.1
Method Blank														

