BC Geological Survey
Assessment Report
33912

Geological, Geochemical and Prospecting Report

Terrace Project

Tenure # 805722, 845186, 867193 and 1010943

Mining Division - Skeena

NTS – 103I 09E

BCGS Map – 103 I.060

Lat/Long – 54° 34’ 5”N, 128° 11’ 10”W

Owner/Operator - P. Walker

15781 Quick Road West
Telkwa, BC V0J 2X2

Event # 5406528

Author – A. Raven Date – December 3, 2012

Table of contents

Summary

The objective of this survey was to determine if economic copper mineralization had been exposed by the access construction for logging activities within the boundaries of the Walker claims since the exploration carried out by Nass Valley Gateway Ltd in 2007.

A field team, a prospector (author of this report) and an assistant (the property owner), carried out a two day sampling and geological mapping reconnaissance program on the Walker's Terrace project claims.

A total of 20 rock samples were collected from the Walker claims during the mapping, prospecting traverses. These reconnaissance traverses was carried out on September 15/16, 2012.

The crew located low grade copper mineralization and anomalous silver values in some of the rock samples collected from the Walker claims. These anomalous samples were located within the structurally controlled quartz/carbonate shear zones in the volcanics.

Six rock samples ranging from 234 ppm to>10,000 ppm copper with only two samples anomalous in silver – 55 and >100 ppm – both from the old Lucky Jim showing area

See table 2 – Rock sample descriptions - for details.

Conclusions

The crew did not locate any copper mineralization of economic interest in the areas exposed by the recent logging activity. The highest copper values outside of the original Lucky Jim showing area were and are located in the quartz carbonate shear zones generally <1 to 3 metres in width.

Recommendations

The results from this field work and a review of the past history of the property suggests that the prospect of finding economic copper/silver mineralization within the boundaries of these claims is not good. It is recommended that the property owner not spend further funds on this project at this time if further logging activity exposes additional bedrock then it may be productive to prospect the new exposures.

Introduction

The Kleanza Mountain property is located approximately 23 kilometers northeast of Terrace, British Columbia in the Bornite Range and within the watershed of Kleanza Creek (Figure 1). The primary mineral showing on the property is the Lucky Jim (Alvija) prospect.
The Lucky Jim prospect is comprised of shear-hosted copper-silver mineralization within dacitic and volcanic flow rocks of the Telkwa Formation, part of the Lower Jurassic Hazleton Group.

The host shear zone, which strikes N20W (340o) and is nearly vertical, is comprised of a series of smaller anastamosing shears, the total of which extends approximately 50 meters east-west at the Lucky Jim prospect. The zone can be traced along surface for approximately 100 meters northwest before it disappears under the forest cover, and approximately 150 meters southeast where it disappears beneath local talus slopes. The mineralization at the Lucky Jim and other smaller showings on the property is restricted within sub-vertical shears, and does not extent into the surrounding wall rocks. Variable, trace degrees of silicification accompany the mineralization. These characteristics are indicative of an epithermal deposit, although the source of metals and heat to drive the hydrothermal fluids is still open to question.

Location and access

The property is located approximately 23 kilometers northeast of Terrace, British Columbia in the Bornite Range and within the watershed of Kleanza Creek (Figure 1).). The property is accessible by driving northeast from Terrace, BC on Yellowhead Highway 16 for approximately 16 kilometers to the entrance for Kleanza Creek Park. Turning onto the logging road adjacent to the park entrance, drive southeast parallel to Kleanza Creek 17.1 kilometers directly to the primary showing on the property, the Luck Jim occurrence.

Topography, vegetation and climate

The topography in the project area is rugged, and the steep mountain slopes are wooded with a combination of second growth timber and occasionally dense brush.

The climate in the Terrace, B.C. region reflects a mix of coastal and interior influences, and due to the shelter of the Coast Mountains, the city maintains moderate temperatures and less rainfall than many of its neighboring communities.

Exploration history

The original Lucky Jim Claim was staked in 1908 on an outcropping of three narrow shear-hosted stringers containing iron, chalcocite, bornite, epidote, and chlorite (*EMPR AR 1914, pp.K126).*

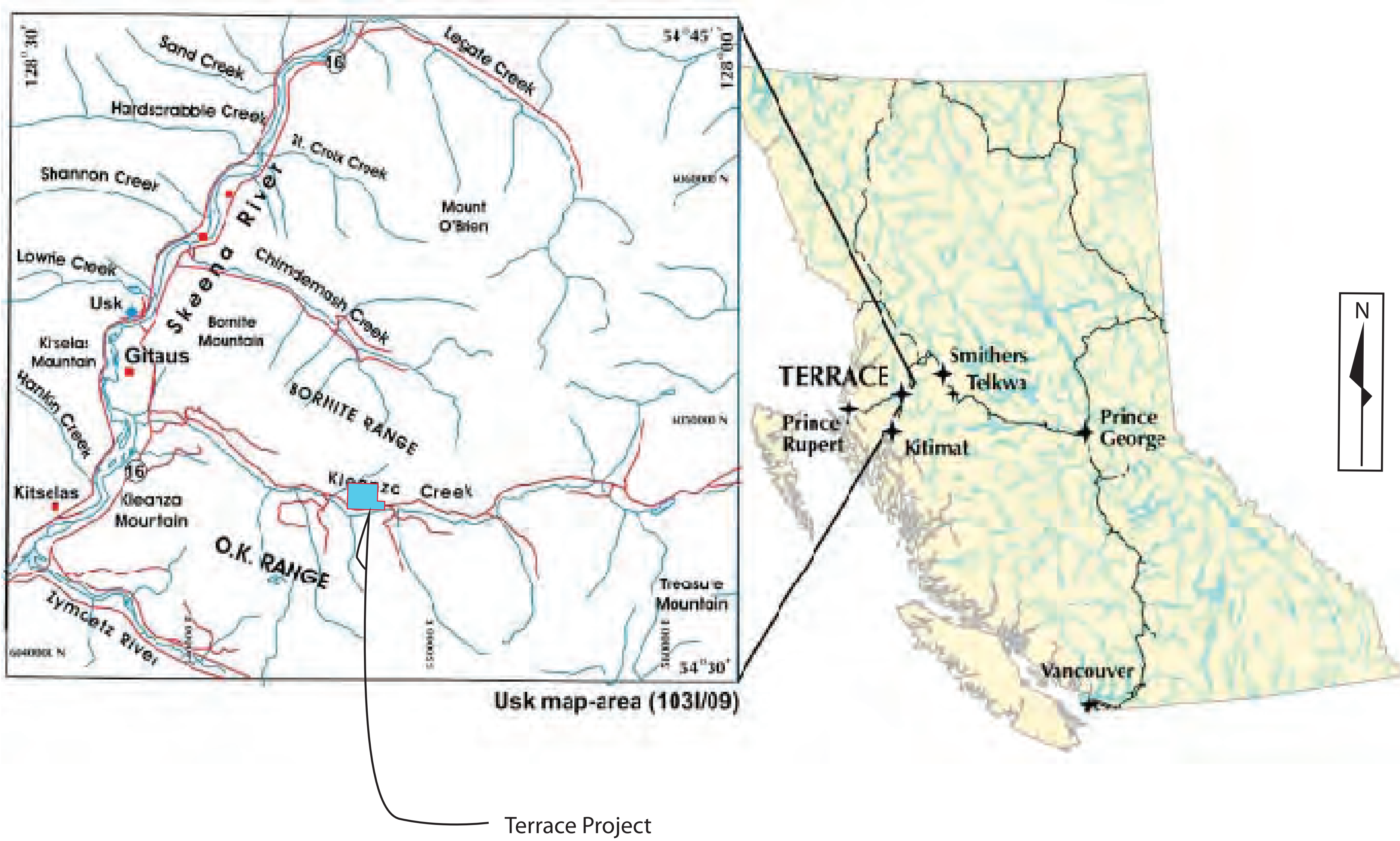
By 1914, reports indicate that two exploration trenches had been dug and a short adit had been driven into the mineralized shear zone. In 1920 Alvija Mines Ltd. owned the property, and had begun to develop the showing by means of a shaft and tunnel, and in 1925 developments consisted of adits and large open-cuts.

In 1924 a 35-foot adit was driven 35 feet by Federal Mining & Smelting Co., and in 1929 the COMINCO Co. sank a shaft from the 2,080 foot elevation to approximately 155 feet in depth. The advent of the Depression and World War II put an end to most of the mining activity in the Terrace area.

Forest products formed the basis for the next economic resurgence, and between 1950 and 1990 extensive networks of logging roads accessed more and more remote locations.

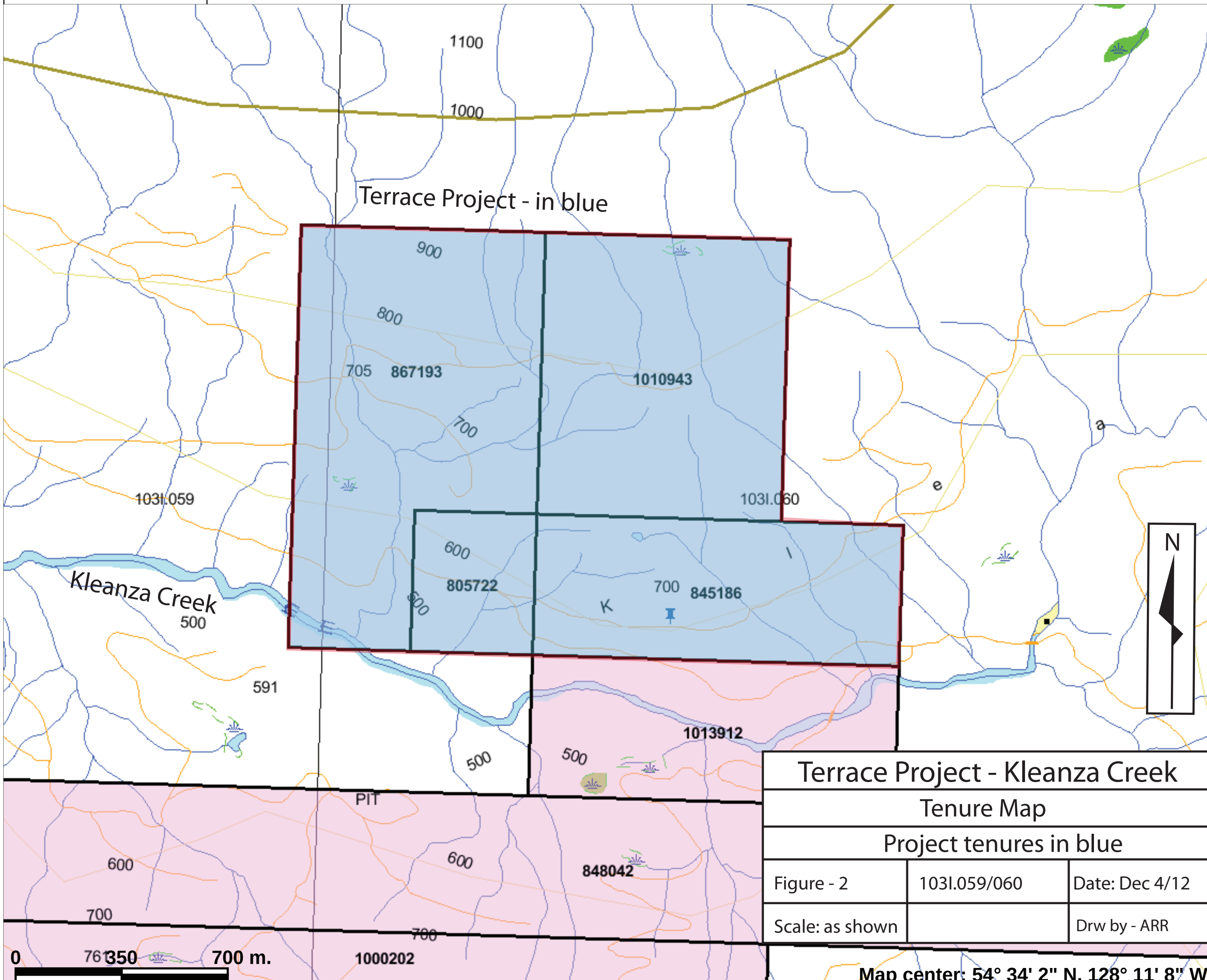
In 1968 Alvija Mines Ltd. continued exploration work by establishing two miles of mining road, mapping in detail a 3,000’ by 5,000’ area, and by blasting 15 trenches for a total length of 1,000 feet. The company also drilled four diamond drill holes for a total length of 1,020 feet. Based on the surface indications and the diamond drill holes, the company estimated 181,420 tonnes of unclassified ore at 4% copper and 68.5 gpt silver (*from Minfile Number 103I-085; historical estimate only, not NI43-101 compliant*).

In 1980 a report by Stephen Quin describing the Lucky Jim Claims was published for the Kelly Creek Joint Venture, and subsequently catalogued as *Mineral Resources Branch Assessment Report No. 9914.* The report discusses the results of a short reconnaissance program consisting of stream sediment, soil and rock chip sampling, and limited structural mapping



Terrace Project - Kleanza Creek		
Location Map		
Project tenures in blue		
Figure - 1	103I.059/060	Date: Dec 4/12
Scale: as shown		Drw by - ARR

Terrace Project Claim Map



Legend

MINFILE Status

- Producer
- Past Producer
- Developed Prospect
- All others

- Indian Reserves
- National Parks
- Conservancy Areas
- Parks
- Federal Transfer Lands

Mineral Tenure (current)

- Mineral Claim
- Mineral Lease

Mineral Reserves (current)

- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others

- First Nations Treaty Related Lands
- First Nations Treaty Lands
- Integrated Cadastral Fabric
- Survey Parcels
- BCGS Grid

Contours (1:250K)

- Contour - Index
- Contour - Intermediate

Scale: 1:20,000

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Claim status – table 1

Tenure Number	Claim Name	Owner	Tenure Type	Issue Date	Good To Date *	Status	Area (ha)
805722	ROAD SHOW	146513 (100%)	Mineral	2010/jul/01	2014/sep/22	GOOD	18.7518
845186	GOTIT	146513 (100%)	Mineral	2011/feb/01	2014/sep/22	GOOD	56.2556
867193	GOT MORE	146513 (100%)	Mineral	2011/jul/22	2014/sep/22	GOOD	93.7476
1010943	ROAD SHOW 2	146513 (100%)	Mineral	2012/jul/10	2014/jul/10	GOOD	74.9961

*- assuming acceptance of this report.

Field Program

The field crew carried out a program of prospecting and rock sampling on the Terrace Project (Walker claims) on September 15 and 16, 2012. The crew mobilized from Smithers on a daily basis using a 4X4 vehicle with approximately 7 to 8 hours spent doing field work on the property each day.

The objective of this program was to determine if recent logging in the area had exposed any significant copper/silver mineralization similar to the old Lucky Jim showing to the south. This program did locate some low grade copper mineralization and anomalous silver values within the exposures of dacite uncovered by the construction of logging roads in the area. However the grades were not sufficient to offer any encouragement to the property owner as only the samples from the old dump in the Lucky Jim showing area returned values of interest.

The rock samples collected in the field were placed in plastic sample bags with an identifying “assay” tag, transported to Smithers and delivered to the Acme prep lab where the samples were prepared for analysis and the pulps were shipped to Acme Analytical Laboratories of Vancouver where they were analyzed using the Acme 1DX3 analytical package. A permanent field marker was left at the sample site for relocation of the site if necessary; field notes were taken including the UTM location using handheld GPS units set to the NAD 83 data base and the descriptions of the rocks sampled were recorded in field notes. See appendix A for analytical results.

Discussion of analytical results

The highest grade sample were from the ones collected from the old dump in the area of the Lucky Jim showing, 204010 and 204011, with copper >1% and silver at 55 g/t and >100 g/t.

Copper values: the highest values >1% were from the samples collected from the old Lucky Jim showing area with the other anomalous samples ranging from 234 to 1385 ppm being collected from altered dacite and quartz/carbonate zones

Silver values: the only values of significance are from the old showing samples 55 g/t and >100 g/t from numbers 204010 and 204011 respectively

Arsenic, cadmium and antimony along with copper were elevated in sample 204008 – 20, 3.1 31 and 1386 ppm respectively.

Barium was elevated in samples 204017 to 204021 with values ranging from 264 to 1499 ppm respectively These values may indicate a more distal exposure of the system but only 204020 (227 ppm) showed any elevation of copper values

Sulphur, selenium and tellurium are elevated in the samples from the Lucky Jim showing area. These elevated values may be of assistance in future reconnaissance work in the area

Regional Geology

The Terrace area lies within the western extent of the intermontane Stikinia Terrane, a Paleozoic through mid-Jurassic island arc magmatic sequence, which is the subject of an on-going geologic mapping program (*Nelson, et al,* 2006-A/B, 2007; *Geology and Mineral Potential of the Usk Map Area, NTS 103I/09*). The area is part of a large crustal block dominated by typically variable sequences of volcanic and volcaniclastic rocks, related sedimentary units, and minor limestones (Figure 3). Terrace also lies on the eastern edge of the deeply-eroded mid-Jurassic to Eocene Coast Plutonic Complex, a linear belt of granitoid and metamorphic rocks accreted along the western edge of the Stikinia Terrane, and which dominate the coast of British Columbia.

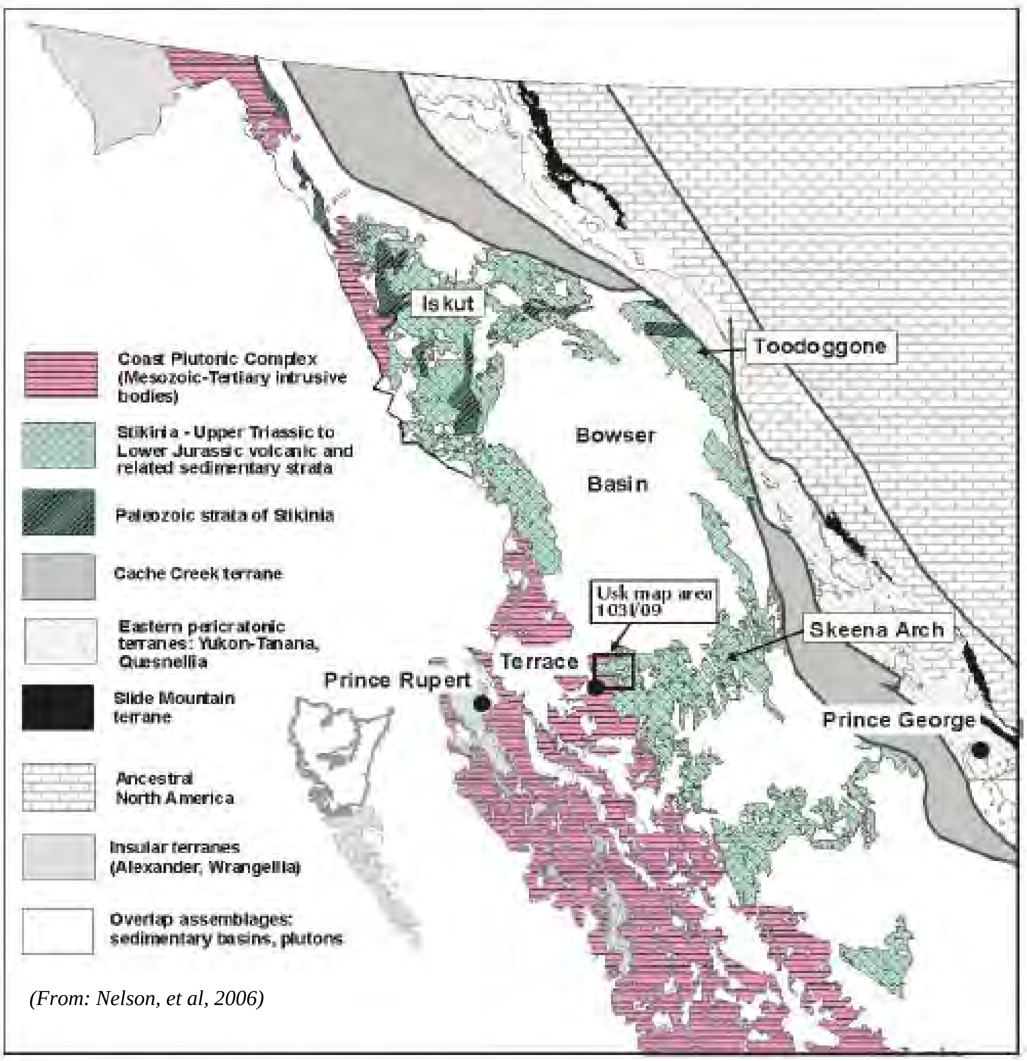


Figure 3: Tectonic Setting of the Terrace (Usk) Area

Local Geology

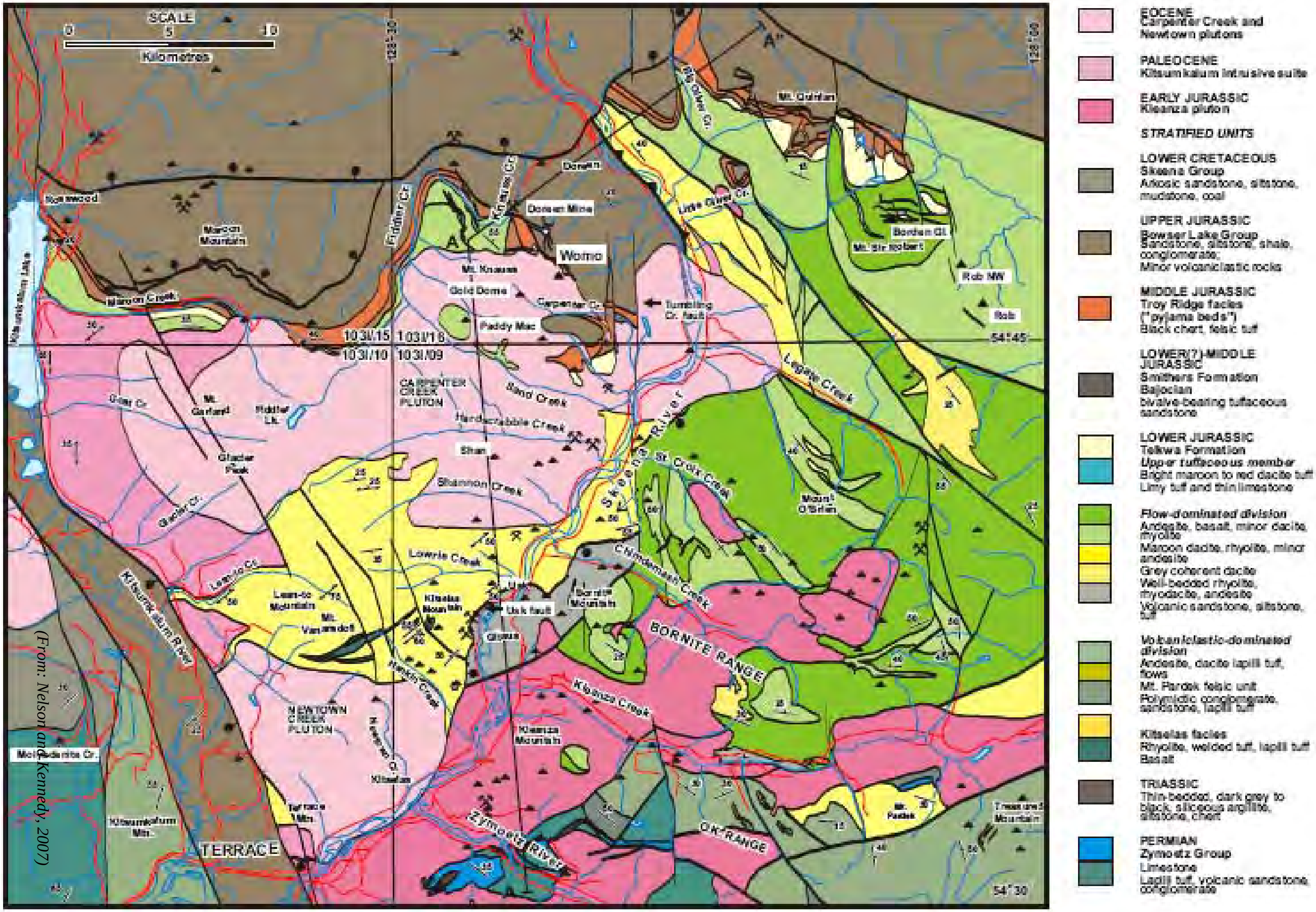
The local geology of the Terrace area is tectonically divided into two distinct sub-terranes by gently to steeply-east-dipping faults in the valley of the Skeena River, referred to as the Skeena River Fault Zone. In the hanging wall of the SRFZ on the east side of the river the rock sequences range in age from early Permian to Late Jurassic (Figure 6), and are the host rocks to the Kleanza Property. These rocks fall into sub-facies of the Telkwa Formation, part of the Lower Jurassic Hazleton Group (*Nelson and Kennedy, 2007*).

The Telkwa Formation on the east side of the SRFZ is comprised of the following informal lithologic divisions:

- The upper tuffaceous member
    - Bright maroon to red dacite tuff, limy tuff, and thin limestone
- The middle flow-dominated division
    - Andesites and basalts with minor dacites and rhyolites
    - Maroon-colored dacite, rhyolite, and minor andesite
    - Grey coherent dacite
    - Well-bedded rhyolite, rhyodacite, and andesite
    - Volcanic sandstone, siltstone, and tuff
- The lowermost volcaniclastic-dominated division
    - Andesites, dacite lapilli tuffs and lava flows
    - Mt. Pardek felsic unit
    - Polymictic conglomerates, sandstones, and lapilli tuffs

The stratigraphic units of the Telkwa Formation in the Kleanza Project area have been intruded by the Early Jurassic-age Kleanza Pluton, which occurs in the hanging wall (east side) of the SRFZ. It has been dated at *ca.* 200 Ma (*Gareau, et al, 1997a*). The pluton shows a high degree of textural and compositional variation, ranging from gabbro to granite and fine-grained micro-diorite to hornblende-plagioclase pegmatite. The pluton does not exhibit penetrative deformation, but is frequently cut by discrete shear zones.

Figure 4: Geology of the Terrace (Usk) Area



(From: Nelson and Kennedy, 2007)

Property Geology

The bedrock in the immediate area of the Lucky Jim claims is comprised of gray andesite and porphyritic dacite of the flow-dominated division of the Telkwa Formation (Figure 7).

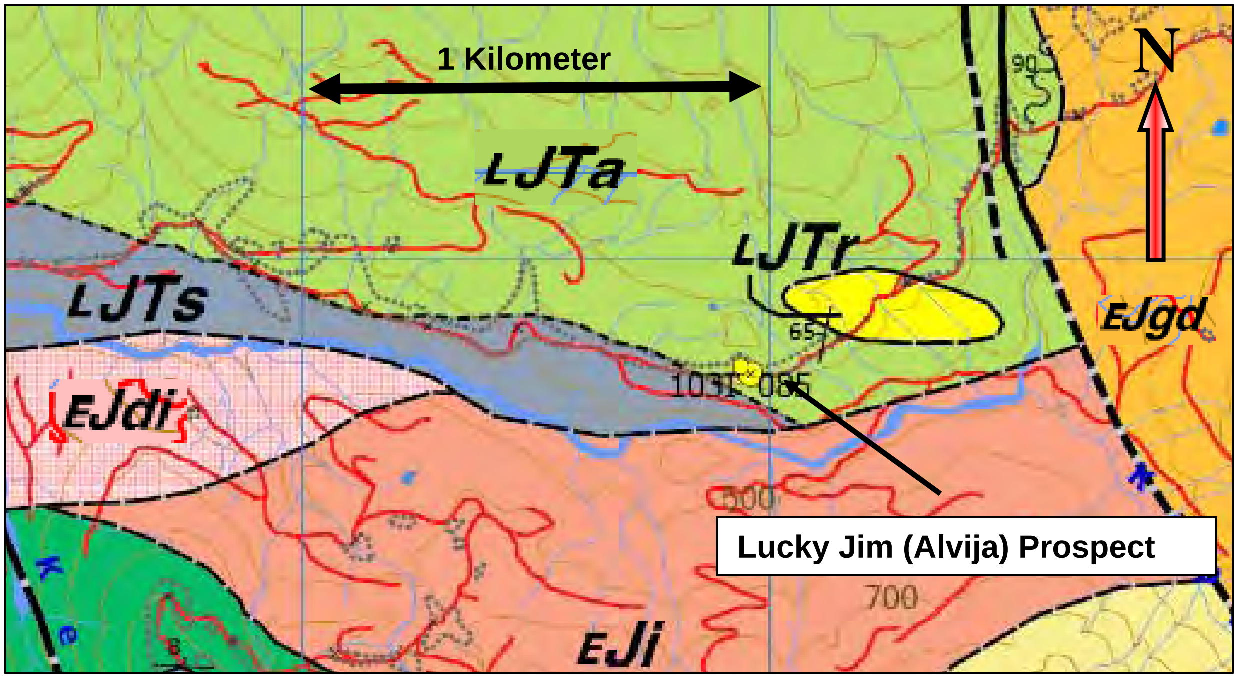
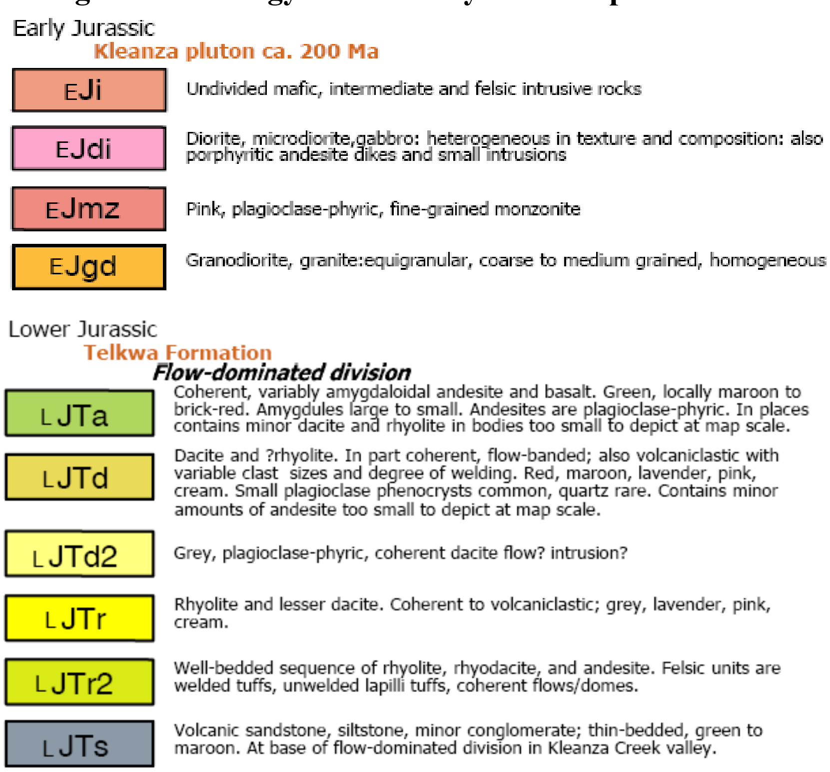


Figure 5: Geology of the Lucky Jim Prospect Area

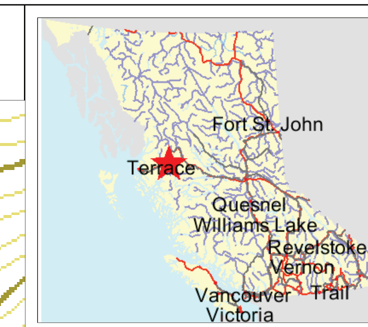


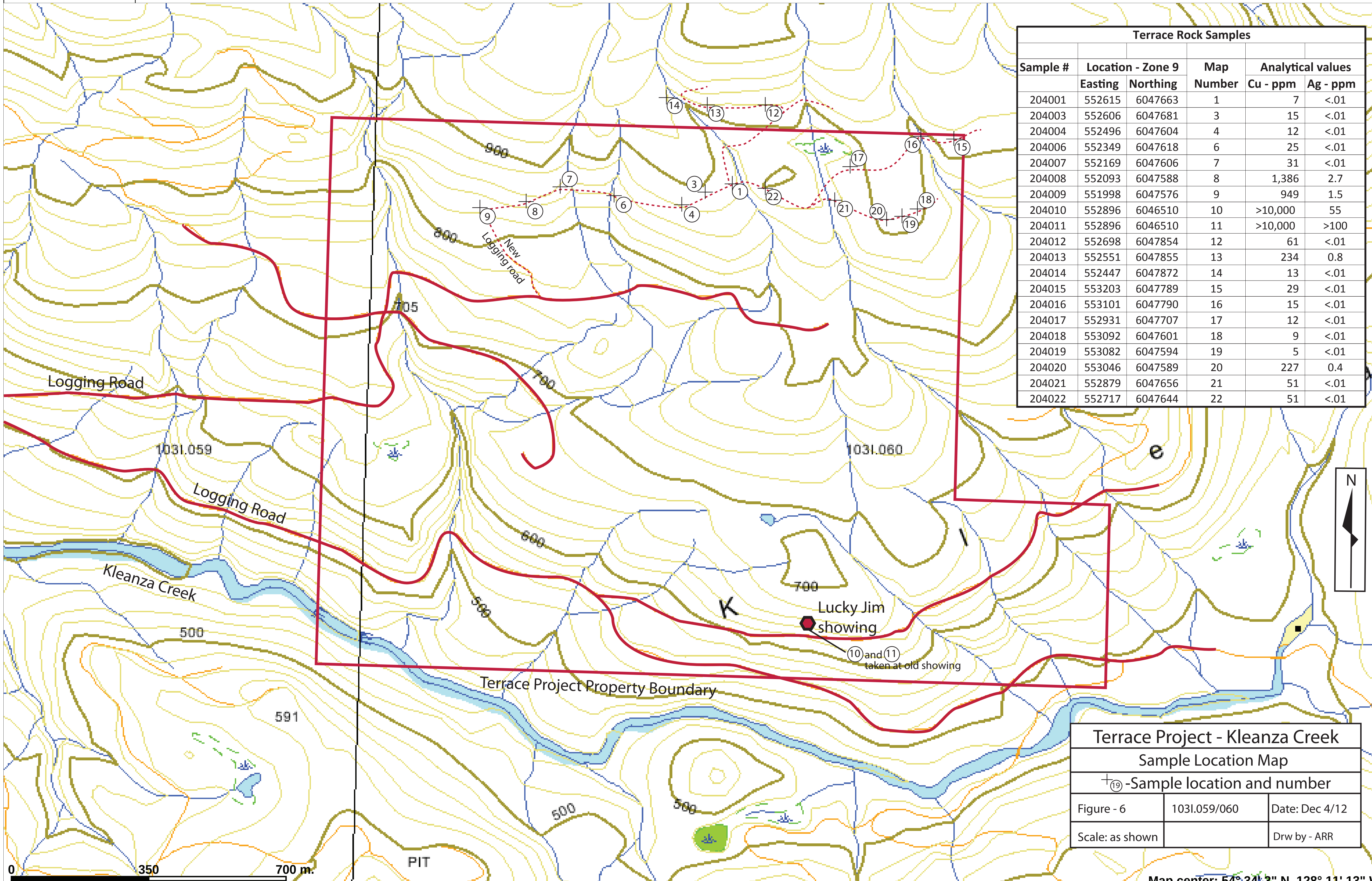
(From: Nelson and Kennedy, 2007)

Table 2 - sample descriptions						
Terrace rock samples						
Sample #	**Location - Zone 9**		**Description**	**Sample type**	**Analytical values**	
	Easting	**Northing**			**Cu - ppm**	**Ag - ppm**
204001	552615	6047663	Dense med to dark green amygdaloidal andesite, weakly magnetic, amygdulesfiled with chlorite, feldspars altered to chlorite, dark minerals (augite?) surrounded by siliceous rim, exposed surface weathers white	Grab	7	<.01
204002			No sample			
204003	552606	6047381	as #1, more visible sulphides (pyrrhotite?), more magnetic, epidote >chlorite	Grab	15	<.01
204004	552496	6047604	andesite as #1, darker in colour, no visible sulphides, less magnetic			
204005			No sample	Grab	12	<.01
204006	552349	6047618	Maroon andesite with zone of chlorite/epidote/clay alteration, no obvious structure but shear like carbonate alteration envelope, non-magnetic, no visible sulphides	Grab	25	<.01
204007	552169	6047606	Dense dark grey dacite, slightly magnetic (pyrrhotite?), minor calcite filled fratures, minor malachite staining	Grab	31	<.01
204008	552093	6047588	Quartz/carbonate shear breccia zone in andesite(?), minor fine grained sulphides (pyrite?), no malachite stain, heavy iron oxide coating on weathering surfaces	Grab	1,386	2.7
204009	551998	6047576	As #7, more siliceous with numerous"patches" of malchite, more obvious flow banding	Grab	949	1.5
204010	552896	6046510	Dump material from Lucky Jim showing area, similar to #7 except strongly magnetic as there are numerous bleb and fracture filllings of pyrrhotite, heavy malchite staining, sulphides (pyrrhotite, chalco and bornite), epidotized fragmnets containing sulphides	Grab	>10,000	55
204011	552896	6046510	As # 10, another sample from the old showing dump but non-magnetic, siliceous brecciated dacite, sulphide (bornite?)	Grab	>10,000	>100
204012	552698	6047854	Dark grey dacite, non-magnetic	Grab	61	<.01
204013	552551	6047855	Medium to dark green andesite, moderately magnetic	Grab	234	0.8
204014	552447	6047872	Light grey dacite, no visible sulphides, non-magnetic	Grab	13	<.01
204015	553203	6047789	As #13	Grab	29	<.01
204016	553101	6047790	Dacite, bleached brecciated appearance, very minor pyrrhotite specks on fractures, siliceous, magnetic only on fractures	Grab	15	<.01

Sample #	Location - Zone 9		Description	Sample type	Analytical values	
	Easting	Northing			Cu - ppm	Ag - ppm
204017	552931	6047707	Reddish stained sheared andesite with minor qtz/carbonate veining, no visible sulphides, iron oxide stained fractures	Grab	12	<.01
204018	553092	6047601	As # 17, less sheared, no qtz/carbonate veining	Grab	9	<.01
204019	553082	6047594	light red, bleached andesite with blebs and fracture fillings of pyrolusite	Grab	5	<.01
204020	553046	6047589	Small quartz/carbonate shear breccia zone in light grey dacite, non-magnetic	Grab	227	0.4
204021	552879	6047656	As # 17	Grab	51	<.01
204022	552717	6047644	As # 16	Grab	51	<.01

Terrace Project





Terrace Rock Samples					
Sample #	Location - Zone 9		Map	Analytical values	
	Easting	Northing	Number	Cu - ppm	Ag - ppm
204001	552615	6047663	1	7	<.01
204003	552606	6047681	3	15	<.01
204004	552496	6047604	4	12	<.01
204006	552349	6047618	6	25	<.01
204007	552169	6047606	7	31	<.01
204008	552093	6047588	8	1,386	2.7
204009	551998	6047576	9	949	1.5
204010	552896	6046510	10	>10,000	55
204011	552896	6046510	11	>10,000	>100
204012	552698	6047854	12	61	<.01
204013	552551	6047855	13	234	0.8
204014	552447	6047872	14	13	<.01
204015	553203	6047789	15	29	<.01
204016	553101	6047790	16	15	<.01
204017	552931	6047707	17	12	<.01
204018	553092	6047601	18	9	<.01
204019	553082	6047594	19	5	<.01
204020	553046	6047589	20	227	0.4
204021	552879	6047656	21	51	<.01
204022	552717	6047644	22	51	<.01

Terrace Project - Kleanza Creek		
Sample Location Map		
⊕19 -Sample location and number		
Figure - 6	103I.059/060	Date: Dec 4/12
Scale: as shown		Drw by - ARR

Legend

- Indian Reserves
- National Parks
- Conservancy Areas
- Parks
- Federal Transfer Lands
- Mineral Reserves (current)
- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others
- First Nations Treaty Related Lands
- First Nations Treaty Lands
- Integrated Cadastral Fabric
- Survey Parcels
- BCGS Grid
- Contours (TRIM)
- Contour - Index
- Contour - Index.Indefinite
- Contour - Index.Depression
- Contour - Index.Depression Indefinite
- Contour - Intermediate
- Contour - Intermediate.Indefinite
- Contour - Intermediate.Depression
- Contour - Intermediate.Depression Indefinite
- Areaof Exclusion
- Areaof Indefinite Contours
- Annotation (1:20K)
- Transportation - Points (TRIM)
- Helipad
- Transportation - Lines (TRIM)
- Airfield
- Airport
- Airstrip
- Airport.Abandoned
- Ferry Route
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes
- Road (Gravel Undivided) - U/C - 1 Lane
- Road (Gravel Undivided) - U/C - 2 Lanes
- Road (Paved Divided) - Not Elevated - 1 Lane Each Way
- Road (Paved Divided) - Not Elevated - 2 Lanes Each Way
- Road (Paved Divided) - U/C - Not Elevated - 2 Lanes Each Way
- Road (Paved Undivided) Not Elevated - 3 Lanes

Scale: 1:10,000

Statement of costs

September 15/16 field program – Terrace project –September 15 and 16, 2012

Field crew

Prospector A. Raven	2 days at $450/day	900.00
Field assistant	2 days at $200/day	400.00
Vehicle	2 days at $80/day	160.00
Fuel		162.42
Analytical costs	20 samples at $25/sample (Acme lab)	629.61
Report by A. Raven	2 days at $300/day	600.00
	Grand total	***2852.03***

Bibliography

Anonymous, *MINFILE Record No. 103I-085, Alvija, Lucky Jim;* British Columbia Ministry of Energy, Mines, and Petroleum Resources.

Anonymous, *MINFILE Record No. 103I-208, Kleanza Creek;* British Columbia Ministry of Energy, Mines, and Petroleum Resources.

Nelson, J.L., Barresi, T., Knight, E., and Boudreau, N., 2006a, *Geology and Mineral Potential of the Usk Map Area (NTS 103I-09), Terrace, British Columbia*; B.C. Geologic Survey Paper 2006-1, 17 pgs.

Nelson, J.L., Barresi, T., Knight, E., and Boudreau, N., 2006b, *Geology of the Usk Map Area (NTS 103I-09), Terrace, British Columbia*; B.C. Geologic Survey Open File Report 2006-3 (map).

Nelson, JoAnne, and Kennedy, R., 2007, *Terrace Regional Mapping Project Tear 2: New Geological Insights and Exploration Targets (NTS 103I-16S, 10W), West-Central British Columbia*; B.C. Geologic Survey Paper 2007-1, 13 pgs.

Assessment reports reviewed for this report

AR #9914 – Report on the Lucky Jim Claims, Kleanza Creek – Stephen Quin, September 22, 1980

AR # 29,734 – Exploration Report on the Kleanza Mountain Project – Erika J. Shepard, January 31, 2008

Note: the “boiler plate” sections of this report including location, access, climate, topography, exploration history, regional and property geology are copied directly from Assessment Report 29,734

Statement of Qualifications

ALAN R. RAVEN

I have been directly involved in the mineral exploration industry as a prospector and exploration field manager since 1969.

Between 1972 and 2011 I have taken a variety of prospector's courses and exploration short courses.

My field exploration experience includes geochemical and geophysical surveying, diamond drilling, prospecting, mapping, crew training and exploration program design, implementation and management in British Columbia and the Western United States (Washington, California, Nevada, Arizona and Utah)

I do not hold any interest in Tenure #805722, 845186, 867193 or 1010943

I carried out the field work and authored this report.

This Assessment Report is an accurate account of the 2012 exploration program as carried out by myself and P. Walker (property owner) in September of 2012.

Dated at Smithers, B.C. this 3rd of December, 2012

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Alan R. Raven
Box 722, Smithers, BC V0J 2N0
Phone: 250-847-2560
Email: hirange@telus.net

Appendix A

Analytical certificates and methodology (Acme Labs)

AcmeLabs Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East Vancouver BC V6A 4A3 Canada

www.acmelab.com

Client: **Raven, Alan**
Box 722
Smithers BC V0J 2N0 Canada

Submitted By:	Alan Raven
Receiving Lab:	Canada-Smithers
Received:	October 10, 2012
Report Date:	October 30, 2012
Page:	1 of 2

CERTIFICATE OF ANALYSIS SMI12000458.1

CLIENT JOB INFORMATION

Project:	None Given
Shipment ID:	
P.O. Number	
Number of Samples:	20

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Method Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
R200-250	20	Crush, split and pulverize 250 g rock to 200 mesh			SMI
1DX2	20	1:1:1 Aqua Regia digestion ICP-MS analysis	15	Completed	VAN

SAMPLE DISPOSAL

STOR-PLP	Store After 90 days Invoice for Storage
DISP-RJT	Dispose of Reject After 90 days

ADDITIONAL COMMENTS

Acme does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: Raven, Alan
Box 722
Smithers BC V0J 2N0
Canada

CC:

BRITISH COLUMBIA CERTIFIED ASSAYER
CLARENCE LEONG
GENERAL MANAGER

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only.
All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
"*" asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.

AcmeLabs Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East Vancouver BC V6A 4A3 Canada
Phone (604) 253-3158 Fax (604) 253-1716
www.acmelab.com

Client: **Raven, Alan**
Box 722
Smithers BC V0J 2N0 Canada

Project: None Given
Report Date: October 30, 2012

CERTIFICATE OF ANALYSIS SMI12000458.1

	Method	**WGHT**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**	**1DX15**
	Analyte	**Wgt**	**Mo**	**Cu**	**Pb**	**Zn**	**Ag**	**Ni**	**Co**	**Mn**	**Fe**	**As**	**Au**	**Th**	**Sr**	**Cd**	**Sb**	**Bi**	**V**	**Ca**	**P**
	Unit	**kg**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**%**	**ppm**	**ppb**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**%**	**%**
	MDL	**0.01**	**0.1**	**0.1**	**0.1**	**1**	**0.1**	**0.1**	**0.1**	**1**	**0.01**	**0.5**	**0.5**	**0.1**	**1**	**0.1**	**0.1**	**0.1**	**2**	**0.01**	**0.001**
G1-SMI	Prep Blank	<0.01	<0.1	2.3	3.0	46	<0.1	2.5	4.1	577	1.88	<0.5	2.6	4.7	54	<0.1	<0.1	<0.1	35	0.45	0.070
G1-SMI	Prep Blank	<0.01	<0.1	2.3	2.4	40	<0.1	2.2	3.6	498	1.67	<0.5	1.8	4.2	50	<0.1	<0.1	<0.1	31	0.43	0.070
204001	Rock	0.83	0.2	7.4	4.1	178	<0.1	16.1	20.1	674	2.03	1.7	1.5	0.3	70	<0.1	0.2	<0.1	69	1.02	0.052
204003	Rock	0.62	0.1	15.0	5.2	155	<0.1	11.7	20.3	889	1.96	1.6	0.8	0.4	65	0.1	<0.1	<0.1	47	1.18	0.049
204004	Rock	0.55	0.3	11.9	1.9	66	<0.1	10.2	21.7	582	3.16	1.8	3.0	0.6	47	<0.1	<0.1	<0.1	88	0.68	0.061
204006	Rock	0.71	0.1	24.7	0.5	42	<0.1	11.8	16.7	304	2.25	2.0	1.3	0.4	141	<0.1	<0.1	<0.1	50	3.19	0.052
204007	Rock	0.47	0.1	30.7	5.6	147	<0.1	55.0	29.6	1054	3.85	1.7	2.5	0.4	60	<0.1	0.1	<0.1	137	4.06	0.059
204008	Rock	1.70	0.4	1386	13.5	200	2.7	36.4	31.6	1894	4.63	19.6	1.0	0.2	97	3.1	30.8	<0.1	121	10.33	0.034
204009	Rock	1.01	0.3	948.5	12.2	74	1.5	9.6	16.5	842	2.98	2.9	3.8	0.6	139	0.5	0.7	<0.1	176	0.75	0.061
204010	Rock	1.55	1.8	>10000	17.3	182	55.0	8.7	21.1	1283	3.15	0.6	42.2	0.5	33	2.9	0.4	0.1	52	1.08	0.082
204011	Rock	1.41	3.0	>10000	26.4	136	>100	19.0	17.8	891	3.69	3.2	27.7	0.7	30	1.5	1.1	0.1	59	0.76	0.099
204012	Rock	0.97	0.1	61.0	1.7	93	<0.1	11.2	22.9	751	2.93	1.1	1.0	0.4	76	<0.1	<0.1	<0.1	66	1.08	0.057
204013	Rock	0.89	0.3	234.2	3.0	666	0.8	9.7	32.2	2406	5.71	1.5	4.1	0.6	20	0.2	<0.1	<0.1	107	0.59	0.078
204014	Rock	0.88	0.1	12.8	2.3	72	<0.1	3.2	9.3	363	1.58	1.0	<0.5	0.6	31	<0.1	<0.1	<0.1	33	0.59	0.102
204015	Rock	0.74	0.3	29.3	4.5	323	<0.1	9.0	26.6	1723	3.12	1.2	<0.5	0.4	75	<0.1	0.5	<0.1	60	1.29	0.060
204016	Rock	0.77	0.1	14.8	2.1	228	<0.1	10.2	16.4	770	2.41	2.1	<0.5	0.6	270	<0.1	<0.1	<0.1	39	2.03	0.050
204017	Rock	0.64	<0.1	12.0	6.1	92	<0.1	9.7	14.7	916	2.42	1.8	12.5	0.6	25	0.4	0.9	<0.1	30	0.08	0.036
204018	Rock	1.23	<0.1	8.9	5.7	109	<0.1	9.7	16.8	1224	3.49	2.1	6.2	0.6	28	0.6	0.4	<0.1	60	1.98	0.086
204019	Rock	1.32	<0.1	4.9	5.4	89	<0.1	6.5	11.9	744	2.49	2.6	3.0	0.7	23	0.4	0.3	<0.1	33	0.69	0.078
204020	Rock	1.31	<0.1	226.7	7.6	215	0.4	12.3	21.9	1871	4.12	1.2	7.1	0.6	115	2.6	0.6	<0.1	76	6.48	0.070
204021	Rock	0.73	0.3	50.7	12.4	213	<0.1	17.1	51.0	4449	8.16	4.5	3.4	0.9	3	0.4	1.0	<0.1	81	0.04	0.086
204022	Rock	1.38	0.1	51.0	4.8	138	0.4	45.9	18.6	666	1.50	2.4	2.4	0.1	77	0.2	<0.1	<0.1	42	1.02	0.030

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Project: None Given
Report Date: October 30, 2012

CERTIFICATE OF ANALYSIS SMI12000458.1

	Method	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	1	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
G1-SMI	Prep Blank	10	7	0.52	166	0.111	2	0.86	0.065	0.46	<0.1	0.01	2.2	0.3	<0.05	5	<0.5	<0.2
G1-SMI	Prep Blank	9	7	0.46	142	0.092	2	0.78	0.068	0.42	<0.1	<0.01	1.9	0.3	<0.05	4	<0.5	<0.2
204001	Rock	2	23	1.41	11	0.281	2	1.89	0.027	0.02	<0.1	<0.01	6.0	<0.1	<0.05	5	<0.5	<0.2
204003	Rock	3	10	1.33	21	0.117	3	1.67	0.005	0.05	<0.1	<0.01	4.6	<0.1	<0.05	5	<0.5	<0.2
204004	Rock	2	12	1.89	18	0.213	2	1.94	0.017	0.05	<0.1	<0.01	5.5	<0.1	<0.05	8	<0.5	<0.2
204006	Rock	2	14	1.02	22	0.117	2	4.54	0.001	0.03	<0.1	<0.01	3.2	<0.1	<0.05	6	<0.5	<0.2
204007	Rock	5	49	2.99	118	0.023	1	2.69	0.047	0.10	<0.1	<0.01	11.9	<0.1	<0.05	7	<0.5	<0.2
204008	Rock	2	33	3.52	120	0.001	2	0.64	0.007	0.03	0.2	2.75	13.3	<0.1	0.09	1	<0.5	<0.2
204009	Rock	8	12	1.63	52	0.008	1	2.57	0.001	0.06	<0.1	0.04	11.3	<0.1	<0.05	8	<0.5	<0.2
204010	Rock	6	8	1.07	55	0.016	1	1.27	0.035	0.06	<0.1	0.52	6.0	<0.1	1.14	4	2.0	0.6
204011	Rock	9	5	0.91	36	0.038	<1	1.06	0.035	0.05	0.1	0.57	5.6	<0.1	1.34	4	2.6	0.7
204012	Rock	2	13	1.76	17	0.092	1	2.38	0.009	0.05	<0.1	<0.01	4.2	<0.1	<0.05	6	<0.5	<0.2
204013	Rock	3	7	3.41	95	0.213	1	3.99	0.002	0.12	<0.1	<0.01	7.3	<0.1	<0.05	9	<0.5	<0.2
204014	Rock	7	3	0.66	36	0.084	1	0.95	0.032	0.09	0.1	<0.01	1.9	<0.1	<0.05	3	<0.5	<0.2
204015	Rock	2	7	1.97	158	0.184	2	2.62	<0.001	0.09	<0.1	<0.01	3.9	<0.1	<0.05	6	<0.5	<0.2
204016	Rock	5	7	1.39	61	0.089	1	4.05	0.011	0.12	<0.1	<0.01	2.8	<0.1	<0.05	6	<0.5	<0.2
204017	Rock	7	5	0.04	1184	0.005	2	0.29	0.003	0.11	1.8	0.02	5.4	<0.1	<0.05	<1	<0.5	<0.2
204018	Rock	6	3	0.50	275	0.001	2	0.79	0.008	0.19	<0.1	<0.01	7.9	<0.1	<0.05	2	<0.5	<0.2
204019	Rock	5	2	0.22	1499	<0.001	2	0.71	0.005	0.19	<0.1	<0.01	8.7	<0.1	<0.05	1	<0.5	<0.2
204020	Rock	6	3	1.98	264	0.009	2	0.78	0.022	0.08	<0.1	0.01	5.2	<0.1	<0.05	3	<0.5	<0.2
204021	Rock	9	26	0.06	296	0.003	2	1.33	0.007	0.18	0.4	0.06	19.9	0.1	<0.05	1	<0.5	<0.2
204022	Rock	<1	42	1.24	8	0.135	2	1.46	0.005	0.02	<0.1	<0.01	4.4	<0.1	<0.05	3	<0.5	<0.2

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Project: None Given
Report Date: October 30, 2012

QUALITY CONTROL REPORT SMI12000458.1

	Method	WGHT	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15
	Analyte	Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
Pulp Duplicates																					
204003	Rock	0.62	0.1	15.0	5.2	155	<0.1	11.7	20.3	889	1.96	1.6	0.8	0.4	65	0.1	<0.1	<0.1	47	1.18	0.049
REP 204003	QC		0.2	15.6	5.6	156	<0.1	11.5	20.5	922	2.04	2.0	1.1	0.4	72	0.1	<0.1	<0.1	52	1.26	0.052
204022	Rock	1.38	0.1	51.0	4.8	138	0.4	45.9	18.6	666	1.50	2.4	2.4	0.1	77	0.2	<0.1	<0.1	42	1.02	0.030
REP 204022	QC		<0.1	52.0	4.7	136	0.5	45.2	18.3	656	1.47	2.1	2.5	0.1	73	0.3	<0.1	<0.1	41	0.99	0.032
Core Reject Duplicates																					
204014	Rock	0.88	0.1	12.8	2.3	72	<0.1	3.2	9.3	363	1.58	1.0	<0.5	0.6	31	<0.1	<0.1	<0.1	33	0.59	0.102
DUP 204014	QC	N.A.	0.1	9.7	2.4	70	<0.1	3.1	8.9	354	1.59	0.9	<0.5	0.6	32	<0.1	<0.1	<0.1	32	0.59	0.101
Reference Materials																					
STD DS9	Standard		12.6	115.5	120.6	309	1.8	39.9	7.6	554	2.29	24.0	121.2	5.9	63	2.3	5.3	6.4	37	0.70	0.077
STD DS9 Expected			12.84	108	126	317	1.83	40.3	7.6	575	2.33	25.5	118	6.38	69.6	2.4	4.94	6.32	40	0.7201	0.0819
BLK	Blank		<0.1	11.5	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
Prep Wash																					
G1-SMI	Prep Blank	<0.01	<0.1	2.3	3.0	46	<0.1	2.5	4.1	577	1.88	<0.5	2.6	4.7	54	<0.1	<0.1	<0.1	35	0.45	0.070
G1-SMI	Prep Blank	<0.01	<0.1	2.3	2.4	40	<0.1	2.2	3.6	498	1.67	<0.5	1.8	4.2	50	<0.1	<0.1	<0.1	31	0.43	0.070

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Project: None Given
Report Date: October 30, 2012

QUALITY CONTROL REPORT SMI12000458.1

Method		1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15	1DX15
Analyte		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
Unit		ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
MDL		1	1	0.01	1	0.001	1	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
Pulp Duplicates																		
204003	Rock	3	10	1.33	21	0.117	3	1.67	0.005	0.05	<0.1	<0.01	4.6	<0.1	<0.05	5	<0.5	<0.2
REP 204003	QC	3	11	1.36	23	0.135	2	1.79	0.007	0.06	<0.1	<0.01	4.9	<0.1	<0.05	5	<0.5	<0.2
204022	Rock	<1	42	1.24	8	0.135	2	1.46	0.005	0.02	<0.1	<0.01	4.4	<0.1	<0.05	3	<0.5	<0.2
REP 204022	QC	<1	42	1.22	8	0.128	1	1.40	0.004	0.02	<0.1	<0.01	4.0	<0.1	<0.05	3	<0.5	<0.2
Core Reject Duplicates																		
204014	Rock	7	3	0.66	36	0.084	1	0.95	0.032	0.09	0.1	<0.01	1.9	<0.1	<0.05	3	<0.5	<0.2
DUP 204014	QC	7	3	0.64	39	0.081	1	0.96	0.033	0.10	<0.1	<0.01	2.1	<0.1	<0.05	3	<0.5	<0.2
Reference Materials																		
STD DS9	Standard	12	118	0.60	288	0.104	3	0.91	0.078	0.39	2.9	0.20	2.3	5.5	0.16	4	4.8	4.8
STD DS9 Expected		13.3	121	0.6165	295	0.1108		0.9577	0.0853	0.395	2.89	0.2	2.5	5.3	0.1615	4.59	5.2	5.02
BLK	Blank	<1	<1	<0.01	<1	<0.001	<1	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2
Prep Wash																		
G1-SMI	Prep Blank	10	7	0.52	166	0.111	2	0.86	0.065	0.46	<0.1	0.01	2.2	0.3	<0.05	5	<0.5	<0.2
G1-SMI	Prep Blank	9	7	0.46	142	0.092	2	0.78	0.068	0.42	<0.1	<0.01	1.9	0.3	<0.05	4	<0.5	<0.2

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METHOD SPECIFICATIONS
GROUP 1D AND 1F – GEOCHEMICAL AQUA REGIA DIGESTION

Package Codes:	**1D01 to 1D03, 1DX1 to 1DX3, 1F01 to 1F07**
Sample Digestion:	**HNO3-HCl acid digestion**
Instrumentation Method:	**ICP-ES (1D), ICP-MS (1DX, 1F)**
Applicability:	**Sediment, Soil, Non-mineralized Rock and Drill Core**

Method Description:

Prepared sample is digested with a modified Aqua Regia solution of equal parts concentrated HCl, HNO3 and DI H2O for one hour in a heating block of hot water bath. Sample is made up to volume with dilute HCl. Sample splits of 0.5g, 15g or 30g can be analyzed.

For 1F07, Lead isotopes (Pb_{204}, Pb_{206}, Pb_{207}, Pb_{208}) are suitable for geochemical exploration of U and other commodities where gross differences in natural to radiogenic Pb ratios, is a benefit. Isotope values can be reported in both concentrations and intensities. Sample splits of 0.25g, 0.5g, 15g or 30g can be analyzed.

Element	Group 1D Detection	Group 1DX Detection	Group 1F Detection	Upper Limit
Ag	0.3 ppm	0.1 ppm	2 ppb	100 ppm
Al*	0.01%	0.01%	0.01%	10%
As	2 ppm	0.5 ppm	0.1 ppm	10000 ppm
Au	2 ppm	0.5 ppb	0.2 ppb	100 ppm
B*^	20 ppm	20 ppm	20 ppm	2000 ppm
Ba*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Bi	3 ppm	0.1 ppm	0.02 ppm	2000 ppm
Ca*	0.01%	0.01%	0.01%	40%
Cd	0.5 ppm	0.1 ppm	0.01 ppm	2000 ppm
Co	1 ppm	0.1 ppm	0.1 ppm	2000 ppm
Cr*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Cu	1 ppm	0.1 ppm	0.01 ppm	10000 ppm
Fe*	0.01%	0.01%	0.01%	40%
Ga*	-	1 ppm	0.1 ppm	1000 ppm
Hg	1 ppm	0.01 ppm	5 ppb	50 ppm
K*	0.01%	0.01%	0.01%	10%
La*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Mg*	0.01%	0.01%	0.01%	30%
Mn*	2 ppm	1 ppm	1 ppm	10000 ppm
Mo	1 ppm	0.1 ppm	0.01 ppm	2000 ppm

Element	Group 1D Detection	Group 1DX Detection	Group 1F Detection	Upper Limit
Na*	0.01%	0.001%	0.001%	5%
Ni	1 ppm	0.1 ppm	0.1 ppm	10000 ppm
P*	0.001%	0.001%	0.001%	5%
Pb	3 ppm	0.1 ppm	0.01 ppm	10000 ppm
S	0.05%	0.05%	0.02%	10%
Sb	3 ppm	0.1 ppm	0.02 ppm	2000 ppm
Sc	-	0.1 ppm	0.1 ppm	100 ppm
Se	-	0.5 ppm	0.1 ppm	100 ppm
Sr*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Te	-	0.2 ppm	0.02 ppm	1000 ppm
Th*	2 ppm	0.1 ppm	0.1 ppm	2000 ppm
Ti*	0.01%	0.001%	0.001%	5%
Tl	5 ppm	0.1 ppm	0.02 ppm	1000 ppm
U*	8 ppm	0.1 ppm	0.05 ppm	2000 ppm
V*	1 ppm	2 ppm	2 ppm	10000 ppm
W*	2 ppm	0.1 ppm	0.05 ppm	100 ppm
Zn	1 ppm	1 ppm	0.1 ppm	10000 ppm
Be*	-	-	0.1 ppm	1000 ppm
Ce*	-	-	0.1 ppm	2000 ppm
Cs*	-	-	0.02 ppm	2000 ppm
Ge*	-	-	0.1 ppm	100 ppm
Hf*	-	-	0.02 ppm	1000 ppm
In	-	-	0.02 ppm	1000 ppm
Li*	-	-	0.1 ppm	2000 ppm
Nb*	-	-	0.02 ppm	2000 ppm
Rb*	-	-	0.1 ppm	2000 ppm
Re	-	-	1 ppb	1000 ppb
Sn*	-	-	0.1 ppm	100 ppm
Ta*	-	-	0.05 ppm	2000 ppm
Y*	-	-	0.01 ppm	2000 ppm
Zr*	-	-	0.1 ppm	2000 ppm
Pt*	-	-	2 ppb	100 ppm
Pd*	-	-	10 ppb	100 ppm
$\mathbf{Pb_{204}}$	-	-	0.01 ppm	10000 ppm
$\mathbf{Pb_{206}}$	-	-	0.01 ppm	10000 ppm
$\mathbf{Pb_{207}}$	-	-	0.01 ppm	10000 ppm
$\mathbf{Pb_{208}}$	-	-	0.01 ppm	10000 ppm

* Solubility of some elements will be limited by mineral species present.
^Detection limit = 1 ppm for 15g / 30g analysis.

Limitations:

Au solubility can be limited by refractory and graphitic samples.