GEOLOGY, ASHTON COPPER PROPERTY, NICOAMEN RIVER, KAMLOOPS MINING DIVISION, SOUTHWESTERN BRITISH COLUMBIA

(92I.023E and 92I.024W)

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BC Geological Survey
Assessment Report
32430

Nature of Work:	**Geological Mapping**
Property:	**Ashton Copper Property**
Tenure Numbers:	**369944, 537356, 536357, 536358, 537359, 357360 and 598590**
Mining Division:	**Kamloops**
Latitude:	**50° 14' 47" N**
Longitude:	**121° 23' 39" W**
Owner:	**Sitka Holdings Ltd.**
Operators:	**J.M. Ashton and Associates Ltd.** **Houston Minerals Inc.**
Consultant:	**Geotex Consultants Limited**
Author:	**Peter B. Read**
Date:	**September 26, 2011**

32,430
GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

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Ashton Copper Property, Property Geology (Scale 1:10 000) in pocket

GEOLOGY, ASHTON COPPER PROPERTY, NICOAMEN RIVER, KAMLOOPS MINING DIVISION, SOUTHWESTERN BRITISH COLUMBIA
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1. INTRODUCTION

This geological investigation, done at the request of J.M. Ashton, president of Sitka Holdings Ltd., incorporates eight days of field work done in the periods May 2 to 5 and September 18 to 21, 2010 and results in a geological map of a portion of the property. Twelve assessment reports with an emphasis on the geochemistry and geophysics of the property precede this report, which deals with the bedrock geology of the area.

2. PROPERTY

The Ashton Copper property consists of the following mineral claims with expiry dates as shown in Table 1. All of the claims, except Rebecca 2, have been converted to cell tenure and two recent cell tenure claims with tenure numbers 537358 and 537360 have been added. All of the claims are held by record in the name of Sitka Holdings Ltd., Suite 911 – 850 West Hastings Street, Vancouver, B.C., V6C 1E1.

TABLE 1: Ashton Copper Property, Mineral Claims

Mineral Claim	Tenure Number	Area in Hectares	Cells (C) Units (U)	Expiry Date
Rebecca 2	369944	375.00	15 U	July 17, 2015
Cell Tenure	537356	186.01	7.44 C	July 17, 2011
Cell Tenure	537357	227.28	9.09 C	July 17, 2012
Cell Tenure	537358	144.62	5.79 C	July 17, 2014
Cell Tenure	537359	413.33	16.52 C	July 17, 2011
Cell Tenure	537360	62.00	2.48 C	July 17, 2013
Cell Tenure	598590	20.67	0.83 C	July 17, 2016

3. LOCATION AND ACCESS

In southern British Columbia, the Ashton Copper property lies approximately 170 km in a direct line northeast from Vancouver. It is about 19 km south of Spences Bridge on the left bank of the Thompson River where the river turns sharply from south-flowing to a west course towards Lytton at the confluence of the Thompson and Fraser rivers. The property adjoins and lies directly south of the Nicomen #1 Indian Reservation, which straddles the mouth of Nicoamen River, and extends to or slightly beyond the height of land near the southern boundary of the property.

The northern boundary of the property lays a few hundred metres south of the Trans Canada Highway and the mainline of the Canadian Pacific Railway. Near the mouth of the Nicoamen River, an unmaintained, gravel forestry access road, twists uphill to the south, bisects the property and provides access to branch roads that range from drive able to walk able with difficulty. This road system provides ready access to the areas of geochemical and geophysical anomalies.

4. PREVIOUS INVESTIGATIONS

The first recorded exploration work in part of the area now occupied by the Ashton Copper property was a soil geochemical survey for copper by Burgoyne (1969). It outlined a large area of anomalous copper in soils. Antal (1969) extended the copper soil geochemical survey area, reported on four trenches, apparently did some geological mapping, although it is not shown on his geological map (Figure 2, 1969) and concluded that the area had the potential for hosting a large low-grade copper deposit at depth. W. F. Filipek and Associates of Alberta were believed to be the claim owners.

In 1989 and 1990, Ashton (1990) carried out a very low frequency electromagnetic (VLF-EM survey over the northern half of the copper anomaly area outlined by Burgoyne and Antal between lines 5000N and 6400N. This work outlined a prominent north-striking magnetic anomaly between lines 5300N and 5700N with a maximum amplitude response of 5,600 gammas above background. The half-space dimension of this anomaly is about 500 m north-south by 200 m east-west. The claim owner was now Sylvia Apchkrum.

In 1992 Kingston Resources Ltd. optioned the property from the recorded owner S.E. Apchkrum and Smith (1993a; 1993b)) carried out geochemical sampling and a limited mapping program to confirm the copper anomaly discovered by Burgoyne. In addition, they sampled areas farther to the west and southwest of the original anomalous area enlarging it but leaving it open to the north. Kingston Resources then used an induction polarization survey over part of the copper anomaly focused on the altered diorite (Smith, 1993b). As a result of discovering a significant induced polarization chargeability anomaly coinciding with the copper anomaly and altered diorite, the company undertook a seven-hole reverse circulation drilling program totaling 816 m.

In 1999, a deep-probe IP survey showed a very strong conductivity anomaly at 120 m depth below the coincident VLF-EM and copper-in-soil anomalies. The conductor was estimated to be about 100 m thick and dip about 40°E (**). The claims were owned by Sylvia Apchkrum and J. M. Ashton.

Magnetic surveying in 2001 extended the 1990 survey further to the south to cover the northern half of the 1999 IP chargeability anomaly. This survey showed anomalous magnetic results of various widths trending north.

In 2004 a second reconnaissance deep-probe IP survey similar to the 1999 survey was completed in an east to west direction across the 4,000 gamma magnetic anomaly. This line was 425 m north and parallel to the 1999 deep-probe east west IP line. The results showed significant chargeability anomalies (indicating disseminated sulphides) on both sides of the magnetic anomaly

extending to a penetration depth of 420 m. The claims were held by record by J. M. Ashton.

In 2006, arsenic in-soils geoehemical data from the 1993 soil survey were plotted. Arsenic anomalies were found adjoining the copper-vanadium anomaly to the south. Follow up prospecting in this area along with rock sampling showed anomalous gold pathfinder elements Te, Hg, As, Sb, Se and Ag. These results led to a multi-element Mobile Metal Ion (MMI) geochemical survey over two lines to the south of the 1992 copper-vanadium anomaly.

In 2007 an additional three lines of MMI sampling extended the MMI surveying a further 300 m to the south from the 2006 survey. As for the 2006 survey, samples were taken every 50 m along east-west survey lines of 1.4 km in length with 100 m line spacing for a total of five lines sampled. The total area covered in the combined 2006 and 2007 MMI surveys was 560,000 m^2. The target element was gold. The areal extent of anomalous MMI gold was found to be 450,000 m^2 in two large anomalies. The central area of each contains anomalous arsenic. As of 2007, all of the claims were held by record by Sitka Holdings Ltd.

In 2009, additional total field magnetic surveying provided further coverage of the area of interest to the south. A small amount of self-potential surveying was also completed.

5. PROPERTY GEOLOGY

The most recent regional geological mapping is that of Monger and McMillian (1989) which shows the property lies at the northeast corner of the Triassic to Jurassic Mount Lytton Complex where the Late Cretaeeous volcanic and sedimentary rocks of the Spences Bridge Group nonconformably overlie the complex. On the property, the units of the complex and overlying rocks are described in order of decreasing age.

(a) Marble and Skarn (unit ls)

Marble and skarn form a few road cuts along the forestry access road near the pass at 1080 m and a precipitous cliff forming peak 1191 m near the southern edge of the property. An old trench north-northwest of peak 1191 m exposes a north-trending sliver of marble. Skarn also occurs in the following reverse circulation holes: RCA93-1 at 390-430', RCA93-4 at 80-100', RCA93-5 at 120-150' and 340-400' (Read, 1999).

Typically the unit consists of light grey weathering, white crystalline (1-2 mm) marble. Here and there streaks of red-brown andradite garnet and pale green diopside develop giving rise to a skarn. The thin-sectioned rock chips from the reverse-circulation holes indicate that wollastonite and tremolite-actinolite are part of the skarn assemblages.

The few bedding measurements strike northwesterly and are subvertical in dip. Only the bedding in the northernmost outcrop strikes north and dips steeply to the west. This attitude is consistent with the geophysical anomalies, which lie in an overburden eovered area to the north.

The age and correlation of the unit are unknown, but it may be part of the Nicola Group of Middle and Late Triassic. In view of the metamorphism of the

rocks, a correlation with Lower Jurassic limestone of the Ashcroft Formation of post-Guichon Batholith age is less likely. Rocks of both units outcrop in Venables Creek about 30 km north of the property.

(b) Hornblende/Pyroxene Diorite/Gabbro (unit ЂJd)

In the southwest corner of the property, road cuts expose this unit where it is free of felsite dikes and alteration. Elsewhere on the property, it outcrops on along a few of the old logging roads and trenches to the west of the forestry access road in the southern half of the property.

Where fresh, the rocks are medium-grained (2 to 4 mm) hornblende and/or pyroxene diorite or gabbro. Some of the pyroxene gabbro has up to 5% accompanying biotite. Although not seen in outcrop, the reverse-circulation holes indicate that pyroxenite and hornblendite are also present (Read, 1999).Where altered, the mafic minerals are chloritized with tremolite-actinolite developed and the plagioclase is epidotized and converted to albite. In one thin-sectioned sample, tourmaline forms 20% of the rock (Read, 2000). The unit is usually altered close to the forestry access road where it is felsite-diked.

Although these rocks are not radiometrically dated in the area, they are cut southwest of here by granodiorite with a zircon U-Pb age 212 ± 1 Ma (Parrish and Monger, 1992), which is similar to the Guichon Batholith. The presence of intruded marbles, probably correlative to the Nicola Group, imply that these intrusions can be no older than Middle to Late Triassic.

(c) Felsite (unit ЂJf)

West of the forestry access road, a few old logging road cuts expose felsite. The rocks are light grey to cream and aphanitic. Also included is a quartz-eye felsite porphyry dike. The age of the unit is uncertain and could range from Early Jurassic to as late as Middle to Late Cretaceous, if they represent feeders to the flows of the Spences Bridge Group.

(d) Spences Bridge Group – Pimainus Formation (uKSB)

Where the forestry access road zigzags uphill to the south, the road cuts in the upper half, before the pass, expose andesite and dacite flows. Cliffs extend eastward and span Nicoamen River valley to the eastern edge of the property. Near the southern edge of the property, flows cap at least one high point.

The flows are amygdaloidal with quartz, calcite, prehnite and zeolites forming the amygdules. The grey to brown flows are aphyric to plagiophyric and locally show platy jointing. The flows forming the cap are aphanitic and nonamygdaloidal andesite and dacite.

On the property, the platy jointing attitudes show that the rocks of the Spences Bridge Group dip gently to the northeast consistent with the trace of the unexposed contact of the Spences Bridge Group against the underlying rocks. This contact is exposed to within 5 m on the right bank of Nicoamen River a few hundred metres upstream from the TransCanada Highway where it shows no signs of faulting (station AC6b). The most likely interpretation of the nature of the contact between the Spences Bridge Group and the underlying rocks is that it

represents an unconformity or nonconformity with significant paleo-relief, rather than the faulted boundary shown by Monger and McMillian (1989).

6. GEOPHYSICAL AND GEOCHEMICAL ANOMALIES AND BEDROCK GEOLOGY

Although overburden completely covers the area of coincident geophysical and geochemical anomalies, the combination of the rock types intersected in the reverse-circulation holes and surrounding bedrock geology allows the following interpretation.

The northerly trending marble and skarn exposed in an old trench at station AC5c continues northward and becomes more widespread in holes RCA93-1, 93-4 and 93-5 where it forms septa in meta-diorite/gabbro intrusions. Younger intrusions of an intermediate composition appear to exist at station AC7r and in hole RCA93-7. The northerly trending geophysical anomalies and similarly trending geochemical anomalies apparently reflect the northerly strike of the skarn south of the anomalous area.

The anomalous area terminates to the east against the younger overlying volcanic rocks of the Spences Bridge Group. However, because this boundary is probably an unconformity/nonconformity, and not a fault, mineralization associated with the anomalies should continue undeflected beneath the Spences Bridge Group.

7. RECOMMENDATIONS

Due to financial constraints, the bedrock mapping covered only a portion of the property.

(a) Bedrock mapping should be completed on the property west of the forestry access road.

8. REFERENCES

Antal, J.W. (1969)
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Read, P.B. (2000)
Petrography of Sample 54N + 250W; unpublished report to J.M. Ashton and Associates Ltd., *Geotex Consultants Ltd.,* 2 p.

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Smith, D.W. (1993a)
Geological Mapping and Geological Sampling on the Ashton Property; B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report 23028, 9 p.

Smith, S.W. (1993b)
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STATEMENT OF AUTHOR'S QUALIFICATIONS

I, Peter B. Read, of Geotex Consultants Limited, #832 - 470 Granville Street, Vancouver, B.C., V6C 1V5, certify that:

- I am an independent consulting geological engineer providing geological expertise to the exploration, mining and engineering communities and federal, provincial and municipal governments.
- I am a member in good standing of the Geological Association of Canada (F1746) since 1971.
- I am a graduate of the University of British Columbia with a Bachelor of Geological Engineering 1957 and Masters of Geological Engineering 1960, and a PhD in Geology from the University of California, Berkeley 1965.
- I have practiced my profession continuously since leaving academia in 1974 and since 1977 in the field of structural geology for industry and the federal government. With respect to J.M. Ashton and Associates, Houston Minerals and Sitka Holdings, I have advised these companies at times over the last 15 years.
- I am completely independent of Sitka Holdings Ltd. and hold no financial interest in the company nor do I expect to do so in the future.
- This report is based on seven days on the property in the periods May 2 to 5 and September 18 to 21, 2010 and another four days in the office in 2011.

Dated at Vancouver, B.C., this 24th day of September, 2011.

Peter B. Read, PhD

COST STATEMENT: Ashton Copper Property

Exploration Work type	Comment	Days			Totals
Personnel (Name)* / Position	**Field Days (list actual days)**	**Days**	**Rate**	**Subtotal***	
Peter B. Read / geologist	May 2, 3, 4, 5 and Sept 18, 19, 20	8	$700.00	$5,600.00	
	and 21		$0.00	$0.00	
			$0.00	$0.00	
			$0.00	$0.00	
			$0.00	$0.00	
			$0.00	$0.00	
				$5,600.00	**$5,600.00**
Office Studies	**List Personnel (note - Office only, do not include field days**				
Literature search			$0.00	$0.00	
Database compilation			$0.00	$0.00	
Computer modelling			$0.00	$0.00	
Reprocessing of data			$0.00	$0.00	
General research			$0.00	$0.00	
Report preparation	Peter B. Read	3.8	$700.00	$2,617.27	
Other (specify)	Map preparation and drafting			$1,962.55	
				$4,579.82	**$4,579.82**
Airborne Exploration Surveys	**Line Kilometres / Enter total invoiced amount**				
Aeromagnetics			$0.00	$0.00	
Radiometrics			$0.00	$0.00	
Electromagnetics			$0.00	$0.00	
Gravity			$0.00	$0.00	
Digital terrain modelling			$0.00	$0.00	
Other (specify)			$0.00	$0.00	
				$0.00	**$0.00**
Remote Sensing	**Area in Hectares / Enter total invoiced amount or list personnel**				
Aerial photography			$0.00	$0.00	
LANDSAT			$0.00	$0.00	
Other (specify)			$0.00	$0.00	
				$0.00	**$0.00**
Ground Exploration Surveys	**Area in Hectares/List Personnel**				
Geological mapping	Peter B. Read / 4500 hectares				
Regional		*note: expenditures here*			
Reconnaissance		*should be captured in Personnel*			
Prospect		*field expenditures above*			
Underground	Define by length and width				
Trenches	Define by length and width			$0.00	**$0.00**
Ground geophysics	**Line Kilometres / Enter total amount invoiced list personnel**				
Radiometrics					
Magnetics					
Gravity					
Digital terrain modelling					
Electromagnetics	*note: expenditures for your crew in the field*				
SP/AP/EP	*should be captured above in Personnel*				
IP	*field expenditures above*				
AMT/CSAMT					
Resistivity					
Complex resistivity					
Seismic reflection					

Seismic refraction					
Well logging	Define by total length				
Geophysical interpretation					
Petrophysics					
Other (specify)					
				$0.00	**$0.00**
Geochemical Surveying	**Number of Samples**	**No.**	**Rate**	**Subtotal**	
Drill (cuttings, core, etc.)			$0.00	$0.00	
Stream sediment			$0.00	$0.00	
Soil	*note: This is for assays or*		$0.00	$0.00	
Rock	*laboratory costs*		$0.00	$0.00	
Water			$0.00	$0.00	
Biogeochemistry			$0.00	$0.00	
Whole rock			$0.00	$0.00	
Petrology			$0.00	$0.00	
Other (specify)			$0.00	$0.00	
				$0.00	**$0.00**
Drilling	**No. of Holes, Size of Core and Metres**	**No.**	**Rate**	**Subtotal**	
Diamond			$0.00	$0.00	
Reverse circulation (RC)			$0.00	$0.00	
Rotary air blast (RAB)			$0.00	$0.00	
Other (specify)			$0.00	$0.00	
				$0.00	**$0.00**
Other Operations	**Clarify**	**No.**	**Rate**	**Subtotal**	
Trenching			$0.00	$0.00	
Bulk sampling			$0.00	$0.00	
Underground development			$0.00	$0.00	
Other (specify)			$0.00	$0.00	
				$0.00	**$0.00**
Reclamation	**Clarify**	**No.**	**Rate**	**Subtotal**	
After drilling			$0.00	$0.00	
Monitoring			$0.00	$0.00	
Other (specify)			$0.00	$0.00	
Transportation		**No.**	**Rate**	**Subtotal**	
Airfare			$0.00	$0.00	
Taxi			$0.00	$0.00	
truck rental			$0.00	$0.00	
kilometers			$0.00	$0.00	
ATV			$0.00	$0.00	
fuel			$0.00	$164.94	
Helicopter (hours)			$0.00	$0.00	
Fuel (litres/hour)			$0.00	$0.00	
Other					
				$164.94	**$164.94**
Accommodation & Food	**Rates per day**				
Hotel			$0.00	$534.65	
Camp			$0.00	$0.00	
Meals	day rate or actual costs-specify		$0.00	$120.59	
				$655.24	**$655.24**

Miscellaneous					
Telephone			$0.00	$0.00	
Other (Specify)					
				$0.00	**$0.00**
Equipment Rentals					
Field Gear (Specify)			$0.00	$0.00	
Other (Specify)					
				$0.00	**$0.00**
Freight, rock samples					
			$0.00	$0.00	
			$0.00	$0.00	
				$0.00	**$0.00**
TOTAL Expenditures					**$11,000.00**

APPENDIX A: Field Notes

Station	WP	RH Strike/ Trend	Dip/ Plunge	Dip/Plunge Quadrant	Structure Type	Structure Code	East NAD83	North NAD83	Elev m	Rock Unit	Notes
AC1	62						614765	5567699	702	uKsb	Shattered outcrop of medium grey-green aphanitic, vesicular(?) (could be weathered amygdules (!%, 1 mm) andesite-dacite flows of the Spences Bridge Group
AC1a	63						614786	5567763	697	uKsb	In roadcut of medium grey-green microvesicular (1%, 1 mm) andesite-dacite flows of the Spences Bridge Group. The outcrop continues up the road for 80 m
AC1b	64						614824	5567914	716	uKsb	Up roadcut in chlorite/celadonite filled amygdaloidal (5%, 1 mm) andesite-dacite flows of the Spences Bridge Group. Station at the downhill edge of outcrop.
AC1c	65	83	90	SE	V		614826	5568050	725	uKsb	I am at the uphill edge of outcrop at 120 m from station AC1b in aphanitic andesite-dacite flow. At 110 m fracturing and veining filled with quartz-albite(?) not calcite
AC1d	66						614908	5568211	746	uKsb	Small roadbed outcrop of medium grey aphanitic andesite flows
AC1e	67						614901	5567467	807	Qs	No outcrop along road to here
AC1f	68						615013	5567639	817	Qs	No outcrop along road to here
AC1g	69						614956	5567392	834	uKsb	On road at downhill edge of slumped blocks and outcrop of prehnite(?)-bearing reddish amygdaloidal andesite-dacite flows of the Spences Bridge Group
AC1h	70						614864	5567252	843	uKsb	At downhill edge of roadcut of crumbly weathering amygdaloidal (20%, 2 mm) aphanitic andesite flows which are fractured and veined
AC1i	71						614843	5567121	855	uKsb	Along road in same volcanics to here at the uphill edge of slumped outcrop
AC1j	72						614700	5567019	869	Qs	No outcrop along road to here
AC1k	73						614638	5566984	875	TbJd	Along road to start of outcrop of medium-grained, chloritized and epidotized diorite
AC1l	74						614770	5566994	885	TbJf	Either outcrop or slumped block in drift. The rock in question is a phaneritic (<1 mm) felsite which sits in a light coloured drift unlike the grey drift which surrounds the volcanics of the Spences Bridge Group. The rock is extensively epidotized
AC1m	75						614893	5567053	891	uKsb	On the downhill edge and first outcrop of smashed, dark grey aphanitic andesite with extensive laumontite(?) veining. Although the outcrop is smashed, it lacks slickensides

AC1n	76						614962	5567145	897	uKSB	Uphill end of roadcut in grey aphanitic andesite flows locally amygdaloidal and veined with zeolite. Note that epdiote is absent from the Spences Bridge Group rocks.
AC1o	77	295	30	NE	FL		614995	5567168	896	uKSB	At the downhill edge of roadcut in medium grey-green aphanitic, amygdaloidal (35%, 1-4 mm zeolite filled) andesite flows Sample AC1O. The amygdules are flattened along the flow plane
AC1p	78						615124	5567304	908	uKSB	At the uphill edge of the roadcut in amygdaloidal andesite flows all the way. Calcite is not significantly present but zeolites probably are.
AC1q	79						615188	5567376	917	Qs	No outcrop along road to here
AC1r	80						615115	5567253	926	uKSB	On the downhill edge of outcrop of amygdaloidal (10-15%, 1-3 mm) andesite flows of the Spences Bridge Group
AC1s	81						615058	5567189	927	uKSB	In the same dark grey-green amygdaloidal andesite flows here fractured and veined with zeolites Sample AC1S *PHOTO GEOLOGY* (2) showing veining and amygdaloidal texture (pole 1 m high)
AC1t	82						615021	5567044	932	uKSB	Still in amygdaloidal andesite flows but near the end of outcrop
AC1u	83						615006	5567002	938	uKSB	On the last outcrop of an assured amygdaloidal andesite cut by zeolite-filled fractures
AC1v	84						614970	5566971	938	uKSB	On the first outcrop of nonamygdaloidal medium grey andesite flows cut by zeolite-filled fractures Sample AC1V
AC1w	85						614942	5566884	948	uKSB	On the uphill edge of road cuts of medium grey nonamygdaloidal andesite flows
AC1x	86	185	86	NW	FLT		614884	5566680	972	uKSB	Isolated roadcut of medium grey aphanitic andesite flows
		187	25	SW	SS					uKSB	cut by calcite and zeolite-filled fractures which have been
										uKSB	later faulted with slickensides
AC1y	87						614830	5566571	972		No outcrop along road to here
AC1z	88						614910	5566624	1000	uKSB	Outcrop of medium grey macroamygdaloidal (10%, 2-12 mm) andesite flows Sample AC1Z
AC2	89						614967	5566691	997	uKSB	Roadcut of medium grey, aphanitic andesite fractured and veined with zeolites
AC2a	90						615031	5566736	1003	uKSB	Downhill edge of road cuts and roadbed outcrops of medium grey aphanitic andesite flows
AC2b	91						615069	5566818	1010	uKSB	Scattered outcrops and roadbed outcrops of grey aphanitic andesite flows.
AC2c	92						615108	5566855	1017	uKSB	Uphill end of scattered roadbed outcrops of grey aphanitic andesite flows

AC2d	93						615174	5566888	1016		No outcrop along road to here
AC2e	94						615123	5566791	1027	uKSB	Roadbed outcrop of aphanitic medium grey andesite flows starts here.
AC2f	95						615090	5566675	1041	uKSB	Up to here in roadbed outcrops and road cuts of aphanitic medium andesite flows without zeolite fracture filling which starts to come in here.
AC2g	96						615031	5566529	1048	uKSB	Still in medium grey aphanitic andesite flows but here fractured and laumontite-veined
AC2h	97						615018	5566430	1060	uKSB	Possible roadcut outcrop of medium grey amygdaloidal andesite flows
AC2i	98						614971	5566257	1073		On the ridge crest in no outcrop to here
AC3	99	240	90	NW	FLT		614111	5569624	203	uKSB	Roadcut of medium grey plagiophyric (1 mm, 15% andesite or more likely microdiorite
AC3	99	240	3	SW	SS		614111	5569624	203		
AC3	99	228	85	NW	FLT		614111	5569624	203		
AC3	99	48	25	NE	SS		614111	5569624	203		
AC3a	100						614305	5569012	331		No outcrop along road to here
AC3b	101						614371	5568989	357	uKSB	On lowest outcrop of crumbly weathering (not smashed in the tectonic sense because it lacks slickensides) aphanitic medium grey andesite-dacite flows
AC3c	102	220	20	NW	PJ		614412	5569212	395	uKSB	Roadcut through cliffs of platy jointed medium grey, aphanitic andesite-dacite flows. 50 m down the road from here and the lavas look pillowed
AC3d	103	322	22	NE	PJ		614401	5569160	388	uKSB	In the same flows with platy jointing Sample AC3D typical for thin section
AC3e	104	310	18	NE	C		614407	5569106	380	uKSB	On the boundary between overlying platy jointed and underlying crumbly weathered, aphanitic medium grey andesite-dacite flows
AC3f	105	230	21	NW	PJ		614419	5569250	405	uKSB	In platy jointed medium grey aphanitic andesite-dacite flows
AC3g	106	0	0	E	PJ		614457	5569414	412	uKSB	In platy jointed medium grey aphanitic andesite-dacite flows
AC3h	107	0	23	E	PJ		614484	5569571	408	uKSB	On the uphill edge of outcrop of platy jointed aphanitic andesite-dacite flows. Looking north across Nicoamen Creek the flows on the north side dip 23E
AC3i	108						614608	5569656	443	uKSB	On the road 10 m vertically above the outcrop of aphanitic medium grey andesite-dacite flows
AC3j	109						614749	5569637	432	uKSB	Small roadcut of medium grey aphanitic andesite-dacite flows

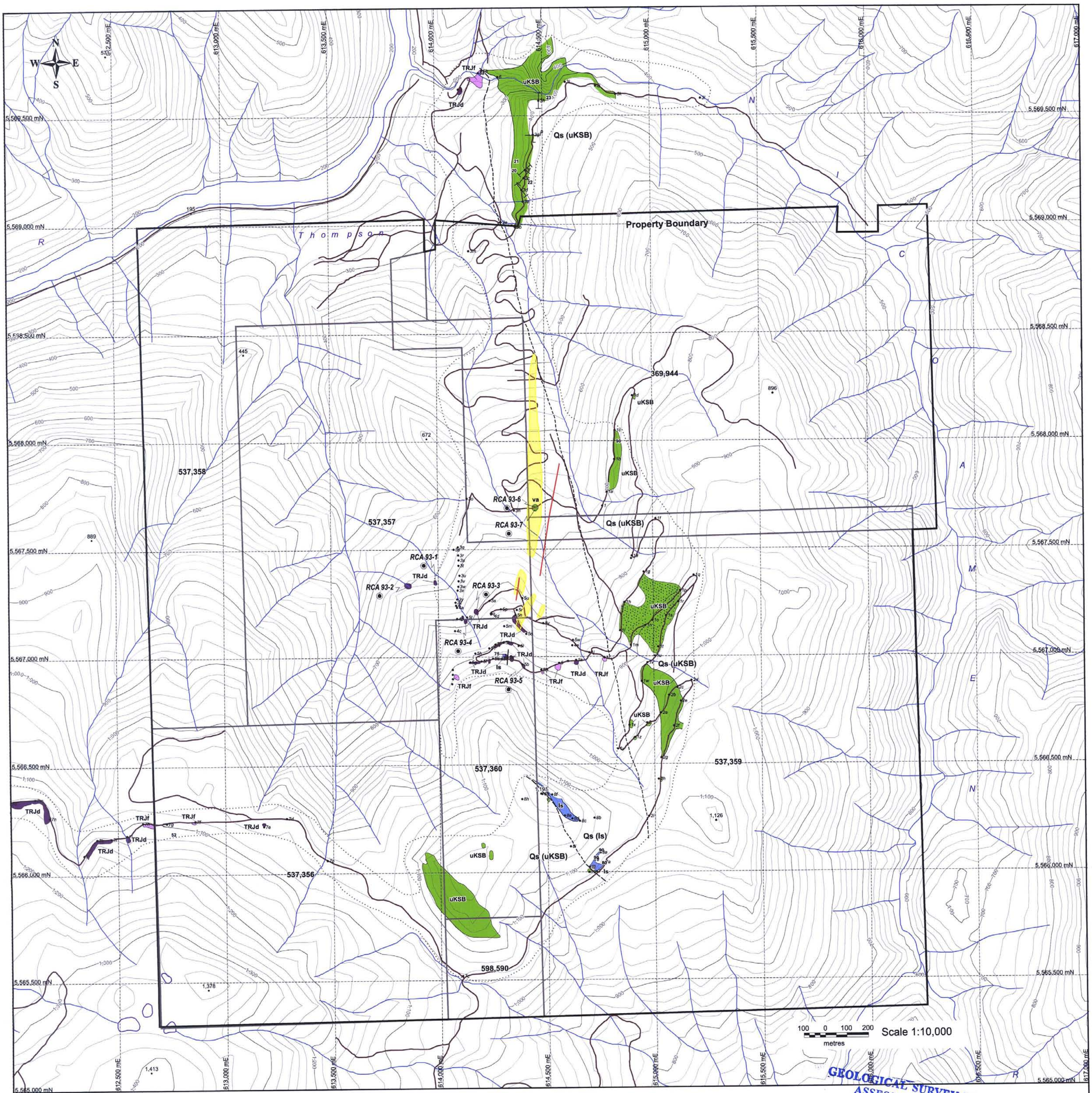
AC3k	110						614842	5569599	418	uKsB	At the base of outcrop of somewhat crumbly weathering platy jointed aphanitic andesite-dacite flows. Throughout from station AC3b there have been no zeolite-filled amygdules and few if any zeolite filled fractures
AC3l	111						615236	5569578	406	Qs	No outcrop along road to here where the road crosses the Nicoamen Creek on an old wooden bridge
AC3m	112						614152	5568880	349	Qs	No outcrop along road to here
AC3n	113						614355	5567678	668	Qs	No outcrop along road to here
AC3o	114						614136	5567734	655	Qs	No outcrop along road to here
AC3p	115						614073	5567500	668	Qs	No outcrop along road to here
AC3q	116						614093	5567511	675	Qs	On baseline at 51+25N
AC3r	117						614094	5567473	679	Qs	On baseline at 51+00N
AC3s	118						614096	5567450	691	Qs	On baseline at 50+75N
AC3t	119						614095	5567425	700	Qs	On baseline at 50+50N
AC3u	120						614099	5567379	708	Qs	At the LCP of Rebecca 2 (to NE) and Rebecca 3 (to SW); this is baseline at 50+00N
AC3v	121						614095	5567353	715	Qs	On baseline at 49+75N
AC3w	122						614093	5567328	711	Qs	On baseline at 49+50N with nearby skarn float Sample AC3W
AC3x	123						614090	5567310	731	Qs	On baseline at 49+25N
AC3y	124						614087	5567269	728	Qs	On baseline at 49+00N
AC3z	125						614080	5567254	747	Qs	On baseline at 48+75N right in gully bottom
AC4	126						614082	5567240	771	Qs	On baseline at 48+50N
AC4a	127						614086	5567231	799	Qs	On baseline at 48+25N
AC4b	128						614086	5567179	786	Qs	On baseline at 48+00N
AC4c	129						614076	5567123	837	Qs	On baseline at 47+75N
AC4d	130						614245	5567199	845	Qs	On baseline at 47+00N
AC4e	131						614621	5567053	852	Qs	On trench
	132						614601	5566979	882		
	133						614897	5567455	801		
AC5	134						614560	5566971	888	TbJf	After Station AC1k and into felsite float which here is in outcrop Sample AC5.
AC5a	135						614476	5566939	910	TbJf	Small outcrop of epidotized quartz-eye porphyry Sample AC5A
AC5b	136						614389	5566965	927	TbJd	In a 25' high roadcut, the top of which exposes a closely fractured and zeolite-filled veins cutting a medium-grained (2 mm) weathered and chloritized diorite

AC5c	137	185	75	NW	S0		614321	5566999	941	ls	On the floor of a 10' deep trench at the start of outcrop on the north side of the trench running at 270° is a medium-grained (2 mm) fresh pyrite and magnetite-bearing hornblende (25%, 2 mm) diorite Sample AC5C. However, where cut by calcite veins the diorite is chloritized and epidotized. 10 m to the west along the trench is a 10 m thick crystalline limestone yielding two samples Sample AC5C1 malachite-stained marble and Sample AC5C2 a bedded crystalline limestone. The limestone has interbedded rotten rusty layers of unknown protolith.
AC5d	138						614293	5566991	930		At the west end of outcrop of rotten rusty weathering rock of unknown protolith
AC5e	139						614252	5566992	930	TbJd	Opposite biffy in small roadcut outcrop of medium-grained (1 mm) diorite
AC5f	140						614199	5566980	929	TbJd	In a medium-grained (2 mm) diorite or gabbro Sample AC5F cut by a felsite dyke.
AC5g	141						614146	5566976	928	TbJd	At the end of trench in the same outcrop of diorite
	142						614064	5566942	927	TbJf	Baseline at 45+25N.15 m to the west is a small outcrop of felsite
	143						614064	5566919	933	TbJf	Baseline at 45+00N with the base of light to medium grey felsite outcrop running along the baseline
	144						614064	5566899	948	TbJf	Baseline 44+75N with base of outcrop of felsite running along baseline to here
	145						614061	5566876	958	Qs	Baseline at 44+50N
AC5h	146						614170	5567017	905	Qs	At the end of trench in no outcrop
AC51	147						614235	5567041	915	TbJf	Possible aplite in trench wall.
AC5j	148						614264	5567059	903	TbJd	At the west end of good outcrop in the trench wall which is a medium-grained (2 mm) medium grey, pyritiferous pyroxene diorite or gabbro that is fractured and veined by zeolites. Sample AC5J
AC5k	149						614303	5567067	904	TbJd	At the east end of outcrop of chloritized medium-grained (2 mm) diorite
AC5l	150						614372	5567051	894	TbJd	At the end of the trench wall which has been all the way in medium-grained (2 mm) chloritized diorite. The outcrop stops 20 m to the west of here.
AC5m	151						614306	5567144	871	Qs	Down old road in no outcrop
AC5n	152						614358	5567195	844	TbJd	At the west end of trench in medium-grained (1-3 mm) pyroxene (20%) diorite or gabbro. Sample AC5N
AC5o	153						614407	5567108	831	TbJd	Outcrop down to end of trench of altered diorite-gabbro.
AC5p	154						614290	5567222	839	Qs	In trench in no outcrop

AC5q	155						614244	5567203	836	Qs	At the end of a shallow trench in no outcrop, but diorite-gabbro talus is widespread
AC5r	156						614364	5567219	833	Qs	At east end of shallow trench in no outcrop
AC5s	157						614239	5567262	813	TbJf	Small roadcut of aplite.
AC5t	158						614133	5567186	821	TbJd	At the end of logging road trench in medium-grained (1-2 mm) fairly fresh diorite-gabbro Sample AC5T
AC5u	159						614390	5567273	810	Qs	An old road joins this road from below. No outcrop
AC5v	160						614487	5567157	817	Qs	Along road in no outcrop but lots of fine talus
AC5w	161						614625	5567078	849	Qs	Along road in no outcrop but lots of fine talus
AC6							614295	5569680	215		On the right bank of Nicoamen River at the base of waterfalls in medium grey amygdaloidal (zeolites, chlorite/celadonite) (2 mm, 10%) andesite/dacite flows Sample AC6.
AC6a	162						614205	5569698	214	uKsB	On the right bank of Nicoamen Creek at water level in rusty weathering complexly jointed felsite/aplite present in outcrop which extends up to 15 m above the creek level
AC6b	163						614220	5569708	223	uKsB /TbJf	Just above complexly jointed, rusty weathering aplite/felsite. The contact with the base of the Spences Bridge Group is covered but cannot be more than a 5 m outcrop gap with the outcrop on both sides showing no signs of faulting. The contact must be an angular unconformity not a fault as shown by the GSC.
AC7	269	310	80	NE	S1		614725	5566002	1077	ls	At the west end of a roadcut of white calcite marble (1-2 mm) and light to medium grey crystalline (1 mm) marble
AC7a	270						614759	5566046	1077	ls	At the east end of the crystalline marble outcrop
AC7b	271						614690	5566000	1087	ls	Uphill in a bulldozer-scraped area in light pink felsite in scattered outcrop; lots of marble and garnet skarn around
AC7c	272						614099	5565520	1080	Qs	No outcrop along road
AC7d	273						613285	5566257	1047	Qs	No outcrop along road
AC7e	274						613178	5566221	1054	TbJd	In a cat striped area showing scattered outcrops of medium-grained (1-4 mm) chloritized pyroxene (30%) metagabbro/metadiorite Sample AC7E
AC7f	275						612858	5566246	1084	uKsB	Roadcut of medium to dark grey aphanitic andesite - Spences Bridge Group?
AC7g	276	60	52	NW	S1		612726	5566238	1090		In biotite-rich (40%) schist
AC7h	277						612615	5566240	1105	TbJf	After a 50 m outcrop gap into good outcrop of light pink to grey (1 mm) aplite Sample AC7H
AC7i	278						612541	5566182	1114	TbJd	A single outcrop of medium-grained (1 mm) hornblende (35%) metadiorite

AC7j	279						612341	5566092	1139	ƀJd	Uphill edge of outcrop of medium-grained (2-4 mm) chloritized pyroxene metagabbro/metadiorite
AC7k	280						612402	5566166	1128	ƀJd	A clean outcrop shows medium-grained (1-3 mm) biotite pyroxene gabbro/diorite Sample AC7K
AC7l	281						612468	5566168	1118	ƀJd	At the east end of the same medium-grained (1-3 mm) biotite pyroxene gabbro/diorite
AC7m	282						612116	5566354	1140	ƀJd	Still in medium grained (1-3 mm) chloritized pyrobole (30%) metagabbro/metadiorite
AC7n	283						612182	5566266	1144	ƀJd	At the start of outcrop of medium-grained (1-3 mm) chloritized pyrobole (30%) metagabbro/metadiorite. PHOTO GEOLOGY (2) Looking NE to Ashton Copper
AC7o	284	130	57	SW	S1		612000	5566341	1150	ƀJd	In medium-grained (1-3 mm) biotite-pyroxene diorite/gabbro locally with inclusions
AC7p	285						613472	5566061	1045	ƀJd	On talus at road edge of medium grey, medium-grained (1-2 mm) hornblende-pyroxene-rich melanodiorite/gabbro probably a marginal phase of the metagabbro/metadiorite Sample AC7P
AC7q	286	65	56	SE	S1		613759	5564789	1090	ƀJd	In sheared, medium-grained (1-3 mm) chloritized biotite-pyroxene metagabbro/metadiorite
AC7r	287						613533	5564497	1082	ƀJd	Roadcut to the east of here exposes a chloritized hornblende (10%) syenite or monzonite. On the west side of the gully is a marginal phase of the metagabbro/metadiorite
AC7s	288						613804	5564355	1064	ƀJd	Still on road cuts of metagabbro/metadiorite
AC8	289	297	90	NE	S0		614718	5566057	1090	ls	In road cut of white crystalline (1-2 mm) limestone
C8a	290						614745	5566090	1094	ls	At the end of the white marble outcrop to the east.
AC8b	291						614717	5566250	1115	Qs	No outcrop to here
AC8c	292						614649	5566237	1137	ls	White crystalline marble outcrop
AC8d	293						614614	5566248	1159	ls	White crystalline marble outcrop
AC8e	294						614579	5566261	1177	ls	White crystalline marble outcrop
AC8f	295						614521	5566360	1187	ls	White crystalline marble outcrop
AC8g	296						614475	5566363	1189	Qs	In possible dark grey aphanitic volcanic rocks
AC8h	297						614381	5566340	1179	Qs	In possible diorite float - reliable?
AC8i	298						614606	5566119	1129	ls	In marble slumpcrop
AC8j	299	298	90	NE	S0		614693	5566023	1090	ls	In light to medium grey crystalline (1-2 mm) limestone
AC9	300						614271	5565701	1113	uKsB	Lowest outcrop of aphanitic medium grey-green andesite
AC9a	301						614230	5565768	1133	uKsB	In grey-green aphanitic andesite volcanics
AC9b	302						614245	5565841	1153		No outcrop
AC9c	303						614163	5565868	1191	uKsB	Uphill in constant outcrop of grey-green epidotized andesite flows

AC9d	304						614167	5566055	1190		
AC9e	305						614236	5566082	1166	uKsB	Red-brown aphanitic volcanic rocks
AC 9f	308						614304	5566157		uKsB	On a small outcrop of aphanitic andesite/dacite flows typical of the Spences Bridge Group
AC9g	309						614380	5566217		Qs	In the gully bottom in no outcrop
AC9h	310						614415	5566306		Qs	No outcrop to here
AC9i	311						614439	5566369	1187	Qs	Last good showing of marble detritus
AC9j	312						614206	5566120	1183	uKsB	A 10' deep pit dug in medium grey-green aphanitic volcanic rocks
AC9k	313						614021	5566010	1186	uKsB	At the top edge of aphanitic grey-green aphanitic volcanics
AC9l	314						613792	5566103	1151	Qs	No outcrop to here
AC9m	316						613894	5566043	1105	uKsB	At the base of outcrop of aphanitic medium grey-green andesite



LEGEND

QUATERNARY
PLEISTOCENE AND RECENT

- Qs(ls) — Unconsolidated sediments: glacial deposits, colluvium and alluvium; few if any outcrops; probable subcrop unit within parentheses

CRETACEOUS
MIDDLE AND UPPER CRETACEOUS
SPENCES BRIDGE GROUP
Pimainus Formation

- uKsn — Medium grey aphanitic andesite/dacite flows, locally pillowed
- uKsp — Medium grey aphanitic amygdaloidal (zeolites, quartz, calcite, chlorite/celadonite) andesite/dacite flows

TRIASSIC AND/OR JURASSIC
UPPER TRIASSIC AND/OR LOWER JURAQSSIC
MOUNT LYTTON COMPLEX

- TrJf — Cream to medium grey felsite
- TrJd — Fresh to propylitically altered hornblende/pyroxene diorite/gabbro with aplite/felsite dykes

TRIASSIC
MIDDLE AND UPPER TRIASSIC
NICOLA GROUP

- ls — Marble and skarn
- va — Aphanitic meta-andesite flows

SYMBOLS

- Contact — (Observed / (Approximate / (Assumed
- Bedding — (Flat / (Inclined / (Vertical
- Platy Jointing — (Flat / (Inclined / (Vertical
- Drill Hole
- Outcrop
- Cu Anomaly (>400 ppm)
- Axis of Geophysical Anomaly
- Station • 5
- Limit of mapping

Geology mapped by P.B. Read at 10:000, 2010

GEOLOGICAL SURVEY BRANCH
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Property Geology

Scale: 1:10,000 **Date: Sept. 22, 2011**

Geology by: P.B. Read