

**Ministry of Energy & Mines** Energy & Minerals Division Geological Survey Branch



#### ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT [type o Clapperton Property 2013 Prospe		Report	тотаl cost \$ 12,241.90
AUTHOR(S) Mike Brown		SIGNATURE(S)	"Mike Brown"
NOTICE OF WORK PERMIT NUMBER(S)/DAT			
STATEMENT OF WORK - CASH PAYMENT EV	ENT NUMBER(S)/DATE(S)	Event <b>5478</b>	278 - 2013/NOV/25
PROPERTY NAME CLAPPERTO	ON PROPERTY		
CLAIM NAME(S) (on which work was done)	787902 "ARGIE 13"	, 787922 "ARGI	E 14", 788362 "ARGIE 15"
COMMODITIES SOUGHT Copper, M	olybdenum, Lead, Z	inc, Gold, Silver	
MINERAL INVENTORY MINFILE NUMBER(S),	IF KNOWN 092ISE	174	
MINING DIVISION Nicola		NTS 0921.037	', 092I.038
latitude <u>50</u> ° <u>19</u> ′	01.1_" LONGITUDE	<u>120_</u> º <u>3</u>	<u>6</u> , <u>43.4</u> " (at centre of work)
OWNER(S)			
1) Argentex Mining Corporation		_ 2)	
MAILING ADDRESS			
835 - 1100 Melville Street			
Vancouver, BC V6E 4A6			
OPERATOR(S) [who paid for the work]			
		2)	
,		,	
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PROPERTY GEOLOGY KEYWORDS (lithology	, age, stratigraphy, structure	, alteration, mineraliza	ation, size and attitude):
Triassic, Jurrasic, Tertiary, Paleocene, Nic	ola Group, Nicola Horst,	Nicola Batholith, Cl	apperton Fault System, Quesnellia Terrane,
pluton, sedimentary rocks, tonalite, tonalit	e porphyry, amphibolite f	acies, metadiorite, i	metagabbro, granodiorite, granite,
staurolite, garnet, hornblende, augite, biot	ite, aplite dyke, feldspar,	kaolinite, epidote, o	chlorite, calcite, malachite, chalcopyrite, pyrite,
quartz-carbonate vein, copper, Coquihalla	Highway, Helmer Lake,	Clapperton Creek,	Merritt, Nicola, magnetometry, ICP-MS
REFERENCES TO PREVIOUS ASSESSMENT	WORK AND ASSESSMEN	T REPORT NUMBERS	ع ۶
02715, 05678, 06040, 27476			

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS
-	(		(incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping	1:10,000, 63.4 ha,	787902, 787922, 788362	\$ 2,040.31
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL			
(number of samples analysed for)			
Soil			
Silt			
Rock	8 samples: 36-element ICP	787902, 787922, 788362	\$ 8,161.27
Other			
DRILLING			
(total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)	1:10,000, 8.0 ha,	787902, 787922, 788362	\$ 2,040.32
PREPARATORY/PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST	\$ 12,241.90



# Clapperton Property 2013 Prospecting and Sampling Report

# South-Central British Columbia

Mineral Tenures 787902 [ARGIE 13], 787922 [ARGIE 14], 788362 [ARGIE 15]

Nicola Mining Division

NTS: 0921.037, 0921.038

Latitude: 50° 19' 01"N Longitude: 120° 36' 43"W

Owned & Operated by Argentex Mining Corporation 835-1100 Melville Street Vancouver BC V6E 4A6

> Prepared by Mike Brown 21 February 2014

BC Geological Survey Assessment Report 34566

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## **SUMMARY**

In October 2013 Argentex conducted it's first reconaissance field trip to the wholly owned Clapperton Proerty and a 3 day program of mapping, prospecting and rock chip sampling. A crew of two particiapted in the initial program. Prospecting mainly concentrated on a central copper geochemical anomaly identified from historical work and looking for the source and extensions of this anomaly. Eight rock samples were collected and submitted for assay.

The 825-hectare Clapperton Property consists of 3 contiguous mineral tenures located about 25km north of Merritt in south-central British Columbia. A powerline passes NW-SE through the south western corner of the Property. The area is easily accessible, lying immediately east of highway 5 with forestry roads still transitable in most sections of the Property.

The Property is predomonantly underlain by a dioritic complex, characterised by hornblende, quartz and biotite phases. This is considered to be part of the Nicola Horst. The normal faulted contact with the Nicola Group volcanic rocks is interpreted to run north-south inside the south-central part of the Property. The diorite represents a horst block some forty kilometres in length bounded by later Tertiary normal faults. (Moore, 2000, fig 1).

Historical work by Canadian Occidental Petroluem in 1975 and 1976 identified a copper soil anomaly (only Cu and Mo were assayed for) in the central-south portion of the Property with concident quartz, chalcopyrite, epidote, chlorite, malachite veins and veinlets in outcrops. The western edge of this mineralisation appears to be truncated by southerly trending creeks, which is interpreted as being the Clapperton Fault. No outcrop was found west of this interpreted fault boundary, with rolling low profile hills of unconsilidated rounded unsorted gravels overlying the areas.

The target of the field work was to revisit the anomalous area to determine if any other base metals or precious metals were in the area and to attempt to identify a source for the soil anomaly on both its western and eastern sides. Given that logging activity had provided access to other areas, brief reconnassance mapping was undertaken on these areas with limited rock chip sampling.

- The existence of mineralised viens in the centre-south anomalous region of the Property was confirmed to be limited to copper mineralaisation, with no ikndication of significant precious metal values based on the rock chip sampling.
- The western area of the southern section is overlain with unconsolidated rounded gravels and rocks with thicknesses no less than 5 metres, and as such, that area remains untested.
- The western edge of the north of the Property is overlain by the same gravels as in the south.
- No mineralised outcrop was discovered to the immediate east of the historical and current mineralised outcrops, which lie on the western side of the historical copper soil geochemical anomaly. However, outcrop is poor to scattered. Minor evidence of hormfels skarn float was observed on the western slope of Mount Mabel, immediately upslope from the mineralised outcrops, although the nature of this float and its source could not be determined.

The presence of mineralised westerly dipping veins and veinlets that are broadly analogous to the Turlight system, some 15km to the south of the Property, warrants further consideration for a potential feeder system, such as a porphry.

#### **INTRODUCTION**

Argentex Mining Corporation (ATX or Company) acquired a group of contiguos mineral tenures (Clapperton Property) in south central British Columbia (BC) in 2010, based on the potential prospectivity in the region for copper and other base and precious metals. A short field program of reconaiassance mapping and rock chip sampling was undertaken in October 2013 as the company's first activity on the Property since its acquisition. The pupose of this fieldwork was to understand the geological setting, verify work previously undertaken in 1975-76 and test if precious metals and/or base metals, apart from copper, were present on the Property.

Previous work on the Property by Occidental Petroluem in 1975 and 1976 had identified anomalous copper in stream silts and soils, as well as outcropping veins hosting copper with minor traces of molybendunum. The purpose of the fieldwork was to review the geological setting and the nature of the mineralisation previously identified and undertake reconnassance on the rest of the Property for additional indications of mineralisation.

All units of measurement are consistent with the Systeme Internationale d'Units [SI] unless specifcally noted otherwise. All maps and drawings containing Universal Transverse Mercator [UTM] coordinates conform to North American Datum 1983 [NAD83] unless specified differently. All monetary figures are in Canadian dollars. Software programs employed in the completion of the Report include Microsoft Word 2010, Microsoft Excel 2010 as well as AutoCAD Civil 3D 2012 which we used in preparation of the technical maps. Other illustrations were prepared in Corel Graphics Suite X6 and the Report submitted to Mineral Titles in PDF format was generated by Adobe Acrobat version XI Pro.

## LOCATION AND ACCESS

The Clapperton Propoerty is located in south-central BC (Figure 1), some 215 kms from Vancouver, about 25kms north of Merritt, the nearest town. The Property lies immediately to the east of Highway 5, which runs mainly north-south between Merritt and Kamloops. Access to the Property is via the Helmer Lake exit and then via a network of logging trails that extend through most parts of the Property. These logging trails were accessible in most part, given the late summer season in which the fieldwork was undertaken. The Property also has 130kv powerline passing through the southwest corner.

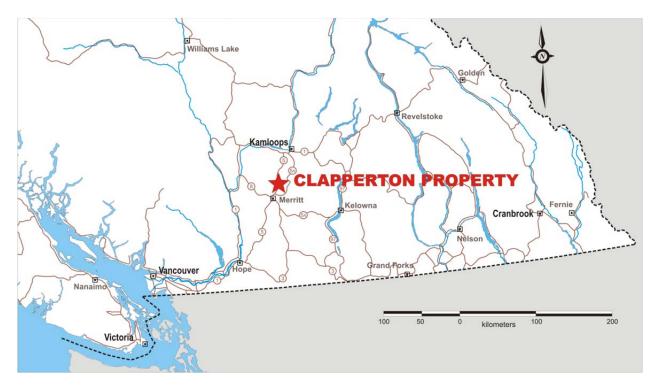


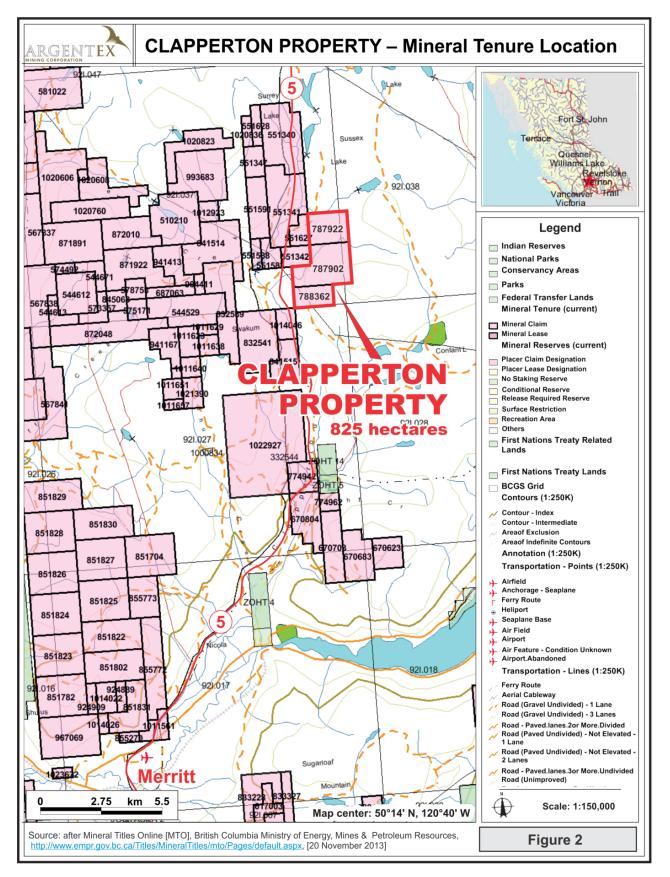
Figure 1: Location of the Clapperton Property in southern British Columbia

## **TOPOGRAPHY, VEGETATION & PHYSIOGRAPHY**

The Clapperton Property lies within the Nicola Plateau and is the northern part of the Nicola watershed, within the Clapperton Creek subbasin (Unnila, 2007,p.2). Topography consists of rolling low hills 1300-1420m.a.s.l. in the western part of the Property. The Property rises in elevation to the east, where the western flank of the rounded Mount Mable reaches up to 1660masl. in elevation.

The entire Property area has been actively logged, with clearcut patches and other areas either replanted or recovered with advanced regrowth. There are no permanent flowing streams or rivers on the Property. The area drains westwards, containing southwest tributaries into Clapperton Creek which flows south and lies off the Property to the west.

Outcrop distribution on the Property is variable. Lower lying hills along the west margin are covered by unconsolidated alluvial/glacial material consisting of unsorted rounded boulders and gravels. The base of the western flank of Mt Mabel steeply rises from the streams, forming a number of gorges and ridges in the south-central section of the Property. Outcrop along this north-south trending flank is generally good. Above these gorges the slope flattens, with outcrop varying significantly between good exposure to float and soil covered. Ridges and spines display good outcrop, and logging roads provide access and exposure which would otherwise be limited and difficult to locate.



**Figure 2: Clapperton Property Mineral Tenure Location** 

For geophysical surveys there is a limited number of clutural effects that need to be noted. Principal among those is the BC Transmission Corp powerline that crosses through in the southwest of the Property. For geochemical surveys, active forestry is the main potential source of contamination, with some gravel pits also evidenced.

## **MINERAL TENURE DESCRIPTION**

The Clapperton Property consits of three contiguous mineral tenures, wholly owned by Argentex Mining Corp. The Property covers a total of 825 hectares (see Table 1) spannig a distance of over 4km north-south and about 1700m east to west (see Figure 2).

Tenure Number	Claim Name	Recorded	Expiry Date	Area (ha)
787902	ARGIE 13	07-Jun-2010	01-Mar-2016	412.67
787922	ARGIE 14	07-Jun-2010	01-Mar-2016	247.52
788362	ARGIE 15	07-Jun-2010	01-Mar-2016	165.11
				825.30

#### **Table 1: Mineral Tenures of the Clapperton Property**

The tenures were staked in June 2010 by the Company under the Minerals Titles Online (MTO). No royalty agreement or any other encumberences applies to any part of the Property. To date, payments in lieu have been made to maintain the tenures in good standing. Expenses from the 2013 field program are claimed for assessment by Michael Brown in a Statement of Work filed on November 25<sup>th</sup>, 2013, extending the expiry date of all tenures to March 1, 2016. This expiry date is contingent on acceptance by the BC Minerals Titles of this Report in support of that Statement of Work (Event number **5478278**).

## **PROPERTY HISTORY**

The area was staked in 1974 (Clap (I-18) by Eastern Associates Registered of Whitehorse on behalf of and in the name of Canadian Occidental Petroleum Ltd following the Nicky regional stream sediment geochemistry program completed in the summer of 1974. Canadian Occidental Petroluem Ltd. undertook geological and geochemical sampling during the summer of 1974 and 1975, identifying a coincident copper soil and stream sediment geochemical anomaly. Mapping identified a number of mineralised veins outcropping in the western area of the soil and silt anomaly.

Historical geochemistry was only undertaken for copper. The entire Property was covered in an east-west and north-south grid and soil sampled. A total of 567 soil samples, 122 stream silt samples and 87 rock samples were collected in the 1975 campaign<sup>1</sup>.

Copper to 4000 ppm was identified in rock samples of veins and veinlets, as generally indicated in Figure 3. A broad soil anomaly with values up to 700 ppm copper covered the center-south area where copper mineralisation was encountered in outcrop. A silt stream sampling program also gave copper anomalous values up to 203 ppm in the small westerly flowing creek running from the western slope of Mt Mabel to

<sup>&</sup>lt;sup>1</sup> George, R.L. (1975): <u>Geology and Geochemistry of the Clap Claim Group</u>; Canadian Occidental Petroleum Ltd., British Columbia Ministry of Energy, Mines and Petroleum Resources, Assessment Report 05678, 69 pages, 7 maps.

one of the gorges towards the main creek. The work did not encounter any other significant or sizeable anomalous areas.

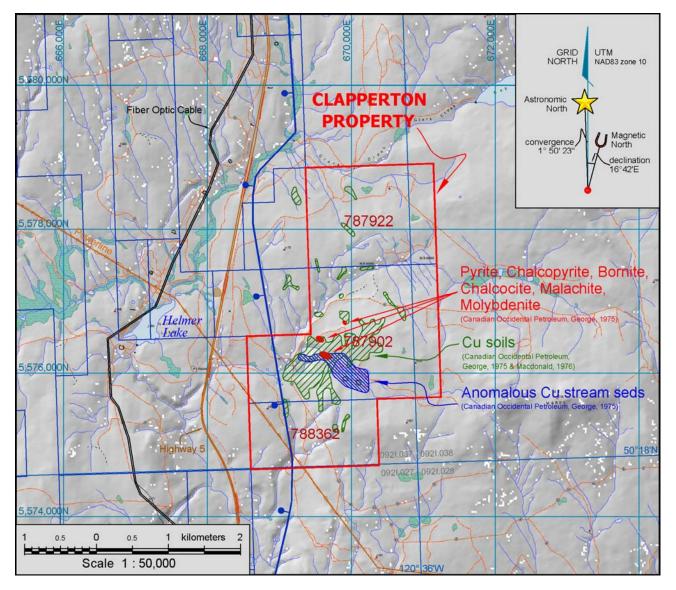


Figure 3: Summary of Historical geochemical work, including copper soil and silt steams and mineralised outcrop.

In 1975 an additional claim, Clap (I-19), was staked to the west to cover possible western extensions of the copper geochemical anomaly. A soil geochemical survey was undertaken over the Clap (I-19) Property in 1976. That survey consisted of 96 samples, which were analysed for copper and molybedenum. Copper up to 465 ppm was reported, with no anomalous molybdenum. This anomaly aligned with the copper geochemical anomaly identified on the Clap (I-18) Property, extending it some 100m to the west.<sup>2</sup>

Since 1976 no further work appears to have been conducted.

<sup>&</sup>lt;sup>2</sup> George, R.L. (1976): <u>Geology and Geochemistry of the Clap Claim Group</u>; Canadian Occidental Petroleum Ltd., British Columbia Ministry of Energy, Mines and Petroleum Resources, Assessment Report 06040, 20 pages, 3 maps.

## **GEOLOGICAL SETTING**

## **Regional Geology**

The Clapperton Property lies in Nicola Group rocks comprised of a diverse assemblage of Late Triassic to Early Jurassic submarine and subaerial volcanic, volcaniclastic, and sedimentary rocks that underlie much of the Intermontane Belt of south central British Columbia. The Nicola Group, part of the Quesnellia tectono-stratigraphic terrane, is accompanied by other early Mesozoic volcanic-arc sequences of the Takla and Rossland Groups (Mortimer, 1987, p.2521). Several plutons that straddle the Traissic-Jurrasic boundary intrude the Nicola Group. A tertiary fault-bounded structure of the Nicola Horst (Figure 4), exposes relatively deep-seated metamorphic equivalents of the Nicola Group, intruded by plutons of Triassic to Paleocene age<sup>3</sup>.

#### Nicola Group

Nicola Group rocks have been divided in a sequence of three belts, each characterized by distinct facies and assemblages. A western belt is an easterly facing succession of calcalkaline, mainly plagioclase phyric andesitic flows and breccias, with lenticular interlayers of limestone and bedded volcaniclastic rocks. Although flows are more abundant relative to clastic facies in the western part of the belt, sedimentary facies can be found throughout its entire width in the Swakum Mountain area. The alternation of thick successions of massive uniform green flows and unsorted breccias with bioclastic limestones, volcanic conglomerate and local subaerial volcanic facies, such as maroon scoriaceous breccias, testifies to deposition near a rapidly fluctuating shoreline. Local felsic centers contain dacite and rhyolite flows, welded tuff and breccia, with intercalated heterolithic, intermediate to felsic volcaniclastics. The central belt consists of mainly augite and plagioclase-phyric basaltic flows and associated breccias. These may be considered largely submarine deposits of alkalic composition. Subvolcanic intrusions of diorite and gabbro are abundant. Preto interpreted similar intrusions in the eastern belt south of Merritt, at least in some cases, as the erosional remnants of Upper Triassic volcanoes<sup>4</sup>. Finally, the eastern belt consists almost entirely of mafic augite-phyric volcaniclastics, ranging from predominant coarse breccias to more subordinate fine wacke and siltstone. This eastern succession may be an emergent part of the western belt. Regional metamorphism has advanced to low greenschist facies.

An unconformable sequence of clastic rocks of the Early and Middle Jurassic Ashcroft Formation overlie the Nicola Group. They are mostly unlayered, poorly sorted coarse conglomerate with discontinuous interbeds of pyritic, rusty weathering sandstone and siltstone. In the Swakum Mountain area a grey, commonly fetid bioclastic limestone up to 200 m thick occurs near the base of the formation. Clasts in the conglomerate consist mainly of volcanics resembling Nicola Group rocks, and granitic and dioritic boulders. At several localities, a distinctive chert-pebble conglomerate containing green clasts overlies the

<sup>&</sup>lt;sup>3</sup> Moore, John M. (2000): Nicola Horst: southern British Columbia: window into the pre-Triassic margin of North America?; Natural Resources Canada, Geological Survey of Canada, Current Research, 2000-A16, 8 pages, Url: <u>http://dsp-psd.pwgsc.gc.ca/Collection-R/GSC-CGC/M44-2000/M44-2000-A16E.pdf</u>

<sup>&</sup>lt;sup>4</sup> Preto, V.A. (1977): The Nicola Group: Mesozoic Volcanism Related to Rifting in Southern British Columbia; *in* Volcanic Regimes in Canada, Baragar, W.R.A., Coleman, L.C., Hall J.M., eds., The Geological Association of Canada Special Paper Number 16, pages 39-57.

polymictic conglomerate sometimes along with chert-bearing horizons. Flat-lying Miocene Chilcotin basalts occur north of the Fox Property and probably in smaller outliers elsewhere. These flows are nearly indistinguishable from Pleistocene and Recent valley basalts that once filled the major drainage channels of the region and now occur only as remnants in the Nicola and Quilchena valleys The seven major plutons that intrude Nicola Group rocks are also of Late Triassic to Early Jurassic in age. Principal among them is the Guichon Creek batholith that consists of biotite and hornblende diorite, quartz monzonite, granodiorite and rare granite. The batholith is chemically and mineralogically very similar to lavas of the western Nicola belt. Some of the plutons are zoned, consisting of pyroxenite, gabbro, diorite, monzonite and syenite, while others are composed of biotite and hornblende diorite, quartz monzonite, granodiorite and rare granite<sup>5</sup>. Based on the similarity of their chemical signatures to adjacent Nicola volcanics, at least some plutons are considered comagmatic to the volcanics they intrude.

#### Nicola Horst

The Nicola Horst is a northerly trending block 40kms long, entirely detached from the surrounding Nicola Group rocks by Tertiary normal faults. The Horst, often referred to as the "Nicola batholith" in earlier studies, is a complex of Nicola Group rocks, sedimentary rocks of unknown age, tonalite and tonalite porphyry. Those rocks are all strongly deformed, metamorphosed to low amphibolite facies and intruded by granitoid rocks ranging in age from at least Early Jurassic to Paleocene. Stratified rocks of the Nicola Horst consist of strongly foliated and lineated quartzite metaconglomerate and interlayered graphitic mica schist as well as several units that are closely comparable to Nicola Group rocks except for their relatively high strain and metamorphic grade. The conglomerate and black schist are not comparable to any facies of the Nicola Group. They appear to structurally overlie the Nicola correlatives in the Horst, although they are separated from them by plutonic units. The conglomerate comprises stretched pebble-size clasts mainly of white, grey and black quartzite in a biotite-muscovite-quartz matrix with a few granitoid clasts. Staurolite and garnet accompany andalusite in the schist that suggests uplift during metamorphism. The Nicola-like rocks are characterized by hornblende pseudomorphs after augite phenocrysts that resemble units of the central and eastern belts. Those identified with the central belt consist mainly of uniform or meta-augite porphyry while the remainder are mostly layered hornblende and hornblende-biotite schists that appear to be volcaniclastic sediments. In the east-central part of the Horst, these rocks contain relict graded and load-cast beds, but in the north end those primary features are obscured by strain and grain growth.

The most strongly deformed intrusive rocks in the Horst are leucocratic and tonalite porphyry that exhibits strain geometry comparable to the metasediments. Metadiorite, varying to metagabbro and tonalite is generally less penetratively and homogeneously strained. Along the Clapperton Fault system that bounds the west side of the Horst, the metadiorite has been intruded by granodiorite to granite that is also metamorphosed. A lenticular body of metaperidotite is converted to a pale amphibolite assemblage. Two varieties of less-deformed but metamorphosed, coarse biotite granitoid rocks are recognized; the Le Jeune variety containing augen of potassium-feldspar that cuts the Frogmore variety, which is less strongly foliated and more equigranular, containing highly oblate mafic xenoliths. Both of these types vary in composition from granite to tonalite but are predominantly granite and granodiorite. The Le Jeune metagranodiorite has been dated to early Jurassic. The southern part of the Horst is dominated by the

<sup>&</sup>lt;sup>5</sup> Mortimer, N. (1987): The Nicola Group: Late Triassic and Early Jurassic subduction-related volcanism in British Columbia; Canadian Journal of Earth Sciences, vol. 24, pages 2521-2536.

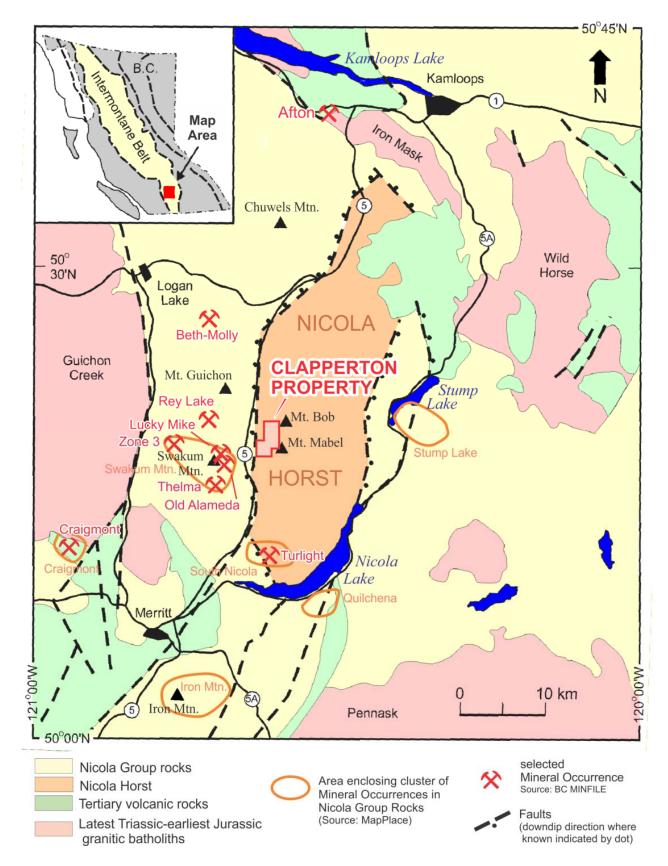


Figure 4: Regional Geology of the Nicola Group at the Clapperton Property

#### ARGENTEX MINING CORP Clapperton Property 2013

Paleocene Rocky Gulch batholith, a potassium-feldspar megacrystic granodiorite to granite that is superficially similar to the earlier units but is typically coarser and essentially massive and undeformed. It cuts the older type with which it is intimately mixed in the north-central part of the Horst.

## **Regional Tectonics & Structure**

The tectonic history of the Property region is dominated by a complex pattern of brittle deformation. Only in the Nicola Horst are the rocks penetratively deformed – evident as westerly plunging stretching features probably related to accretion of the Nicola arc in Mesozoic time. Most of the Nicola rocks are steeply dipping with stratigraphic tops facing east. Major northwest trending lineaments are seen in Nicola rocks that are transected by northerly striking Tertiary extensional fault systems. These systems occupy the Nicola River, Guichon, Clapperton and Quilchena Creek valleys. Eocene sediments have been deformed to a near vertical dip and the Nicola Horst elevated relative to its surroundings. Where exposed, these faults exhibit intense shattering, veining and local alteration.

## **Property Geology**

The Property is considered to comprise of underlying hybrid dioritic phase of the Nicola Batholith (horst) containing metamorphosed volcanic xenoliths and some volcanic country rock. This batholith is considered fault bounded to the west by the north-south trending Clapperton Fault. The Clapperton Fault is tertiary in age, obsured by overlying alluvium/glacial till cover of the Clapperton Creek valley. It is interpreted to run just inside the western boundary in the southern part of the Property. The alluvium cover is inferred to also overly the meatmorphosed volcanics. Literature indicates three phases of the diorite exist; as hornblende, biotite and quartz-biotite varieites. Mapping did not delineate any clear zonation of these sub-units, although biotite may represent a weak metamorphic genesis. Apalite dykes intrude the diorite, and consist of fine grained felspar with a pinky-brown colour. These dykes vary from veinlets to bodies up to 9m wide. They were best observed in the gorge area of the central west portion of the Property, although this is likely to be related to better outcrop exposure than anything else. They typically follow the local shear and joint set orinetation of 060°, dipping 75° to the west.

Classification Code	Unit	Description
5a	Chloritised andesite	
5b	Sericitised dacitic tuff	
<b>4</b> a	Aplite dykes, veins	Fine grained siliceous aplite, found as small dykes and
		veins.
4b	Plagioclase porphyry	Euhedral to subhedral zoned crystals of plagioclase in
	dykes	a fine grained, grey, apparently dioritic matrix.
4c	Pegmatite dykes, veins	Set of pegmatite veins consisting of fine to medium-
		grained feldspar with 10-20% quartz in irregular
		granophyric textured grains.
3	Biotite-quartz diorite	5-15% biotite, 10-15% quartz and 60-75% plagioclase
2	Biotite diorite	5-15% biotite flakes within a plagioclase matrix.
		Limited irregular outcrop may support that the biotite
		represents a metamorphosis of hornblende.
1	Hornblende diorite	15-35% subhedral hornblende in a plagioclase
		groundmass. Variable grain size, with weak to strong
		localized foliation.

George (1975) and Mackenzie and George (1976) have classified the geology on the Property as follows:

#### ARGENTEX MINING CORP Clapperton Property 2013

The diorite exhibits a pervasive foliation, which varies locally in intensity. The foliation has a general 100-130° to true north strike, with southerly dips of 50-80°. In areas of more intensive foliation kaolinite/epidote/chlorite alteration was observed, as well as minor veinlets of quartz-carbonate-calcite-epidote-chlorite, oriented sub-parallel to the foliation, typically in an irregular en echelon distribution, with very minor limonite after possible magnetite (sample 157958). Coarser grained pegmatitic veins postdate these veinlets and foliation.

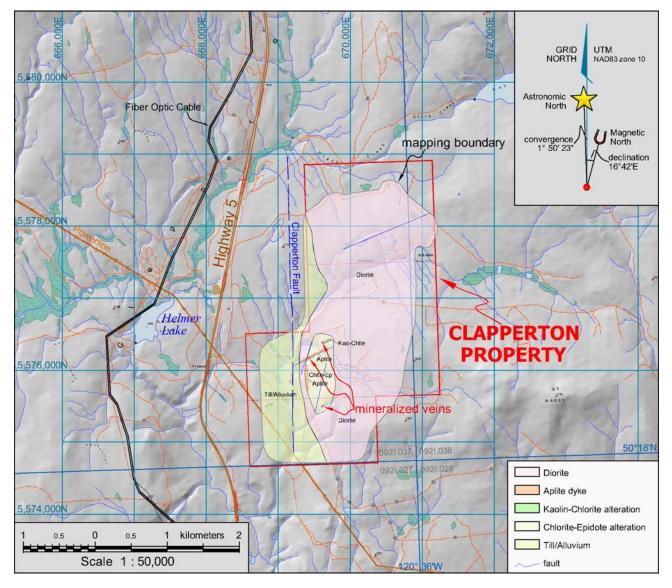


Figure 5: Clapperton Property Geology. Bedrock units are shown based on the mapping undertaken during the 2013 fieldwork and compilation from historical work undertaken.

## **Mineralisation**

The historical work undertaken on the Property has focused on the quartz carbonate veins with copper mineralisation. No other form or type of mineralisation has to date been documented on the Property, nor was any identified during the 2013 fieldwork.

#### **Copper Mineralisation**

Page 12

The copper mineralisation identified in George, 1975 and Mackenzie & George, 1976 and verified in this field program is located in the south-central portion of the Property (Figure 3 and Figure 5). Mineralisation discovered in outcrop consisted of quartz-carbonate-epidote-calcite veins and rare veinlets with disseminated blebs of chalcopyrite, malachite and minor pyrite. No molybdenite was found, although it was observed rarely in historical work. The veins are typically 5-15cm wide, of en echelon style, with typical outcrops consisting of 0.40-3m long veins. The distribution appeared scattered in observed outcrops, with no pervasive veining encountered. The orientation of mineralised veins encountered was predominantly 020-040°/60°W. Similar quartz-carbonate-calcite-epidote veins also showed a more N-S orientation, as well as a trend parallel to mineral foliation in the diorites (120°/60-75°S). The area of mineralised veining appears restricted to a 2km-long north-south trending area, which lies within the western sector of the stream silt and soil geochemical anomaly identified by the historical work conducted by Occidental Petroleum.

Localized weak to moderate epidote and chlorite alteration was observed in wall rock. Veins were not continuous in outcrop, typically en echelon in style. Outcropping mineralisation encountered in all work undertaken on the Property is shown on Figure 5. Evidence for pervasive veining, or continuity of the veining to the east was not observed, but outcrop is very scattered and sparse, heading upslope towards the east. As such, the source of the copper geochemical anomaly that extends upslope to the east of the encountered mineralisation was not encountered. No evidence for mineralised veins was found in the northern, southern or eastern areas of the Property.

## **Structure**

The mineral foliation of the diorites is the most prominent evidence of an active structural regime on the Property. This foliation typically runs at 100-130° to true north, with a dip to the south varying between 60-75°. Foliation in the diorite varies from weakly pervasive to a pervasive-, almost shear-related in nature. Aplite dykes, pegmatite veins and quartz veins were either coplanar to the foliation or 010-020° with a westerly dip varying between 55-75°. As discussed above only the quartz veins appear to carry mineralisation.

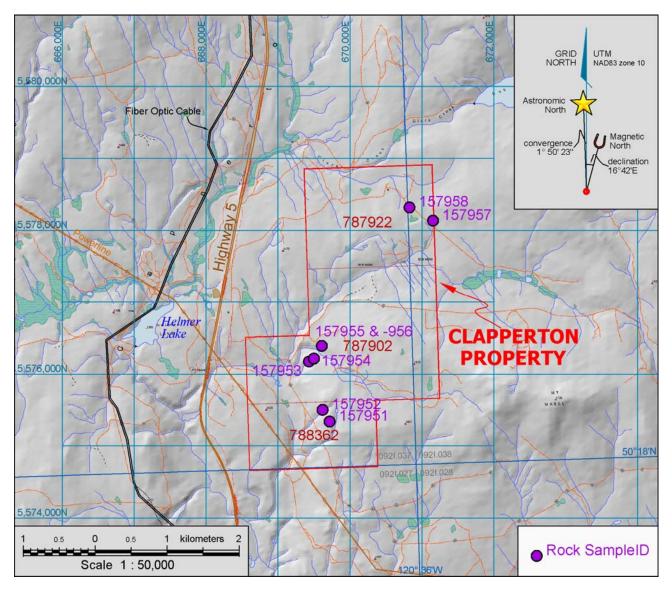
Faults are difficult to distinguish in the field due to the nature of the outcrop. A small fault was observed in the northern face of the central gorge, about 20m west of a mineralised quartz-carbonate-calcite-epidote-chalcopyrite-malachite-vein (sample #157953). This was sub-vertical, striking 020° (Magnetic), with brittle fracturing extending some 40cm out into wall rock. An inferred fault, based on strong foliation and brittle fracturing in nearby outcrop was observed within a small NE striking gully in the southern area of the geochemical anomaly (see Figure 5).

The Clapperton Fault is interpreted to run just inside the western boundary of the Property (see again Figure 5). No evidence for its location was observed, with its trace covered by glacial debris/alluvium.

## FIELDWORK OF 2013

#### **Copper Veins Showing**

Argentex Mining began its program of activities on 23<sup>rd</sup> September and completed these on the 25<sup>th</sup> of September. During this period the area of the geochemical anomaly was walked, as well as reconnaissance of the area along the accessible logging trails. The key focus was to identify the veins encountered in Occidental Petroleum's work in 1975 and 1976, attempt to identify a source for the copper geochemical anomaly in the eastern area, establish if any of the mineralisation contained other minerals not previously assayed for, and look for any indications of other forms of mineralisation not related to copper in other parts of the Property, and thus not detected in previous work done. A total of 8 rock samples were taken of different veins encountered during the field work. Only one of these samples was not of a vein, sample #15796, which was taken from a section of wall rock within one meter of a narrow weakly mineralised quartz-carbonate-calcite-epidote-malachite vein.



**Figure 6: Clapperton Property Geochemistry** 

#### ARGENTEX MINING CORP Clapperton Property 2013

Sample	Mo [ppm]	Cu [ppm]						As [ppm]	Au [ppb]
157951	< 0.1	8.9	2.3	20	< 0.1	< 0.5	1.7		
157952	0.4	3155.8	3.3	78	3.5	< 0.5	33.6		
157953	1.7	3011.4	6.8	53	2.4	1.2	8.3		
157954	< 0.1	23.5	1.4	12	< 0.1	< 0.5	< 0.5		
157955	0.3	205.0	1.6	7	0.3	< 0.5	2.0		
157956	0.2	87.1	2.2	81	< 0.1	0.8	1.2		
157957	0.2	5.7	1.0	6	< 0.1	< 0.5	1.2		
157958	0.3	5.3	0.8	3	< 0.1	< 0.5	2.6		

A summary of the analyses of all 8 rock samples are tabulated below:

Field locations of those samples are plotted in Figure 6. The location, description and geochemistry of all rock samples are contained in Appendix A.

#### Follow up work on historical geochemistry anomalies

No mineralised veins were encountered on traverses made in the eastern section of the soil anomaly, other than those indicated in Figure 5 and sampled in Figure 6. The area was either logged or replanted, with considerable surface disturbance. There was some minor evidence of rounded hornfels-magnetite skarn float in some areas bordering the small creek that returned the copper silt stream anomaly in Occidental Petroleum's previous work. However, there was no clear evidence it was not transported alluvial or glacially derived material, as rounded boulders of varying rock types were scattered in the lower slopes.

Areas to the west of the gorges, where the creek drains south westerly on the main access trail into the Property, was overlain with alluvial/glacial gravels and poorly sorted rounded boulders. No outcrop was encountered in this area.

Reconnaissance traverses on the southern and the northeast parts of the Property (areas where Nicola Group outcrop was present) was undertaken along logging roads in variable condition. No signs of alteration, significant structure or mineralisation were encountered. No outcrop or indications as to the source of copper associated with several small discrete copper anomalies from Occidental Petroleum's soil geochemistry was observed. Two quartz-carbonate-calcite veins with coarse, almost pegmatitic crystals were sampled (#157957-8) with no mineralisation detected. Minor limonite in these veins is assumed to derive from magnetite or other Fe minerals. Minor epidote was observed in these veins. These areas contained the same hornblende diorite, with various generations of generally coarser grained veins cross cutting and parallel to the pervasive foliation.

## **Sampling Method & Analyses**

Rock samples weighing between about one to 3 kg were collected in oversize sample bags, gathered by the author. A uniquely numbered tag was added to each bag before being sealed. Once sealed, the sample remained in the custody of the author. A description of the sample and its location coordinates, with reference to a GPS, were recorded in the corresponding receipt portion in the book of sample tags or in a field book. Samples at the end of the field program were couriered by the author to Acme Analytical Laboratories Ltd. [Acme Labs] of Vancouver, BC, an ISO 9001:2008 accredited facility. Acme Labs completed both the sample preparation and the analytical treatment on all samples related to the 2013

#### ARGENTEX MINING CORP Clapperton Property 2013

fieldwork. The assayer's certificate is appended herein (Appendix B) as are 'Method Specifications' sheets as released by Acme Labs, that detail the procedure used in the sample analysis.

All 8 rock samples were crushed to 80% -10 mesh [2mm] with a 250 gm riffled portion pulverized to 85% -200 mesh. All samples were analysed by a 36-element ICP-MS procedure (Acme Group 1DX1) where a 0.5-gram subsample of the pulp was digested in hot aqua regia for an hour then, after cooling, was diluted to 10ml with a 5% solution.

No samples exceeded detection limits, and as such no over limit assaying was undertaken. No standards, blanks or duplicates were added by the company prior to the samples being delivered Acme Labs.

#### **INTERPETATIONS AND CONCLUSIONS**

The fieldwork undertaken was successful in one of its key objectives; determining if historical geochemical work analysing copper (1975) and copper and molybdenum (1976) required additional geochemical work for other base and precious metals. The 8 rock samples and field observations gave no indication that other economic minerals are likely to exist, at least in a near surface environment. That being said, the area to the west of the Property (see Figure 5) is covered by glacial tills/alluvial materials, and as such remains a target. This area is proximal to the likely trace of the Clapperton Fault, and could mean that the Nicola Group metasediments and volcanics are covered by overburden. The metasediments appear to be a prospective host rock, based on known mineral occurrences (see Figure 4). The covered area might also be more conducive to generation of Turlight type precious metal vein hosted mineralisation related to the Tertiary Clapperton Fault activity.

The fieldwork was not successful in identifying any mineralised outcrop or indications of the source of the copper in soils and stream silts in the eastern part of the copper anomaly. Nor were the sources of other discrete copper anomalies located. The presence of transported cover on the western margin of the Property suggests that geophysical methods may need to be employed to determine the potential for this area as a favourable exploration target.

Although evidence of veining was relatively limited in area, the nature of the alteration and mineralisation could point towards a deeper seated intrusive body as the source for the copper. The epidote and chlorite alteration associated with these veins is the typical outer halo alteration assemblage of copper porphyry systems. As such, any future work should be directed towards exploring the potential for deeper seated mineralisation either under or proximal to the gorges outcropping mineralisation or under transported material in the west of the Property.

## RECOMMENDATIONS

Multi-element geochemistry on rock samples within the area of the previously identified copper geochemical anomaly did not show the existence of other base or precious metals. This suggests that mineralisation types are probably restricted to Cu with minor Mo (reported in previous work) and, as such, conducting additional soil geochemical surveys for precious and base metals is not warranted. The predominant copper and minor molybdenum mineralisation observed in geochemistry and the chlorite/epidote alteration may support a theory for a deeper seated porphyry body underlying these veins.

The area to the west of the mineralised veins observed immediately east of the creek running generally SW to the west of the gorges may provide a future target for further field efforts. There are two possible targets in this area, subject to the actual underlying bedrock. This will be controlled by the actual location of the Clapperton Fault.

The first theory is based on the area being underlain by the Nicola Horst diorite, with the fault trace therefore to the west of the Property boundary. In this scenario this area could be a possible location for deeper seated porphyry underlying the mineralised veins and soil anomaly. The second scenario is that the covered area is actually underlain by the younger Nicola Group rocks, representing the downside fault block and with the Clapperton Fault lying immediately to the west of the gorge. The Nicola Group hosts a number of local mineral occurrences, such as Rey Lake, Lucky Mine, Thelma and Old Alameda (see

Figure 4). However, the east-west extent of this area from the Clapperton creek to the western boundary is only 400m. This limits the potential size of any potential mineral discovery and would constrain the economic potential of any discovery.

Due to the transported nature of the overburden, geophysics, aerial magnetometry and gradient surveys may provide insight into the existence of other porphyry phases in the diorite batholith, and delineate the Clapperton Fault. A hand held magnetometry survey may be the most effective, given the company owns such equipment already.

## **ITEMIZED COST STATEMENT**

The field work undertaken commenced in September on Monday 23 and was completed on Wednesday 25<sup>th</sup> under the management of Michael Brown of Argentex Mining Company. During that period reconnaissance traverses including mapping and sampling was undertaken over most areas of the Property. Hotel accommodation in Merritt was used for two nights with the team returning to their respective bases on Wednesday night directly from the Project.

Chargeable	Description	Rate	Units	Total	
Geologist	map review	\$ 1,000.00	1.5	\$ 1,500.00	
		field trip	\$ 1,000.00	3	\$ 3,000.00
		report preparation	\$ 1,000.00	2	\$ 2,000.00
Field Technician	Peter Ball		\$ 750.00	3	2,250.00
Graphics preparation	J. David Williams		735	1.5	\$ 1,102.50
Land Search	J. David Williams		73.5	1	\$ 73.50
Transportation					
Truck rental					\$ 593.77
Fuel					231.07
Food and Lodging					
Accommodation					209.00
Food					102.13
Field supplies					1,014.99
<u>Laboratory</u>		8 rock samples			164.94
TOTAL PROJECT EXPENSES					<u>\$ 12,241.90</u>

#### **Table 2: Summary of Project Costs**

Respectfully Submitted,

<u>"Mike Brown"</u> Mike Brown

Vancouver, February 21, 2014

## STATEMENT OF QUALIFICATIONS

I, Michael James Paterson Brown residing at 1345 Palmerston Ave in the City of West Vancouver, in the Province of British Columbia

Do Hereby Certify;

- 1. That I am President and CEO of Argentex Mining Corp, a public company registered at 835-1100 Melville St Vancouver, BC
- 2. That I am a graduate of the University of Melbourne, where I obtained a Bachelors of Science: Honours in Geology in 1992.
- 3. That I am a Member of the Australian Institute of Geoscientists.
- 4. That I have practiced my profession as a geologist since 1993.
- 5. That I am the author of this Report, entitled "Clapperton Property 2013 Prospecting and Sampling Report", dated 21 February 2014.

#### ARGENTEX MINING CORP Clapperton Property 2013

#### APPENDIX A: SAMPLE DESCRIPTIONS

							Method Element	WGHT Wgt		1DX Cu	1DX Pb	1DX Zn	1DX Fe	1DX As	1DX Au
							Unit	-	PPM	PPM	PPM	PPM	%	PPM	PPB
Sample	UTM Easting	UTM Northing	Elevation	Description	Sample type	Source	Туре	MDL	0.01	0.1	0.1	0.1	1	0.01	0.5
457054	cc0710	FF7F2.44	1554	quartz/carbonante/chlorite veinlets 3-6cm wide, 40 60 cm long) in a hornblende diorite with moderate epidote alteration. Moderaltely foliated, with minor limonite	De de de la	Sampled from 2m rock		2.00	-0.1		2.2	20	1 22	-0.5	
157951	669718	5575341	1554	staining. quartz/carbonate/epidote/chalcopyr	Rock chip	face. sampled in 1m section of vein wih approximately 15m	Rock	3.00	<0.1	8.9	2.3	20	1.33	<0.5	1.7
157952	669620	5575504	1505	ite/malachite vein. 5-20cm wide.	Rock chip	exposire in gorge face sampled 40cm section	Rock	2.47	0.4	3155.8	3.3	78	3.76	<0.5	33.6
				quartz/carbonate/epidote/chalcopyr		of a 3m outcrop of mineralised vein in									
157953	669432	5576172	1440	ite/malachite vein. 5-10cm wide. quartz/carbonate veinlet, FeOx (after magnetite?) in moderately	Rock chip	gorge face.	Rock	2.34	1.7	3011.4	6.8	53	2.58	1.2	8.3
157954	669500	5576214	1468	foliated hornblende/quartz diorite	Rock chip	2m outcropping face	Rock	2.48	<0.1	23.5	1.4	12	0.66	<0.5	<0.5
157955	669609	5576389	1476	quartz/carbonate/epidote/malachit e/limonite echelon veinlets in a foliated quartz-biotite diorite.	Rock chip	veinlets outcropping on edge of low outcrop on western slope.	Rock	2.54	0.3	205.0	1.6	7	0.54	<0.5	2.0
157956	669609			Moderately silicified and cholorite altered foliated diorite wallrock to previous sample.	Rock chip	Wall rock on northern contact with echelon veinlets in sample # 157955	Rock	3.10					3.24		
157957	671155			Quartz/carbonate/biotite veinlets (5- 35cm wide) with cholrite/epidote blobs.		4 veinlets in 4m wide rock exposure	Rock	2.53					0.66		1.2
157958	670828	5578317	1495	Course quartz/carbonate vein 25-50 cm wide) with minor coarse limonite (after magnetite?) in a strongly foliated quartz biotite diorite.	Chip	2m long outcrop beisde forestry road.	Rock	2.55	0.3	5.3		3	0.40	<0.5	2.6

#### APPENDIX B:

Assay Certificate & Method Specifications

Assayer's certificate issued by ACME Analytical Laboratories of Vancouver, BC, related to the sampling completed on the Clapperton Property in September 2013, followed by 'Method Specifications' sheet related to the ICP-MS analytical procedure employed by Acme Labs in its analyses.



www.acmelab.com

Acme Analytical Laboratories (Vancouver) Ltd. 9050 Shaughnessy St Vancouver BC V6P 6E5 CANADA PHONE (604) 253-3158

## CERTIFICATE OF ANALYSIS

CLAPPERTON

#### **CLIENT JOB INFORMATION**

Project: Shipment ID:

P.O. Number Number of Samples:

SAMPLE DISPOSAL

Client: **Argentex Mining Corporation** 835 - 1100 Melville St Vancouver BC V6E 4A6 CANADA

Submitted By:	Michael Brown
Receiving Lab:	Canada-Vancouver
Received:	September 26, 2013
Report Date:	October 22, 2013
Page:	1 of 2

## VAN13003904.1

#### SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
R200-250	8	Crush, split and pulverize 250 g rock to 200 mesh			VAN
1DX1	8	1:1:1 Aqua Regia digestion ICP-MS analysis	0.5	Completed	VAN

#### **ADDITIONAL COMMENTS**

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

8

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

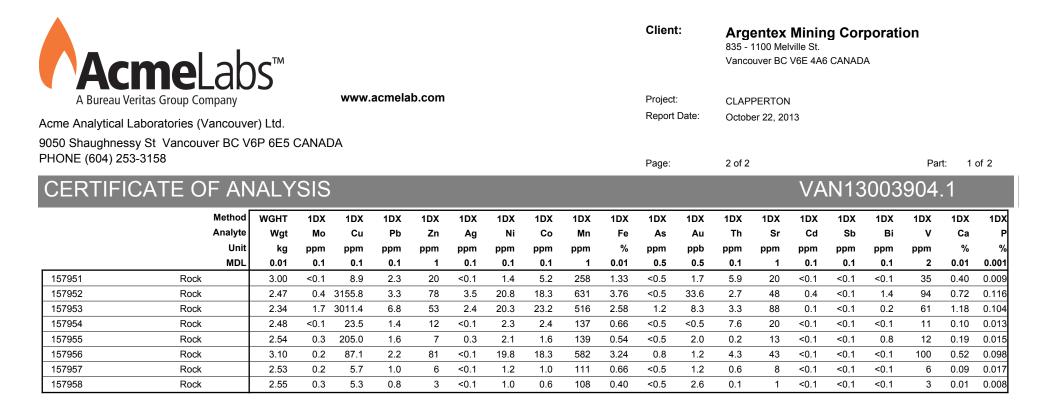
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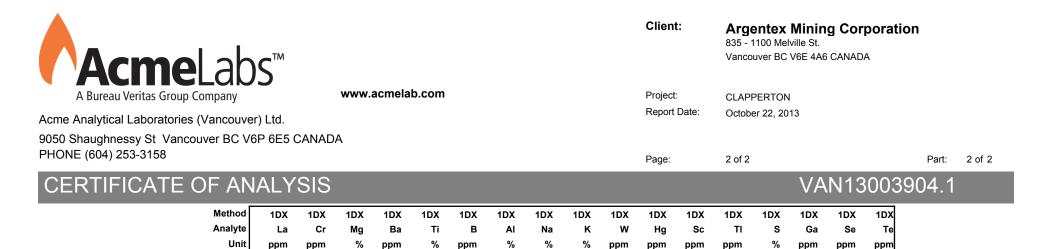
CC:

Argentex Mining Corporation 835 - 1100 Melville St. Vancouver BC V6E 4A6 CANADA

CLARENCE LEONG Country Manager - Canada

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. Acre 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.





MDL

Rock

Rock

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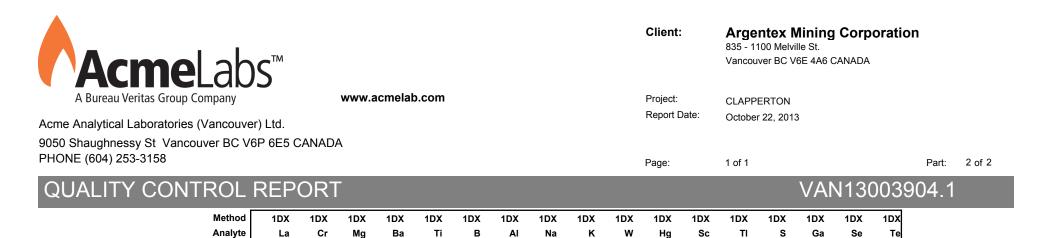
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QUALITY COI	NTROL	REP	OR	Г												VA	N13	0039	904.	.1	
	Method	WGHT	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Method Analyte	WGHT Wgt	1DX Mo	1DX Cu	1DX Pb	1DX Zn	1DX Ag	1DX Ni	1DX Co	1DX Mn	1DX Fe	1DX As	1DX Au	1DX Th	1DX Sr	1DX Cd	1DX Sb	1DX Bi	1DX V	1DX Ca	
																					1DX P
	Analyte	Wgt	Мо	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	v	Ca	F
Reference Materials	Analyte Unit	Wgt kg	Mo ppm	Cu ppm	Pb ppm	Zn	Ag ppm	Ni ppm	Co ppm	Mn	Fe %	As ppm	Au ppb	Th ppm	Sr	Cd ppm	Sb ppm	Bi ppm	V	Ca %	F %
Reference Materials STD DS10	Analyte Unit	Wgt kg	Mo ppm	Cu ppm	Pb ppm	Zn	Ag ppm	Ni ppm	Co ppm	Mn	Fe %	As ppm	Au ppb	Th ppm	Sr	Cd ppm	Sb ppm	Bi ppm	V	Ca %	F % 0.001
	Analyte Unit MDL	Wgt kg	Mo ppm 0.1	Cu ppm 0.1	Pb ppm 0.1	Zn ppm 1	Ag ppm 0.1	Ni ppm 0.1	Co ppm 0.1	Mn ppm 1	Fe % 0.01	As ppm 0.5	Au ppb 0.5	Th ppm 0.1	Sr ppm 1	Cd ppm 0.1	Sb ppm 0.1	Bi ppm 0.1	V ppm 2	Ca % 0.01	F %
STD DS10	Analyte Unit MDL Standard	Wgt kg	Mo ppm 0.1 12.9	Cu ppm 0.1 162.0	Pb ppm 0.1 156.5	Zn ppm 1 368	Ag ppm 0.1 1.9	Ni ppm 0.1 76.0	Co ppm 0.1 12.6	Mn ppm 1 904	Fe % 0.01 2.80	As ppm 0.5 44.8	Au ppb 0.5 80.3	Th ppm 0.1 7.3	Sr ppm 1 67	Cd ppm 0.1 2.5	Sb ppm 0.1 8.2	Bi ppm 0.1 12.3	V ppm 2 47	Ca % 0.01 1.08 0.03	F % 0.001 0.080 0.025
STD DS10 STD OREAS45EA	Analyte Unit MDL Standard	Wgt kg	Mo ppm 0.1 12.9 1.7	Cu ppm 0.1 162.0 698.7	Pb ppm 0.1 156.5 14.7	Zn ppm 1 368 31	Ag ppm 0.1 1.9 0.3	Ni ppm 0.1 76.0 383.6	Co ppm 0.1 12.6 50.7	Mn ppm 1 904 384	Fe % 0.01 2.80 22.86	As ppm 0.5 44.8 9.4	Au ppb 0.5 80.3 53.1	Th   ppm   0.1   7.3   10.1	Sr ppm 1 67 4	Cd ppm 0.1 2.5 <0.1	<b>Sb</b> ppm 0.1 8.2 0.2	Bi ppm 0.1 12.3 0.2	V ppm 2 47 303	Ca % 0.01 1.08 0.03	F % 0.001
STD DS10 STD OREAS45EA STD DS10 Expected	Analyte Unit MDL Standard	Wgt kg	Mo ppm 0.1 12.9 1.7 14.69	Cu ppm 0.1 162.0 698.7 154.61	Pb ppm 0.1 156.5 14.7 150.55	Zn ppm 1 368 31 352.9	Ag ppm 0.1 1.9 0.3 1.96	Ni ppm 0.1 76.0 383.6 74.6	Co ppm 0.1 12.6 50.7 12.9	Mn ppm 1 904 384 861	Fe % 0.01 2.80 22.86 2.7188	As ppm 0.5 44.8 9.4 43.7	Au ppb 0.5 80.3 53.1 91.9	Th ppm 0.1 7.3 10.1 7.5	Sr ppm 1 67 4 67.1	Cd ppm 0.1 2.5 <0.1 2.48	<b>Sb</b> ppm 0.1 8.2 0.2 9.51	Bi ppm 0.1 12.3 0.2 11.65	V ppm 2 47 303 43	Ca % 0.01 1.08 0.03 1.0355	F % 0.001 0.080 0.025 0.073
STD DS10 STD OREAS45EA STD DS10 Expected STD OREAS45EA Expected	Analyte Unit MDL Standard Standard	Wgt kg	Mo ppm 0.1 12.9 1.7 14.69 1.39	Cu ppm 0.1 162.0 698.7 154.61 709	Pb ppm 0.1 156.5 14.7 150.55 14.3	Zn ppm 1 368 31 352.9 28.9	Ag ppm 0.1 1.9 0.3 1.96 0.26	Ni ppm 0.1 76.0 383.6 74.6 381	Co ppm 0.1 12.6 50.7 12.9 52	Mn ppm 1 904 384 861 400	Fe % 0.01 2.80 22.86 2.7188 23.51	As ppm 0.5 44.8 9.4 43.7 9.1	Au ppb 0.5 80.3 53.1 91.9 53	Th ppm 0.1 7.3 10.1 7.5 10.7	Sr ppm 1 67 4 67.1 3.5	Cd ppm 0.1 2.5 <0.1 2.48 0.02	Sb   ppm   0.1   8.2   0.2   9.51   0.2	Bi ppm 0.1 12.3 0.2 11.65 0.26	V ppm 2 47 303 43 303	Ca % 0.01 1.08 0.03 1.0355 0.036	0.00 0.080 0.025 0.073 0.025



%

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0.053

< 0.01

0.53

ppm

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3.2

<0.1

3.34

<0.1

<0.1

ppm

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0.29

< 0.01

0.289

< 0.01

< 0.01

ppm

0.1

2.6

77.5

2.8

78

0.1

2.5

ppm

0.1

5.2

< 0.1

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0.3

%

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< 0.05

0.2743

0.036

< 0.05

< 0.05

ppm

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5

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4.3

11.7

<1

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ppm

0.5

1.6

1.6

2.3

0.6

<0.5

< 0.5

ppm

0.2

5.1

0.5

4.89

0.07

<0.2

<0.2

%

0.01

1.04

3.06

3.13

<0.01

1.02

1.0259

Unit

MDL

Standard

Standard

Blank

Prep Blank

Reference Materials STD DS10

STD OREAS45EA

BLK

Prep Wash G1

STD DS10 Expected

STD OREAS45EA Expected

ppm

1

16

7

17.5

6.57

<1

9

ppm

1

56

802

54.6

849

<1

10

%

0.01

0.79

0.10

0.7651

0.095

< 0.01

0.59

ppm

382

139

260

1

%

0.001

0.072

0.088

0.128

349 0.0817

148 0.0875

<1 <0.001

ppm

20

<20

<20

<20

<20



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

Package Codes: Sample Digestion: Instrumentation Method: Applicability: 1D01 to 1D03, 1DX1 to 1DX3, 1F01 to 1F07 HNO3-HCI acid digestion ICP-ES (1D), ICP-MS (1DX, 1F) 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
Со	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
К*	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
Мо	1 ppm	0.1 ppm	0.01 ppm	2000 ppm



Element	Group 1D	Group 1DX	Group 1F	Upper		
	Detection	Detection	Detection	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		
Те	-	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%		
TI	5 ppm	0.1 ppm	0.02 ppm	1000 ppm		
U*	8 ppm	0.1 ppm	0.05 ppm	2000 ppm		
۷*	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		
Та*	-	-	0.05 ppm	2000 ppm		
Υ*	-	-	0.01 ppm	2000 ppm		
Zr*	-	-	0.1 ppm	2000 ppm		
Pt*	-	-	2 ppb	100 ppm		
Pd*	-	-	10 ppb	100 ppm		
Pb <sub>204</sub>	-	-	0.01 ppm	10000 ppm		
Pb <sub>206</sub>	-	-	0.01 ppm	10000 ppm		
Pb <sub>207</sub>	-	-	0.01 ppm	10000 ppm		
Pb <sub>208</sub>	-	-	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.

