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Ministry of Energy, Mines & Petroleum Resources Mining & Minerals Division	CONTAL SA
BC Geological Survey	Assessment Report Title Page and Summary
TYPE OF REPORT [type of survey(s)]: Structural Analysis	TOTAL COST: \$5,400
AUTHOR(S): Gerald G. Carlson	SIGNATURE(S):
NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): N/A	YEAR OF WORK: 2014
STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE	E(S): 5523419 - 2014/SEP/23
PROPERTY NAME: XAMA	
CLAIM NAME(S) (on which the work was done): SKIP#1, XAMA20	14A, XAMA2014B, XAMA2014C, XAMA2014D, XAMA2014E,
XAMA20143F	
MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:       93F 019 (C         MINING DIVISION:       Omineca         LATITUDE:       53       ° 56       '30       " LONGITUDE: 12	NTS/BCGS: 93F/10
owner(s): 1) Gerald G. Carlson (25%)	2) John A. Chapman (25%)
1740 Orchard Way, West Vancouver, BC V7V 4E8	#43 - 1725 Southmere Cres., Surrey, BC V4A 7A7
Alling address: 3) G.W. Kurz (25%)	4) Garry D. Bysouth (25%)
Box 894, Fraser Lake, BC V0J 1S0	12340 Christie Road, Boswell, BC V0B 1A4
OPERATOR(S) [who paid for the work]: 1) Gerald G. Carlson	2) John A. Chapman
MAILING ADDRESS: as above	as above
	Suite of the Endako Batholith, including Casey Alaskite, the same
	alization includes vein and disseminated Mo mineralization in two
to Endeke including actacle and the including actacle	e surface exposures and percussion drilling. Alteration is similar

to Endako, including potssic, quartz-sericite-pyrite and late stage kaolinite.

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: 01002, 01107, 01108, 01216, 01689, 02368, 02455, 02668, 21587, 22061, 24798, 28350, 29601, 32400, 33221





TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COST APPORTIONE (incl. support
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation		All claims	\$5,40
GEOPHYSICAL (line-kilometres)			φ0,40
Ground			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for)			
Soll			
Cilt			
Rock			
Other			
DRILLING total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)			
REPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)		·	
Legal surveys (scale, area)			
Road, local access (kilometres)/tra			
Trench (metres)			
Underground dev. (metres)			
Underground dev. (metres)			
		TOTAL COST:	\$5,400

BC Geological Survey Assessment Report 34956

## **ASSESSMENT REPORT**

## **REGIONAL AND PROPERTY SCALE**

## **STRUCTURAL ANALYSIS**

OF THE

## **XAMA PROPERTY**

**CENTRAL BRITISH COLUMBIA,** 

CANADA

NTS 093F/10

UTM: 381500 E, 5978000 N, NAD 83, Zone 10

53°56'30" N LATITUDE, 124°48'30" W LONGITUDE

**OMINECA MINING DIVISION** 

by

Gerald G. Carlson, Ph.D., P.Eng. 1740 Orchard Way West Vancouver, BC V7V 4E8

October 20, 2014

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## SUMMARY

The Xama property holds potential for the discovery of a porphyry molybdenum deposit similar to Endako, 21 km to the northwest. Anomalous molybdenum values in stream sediments and soils led to the discovery of porphyry style molybdenum mineralization within the Property at the Owl (Minfile 93F 019) and GeI (Minfile 93F 020) showing areas by Amax and Anaconda in the 1960's. The Property has been explored intermittently since that time with additional prospecting, geological mapping, soil, rock and stream sediment sampling, ground geophysics (IP surveys) and 875 m of percussion drilling in 18 holes.

This report describes a structural analysis of the Xama property and its regional setting. The Property is located in central British Columbia, 160 km west of the City of Prince George, in the Omineca Mining Division. It consists of seven BCMTO mineral tenures covering 3,579 ha. Registered owners are John A. Chapman, Gerald G. Carlson, Garry D. Bysouth and Gary W. Kurz.

The Property is located in the Interior Plateau of British Columbia, within the Intermontane Belt, including late Paleozoic to late Tertiary sedimentary and volcanic rocks belonging to the Stikine, Cache Creek and Quesnel Terranes. The Property lies within eastern edge of the Stikine Terrane, near its boundary with the Cache Creek Terrane and immediately south of the Skeena Arch. The Endako Batholith is the key geologic feature of the area, underlying much of the claim group and extending for almost 100 km in a northwestern direction, with a width of up to 40 km. It is a composite batholith that comprises five temporally distinct plutonic suites, only one of which is mineralized.

The Property is underlain by plutonic rocks of the Upper Jurassic Francois Lake Suite of the Endako Batholith. A few outcrops of Casey Alaskite, belonging to the Endako Suite, occur in the southern and central parts of the property and quartz diorite is well exposed along the high ridge south of the claims. Two areas of molybdenite mineralization have been defined on the Property. The largest of these is the Gel Zone which lies in the southeast part of the Property east of Skip Creek. It has been defined by soil geochemistry, an IP survey and a line of eight percussion drill holes. The second area lies in the southwest quadrant of the Property, west of Skip Creek and is referred to as the Owl Zone. It has been defined by three percussion holes drilled near two areas of surface quartz-molybdenite mineralization. Depth continuation was confirmed in both areas. The major host rock in both zones is a dark green rock of either dioritic or andesitic composition.

In this study, topographic features and airborne geophysical patterns, viewed as overlays on the BC government MapPlace web site at 1:1,500,000 (regional) and 1:100,000 (local) scales have been used to define linear features. It is assumed that, in many cases, these features represent zones of crustal weakness, likely faults and fractures.

On a regional, 1,500,000 scale northeasterly linears, roughly parallel with the Skeena Arch, dominate, along with a significant north-south linear that corresponds with the Fraser River valley, through Prince George and Quesnel, and the strong east-west linear that cuts through Prince George and Vanderhoof, just to the south of Endako and just north of the Property. Of particular interest is a swarm of north-south linears through the central portion of the study area.

The Xama property is located near the intersection of the important east-west linear, a strong northeast trending linear and a weaker north-northeast linear. Many of the known porphyry-style

deposits in the district may occur within specific, fault-bounded blocks rather than directly along regional linears. At this scale of examination, it may be equally important for a deposit to be proximal to a linear as to be directly on it.

At the Property scale (1:100,000), many of the linears are sub-parallel to, but not exactly coincident with, mapped faults and contacts from the BCGS MapPlace geology map. In many cases, they are probably reflecting the same features, but in others, they are clearly distinct. According to Lowe et al, (2001), most of these, especially NE and NW structures, are Tertiary structures and therefore post-mineral.

Not reflected in the mapped geology are north-south linears that appear to be important and potentially related to the known mineralization, as reflected mainly in the magnetics as lows, possibly caused by magnetite destruction due to hydrothermal fluids and, more regionally, gravity trends. The most important of these cuts directly through the Gel Zone.

The target deposit type at Xama is an Endako style porphyry Mo (Cu) deposit or, secondarily, a bulk tonnage Au-Ag deposit, such as Blackwater. Both deposit types would be expected to be related to high level intrusive activity and demonstrate structural control. The key exploration target suggested by this study is defined by the known porphyry-style molybdenum mineralization at the Owl and Gel Zones, the magnetic low embayment in the area of these showings that could be a reflection of magnetite destruction by mineralizing fluids, as well as linears, likely structures, that are reflected in the magnetic data and may control the emplacement of intrusions and related hydrothermal activity.

A 2,000 m Phase I drill program, targeted utilizing the results of this study in combination with existing geological mapping, surface geochemical sampling, IP surveys and percussion drill results, is recommended to test the Owl and Gel zones at depth.

# **INTRODUCTION**

The Xama property (the "Property") holds potential for the discovery of a porphyry molybdenum deposit similar to Endako, 21 km to the northwest. Anomalous molybdenum values in stream sediments and soils resulted in the discovery of porphyry style molybdenum mineralization at the Owl (Minfile 93F 019) and Gel (Minfile 93F 020) showing areas, both within the Property, by Amax and Anaconda in the late 1960's. The Property has been prospected intermittently since that time with additional prospecting, geological mapping, soil, rock and stream sediment sampling, ground geophysics (IP surveys) and 875 m of percussion drilling in 18 holes.

This report describes a structural analysis of the Xama property and its regional setting conducted on behalf of the property's owners, John A. Chapman, Gerald G. Carlson, Garry D. Bysouth and Gary W. Kurz. The study was conducted during the period August 1<sup>st</sup> to 25<sup>th</sup>, 2014, at a cost of \$5,400.

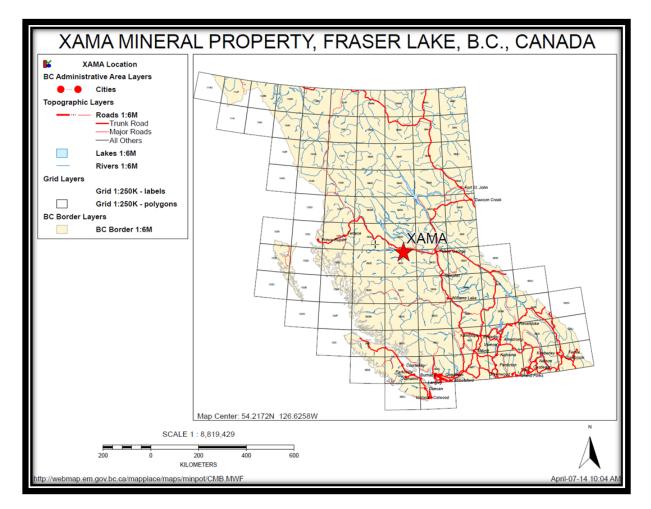


Figure 1 - Xama Property Location and Infrastructure Map (from BC MapPlace).

# **PROPERTY DESCRIPTION AND LOCATION**

The XAMA mineral property is located in central British Columbia, 160 km west of the City of Prince George, 12 km south of the resource (timber and mining) Village of Fraser Lake and 21 km southeast of the Endako Molybdenum Mine, the largest molybdenum mine in Canada, operating since 1965. It is possible to work all year round in the area, as the summers are warm and reasonably dry, and the winters are not too cold, nor the snowfall too heavy to prevent any operations.

The Property is located in the Omineca Mining Division, on NTS sheet 93F/10 and centred at UTM 381500 E, 5978000 N (NAD 83, Zone 10N), as shown on Figure 1.

#### MINERAL TENURES AND OWNERSHIP

The Property consists of seven BCMTO mineral tenures covering 3,579 ha. Registered owners are John A. Chapman (Free Miner Certificate no. 104633 – 25%), Gerald G. Carlson, (Free Miner Certificate no. 104271 – 25%), held by Carlson on behalf of KGE Management Ltd., Garry D. Bysouth (Free Miner Certificate no. 103905 – 25%) and Gary W. Kurz (Free Miner Certificate no. 114787 – 25%).

#### Table I. Xama Property Tenures.

Tenure Number	<u>Type</u>	Claim Name	Good Until	<u>Area</u> (ha)
574353	Mineral	SKIP#1	20150719	685.3169
1027264	Mineral	XAMA2014A	20150404	989.8245
1027265	Mineral	XAMA2014B	20150404	837.6758
1027267	Mineral	XAMA2014C	20150404	171.3061
1027270	Mineral	XAMA2014D	20150404	323.7134
1027284	Mineral	XAMA2014E	20150405	513.7281
1027356	Mineral	XAMA2014F	20150409	57.0846

Total Area: 3578.6494 ha

# ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES AND INFRASTRUCTURE

#### ACCESS

The Property has excellent access via a network of all-weather logging roads that connect to Highway 16 near the community of Lejac, 2 km east of Fraser Lake village. Secondary logging roads provide access to most parts of the Property (see Figure 2).

#### **CLIMATE AND VEGETATION**

The climate is typical of central British Columbia with below freezing temperatures (0° C to -40° C) from November to April and periods of hot weather in the summer ranging from 5° to over 30° C. Precipitation averages 430 mm a year, with a substantial portion in the form of snow

Xama Property Assessment Report

averaging 90 cm per year. In typical years, field work can usually start in April and continue through October. Drilling can be carried out year round.

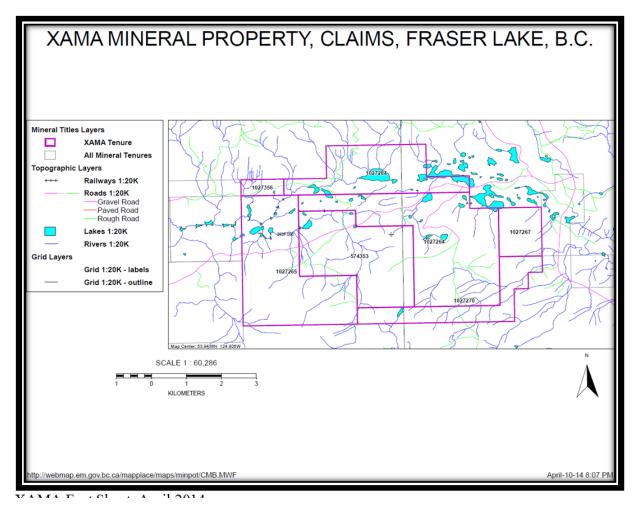


Figure 2 - Xama Property tenure map (from BC MapPlace).

## **TOPOGRAPHY AND VEGETATION**

The topographic relief is moderate throughout the claim area, ranging from 800 m, in the valley to 1,500 m on the mountain tops. Vegetation is variable depending upon soil conditions and southerly exposure. Sparse pine and grasses are common on glacial outwash sands on south slopes. The valley bottom is marked with several "kettle" lakes and in some areas, with a near-surface water table, the deciduous vegetation is abundant. North slopes have good stands of spruce, but in some areas contain heavy windfalls.

## LOCAL RESOURCES AND INFRASTRUCTURE

Logging has been, and continues to be, very active in and around the XAMA area as one of the world's largest sawmills is located at Lejac (Fraser Lake Sawmills, a division of West Fraser Mills Ltd.). Infrastructure in the area is primarily a well maintained network of logging roads that transect the area of the claims. The nearest power lines, gas pipelines and rail lines are located at Fraser Lake along the Highway 16 corridor.

Both Fraser Lake and Prince George are main supply centres for work on the property. A large variety of geological contractors as well as all types of necessary heavy equipment, camp supplies, work personnel and expeditors is available for hire in both communities. Daily jet services link Prince George with Vancouver, B.C.

# **GEOLOGICAL SETTING AND MINERALIZATION**

## **REGIONAL GEOLOGY**

The Property is located in the Interior Plateau of British Columbia, within the Intermontane Belt, late Paleozoic to late Tertiary sedimentary and volcanic rocks belonging to the Stikine, Cache Creek and Quesnel Terranes. The Yalakom and Fraser Fault systems bound the Interior Plateau to the southwest and northeast, respectively. The Property lies within eastern edge of the Stikine Terrane, near its boundary with the Cache Creek Terrane and immediately south of the Skeena Arch (Figure 4). Strata of the Stikine Terrane in central British Columbia include late Paleozoic to Tertiary island and continental margin arc assemblages and epicontinental sedimentary sequences.

The oldest stratigraphic assemblages consist of Upper Triassic to Middle Jurassic island arc volcanics of the basaltic Stuhini Group and calc-alkaline Hazelton Group (Diakow et al. 1997). These rocks were intruded by the mainly Jurassic Topley plutonic rocks, including the Endako Batholith, and experienced at least two distinct cycles of uplift, erosion and related sediment deposition. These extensive sedimentary deposits include Upper Jurassic black mudstone, chert pebble conglomerate, and sandstone of the Bowser Lake Group (Ashman Formation) and the overlying Lower Cretaceous Skeena Group.

Rocks of the Hazelton and Bowser Lake groups are overlain by Upper Cretaceous and Paleocene continental volcanic arc intermediate volcanic rocks and related sedimentary rocks of the Kasalka Group (Diakow et al. 1997). Widespread Eocene volcanic arc related extensional felsic volcanic rocks and minor sedimentary rocks of the Ootsa Lake Group overlie the older rocks and are themselves overlain on higher ridges by basalt and andesite of the Eocene Endako Group (Diakow et al. 1997).

The Endako Batholith is the key geologic feature of the area, underlying much of the claim group and extending for almost 100 km in a northwestern direction, with a width of up to 40 km. It is a composite batholith that comprises five temporally distinct plutonic suites, only one of which is mineralized. These plutonic suites include early foliated hornblende  $\pm$  biotite diorites, intermediate-age unfoliated hornblende  $\pm$  biotite diorites, and late granodiorites to monzogranites. The youngest phases host the Endako molybdenite deposit.

Data presented by Villeneuve et al, (2001) and Whalen et al (2001) show that the batholith had a lengthy emplacement history, covering approximately 75 my (see Table II), with evidence for periods of magmatic quiescence between the major plutonic phases. The oldest magmatic suite of the Endako batholith, the Stern Creek suite, is dated at 220 Ma and comprises foliated gabbros and diorites. Mafic to intermediate plutons of the Stag Lake suite range in age from 180 Ma to 161 Ma. The Francois Lake suite is divided into two subsuites, the Glenannan subsuite dated at 157 Ma to 155 Ma and the 149 to 145 Ma Endako subsuite that hosts the Endako molybdenite deposit. Specifically, the Endako deposit is associated with the 145.1  $\pm$  0.2 Ma Casey phase monzogranite and local variations of this phase (see Property Geology).

Table II Geochronology of Endako Batholith (from Villeneuve et al, 2001)

Plutonic phase	<u>Age (Ma)</u>
Late Triassic: Stern Creek plutonic suite Stern Creek phase	219.3 ± 0.4
Early to Middle Jurassic: Stag Lake plutonic suite Boer phase Stag Lake phase Taltapin phase McKnab phase Sugarloaf phase Sheraton phase Stellako phase Caledonia phase Limit Lake phase Tintagel phase	$181.0 \pm 0.6$ 162.0 ± 1.6 166-164 171.0 ± 1.7
Late Jurassic: Francois Lake plutonic suite Glenannan subsuite	
Glenannan phase Tatin Lake subphase	157.2 ± 1.5
Nithi phase Leg Lake pluton Endako subsuite	~155
Endako subsulte Endako phase Francois subphase Pre-ore dikes Casey phase	148.4 ± 1.5 147.9 ± 1.5 147.4 ± 0.6 145.1 ± 0.2
Cretaceous stocks Hanson Lake phase Fraser Lake pluton Eocene Stock	~126 112.5 ± 0.31
Sam Ross Creek phase	$50.6 \pm 0.2$

Younger volcanic rocks and related sub-volcanic intrusives are also important from an economic geology perspective and include the Upper Cretaceous andesitic Kasalka Group, the felsic Ootsa Lake Group (both deposited in caldera environments and associated with granodiorite stocks and plugs of Quanchus and Bulkley Intrusions) and basaltic Eocene to Oligocene Endako Group. The Kasalka Group has been interpreted as the host to New Gold's Blackwater Davidson deposit, 40 km to the south, as well as the nearby Capoose deposit.

The structural elements of the Nechako Plateau area are part of a regional Tertiary extensional system that extends 1000 kilometres from northern Washington State, into the Babine district of north-central British Columbia. This belt crosses all major terrane boundaries and underlies the Quesnel, Kootenay and Omineca Terranes in the south and the Stikine Terrane in the north, crossing the oceanic Cache Creek Group.

In the Endako area, Lowe et al (2001) describe most of the observed faults being related to significant Tertiary transtensional deformation, with north to northeast-trending extensional Xama Property Assessment Report October, 2014

faults and northwest-trending strike-slip faults. The localization of epithermal mineralization such as at Blackwater Davidson and Capoose may be related to such structures.

## **PROPERTY GEOLOGY**

The Property, including an area extending from Endako to Nithi Mountain, is situated on the extreme southwest flank of a large batholith, formerly known as the Topley batholith and later renamed as the Francois Lake Intrusions (Carr, 1966) and now the Francois Lake Suite of the Endako Batholith (Villeneuve et al, 2001). The property is underlain by younger phases of the batholith, from late Jurassic to early Cretaceous, in a geological setting similar to that of the nearby molybdenite deposits at Endako and Nithi Mountain.

A few outcrops of Casey phase alaskite, belonging to the Endako subsuite, occur in the southern and central parts of the property. Limit Lake phase quartz diorite is well exposed along the high ridge south of the claims. The contact between the two units is considered to lie along the southeastern edge of the property. Outcrops of Nithi phase quartz monzonite occur to the west. This contact may lie within or near the western boundary of the property.

#### Table III. Geologic Map Units for the Xama Project Area (from BC MapPlace)

#### Eocene to Oligocene

EE Nechako Plateau Group, Endako Formation – andesitic volcanics

#### Eocene

Evf undivided intrusive rocks

Efp feldspar porphyry intrusives

#### Late Cretaceous to Pliocene

LKi Unnamed intrusives, undivided

#### Late Cretaceous

- uKK Kasalka Group andesitic volcanics
- LKCL Cabin Lake Pluton quartz monzonite to monzogranite
- LKH Holy Cross Pluton feldspar porphyry intrusives

#### Late Jurassic

- LJF Endako Batholith, Francois Lake Suite
  - LJFE Endako Subsuite Endako Phase granodiorite
  - LJFF Endako Subsuite Francois Subphase granodiorite
  - LJFN Francois Lake Suite Nithi Phase quartz monzonite to monzogranite

#### Middle Jurassic

MJS Endako Batholith, Stag Lake Plutonic Suite

MJSLS Sellako Phase – quartz diorite

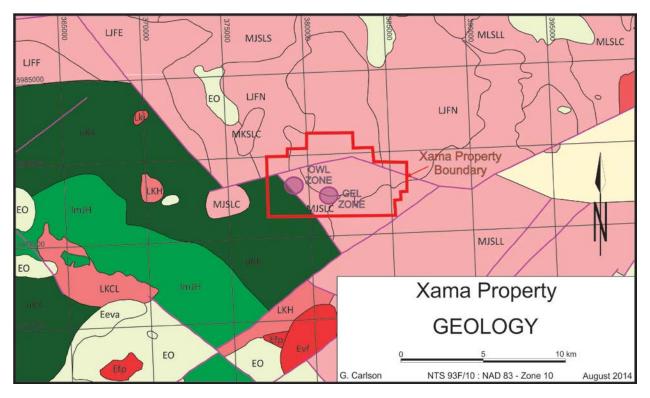
MJSLC Caledonia Phase – quartz monzonite to monzogranite

MJSLL Limit Lake Phase – quartz diorite

#### Early to Middle Jurassic

ImJH Hazelton Group – undivided volcanics

Bedrock geology of the Property is not well known due to minimal bedrock exposure. Four major plutonic rock groupings have been recognized. The oldest of these are dioritic rocks of the Jurassic Limit Lake phase of the Stag Lake Suite which underlies most of the high ground along the southeast portion of the Property. Next are medium to course grained biotite quartz monzonites that occur in sparsely distributed rock exposures along the east and west flanks of the Property. Those to the east are correlative with the early Cretaceous Nithi quartz monzonite of the Glenannan subsuite and that classification is applied to all similar textured quartz monzonite that is correlative with the Casey quartz monzonite unit exposed at Nithi Mountain. The fourth unit is similar to Casey rocks but is pale red in colour and occurs at contacts with the older rocks and in dykes cutting the older rocks and it has a close association with hydrothermal alteration and mineralization.



# Figure 3 - Xama property area geology (from BCGS MapPlace). Faults in purple, contacts in black, see text (Table III) for lithology legend.

The oldest rocks are dark green pyroxene andesite or basalts of the Upper Triassic Takla Group. Exposures of these rocks occur in the upper valleys of Skip Creek and in road cuts west of the creek. At contacts with the granitic rocks, the andesites are variously altered by chlorite, epidote and saussurite.

The following lithology descriptions are taken from Property mapping as described in Bysouth (2011) and the reader is referred to that report for more detailed descriptions.

Limit Lake Diorite – This locally defined unit may be the oldest rock unit of the map area is a part of the GSC's Jurassic Limit Lake sequence (Anderson, et al 1997). These are fresh, dark rocks consisting essentially of hornblende and plagioclase in varying proportions. The unit ranges from diorite or gabbro consisting of about 65% subhedral interlocking hornblende prisms and 30% plagioclase to granitic textured quartz diorite made up of 40% hornblende in a matrix of mainly plagioclase and minor quartz, with minor pink orthoclase. The diorite is intruded in

Xama Property Assessment Report

numerous places by alaskite dykes. Irregular patches of red and salmon red orthoclase alteration have been noted locally.

Eastern Nithi Quartz Monzonite – This is a medium to coarse grained biotite quartz monzonite similar to that mapped on Nithi Mountain (Anderson et al, 1997). A striking feature of the rock is an abundance of subhedral orthoclase crystals that reach lengths of about 15 mm. Most of the other minerals range in size from 3 mm to 9 mm.

Western Nithi Quartz Monzonite - On the west side of the Casey-Nithi contact, quartz monzonites and granites of varying textures and general appearance have been mapped in road excavations. To the south, the quartz monzonite appears as a medium grained (2 mm-6 mm) grey rock with a slight pinkish tinge due to approximately equal proportions of pale gray plagioclase and pale pink orthoclase. Pink orthoclase megacysts are also present as inconspicuous subhedral prisms up to 2.0 cm in length. About 30% guartz is also present as individual grains and segregations of grains up to 13 mm in diameter. Biotite and chloritized hornblende occur as a mafic component often exceeding 10%. To the north, within and around the Owl Zone molybdenite mineralization, the quartz monzonites are characterized by a deep pink to salmon red orthoclase feldspars and a general medium to coarse grain size. In most exposures, the rock has a bleached, crushed appearance with the plagioclase clay altered and the mafics converted to chloritic wisps. In the Owl Zone, fine grained dark green mafic rock is commonly observed. These are assumed to be large xenoliths of older rock that had been intruded by the quartz monzonite and later granitic dykes. Late stage basalt dykes also occur here but can be distinguished by an overall fresh appearance compared to the pervasive chlorite-epidote altered mafic rocks.

Casey Quartz Monzonite –This distinctive granitic rock has been identified within the central part of the Property where it is interpreted to form a core-like pluton intrusive to the older surrounding rock units. It has been classified as Casey quartz monzonite based on its low mafic content and total lack of hornblende. Most of the Casey rocks occur as fine grained leucocratic granites and quartz monzonites and a medium grey, slightly pinkish coloration. Textures appear aplitic in the finest grained rocks but with increased grain size, the inequigranular nature of the rock becomes more evident. Random megacrysts of grey quartz and pink orthoclase are common to the fine grained rocks but rare in the medium grained granites. The quartz megacysts can occur as either large grains or as aggregates of smaller grains.

Red Granite - A distinctive red granitic rock occurs as dykes in the Owl Zone where it is closely associated with the molybdenite mineralization. It is considered to be related to the Casey intrusions, possibly as an earlier magmatic differentiate. In appearance, the red granite resembles Casey granite but differs from it in pale red colouration and greater mafic content which may exceed 10% and include hornblende. It commonly contains remnants of corroded and engulfed red orthoclase megacrysts. The mafics include chloritic patches, usually with rounded outlines or, more rarely, prismatic outlines. Some relict biotite shows up as ragged black flakes but the true identity of the dark components is not evident. Overall the rock appears to consist mainly of quartz and orthoclase, with about 20% to 25% plagioclase.

Pre-Mineral Dike Rocks – The pre-mineralization dike rocks are likely of early Cretaceous age. The most important of these are the red granites associated with the Owl Zone quartz-molybdenite vein systems. Beyond the effects of hydrothermal alteration, the dykes are identical to the red granite found in road exposures in the east-central part of the Property. Another dyke rock is a siliceous, pale grey, fine grained to aphanitic alaskite or quartz porphyry, commonly occurring in small dykes within the dioritic rock unit.

Post-Mineral Dike Rocks - Felsite dykes occur within the Owl Zone and along the east side of Skip Creek Valley. The common occurrence of such small intrusions in the very small areas of exposed rock suggest a large number of dykes are present, probably as dyke swarms. The felsites can be readily identified by a pale grey colour, a fine grained texture and, above all, a chalk-like surface appearance. A general similarity with some Ootsa Lake Group tuffs suggest the dykes are of Eocene age. A few dykes of black basalt and grey hornblende porphyry occur with the felsite in both locations and are also considered to be of the Eocene age. None of the above dykes show any sign of sulphide mineralization or quartz veining which is consistent with a supposed post-mineralization age.

Ootsa Lake Group - Within the Property, these volcanic rocks are considered to form a thin cover over the older rocks. As such, they mark the present position of a pre-Eocene erosion surface. The high ground at the southwestern corner of the map area is underlain by a sequence of grey volcanic tuffs and other pyroclastics. The rocks observed are pale grey tuffs of probable rhyolite to dacite composition.

#### **MINERALIZATION**

Within the Cordillera of western North American, Endako is the oldest significant porphyry molybdenum deposit, at ~145 Ma and it is the largest mined granodiorite type molybdenum deposit (Whalen et al, 2001). Mineralization occurs in two distinct vein types, including stockwork veins with minor molybdenite and ribbon-textured veins that contain the majority of the molybdenum in the deposit. Three distinct alteration assemblages are recognized. The earliest includes K feldspar selvages, locally with hydrothermal biotite. Sericite alteration includes quartz-sericite-pyrite envelopes, primarily on the stockwork veins but also on the ribbon veins. Finally, late stage, low temperature kaolinite alteration is evident throughout the Endako phase granodiorite.

On the Property, two areas of molybdenite mineralization have been defined in limited surface exposures and with percussion drilling. The largest of these is the Gel Zone which lies in the southeast part of the Property east of Skip Creek. It has been defined by a line of eight percussion drill holes. The second area lies in the southwest quadrant west of Skip Creek and, in reference to earlier work, has been called the Owl Zone. It has been defined by three percussion holes drilled near two areas of surface quartz-molybdenite mineralization (Bysouth, 2008). Depth continuation was confirmed in both areas.

Mineralization in road cuts at the Owl Zone consists of a quartz-molybdenite vein system in Casey quartz monzonite which has been hydrothermally altered to white kaolinite, greenish sericite and red secondary K-feldspar (Bysouth, 2008). To the north, quartz-molybdenite veins occur in Takla andesite near contacts with Casey quartz monzonite. At the Gel Zone, bleached and pyritized Casey quartz monzonite occurs associated with quartz veining, chlorite stock works and minor molybdenite in hairline fractures. Minor amounts of hematite occur in all the known showings, mainly as hairline fracture fillings without gangue.

# **EXPLORATION HISTORY**

The first modern exploration in the vicinity of the Xama property occurred in the mid 1960's as part of the porphyry exploration boom in British Columbia and in particular in response to the discovery of the Endako ore body and its development by Placer Development Ltd. as a large open-pit molybdenum mine Endako molybdenum mine, 21 km northwest of the Property.

The Owl and Bee claims (Minfile 93F 019) were staked by Anaconda American Brass Ltd. in 1967 and 1968, in what is now the eastern portion of the Property. Soil and stream sediment surveys, including 262 mainly B soil horizon samples collected on 200 m by 130 m centres, detected poorly defined copper and molybdenum anomalies (Brown & Macrea, 1966; Hirst, 1968A). An IP survey was conducted later in the summer (Hirst, 1968B), with follow-up IP in 1969 (Macrea & Conto). Only weakly anomalous chargeability zones were observed.

During the same period, Amax Exploration Incorporated's staked the Counts Lake property (GEL claims – Minfile 93F 020), in the eastern portion of the Property, to cover anomalous silt and water samples over a magnetic low, with associated minor disseminated copper and molybdenum mineralization in float samples. In 1967, Amax completed 15.4 km of IP surveying over the claim group (Sutherland and Hallof, 1967) which detected weak chargeability. A 35 line km soil survey outlined a 750 by 1,500 m area with Mo values greater than 10 ppm and bands of anomalous Cu in the 100 to 650 ppm range. 2,700 m of tractor trenching was also carried out.

Mercury Explorations Limited acquired the Count claims in 1968, along the north side of Amax's Counts Lake property, and conducted 38.4 km of IP surveying (Chaplin, 1969). The survey detected a weak, 2,100 by 300 m east-northeast trending chargeability anomaly. A five hole drill program was recommended.

In 1970, Taurus Exploration Corporation carried out a soil geochemical survey over the "I" claim group, in the north-central portion of the Property. Samples were taken at 61 m intervals over 39.5 km of grid. Discontinuous zones of anomalous Mo values were noted, particularly in the northwestern part of the grid.

Also in1970, Cyprus Exploration Corporation, Ltd. acquired a very large group of mineral claims to the northeast of XAMA. The scope and results of their work is not well known as there was little to no public disclosure.

In the mid 1070's, due to a downturn in mineral exploration in British Columbia, drill holes that had been recommended on the Property were never drilled.

In 1990 and 1991, Escondido Exploration Corporation acquired the Skip and Ven claims over the historical Anaconda, Amax and Mercury properties and completed a compilation of the prior exploration work (Chapman, 1991). They conducted reconnaissance prospecting, soil sampling, VLF-EM and self-potential (SP) surveys.

In 1996, G. W. Kurz acquired the Hen claim over the Amax exploration target area from 1967-68 and completed 760 m of SP surveying (Kurz, 1996). The survey defines a weak anomalous north-northeast trending zone that might indicate weak underlying sulphide mineralization.

In 2005, Kurz acquired the Skip claim over the main Anaconda-Amax target area and, in 2006, completed a reconnaissance geochemical survey of 85 soil and silt samples and 4 rock samples (Bysouth, 2006). The survey defined two composite metal anomalies, suggesting a porphyry

molybdenum target surrounded by anomalous base metal values. In 2007, an 875 m percussion drill program of 18 holes tested a portion of this anomaly that was underlain by a chargeability anomaly that had been defined by Amax (Bysouth, 2008). The program confirmed that the IP chargeability anomaly is caused by disseminated pyrite mineralization with associated anomalous molybdenum values.

In 2010, G.W. Bysouth became a part owner in the Skip claim with Kurz. They completed a program of geological mapping and sampling was carried out over the central anomaly (Bysouth, 2011). The work defined two zones of molybdenite mineralization, with similarities to the nearby Nithi Mountain occurrence. The mapping program provided considerably greater detail regarding the geological setting and the alteration associated with the mineralized system.

In 2012, Bysouth and Kurz competed a program of additional soil and rock geochemical surveying designed to further define and characterize the main Owl and Gel anomalies.

In 2014, John A. Chapman and KGE Management Ltd. (Gerald G. Carlson, President) acquired a large block of mineral claims surrounding the Skip claim owned by Bysouth and Kurz. Subsequently, the two properties were combined as the Xama property.

# STRUCTURAL ANALYSIS

It has long been recognised that the location of major ore deposits is often controlled by deep penetrating structures (see for example - Billingsley, 1941; Ernst, 2013; Kutina, 1987; Lowell, 1974). On a regional scale, major, crustal penetrating structures, or the intersection of such structures, may control the ascent of magmas and related ore-forming fluids. Near surface, smaller structures such as faults, calderas or vents can provide both channelways and depositional sites for hydrothermal fluids.

In this study, topographic features and airborne geophysical patterns, viewed as overlays on the BC government MapPlace web site at 1:1,500,000 (regional) and 1:100,000 (local) scales have been used to define linear features. It is assumed that, in many cases, these features represent zones of crustal weakness, likely faults and fractures.

### **REGIONAL 1:1,500,000 SCALE ANALYSIS**

Many types of mineral deposits that are related to magmatic and hydrothermal activity have been shown to occur along major structures, including porphyry systems, VMS and Sedex deposits. Indeed, many intrusive and volcanic associated deposits, such as porphyry and epithermal deposits, have been shown to be associated not only with structures parallel to the regional tectonic fabric but also, more importantly, with deep, crustal penetrating cross structures (Kutina, 1987). It is therefore important to examine any prospect in terms of its regional structural setting.

#### Regional and Tectonic Setting of the Xama Property

The Xama property lies within the Intermontane Belt, along the western edge of the Stikine Terrane, adjacent to its boundary with the Cache Creek terrane, in central British Columbia (Figure 4). This is a known and establish belt of porphyry molybdenum (Endako, Huckleberry) and epithermal gold-silver mineralization (Blackwater, Capoose) but, due to extensive cover, in this case mainly glacial till overburden, exploration has been hampered at the Xama property.

The following section examines lineaments as interpreted from regional topographic, magnetic and gravity data and compares these data to regional faults as mapped by the BC Geological survey and to MINFILE occurrences. The analysis was completed at 1:1,500,000 scale on the BC Geological Survey MapPlace web site on an image with the Xama property in the centre of the map. However, the actual location of the Property was not positioned on the map until after the analysis was completed.

The styles of mineralization being sought at Xama would be most similar to a porphyry Mo deposit similar to Endako and deposits on nearby Nithi Mountain and, secondarily, epithermal Au-Ag such as at to Blackwater Davidson and Capoose.

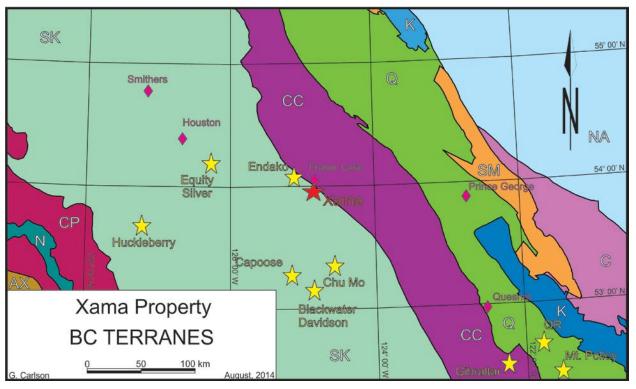


Figure 4 - BC terrane map and significant deposits. (AX – Alexander, N – Nisling, CP – Coast Complex, SK – Stikine, CC – Cache Creek, Q – Quesnel, SM – Slide Mountain, K – Kootenay, C – Cassiar, NA – North America; known significant deposits as yellow stars.)

#### Linears from Topography

Geomorphology is a reflection of underlying geologic features, such as faults, stratigraphy, intrusive contacts and alteration zones as modified by the forces of weathering, most particularly glaciers and rivers. When examining the distribution of lakes, rivers and topographic features from afar, in this case at a scale of 1:1,500,000, there is potential to recognise large, crustal scale structures, in particular those that are greater than 100 km in length, that could have importance in focusing hydrothermal and mineralizing fluids.

The blue dashed lines in Figure 5 are the major linears as interpreted from 1:1,500,000 scale topography. The predominant orientations are northwesterly, parallel or sub-parallel to the main trends of the cordillera, and cross-cutting northeasterly trends. A major east-west linear cuts through the Endako deposit and runs close to the Xama property as well as the centres of Vanderhoof and Prince George. Some significant north trending linears are observed in the eastern half of the map.

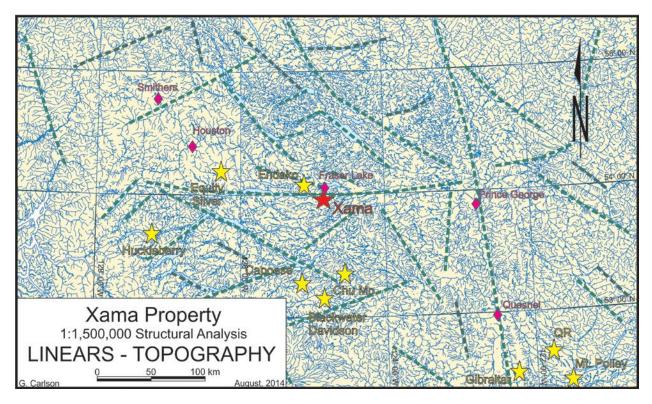


Figure 5 - Regional scale linears identified based on topography.

## Linears from Magnetics

The regional magnetic data are useful for outlining lineaments (Figures 6 and 7). In this case, the magnetics are most effective in mapping fault offsets of regional stratigraphic units or intrusives that have varying magnetic intensity. These linears are typically northeast trending cross structures. The northwest trends parallel major lithologies and the Cordilleran tectonic trend, and may or may not be fault contacts.

The dashed lines in Figure 6 show linears from total field magnetics and have been drawn where major offsets are evident. There is a significant set of east-northeast (N65°E) linears with a periodicity of 50-75 km, evident particularly in the central portion of the map. These could represent major cordilleran cross structures and they are, in fact, sub-parallel to the Skeena Arch (see Figure 10), a major uplift and centre of intrusive activity to the north of the Property. Another significant trend noted in this figure is northerly, in the central part of the map area, cutting through the area of the Property. To the east, very prominent west-northwesterly linears parallel the Pinchi Fault and Rocky Mountain Trench. The major east-west structure that strikes through Endako is evident on the western half of the map area.

The first vertical derivative (1VD) map (Figure 7) provides greater detail of magnetic patterns. The cross linears are evident, but that they are at a steeper angle than was noted for the total field magnetics, closer to 45°. The difference could be attributed to the total field magnetics reflecting deeper features while the 1VD magnetics may reflect shallower features. Several north trending linears are evident, but they don't correlate with the north trending linears in the total field magnetics.

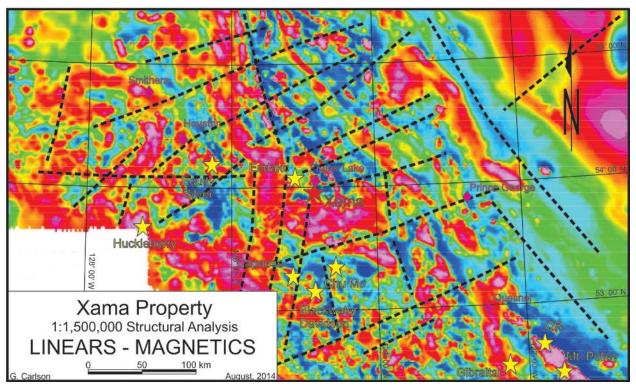


Figure 6 - Regional scale linears based on regional total field magnetics.

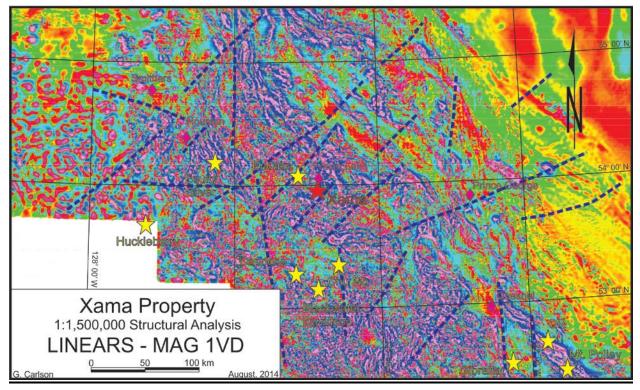


Figure 7 - Regional scale linears based on regional first vertical derivative magnetics.

#### Linears from Gravity

The regional gravity data is quite course and, as a result, the Bouger gravity map tends to reflect only deep structures or features. In the case of Figure 8, the dashed red lines indicate a number of east-northeast linears that are roughly parallel to those defined by the total field magnetics. In the central and eastern portions of the map, north trending linears are strongly defined. The rectangular pattern divides the area into 50 to 100 km wide cells that could be fault bounded blocks uplifted or down-dropped relative to each other.

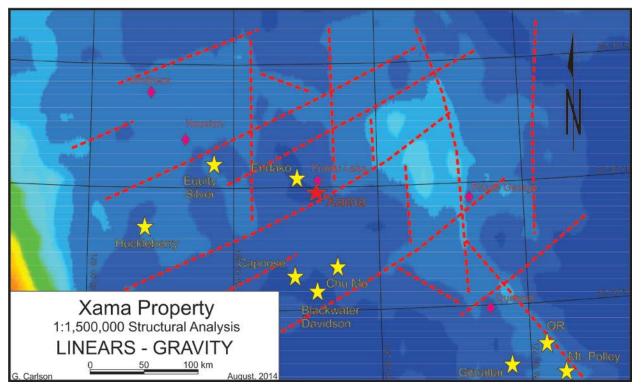


Figure 8 - Regional scale linears based on Bouger gravity.

## Summary of Regional (1:1,500,000) Scale Linears

Figure 9 depicts a compilation of all the linears determined from the above data superimposed on topography. Figure 10 shows the same compilation on the Bouger gravity image and Figure 11 on the Terrane map. Also shown are the Skeena Arch, the Topley Magmatic Arc, which includes the Endako Batholith, (Bright, 1964; Chapman, pers. com.) and significant mines and occurrences. Those areas where three or more linears from different data sets aligned were combined into a single thicker line.

Northeasterly linears, roughly parallel with the Skeena Arch, dominate the map, along with a significant north-south linear corresponds with the Fraser River valley, through Prince George and Quesnel and the strong east-west linear, previously noted, cuts through Prince George and Vanderhoof, just to the south of Endako and just north of the Property. Of particular interest is a swarm of north-south linears through the central portion of the study area.

The Xama property is located near the intersection of the important east-west linear, a strong northeast trending linear and a weaker north-northeast linear. When examining Figure 10, with the gravity background, it appears that many of the deposits may occur within specific, fault

Xama Property Assessment Report

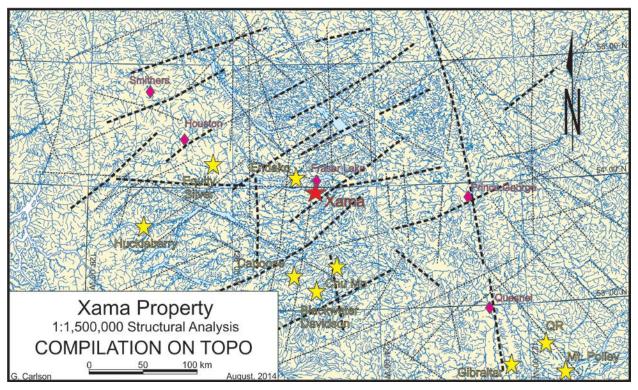


Figure 9 - Regional scale linear compilation (lines with 3 or more superimposed linears are thicker than 2 or less).

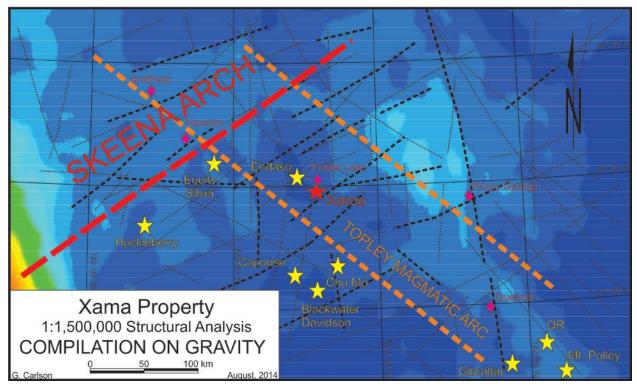


Figure 10 – Regional scale linear compilation on Bouger gravity map.

bounded blocks rather than along specific linears. At this scale of examination, it may be equally important for a deposit to be proximal to a linear as to be directly on it.

Of particular interest is the cluster of north-south linears in the centre of the map area in a 100 km wide swath that contains the Property as well as Endako, Capoose, Chu and Blackwater-Davidson. This trend is also defined by a north trending gravity low (Figure 10). If these linears reflect extensional fractures, they could be important for the localization of intrusive centres and for ore forming fluid migration, especially where they intersect other lineaments.

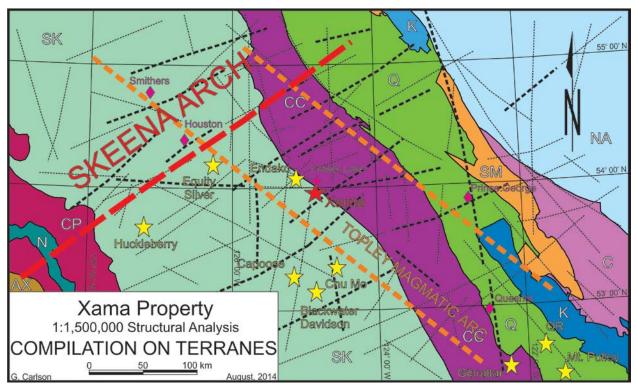


Figure 11 - Regional scale linear compilation over GSC terrane map of BC.

## **PROPERTY 1:100,000 SCALE ANALYSIS**

The property scale analysis was conducted using topographic and magnetic patterns from BC MapPlace at a scale of 1:100,000. Magnetic data include both total field and 1VD magnetics. As was done for the regional setting, linear features were identified on each map and compiled. From the compilation map, target identified for further exploration were determined based on intersections along main lineaments, as well as other supporting data. As mentioned above, most of the local scale structures recognized in the Endako area are related to Tertiary extension (Lowe et al, 2001) and, unless they represent remobilization of older structures, they would be post-ore in terms of Endako style porphyry molybdenum mineralization. However, they could be important in the localization of younger Blackwater style gold mineralization.

#### Linears based on Topography

Linears defined by topography are indicated in Figure 12. Some of the most obvious features are northeast and north-northeast trending and relatively short length, but north, west-northwest

and northwest linears are also observed. Short strike length, northeasterly trending linears, although abundant in the study area, have been largely ignored for the purposes of this study, as they reflect for the most part effects of the most recent glaciation.

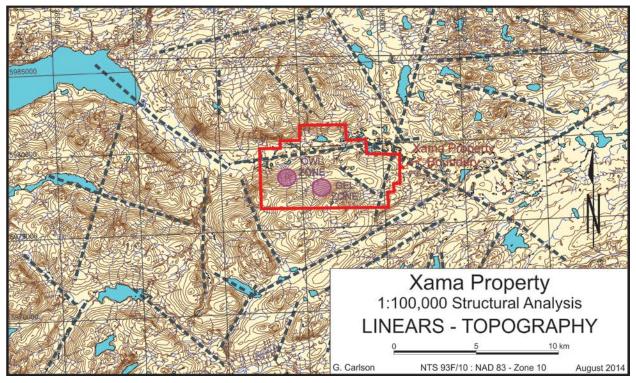


Figure 12 - Property scale linears based on topography.

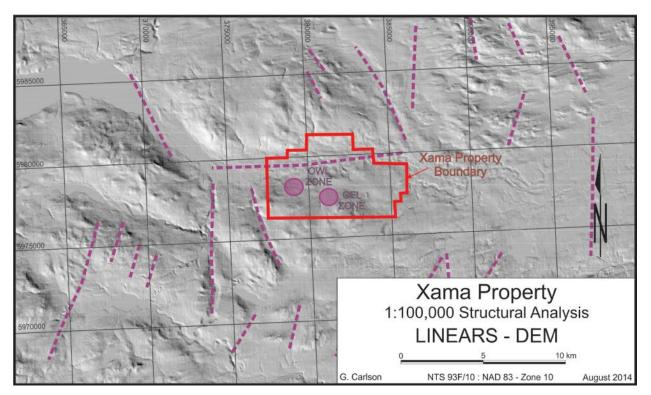


Figure 13 - Property scale linears based on the digital elevation model.

The Property is bracketed by a number of topographic linears that could be important from a mineralization perspective. These include an east-northeastern linear on the north, a northeastern linear on the south and northwest and north-northeast on the east.

These same linear directions are reflected in the digital elevation model, although they are less abundant, perhaps due to the particular sun angle used in this model.

#### Linears based on Magnetics

Both the total field and 1VD magnetic data were used at the property scale to help better define local trends (Figures 14 and 15). The total magnetic field at Xama is dominated by an irregular magnetic low on the north side of the property.

In terms of exploration interest, two north-south linears and an east-northeast linear are associated with embayments on the south side of the mag low. Mapping suggests that the magnetic low is underlain mainly by Nithi phase quartz monzonite to monzogranite of the Endako Batholith, while the Property is underlain by Limit Lake Phase quartz diorite and Kasalka Group andesites (see Figures 3, 16). It is possible that these linears, and the weak magnetic lows extending south into the area of the Property, are due to the destruction of magnetite by hydrothermal solutions focused along structures reflected by these linears. Both the Owl Zone and the Gel Zone lie along two of these linears, within the western magnetic embayment.

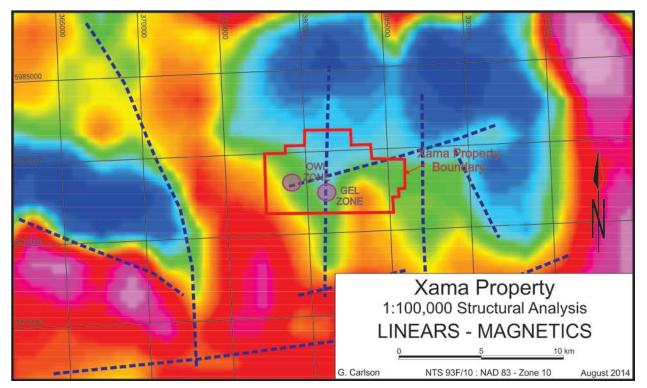


Figure 14 - Property scale linears based on total field magnetics.

Although the linear pattern from the first vertical derivative magnetics shows a more complex pattern than the total field magnetics, the patterns are similar. The key directions are northeast and north-south.

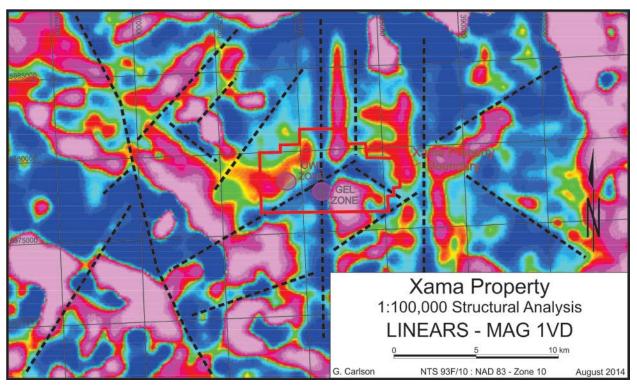


Figure 15 - Property scale linears based on first vertical derivative magnetics.

## Summary of Property (1:100,000) Scale Linears

All linears from the property scale datasets were compiled and superimposed onto the geology base (Figure 16). The heavy dashed lines represent three or more coincident linears from different data sets, while the thin dashed lines are single or double linears.

According to BCGS MapPlace geology, mineralization at the Owl and Gel Zones is within Endako Batholith intrusives adjacent to its northwest trending fault contact with Kasalka Group volcanics to the west. Actual Property geology is poorly known due to lack of exposure. The most important mineralization appears to be associated with the Casey quartz monzonite and related Red Granite dikes (Bysouth, 2011), the same rocks that host the Endako porphyry deposit.

As can be seen in the central part of Figure 16, many of the property scale linears are subparallel to, but not exactly coincident with, mapped faults and contacts from the BCGS MapPlace geology map. In many cases, they are probably reflecting the same features, but in others, they are clearly distinct. According to Lowe et al, (2001), most of these, especially NE and NW structures, would be post-mineral.

A key structure is the northeast trending linear just south of the Property that is mapped as a fault and is a strong topographic lineament. It is also reflected in the magnetics, but less

strongly. There are other parallel northeast linears, as well as steeper north-northeast linears that could be related to this structure. The northwest to north-northwesterly linears are also important and are also reflected in a number of mapped structures and contacts (Figure 16).

Not reflected in the mapped geology are the north-south linears that appear to be important and potentially related to the known mineralization, as reflected mainly in the magnetics as lows (magnetite destruction due to hydrothermal fluids?) and, more regionally, Bouger gravity trends. The most important of these cuts directly through the Gel Zone.

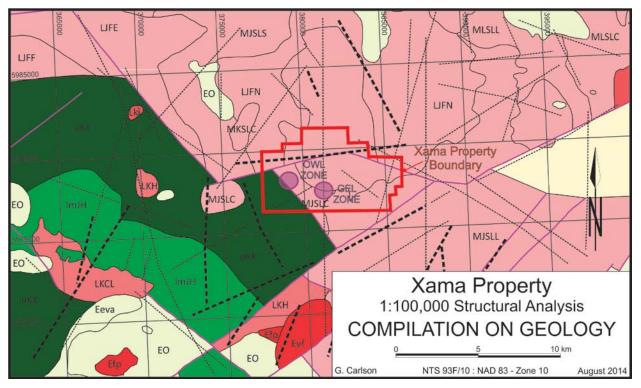


Figure 16 - Compilation of property scale linears over BCGS geology and faults (lines thicken with the number of linears superimposed on top of each other; 3 or more are thicker than 2 or less).

## TARGETS FROM THE STRUCTURAL STUDY

The target deposit type at Xama is a porphyry Mo (Cu) deposit, similar to Endako or, secondarily, a bulk tonnage Au-Ag deposit, such as Blackwater Davidson. Both deposit types would be expected to be related to high level intrusive activity and demonstrate structural control. The key exploration target suggested by this study is defined by the known mineralization, the Owl and Gel Zones, the magnetic low embayment in the area of these showings that could be a reflection of magnetite destruction by mineralizing fluids and linears, likely structures, that are reflected in the magnetic data and may control the emplacement of intrusions and related hydrothermal activity.

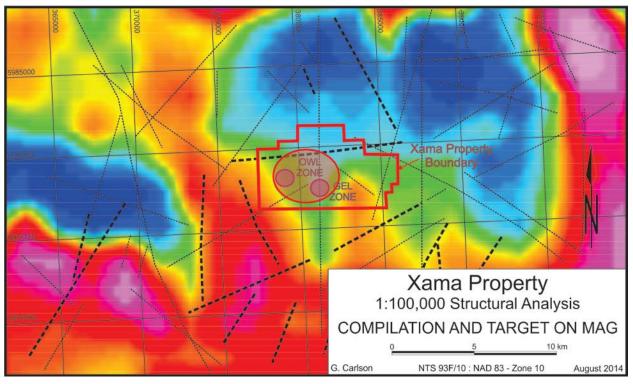


Figure 17 - Compilation of property scale linears with target location (red circle).

# CONCLUSIONS

The Xama property holds potential for the discovery of a porphyry molybdenum deposit similar to Endako, 21 km to the northwest. Anomalous molybdenum values in stream sediments and soils resulted in the discovery of porphyry style molybdenum mineralization at the Gel and Owl showing areas by Amax and Anaconda in the late 1960's.

The Property lies within eastern edge of the Stikine Terrane, near its boundary with the Cache Creek Terrane and immediately south of the Skeena Arch. The Endako Batholith is the key geologic feature of the area, underlying much of the claim group and extending for almost 100 km in a northwestern direction, with a width of up to 40 km. It is a composite batholith that comprises five temporally distinct plutonic suites, only one of which is known to be mineralized.

The Property is underlain by plutonic rocks of the Upper Jurassic Francois Lake Suite of the Endako Batholith. A few outcrops of Casey quartz monzonite, belonging to the Endako Suite, the same suite that hosts the Endako deposit, occur in the southern and central parts of the Property and quartz diorite is well exposed along the high ridge south of the claims. Two areas of molybdenite mineralization have been defined on the Property. The largest of these is the Gel Zone which lies in the southeast part of the Property east of Skip Creek. It has been defined by a line of eight percussion drill holes. The second area, the Owl Zone, lies in the southwest quadrant west of Skip Creek. It has been defined by three percussion holes drilled near two areas of surface quartz-molybdenite mineralization. Depth continuation of molybdenite mineralization was confirmed in both areas.

In this study, topographic features and airborne geophysical patterns, viewed as overlays on the BC government MapPlace web site at 1:1,500,000 (regional) and 1:100,000 (local) scales have been used to define linear features. It is assumed that, in many cases, these features represent zones of crustal weakness, likely faults and fractures.

On the regional, 1,500,000 scale northeasterly linears, roughly parallel with the Skeena Arch, dominate, along with a significant north-south linear corresponds with the Fraser River valley, through Prince George and Quesnel and the strong east-west linear cuts through Prince George and Vanderhoof, just to the south of Endako and just north of the Property. Of particular interest is a swarm of north-south linears through the central portion of the study area.

The Xama property is located near the intersection of the important east-west linear, a strong northeast trending linear and a weaker north-northeast linear. Patterns observed in the Bouger gravity map suggest that many of the deposits may occur within specific, fault-bounded blocks rather than along specific linears. At this scale of examination, it may be equally important for a target to be proximal to a linear as to be directly on it.

At the Property scale (1:100,000), many of the linears are sub-parallel to, but not exactly coincident with, mapped faults and contacts from the BCGS MapPlace geology map. In many cases, they are probably reflecting the same features, but in others, they are clearly distinct. According to Lowe et al, (2001), most of these, especially NE and NW structures, would be post-mineral.

Not reflected in the mapped geology are the north-south linears that appear to be important and potentially related to the known mineralization, as reflected mainly in the magnetics as lows, possibly resulting from magnetite destruction due to hydrothermal fluids and, more regionally, the gravity. The most important of these cuts directly through the Gel Zone.

The target deposit type at Xama is a porphyry Mo (Cu) deposit (Endako) or, secondarily, a bulk tonnage Au-Ag deposit (Blackwater). Both deposit types would be expected to be related to high level intrusive activity and demonstrate structural control. The key exploration target suggested by this study is defined by the known mineralization, the Owl and Gel Zones, the magnetic low embayment in the area of these showings that could be a reflection of magnetite destruction by mineralizing fluids and linears, likely structures, that are reflected in the magnetic data and may control the emplacement of intrusions and related hydrothermal activity.

## RECOMMENDATIONS

A Phase I, 2,000 m drill program, budgeted at \$750,000, targeted utilizing the results of this study in combination with existing geological mapping, surface geochemical sampling, IP surveys and percussion drill results, is recommended to test the Owl and Gel zones at depth. Holes should be drilled to minimum 250 to 300 m depth.

## **STATEMENT OF EXPENDITURES**

Period: Aug 1-25, 2014	PROJECT: Xama Property – Endako Area, BC					
Professional Wages						
G. Carlson	Structural study	3.0	days @	\$1,200.00	/day	\$3,600.00
	Report compilation	1.5	days @	\$1,200.00	/day	<u>\$1,800.00</u>
		ΤΟΤΑ	L	\$5,400.00		

## STATEMENTS OF QUALIFICATIONS

I, Gerald G. Carlson, hereby certify that:

- 1. I am a consulting mineral exploration geologist residing at 1740 Orchard Way, West Vancouver, B.C. V7V 4E8.
- 2. I am a graduate of the University of Toronto, with a degree in Geological Engineering (B.A.Sc., 1969). I attended graduate school at Michigan Technological University (M.Sc., 1974) and Dartmouth College (Ph.D., 1978). I have been involved in geological mapping, mineral exploration and the management of mineral exploration companies continuously since 1969, with the exception of time between 1972 and 1978 for graduate studies in economic geology.
- 3. I am a member in good standing of the Association of Professional Engineers and Geoscientists of the Province of British Columbia, Registration No. 12513 and of the Association of Professional Engineers of Yukon, Registration No. 0198.
- 4. I am the author of this report on the Structural Study of the Xama Property.
- 5. The report is based on a literature review, on assessment reports and on my analysis of linears related to topographical and geophysical data.
- 6. I am the registered owner of a 25% beneficial interest in the Xama property.

Dated at Vancouver, B.C. this 20th day of October, 2014,

Gerald G. Carlson, Ph.D., P. Eng.

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