

# **TECHNICAL REPORT**

## **LONGWORTH SILICA PROPERTY NORTH-CENTRAL BRITISH COLUMBIA CANADA**

NTS MAP SHEETS 93H/13, 14, 93I/4

Location of Snow zone:

54°00'31"N Latitude, 121°32'37"W Longitude

UTM Zone 10, 595442E 5985462N (NAD83)

Cariboo Mining Division

### **Prepared for:**

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## Date and Signature Page

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# 1 Summary

The Longworth Silica Property is located approximately 83 kilometres east-northeast of the City of Prince George, near the small community of Sinclair Mills on the Fraser River. The main transcontinental CNR rail line is located approximately 4 kilometres to the east of the property. Road access via a network of well-maintained logging roads comes within 2 kilometres of the western end of the property. The property consists of 15 contiguous mineral tenures covering an area of 1083.77 hectares. The registered owner of the tenures is J. Lazerson who holds the property on behalf of MGX Minerals Inc. (“MGX”).

The Longworth mineral property covers 4 bands or zones of Lower Silurian Nonda Formation quartzite that crop out on Bearpaw Ridge. Each zone of quartzite is approximately 300 to 800 metres in strike length and 100 to 400 metres wide. These areas or zones, referred to as the Snow, Rain, Long and Doll trend northwest, dip steeply to the northeast, and form topographic highs on the southwest facing slope of Bearpaw Ridge. Impurities in quartzite include rare limonite, calcite and muscovite along fractures and joints. The quartzite beds exhibit minor faulting and folding.

In 2015, MGX collected a total of 10 rock chip samples from surface outcrops exposed over an area of approximately 150 X 500 metres in the Snow zone. Rock chip samples collected by MGX and previous operators on the property have returned high, nearly pure values for silica. Based on the range of relatively high purity %SiO<sub>2</sub> and relatively low impurity values for Al<sub>2</sub>O<sub>3</sub>, MgO, CaO, Na<sub>2</sub>O, K<sub>2</sub>O and Fe<sub>2</sub>O<sub>3</sub>, it is possible that quartzite from the Longworth Silica Property is suitable for use as a raw material for ferrosilicon production as well as other high purity uses. Because of these encouraging results and the extensive nature of quartzite outcrops on the property, additional exploration work is warranted to determine the true extent and purity of the quartzite and its suitability as a high purity silica source.

A two stage exploration program is recommended for the Longworth Silica Property. The first stage would involve drilling 9 short holes totalling 810 metres to test the purity and continuity of quartzite outcrops in the Snow zone. The estimated cost of this exploration program, which would have to be helicopter supported, is \$289,300. If results from the Stage 1 work program are encouraging then additional Stage 2 drilling would be warranted.

## 2 Introduction

This technical report has been prepared at the request of Jared Lazerson, President and CEO of MGX Minerals Inc. (“MGX” or the “Company”). The writer was asked to review all data

pertaining to the property and to prepare a technical report that describes historical work completed on the property, the geologic setting of the property, results of sampling done by MGX in 2015 and to make recommendations for further work if warranted.

This report is based on an assessment report recently filed by MGX (Kikauka, 2016) outlining the results of work done on the property in 2015. This work focussed exclusively on the Snow zone which is located at the northwest end of the property. Where appropriate, the writer has extracted and modified or enhanced sections of this and previous assessment reports for incorporated into this technical report.

This technical report has been prepared in compliance with the requirements of National Instrument 43-101 and Form 43-101F1 and is intended to be used as supporting documentation to be filed with appropriate regulatory authorities.

In preparing this report, the author has reviewed geological and geochemical reports, maps and miscellaneous papers listed in the References section. Of particular value are a number of publically available assessment reports filed by previous operators on the Longworth Silica Property. These reports contain detailed information on the results of historical work conducted on the property since its initial discovery.

Most of the work done on the property has been filed for assessment credit and much of this information is available as free, downloadable Adobe Portable Document (PDF) format files from the B.C. Ministry of Energy and Mines Assessment Report Indexing System (ARIS). The author is satisfied that the information contained in these publicly available reports was collected and processed in a professional manner following industry best practices applicable at the time, and that the historical data gives an accurate indication of the nature, style and possible economic value of known mineral occurrences on the property.

MGX has provided information on the work they did on the property in 2015. A review of the sampling procedures and analytical results, including original analytical certificates indicates this work was done following industry best practises with appropriate determinations of precision and accuracy. The property is at an early stage of exploration and a great deal more work is required to fully determine its economic potential. However initial sampling results from the Snow zone are very encouraging. MGX spent \$ 5,473.40 on the property in 2015 (Kikauka, 2015).

The writer visited the Longworth Silica Property on June 17, 2016. Unfortunately there was still too much snow on Bearpaw Ridge and it was not possible to access the Snow Zone using the previously cut trail. A second visit will be attempted later in the summer when conditions improve.

Units of measure in this report are metric; monetary amounts referred to are in Canadian dollars. All maps with the exception of general location map (Figure 1) are in Universal Transverse Mercator projection, Zone 10N and are based on the North American 1983 datum (NAD83) or World Geodetic 1984 datum (WGS84).



Figure 1. General location map, Longworth Silica Property, central British Columbia. Map prepared by D.G. MacIntyre, June 2016.

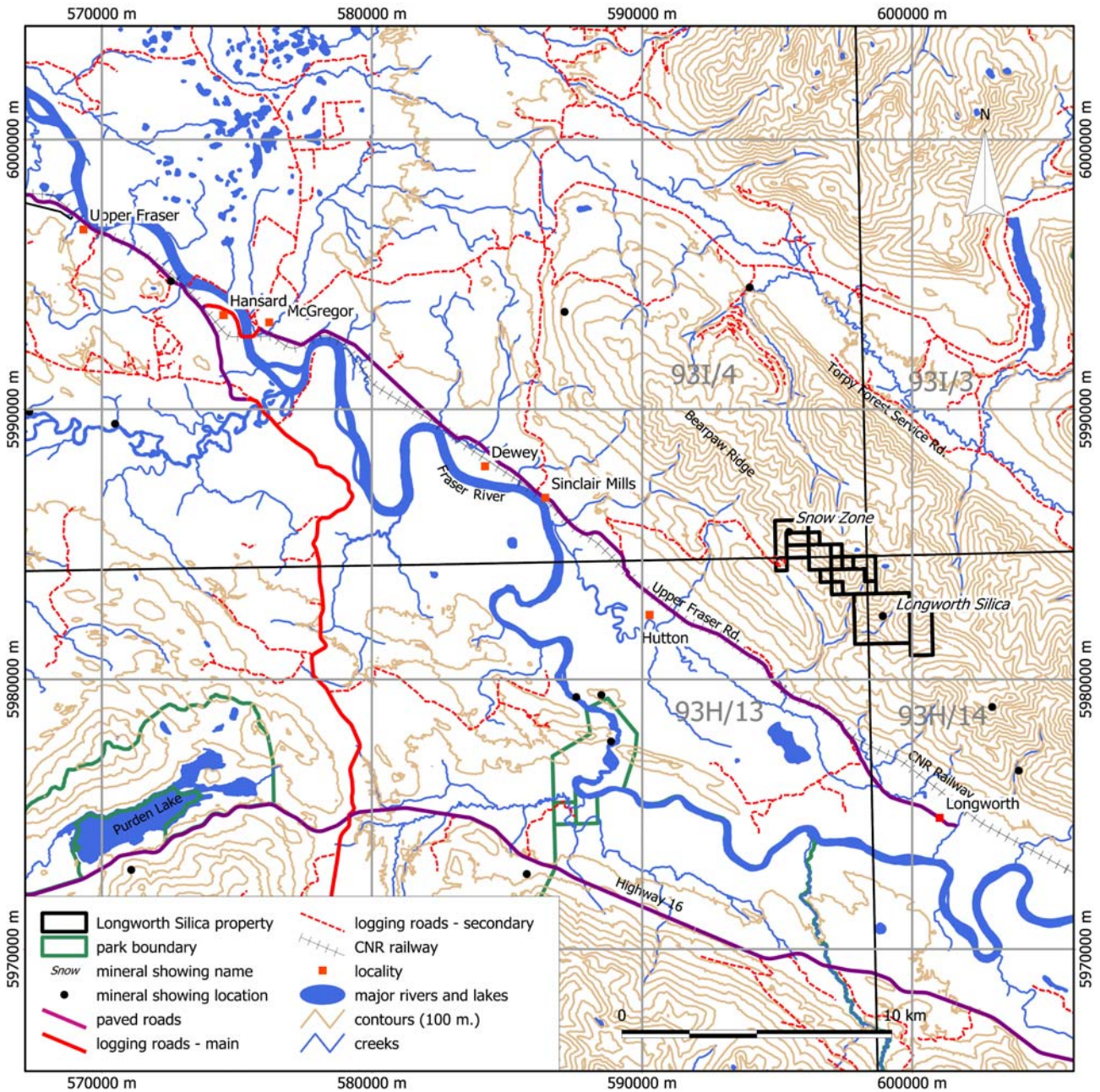


Figure 2. Detailed location and infrastructure map, Longworth Silica Property. Map prepared by D.G. MacIntyre, June 2016.

### 3 Reliance on other Experts

The writer has not relied on the opinion of non-qualified persons in the preparing of this report. All opinions expressed in this report are those of the writer based on personal knowledge of the geology and mineral resources in the Longworth area and on a review of historical work done on the property including work done in 2015 by Andris Kikauka, a registered Professional Geoscientist (P.Ge.) in the province of British Columbia.

## 4 Property Description and Location

The Longworth Silica Property is located in the Cariboo Mining Division of central British Columbia, Canada. The Snow zone is centered at latitude 54°00'31"N and longitude 121°32'37"W (UTM Zone 10, 595442E 5985462N NAD83) approximately 83 kilometres east-northeast of the city of Prince George (Figure 1). The property spans the boundary between NTS map sheets 93H/13, 93H/14 and 93I/4 and is on BCGS map sheets 093H093 and 093I003 (Figure 2). The property covers a series of northwest trending ridges (Photo 1) of resistant, relatively pure quartzite that are located between Bearpaw Ridge to the northeast and the CNR rail line and the Fraser River to the southwest (Figure 2).

The Longworth Silica Property encompasses a 2 X 8 kilometre area aligned with northwest trending topography approximately 30 kilometres southeast of the community of Upper Fraser. The community of Sinclair Mills is located roughly 10 kilometres west of the property (Figure 2).



*Photo 1. View southeast toward the Snow zone and white weathering quartzite outcrops.*

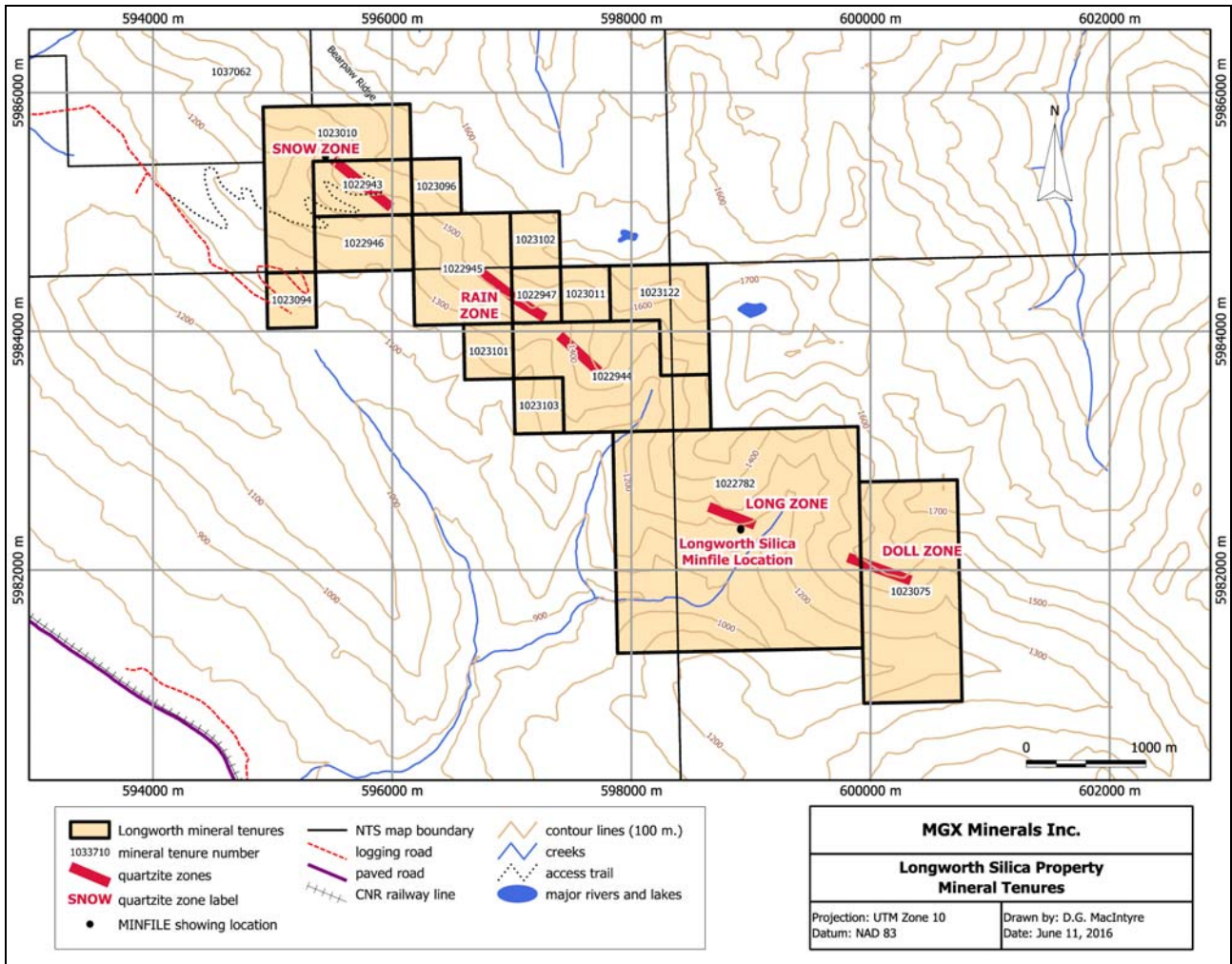


Figure 3. Mineral tenure map, Longworth Silica Property. Map prepared by D.G. MacIntyre, June 2016. Mineral tenure boundaries were generated using Mineral Titles-on-Line geospatial data.

### 4.1 Mineral Tenures

The Longworth Silica Property consists of a total area of approximately 1,083.77 hectares located approximately 4 kilometres east of CNR rail siding near Sinclair Mills and about 20 kilometres east-southeast of McGregor, BC (Figures 2 and 3).

Details of the status of tenure ownership Longworth Silica Property were obtained from the Mineral-Titles-Online (MTO) electronic staking system managed by the Mineral Titles Branch of the Province of British Columbia. This system is based on mineral tenures acquired electronically online using a grid cell selection system. Tenure boundaries are based on lines of latitude and longitude. There is no requirement to mark claim boundaries on the ground as these can be determined with reasonable accuracy using a GPS. The Longworth Silica claims have not been surveyed.

The mineral tenures comprising the Longworth Silica Property are shown in Figure 2 and listed in Table 1. The claim map shown in Figure 2 was generated from GIS spatial data downloaded from the Government of BC GeoBC website. These spatial layers are the same as those incorporated into the Mineral-Titles-Online (MTO) electronic staking system that is used to locate and record mineral tenures in British Columbia.

Claim details given in Table 1 were obtained using an online mineral tenure search engine available on the MTO web site. All claims listed in the table are in the Cariboo Mining Division within NTS map sheets 93H/13, 14 and 93I/4.

**Table 1. List of Mineral Tenures, Longworth Silica Property**

Tenure number	Claim Name	Issue Date	Good To Date	Area in hectares
1022782	Silver Standard Silica #2	2013 Oct 03	2017 Jan 31	380.36
1022943	Snow	2013 Oct 11	2017 Jan 31	38.01
1022944	Rain	2013 Oct 11	2017 Jan 31	114.08
1022945	Snowjob	2013 Oct 11	2017 Jan 31	76.03
1022946	Big Snow	2013 Oct 11	2017 Jan 31	38.01
1022947	Lookout	2013 Oct 11	2017 Jan 31	19.01
1023010	Ultra	2013 Oct 12	2017 Jan 31	95.02
1023011	Sinclair Silica	2013 Oct 12	2017 Jan 31	19.01
1023075	Silicon 11	2013 Oct 15	2017 Jan 31	152.16
1023094	\$\$\$Silicapitrd	2013 Oct 16	2017 Jan 31	19.01
1023096	Max'ssilica	2013 Oct 16	2017 Jan 31	19.01
1023101	Realrain1&2	2013 Oct 16	2017 Jan 31	19.01
1023102	Silicastarridge	2013 Oct 16	2017 Jan 31	19.01
1023103	Silex	2013 Oct 16	2017 Jan 31	19.01
1023122	Superflux	2013 Oct 17	2017 Jan 31	57.03

The total area of the mineral tenures that comprise the property is 1083.77 hectares.

## 4.2 Claim Ownership

The B.C. Ministry of Energy and Mines Mineral Titles Online (“MTO”) website indicates that the mineral tenures comprising the Longworth Silica Property are registered 100% to Jared Lazerson (Client number 249963), President and CEO of MGX Minerals Inc. As of the time of writing, the property consisted of fifteen contiguous (15) mineral tenures (Table 1) that cover quartzite outcrops along the crest of Bearpaw Ridge (Figure 3).

The mineral tenures that comprise the Longworth Silica Property were acquired by Lazerson, on behalf of MGX, from Zimtu Capital Corp. (“Zimtu”) in exchange for 700,000 common shares of MGX at a deemed price of CA \$0.30 per share (MGX news release dated July 6, 2015). This agreement superseded a previously announced alliance between MGX, Zimtu and Electra Gold Corp. (MGX press release dated November 20, 2014).

### **4.3 Required Permits and Reporting of Work**

In British Columbia, an individual or company holds the available mineral or placer mineral rights as defined in section 1 of the Mineral Tenure Act by acquiring title to a mineral tenure. This is now done by electronic staking as described above. In addition to mineral or placer mineral rights, a mineral title conveys the right to use, enter and occupy the surface of the claim or lease for the exploration and development or production of minerals or placer minerals, including the treatment of ore and concentrates, and all operations related to the business of mining providing the necessary permits have been obtained.

In order to maintain a mineral tenure in good standing exploration work or cash in lieu to the value required must be submitted prior to the expiry date. The amount required is specified by Section 8.4 of the British Columbia Mineral Tenure Act Regulation.

Up to 10 years of work or cash in lieu can be applied on a claim. A change in anniversary date can be initiated at anytime and for any period of time up to 10 years. In order to obtain credit for the work done on the Longworth Silica Property, MGX must file a Statement of Work (SOW) and submit an Assessment Report documenting the results of the work done on the property. This report must also include an itemized statement of costs.

On June 27, 2012, the Province of British Columbia increased the assessment work required to maintain a mineral tenure in good standing. The tiered increases for mineral claims were revised and expanded, while the single tier for placer claims remained the same. For mineral claims, the assessment work requirement changed from a 2-tier to 4 tier structure. The new assessment work requirements are:

- \$5.00 per hectare for anniversary years 1 and 2;
- \$10.00 per hectare for anniversary years 3 and 4;
- \$15.00 per hectare for anniversary years 5 and 6; and
- \$20.00 per hectare for subsequent anniversary years.

To aid in the adjustment to the new work requirements, all claims will be treated as if they are in their first anniversary year for assessment purposes as of the date of implementation (June 27, 2012). In other words, regardless of the age of the claim, the next time work is

registered on or after June 27, 2012, the assessment work requirement for a mineral claim will be \$5.00 per hectare per year.

Payment instead of exploration and development work (PIED) amounts have also increase and a minimum time period for use of PIED has been established.

The old PIED rate was equivalent to the value of exploration and development work. The new PIED rate has been set at double the value of the corresponding assessment work requirement.

Previously, a minimum of one day of PIED could be applied to the expiry date of a mineral tenure. The new minimum requirement for PIED is now 6 months. The 12 month (1 year) maximum still remains in place.

Similar to the assessment work requirements, if a recorded holder wishes to register PIED, the claim will also be treated as if it is in its first anniversary year for the purposes of calculating the assessment requirement, as of the date of implementation (June 27, 2012). PIED will be \$10.00 per hectare for anniversary years 1 and 2 for mineral claims (double the work amount).

Prior to initiating any physical work such as drilling, trenching, bulk sampling, camp construction, access upgrading or construction and geophysical surveys using live electrodes (IP) on a mineral property a Notice of Work permit application must be filed with and approved by the Ministry of Energy and Mines. The filing of the Notice of Work initiates engagement and consultation with all other stakeholders including First Nations.

#### **4.4 Environmental Liabilities**

There has not been any mining or other exploration related physical disturbances on the Longworth Silica Property that would be considered an environmental liability. Most of the roads built on the property have overgrown and are no longer passable. Roads built for logging activities are not the responsibility of the mineral tenure holder. The author is not aware of any environmental issues or liabilities related to historical exploration or mining activities that would have an impact on future exploration of the property.

## **5 Accessibility, Climate, Local Resources, Infrastructure and Physiography**

### **5.1 Access**

From Prince George the property can be accessed by travelling east on Highway 16 for approximately 15 kilometres and turning left onto the paved Upper Fraser access road. At approximately 58 kilometres this road crosses the Fraser River near the community of McGregor. The road continues eastward along the north side of the river passing through the community of Sinclair Mills which is located approximately 16 kilometres from the bridge crossing. At approximately 3 kilometres past Sinclair Mills is a logging road that heads northward toward Bearpaw Ridge. This road is followed for about 10 kilometres and provides access to the southwest corner of the property. The last few kilometres of the road have been decommissioned and require a 4 wheel drive vehicle. A 1.8 kilometre trail starting at 593,950 E and 5,985,390N, elevation 1,090 metres (Figure 3) leads upslope to the Snow zone which is at an elevation 1560 metres.

### **5.2 Climate and Vegetation**

Vegetation on top of and along the flanks of Bearpaw Ridge consists predominantly of tall spruces, along with some alder (Photo 1). Shrubs, including Devil's Club, are abundant along drainages. The climate in the region is temperate, reaching extremes of 34 degrees C in summer and -50 degrees C in winter. Precipitation is variable and dependent on elevation. Mean annual precipitation ranges from 44 to 90 centimetres. Snow can be expected in late October or early November and remains until April or May. Total accumulations of snowfall in the region average 240 centimetres, with higher accumulations on Bearpaw Ridge due to its higher elevation.

### **5.3 Local Resources**

The nearest towns are Sinclair Mills and McGregor on Upper Fraser Road where the CNR rail line with sidings provides a transportation link to markets. The nearest population center with significant services is Prince George which has suitable infrastructure to support mining and mineral processing.

### **5.4 Infrastructure**

The CNR main transcontinental rail line runs parallel to Upper Fraser Road and is located less than 4 kilometres from the Property (Figures 2 and 3). This rail line connects to the Port of Prince Rupert, a major shipping centre for containers, coal, oil, wheat and lumber (Figure

1). Roughly 75 kilometres northwest of the property, the main 500 kV transmission lines from the Peace River Hydro Power Project run through the region.

## 5.5 Physiography

Topography in the Prince George region is characterized by rolling hills separated by swamps. The most prominent topographical feature on the Longworth Silica Property is 1,840 metre elevation Bearpaw Ridge which flattens to 1,650 metres elevation to the northwest. The Property is situated on the southwestern flank of Bearpaw Ridge. Here, topography is moderate although locally steep, NW trending cliffs with maximum dimensions of 5 m (16.5 ft) in height occur in the vicinity of the Snow, Rain, Long and Doll Zones. Elevations on the claim block range from 960 to 1,800 metres (3,149-5,094 feet).

## 6 History

The following history is based on information contained in publically available assessment reports filed with the Province of British Columbia by previous property operators. These reports are listed in the References section of this report. Selected maps and illustrations are reproduced from these reports as a means of illustrating the location and extent of previous exploration activities on the property. The writer is confident that these maps and illustrations fairly depict the results of previous exploration efforts and were produced following industry best practises applicable at the time.

Outcrops of high purity quartzite exposed on Bearpaw Ridge were first sampled by employees of Consolidated Silver Standard Mines Ltd. (“Silver Standard”) in 1974 as part of a regional exploration program for stratiform Pb-Zn-Ag deposits. Recognizing that the nearly pure quartzite beds could be a potential source of ferrosilicon and silicon metal, Silver Standard staked claims to cover the main outcrop areas (Snow, Rain, Long and Doll zones). The analytical work done in 1974 gave poor results due to poor analytical technique. Reanalysis of these samples in 1980 using more appropriate analytical procedures returned much better results with average silica content of 99.0% SiO<sub>2</sub> and better (Quartermain, 1986).

In 1981 a major sampling program was carried out by Silver Standard employees under the supervision of Hanna Mining Corp., optionees of the property. This program confirmed the presence of potentially economic silica-pure quartzites in substantial volume at several localities along Bearpaw Ridge. The 1981 program included helicopter supported blasting and sampling of exposures over a two-week time period. No assessment report was filed detailing the results of this work.

In 1981 and 1982, the British Columbia Geological Survey Branch collected samples from four of the southeastern tenures and published analytical results for eight samples, which returned SiO<sub>2</sub> values between 98.76% and 99.40% (Foye, 1987).

In 1985, Silver Standard carried out another program of blasting, trenching and sampling. A total of 42 samples were collected - 10 samples from the Snow zone, 17 samples from the Rain zone, 7 samples from the Long zone and 8 samples from the Doll zones (Quartermain, 1986). Of the 42 samples collected and analyzed by Silver Standard, 28 met the required chemical specifications with silica dioxide (SiO<sub>2</sub>) levels ranging between 98.84 and 99.80 percent. In addition to the favourable geochemical analysis of these samples, 16 samples were sent to the University of British Columbia Metallurgical Engineering Lab for thermal shock testing. Twelve of these samples returned acceptable thermal shock resistance results (Quartermain, 1986). Some of these samples were collected from within MGX's current tenures (Rain and Snow zones).

In 2007, Card JM Resources Inc. staked 38 tenures surrounding the Silver Standard Longworth tenures. In 2008, a vertical drill hole was drilled to a depth of 100.6 m on Tenure 559360, then logged and assayed. This drill site was located at UTM coordinates 603010E, 5978973N, approximately 5.2 kilometres southeast of the Longworth Minfile locality and outside of the boundary of the current Longworth mineral tenures. Three composite samples (roughly 100 ft. each) yielded silica values between 97.90% and 98.83% (Duncan and Childs, 2008).

The current mineral tenures covering zones of high purity Nonda Formation quartzite were acquired by D.A. Heyman and C.G. Brook in October, 2013. Ownership of the claims was subsequently transferred to Zimtu Capital Corp. ("Zimtu"). Dahrouge Geological Consulting Ltd. ("Dahrouge") and Zimtu carried out prospecting and sampling on the Longworth mineral property in 2014. Only 2 hand samples were collected, both from the western end of the Snow zone (Kluczny, 2014).

MGX acquired 100% ownership of the Longworth Silica Property from Zimtu in July 2015 in exchange for 700,000 common shares with a deemed value of \$0.30 per share.

## **7 Geological Setting and Mineralization**

### **7.1 Regional Geology**

The Longworth Silica Property lies within the western margin of the Foreland Belt east of the Rocky Mountain Trench. The Foreland Belt is fault-bounded to the Omineca Belt to the west, which covers the Prince George area. The rocks in this area have been folded and

faulted during Mesozoic orogenic activity, with sheets of Proterozoic and Paleozoic rocks being thrust-imbricated in an eastward direction. The main stratigraphic units in the area are listed in Table 2.

The region is dominated by Upper Proterozoic and Paleozoic sedimentary and metamorphic rocks separated by a series of northwest-southeast trending faults (Figure 4). In general, the Upper Proterozoic succession is represented by a clastic-dominated sequence on a carbonate shelf environment lying directly on top of Archean and Proterozoic crystalline basement (Lickorish, 1993). This sediment sequence is related to Upper Proterozoic rifting along the western North American margin (Lickorish and Simony, 1995). Overlying the Proterozoic clastics, the Paleozoic deposits, which thicken westwards from southwest Alberta to northeastern British Columbia, represent the shallow water carbonates passing to the west to deep water slope and basinal facies of the Canadian Cordillera passive margin (Pyle and Barnes, 2003).

### **7.1.1 Miette Group**

The oldest rocks in the area are assigned to the Proterozoic Miette Group. The Miette Group can be divided in three separate units (Lickorish, 1993). The lowermost unit is made up of recrystallized dolomite and limestone. The middle unit is comprised of a thick package (2 kilometres) of coarse sandstone and conglomerate, with minor slate. The uppermost unit of the Miette Group is a thin package of black argillites (Taylor, 1971). The Misinchinka Group is considered the metamorphosed equivalent of the Miette Group (Stott and Taylor 1979) and generally consists of quartzite, schist, slate and phyllite metamorphosed to greenschist grade.

### **7.1.2 Gog Group**

Overlying the Miette Group is the Lower Cambrian Gog Group, which consists of 1–2 kilometres of thick-bedded quartzites with minor interbedded shale and limestone (Lickorish, 1993). Similar to the Miette Group, the Gog Group can be sub-divided into three distinct units, with the lower quartzites of the McNaughton Formation being separated from the upper quartzites of the Mahto Formation by the middle shale and limestone unit of the Mural Formation.

### **7.1.3 Kaza Group**

The Kaza Group, which is more prominent in the Kaza Mountain area roughly 150 kilometres southeast of Prince George, is comprised of alternating gritty micaceous quartzites and schists, regionally metamorphosed to greenschist facies (Sutherland Brown,

1963). Although reported to be roughly 3.5 kilometres thick, only 1.75 kilometres is exposed at Kaza Mountain itself.

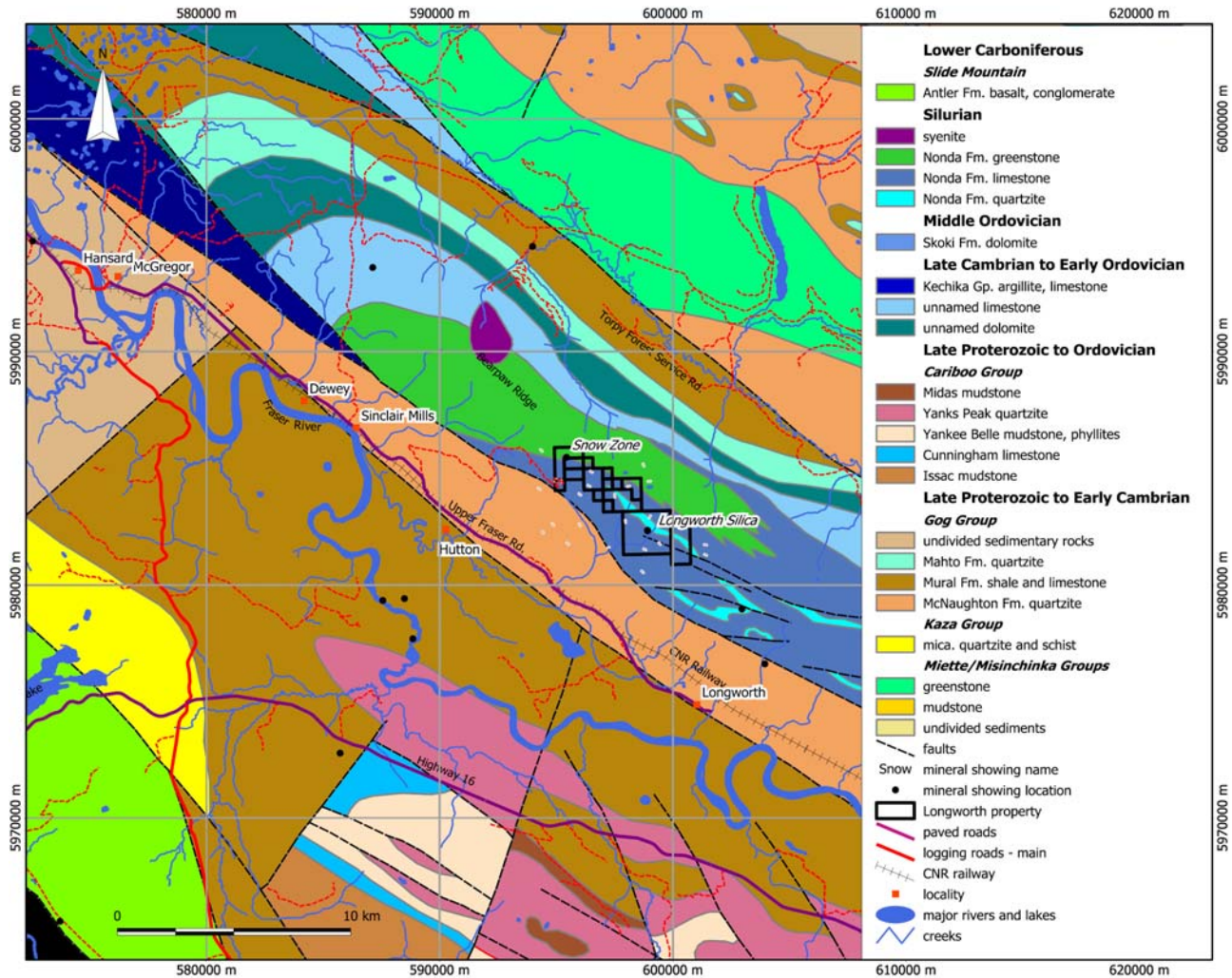


Figure 4. Regional geology, Longworth Silica Property. Geology after Massey et al., 2005. Map created by D.G. MacIntyre, June 2016.

### 7.1.4 Cariboo Group

The Cariboo Group, with an estimated thickness of 3 kilometres, is comprised of phyllites, micaceous quartzites, and limestones. It is divided into six separate formations, the Issac grey phyllites, the Cunningham medium-grey thickly bedded limestone, the Yankee Belle light grey-green phyllites and minor fine quartzites, the Yank’s Peak thick bedded pure quartzite with minor phyllite interbeds, the Midas dark grey to black phyllite, slate and argillite and the Snowshow coarse and fine clastics with minor carbonates (Sutherland Brown, 1963).

**Table 2. Stratigraphic Units of the Longworth Area (Massey et al., 2005)**

Age	Group	Formation	Lithology
Lower Carboniferous	Slide Mountain	Antler	conglomerate, pillow basalts, bedded chert
Silurian		Nonda	dolostone, dolomitic siltstone, sandstone, quartzite, greenstone
Middle Ordovician		Skoki	dolostone, limestone, shale
Late Cambrian to Early Ordovician	Kechika		calcareous argillites
Late Proterozoic to Ordovician?	Cariboo	Snowshoe	clastics with minor carbonates
		Midas	phyllite, slate, argillite
		Yanks Peak	quartzite with minor phyllite
		Yankee Bell	phyllites and minor quartzite
		Cunningham	limestone
		Issac	phyllites
Late Proterozoic	Kaza		micaceous quartzites and schists
Late Proterozoic to Early Cambrian	Gog	Mahto	quartzite
		Mural	shale and limestone
		McNaughton	quartzite
Late Proterozoic	Misinchinka		unnamed quartzite, schist, slate, phyllite (metamorphosed equivalent of Miette Group)
Proterozoic	Miette	Upper	argillites
		Middle	sandstone, conglomerate, slate
		Lower	recrystallized dolomite and limestone

### 7.1.5 Kechika Group

The Late Cambrian to Early Ordovician Kechika Group consists of calcareous shale with light-grey to brown weathering limestone interbeds. Facies changes within the group represent a change in deposition from a platform to a broad gently dipping ramp environment (Pyle and Barnes, 2003). This formation thickens westward (400 to 1200 m) from the McDonald Platform to the Kechika Trough.

### 7.1.6 Skoki Formation

The Skoki Formation, locally recorded to be 1,000 metres thick, is typically comprised of thick-bedded to massive, grey weathering dolostone, limestone and shale (Pyle and Barnes,

2003). In the Wilcox Pass area, Pyle and Barnes (2003) recognised two members of the Skoki Formation. Here, the lower Sikanni Chief member is a 126 m thick succession of medium grey thin to thick bedded dolostone with discontinuous chert beds and stringers. The Upper Kelly Member is a dark grey mottled massive limy mudstone. Overall, the Skoki Formation represents a shallow water platformal succession that conformably overlies the Kechika Group.

### **7.1.7 Nonda Formation**

The Nonda Formation, also a shallow water succession, consists of medium grey weathering, siliceous dolostone, dolomitic siltstone, sandstone and quartzite, with rare limestone beds. Locally, in the Longworth area, it contains greenstone volcanics as well (Figure 4). It is massive to thick-bedded (Pyle and Barnes, 2003). The relatively pure white quartzite that occurs within the Nonda Formation is approximately 100-300 metres in width and laterally extensive in the Longworth area (Figure 4). The continuity of the quartzite is intermittent over a 20 kilometre strike length, and appears to have repeated sequences in areas of complex parallel northwest trending faults. The quartzite terminates to the southeast in a regional north trending fault.

### **7.1.8 Slide Mountain Group**

The Slide Mountain Group is represented in the region by the Mississippian Antler Formation. It is comprised of dark green-grey, fine-grained basalt pillow lavas and thinly interbedded cherts and argillite. It has a thickness of 1 kilometre at its type locality, Slide Mountain, but has been reported to be thicker at Palmer Mountain (Sutherland Brown, 1963).

### **7.1.9 Structures**

Regional mapping by the Geological Survey of Canada (Muller and Tipper, 1968), at a scale of 1 inch to 4 miles covering the area north and east of Prince George, has been superseded by that of Struik (1994). Struik (1989) indicates there are two strike-slip fault trends in the region. One trend follows the McLeod Lake Fault Zone at approximately 160°. Movement along this feature is interpreted as mid-Tertiary. The other set includes the older northern Rocky Mountain Trench fault system, which trends approximately 140°.

## **7.2 Property Geology and Mineral Occurrences**

Glacial deposits of various types, exceeding 100 metres in places, cover much of the area around Prince George, Upper Fraser and Longworth. As a result, outcrop exposure on the

property is scarce and is limited to the high ridges of Bearpaw Ridge which run in a northwest direction, roughly parallel to the Fraser River.

The Longworth Silica Property is underlain by a folded sequence of sedimentary and volcanic rocks that crop out along the length of Bearpaw Ridge (Figure 5). These rocks are assigned to the Lower Silurian Nonda Formation. In the vicinity of the Longworth Silica Property, the Nonda Formation quartzite crops out intermittently over a 20 kilometre strike length at approximately 1,250-1,550 metres elevation (Figure 4). The Longworth mineral property features 4 zones (each zone approximately 300 to 800 m strike length) of high purity silica zones referred to as ‘Snow, Rain, Long & Doll’ (Figure 5). Lower Silurian Nonda Fm white coloured quartzite is approximately 100-400 metres wide, trends northwest, dips steeply to the northeast, and outcrops prominently where numerous localized topographic highs occur on southwest facing slopes. Impurities in quartzite include rare limonite, calcite and muscovite along fractures and joints.

Four northwest trending bands of white weathering quartzite, the Snow, Rain, Long and Doll, each 100-300 metres in width and with strike lengths of 300-800 metres have been mapped along the western flank of Bearpaw Ridge (Foye, 1987). Bedding in the area has been reported as trending northwest and steeply dipping (70-80°) to the northeast. The quartzite bands are slightly folded and faulted, and trace a synformal structure which opens to the northwest (Foye, 1987).

The primary target for high purity silica on the property is the Nonda Formation quartzite. This quartzite is very pure, massive and homogeneous. It is composed of extremely well-rounded and well-sorted quartz grains, averaging 0.5 millimetres in diameter, which are cemented by silica (Quartermain, 1986). Prior to metamorphism this rock was a relatively pure quartz arenite. The quartzite is pinkish white to buff on fresh surfaces and weathers grey to white. Local impurities include muscovite in cavities, limonite on microfractures, minor calcite and possible hydrocarbons.

The carbonates and volcanics that host the quartzite bands exposed on Bearpaw Ridge are comprised of dolostone, calcareous shale and volcanic greenstone fragmentals and flows. Brachiopods and corals occur in the carbonates (Quartermain, 1986).

The Nonda Formation quartzite exposed in the Snow zone (Figure 6) is massive with minor impurities (Kikauka, 2016). The quartzite beds exhibit minor faulting and folding. Quartzite bedding trends parallel the northwest trending ridge axis (sub-vertical dip), with jointing trends perpendicular and parallel to the ridge axis (sub-vertical dip).

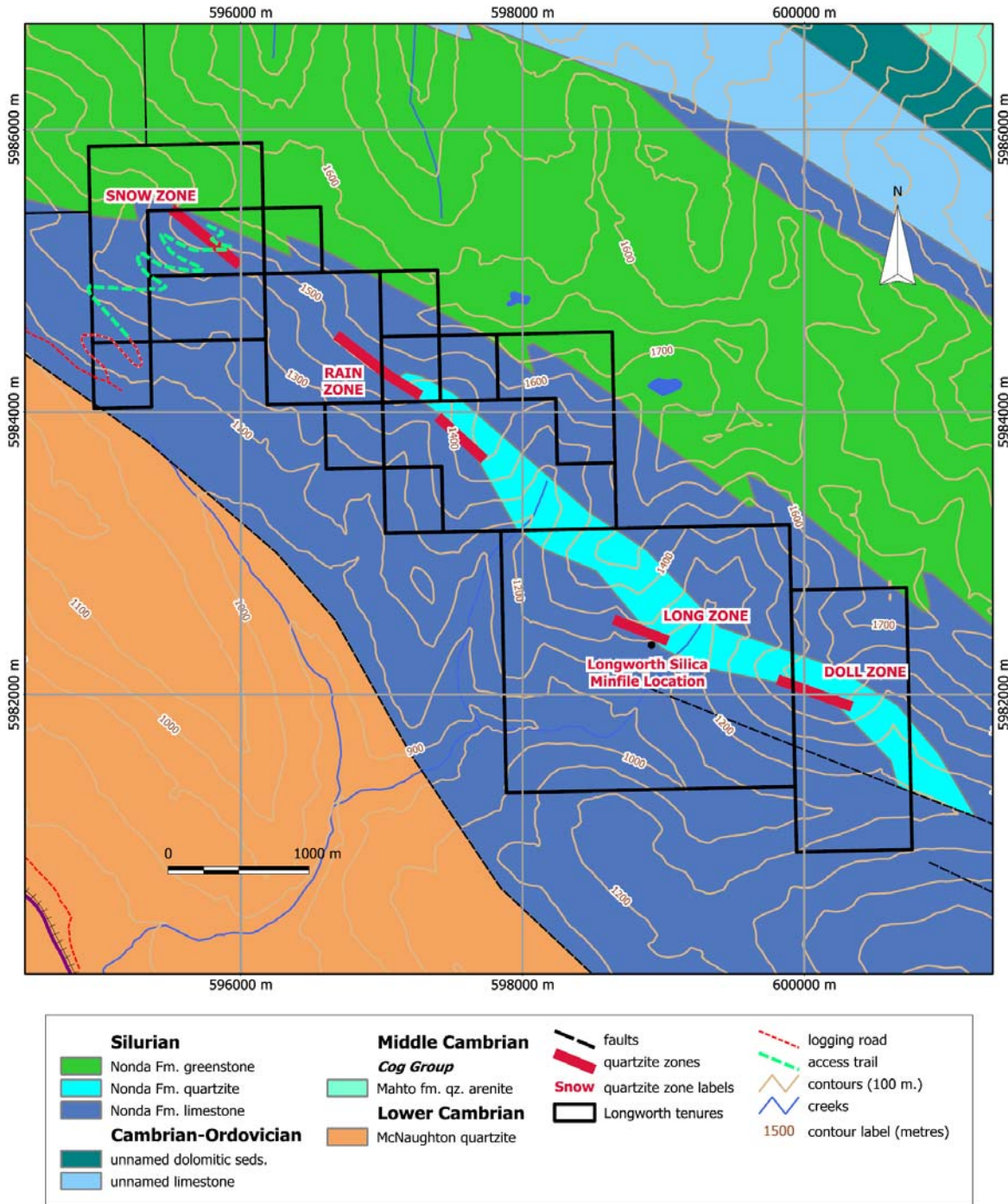


Figure 5. Property geology Longworth Silica Property. Map prepared by D.G. MacIntyre, June 2016 using data from Kikauka, 2016 and Massey et al., 2005.

Quartzite in the central portion of the Snow zone exhibits rare 0.3-0.5 meter wide pure white, northeast trending quartz veins with an echelon pattern (sigmoidal) strain shadows (Kikauka, 2016). These minor quartz veins exhibit sigmoidal strain shadows (also known as ladder veining). The observed sigmoidal texture is believed to be the result of deep burial

recrystallization that was subjected to an extension-shortening stress-strain regime. Quartz veining is interpreted as syngenetic in origin whereby pure sandstones are subjected to metamorphism and partial melting (i.e. metamorphic quartz), and not the result of distal source hydrothermal quartz veins (Kikauka, 2016).

## 8 Deposit Types

The primary targets on the Longworth Silica Property are relatively pure quartzite beds that are part of the Silurian Nonda Formation. These beds locally crop out along the crest of Bearpaw Ridge. The beds were originally deposit as quartz sand in a shallow, near shore platformal environment. Post deposition metamorphism has produced nearly pure beds of quartzite.



*Photo 2. View west from sample site 902, Snow zone. Photo from Kikauka, 2016.*

## 9 Exploration

MGX did fieldwork on the Longworth Silica Property between October 14th and 18th, 2015. This work consisted primarily of geochemical sampling and geological mapping. A detailed summary of the results of this work are contained in an assessment report filed with the B.C. Ministry of Energy and Mines (Kikauka, 2016). Geochemical sampling was carried out on exposed surface bedrock within the Snow zone, located in close proximity to historic surface

sampling and trenching performed by Consolidated Silver Standard Mines Ltd in 1986. A total of 10 rock chip samples were collected from surface outcrop from an area of approximately 150 X 500 metres covering the Snow zone (Figure 6). Rock samples were analyzed by ALS Minerals, North Vancouver, BC. Major oxide analytical results for 10 rock chip samples collected by Mr. Kikauka from the Snow zone are listed in Table 3.

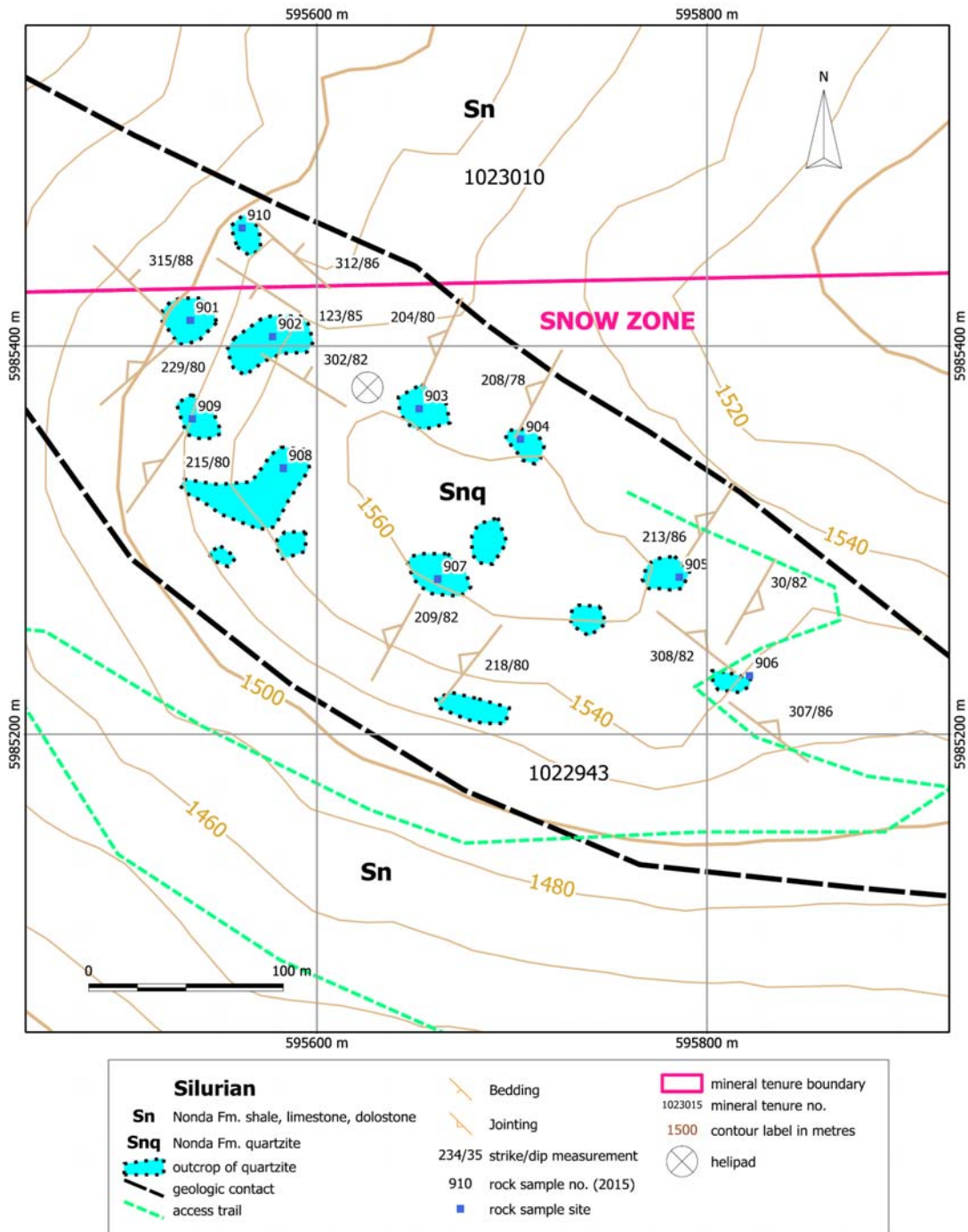


Figure 6. Geology and sample locations, Snow zone. Mapping and sampling by Kikauka (2016).  
Map prepared by D.G. MacIntyre, June 2016

**Table 3. Snow zone 2015 Rock Chip Sample Analytical Results (Kikauka, 2016)**

Sample ID	SiO <sub>2</sub> %	Fe <sub>2</sub> O <sub>3</sub> %	CaO %	MgO %	Al <sub>2</sub> O <sub>3</sub> %	Na <sub>2</sub> O %	K <sub>2</sub> O %	LOI %	Total %
901	98.9	0.04	0.03	0.04	0.44	0.03	0.14	0.21	99.85
902	99.1	0.02	0.02	0.01	0.14	0.03	0.04	0.08	99.45
903	99.5	0.02	0.01	0.01	0.13	0.04	0.04	0.09	99.85
904	99.4	0.04	0.01	0.01	0.11	0.04	0.03	0.04	99.7
905	99.3	0.02	0.01	0.01	0.13	0.05	0.04	0.06	99.63
906	99.2	0.02	0.01	0.01	0.12	0.05	0.03	0.11	99.56
907	99.6	0.03	0.01	0.01	0.27	0.01	0.06	0.23	100.24
908	99.9	0.03	0.01	0.01	0.14	0.06	0.04	0.07	100.27
909	99.8	0.03	<0.01	0.01	0.17	0.01	0.05	0.15	100.23
910	98.7	0.03	0.01	0.02	0.4	0.07	0.13	0.18	99.56

**Table 4. Average values from 10 Rock Chip Samples, Snow zone (Kikauka, 2016)**

SiO <sub>2</sub> %	Fe <sub>2</sub> O <sub>3</sub> %	CaO %	MgO %	Al <sub>2</sub> O <sub>3</sub> %	Na <sub>2</sub> O %	K <sub>2</sub> O %	LOI %	Total %
99.34	0.028	0.012	0.014	0.205	0.039	0.06	0.122	99.834

## 10 Drilling

There has not been any diamond drilling done on the mineral tenures that currently comprise the Longworth Silica Property. As mentioned in the History section of this report, in 2008, Card JM Resources Inc. drilled a 100.6 m hole on Tenure 559360 but this hole is located 5.5 kilometres southeast of the Longworth showing and outside the current boundaries of the property.

## 11 Sample Preparation, Analyses and Security

Rock samples collected in 2015 were analyzed by ALS Minerals, North Vancouver, B.C., an accredited analytical laboratory. The analytical procedure (modified Prep 31) used a special zirconia ring pulverization disc instead of a chrome steel pulverization disc, in order to minimize iron contamination. The pulverized samples were then analyzed using the whole rock fused bead lithium borate fusion method (ME-ICP-06).

The collection and shipping of samples was done by A. Kikauka, P.Ge. The writer is confident that the samples were kept secure by Mr. Kikauka and that they were not tampered with prior to arriving at the ALS Minerals laboratory.

## 12 Data Verification

The writer has reviewed the original analytical certificates issued by ALS Minerals for samples collected by MGX in 2015. The analytical procedure used is appropriate for determining the major oxide content of the samples submitted. The quality control employed by ALS indicates a high level of precision and accuracy in the analytical results.

The writer has also done a search of the Mineral Titles Online website to confirm the current ownership of the claims comprising the Longworth Silica Property.

## 13 Mineral Processing and Metallurgical Testing

In 1985, Silver Standard carried out a program of blasting, trenching and sampling. In addition to the geochemical analysis of the samples collected, some material was also sent to the University of British Columbia Metallurgical Engineering Lab for thermal shock testing. The samples yielded favourable results, with some exceeding Silver Standard's metallurgical grade specifications for raw quartzite, SiO<sub>2</sub> 99.5%, Al<sub>2</sub>O<sub>3</sub> 0.25%, Fe<sub>2</sub>O<sub>3</sub> 0.10%, CaO nil, and L.O.I, 0.20% (Quartermain,1986). Some of these samples were collected from within MGX's current tenures (Rain and Snow zones). To date, the issuer has not done any mineral processing or metallurgical testing on material collected from the Snow zone.

## 14 Mineral Resource and Mineral Reserve Estimates

There has not been sufficient work done on the Longworth Silica Property to determine the subsurface extent and overall grade of the silica deposit. There are no historical mineral resource estimates for the property.

## 15 Adjacent Properties

There are no significant mineral properties immediately adjacent to the Longworth Silica Property.

## 16 Other Relevant Data and Information

The author has reviewed all public and private reports pertaining directly to the property. Many of these were provided by MGX Minerals Inc. The writer is not aware of any additional sources of information that might significantly change the conclusions presented in this technical report.

## 17 Interpretation and Conclusions

The Longworth property has been identified as a potential source of high purity silica (Simandl et al., 2014). As a group, silica deposits in British Columbia offer potential for the production of material such as fiberglass, various glass products, dinas, ferrosilicon, silicon carbide, metallurgical grade silicon, and sodium silicate (Simandl et al. 2014). Historically, British Columbia has not been a major producer of silica. Some quartz, especially from veins, has been used as a flux in smelter operations. The Gypo quartz vein near Oliver produced about 600,000 tonnes of quartz up to 1968 when the main mining operations ceased. Most of this material was used in the building industry and to produce ferrosilicon. In more recent years a significant amount of production has taken place from the Moberly Mountain and Hunt deposits, in quartzite of the Mount Wilson Formation, near Golden (Simandl et al, 2014) silica sand from the Moberly Mountain deposit is sold for a variety of uses. The Hunt deposit has produced intermittently since 1980 at approximately 30,000 tonnes per year, with much of the product being shipped to a ferrosilicon plant in Wenatchee, Washington. Some of the fines have been used by cement producers in British Columbia and Alberta.

Sampling of quartzite outcrops in the Snow zone has return very encouraging results which indicate the presence of nearly pure silica. High purity silica is prized by the silicon industry that uses it in the production of silicon metal. Silicon-based materials, including silicones, can be formulated to deliver a wide range of products from more durable construction materials; faster, smarter electronic devices; to more efficient solar panels and wind turbines. They are also used in healthcare and cosmetic products.

The Snow zone quartzite may also be a possible source of frac sand for the oil and natural gas proppant markets. More work is required to determine if the Longworth quartzite meets the rigorous specifications to supply the frac sand market.

High purity silica can be used to make silicon and ferrosilicon. MGX has specific interest in the production of ferrosilicon as it, along with magnesium oxide, are primary inputs in the production of magnesium alloy using the Pidgeon Process, a relatively simple and scalable

production process. Ferrosilicon is an essential alloy in the production of iron and steel. Ferrosilicon is used to remove oxygen and increase the strength, resistance and elasticity of steel. It can also serve as the basis to manufacture pre-alloys like Magnesium Ferro Silicon (FeSiMg).

Based on the range of relatively high purity %SiO<sub>2</sub> and relatively low impurity values such as MgO, CaO, Na<sub>2</sub>O, K<sub>2</sub>O and Fe<sub>2</sub>O<sub>3</sub>, it is possible that the Longworth quartzite silica is suitable for use as a raw material for ferrosilicon production as well as other high purity uses (Kikauka, 2016). The relatively pure silica content of the samples collected by MGX from the Snow zone in 2015 (98.7-99.9 % SiO<sub>2</sub>) compares favourably with other silica producers such as Moberly, Hunt and HCJ Properties near Golden, B.C. Impurity compounds of interest (Al<sub>2</sub>O<sub>3</sub>, MgO, CaO, Fe<sub>2</sub>O<sub>3</sub>) approach specifications required for producing ferrosilicon alloy. Manufacturers of glass and fibreglass have listed specifications for the purity of silica as shown in Table 5. A total of 8 of the 10 samples collected from the Snow zone in 2015 (Table 3) meet or exceed these values. These initial results from the Snow zone are encouraging.

**Table 5. Minimum and Maximum Values Specified for Silica Used in Glass & Fibreglass**

Silica	99.1 % minimum
Calcium Carbonate	0.3 % maximum
Magnesium Carbonate	0.3 % maximum
Iron Oxides	0.3 % maximum
Aluminum Oxides	0.3 % maximum

## 18 Recommendations

Extensive beds of Silurian age Nonda Formation quartzite crop out on the Longworth Silica Property. Some of the rock chip samples collected by MGX and previous operators on the property have returned high, nearly pure values for silica, particularly from the Snow zone. In the writer's opinion, because of these encouraging results and the extensive nature of quartzite outcrops on the property, additional exploration work is warranted to determine the true extent and purity of the quartzite beds present on the property.

The initial phase of work should focus on the Snow zone which is the most accessible. The only effective way to evaluate the economic potential of the Snow zone is by diamond drilling. It is recommended that the first stage of this program involve the drilling of 9 NQ or HQ diamond drill holes each to a depth of 90 metres (total 810 metres) and at an azimuth of 210 degrees and inclination of -60 (Table 6, Figure 7). These holes will cross cut the strike of the bedding and should give a good indication of the true thickness and purity of the beds. The drill core should be split and sampled in 2 metre intervals and the samples

analyzed using the Li Borate Fusion ICP AES geochemical analysis. Because of limited access to the Snow zone it will be necessary to use a helicopter for drill moves. A 2.5 kilometre ATV access trail will also need to be built following the current foot path to allow for access to the drill and a route for emergency medical evacuation. The cost of this Stage 1 program is estimated to be \$289,300 (Table 7). If the Stage 1 drill results are encouraging then additional drilling as part of a Stage 2 program is warranted.

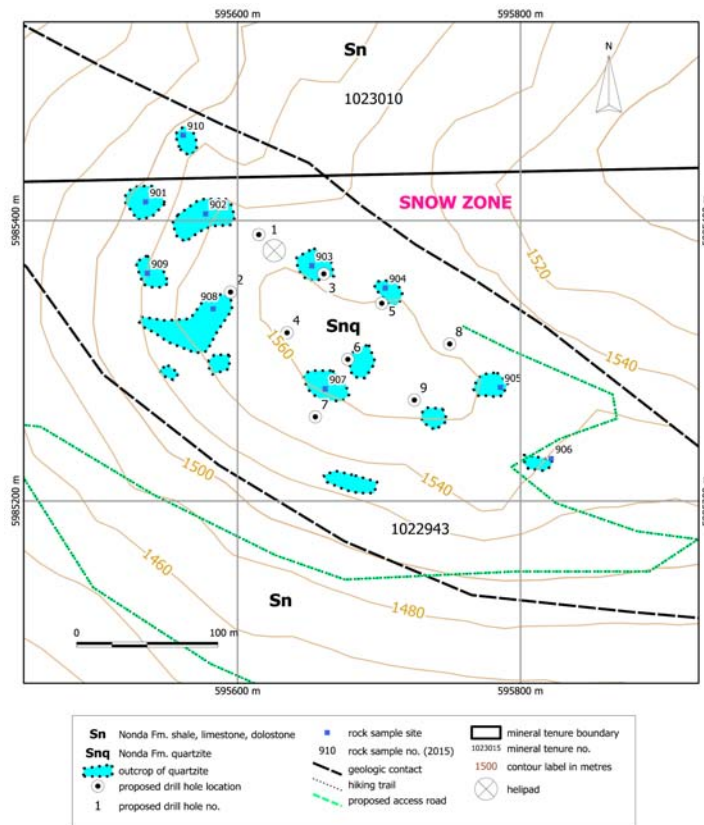


Figure 7. Location of proposed drill holes, Snow zone.

**Table 6. Proposed drill holes**

DDH No.	Easting	Northing	Elev. (m.)	Depth (m.)	Azimuth	Incl.
1	595615	5985390	1557	90	210	-60
2	595595	5985349	1559	90	210	-60
3	595661	5985362	1560	90	210	-60
4	595635	5985320	1562	90	210	-600
5	595702	5985341	1560	90	210	-60
6	595678	5985301	1561	90	210	-60
7	595655	5985260	1549	90	210	60
8	595750	5985312	1560	90	210	60
9	595725	5985272	1556	90	210	60

As part of the proposed exploration program the writer also recommends that MGX engage an industrial minerals expert to investigate the silica market in British Columbia and to help evaluate any economic factors that may have a material impact on the future development of the property. Consultation and engagement with First Nations is also important if the project is to advance beyond the initial exploration stage.

**Table 7. Projected costs, proposed exploration program, Longworth Silica Property**

Expense	No.	Units	Unit cost	Total
Drilling	810	metres	\$130	\$105,300
Mob/Demob	2	days	\$5,000	\$10,000
Helicopter	50	hours	\$2,000	\$100,000
Trail upgrade	5	days	\$1,000	\$5,000
Per diem	200	person days	\$100	\$20,000
Analytical	400	analyses	\$50	\$20,000
Geologists/camp manager	30	person days	\$600	\$18,000
Report preparation	10	days	\$600	\$6,000
Reclamation	5	days	\$1,000	\$5,000
				<b>\$289,300</b>

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## 20 Certificate of Author

I, Donald George MacIntyre, Ph.D., P.Eng., do hereby certify that:

1. I am an independent consulting geologist providing services through D.G. MacIntyre and Associates Ltd. a wholly owned company incorporated December 10, 2004 in the Province of British Columbia (registration no. BC0710941). My residence and business address is 4129 San Miguel Close, Victoria, British Columbia, Canada, V8N 6G7.
2. I graduated with a B.Sc. degree in geology from the University of British Columbia in 1971. In addition, I obtained M.Sc. and Ph.D. degrees specializing in Economic Geology from the University of Western Ontario in 1975 and 1977 respectively.
3. I have been registered with the Association of Professional Engineers and Geoscientists of British Columbia since September, 1979, registration number 11970.
4. I have practiced my profession as a geologist, both within government and the private sector, in British Columbia and parts of the Yukon for over 35 years. Work has included detailed geological investigations of mineral districts, geological mapping, mineral deposit modeling and building of geoscientific databases. I have directly supervised and conducted geologic mapping and mineral property evaluations, published reports and maps on different mineral districts and deposit models and compiled and analyzed data for mineral potential evaluations.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirement to be a “qualified person” for the purposes of NI 43-101.
6. I am responsible for all sections of the technical report titled “Technical Report: Longworth Silica Property, Southern British Columbia, Canada” dated June 27 2016 (the “Technical Report”). The effective date of this Technical Report is June 27, 2016. Sections not written by myself are noted in the text.
7. I visited the Longworth Silica property on June 17, 2016. There was too much snow at the time of this visit and it was not possible to access the showings on Bearpaw Ridge.
8. I have not had prior involvement with the property that is the subject of the Technical Report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report the omission of which would make the Technical Report misleading.
10. I am independent of the issuer, the property vendors and the property applying all of the tests in Section 1.5 of National Instrument 43-101.
11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 27th day of June, 2016



D.G. MacIntyre, Ph.D. P.Eng.