

**ASSESSMENT REPORT**

**PETROGRAPHIC STUDY**

**of the**

**TULAMEEN PLATINUM PROJECT**

**Similkameen Mining Division**

**Latitude: 49° 31' 56'' N; Longitude: 120° 53' 31'' W**

**NTS 092H10**

**For**

**NORTH BAY RESOURCES INC.  
PO Box 162, Skippack, PA 19474  
USA**

**By**

**Dan V. Oancea PGeo**

**July 24, 2019**

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## APPENDIX

Appendix – Brucker Report for Sample 0710-1

## 1. Summary

The Tulameen Platinum Project is located 28 km west of the town of Princeton in the Similkameen Mining Division of southern British Columbia, Canada.

The Project is 100% owned by North Bay Resources Inc. of Skippack Pennsylvania, USA. It is represented on NTS map 092H056.

The 796.79 hectares mineral property straddles the Tulameen River in between Hines Creek and Britton Creek. It is located in a transition zone in between the Cascade Mountains to the west and the Interior Plateau to the east. The property is generally in steep terrain characterized by the presence of bluffs and is partially covered by coniferous type forests.

The Project lies along the western margin of the Intermontane Belt of the Quesnellia tectonostratigraphic terrane. The Quesnell Terrane is a volcano-sedimentary arc terrane that stretches along most of the length of the Canadian Cordillera. Rocks underlying the mineral property are represented by the Triassic rocks of the Tulameen Ultramafic Complex, and sedimentary and volcanic rocks of the Upper Triassic Nicola Group.

The Tulameen Ultramafic Complex represents an Alaskan-type magmatic intrusion that hosts platiniferous chromites in its dunite rock core. The dunite rocks represent the hardrock source for the 20,000 ounces of placer platinum that have been mined since the 1885 discovery of gold rich placer deposits on the Tulameen River and its tributaries. In late 1800s the Tulameen region was recognized as North America's premier platinum producer. Subsequent mineral exploration activities failed to delineate economic hardrock Platinum Group Metals (PGM) mineralization.

The hardrock source of the 37,707 ounces of gold known to have been mined in the Tulameen area proved to be even more elusive, but it is generally accepted that gold was derived from the Nicola Group rocks.

Industrial uses for the mineral olivine that represents over 90 per cent of the Tulameen dunite rocks had also been investigated as early as 1986. It was concluded that an important part of the olivine contained in the dunite rocks favorably compares with commercially produced olivine from around the world.

The potential of the olivine rich dunite rocks for mineral sequestration of carbon dioxide (CO<sub>2</sub>) has been studied since early 2000s. Test results indicated that one tonne of Tulameen dunite could potentially sequester up to 0.4 tonnes of CO<sub>2</sub>.

By studying new worldwide developments as well as processing options for magnesium-rich silicate minerals the writer concluded that the olivine rich dunite rocks of the Tulameen Complex represent a suitable feedstock to produce magnesium oxide and/or of different other types of magnesium products.

In 2013, the writer undertook a prospecting survey on the Tulameen Platinum Project. It was designed as a reconnaissance study of the main rock types, mineralization and of the mineral potential of the Tulameen ultramafic rocks. Assays returned values in line with the ones obtained by previous explorationists. Top values were 0.54 g/t platinum, 0.18 g/t gold, 0.2% copper, 0.14% nickel, 15.40% iron and 20.3% chromium (AR34218).

The writer's June 2016 assessment work had as main objective the collection of dunite samples from the core of the ultramafic intrusion. Samples were assayed for loss-on-ignition (LOI) and were used to evaluate the industrial mineral potential of the Tulameen olivine from an area centered on Britton Creek. The phytomining potential of the vegetation growing on the nickel-enriched body of dunite rock was also tested by assaying some of the local types of vegetation present on the ultramafic intrusion (AR36194).

The June 2018 assessment work had as main objectives the validation of historic LOI results for the Britton Mountain area and an evaluation of the precious and base metals potential of the contact zone between the volcanic-sedimentary Nicola Group rocks and the Tulameen intrusive ultramafic rocks.

Britton Mountain loss-on-ignition results validated the historic Diamet results and were reported as ranging from 1.93% in the fresh dunite rock to 18% in altered zones. Other significant assay results were platinum up to 0.509 g/t, nickel over 0.12%, 0.01% cobalt, and chromium assays reported as over the analytical method's detection limit (>1%). Magnesium assay results for the dunite rock were in the 24% to 25.9% range, which are equivalent to 39.79% to 42.94% magnesium oxide. (AR37624)

The results of the writer's assessment work combined with an extensive literature search were used to draw conclusions and make recommendations for further exploration and development programs that would provide for economic mining and processing of the different types of commodities present in the Tulameen dunite rocks.

The present report showcases the results of an initial petrographic study effectuated on a few representative types of rocks collected during the month of October 2018. The survey was initiated by a major company and was designed to confirm the historic information about the compatibility of the Tulameen olivine in being used as an industrial mineral.

## 2. Conclusions

The central part of the Tulameen Ultramafic Complex, which is part of the Company's Tulameen Platinum Project, represents an attractive industrial mineral exploration and development target because of the favorable characteristics of the Tulameen olivine, which would require minimum preparation in order to be used for industrial applications.

Mining of the dunite rocks for olivine could be economically viable and might have a greater potential than mining for precious and base metals.

The potential for carbon dioxide mineral sequestration of the Tulameen dunite rocks is considered excellent and if pursued could further improve the economics of a possible olivine mining project.

In conclusion the mining of the olivine rich core of the Tulameen Ultramafic Complex can be envisioned as a possible open pit mining operation that would include on-site processing of the rock (crushing, grinding, flotation and/or gravity concentration) which is considered to represent a viable solution for moving the project forward.

The main product could be represented by olivine industrial mineral, while by-products could be represented by metals (PGM, nickel, cobalt, chromites, magnetite). The tailings could be marketed for their CO<sub>2</sub> sequestration potential or could be acid leached which would result in the production of magnesium carbonate accompanied by the production of some of the metals.

The other important option for developing the olivine mineral deposit is represented by mining the Tulameen olivine for its magnesium content. Viable processing methods (crushing, grinding, acid leaching, and calcination) are available for an economic processing of magnesium rich silicate minerals, including olivine and serpentine.

By taking into account recent geological maps of the area created by the British Columbia Geological Survey and considering the final depth of a possible mining operation to about or below 900 m in elevation the writer estimates that a potential exploration target for the mineral olivine contained in the dunite rocks located within the Project Area could be in the 225 million tonnes to 240 million tonnes range.

Parts of the mineral property (Grasshopper Mtn. and Britton Creek dunites) that had been explored and drilled by industry majors and junior miners are suitable exploration targets for PGM, chromites, nickel, cobalt and magnetite mineralization.

The Hines Creek area is prospective for PGM, copper and gold but had not been the focus of any recent survey.

### **3. Recommendations**

North Bay Resource's Tulameen Project should be further explored for its olivine industrial mineral and magnesium potential as these two commodities could represent the most economic alternatives for developing the Project.

Systematic mapping and sampling (LOI, PGM, base metals, magnesium) of the parts of the Grasshopper Mountain, Britton Mountain and Olivine Mountain covered by the Company's mineral claims should be performed during a first pass survey. Continuous channel sampling must be done over areas of the property that have lower loss-on-ignition values and/or present anomalous PGM and base metals values.

Dunite rocks that have a low loss-on-ignition and contain important quantities of platinum-poor chromite mineralization must be identified and thoroughly sampled as chromite, which could represent an important by-product.

Areas known to hold anomalous to economic values of PGM and chromite mineralization have to be identified/re-located, systematically sampled and assayed.

The conclusions of these surveys should guide a drilling program that would identify at depth characteristics of the dunite rocks. If successful olivine and magnesium oxide as well as precious and base metals mineral resources could be estimated and used in a Preliminary Economic Assessment (PEA) of the Tulameen olivine-PGM deposit.

Metallurgical studies must be undertaken in parallel with the exploration program to provide the information necessary for making development decisions.

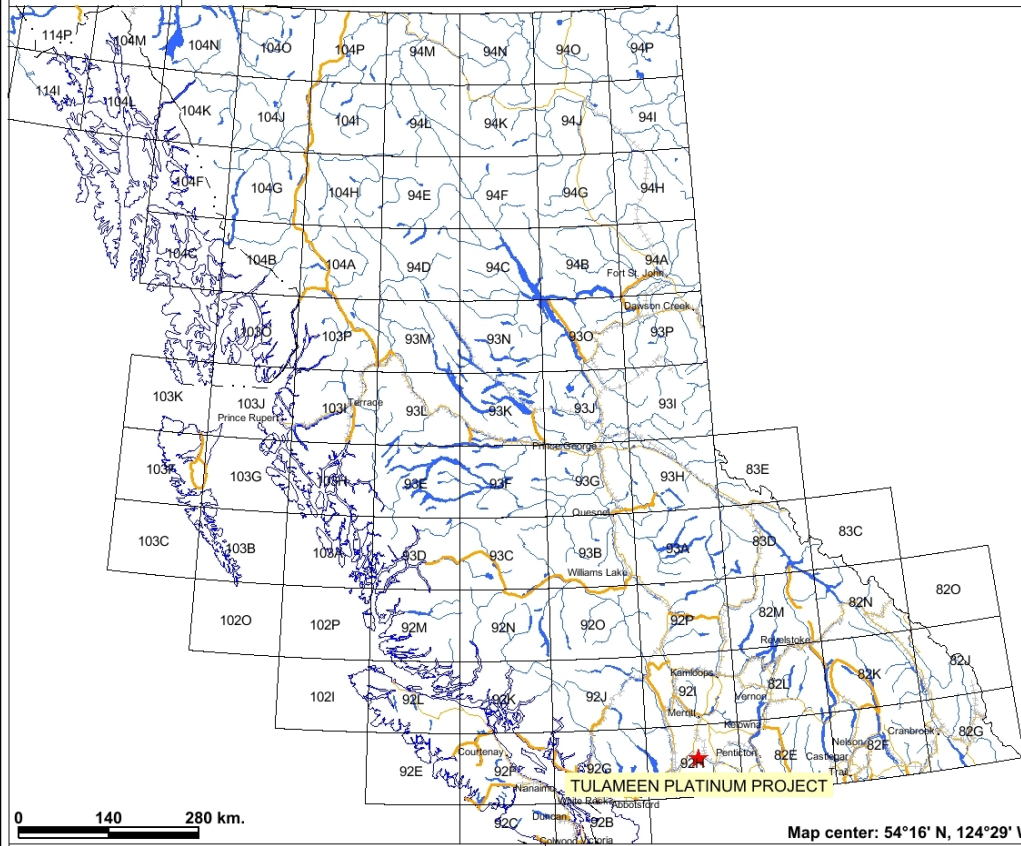
### **4. Introduction**

#### **4.1 Location, Access and Physiography**

The Tulameen Platinum Project is located approximately 28 km west of the town of Princeton in the Similkameen Mining Division of southern British Columbia.

Princeton, a town of 2,700 people, can be reached by following Highway 1 West over a 288 km road distance from the City of Vancouver.

**Fig. 1 - Tulameen Platinum Project Index Map**



**Legend**

- Provincial Boundary (1:6M)
- Boundary (International)
- Boundary (Interprovincial)
- NTS Grid
- Transportation - Lines (1:6M)
  - Road - Trunk
  - Road - Main
  - Rail Line
- Water - Lines (1:6M)
  - River/Stream - Definite
  - Lake - Definite
  - Island - Definite
  - Coastline - Definite
- Water - Polygons (1:6M)
  - River/Stream - Definite
  - Lake - Definite
- Major Cities

0 140 280 km.

Map center: 54°16' N, 124°29' W

Scale: 1:8,000,000

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

Dan V. Oancea, September 2016 for North Bay Resources Inc.

From Princeton the Project can be accessed by driving on the paved Coalmont Road to Tulameen, and then continuing west on the well maintained Tulameen Forestry Service Road (FSR) for another 10 km.

The Company's mineral tenements straddle the Tulameen River. The Hines Creek area which represent the southeastern part of the property that lies south of the river could be accessed by crossing a bridge located 8 km west of the village of Tulameen. The northern side of the Olivine Mountain located opposite to the confluence of Britton Creek with the Tulameen River can be accessed by following a forestry road that crosses the river on the southern side of the property in a location 3.5 km west of the confluence.

The Tulameen Platinum Project is located in a transition zone between the Cascade Mountains to the west and the Interior Plateau to the east. The elevations on the mineral property range from 900 m down in the Tulameen River valley to a maximum of 1,250 m on the northern slopes of the Grasshopper Mountain. The tops of the mountains are rounded by weathering and the eroding action of the glaciers. Glacial till covers many mountainous slopes.

From the Cascade Mountains the Tulameen River follows a northward course for 30 kilometres but it changes course at the Grasshopper Mountain and continues eastward for 10 kilometres to the town of Tulameen. The river then flows southeast for 25 kilometres before joining the Similkameen River at Princeton (Minfile 092HNE199).

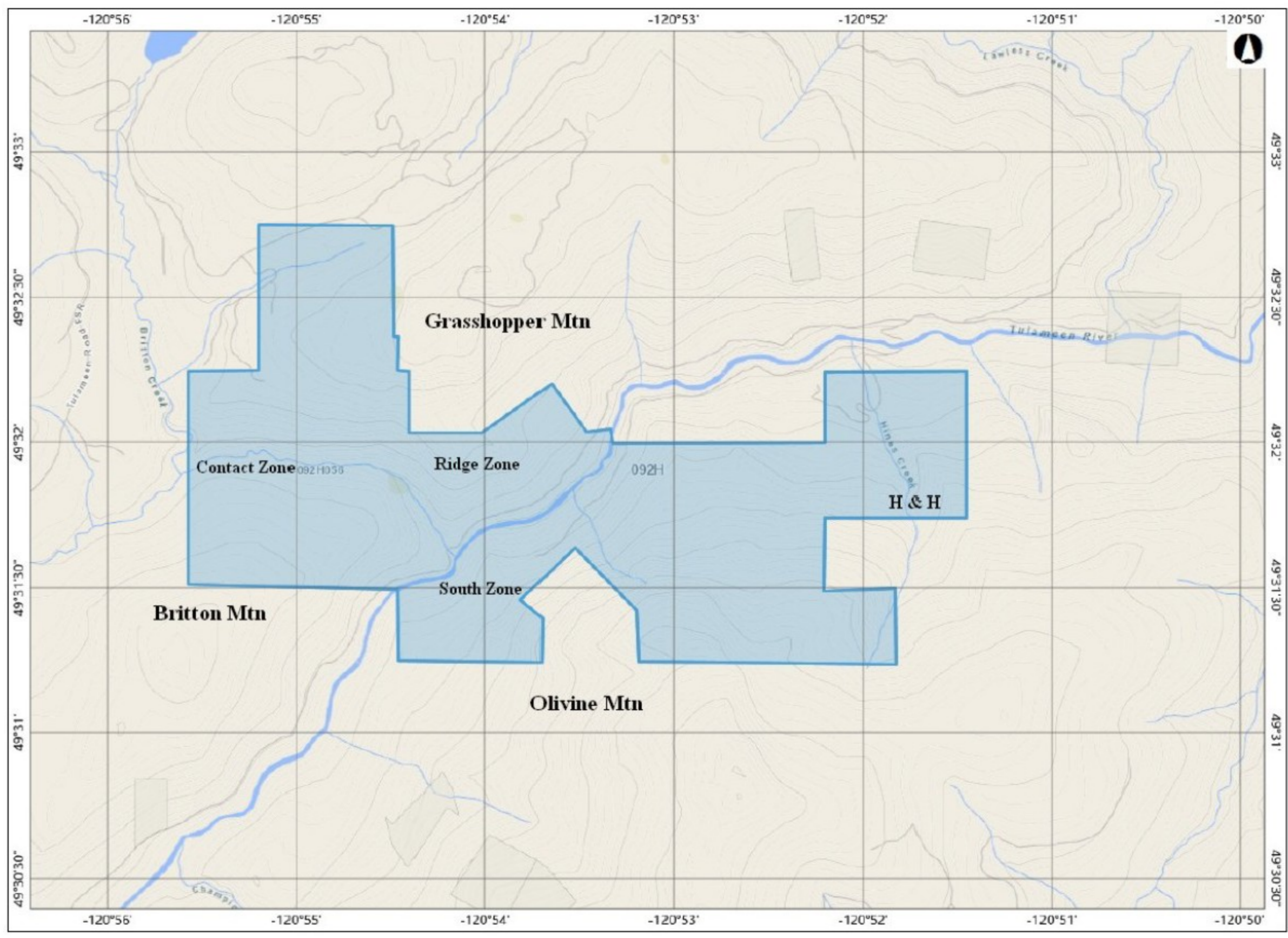
The upper part of the river runs through a wide valley extending from its headwaters in Paradise Valley southward to Champion Creek. The river continues through a narrow rock-walled canyon between Grasshopper and Olivine Mountains to the mouth of Olivine (Slate) Creek. The gravels in this canyon are generally no more than a metre thick and occur in the creek bed and in benches on the sides of the valley, either in or above the level of the canyon.

Below Olivine Creek, a broad valley floor filled with deep gravel deposits opens and continues past the towns of Tulameen and Coalmont to a point 2 kilometres below Granite Creek.

The Tulameen River then cuts through a canyon to a point 5 kilometres west of Princeton. Here, the river enters a broad valley that eventually merges with that of the Similkameen River at Princeton (Minfile 092HNE199).

The Company's mineral property lies mostly in between the Britton Creek to the west and the Hines Creek to the east. Britton Creek is a northern Tulameen River tributary, while Hines Creek is a southern Tulameen River tributary.





**Fig. 2 - Tulameen Platinum Project Access & Topo**

**Legend**

- National Parks - Outlined
- National Parks - Colour Filled
- Ecological Reserves - Tantalus
- Protected Areas - Tantalus
- Recreation Areas - Tantalus
- Conservancy Areas - Tantalus
- Mapsheet Grid (1:20,000)
- Mapsheet Grid (1:250,000)
- Land Act Primary Parcels - Filled

Contours - (1:20,000)

- Contour - Index
- Contour - Index Indefinite
- Contour - Index Depression
- Contour - Index Depression Indefinite
- Contour - Intermediate
- Contour - Intermediate Indefinite
- Contour - Intermediate Depression
- Contour - Intermediate Depression Indefinite

- Federal Transfer Lands - Outlined
- Federal Transfer Lands - Coloured

0 0.75 1.5 km

1: 36,111

**Dan V. Oancea**  
 for  
**North Bay Resources Inc. -**  
**August 2018**

Datum: NAD83  
 Projection: Web Mercator



The Project is generally in steep terrain characterized by the presence of bluffs on both the north face of the Olivine Mountain and the south face of the Grasshopper Mountain. The Tulameen River section that flows east-west through the mineral property is narrow and represented by a canyon.

The Project is centered on the Britton Creek which also flows through a narrow canyon for 4 km from its confluence with the Tulameen River.

The mineral property is partially covered by coniferous type forests usually developed on glacial till. Lower elevations are sometimes covered by dense second growth. A few types of plants that can grow on 'serpentine soils' have developed on the ultramafic rocks of the Grasshopper and Olivine Mountain. The plants that grow on the Grasshopper Mountain are neither protected nor considered endangered in British Columbia.

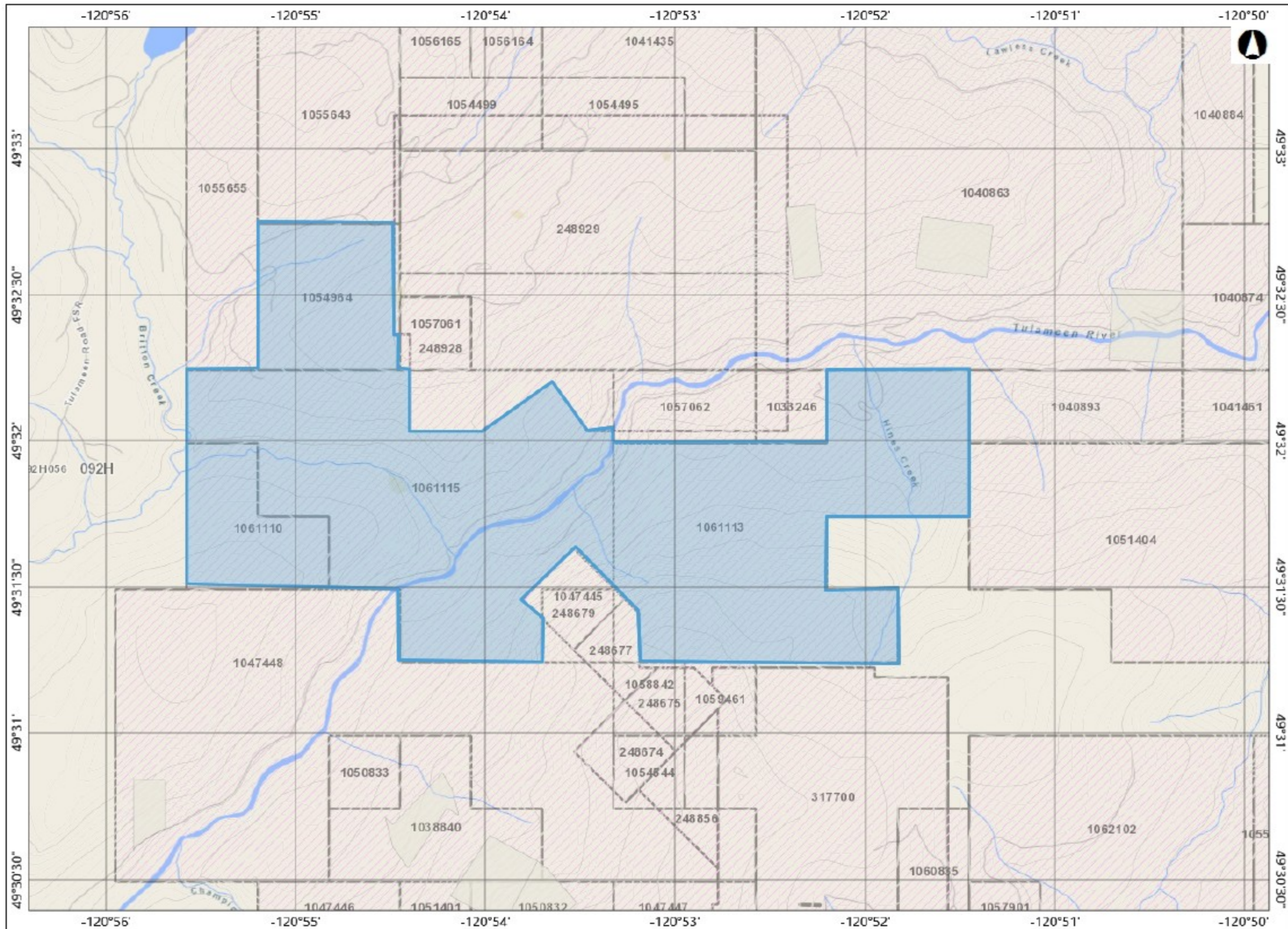
#### **4.2 Mineral Claims**

The Tulameen Platinum Project consists of four mineral claims that cover 796.79 hectares (1,968.91 acres). The claims are 100% owned by North Bay Resources Inc. and are centred at 49° 31' 56" N and 120° 53' 31" W (652534 Easting, 5488758 Northing – Zone 10). The mineral property is part of the NTS 092H10 map.

The Tulameen Platinum project's mineral claims partially overlap a few small legacy claims on its southern and northern borders. The writer did not research the title to the legacy claims, as these are not considered material to the viability of the project.

**TABLE 1: MINERAL TITLES AT TULAMEEN PLATINUM MINERAL PROPERTY**

<b>Tenure Number</b>	<b>Claim Name</b>	<b>Owner</b>	<b>NTS Map Number</b>	<b>Good to Date*</b>	<b>Status</b>	<b>Area (ha)</b>
1054964	TP NW	204090	092H10	2021/SEP/10	GOOD	83.85
1061110	TP SW	204090	092H10	2021/SEP/10	GOOD	62.91
1061113	TP E	204090	092H10	2021/SEP/10	GOOD	293.57
1061115	Tulameen Platinum	204090	092H10	2021/SEP/10	GOOD	356.46
<b>TOTAL</b>						<b>796.79</b>



**Fig. 3: Tulameen Platinum Project Mineral Tenements**

**LEGEND**

- National Parks - Outlined
  - National Parks - Colour Fille
  - Ecological Reserves - Tanta
  - Protected Areas - Tantal
  - Recreation Areas - Tantal
  - Conservancy Areas - Tantal
  - Mapsheet Grid (1:20,000)
  - Mapsheet Grid (1:250,000)
  - Land Act Primary Parcels - 1 Filled
  - Contours - (1:20,000)
  - FOODE
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  - Contour - Index Depression
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  - Federal Transfer Lands - Co
  - Mineral Reserves (Operator
  - MTA\_SITE\_ORDER\_RESTRI\_C
  - No Registration
  - Conditional
  - Conditional, Release Required
- 0 0.73 1.5 km
- 1: 38,111

**Dan V. Oancea  
for  
North Bay  
Resources Inc. -  
August 2018**

Datum: NAD83  
Projection: Web Mercator

Key Map of British Columbia



### **4.3 Climate, Local Resources, Infrastructure**

Climate is typical of southern B.C. interior mountainous areas: moderate winters with warm and semi-arid summers. The region experiences moderate precipitation (356 mm per year) due to being located on the lee side of the Cascade Mountains. Snow covers higher elevations starting in November and lasts until late May. There is usually only a light snow cover that averages 22 cm, but heavier snowfalls could also occur.

The seasonal snow melt reaches its climax in June and July when it causes heavy water flows on the local creeks and rivers. Starting with the month of August the water level on most of the creeks recedes and they all could be easily forded.

Mining and the forestry industry are mainstays of the local Princeton economy. There are three mining operations surrounding the Tulameen Platinum Project: the important Copper Mountain Mine located 14 km south of Princeton; the Basin Coal Mine located south of Coalmont about 9 km up on the Blakeburn Forestry Road; and, the Treasure Mountain silver-base metals mine located about 17 km southwest in direct line of the Tulameen Platinum Project. Both the Basin Coal Mine and the Treasure Mountain Mine are in care and maintenance.

Infrastructure is good with good logging roads connecting the project area with the community of Tulameen.

Accommodation, food and gas could be provided and sourced from Tulameen and Princeton.

### **4.4 History and Development**

Gold was first discovered in the Similkameen region in 1853 by George B. McClellan but mining commenced only in 1860 when placer mining activities started on the Similkameen River at the Blackfoot Camp located 11 km south of Princeton.

The 1861 discovery of gold in the Cariboo region of British Columbia caused most of the local placer miners to leave the poorer Similkameen diggings for the prospect of new riches. A few Chinese miners stayed behind and continued mining the river for the next 25 years. They had not engaged in any prospecting activity so the 1885 Tulameen Gold Rush took them by surprise.

In 1885, cowboy Johnny Chance noticed gold nuggets in the Tulameen River next to the confluence with Granite Creek, which is one of Tulameen River's southern tributaries. Large quantities of gold were subsequently found on Granite Creek and on the Tulameen

River and many of its southern tributaries. Early placer miners noticed the association of gold with a heavy whitish metal but not recognizing it as platinum they have initially discarded it. By 1891, the Tulameen mining district was considered to be the most important producer of platinum in North America.

A city was founded at the confluence of Granite Creek with the Tulameen River. Granite City boasted a population of over 700 people and was a typical city for the gold rush era. The community of Tulameen has developed during the same years, while the community of Coalmont was founded in 1912 when the gold rush subsided, and the development of local coal deposits has already started. No hardrock platinum mine has ever been developed in the Tulameen area.

There are no pre-1885 placer mining activity records as many of the miners (Americans and Chinese alike) used to ship the gold out of the country without paying taxes. There is even less information on the quantity of platinum produced in the region as it was usually shipped and sold out of the province. The records after 1885 are 'reasonably complete'. (Bulletin 28, Placer Gold Production in BC)

In the period 1885 to 1950, some 42,719 ounces of gold were reported as being produced in the Similkameen Mining Division. It is considered that a total of 20,000 ounces of platinum have been placer mined in the region in the period leading to 1905.

Production of placer gold on the Tulameen River was first reported in 1877, but it may have commenced as early as 1860. By 1887, most of the shallower gravel deposits mined along the Tulameen River were reported to be exhausted (ARMM 1887). That might be the reason why in 1890 only Indians (over 100) and a few Chinese were reportedly mining the Tulameen River by employing rudimentary methods (rockers). During that year a Chinese miner reportedly recovered 40 ounces of platinum from the river (ARMM 1890).

A few operators persisted in mining the upper section of the river through the early 1900s. One operation on the Schubert lease, 10 kilometres above Tulameen, recovered 620 grams of gold and also some platinum from 1500 cubic metres of gravel (ARMM 1916).

High platinum prices during the WWI and 1920s prompted a revival of placer mining along both the upper and lower sections of the river. Several deposits saw significant production during this time on the upper part of the river. The Sootheran lease, 1 kilometre below Britton (Eagle) Creek, was operated intermittently between 1925 and

1947, producing 3,920 grams of platinum and 530 grams gold between 1926 and 1928. The claim is located on the Company's Tulameen mineral tenements.

Big Bend Platinum Gold Mining Company Ltd. produced 280 grams of gold and 930 grams of platinum from the J. Marks lease, 10 kilometres upstream from Tulameen (ARMM 1928). Sporadic exploration and placer mining occurred during the 1950s, 1960s and 1970s, mostly below the canyon, in between Olivine Creek and the town of Tulameen. Crude gold production for the entire river between 1885 and 1945 is estimated at 297,000 grams (9,548 ounces). (Minfile 092HNE199)

Most of the British Columbia mining production records could be found in the Annual Reports of the Minister of Mines (ARMM).

Gold and platinum placer deposits have been found within the lower 40 kilometres of the Tulameen River. Most of the recorded production and exploration has occurred along two stretches. The upper stretch begins about 2 kilometres west of the Tulameen Village and continues up the river for 12 kilometres to the mouth of Champion Creek. The lower stretch begins at Coalmont, just above the mouth of Granite Creek, and continues southeast for 19 kilometres to Princeton. (Minfile 092HNE199)

The Tulameen River section in between the Olivine (Slate) Creek and Champion Creek is mostly underlain by mineral claims belonging to the Company's Tulameen Platinum Project and it was the richest in placer platinum. On this section the gold to platinum ratio in placer deposits was 1:1 but close to the mouth of the Britton Creek more platinum had been recovered than gold.

In general placer mining activities on the Tulameen River have been concentrated on areas endowed with thinner alluvium (gravels) or on higher elevation benches. This was also characteristic for the narrow rock walled canyon located on the Company's mineral claims. Areas where the Tulameen valley was larger display thicker but poorer gravels which have never been worked for gold or platinum. (Camsel, 1913)

Kemp (1902) noted that the larger platinum nuggets found in river are associated with chromite, olivine and pyroxenes. He was the first to propose that placer platinum was derived from ultramafic rocks that outcrop in an area cut by the river and which coincided with the richest platinum placer deposits.

Important contributions to understanding the geology of the Tulameen Ultramafic Complex and its mineralization were brought by Camsell (1913), O'Neill and Gunning (1934), Findlay (1969), Mertie (1969), St. Louis (1981), and Nixon (1987, 1990).

The platiniferous dunite rocks of the Tulammen Ultramafic Complex continued to attract the attention of numerous explorers. Explorers with notable finds include Imperial Metals (1984-1986), Newmont Exploration (1986), Longreach Resources Ltd (1987-1988) and Diamet Minerals (1986-1989).

The industrial mineral potential for olivine was evaluated by G.V. White in 1986, K.D. Hancock in 1991, and Diamet Minerals during the period from 1986 to 1989.

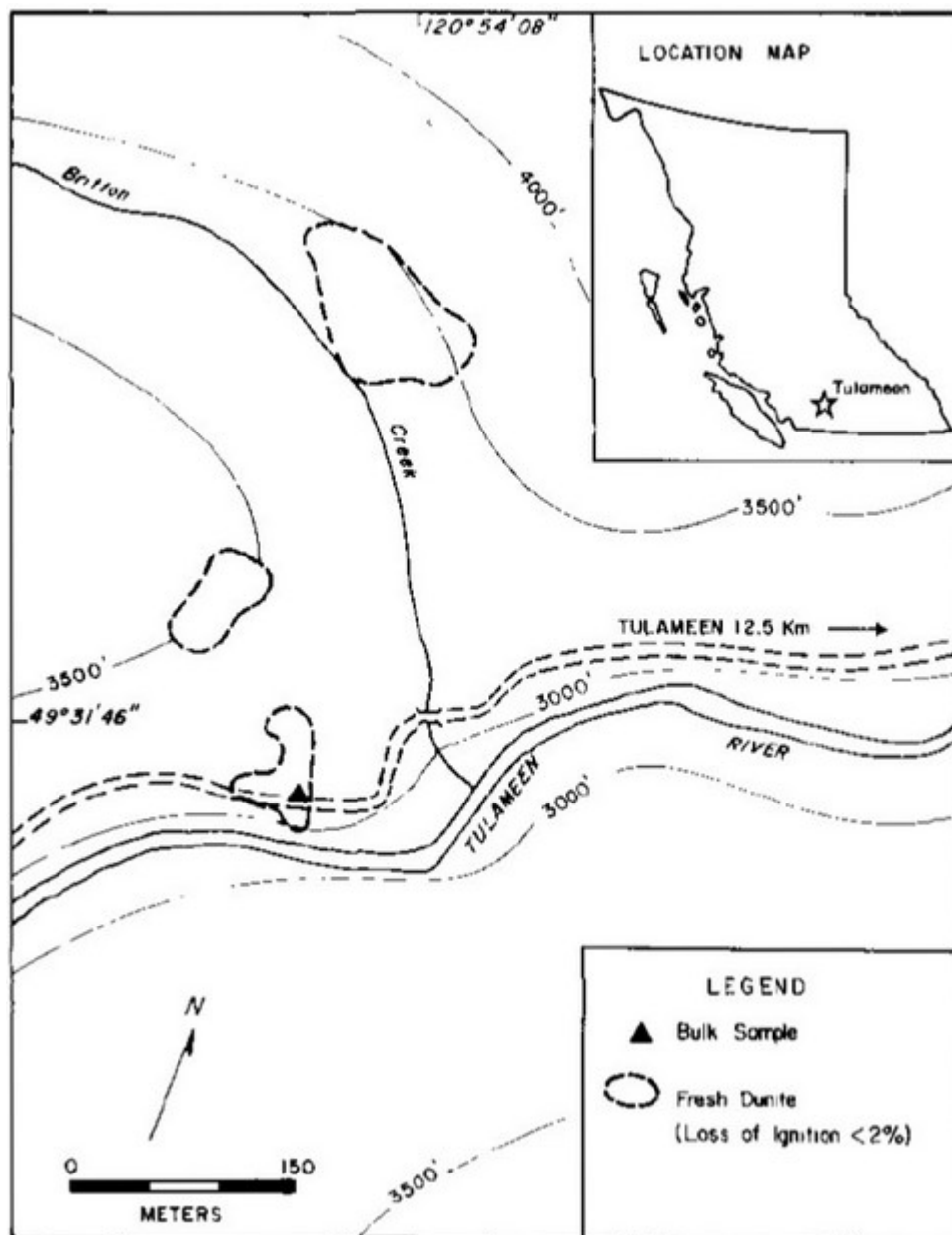


Fig 5: Unaltered Olivine Map (White, 1987)

The carbon dioxide sequestration potential of the Tulameen ultramafic was explored by a series of authors in early 2000s incl. Simandl, G.J. of BCGS who was also involved in studying the magnesium potential of the dunite rocks.

## **5. Geology and Mineralization**

### **5.1 Regional Setting**

The Tulameen Platinum mineral property lies along the western margin of the Intermontane Belt of the Quesnellia tectonostratigraphic terrane. The Quesnell Terrane is a volcano-sedimentary arc terrane that could be found along most of the length of the Canadian Cordillera. The region hosts some of the southernmost exposures of the late Triassic Nicola Group. Clastic sedimentary rocks, dominated by black argillites, which are intercalated with feldspathic tuffs and tuffaceous sediments. These pass westwards, and probably upwards, into typical Nicola pyroxene-feldspar tuffs, lapilli tuffs and breccias. A sequence of massive feldspar basalt and greenstone flows occurs in the area southeast of the Granite Creek campsite.

The volcanic rocks become more deformed to the west, with the change from massive to schistose rocks being transitional and gradual from east to west as foliation becomes progressively more penetrative and steeper. Both schistose metasedimentary and metavolcanic rocks occur in the aureole of the Eagle Plutonic Complex along the western margin of the map area (OF 2010-06).

The Tulameen Ultramafic-Gabbro Complex outcrops over a 60 square kilometers area and is structurally emplaced into, though probably coeval with, the Nicola Group. Several smaller bodies of diorite-gabbro or pyroxenite also occur in the map area. The structural fabric of the area is north-northwest with westward dipping foliation.

The Tulameen complex is elongated and concordant with the structural grain. The Tulameen ultramafic complex consists primarily of dunite, olivine clinopyroxenite, hornblende clinopyroxenite and gabbroic rocks. Dunite is restricted to the northern part of the complex. Olivine clinopyroxenite envelopes the dunite core and extends southward. Breccia bodies occur within this unit. Hornblende clinopyroxenite occurs generally at the periphery of the complex. Gabbroic rocks are most abundant along the eastern side of the complex (OF 1988-25).

Findlay considers that the ultramafic rocks represent fractional crystallization products of an ultrabasic magma. The main ultramafic zone extends from Grasshopper Mountain



south through Olivine Mountain and Lodestone Mountain to Granite Creek (Findlay, 1969).

Volcanic and sedimentary rocks of the Eocene Princeton Group occur in the northern (Tulameen Coal Basin) and eastern (Princeton Basin) parts of the area. They lie unconformably on the Nicola Group and related intrusive rocks. Comagmatic minor intrusions occur throughout the area as ubiquitous intermediate-felsic porphyry dikes.

The local ice movement during the Quaternary glaciation is considered to have been northeast to southwest. Glacial till up to 25 feet (7.6 m) was deposited on the mountainous slopes within the Project area.

The most recent geological maps covering the area are represented by the BC MEMPR Open Files 2010-06, and 2018-2.

## **5.2 Mineralization and Deposits**

The most important mineralization in the Tulameen area is represented by Platinum Group Metals mineralization (PGM) hosted by ultramafic rocks of the Tulameen Complex. The Complex is an Alaskan-type mafic-ultramafic zoned intrusion characterized by the presence of platiniferous cumulate chromites.

Concentrations of chrome spinel and massive chromitite appear to be distributed randomly throughout the dunite as discrete layers, nodular masses and schlieren up to 1 metre in length and 6 centimeters in width. Associated with the chromite are microscopic grains of platinum minerals, nickel-iron sulphides, chalcopyrite and pyrite (St. Louis et al. 1986)

Most of the PGM mineralization is hosted by the dunite core of the ultramafic intrusion.

As a result of the weathering of the platiniferous rocks of the Tulameen Complex and of the other groups of rocks rich platinum and gold placers have been formed on the creeks and rivers that dissect them. While no hardrock source of gold has been clearly identified to date, the Nicola Group rocks could be one of the most important sources.

The precious metals placers of the Tulameen region have been formed before the onset of the Quaternary glacial period and as a result parts of them were obliterated by the moving ice. The wider sections of the Tulameen River valley have experienced the forming of valley glaciers which also scraped the valley's bottom and deposited glacial boulders resulting in the dilution of the placers along these sections.

As a result, even though the wider sections of the valleys are abutted by productive placers they have been rarely worked because of thicker gravels and lower grades. For example, in 1922 an attempt was made to dam the Tulameen River and work the bedrock immediately below the canyon (and Company's claims) but the bottom was found to be flat because of ice scouring it at winter time (ARMM 1922), or because of the work of a valley glacier in the not too distant past.

Older terraces have been preserved along the Tulameen River and many of them have been early on recognized as having a high tenor. The Hines Creek Placer, which is located on the Company's claims, is at over 900 m in elevation and represents an old Tulameen River bench.

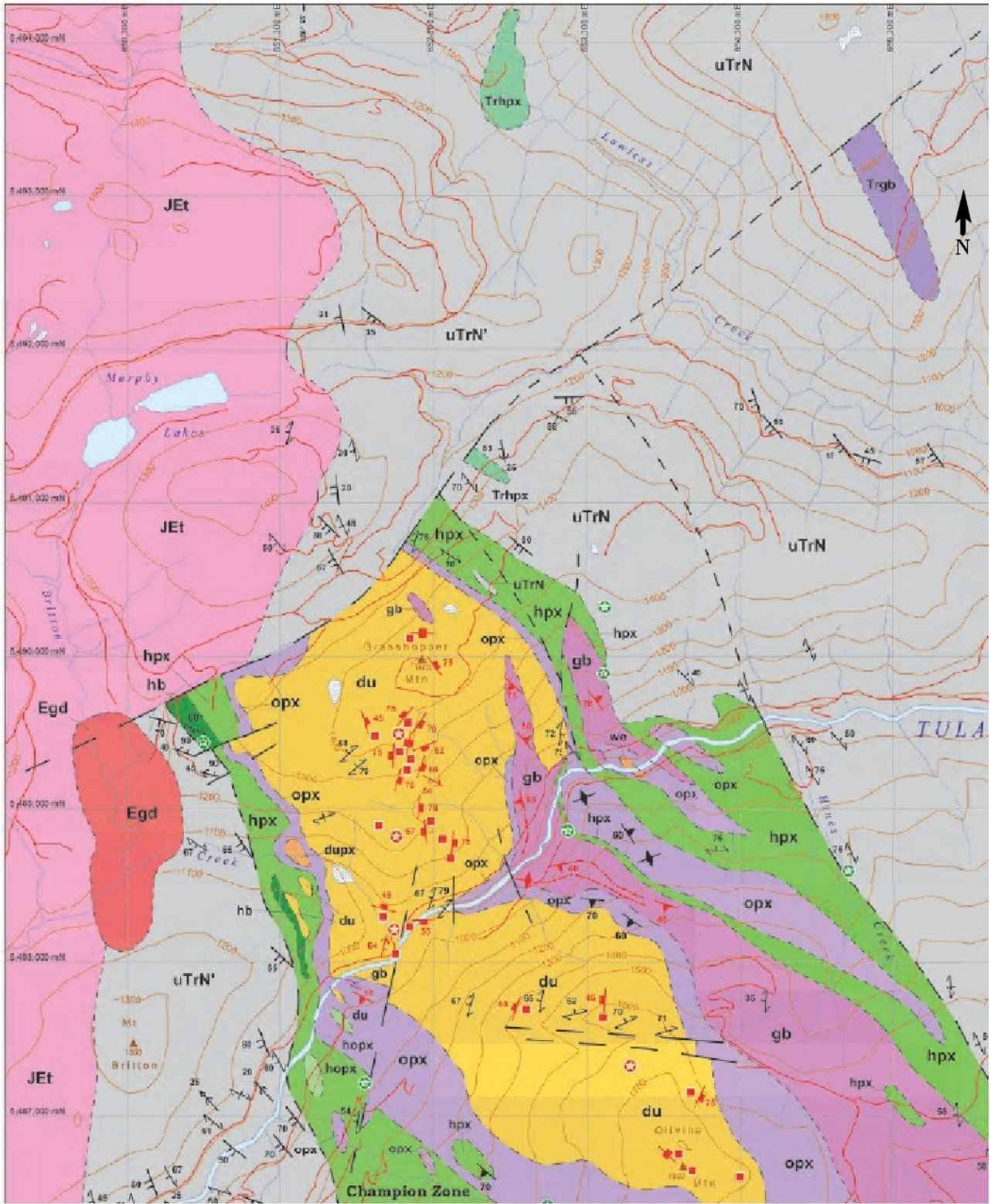
Most of the gold recovered from the Tulameen River was rough and not worn therefore denoting a local origin. Large platinum nuggets were rare but some nuggets weighing up to 0.5 ounces have been recovered from the Tulameen River mostly from the section that is underlain by North Bay Resources' mineral claims. Typically, most of the placer platinum was in the range of 1-4 mm and taking the shape of small rounded pellets. The coarsest and richest platinum was found on the stretch of the Tulameen River in between the Olivine (Slate) Creek and Champion Creek, which coincides with the Company's claims and with the outcrops of platiniferous dunite rocks. (Mertie, 1969).

It was estimated that total platinum production from the Tulameen area exceeded 20,000 ounces of which an important part came from the Tulameen River downstream of the platiniferous dunite rocks of the Tulameen Complex, and also from the Granite Creek.

Other important mineral deposits that were mined starting with 1909 are the Eocene coal deposits of the Tulameen and Princeton Basins. Nowadays the only coal producer in the Tulameen and Princeton Basins is represented by the Basin Coal Mine located 9 km south of Coalmont but the mine is presently on care and maintenance.

Numerous other types of mineral occurrences are described in the Tulameen regional Minfile database. The most important are represented by magnetite deposits in hornblende clinopyroxenite on the Lodestone Mountain (2.84 million tonnes at 24.33% magnetite) and on the Tanglewood Hill (2.84 million tonnes at 16.8% iron). They are hosted by hornblende pyroxenite rocks of the ultramafic complex.

Most of the other Minfile occurrences present in the area are represented by mineralized (copper, lead, zinc, gold, silver) quartz veins and shear zones hosted by the Nicola Group rocks or by gabbro and pyroxenites of the Tulameen Complex. Many of these mineralized zones are hosted in structures parallel to the regional grain.



**Fig 6: Regional Geological Map OF 2018-2 (1:25,000)**

## **LEGEND:**

### **LAYERED ROCKS:**

**uTrN:** Nicola Group undivided volcanic-sedimentary rocks

### **INTRUSIVE ROCKS:**

#### **Eocene**

**Egd:** Britton stock granodiorites

#### **Middle to Late Jurassic**

**JEt:** Eagle tonalites to granodiorites

#### **Late Triassic**

**Trgb:** Gabbro

#### **Tulameen Ultramafic Intrusion:**

**gb:** Gabbro

**hpx:** Hornblende clinopyroxenite

**opx:** Olivine pyroxenite

**du:** Dunite

### 5.3 Property Geology and Mineralization

The Tulameen Platinum Project covers the exposed platiniferous dunite core of the zoned Tulameen Ultramafic Complex (TUC) and part of its eastern and western contact zones with the surrounding Nicola Group rocks.

The rocks making up the intrusive TUC are represented by dunite, olivine pyroxenites, hornblende pyroxenites, gabbro and monzodiorites rocks representing a typical Alaskan-type zoned intrusion.

The dunite rock is principally made of forsteritic (magnesium rich) olivine, accessory chromite, and rare diopside. The rock is medium to dark grey, buff weathering and well jointed. The serpentinized (altered) rock contain serpentine, carbonates, magnetite and talc. Concentrations of chrome spinel and massive chromitite appear to be distributed randomly throughout the dunite as discrete layers, nodular masses and schlieren up to 1 m in length and 6 cm in width. Chromitite schlieren are commonly distinguished in outcrop by a pale alteration halo (0.1 to 1 cm). Associated with chromite are microscopic grains of platinum minerals (platinum -iron alloys, sperrylite), nickel-iron sulphides (pentlandite, violarite, bravoite), chalcopyrite and pyrite (St.Louis et al. 1986).

The olivine clinopyroxenites envelop the dunite core of the Tulameen complex. The fresh rock is medium to coarse grained and has a blotchy green and black appearance due to partially serpentinized olivine (<20 per cent serpentine) and deep green clinopyroxene. Sporadic pegmatitic masses contain crystals up to 8 cm across and olivine segregations locally form schlieren (Nixon, 1987).

Breccias within the olivine clinopyroxenite unit occur near the western margin of the dunite. Angular to rounded blocks (<0.5 m) of dunite, pyroxenite and interlayered dunite-pyroxenite are enclosed in a serpentinized pyroxene-rich matrix carrying calcite and disseminated sulphides (mostly pyrite).

The hornblende clinopyroxenite occurs at the periphery of the complex. The fresh rock is medium to coarse grained and contains diopsidic augite, hornblende, relatively abundant magnetite, and minor biotite, apatite and disseminated sulphides; feldspathic variants are extremely rare. Massive magnetite could be found in this type of rocks (Nixon, 1987).

The gabbroic rocks or monzodiorites are distributed erratically on the eastern side of the complex mostly in direct contact with the olivine clinopyroxenite and hornblende clinopyroxenites rocks. The rocks are massive, sometimes well foliated, and at times affected by saussuritization processes which impart it with different shades of green (Nixon, 1987).

Nixon (1987) describes an almost continuous 530 m long section along the Tulameen River, beginning at the eastern margin of the dunite body and passing through olivine clinopyroxenite into the gabbro rocks. The rocks featured in the section are cut by unfoliated hornblende-bearing dacitic and basaltic dykes, probable feeders for Tertiary lavas in the Princeton Group and Miocene basalts and contains major tectonic breaks at the dunite-pyroxenite and pyroxenite-gabbro contacts. Two thin gabbro units are also well exposed within the pyroxenite.

Findlay (1963, 1969) concluded from contact relationship that gabbroic and ultramafic units represented two separate intrusions, an early gabbroic mass invaded by an ultramafic body in which dunite was the latest emplaced.

Nixon (1987) considers that the occurrence of pyroxenite dykes cutting dunite, suggests that dunite crystallized prior to the pyroxenites. The main body of gabbroic rocks to the east also predate emplacement of the ultramafic rocks. However, there is evidence that points to a protracted history of gabbro crystallization involving more than one influx of parental magma.

The eastern part of the Tulameen Platinum Project straddles the contact between hornblende pyroxenites rocks of the ultramafic complex and the Upper Triassic undifferentiated sedimentary and volcanic rocks of the Nicola Group. According to the most recent geological map (OF 2010-6) the Hines Creek lies on the contact zone between the aforementioned units.

The transitional or contact zone in between the ultramafic rocks and the Nicola Group rocks is sometimes hosting PGM, gold, and copper mineralization.

Possible disseminated sulphides exist in association with silicification and shearing near contact zones.

Chromitite schlieren are 0.5 to 2 cm in width and 5 to 25 cm in length and the most extensive concentrations were reported on the southern flank of the Grasshopper Mountain (part of them on the Company's mineral claims). Chromitite schlieren represent vestiges of formerly rich extensive cumulate layers that have been subjected to tectonic stress. The platinum arsenide mineral sperrylite can be found as fracture filling in chromites (Kemp, 1902)

A detailed description of the Project's mineralized zones featuring a wide range of commodities is described in the writer's AR37624.

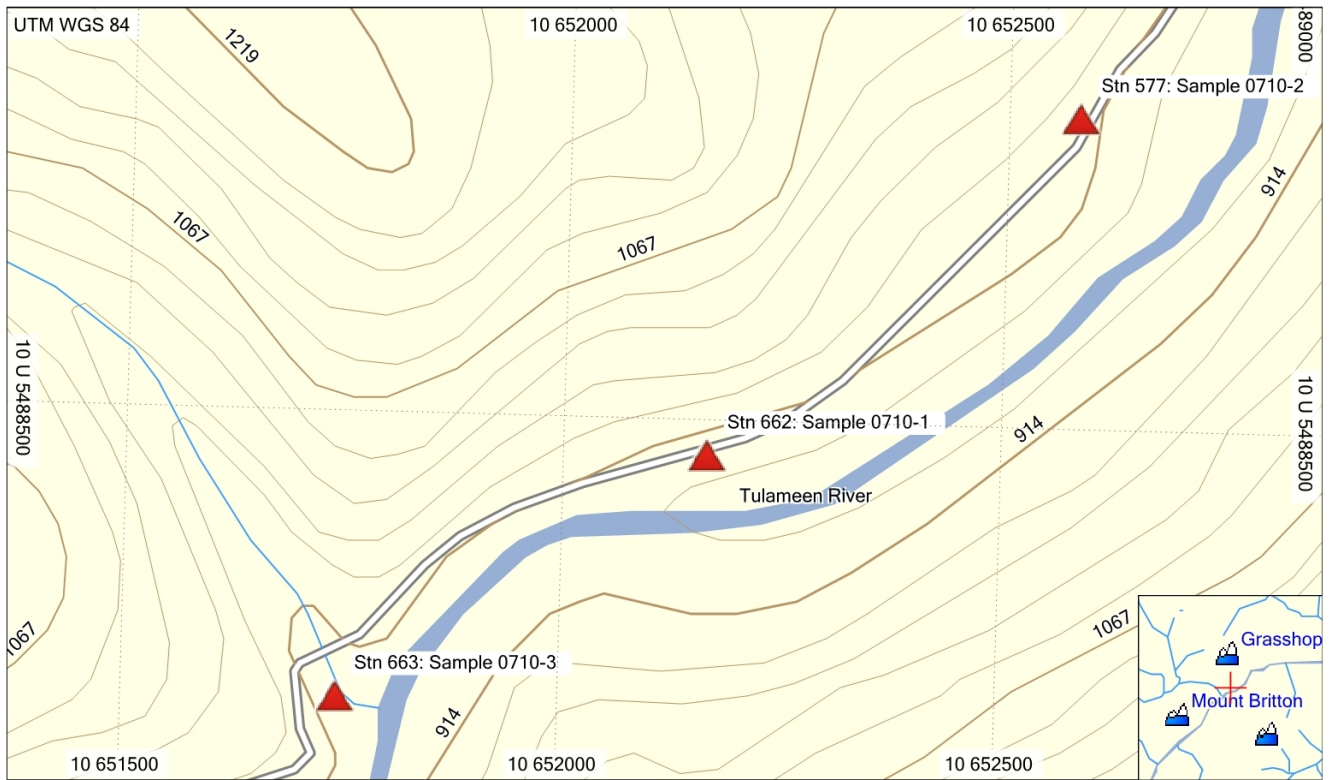


Fig. 4: Tulameen Platinum Sampling Map

Dan V. Oancea for North Bay Resources Inc - July 2019

## **6. Field Survey**

The October 2018 selective rock sampling survey was focused on assessing the olivine mineral potential of the mineral claims as well as on understanding the mineralogy of other Tulameen Ultramafic Complex rocks.

Samples of relatively fresh (0710-1) as well as altered dunite rocks (0710-3) have been collected. Hornblende pyroxenite samples (0710-2) have also been collected and analyzed.

## **7. Lab Assessment**

Thin sections of the three samples were made before examination in petrographic microscope. On the same thin sections (no cover glass) a state-of-the-art ZEISS Sigma 300VP Field Emission Scanning Electron Microscope were employed.

The instrument is equipped with 2 Bruker X flash 6|30 129 eV EDS detectors, a Bruker e-Flash FS EBSD detector, a 185-850 nm Light-Guide Cathodoluminescence detector.

The Scanning Electron Microscope contains the Mineralogic software platform for various rock types. The software is capable of performing automated mineralogy (Bruker Report) on the entire thin section.

The combined evaluation of data in the Bruker report has led to definition of mineral phases as indicated in Table 1, below.

### **7.1 Results**

The Electron Microscope analyses validated the types of rocks and the serpentinization alteration products which affect some of the dunite rocks.

The olivine magnesium content is also within the expected range i.e. 34-35% magnesium.

Chromite was relatively ubiquitous within the dunite samples. One single instance of a zinc sulphide (possibly sphalerite) was noted.



Table 2: Compilation of mineral phases tentatively identified by scanning electron microscopy on three thin sections from the Tulameen mineral property

Sample	Image	Mineral	O	Mg	Al	Si	P	K	Na	Ca	Ti	Mn	Fe	S	Cr	Zn	Total
710-1.11	710-103	Olivine	38,17	34,98		6,29							20,56				100
710-1.12	710-103	Iron oxide	26,65	0,76		0,19							72,40				100
710-1.13	710-103	Mg Serpentine	48,00	38,08		7,45							6,47				100
710-1.14	710-103	Chromite	26,38	4,76	8,56						0,98		35,39		23,93		100
710-1.15	710-103	Mg Serpentine	47,65	37,31		8,64							6,40				100
710-1.16	710-103	Magnesite?	52,86	43,35		0,26							3,53				100
710-1.17	710-104	Talc?	45,08	30,68	0,22	22,34							1,67				99,99
710-1.18	710-104	Talc?	46,09	28,34	0,17	23,59							1,81				100
710-1.19	710-104	Talc?	46,47	29,41	0,09	22,02							2,01				100
710-1.20	710-104	Magnesite?	49,72	40,87		0,28						0,85	8,28				100
710-1.21	710-104	Talc?	45,31	29,93		22,73							2,03				100
710-1.45	710-105	Olivine	36,49	32,20		20,86						0,46	9,99				100
710-1.46	710-105	Chromite	25,63	4,15	7,49						0,87	1,45	35,18		25,23		100
710-1.47	710-105	Chromite/iron oxide	23,40	1,82							1,00	1,44	51,86		20,48		100
710-1.48	710-105	Talc?	45,70	33,26	0,00	19,34							1,69				100
710-1.49	710-105	Talc?	45,96	28,08	0,34	23,50							2,12				100
710-1.5	710-102	Olivine	37,59	34,40		6,58							21,43				100
710-1.50	710-105	Talc?	45,28	30,49		22,87							1,36				100
710-1.51	710-106	Chromite	25,10	5,23	9,28						1,18	1,26	34,68		23,26		100
710-1.52	710-106	Iron oxide	23,71	1,33									74,96				100
710-1.53	710-106	Talc?	45,17	29,06	0,22	23,63							1,92				100
710-1.54	710-106	Magnesite?	52,51	42,97		0,20				0,39		0,46	3,46				100
710-1.55	710-106	Magnesite?	52,17	43,21		0,16						0,75	3,71				100
710-1.56	710-106	Iron oxide	27,63	8,57		3,92							59,88				100
710-1.57	710-107	Chromite	25,27	3,36	8,19						1,26	1,37	38,15		22,40		100
710-1.58	710-107	Talc?	45,76	29,11	0,45	22,40							2,29				100
710-1.59	710-107	Chromite	25,33	3,14	7,81	0,27					0,96	1,48	39,05		21,96		100
710-1.6	710-102	Chromite	24,68	2,94	7,36						1,08	1,27	41,65		21,02		100
710-1.60	710-107	Chromite	25,11	4,72	8,10						1,11	1,14	37,06		22,77		100
710-1.61	710-107	Chromite	25,22	3,40	7,98						1,08	1,30	39,99		21,03		100
710-1.7	710-102	Mg Serpentine	49,12	38,91		8,67							3,30				100
710-1.8	710-102	Mg Serpentine	48,09	38,80		8,07							5,04				100
710-1.9	710-102	Olivine	38,21	35,98		6,02							19,80				100
710-2.34	710-202	Apatite	34,40				17,84			47,76							100
710-2.35	710-202	Amphibole	37,78	13,61	2,12	27,92			0,54	8,97		0,45	8,62				100
710-2.36	710-202	Amphibole	37,51	10,02	5,47	21,32		0,24	1,45	10,47	0,51	0,35	12,67				100
710-2.37	710-202	Albite/Jadeite?	41,40		15,96	30,72		3,01	7,41	0,82			0,69				100
710-2.38	710-202	Albite/Jadeite?	41,09		14,81	32,19			10,48	1,43							100
710-2.39	710-203	Iron sulphide				0,20							46,58	53,22			100
710-2.40	710-203	Amphibole	37,31	10,10	7,81	19,37		0,36	2,34	10,80	2,63		9,27				100
710-2.41	710-203	Amphibole	36,48	8,74	8,68	18,78		0,44	2,30	11,40	2,22		10,63				99,689
710-2.42	710-203	Apatite	34,51				17,67			47,82							100
710-2.43	710-203	Albite/Jadeite?	38,56		16,87	34,15			8,29	2,13							100
710-2.44	710-203	Albite/Jadeite?	41,50		13,35	30,19		0,32	13,89	0,74							100
710-3.22	710-302	Chromite	23,77	3,79	4,55						0,52	2,07	32,73		32,57		100
710-3.23	710-302	Talc?	42,77	31,68		23,87				0,30			1,22	0,16			100
710-3.24	710-302	Carbonate	49,66	4,33						46,02							100
710-3.25	710-302	Talc?	37,76	34,80		21,24						0,51	5,69				100
710-3.26	710-302	Iron oxide	19,12			0,19				0,78			79,91				100
710-3.27	710-302	Magnesite?	52,91	39,27		0,16				4,69			2,97				100
710-3.28	710-201	Iron sulphide			0,27	1,04				1,99	2,05		47,12	47,53			100
710-3.29	710-201	Amphibole	36,82	9,22	7,61	19,78		0,40	1,98	11,16	2,17	0,45	10,42				100,01
710-3.30	710-201	Amphibole	37,04	9,41	7,42	20,89		0,37	2,07	9,69	1,06	0,46	11,58				99,99
710-3.31	710-201	Albite/Jadeite?	42,30		14,18	32,46			9,82	1,23							99,99
710-3.32	710-201	Albite/Jadeite?	41,94		14,96	30,43			10,07	2,61							100,01
710-3.33	710-201	Apatite	34,57				17,07			48,36							100
710-3.62	710-304	Iron oxide	24,64	0,92		0,18							74,26				100
710-3.63	710-304	Iron oxide	22,91	1,13									75,96				100
710-3.64	710-304	Talc?	46,56	28,67	0,06	23,09							1,62				100
710-3.65	710-304	Olivine	38,70	34,58		22,20							4,52				100
710-3.66	710-304	Olivine	38,78	34,46		21,55							5,21				100
710-3.67	710-304	Talc?	45,76	30,65		22,26							1,33				100
710-3.68	710-204	Iron sulphide				0,00							85,70	13,01		1,29	100
710-3.69	710-204	Iron sulphide											47,43	52,57			100
710-3.70	710-204	Apatite	34,70				18,06			46,95			0,28				100
710-3.71	710-204	Amphibole	37,19	8,93	8,77	19,47		0,45	1,73	10,28	2,41		10,76				100
710-3.72	710-204	Albite/Jadeite?	49,86		9,01	30,65			5,81	2,30			2,36				100
710-3.73	710-204	Albite/Jadeite?	41,48	0,50	21,89	22,20		11,04	0,36	0,18			2,36				100

## 8. Cost Statement

<b>Salaries</b>	October 9-10, 2018	
Dan Oancea PGeo	2 days Fieldwork @\$577.50/day (Mob/Demob incl.)	\$1,155.00
<b>Accommodation:</b>		\$124.29
<b>Food:</b>	-	\$160.00
<b>Transportation:</b>	705km @ \$0.65/km	\$458.25
<b>Report:</b>	-	\$832.50
<b>TOTAL</b>		<b>\$2,730.04</b>

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## 10. Statement of Qualifications

I, **Dan V. Oancea**, of 507-1148 Heffley Crescent, Coquitlam do hereby certify that:

1. I am a member in good standing with the Engineers and Geoscientists of the Province of Columbia, Canada. I hold a Professional Geoscientist designation. I am also a Fellow of the Geological Association of Canada (GAC), and of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM).

2. I have graduated a 5-year Engineering Program (Thesis) equivalent to a Master Degree and obtained a Geological Engineering Diploma in Geology and Geophysics (1987) from the Babes Bolyai University of Cluj-Napoca, Romania.

3. I have practiced my profession for 21 years. As a professional geologist in the mining industry, I have extensive geological, geochemical, and exploration experience, management skills, and a solid background in research techniques, and training of technical personnel. I have been involved in underground and surface exploration projects in Canada and Europe.

4. As a result of my experience and qualification I am a Qualified Person as defined in National Instrument 43-101.

5. I have authored this report which is based upon review and compilation of data relating to the Tulameen Platinum Project and upon personal knowledge of the property gained from on-site survey work carried out in 2013, 2016, and 2018.

6. I do not own an interest in the Tulameen Platinum mineral property.

Vancouver,

July 24, 2019

Respectfully submitted

Dan V. Oancea PGeo

**Table 3 – Tulameen Platinum Project Samples & Other Important Locations**

<b>Location</b>	<b>Sample No./ Type</b>	<b>Easting*</b>	<b>Northing*</b>	<b>Description</b>
Stn 662	0710-1 Grab	652164	5488458	Unaltered dunite rock
Stn 663	0710-3 Grab	651745	5488166	Serpentinized dunite rock
Stn 577	0710-2 Float	652581	5488862	Hornblende pyroxenite

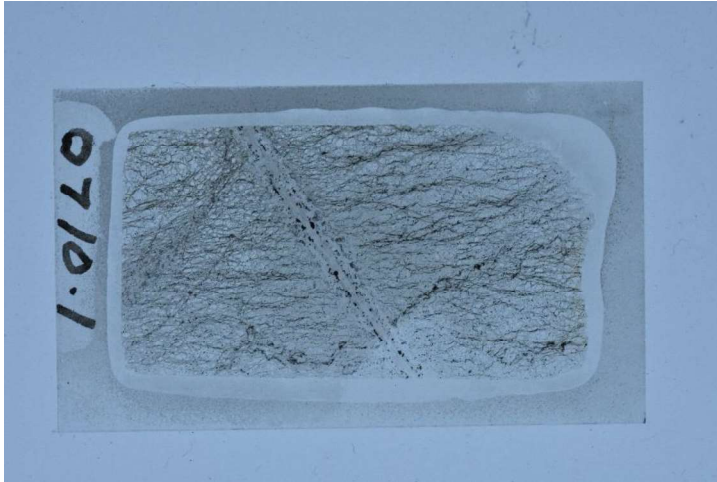
**\*UTM Zone 10 NAD 83**

## **APPENDIX**

**Brucker Report for Sample 0710-1**

The lab work was carried out at the Geological Survey of Greenland and Denmark (GEUS).

An overview photo of each thin section is presented below



**Sample 07/10-1:**  
Unweathered dunite  
with serpentinized  
veinlet

Transmitted polarized  
light

II nicols



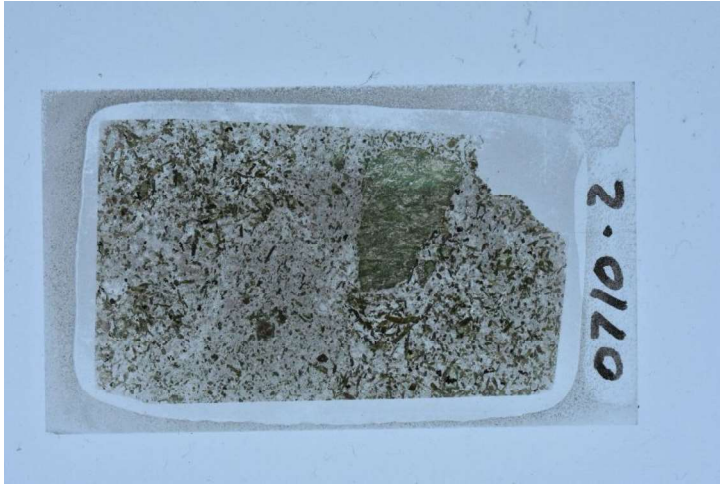
**Sample 07/10-1:**  
Unweathered dunite  
with serpentinized  
veinlet

Same as above

xx Nicols

The red and green  
interference colours are  
typical for olivine.  
Serpentine is dark grey.





Sample 0710-2 II Nicols

Fine grained pyroxenite  
with large clast of  
amphibole  
(pseudomorph after  
pyroxene)



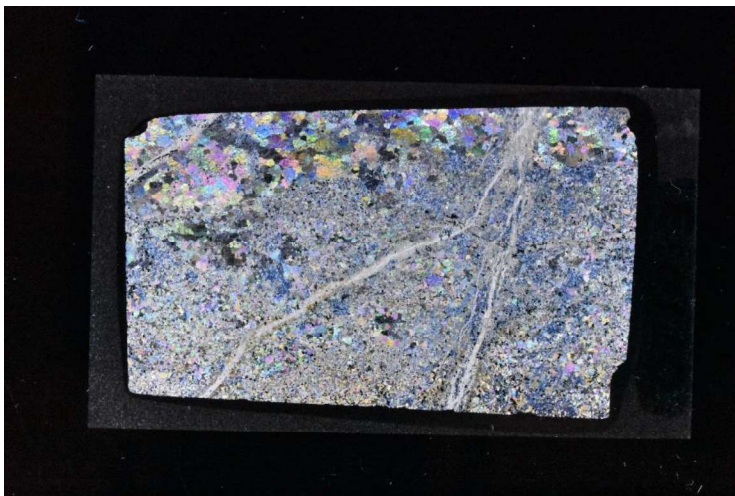
Sample 0710-2 XX nicols

The light grey coloured  
grains are feldspars and  
some apatites whereas  
the greenish grains are  
partly weathered  
pyroxenes



Sample 0710-3 II nicols

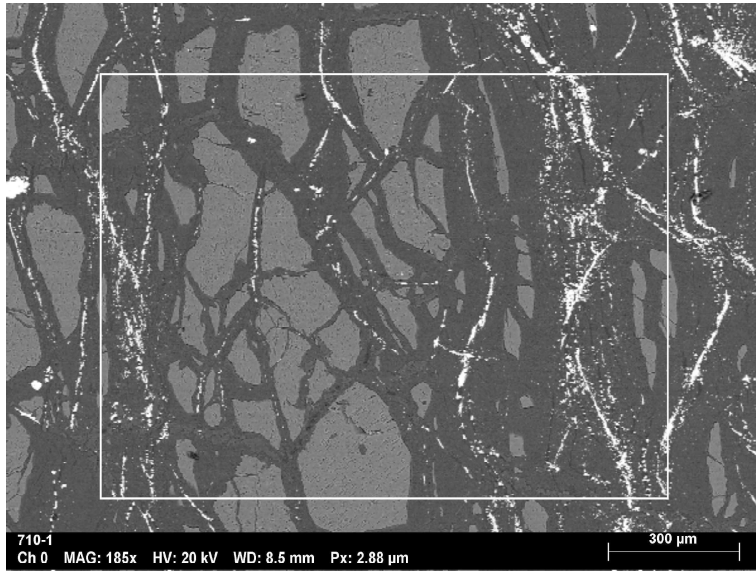
Relatively fresh, fine  
grained dunite with



Sample 0710-3 XX nicols

Fine grained dunite

Image 0710-1-A

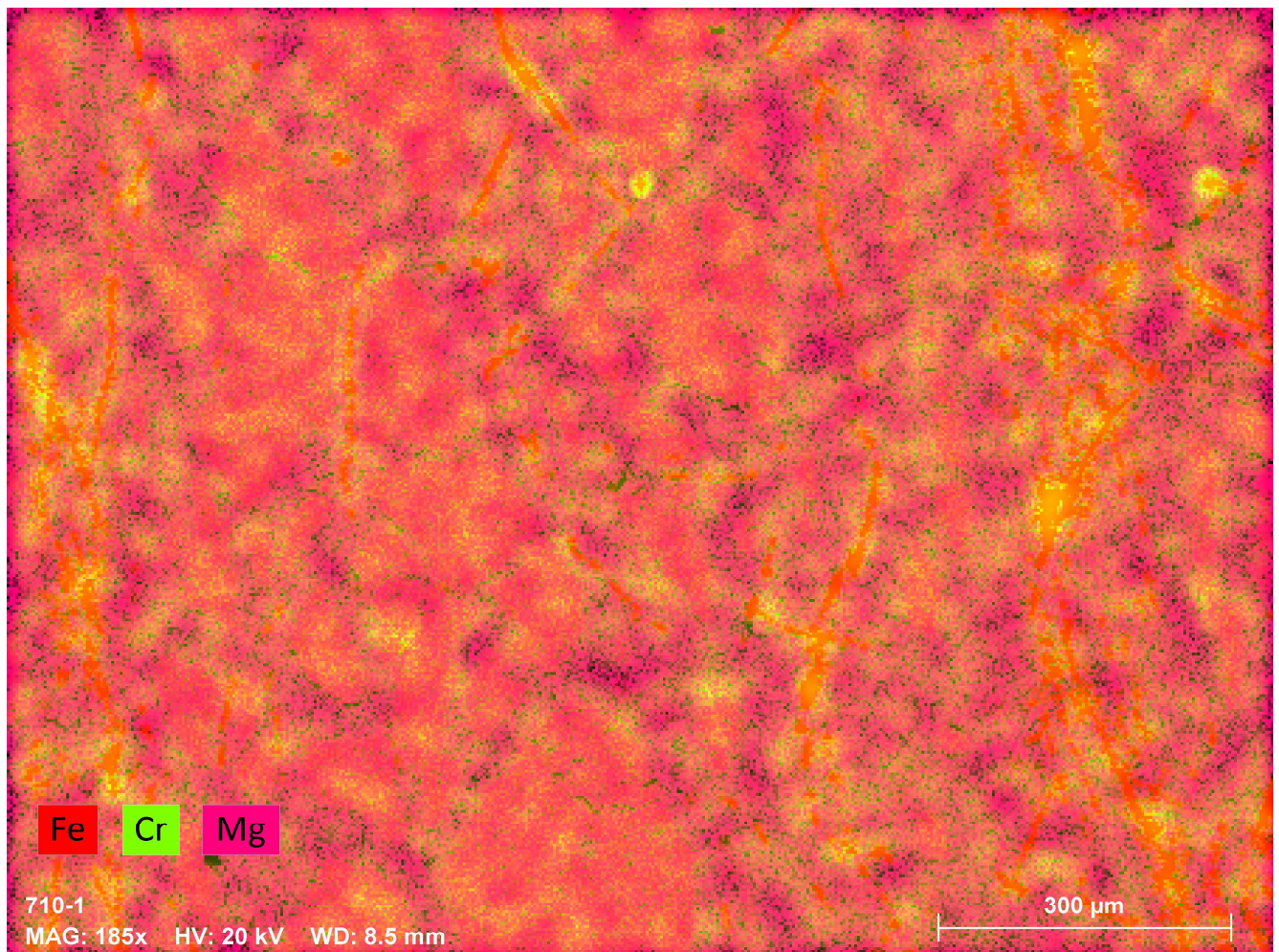


The images on pages 1 and 2 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1..

The image 710-1-A on the left is a scanning electron microscope (SEM) view on part of the thin section made of the 0710-1 sample from Tulameen. In SEM grey scale images, dark grey indicates low average atomic weight and the lighter colours designate relatively higher average atomic weight. The lighter grey massive grains (olivine) are seemingly contained in a dark grey matrix (chemically depleted Mg silicates) with white streaks of veinlets with a high atomic weight typically iron, chromium and heavier elements. The individual elements can be viewed with assigned colours either integrated to one image as in image 710-1 B below or one image for each element as in image assembly on the next page. From this information the actual mineral phase can be tentatively identified. The same format has been used for all subsequent images, image assemblies, diagrams and associated tables throughout the report.

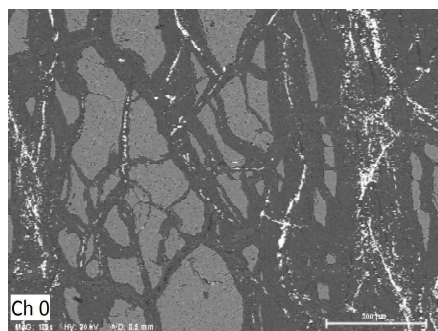
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	14:23:28	20.0 keV	185x	8.5 mm

Image 0710-1-B slightly enlarged from 0710-1-A



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	14:24:51	20.0 keV	185x	8.5 mm

Image assembly 710-1-I

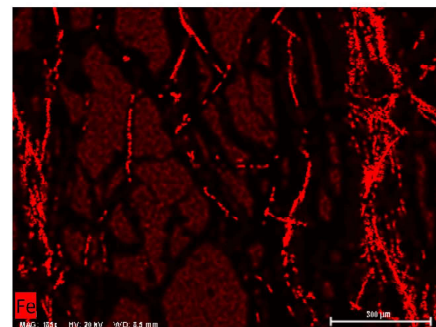


0710 -1-I SEM image continued.

Each of the elements has in the image assembly below, been assigned an individual colour. The actual element is indicated in the left corner of each of the images. The distribution of each element is determined by mineral phase present overprinted with geochemical additions or depletions from the time of emplacement until present. Please note the the actual colours used for the particular elements may change between assembly views presented on pages below in order to enhance the information about distribution of particular elements,

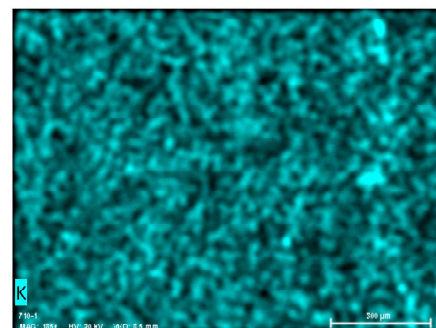
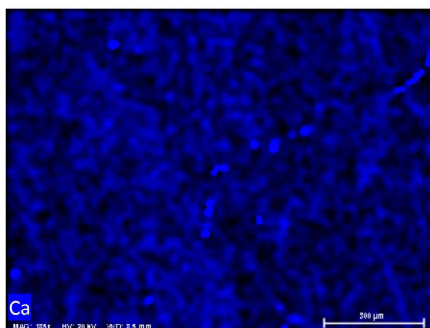
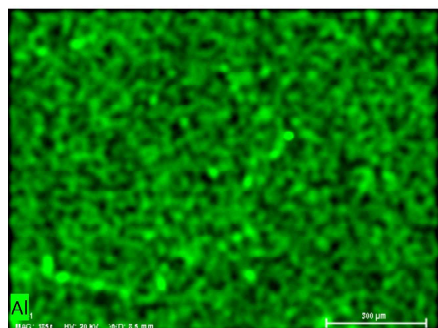
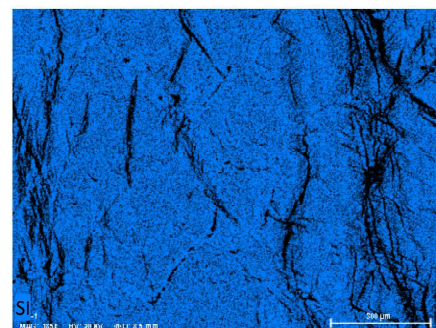
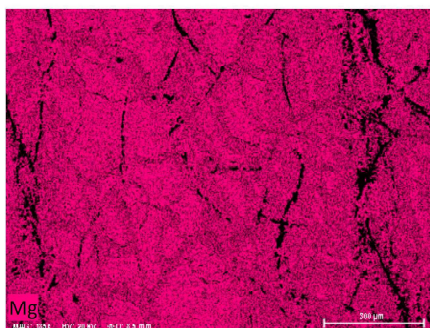
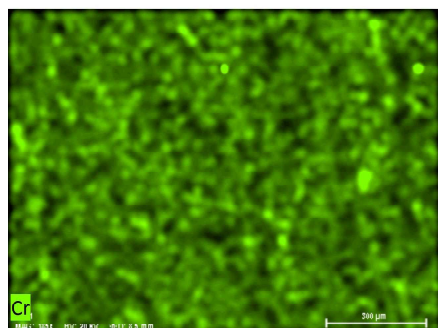
Argus1

Argus2



Argus3

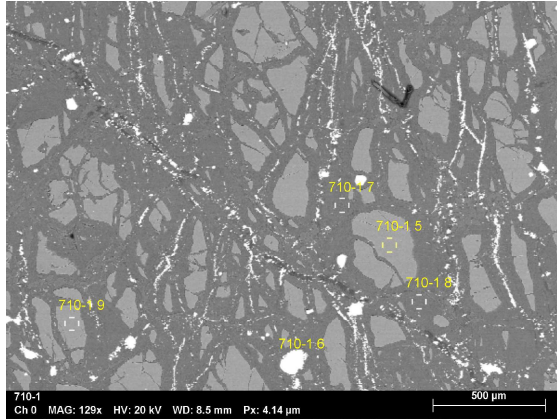
Argus4



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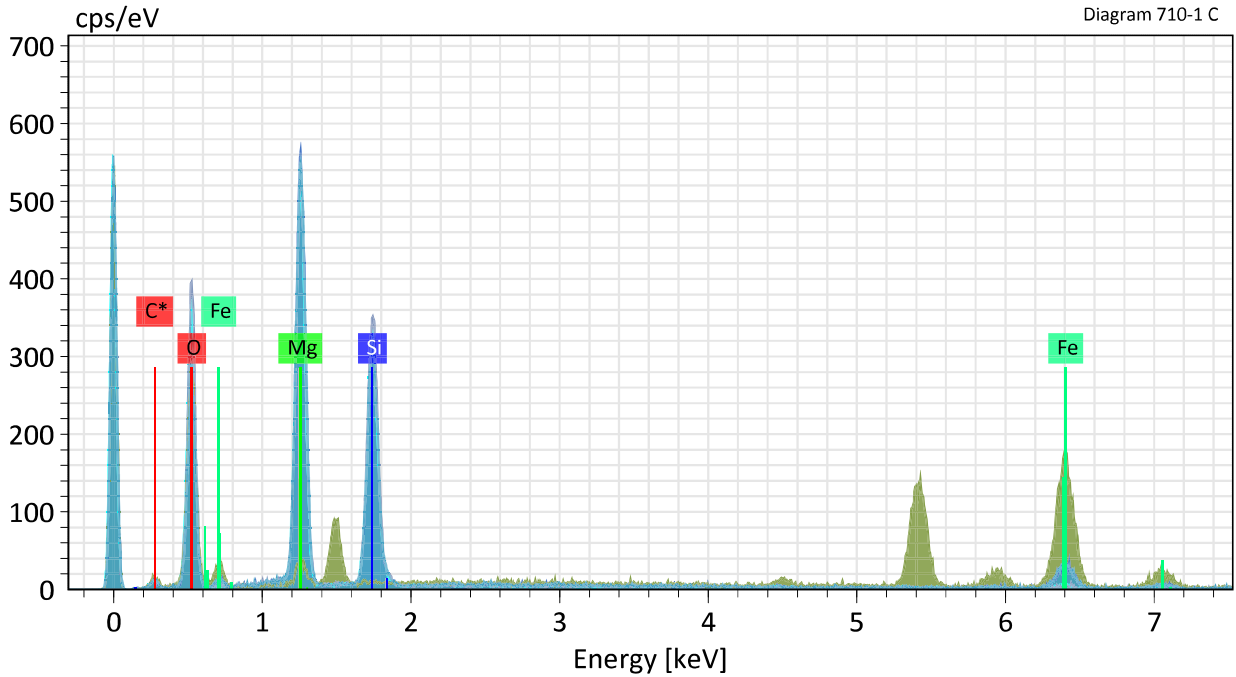
Image 710-1-C



The images, point analyses and diagrams on the next pages 3-5 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

The SEM image 710-1-C to the left is a central section of slide 0710-1. the yellow number refer to point analyses for specified elements indicated in diagram 710-1 C below. By analysing points in different textured areas (e.g. massive light grey grains and darker mottled grey and areas and white grains, it is possible to estimated amount of fresh, well crystallized minerals to amount of chemically altered material.

Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	14:48:32	20.0 keV	129x	8.5 mm



Normalized mass concentration [%] Table values from diagram 710-1 C, above, Numbers to the left refer to yellow numbers in image above

Spectrum	C	O	Mg	Al	Si	Ti	Cr	Mn	Fe
710-1 5	0.00	37.59	34.40		6.58				21.43
710-1 6	0.00	24.68	2.94	7.36		1.08	21.02	1.27	41.65
710-1 7	0.00	49.12	38.91		8.67				3.30
710-1 8	0.00	48.09	38.80		8.07				5.04
710-1 9	0.00	38.21	35.98		6.02				19.80
Mean	<b>0.00</b>	<b>39.54</b>	<b>30.21</b>	<b>7.36</b>	<b>7.33</b>	<b>1.08</b>	<b>21.02</b>	<b>1.27</b>	<b>18.25</b>
Sigma	<b>0.00</b>	<b>9.89</b>	<b>15.36</b>	<b>0.00</b>	<b>1.24</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>15.48</b>
SigmaMean	<b>0.00</b>	<b>4.42</b>	<b>6.87</b>	<b>0.00</b>	<b>0.56</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>6.92</b>

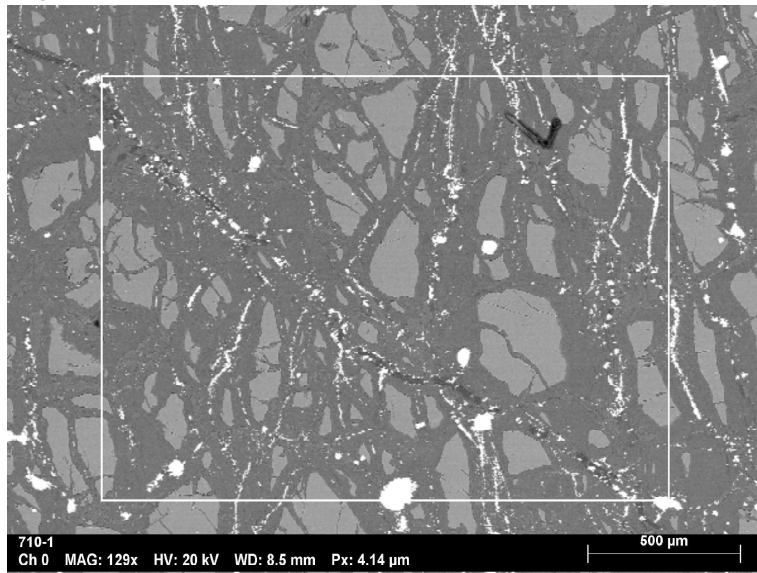
710-1-5: Iron enriched Olivine  
 710-1-6: Chromite grain  
 710-1-7: Serpentine  
 710-1-8: Serpentine  
 710-1-9: Iron enriched olivine

The statistics at the bottom integrates the data as one population, in order to estimate the total chemical analysis.

# Application Note

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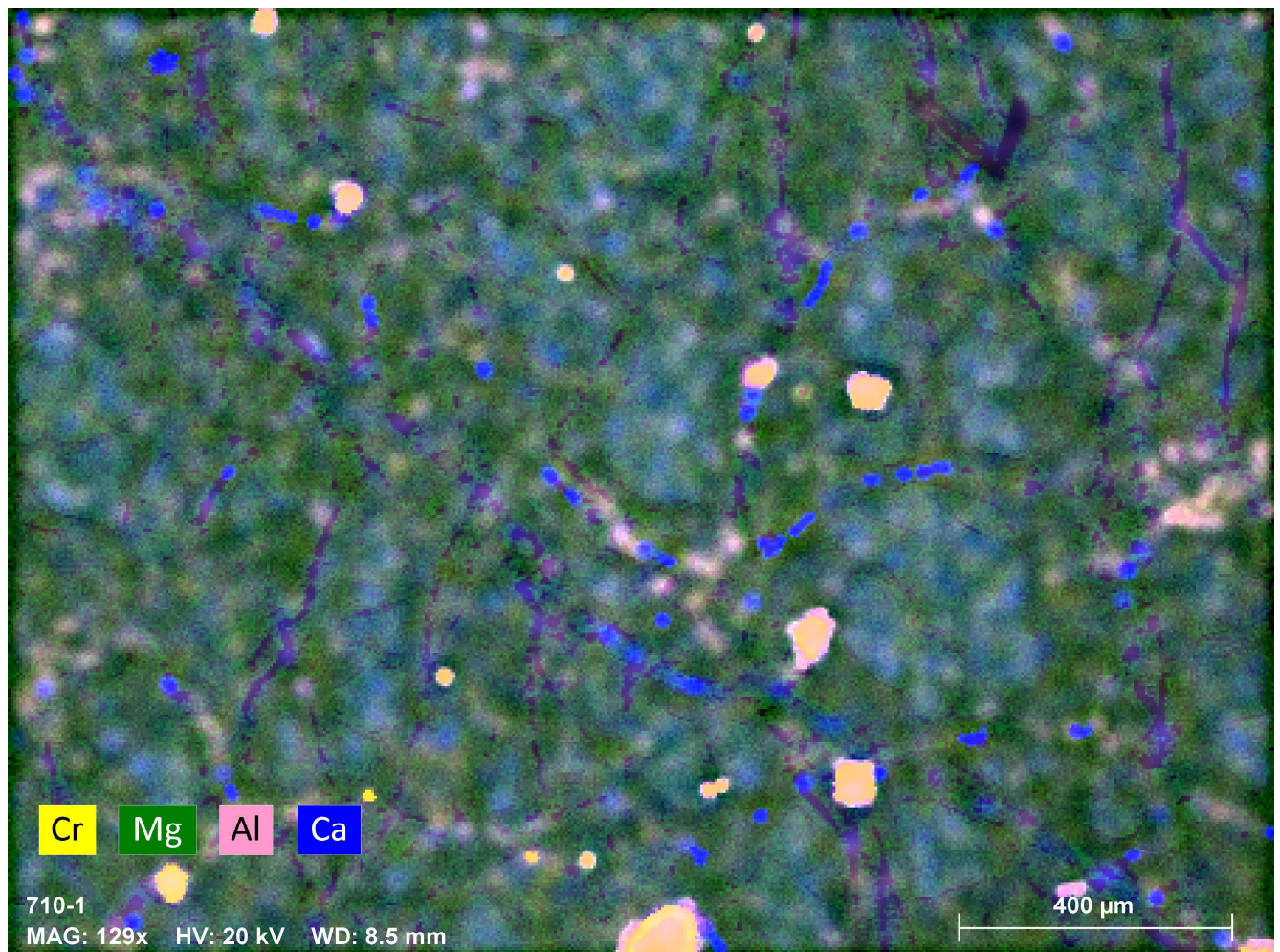
Image 710-1 D



SEM Image 710-1 D is the same as 710-1 C but further analysed. Notice the Calcium containing veinlets in image 710-1-E below. The solid steel grey grains are generally well preserved olivine with intervening calcium enriched veins. The high reflecting almost white minor grains are chromites

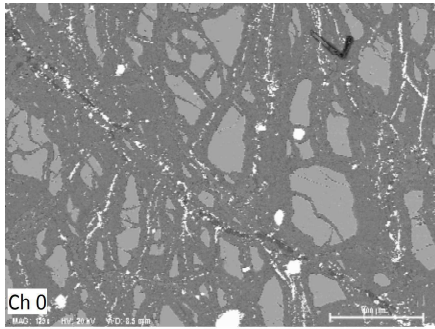
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	14:37:41	20.0 keV	129x	8.5 mm

Image 710-E



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	14:42:06	20.0 keV	129x	8.5 mm

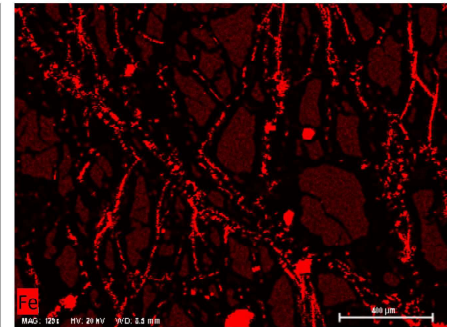
Image assembly 710-1-II



The distribution of Cr is shown in Argus 3 (chromite grains) and it is noteworthy that Aluminium is also detected in the same chromite grains. Brighter whitish colour indicated in veinlet is due to iron enrichment

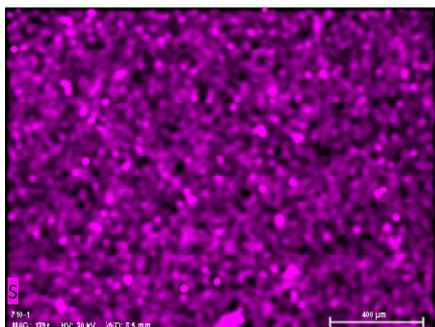
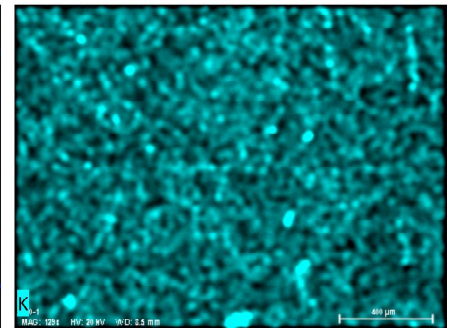
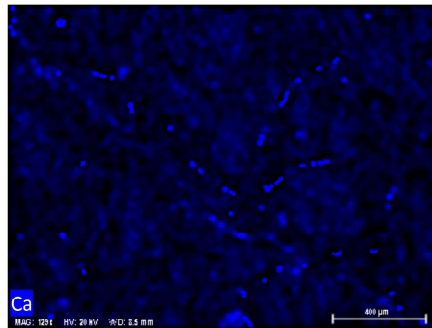
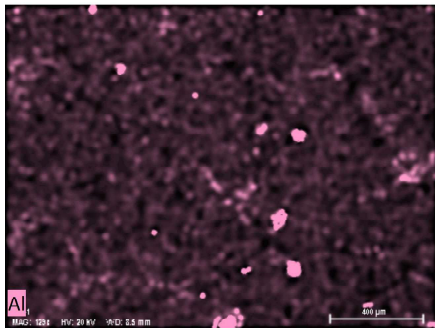
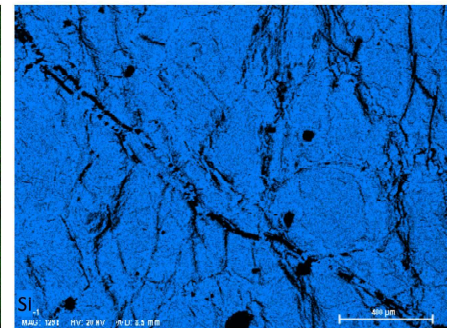
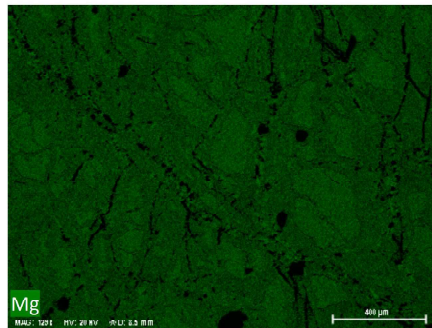
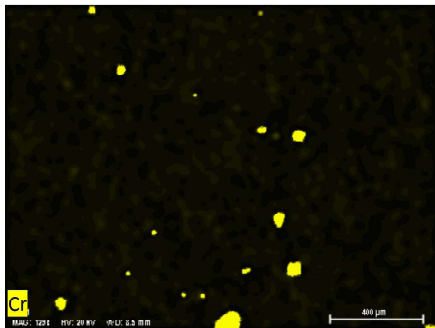
Argus1

Argus2



Argus3

Argus4

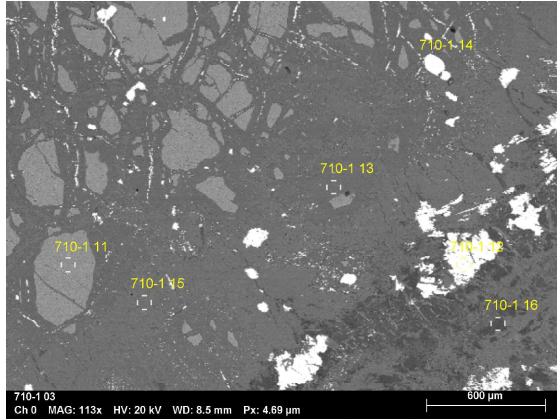


Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	14:42:06	20.0 keV	129x	8.5 mm

# Application Note

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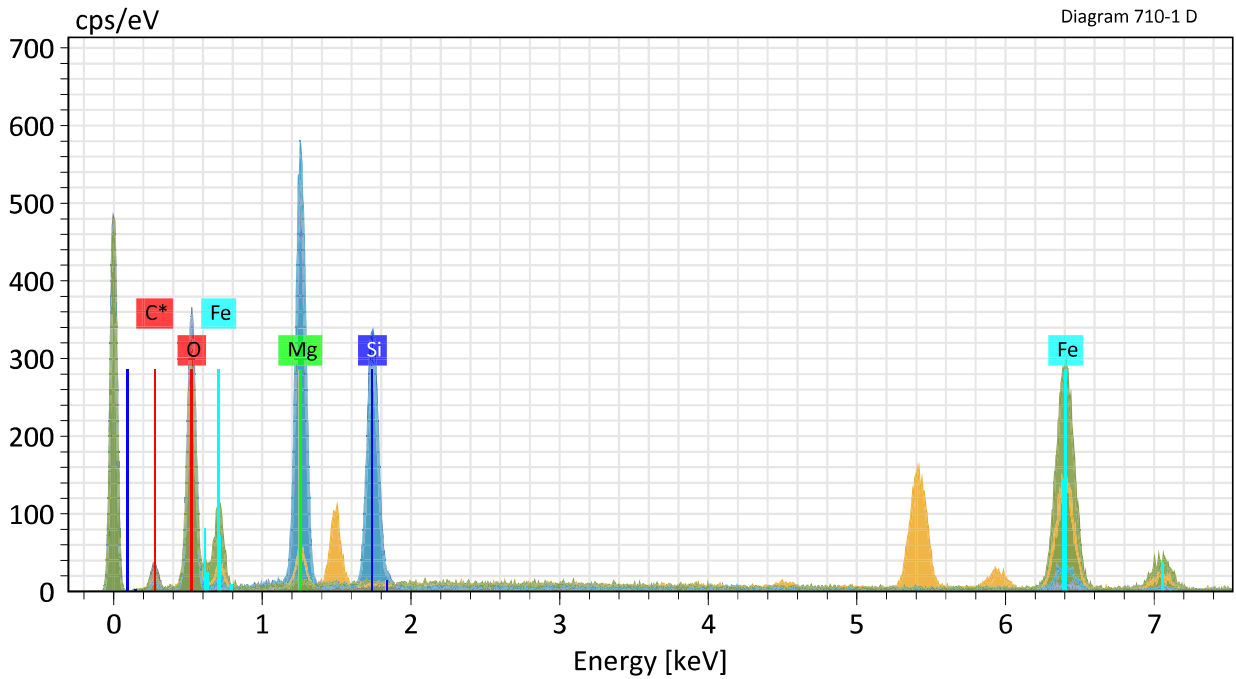
Image 710-1 F



The images, point analyses and diagrams on the next pages 6-8 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

Darker grey colour dominating the area of the slide is an indicator of alterations of the original olivine to other minerals such as magnesite and iron oxide. Introduced chemical elements through fluids along veins and other conducts further complicates the mineral assemblage.

Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1 03	23/01/2019	15:19:49	20.0 keV	113x	8.5 mm



Normalized mass concentration [%] Table values from diagram 710-1 D above. Numbers to the left refer to yellow numbers in image above

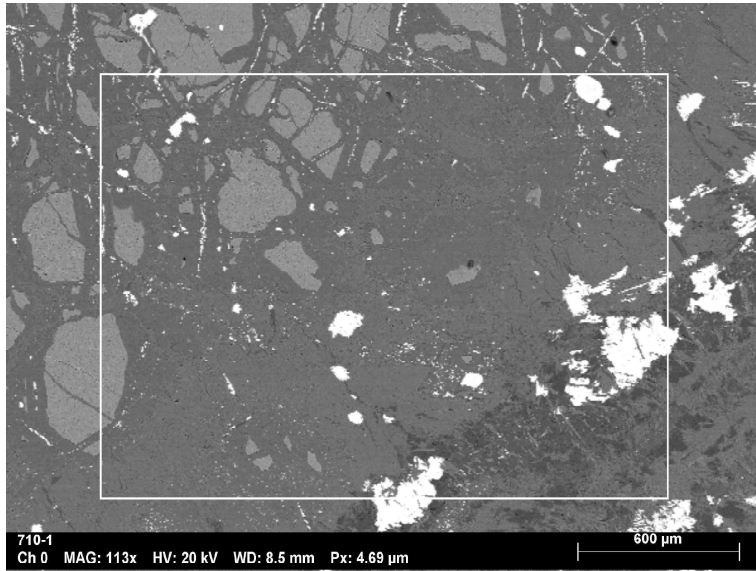
Spectrum	C	O	Mg	Al	Si	Ti	Cr	Fe	
710-1 11	0.00	38.17	34.98		6.29			20.56	Iron enriched Mg silicate
710-1 12	0.00	26.65	0.76		0.19			72.40	Iron Oxide
710-1 13	0.00	48.00	38.08		7.45			6.47	Magnesite grain?
710-1 14	0.00	26.38	4.76	8.56		0.98	23.93	35.39	Chromite grain
710-1 15	0.00	47.65	37.31		8.64			6.40	Magnesite grain?
710-1 16	0.00	52.86	43.35		0.26			3.53	Magnesite grain?
Mean	<b>0.00</b>	<b>39.95</b>	<b>26.54</b>	<b>8.56</b>	<b>4.56</b>	<b>0.98</b>	<b>23.93</b>	<b>24.13</b>	
Sigma	<b>0.00</b>	<b>11.45</b>	<b>18.67</b>	<b>0.00</b>	<b>4.05</b>	<b>0.00</b>	<b>0.00</b>	<b>26.53</b>	
SigmaMean	<b>0.00</b>	<b>4.67</b>	<b>7.62</b>	<b>0.00</b>	<b>1.65</b>	<b>0.00</b>	<b>0.00</b>	<b>10.83</b>	



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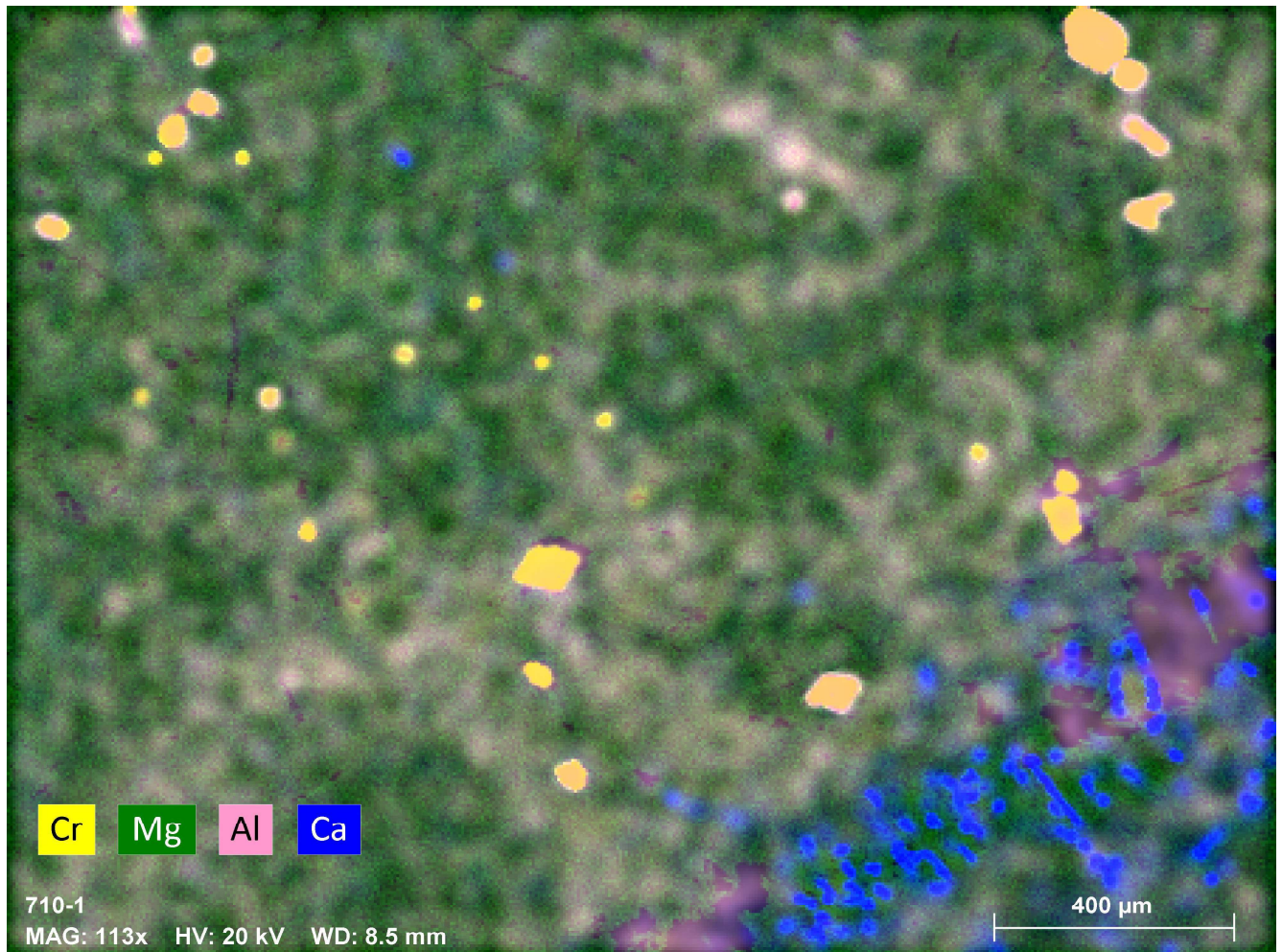
Image 710-1 F, as above



The enlarged (framed area) in image 710-1 F1, below shows a N\_E trending set of grains with Calcium (blue) and Aluminium enrichment (mauve). This section area is highly altered

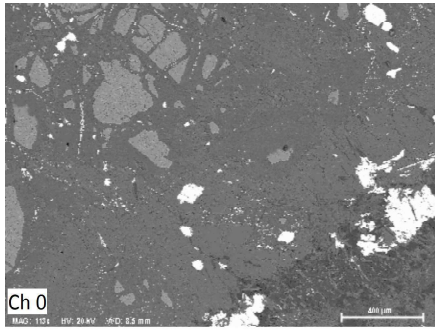
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	15:36:58	20.0 keV	113x	8.5 mm

Image 710-1 G, slightly enlarged from 710-1 F (frame)

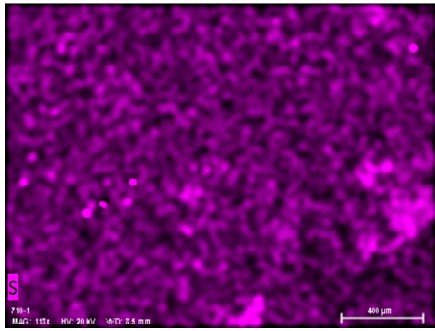
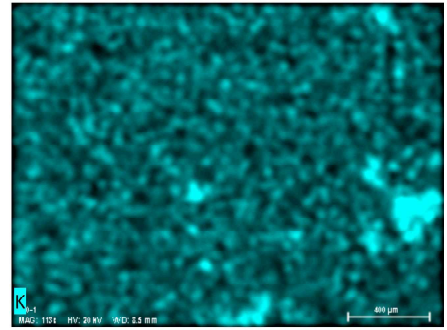
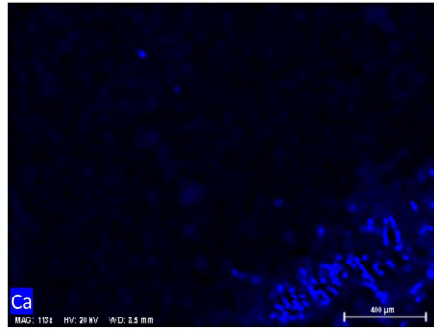
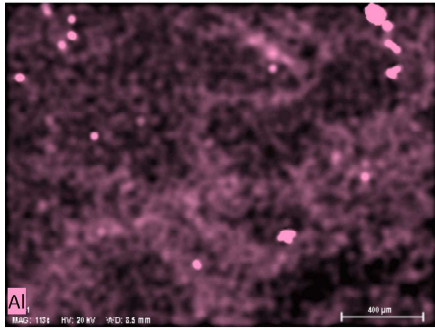
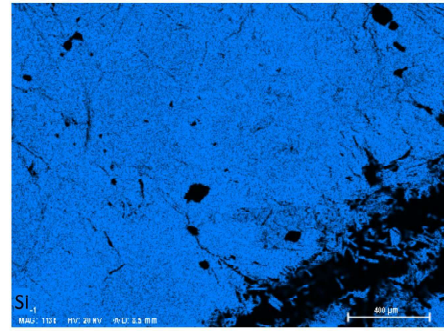
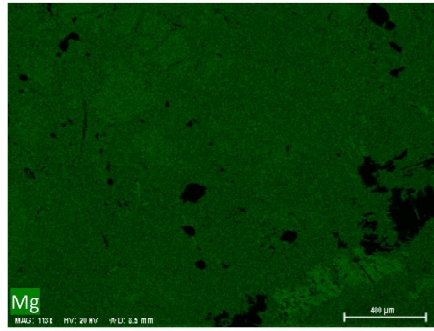
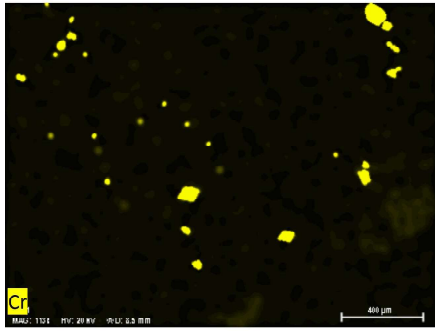
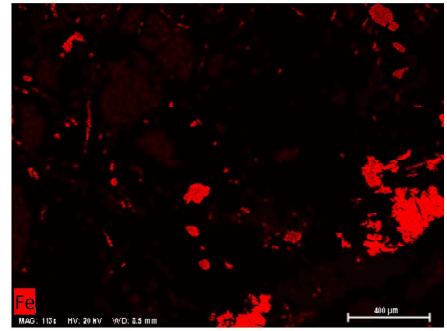
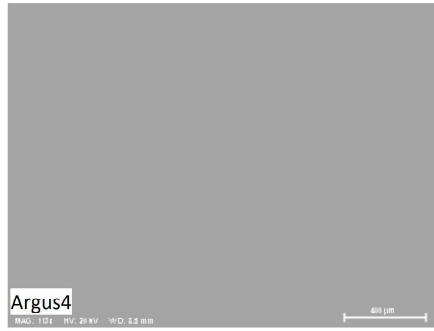


Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	15:37:11	20.0 keV	113x	8.5 mm

Image assembly 710-1.III



As indicated in text to image 710-1 F and G and associated table and diagram the section of the slide is highly altered. This is further indicated by the generally high aluminium in the same area as seen in Al image below. The chromite grains seem to have varying iron content.

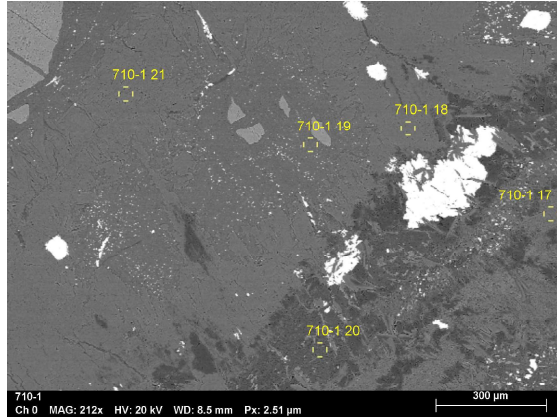


Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	15:37:11	20.0 keV	113x	8.5 mm

# Application Note

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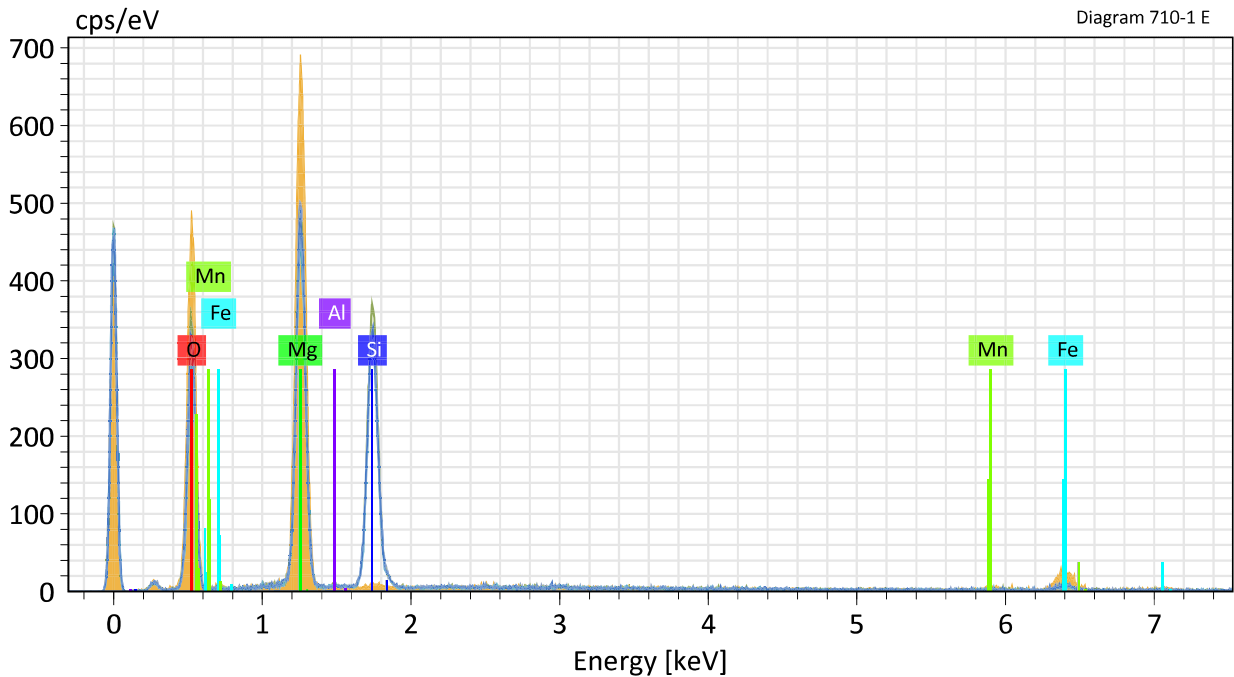
Image 710-1 H



The images, point analyses and diagrams on the next pages 9-11 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

Within viewing area only few unaltered olivine grains. The images, point analyses and diagrams page 9-11 further illustrates distribution of the chemical elements and gives indications of actual mineral phase.

Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	15:45:24	20.0 keV	212x	8.5 mm



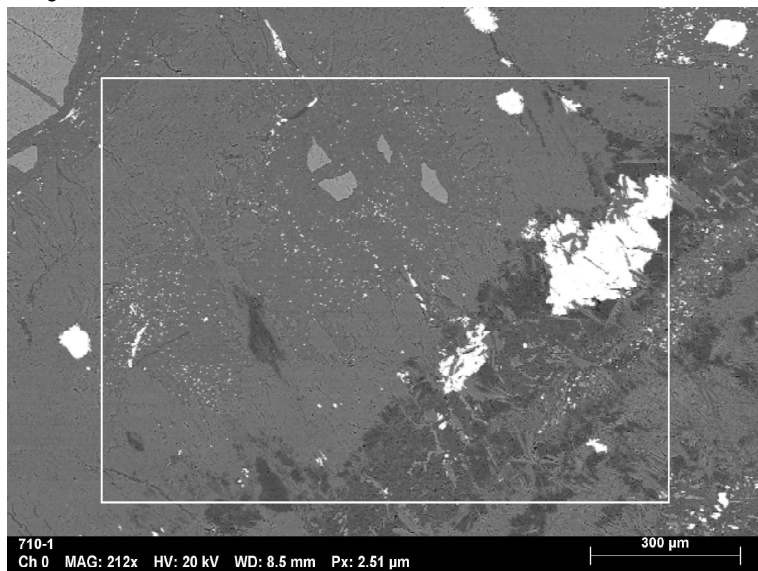
Normalized mass concentration [%] Table values from diagram 710-1 E above. Numbers to the left refer to yellow numbers in image above

Spectrum	O	Mg	Al	Si	Mn	Fe	
710-1 17	45.08	30.68	0.22	22.34		1.67	Low iron Mg-silicate
710-1 18	46.09	28.34	0.17	23.59		1.81	Low iron Mg-silicate
710-1 19	46.47	29.41	0.09	22.02		2.01	Low iron Mg-silicate
710-1 20	49.72	40.87		0.28	0.85	8.28	Olivine composition
710-1 21	45.31	29.93		22.73		2.03	Low iron Mg-silicate
Mean	<b>46.54</b>	<b>31.85</b>	<b>0.16</b>	<b>18.19</b>	<b>0.85</b>	<b>3.16</b>	
Sigma	<b>1.87</b>	<b>5.12</b>	<b>0.07</b>	<b>10.03</b>	<b>0.00</b>	<b>2.87</b>	
SigmaMean	<b>0.83</b>	<b>2.29</b>	<b>0.03</b>	<b>4.49</b>	<b>0.00</b>	<b>1.28</b>	

# Application Note

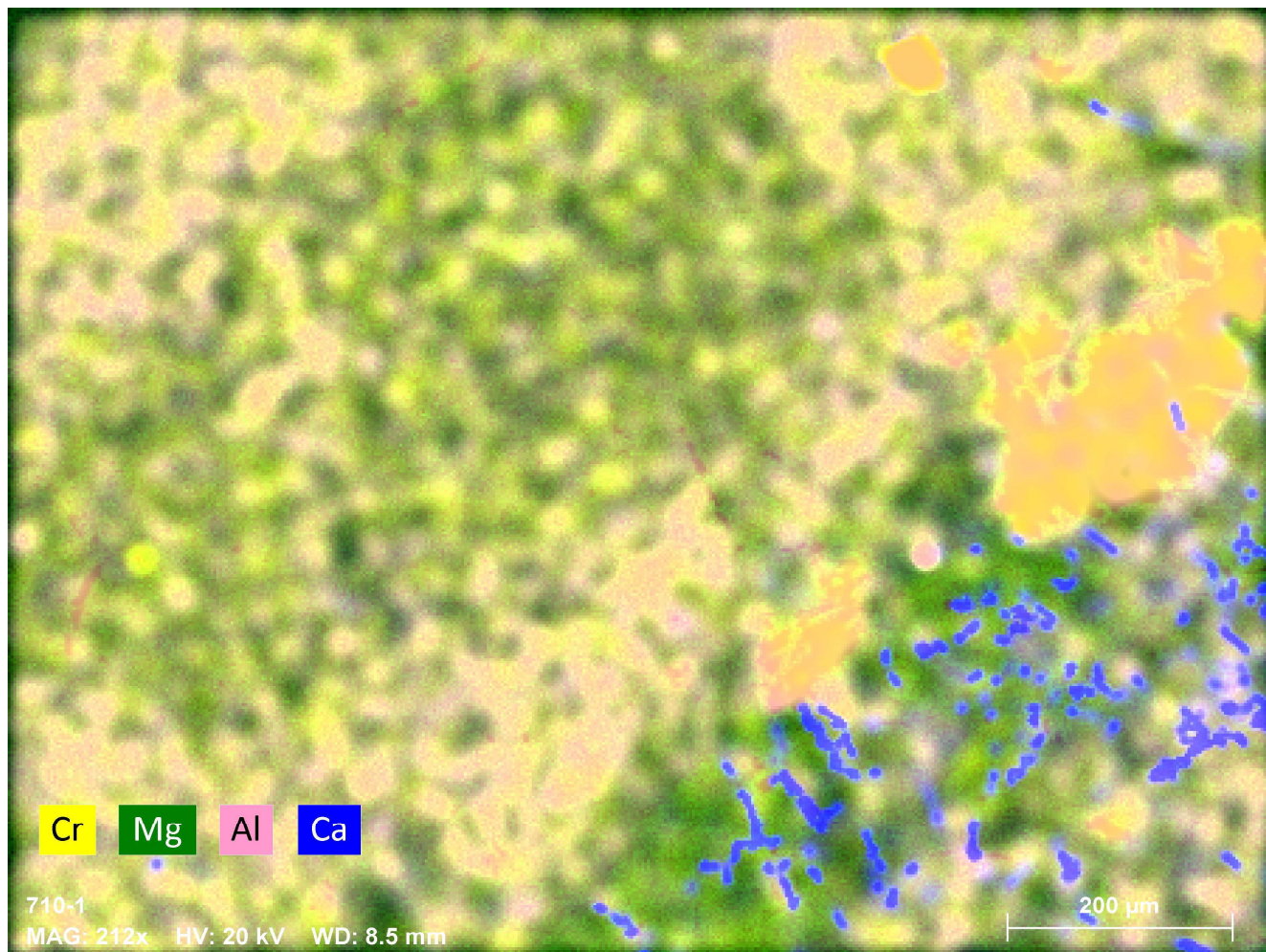
Company / Department

Image 710-1 I



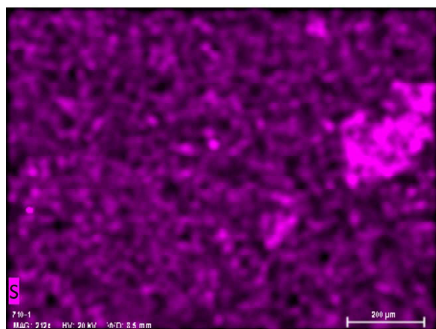
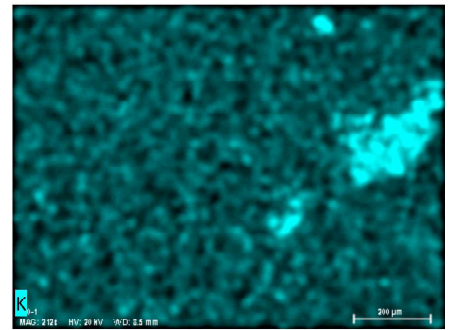
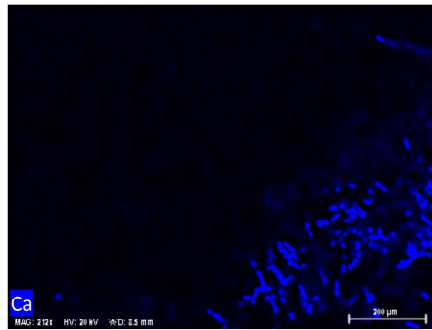
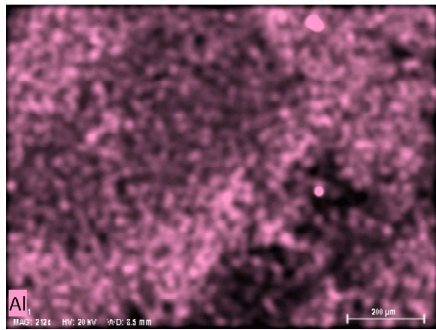
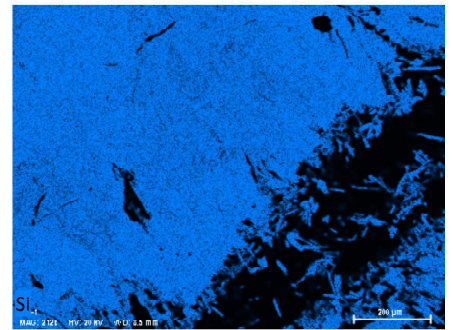
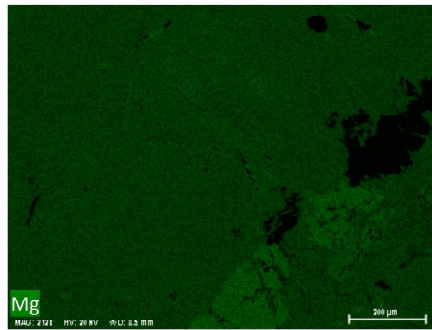
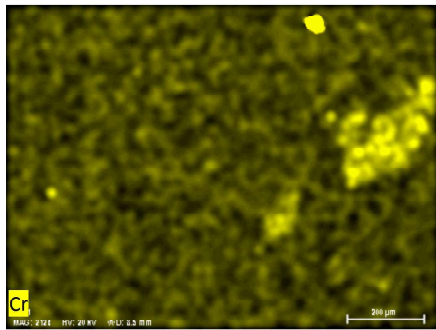
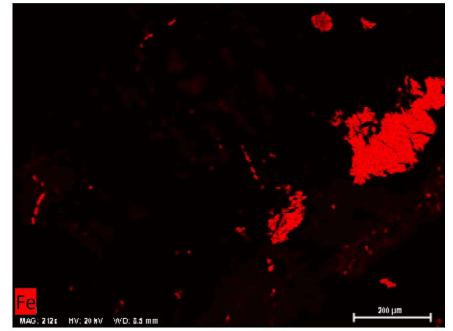
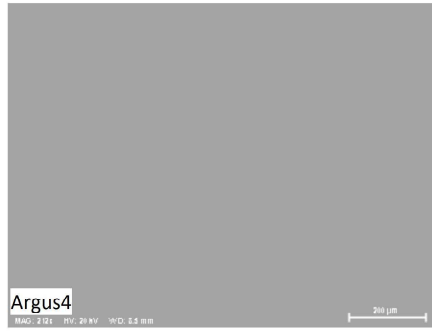
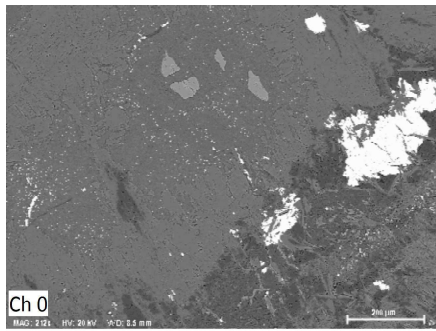
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	15:58:33	20.0 keV	212x	8.5 mm

Image 710-1 J slightly enlarged from 710-1 I (frame)



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	15:58:42	20.0 keV	212x	8.5 mm

Image assembly 710-1 IV

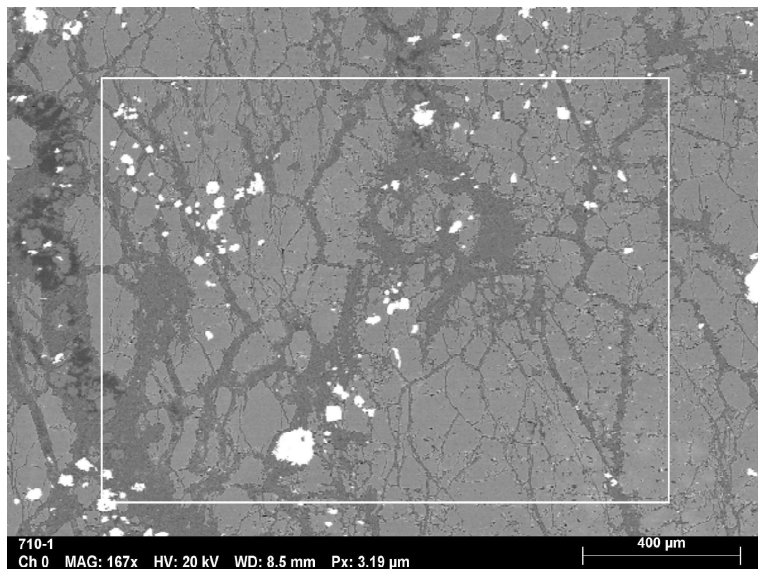


Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	15:58:42	20.0 keV	212x	8.5 mm

# Application Note

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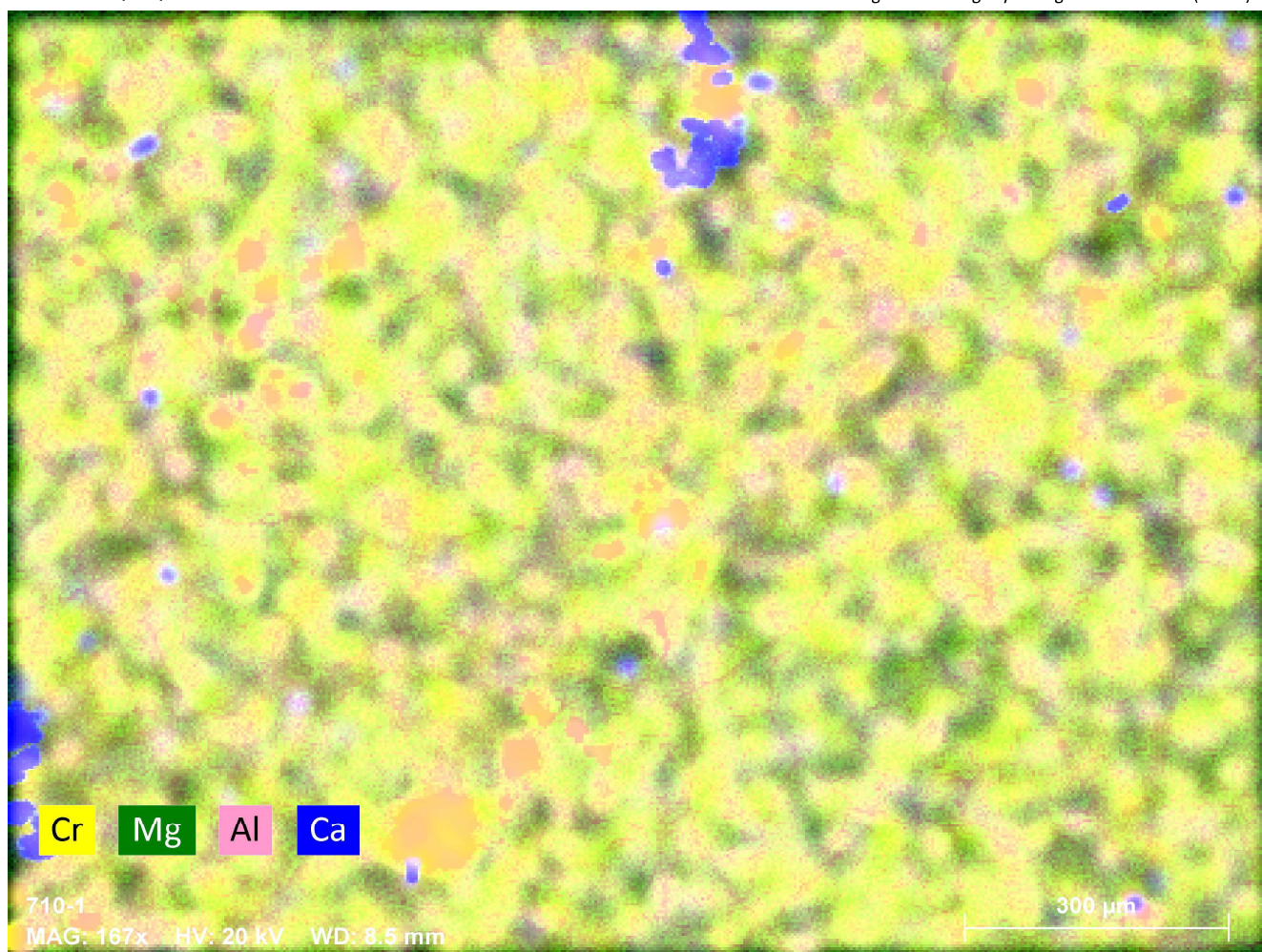
Image 710-1 K



The images and diagrams on the next pages 12-13 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

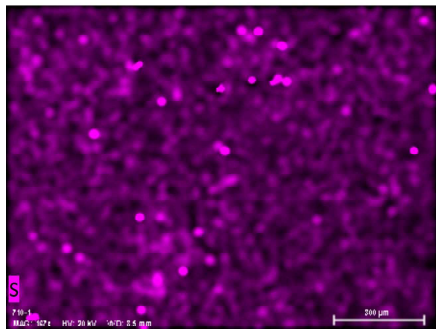
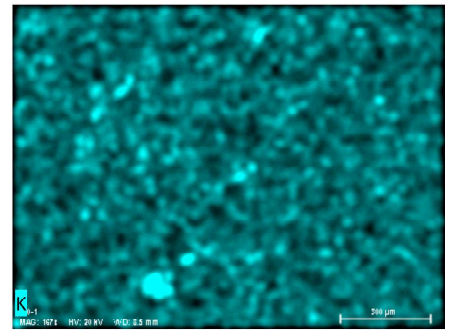
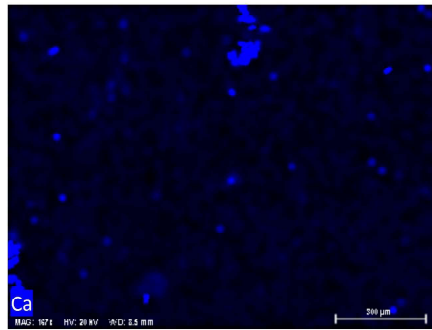
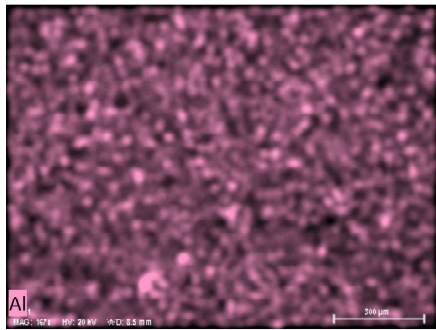
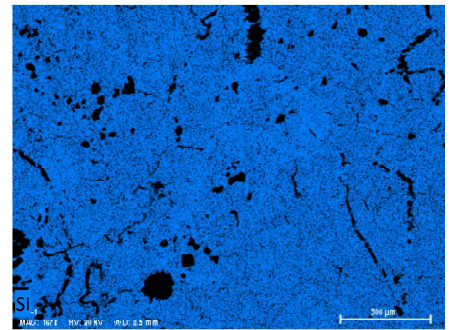
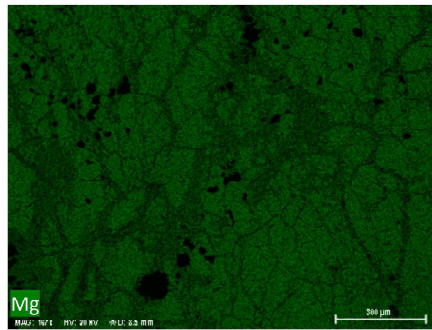
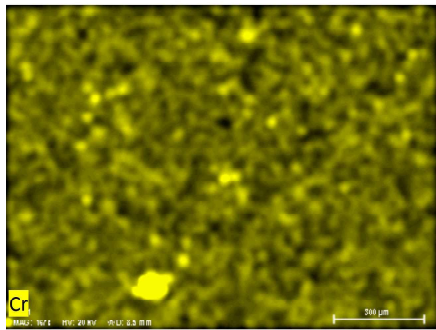
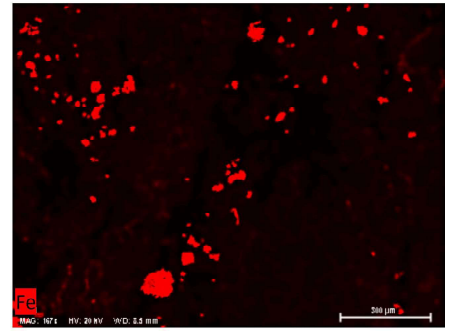
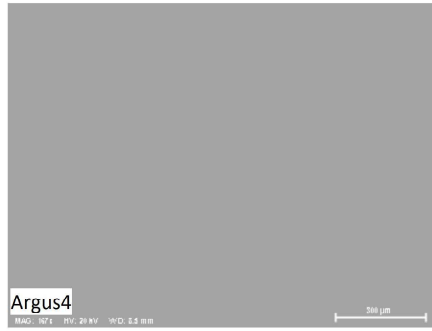
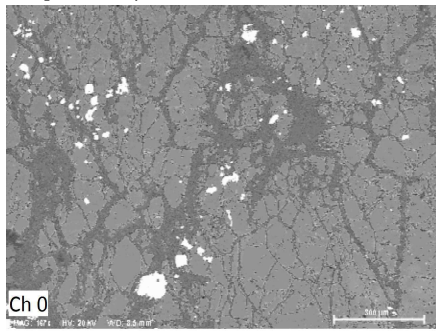
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	16:07:05	20.0 keV	167x	8.5 mm

Image 710-1 L slightly enlarged from 710-1 K (frame)



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	16:07:12	20.0 keV	167x	8.5 mm

Image assembly 710-1 V

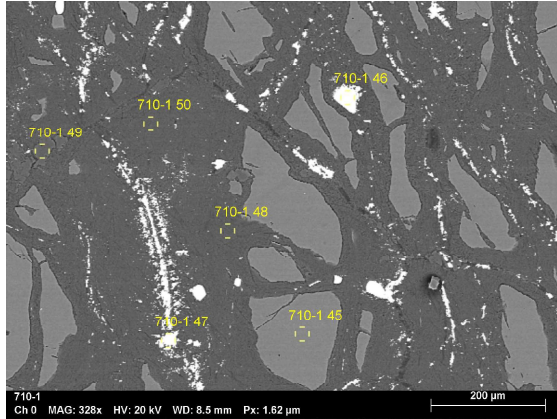


Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	16:07:12	20.0 keV	167x	8.5 mm

# Application Note

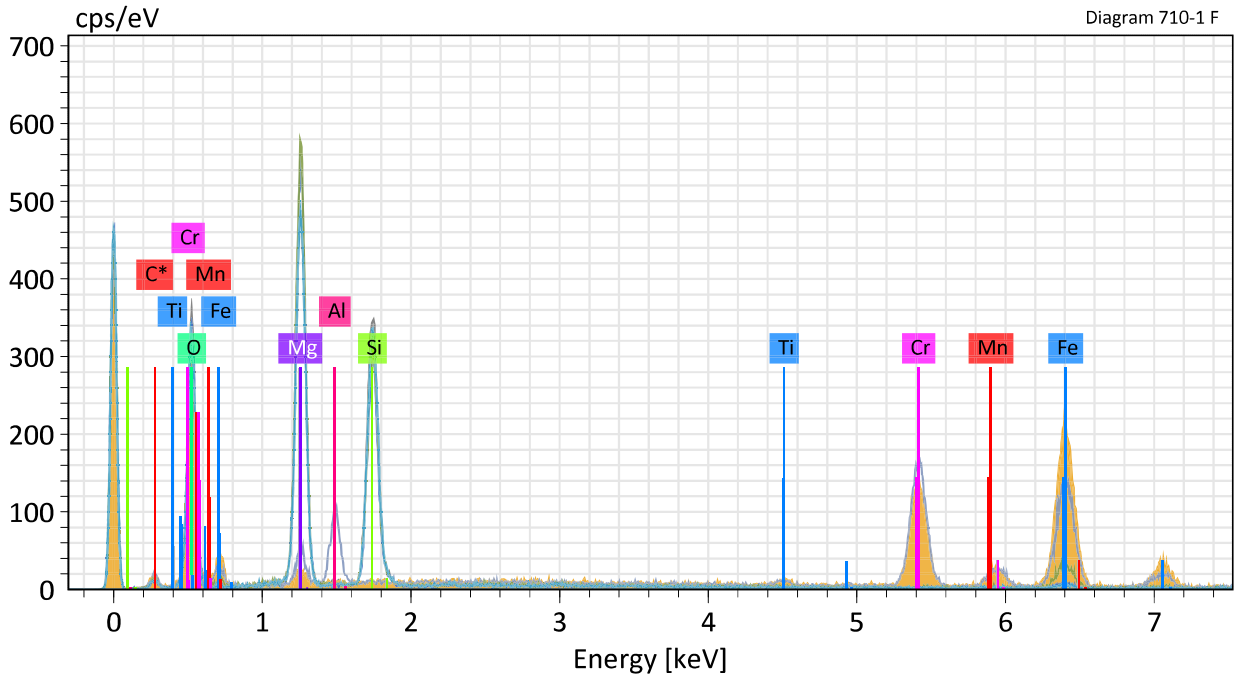
Company / Department

Image 710-1 M



The images, point analyses and diagrams on the next pages 14, 27-29 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:16:20	20.0 keV	328x	8.5 mm



Normalized mass concentration [%] Table values from diagram 710-1 F, above. Numbers to the left refer to yellow numbers in image above

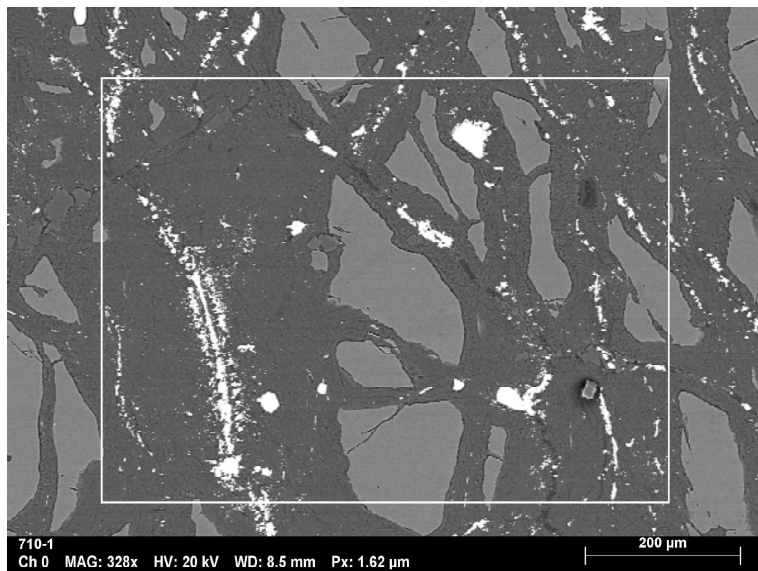
Spectrum	C	O	Mg	Al	Si	Ti	Cr	Mn	Fe
710-1 50		45.28	30.49		22.87				1.36
710-1 45		36.49	32.20		20.86			0.46	9.99
710-1 46	0.00	25.63	4.15	7.49		0.87	25.23	1.45	35.18
710-1 47	0.00	23.40	1.82			1.00	20.48	1.44	51.86
710-1 48		45.70	33.26	0.00	19.34				1.69
710-1 49		45.96	28.08	0.34	23.50				2.12
Mean	<b>0.00</b>	<b>37.08</b>	<b>21.67</b>	<b>2.61</b>	<b>21.64</b>	<b>0.93</b>	<b>22.86</b>	<b>1.12</b>	<b>17.03</b>
Sigma	<b>0.00</b>	<b>10.38</b>	<b>14.60</b>	<b>4.23</b>	<b>1.90</b>	<b>0.09</b>	<b>3.36</b>	<b>0.57</b>	<b>21.42</b>
SigmaMean	<b>0.00</b>	<b>4.24</b>	<b>5.96</b>	<b>1.73</b>	<b>0.78</b>	<b>0.04</b>	<b>1.37</b>	<b>0.23</b>	<b>8.75</b>



# Application Note

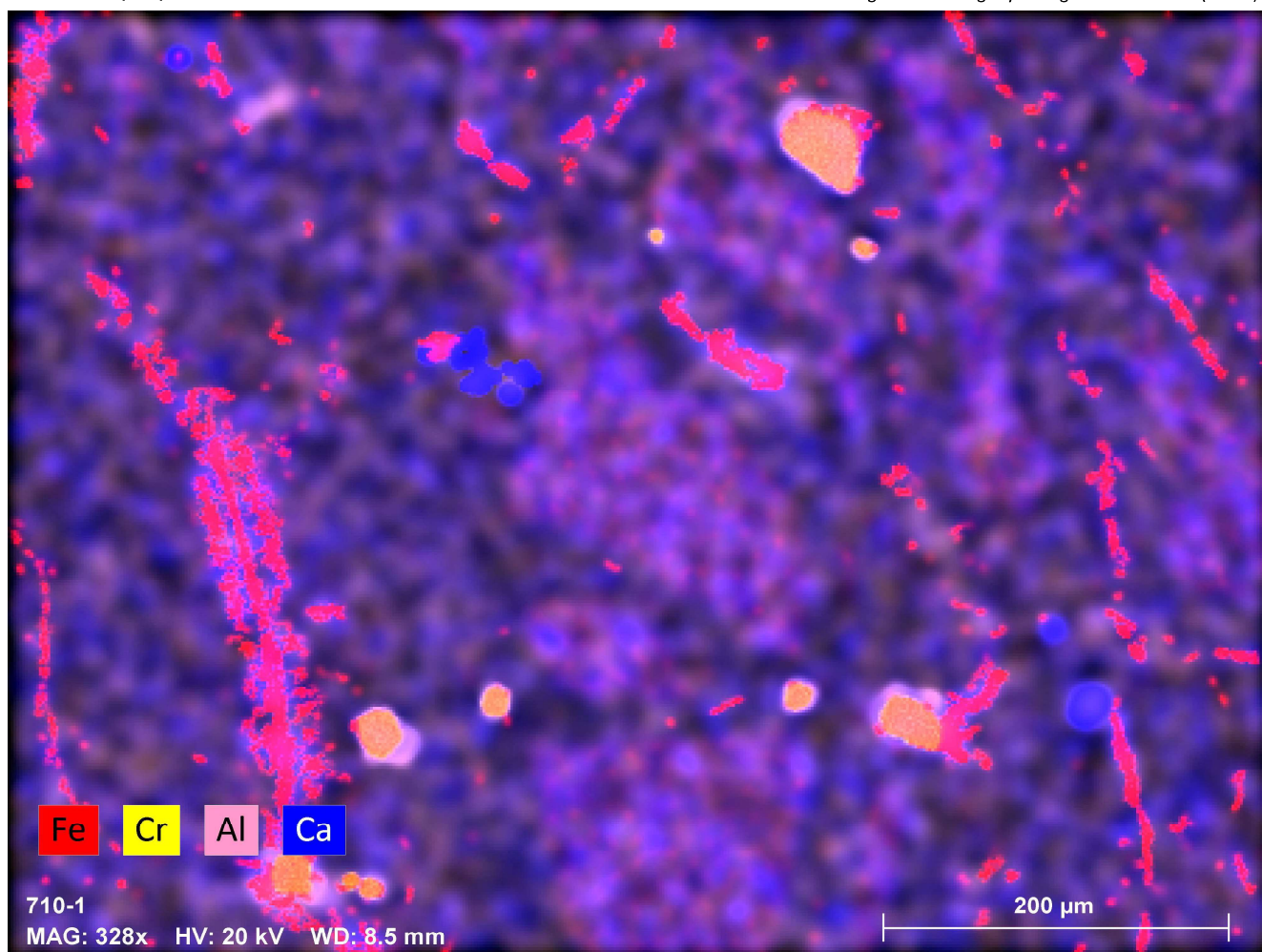
Company / Department

Image 710-1 N



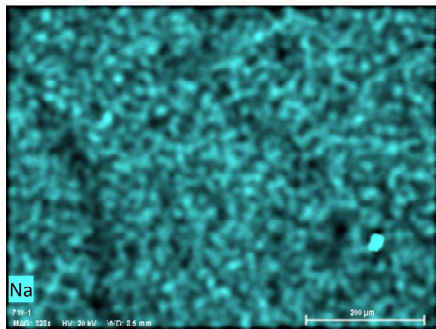
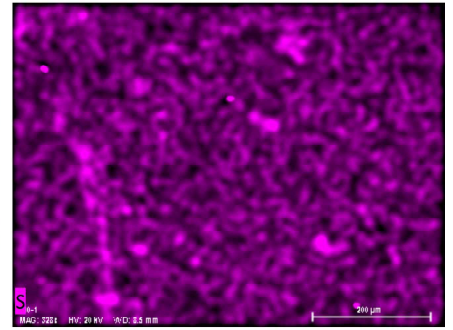
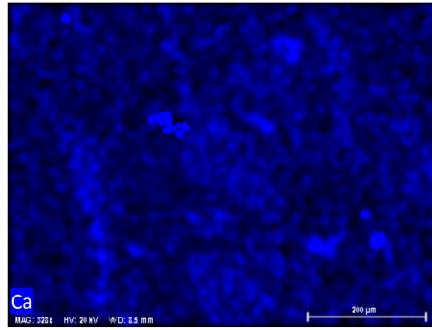
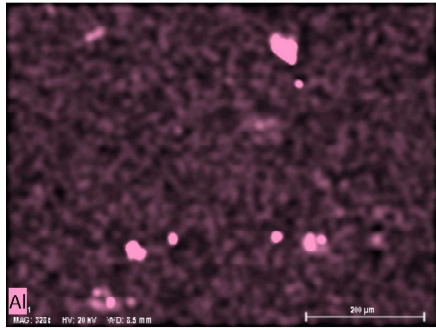
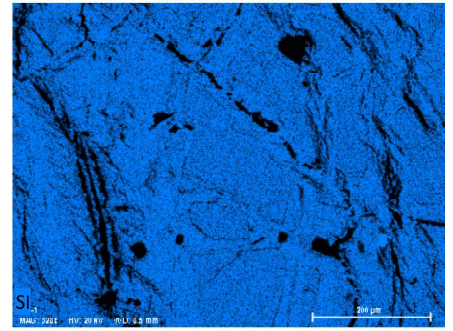
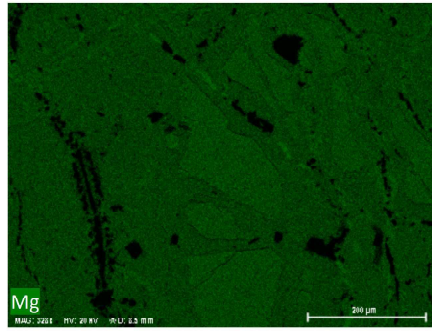
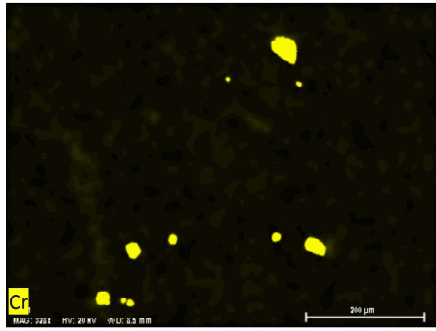
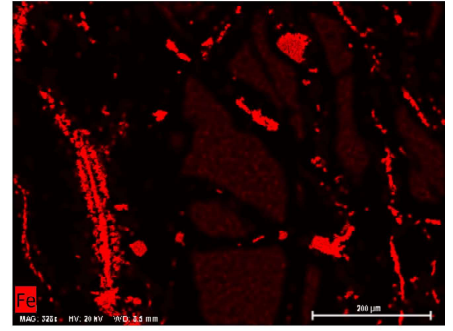
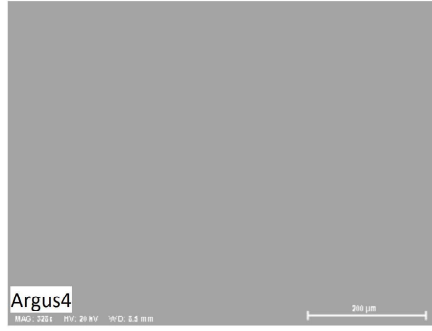
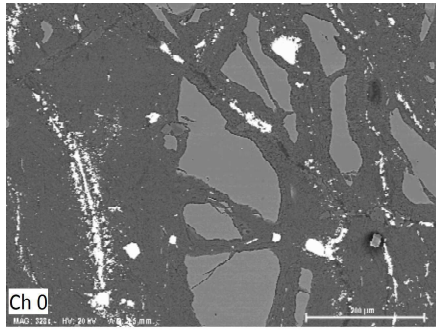
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:22:08	20.0 keV	328x	8.5 mm

Image 710 -1 O slightly enlarged from 710-1 N (frame)



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:22:15	20.0 keV	328x	8.5 mm

Image assembly 710-1 VI

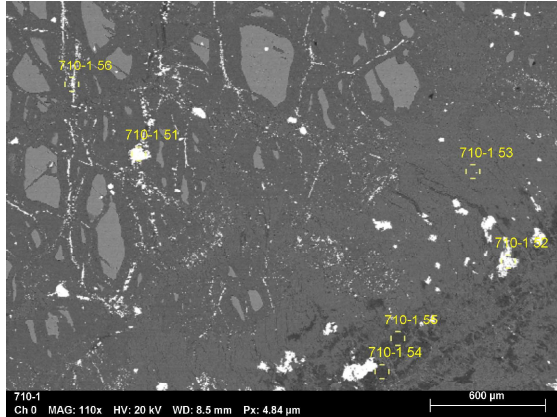


Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	17:22:15	20.0 keV	328x	8.5 mm

# Application Note

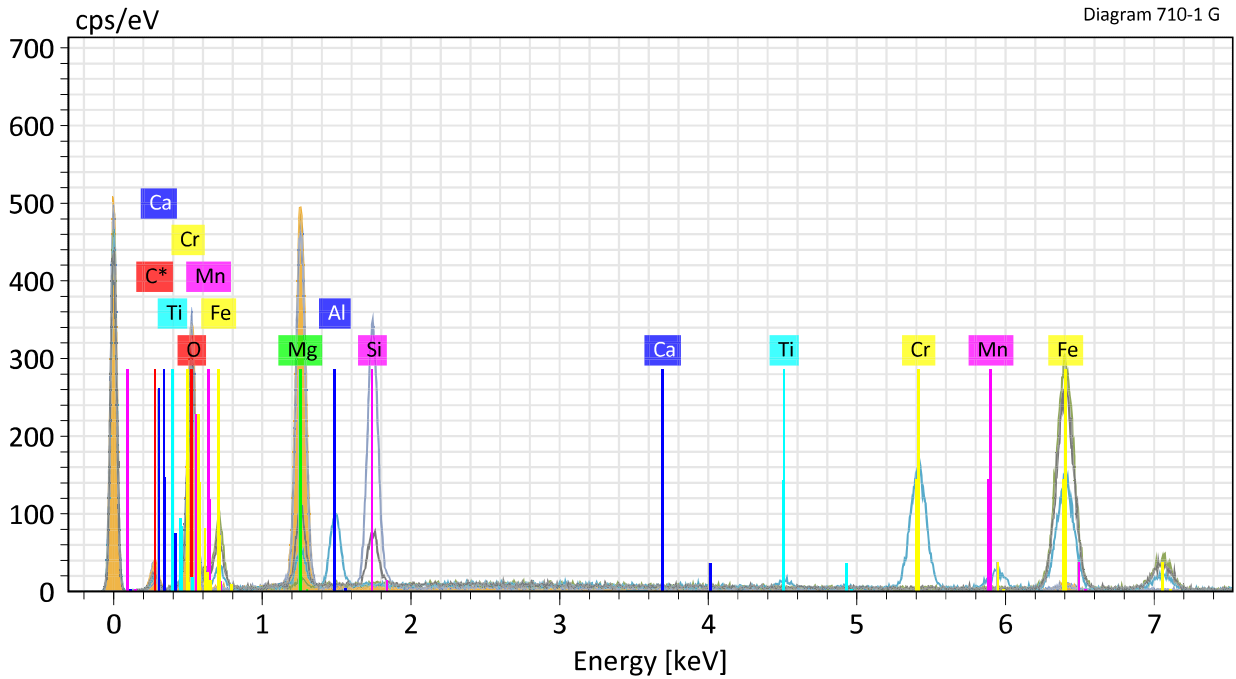
Company / Department

Image 710-1 P



The images, point analyses and diagrams on the next pages 30-32 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:26:58	20.0 keV	110x	8.5 mm



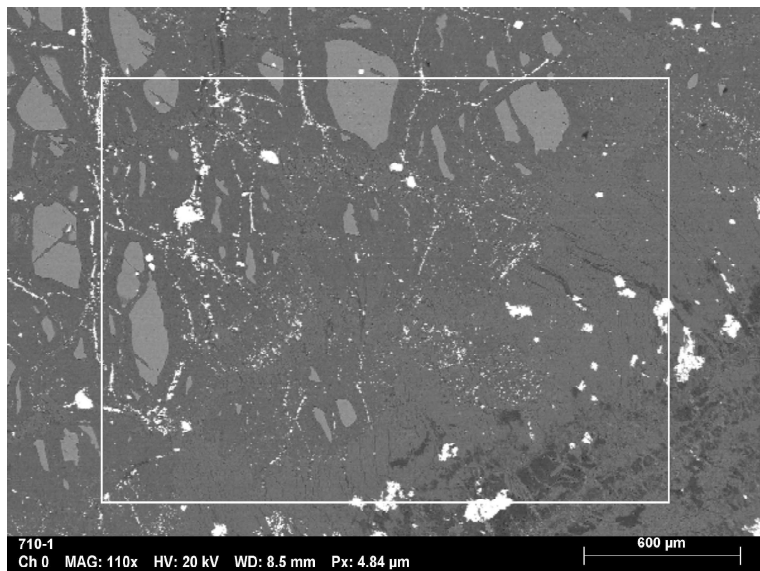
Normalized mass concentration [%] Table values from diagram 710-1 G, above. Numbers to the left refer to yellow numbers in image above

Spectrum	C	O	Mg	Al	Si	Ca	Ti	Cr	Mn	Fe
710-1 51	0.00	25.10	5.23	9.28			1.18	23.26	1.26	34.68
710-1 52	0.00	23.71	1.33							74.96
710-1 53		45.17	29.06	0.22	23.63					1.92
710-1 54		52.51	42.97		0.20	0.39			0.46	3.46
710-1 55		52.17	43.21		0.16				0.75	3.71
710-1 56		27.63	8.57		3.92					59.88
Mean	<b>0.00</b>	<b>37.72</b>	<b>21.73</b>	<b>4.75</b>	<b>6.98</b>	<b>0.39</b>	<b>1.18</b>	<b>23.26</b>	<b>0.83</b>	<b>29.77</b>
Sigma	<b>0.00</b>	<b>13.71</b>	<b>19.12</b>	<b>6.41</b>	<b>11.24</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.41</b>	<b>32.00</b>
SigmaMean	<b>0.00</b>	<b>5.60</b>	<b>7.81</b>	<b>2.62</b>	<b>4.59</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.17</b>	<b>13.06</b>

# Application Note

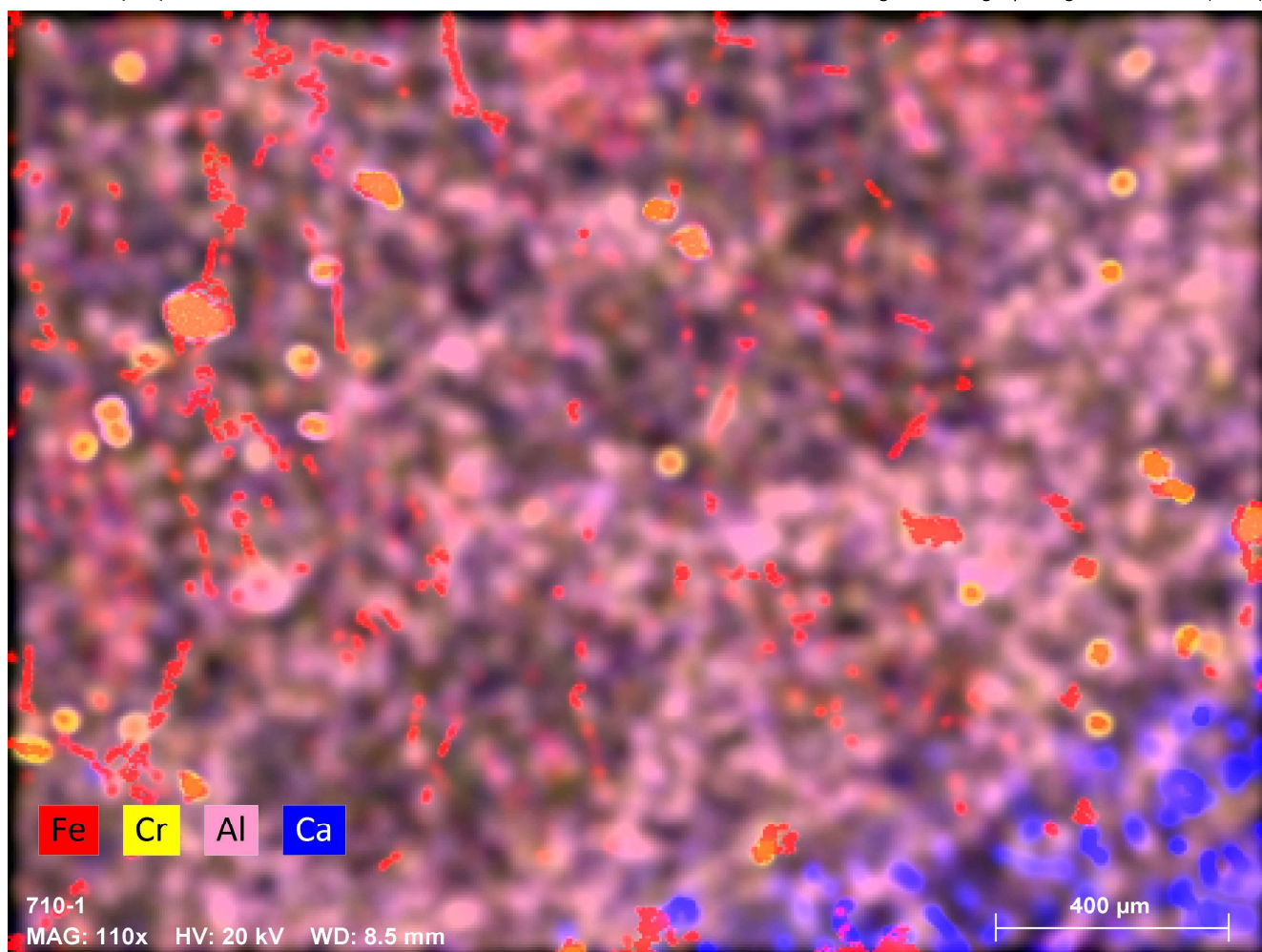
Company / Department

Image 710-1 Q



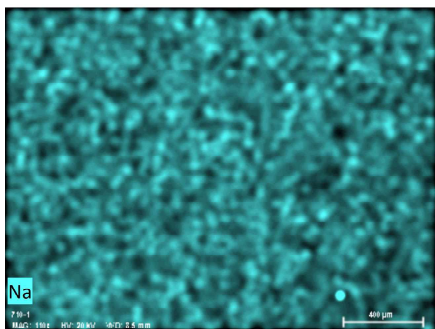
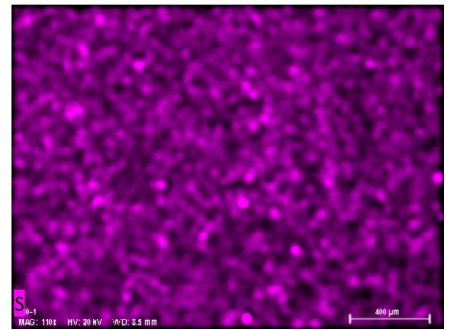
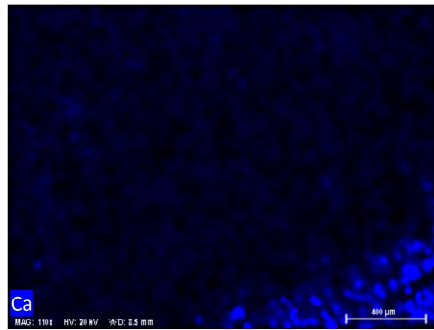
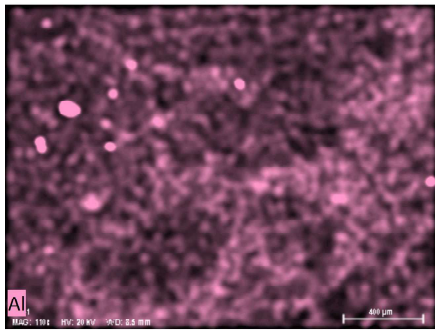
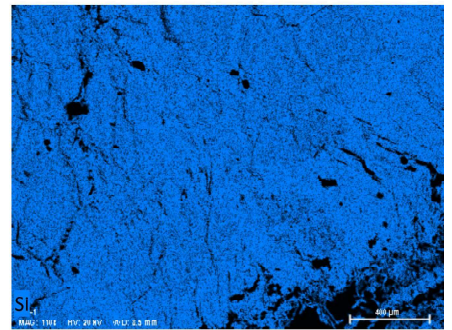
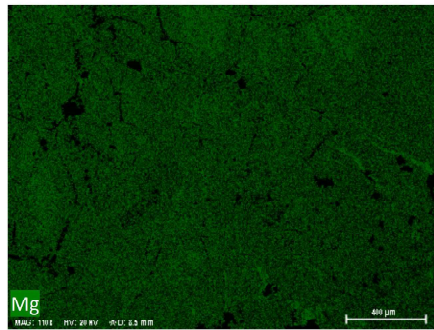
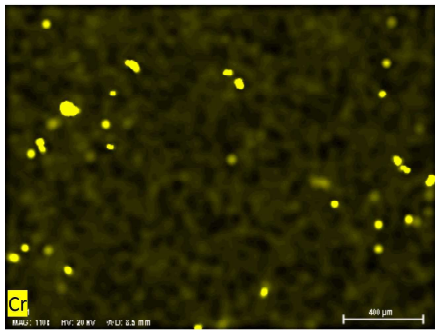
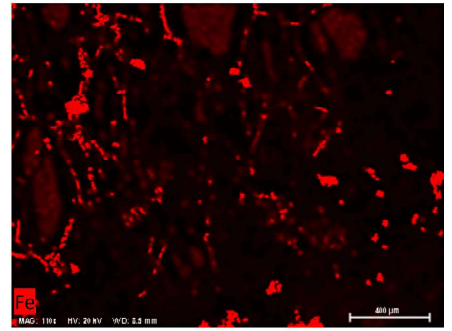
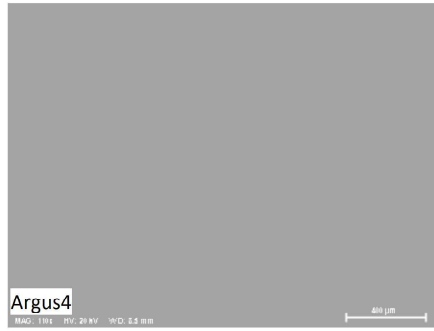
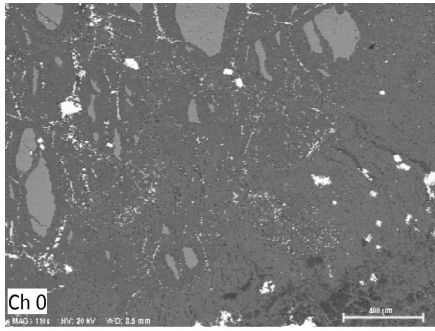
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:33:49	20.0 keV	110x	8.5 mm

Image 710-1 R slightly enlarged from 710-1 Q (frame)



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:33:57	20.0 keV	110x	8.5 mm

Image assembly 710-1 VII

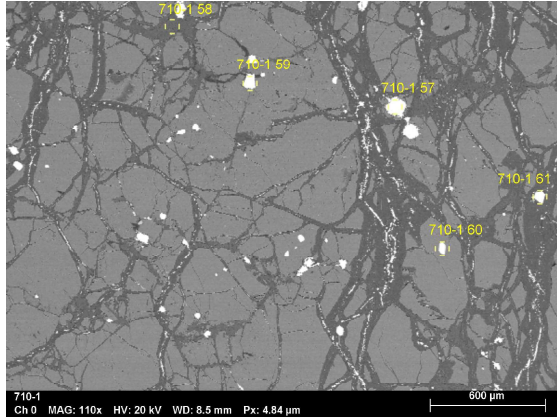


Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	17:33:57	20.0 keV	110x	8.5 mm

# Application Note

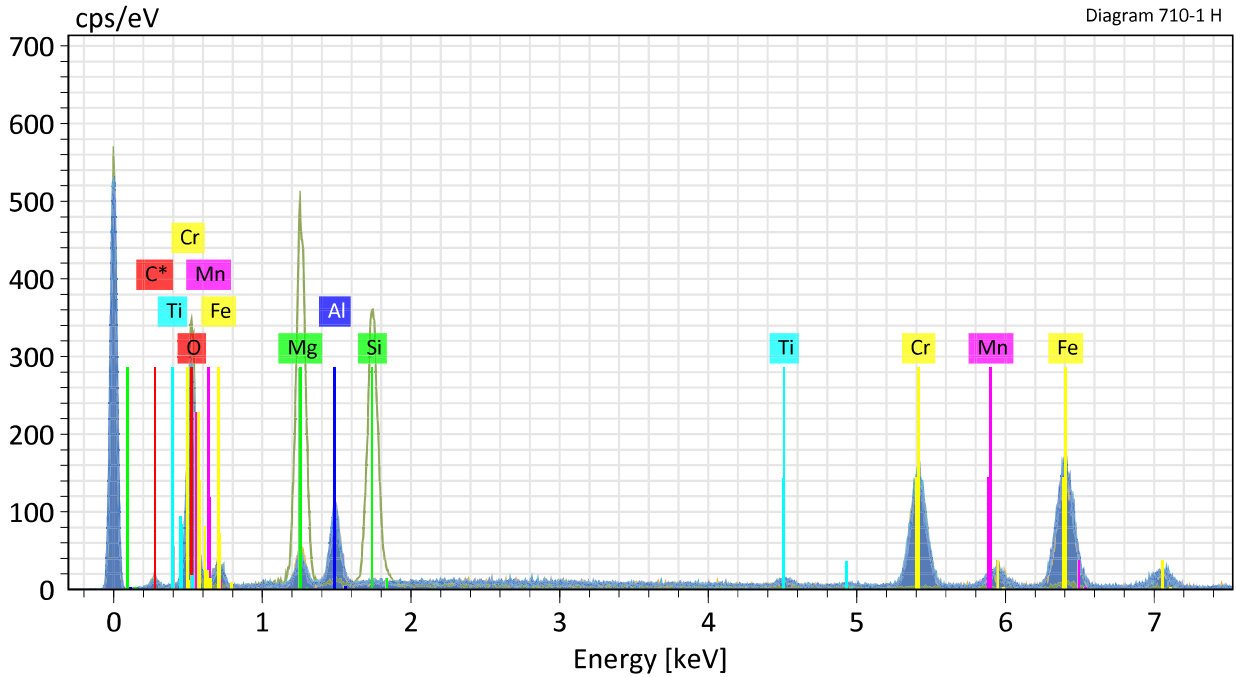
Company / Department

Image 710-1 S



The images, point analyses and diagrams on the next pages 33-35 illustrates distribution of the chemical elements and gives indications of actual mineral phase in the same designated area of slide 710-1.

Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:38:09	20.0 keV	110x	8.5 mm



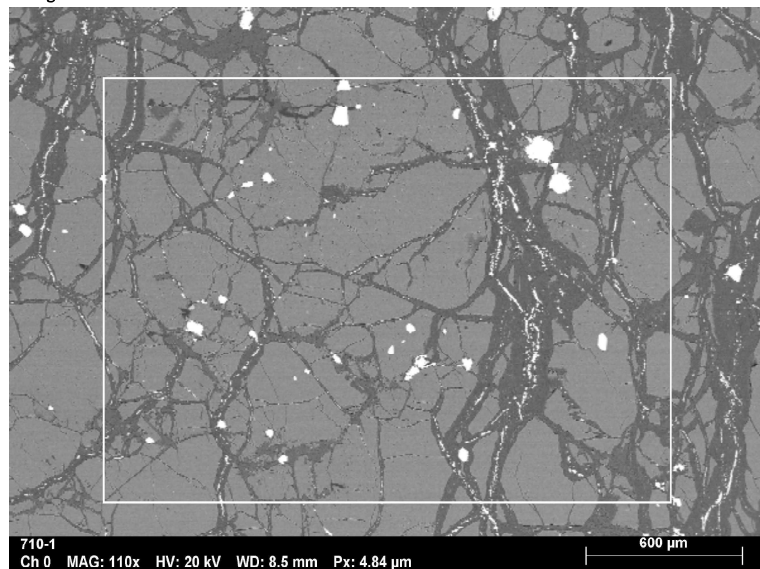
Normalized mass concentration [%] Table values from diagram 710-1 H, above. Numbers to the left refer to yellow numbers in image above

Spectrum	C	O	Mg	Al	Si	Ti	Cr	Mn	Fe
710-1 57	0.00	25.27	3.36	8.19		1.26	22.40	1.37	38.15
710-1 58		45.76	29.11	0.45	22.40				2.29
710-1 59	0.00	25.33	3.14	7.81	0.27	0.96	21.96	1.48	39.05
710-1 60	0.00	25.11	4.72	8.10		1.11	22.77	1.14	37.06
710-1 61	0.00	25.22	3.40	7.98		1.08	21.03	1.30	39.99
Mean	<b>0.00</b>	<b>29.34</b>	<b>8.74</b>	<b>6.51</b>	<b>11.33</b>	<b>1.10</b>	<b>22.04</b>	<b>1.32</b>	<b>31.31</b>
Sigma	<b>0.00</b>	<b>9.18</b>	<b>11.40</b>	<b>3.39</b>	<b>15.64</b>	<b>0.13</b>	<b>0.75</b>	<b>0.14</b>	<b>16.26</b>
SigmaMean	<b>0.00</b>	<b>4.10</b>	<b>5.10</b>	<b>1.52</b>	<b>7.00</b>	<b>0.06</b>	<b>0.34</b>	<b>0.06</b>	<b>7.27</b>

# Application Note

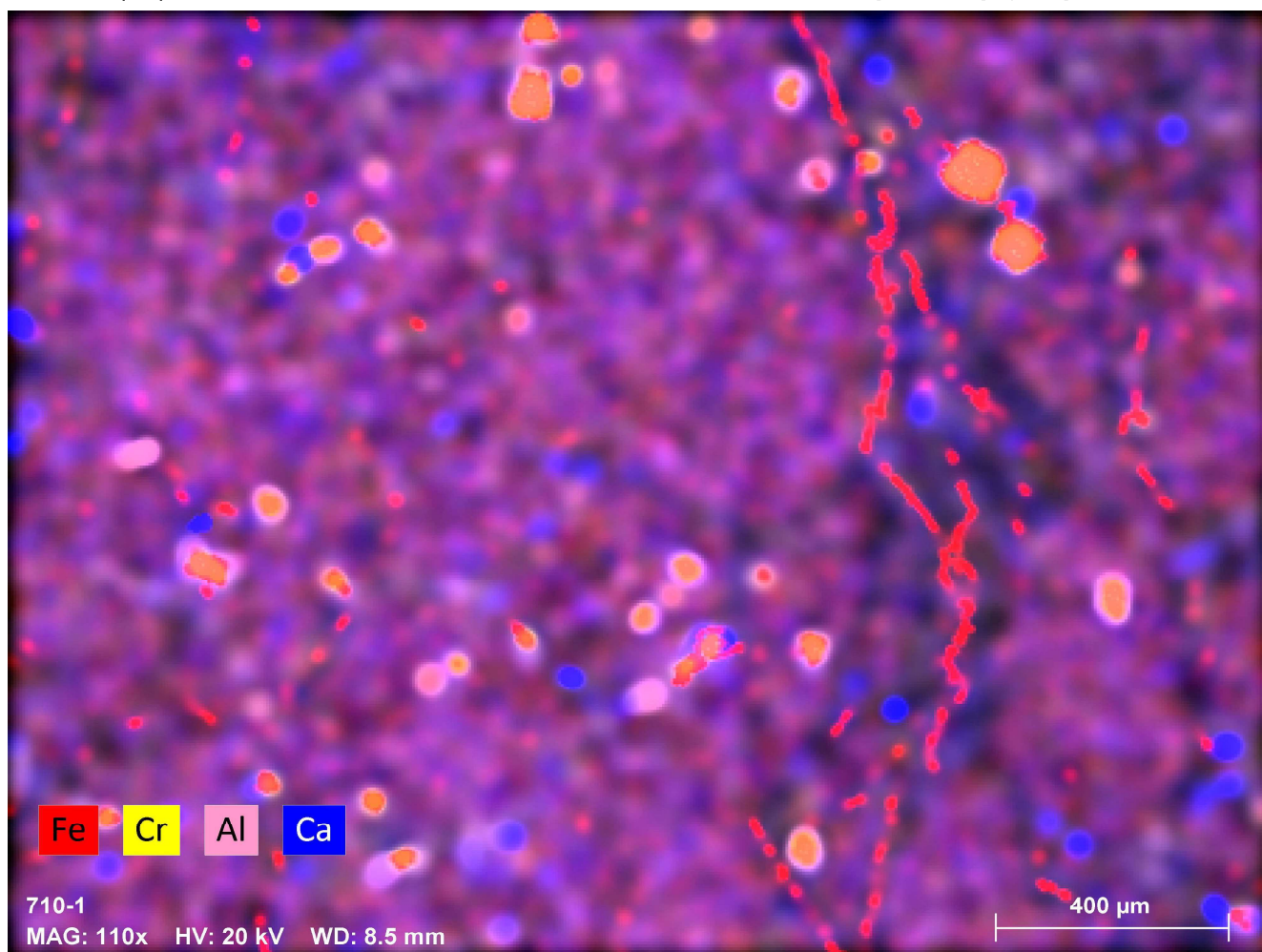
Company / Department

Image 710-1 T



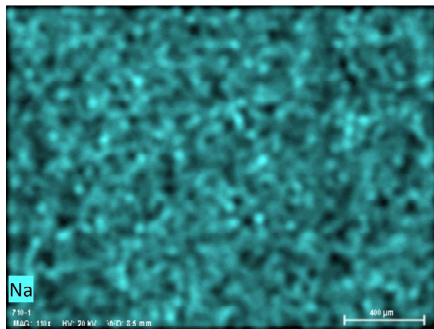
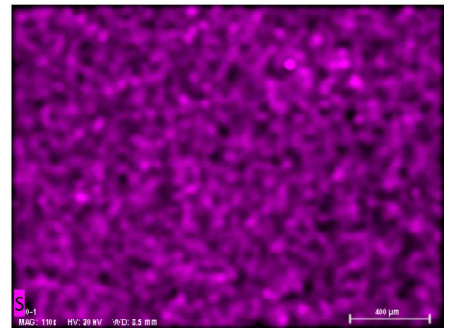
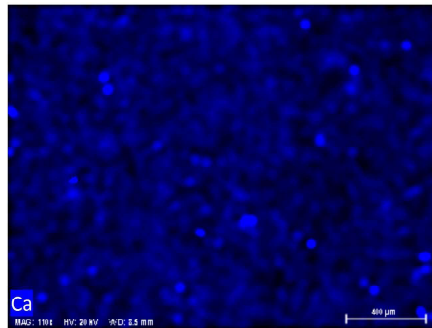
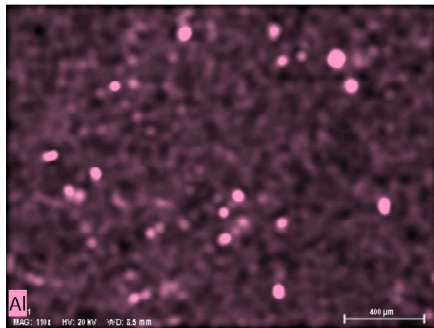
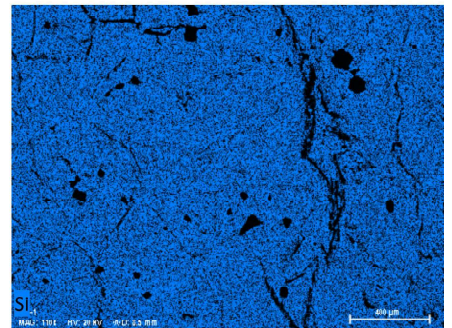
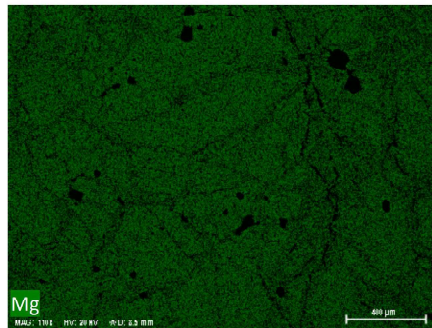
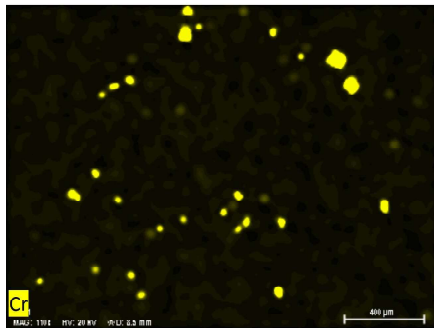
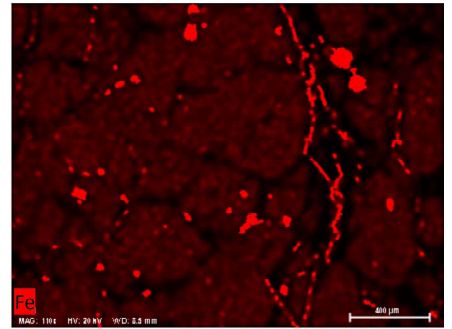
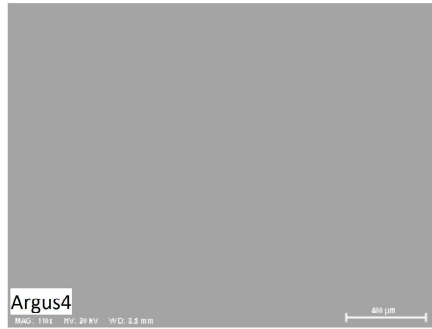
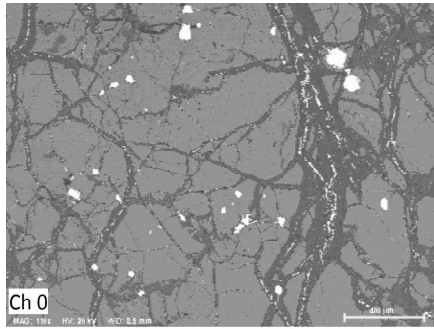
Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:43:00	20.0 keV	110x	8.5 mm

Image 710-1 U slightly enlarged from 710-1 T (frame)



Name	Date	Time	HV [kV]	Mag	WD [mm]
710-1	23/01/2019	17:43:07	20.0 keV	110x	8.5 mm

Image assembly 710-1 VIII



Date	Time	HV [kV]	Mag	WD [mm]
23/01/2019	17:43:07	20.0 keV	110x	8.5 mm