WOLFRAM CAMP PROJECT

Annual Report on Exploration Permit for Minerals 8884,
"Wolfram Camp", for the period
29th September 2012 to 28th September 2013

WOLFRAM CAMP EPM 8884

Annual Report: 29th September 2012 to 28th September 2013

Submitted by: UTM Global Exploration and Mining Tenement Services

Tenement Holder
Wolfram Camp Mining Pty Ltd

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1. INTRODUCTION

EPM 8884 covers the Wolfram Camp tungsten-molybdenum-bismuth project which is located 16 km from the township of Dimbulah in North Queensland. This project is held 85% by Wolfram Camp Mining Pty Limited and 15% by Tropical Metals Pty Limited, both wholly-owned subsidiaries of Deutsche Rohstoff AG. Four Mining Leases, ML 4935, 5117, 20486 and 20534 are contained within the EPM boundary.

This report summarises the exploration work completed within EPM 8884 for the year ending 28th September 2013. Work comprised an ongoing detailed review of the geology and exploration potential, and the commencement of systematic drill testing to delineate extensions to the known resources.

Future exploration within the EPM will continue to target extensions to the known mineralization and potential for concealed W-Mo-Bi systems. The tenement area may also have the potential to host future infrastructure for an expanded Wolfram Camp mine operation.

2. PROJECT LOCATION

The Wolfram Camp tungsten-molybdenum-bismuth project is located 90 km west of Cairns and approximately 16 km outside the township of Dimbulah in North Queensland. (Figure 1)

The project is located on the Chillagoe 1:250,000 Geological Sheet 7863, and on the Chillagoe 1:100,000 Topographic Sheet 7863, centred at AMG 84 coordinates 835,000E and 8,110,000N. (Google Earth plan Figure 2)

Dimbulah lies on the main Burke Development Road between Mareeba and Chillagoe, and is on the Mareeba-Almaden-Forsyth railway line.

3. TENEMENT

EPM 8884 was granted on 29th September 1992 covering the following 4 sub-blocks

MMIM	BLOCK	SUB-BLOCKS
Town	876	XY
Town	948	CD

Renewal of the tenement has been sought to permit the systematic exploration of mineralised targets to be incorporated in planned mining lease applications adjoining the current Wolfram Camp Mine.

A single Native Title Claim (QC 95/11) covers the tenement.

4. GEOLOGICAL SETTING

4.1 REGIONAL GEOLOGY

The Wolfram Camp Mining Field is situated in the Hodgkinson Basin which forms part of the Palaeozoic Tasman Geosyncline and comprises Middle to Upper Devonian flysch sequences intruded by a series of Late Carboniferous to Permian granitic rocks and overlain by the Carboniferous Featherbed Volcanics (Figure 3).

The Wolfram Camp deposits (and others in the region) are associated with the Late Carboniferous - Early Permian Ootann Supersuite granites which are generally composed of biotite granite, hornblende-biotite granite and granodiorite. The Ootann Supersuite has a distinct W, Mo and Bi metallogenic association and the late stage siliceous (greisen) alteration at Wolfram Camp reflects this association.

4.2 PROJECT GEOLOGY

The Wolfram Camp Mineral Field is dominated by the Late Carboniferous - Early Permian Ootann Supersuite granites.

Hodgkinson Formation sediments occur to the north-east of the mineralised contact with the Permian-Carboniferous granite. These sediments have undergone penetrative deformation and are low-grade regional metamorphic rocks which have been folded and uplifted, and subsequently eroded to form a region of low relief (de Keyser and Wolff, 1964). Minor sulphide mineralisation has been seen in veinlets with quartz and minor calcite up to a few hundred metres from the contact. Only very minor greisen alteration with associated wolframite, molybdenite and bismuth has been noted within the sediments and volcanics, and mostly within a few metres of the contact.

The Featherbed Volcanics within the area of interest comprise mostly acid ignimbrites of a similar composition to the granite.

The granite which hosts the mineralisation at Wolfram Camp is the James Creek Granite. It is described as a pale to medium grey, pinkish grey or pink, fine to coarse grained biotite granite and leucogranite which has been dated at 291 +/-6 Ma.

4.3 MINERALISATION AND ALTERATION

The granite has been extensively altered over a length of approximately 3 km along the contact with the sediments and volcanics. This contact appears to dip at 40°- 60° to the north around the arcuate northern edge of the granite, but there is significant evidence to suggest that the current surface of the granite to the south of the exposed contact is close to the original intrusive contact.

The alteration is considered to be related to post intrusion hydrothermal activity. Subsequent alteration of phyllic-argillic type then caused partial repacement of plagioclase and complete replacement of biotite by sericite, clays, carbonate (calcite) and traces of fluorite, sphalerite and bismuthinite.

The most intense alteration is developed near the surface contact with the sediments (and volcanics) and is characterised by quartz pipe and quartz greisens with increasing muscovite greisen and decreasing quartz greisen developing to the south away from the contact.

The surface contact zone of mineralisation possibly represents an apical point for mineralising fluids with a release of pressure resulting in auto brecciation of the granite host. Field evidence (especially underground mapping) indicates multiple phases of mineralisation with brecciation and rehealing of pipe mineralisation (especially wolframite).

The intensity and nature of the alteration decreases and changes to the south, away from the granite-sediment contact. Decreasing alteration has also been noted dipping to the north at depth.

The quartz pipes and sheets are thought to have formed in cooling fractures parallel to the contact and in vertical to subvertical tension joints. The joint systems seem to have acted as solution channel ways and underground mapping reveals alteration of weakening intensity away from the vein system. Pipes have probably developed where alteration and fluid flow is at its most intense.

The auto brecciation has resulted in smaller, scattered irregular pipes with much broader zones of quartz greisen alteration surrounding them. This forms the high grade "bulk tonnage" mineralised zones in the surface contact zone. However, remnant lower grade alteration areas still exist in these high grade zones and alteration patterns can be very erratic.

The presence of a number of small pendants of sediment at various points over the altered granite indicate there is little weathering of the original granite intrusive.

Mineralisation is predominantly confined to quartz greisens with high grade zones occurring in quartz pipes. The alteration developed around the quartz pipes can be used to indicate proximity to mineralisation and a classification system based on the alteration styles has been developed for geological logging purposes.

Aspects of the geology and mineralisation at Wolfram Camp are summarised in a recent AusIMM presentation (Appendix 1)

5, WORK UNDERTAKEN

In conjunction with ongoing geological programs associated with the recommencement of mining operations at Wolfram Camp, during the reporting period systematic testing of extensions to the known mineralisation commenced.

A program of shallow RAB drilling at the Parrott prospect (90 holes / 1241.5m) has delineated a significant sheet-like greisen body with encouraging tungsten mineralisation and an initial program of diamond drilling (6 holes / 904.3m) has intersected extensive alteration and associated W-Mo mineralisation along the prospective granite-sediment contact zone.

5.1 Reconnaissance RAB Drilling

Geological reconnaissance highlighted an extensive sheet-like body of quartz-mica greisen extending along the crest of the hilltop to the south of the current Wolfram Camp mining operation.

The blocky greisen outcrops contain visible disseminated wolframite and minor molybdenite. Numerous historical workings dating from the early 1900's appear to have been developed on locally richer patches of greisen, with the most extensive recorded underground workings (Parrotts) developed along a shallow plunging pipe-like body.

The area had been noted on previous geological mapping but had not been drill tested by previous exploration programs completed during 2005-2010.

A single vertical historical (1981) exploration drillhole (WDDH-8) adjacent to the main greisen bodies did however intersect significant near-surface tungsten mineralisation (8m @ 0.24% WO_3 from 4m downhole).

Shallow RAB drilling was completed to confirm the extent and grade variability of the zone. Encouraging results were followed up with a number of infill holes and drilling adjacent to the main (Parrotts) historical workings.

To date the Parrotts exploration program comprises 90 shallow vertical holes (total 1241.5m) with 493 sample intervals (mostly 2.5m) geologically logged and analysed using standard onsite procedures and QA-QC protocols.

The terrain has made access to the central portion of the mineralised zones difficult and several holes have been abandoned due to poor ground conditions.

The reconnaissance program has delineated a flat-lying sheet of dominantly quartz-mica greisen including the historical Parrotts workings.

Several holes intersected significant mineralisation including:

- WCM EX 31 – 2.5m @ 4.57% WO_3 from 7.5m (within a 12m interval from surface @ 1% WO_3

- WCM EX 41 – 12.5m @ 0.64% WO_3 from surface (including 1.2% WO_3 at the bottom of the hole)

- WCM EX 66 – 2.5m @ 1.95% WO_3 from surface.

Several holes terminated in shallow mineralisation including:

- WCM EX 3 – 5m @ 0.43% WO_3 from surface

- WCM EX 27 – 5m @ 0.32% WO_3 from surface

Geological logging, analytical results and generalised sections across the mineralisation are presented in Appendix 2.

5.2 Diamond Drilling

Drilling of deeper geological targets along the granite contact zone commenced during the current reporting period with six completed to date.

Geological logging of these cored holes is in progress and will be followed by sampling and multi-element analysis of mineralised intercepts and detailed petrological study of associated alteration.

The drilling has intersected extensive alteration within the granite adjacent to the contact, including zones with coarse wolframite - molybdenite mineralisation.

A summary of the geological observations to date is included in Appendix 3, with comprehensive documentation of results to be included in subsequent reporting, upon completion of processing and analysis of the drillcore.

6. FUTURE WORK

To extend the life of the project the company plans to systematically explore for extensions to the currently defined resources at Wolfram Camp and target concealed mineralization within the surrounding exploration tenements.

Proposed exploration for the permit includes the follow-up of extensions / repetitions of the near-surface sheet-like greisens and ongoing deeper target generation and testing.

At Wolfram Camp, additional drilling to the south-east of the current mining operation is scheduled to commence in late 2013, followed by systematic evaluation of the entire prospective granite contact zone within EPM 8884.

7. REFERENCES

Ball, L.C., 1913. Rare Metal Mining in Queensland: Resume of Recent Field Studies. Jan. 15, 1913; QGMJ, p 4;

Ball, L. C. 1913. Map of Rare Metal Mines at Wolfram. Oct. 1913. Pg 526. QGMJ.

Ball, L.C., 1919 The Geology of Wolfram Camp, North Queensland (I) QGMJ, 20, p.509; Dec. 15, 1919.

Ball, L.C., 1920 The Geology of Wolfram Camp, North Queensland (II) QGMJ, 21, p.6. Jan 15, 1920.

Cameron, W.E. 1903. Wolfram, Molybdenite, and Bismuth Mining. At Wolfram Camp. Hodgkinson Goldfield. Geol. Surv report. QGMJ. July 15, 1903. Pg. 350.

Cameron, W.E. 1904. Wolfram and Molybdenite Mining. Geol. Surv report. QGMJ. Feb. 15, 1904. Pg. 62.

Dunstan, F.G.S. 1905. Wolfram in Queensland. QGMJ. July 15,1905.Pg 333.

Morton, C.C. 1943 Molybdenite at Wolfram Camp. Geological Surv. Report, QGMJ Sep. 20, 1943.

Morton, C.C and Ridgeway, J.E., 1944. Wolfram Camp Rare-Metal Field, North Queensland. QGMJ 45, p.117.

Morton, C.C. 1945 Wolfram Camp Rare Metal Field, North Queensland. QGMJ May, 1945.

Morton, J. L. 1967. Discovery and Mining of Wolfram-Molybdenite Bismuth Pipes at Wolfram Camp, Qld. QGMJ. April. R Hare and Assoc.

Plimer, I. R. 1974. Pipe-like Mo-W-Bi Deposits of Wolfram Camp, North Queensland, Australia. Mineral. Deposita, 9, p.95-104.

Plimer, I. R. 1975. Wolfram Camp Wolframite-Molybdenite-Bismuth Quartz Pipes, North Queensland. From Econ. Geol. Of Aust. & PNG , AusIMM Monograph 5. Pg 760-762.

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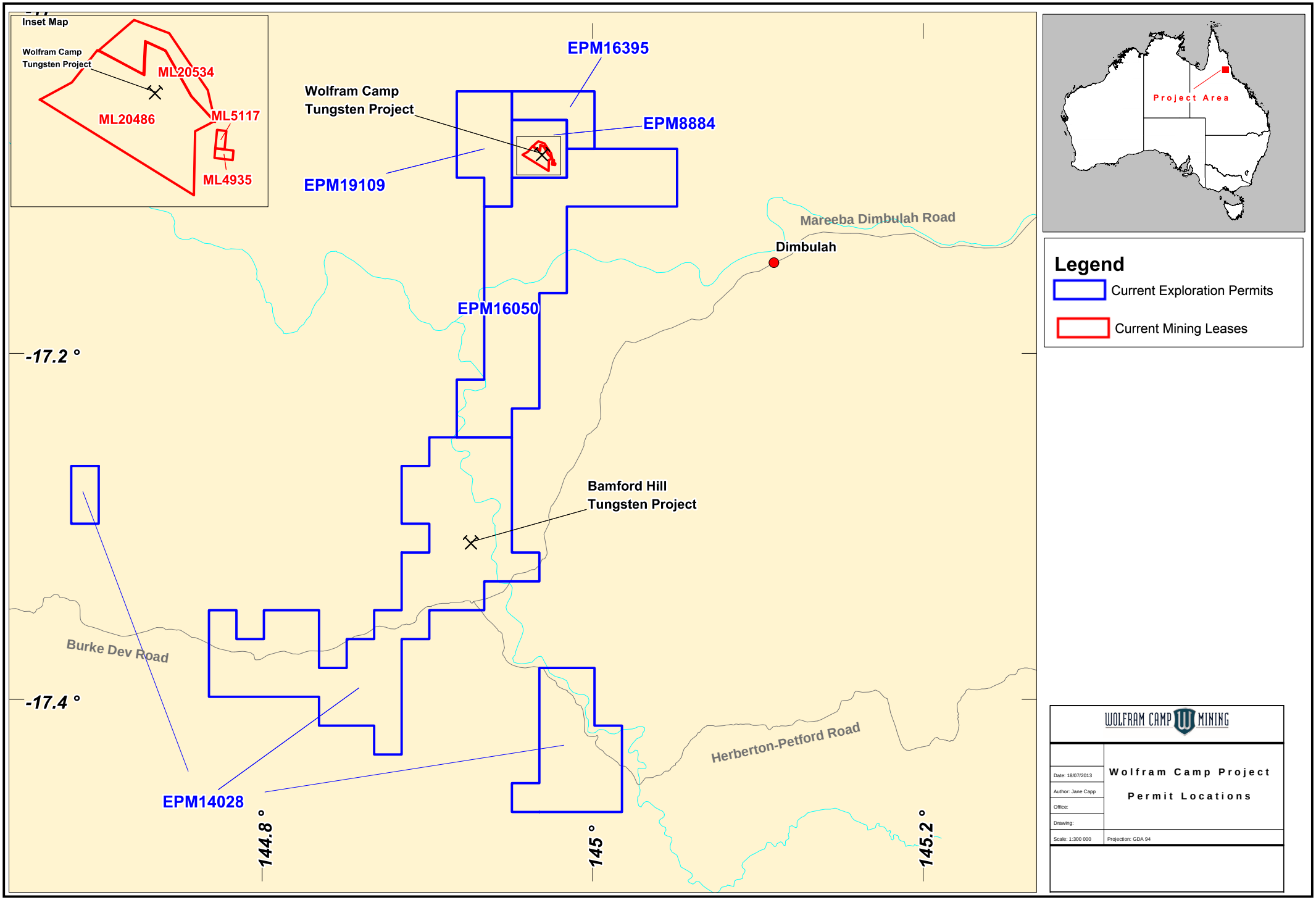
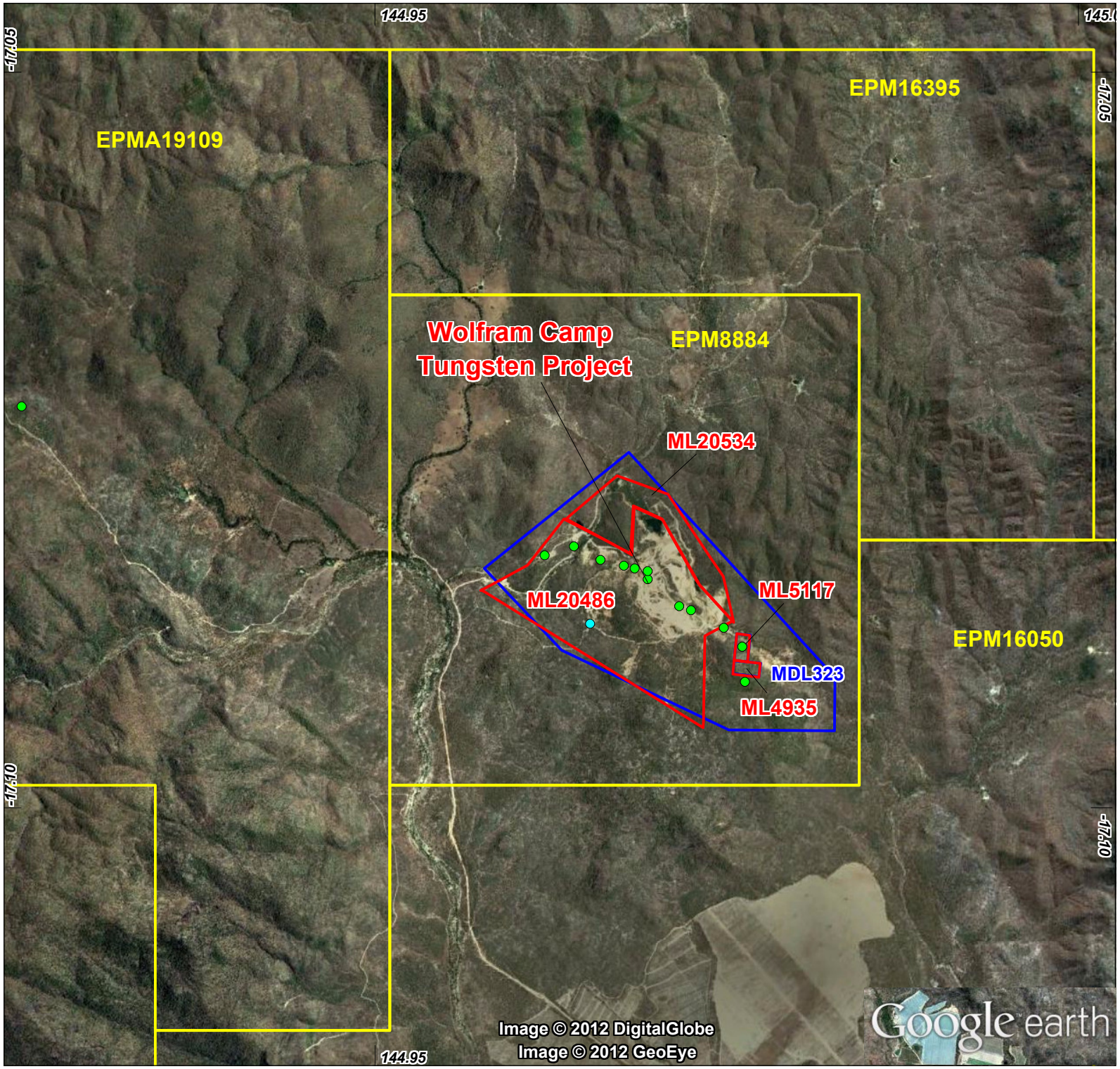
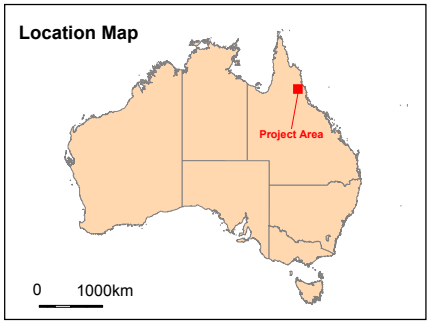

Inset Map
Wolfram Camp
Tungsten Project
ML20534
ML20486
ML5117
ML4935
EPM16395
Wolfram Camp
Tungsten Project
EPM8884
EPM19109
Mareeba Dimbulah Road
Dimbulah
EPM16050
-17.2 °
Bamford Hill
Tungsten Project
Burke Dev Road
-17.4 °
EPM14028
Herberton-Petford Road
144.8 °
145 °
145.2 °
Project Area
Legend
Current Exploration Permits
Current Mining Leases
WOLFRAM CAMP MINING
Wolfram Camp Project
Permit Locations
Date: 18/07/2013
Author: Jane Capp
Office:
Drawing:
Scale: 1:300 000
Projection: GDA 94





LEGEND

Mineral occurrences

- MOLYBDENUM
- TUNGSTEN

- ML boundary
- EPM boundary
- MDL boundary

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Google Earth image captured 4 July 2012

0 1km

SCALE - 1 : 40,000 (at A4)
Latitude - Longitude
Geocentric Datum of Australia 1994

WOLFRAM CAMP MINING

Wolfram Camp Project

Google Earth imagery

Date: 4 July 2012	Author: DH	QA: DM	Rev: A

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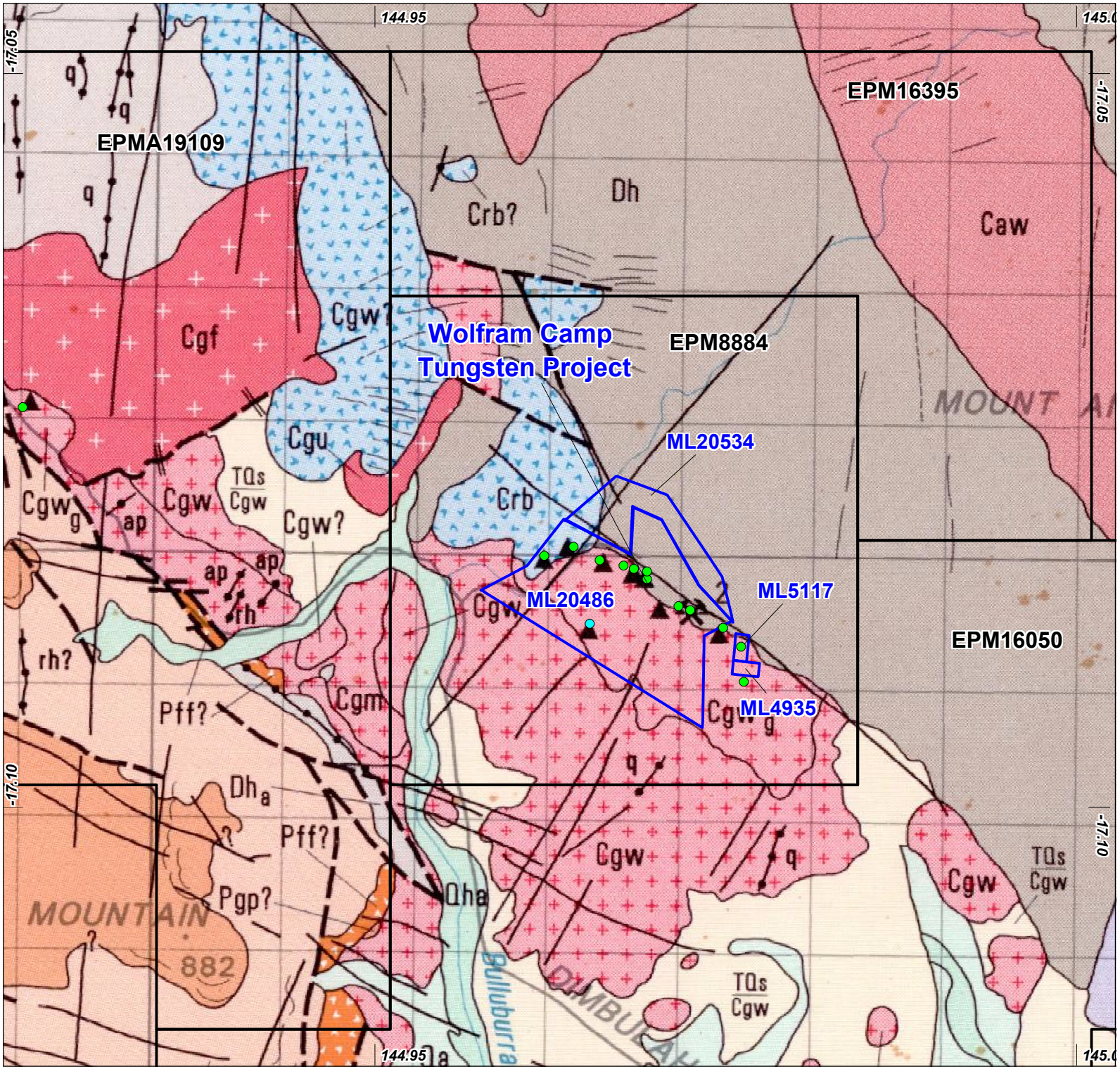
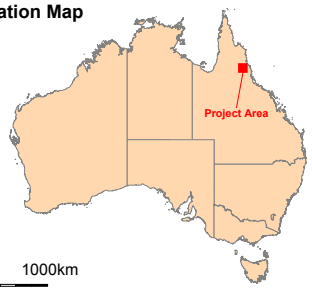


Location Map



LEGEND

Mineral occurrences

- MOLYBDENUM
- TUNGSTEN

- ML boundary
- EPM boundary

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Featherbed Cauldron Complex Geology compiled by D.E. Mackenzie R.J. Bultitude and I.P. Rienks 1993

0 1km

SCALE - 1 : 40,000 (at A4)
Latitude - Longitude
Geocentric Datum of Australia 1994

WOLFRAM CAMP MINING

Wolfram Camp Project

Featherbed Cauldron Complex Geology

Date: 6 July 2012	Author: DH	QA: DM	Rev: A

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WOLFRAM CAMP MINING

Operations Status and Geology

Geology

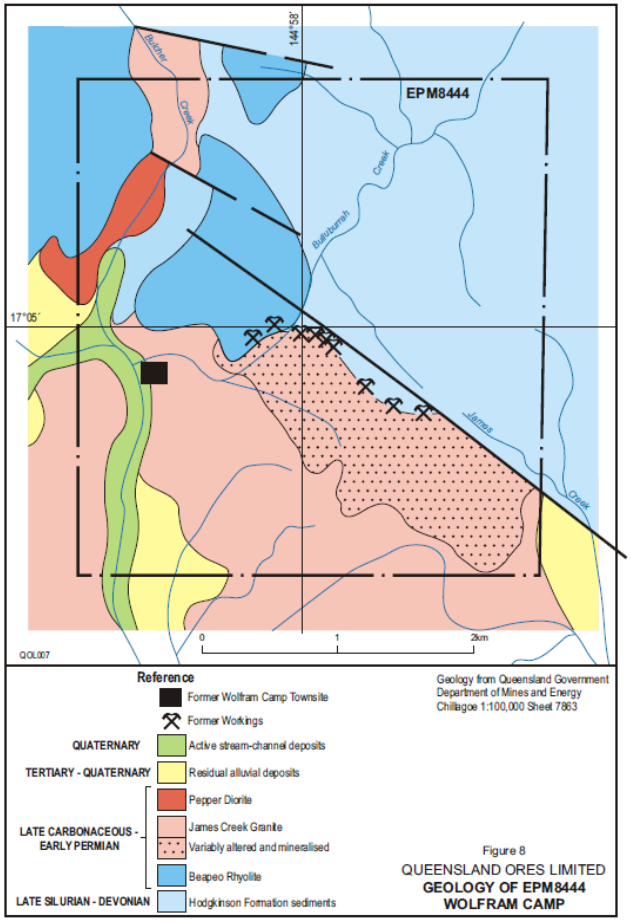
Quartz rich wolframite-molybdenum-bismuth pipes occur within the greisen altered margin of a early Permian granite in contact with Hodgkinson sediments

Regional Geology

- Situated in the Hodgkinson Basin which forms part of the Palaeozoic Tasman Geosyncline and comprises Middle to Upper Devonian flysch sequences intruded by a series of late Carboniferous to early Permian granitic rocks (Ootann Supersuite) and overlain by Permian Featherbed Volcanics (de Keyser and Wolff, 1964)
- The Ootann Supersuite has a distinct W, Mo and Bi metallogenic association and the late stage siliceous (greisen) alteration at Wolfram Camp reflects this

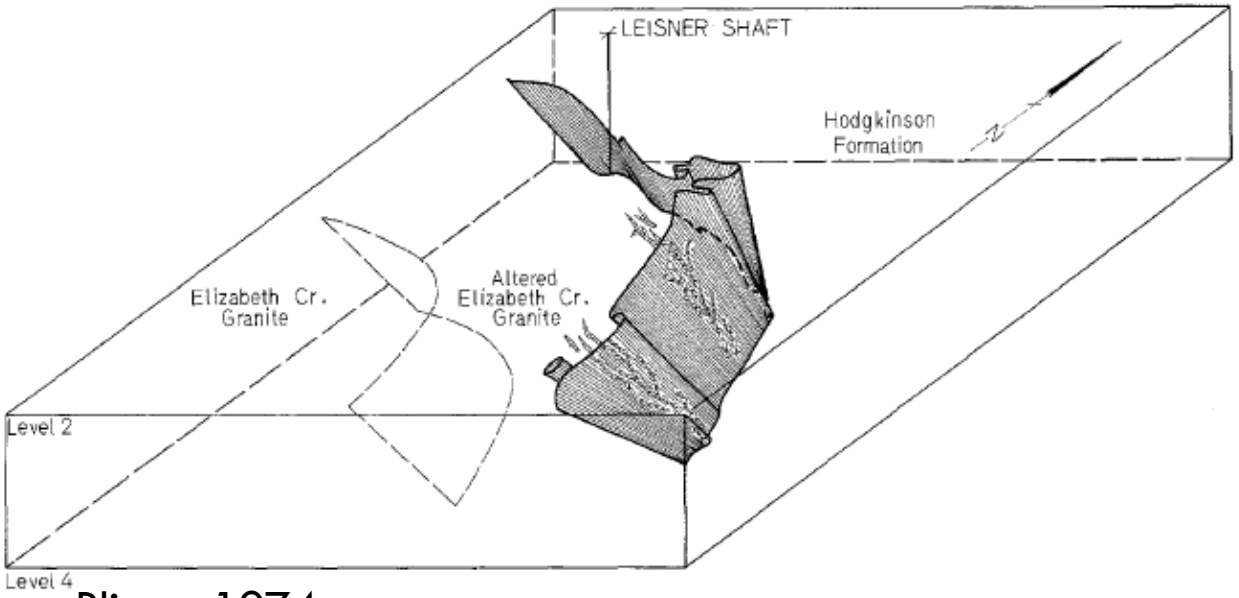
Mine Geology

- Hodgkinson formation sediments to the north east are fine grained sandstones and siltstones which have undergone penetrative deformation and are low-grade regional metamorphic rocks. They have been folded and uplifted and contain very little to no mineralisation
- The James creek granite (formally the Elizabeth Cr. Granite) to the south west is a pale-to-medium grey, pinkish grey or pink, fine to coarse grained biotite granite and leucogranite which has been dated to 291 +/-6Ma



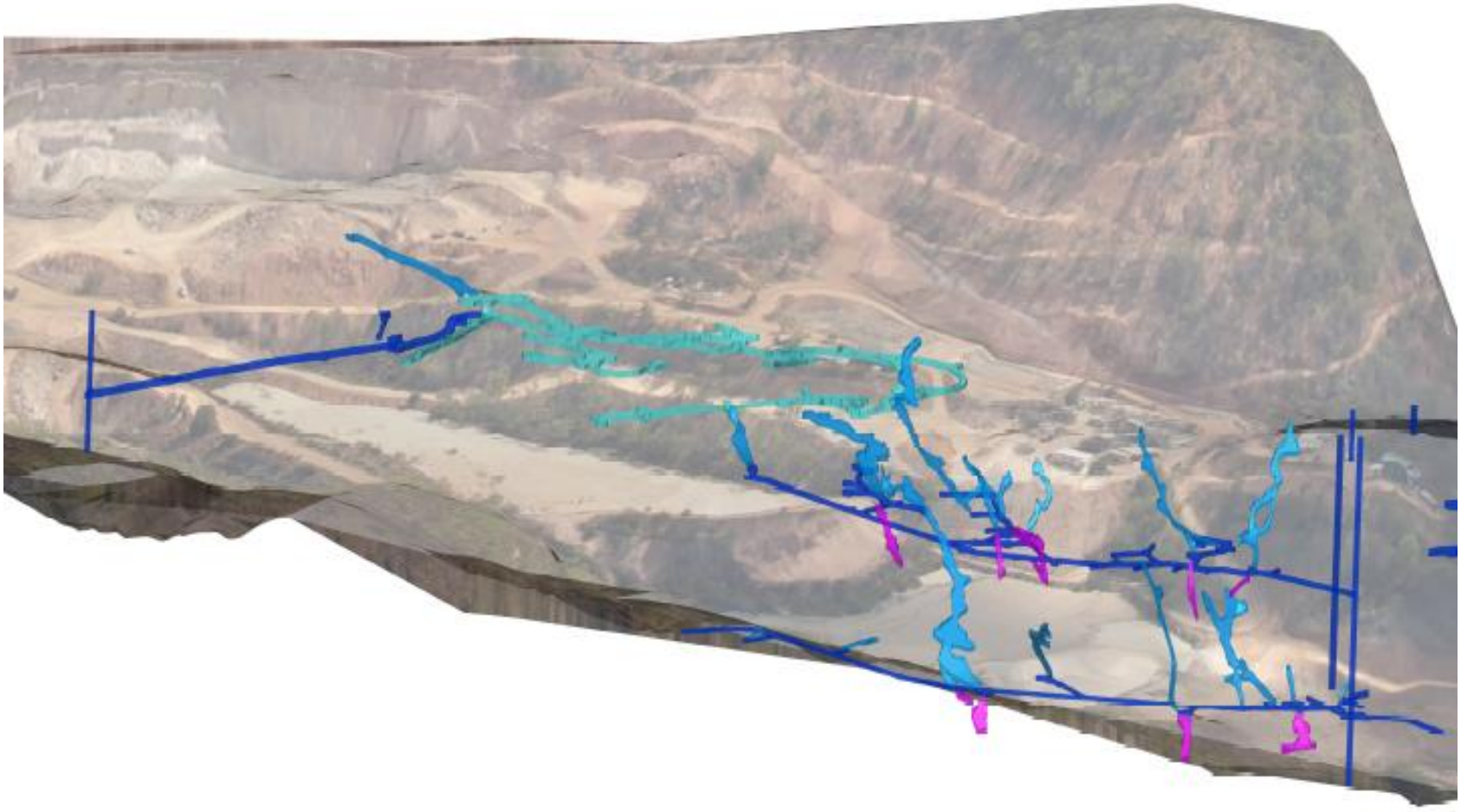
Mineralisation and Alteration

- Pipe-like deposit hosted in the greisen altered margin and roof zone of the James Cr. Granite
- Altered Granite/Greisen zone up to 50m wide and 3km long with variable dip
- Granite in Contact with Hodgkinson formation sediments



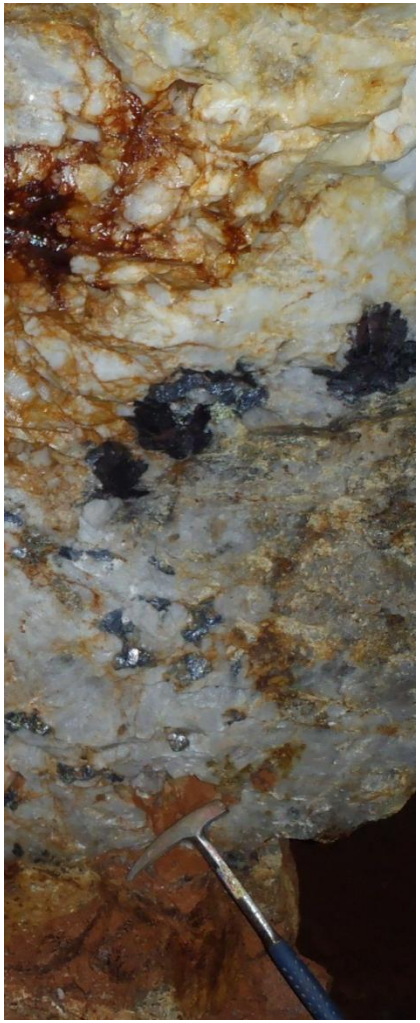
Plimer, 1974

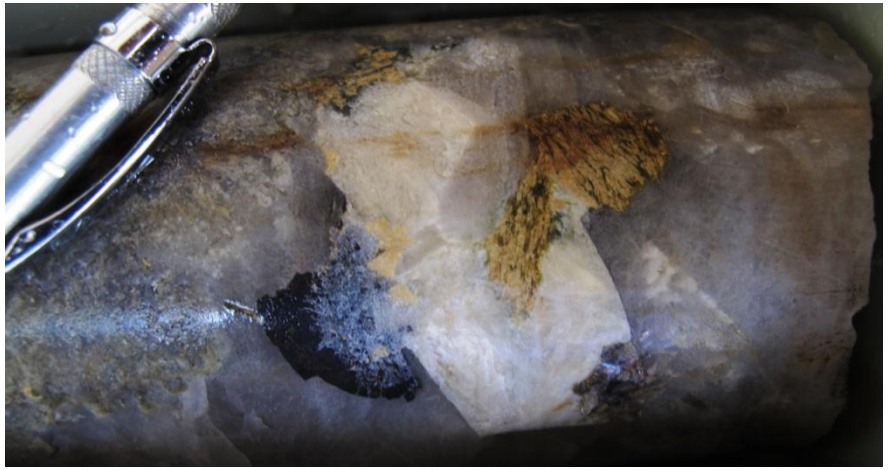
Old Workings



Quartz Pipes

- Range from 6m to a few centimetres
- Discontinuous, at times associated with jointing and follow the contact trend
- Dominated by quartz, clear-white-smoky with minor calcite
- Wolframite, molybdenite and bismuth often found but not always together and not all pipes are mineralised
- Also scheelite, pyrite, arsenopyrite, pyyrotite
- Minor siderite, chalcopyrite, sphalerite, galena and cassiterite



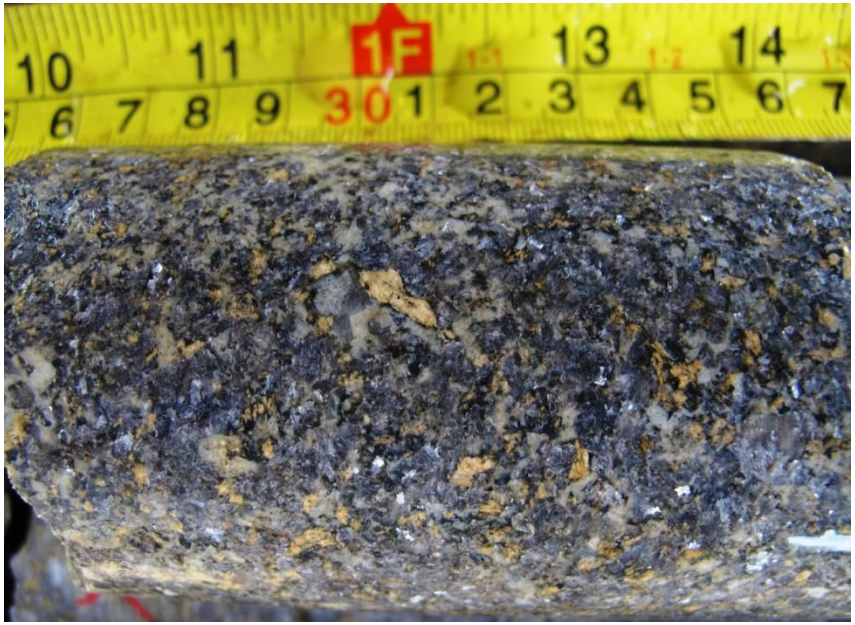


Quartz Greisen

- Forms a rim which can be several meters wide around quartz pipes
- Crystals are pyramidal
- Minor muscovite and common accessory pyrite
- Greyish colour with abundant vuggs
- Variable mineralisation

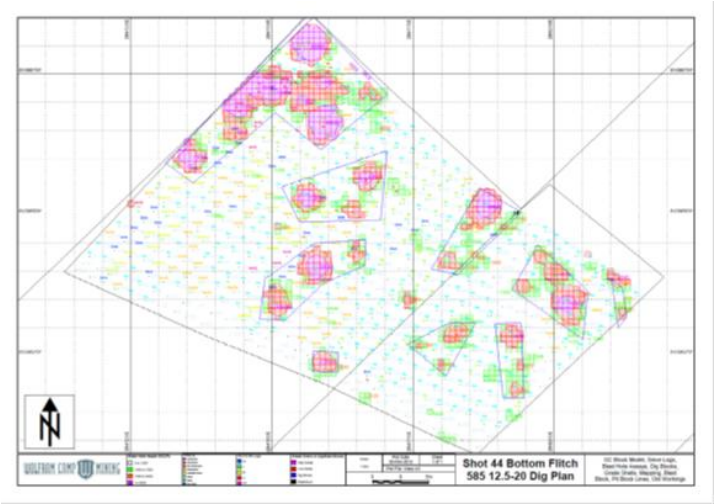
Mica Greisen

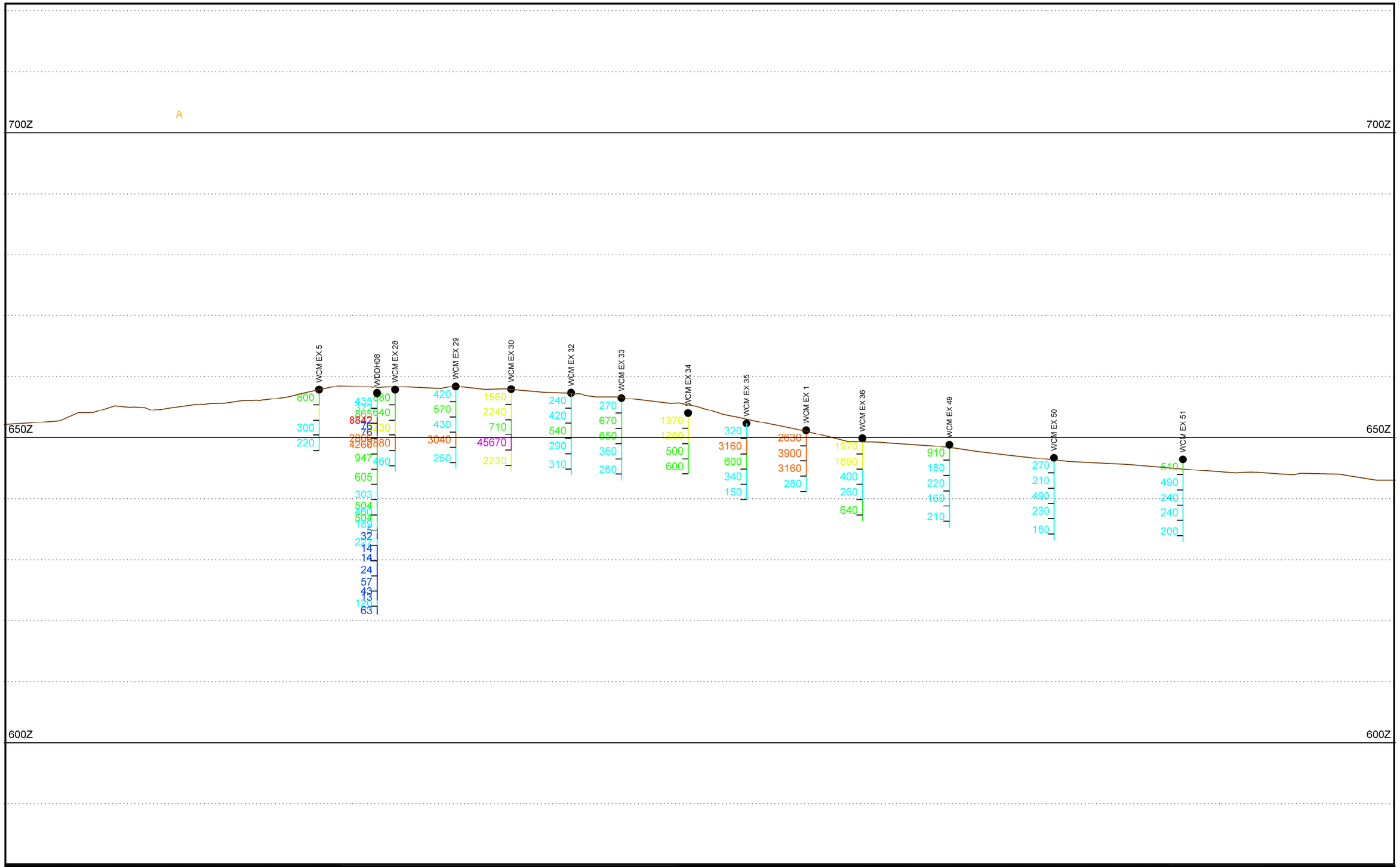
- Grades to quartz greisen
- Increasing amounts of Muscovite and decreasing Quartz
- Minor mineralisation and sometime siderite replacing Micas



Grade Control

- Blast Hole Sampling
- Blast Hole Collar logging
- Floor mapping
- Blast adjustment
- Blast monitoring
- Grade control block modelling
- Dig block mark out
- Visual spotting of high grade
- Oversize sorting
- Stockpile sampling





WOLFRAM CAMP MINING

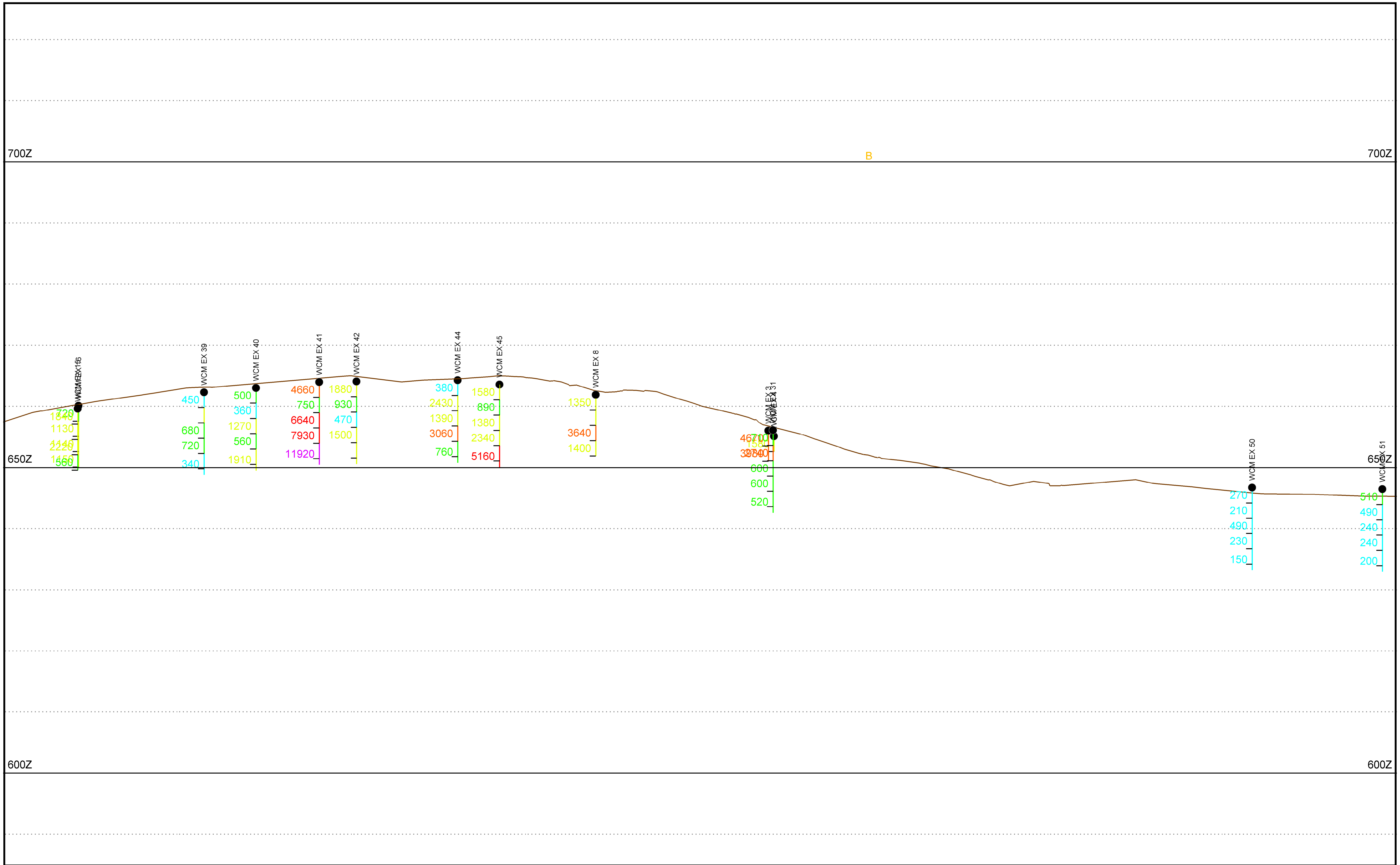
Values in WO3 ppm

.1 to 10 | 10 to 100 | 100 to 500 | 500 to 1000 | 1000 to 2500 | 2500 to 5000 | 5000 to 10000 | >= 10000

Scale	Plot Date	Sheet
1:600	07-Oct-2013	1 of 1
	Plot File: Vizex	

10 0 10m

Parrotts Section C +/- 10m



WOLFRAM CAMP MINING

Values in WO3 ppm

.1 to 10	1000 to 2500
10 to 100	2500 to 5000
100 to 500	5000 to 10000
500 to 1000	>= 10000

Scale	Plot Date	Sheet
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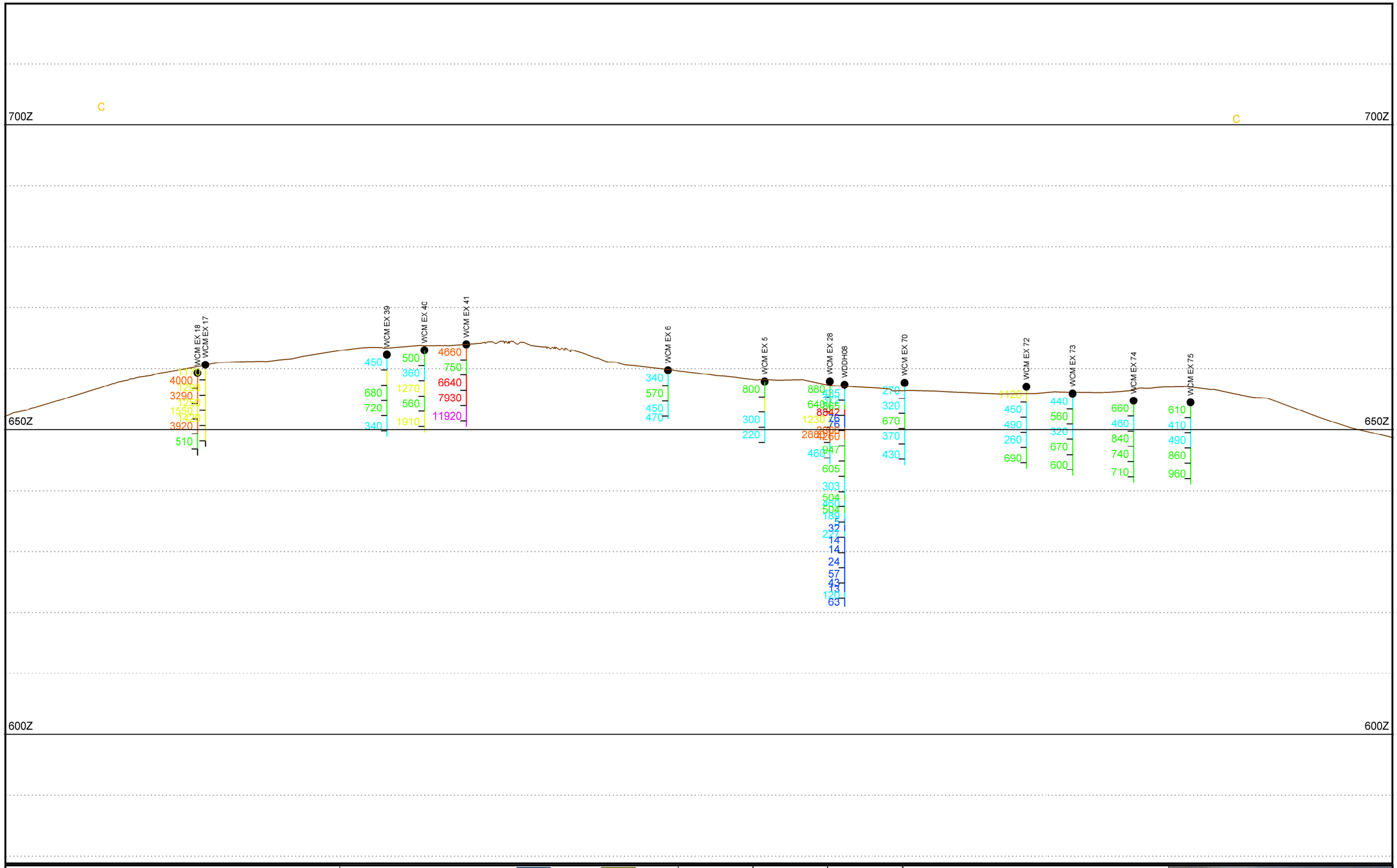
	Plot File: Vizex	

10 0 10m

Parrotts Section B +/- 10m



WOLFRAM CAMP MINING

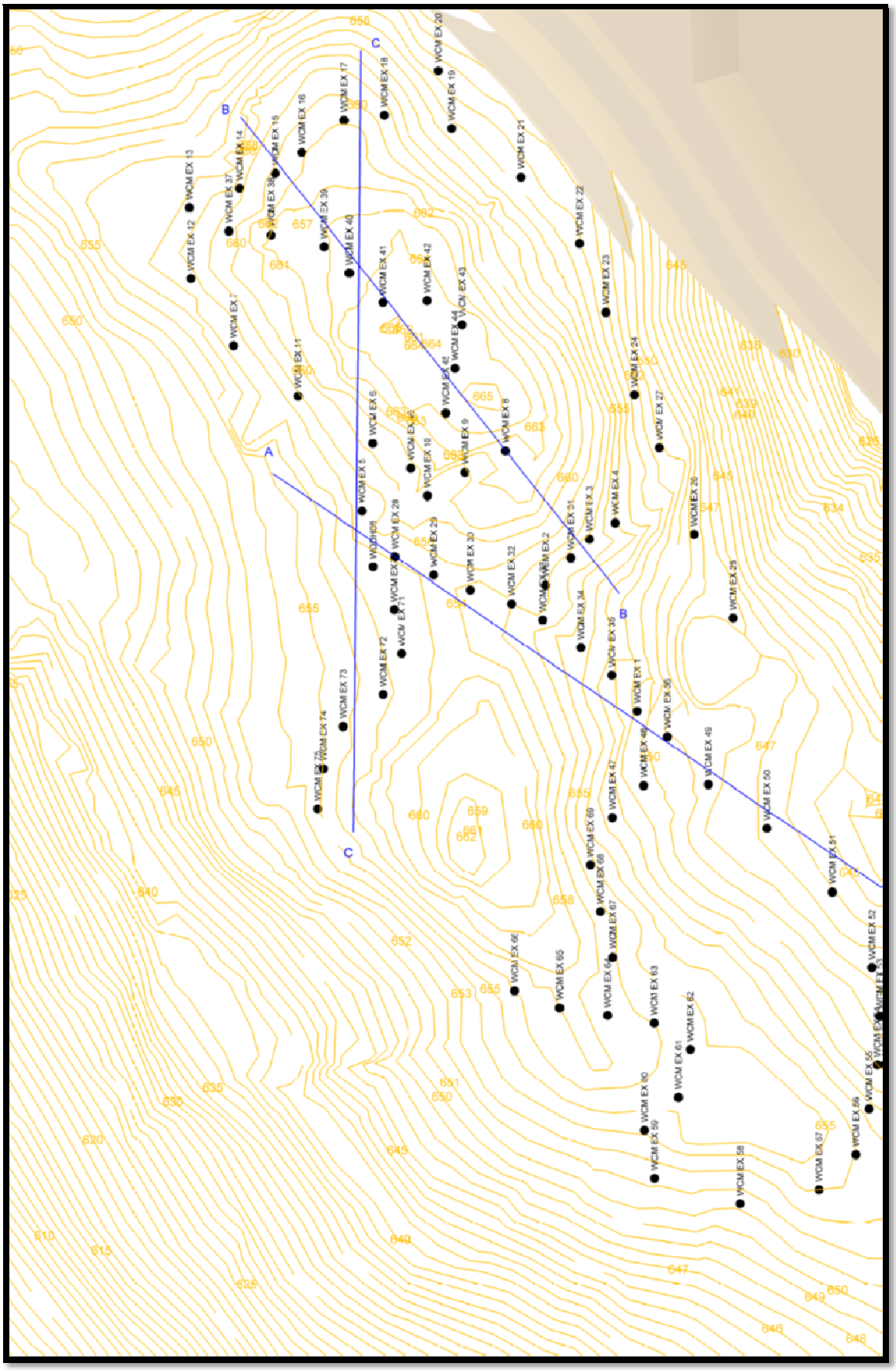
Values in WO3 ppm

1 to 10 | 10 to 100 | 100 to 500 | 500 to 1000 | 1000 to 2500 | 2500 to 5000 | 5000 to 10000 | >= 10000

Scale	Plot Date	Sheet
1:600	07-Oct-2013	1 of 1
	Plot File: Vizex	

10 0 10m

Parrotts Section C +/- 10m



WOLFRAM CAMP MINING

Scale	Plot Date	Sheet
1:1000	07-Oct-2013	1 of 1
	Plot File: Vizex	

10 0 10m

2013 WOLFRAM CAMP CORE DRILLING SUMMARY

To date, 6 drill holes (DRD01-06) have been completed targeting mineralisation along the granite contact (Table 1).

Table 1. Drill Hole Collar Details

HOLE	EASTING	NORTHING	mRL	AZIMUTH	DIP	DEPTH (m)
DRD01	284074	8109777	590	167	-33	98
DRD02	284074	8109777	590	167	-59	116.5
DRD03	284074	8109777	590	146	-29	134.6
DRD04	284074	8109777	590	116	-31	164.5
DRD05	284074	8109777	590	90	-37	191.4
DRD06	284246	8109667	580.6	335	-37	199.3

To remain consistent with already captured and most informative data, the geological code system previously used by Tenneco Oil & Minerals (1981) was adopted. This code system broadly covered all the rock types and was most likely established for surface and underground mapping. Alteration/mineral types are not identified in this geological code system only the intensity of the alteration is captured, for example weakly altered granite. Tenneco Oil & Minerals codes and additional codes are shown in Table 2.

Table 2. Geology Code List

CODE	WOLFRAM CAMP MINING	HERITAGE	COMMENTS
1	Quartz Pipe	Tenneco Oil & Minerals	
2	Quartz Greisen	Tenneco Oil & Minerals	
3	Micaceous Greisen	Tenneco Oil & Minerals	
4	Strongly Quartz-Muscovite (+-sericite)-Argillite Altered Granite, also known as "green spot" Argillite Alteration	Tenneco Oil & Minerals	May be added to microgranite if has strong alteration eg 74
5	Weak to Moderate Quartz-Muscovite (+-sericite)-Argillite Alteration of Granite	Tenneco Oil & Minerals	May be added to microgranite if has weak to moderate alteration eg 75
6	Leucocratic Biotite Granite	Wolfram Camp Mining	
7	Microgranite	Wolfram Camp Mining	
8	Pegmatite	Wolfram Camp Mining	
9	Porphyry	Wolfram Camp Mining	
FLT	Fault	Wolfram Camp Mining	
CLY	Clay	Wolfram Camp Mining	Nominally greater than 25% clay, mostly used as a

			secondary code
CAV	Cavity	Wolfram Camp Mining	Used for cavities and stopes, needs to be reviewed
C/L	Core Loss	Wolfram Camp Mining	
SST	Sandstone from the Hodgkinson Basin	Wolfram Camp Mining	Dark grey fine grain poorly bedded sandstone

Data captured include RQDs, graphic logs, geology logs, UV logs and sample intervals. Remaining work to be completed are photography, cutting, sampling and assaying.

Results for the program will be fully documented upon completion of the program, with brief geological summaries included below:

Drill Hole Summaries

DRD01 did not intercept any quartz pipes but did drill through many intervals of mica greisen. The upper 30m of the hole was mostly moderately altered granite with trace sparse coarse wolframite and molybdenite. The rest of the hole was interchanging intervals of weakly mineralised mica greisen and weakly to strongly altered granite. The most mineralised interval was 0.6m at 1% wolframite and 5% molybdenite from 56.95m.

DRD02 has trace sparse coarse wolframite and molybdenite in the upper 29.4m, leading into a 2.1m mica greisen patch containing 0.2m of weakly mineralised quartz pipe. Over the 2.1m from 29.4m wolframite and molybdenite is minor. The rest of the hole is weakly to strongly altered granite with 0.3-3m mica greisen intervals and patchy weak mineralisation.

DRD03 contained trace sparse coarse wolframite and molybdenite in the upper 26m in granite. The rest of the hole was variably altered granite with 20% mica greisen patches varying from 0.2m to 8.3m wide with weak to no mineralisation.

DRD04 traversed sub parallel to the granite-sediment contact approximately 30m inside the granite body. Mineralisation was weak in the upper 29m compared to the first 3 holes, but then increased down to 52m. Trace sparse mostly coarse wolframite and molybdenite are in mica greisen patches and strongly altered granite. A partly cavernous weakly mineralised 0.2m quartz greisen with similar size mica greisen above and below was drilled from 50.95m. Some massive wolframite and molybdenite were drilled through over a 0.2m mica greisen interval from 83.02m. A 4.2m interval was then drilled through from 101.3m containing 15% to 30% small coarse quartz patches with weak mineralisation in moderately altered granite and mica greisen with a 0.45m cavity from 104.6m. The remainder of the hole was fresh to strongly altered granite with common mica greisen intervals.

DRD05 was rotated towards the granite contact. The upper 38.1m was variably altered granite before drilling through barren 0.6m of mica greisen and 0.65m of quartz greisen leading into 2.35m of barren quartz pipe from 39.35m. Only signs of mineralisation in the pipe were trace molybdenum fracture fill. 5.6m of barren quartz greisen followed and led into a 1.7m cavity/stope from 47.3m. Most likely a stope, as there was no evidence of a cavity on the walls leading in and out. Another 2.3m weakly mineralised quartz greisen was drilled through from 56.1m with weakly mineralised

intervals of granite and mica greisen following down to 68.1m. A massive lump of molybdenite makes up 30% of a 0.34m quartz pipe from 68.1m with minor wolframite. The pipe with some mica greisens continues for another 0.4m but is un-mineralised.

Another 0.7m quartz pipe with lesser mica greisen and trace sparse coarse molybdenite, wolframite and pyrite was intersected from 84.6m. Another 0.2m pipe from 88.12m followed with sparse coarse trace mineralisation. Variably altered granite and mica greisens with sparse coarse molybdenite or wolframite continued down to the next 3.7m quartz greisen interval from 108.3m. This interval contained no molybdenite, only trace coarse wolframite with lesser pyrite. Fresh to strongly altered granite with lesser mica greisens and weak patchy mineralisation led down to a 0.9m strongly molybdenite mineralised mica greisen's from 148.6m with approximately 4% molybdenite and minor wolframite. Following was weakly altered granite from 149.5m to 150.6m, then a 0.23m quartz pipe with 10% molybdenite and 1% wolframite from 150.6m. This was the last quartz pipe intersected in this hole. Variably altered, but mostly fresh granite with lesser mica greisens made up the remainder of the granite intrusion. The hole passed into fine grain sandstone from the Hodgkinson Sediments at 183.8m. The contact was sharp with no signs of brittle or ductile deformation and no signs of alteration to the sandstone. Sediments continued to the end of hole at 191.4m.

DRD06 was designed to test for mineralisation along the granite-sediment contact. Alternating intervals of variably altered granite and mica greisens with rare sparse coarse mineralisation was seen through to 104.9m. 0.7m of strongly altered granite was then drilled through hosting two 0.2m un-mineralised quartz pipes. Another 0.7m weakly mineralised quartz pipe was then seen from 112.5m with minor coarse molybdenite. The hole continued through variable altered granite and intervals of mica greisen down to 172.8m with a single 0.3m un-mineralised quartz pipe at 141.9m. From 172.8m to 175.6m a mica greisen containing a 0.2m quartz greisen patch from 174.6m was intersected with trace to minor coarse molybdenite and wolframite. The sediment contact was reached at 198.5m and 0.8m of sandstone was drilled to end of hole at 199.3m. Granite contact appeared sharp, undeformed and unaltered.

Geology Logging

Identification/definitions of geological units were established from Ian Plimer's 1974 paper from the Mineral Deposita (Pipe-Like Molybdenite-Wolframite-Bismuth Deposits of Wolfram Camp, North Queensland,). All but the alteration mineralogy of the granites are well described in this paper.

Using the Tenneco Oil & Minerals geological coding system proved useful because of its simplicity, particularly when assigning rock codes to the granites. There are 3 main granite codes: 6=unaltered biotite granite, 5=weak to moderate altered granite, 4=strongly altered granite. Alteration of the granites are composed of variable amounts and combinations of sericite – kaolinite > chlorite > siderite. Because all alteration is very fine, colour was the main method of characterising mineralogy of alteration. Suggested thin section locations are provided below to help confirm the above mentioned mineralogy and identify other alteration types.

Figures 1-4 are photos of weak to strong alteration.

Figure 1. Weakly Altered Granite, DRD05 145m

Partial destruction of k-feldspar to quartz and muscovite. Often has common singular sericite-kaolinite-chlorite altered ?plagioclase grains. Still has approximately 1% biotite.

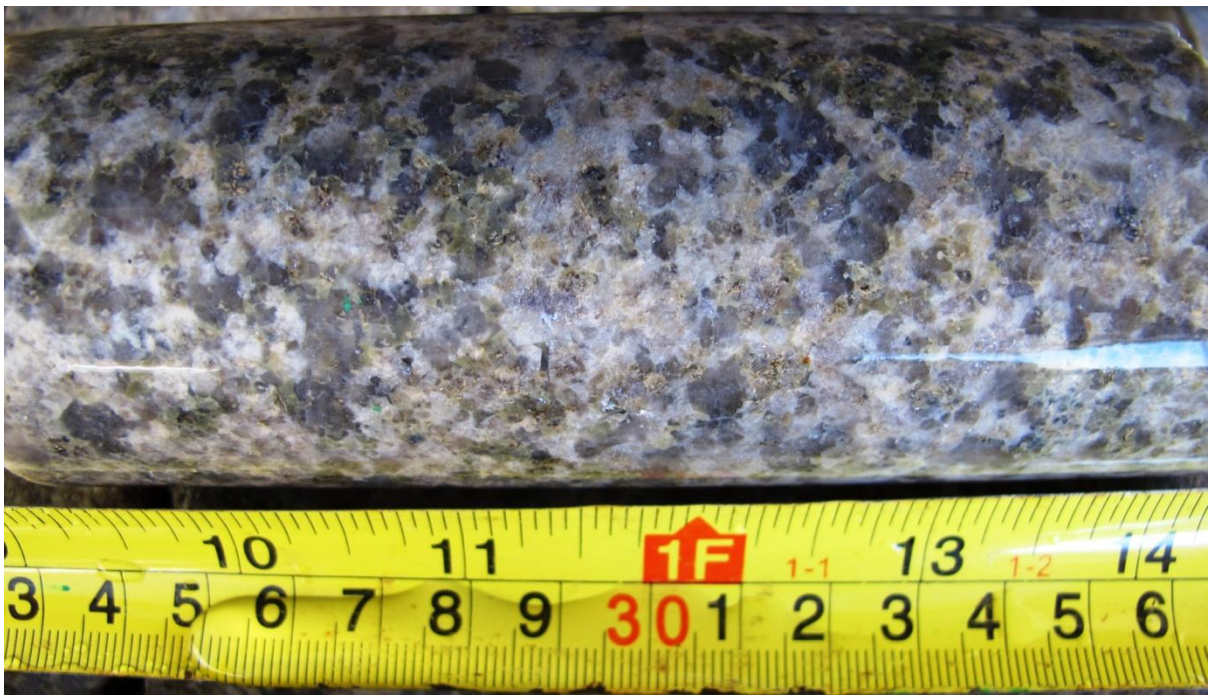


Figure 2. Moderately Altered Granite, DRD04 43.4m

No k-feldspar left. Minor to 1% muscovite. Plagioclase weakly to moderately kaolinite-sericite +- chlorite-siderite altered. The photo below has common siderite.

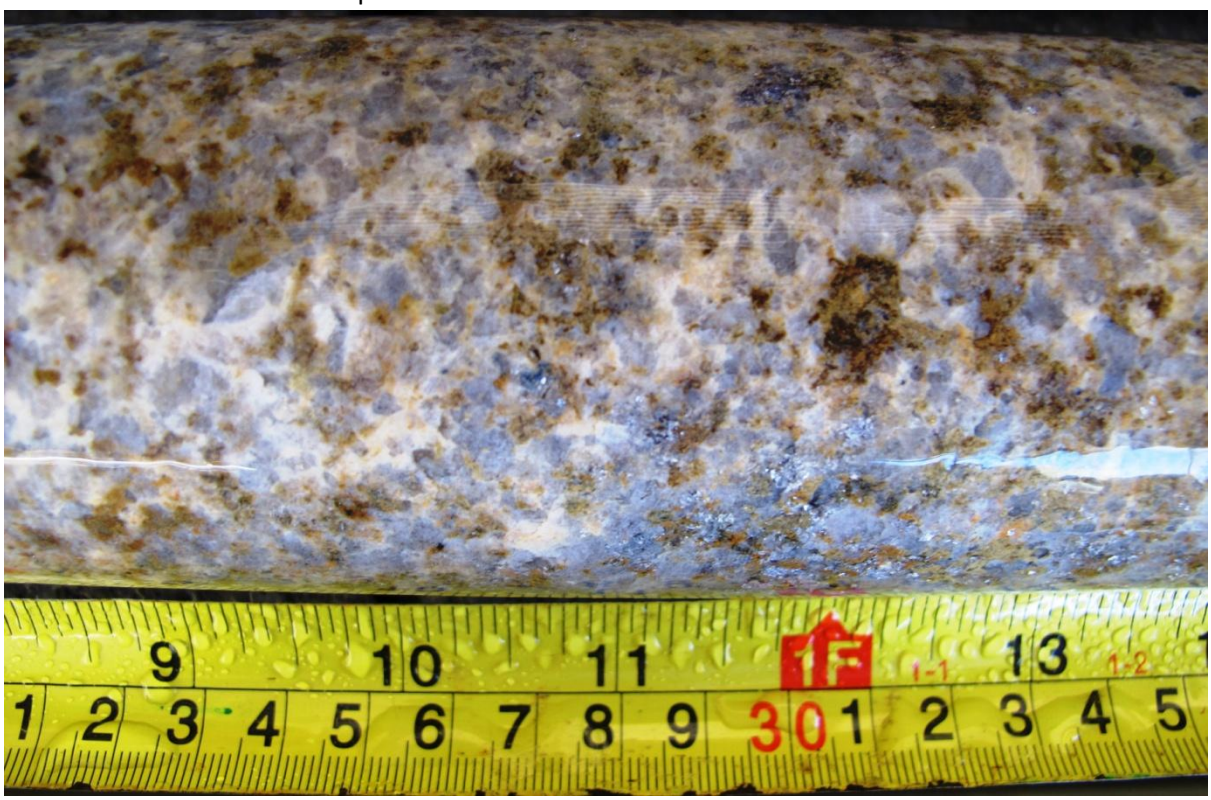


Figure 3. Strongly Altered Granite

All components of the granite have been replaced by kaolinite-sericite-chlorite-siderite except for the quartz. Often has blotches of strong chlorite or sericite. Also known as spotted dog alteration.

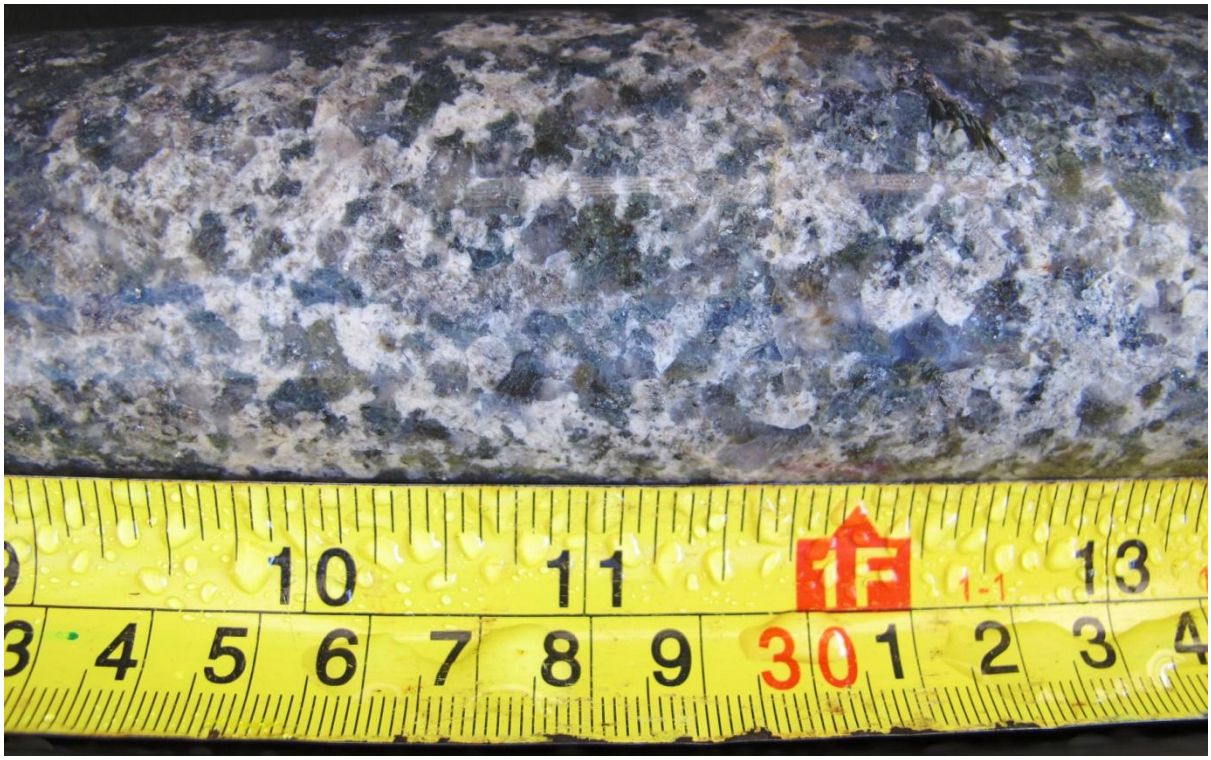


Figure 4. Mica Greisen with Siderite (cream to pale yellow mineral), DRD05 148.9m

Siderite appears to be replacing mica.

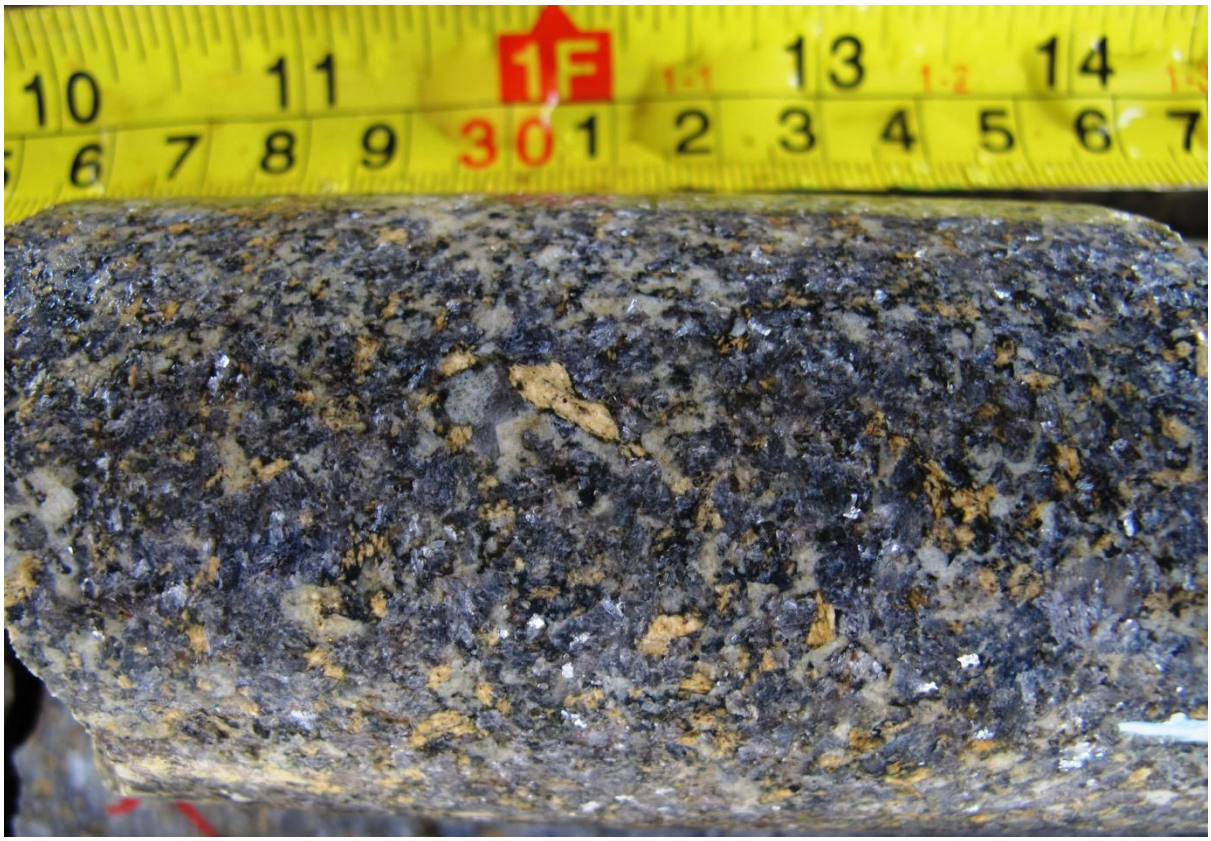


Figure 5. DRD06 113m, Quartz Pipe with (right to left) siderite chlorite altered mica - coarse calcite- scheelite – wolframite.

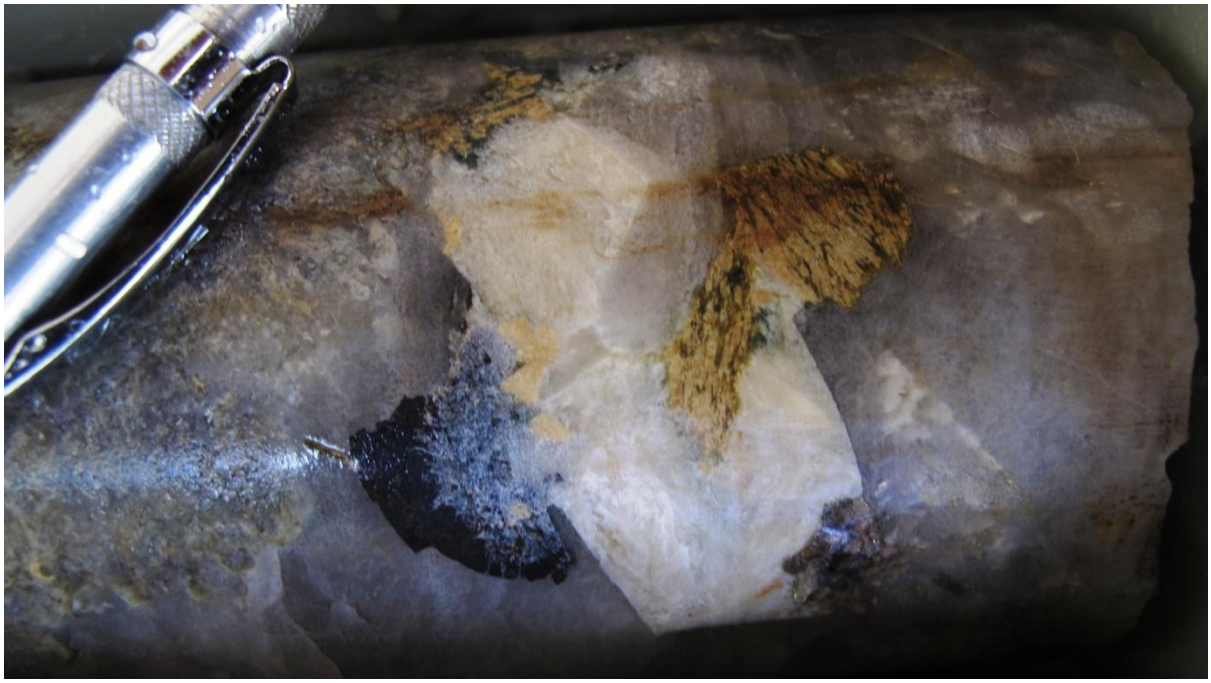


Figure 6. DRD06 112.5m, Layering in granite proximal to above pipe.