Summary for ALS report – "Analysis of Exploration Samples – Preliminary Report"

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Report compiled for McArthur River Mine Technical Services Department

Table of Contents

1.0 Introduction

In August of 2016 seventeen (17) rock chips were taken over various regional Pb/Zn targets within the McArthur River Mine (MRM) tenement portfolio. The samples were sent to ALS laboratories in Queensland for analysis utilising the Mineral Liberation Analyser (MLA) technique. This method was chosen to geochemically fingerprint the samples quantitatively with respect to the mineralising origins of both ore fluids and associated lead / zinc mineralisation. All specifics of the actual sample preparation and analysis can be obtained in the ALS report prepared for MRM. The targets included the Coxco and Amelia prospects and an unknown prospect referred to as MA455 prospect (Fig 1).

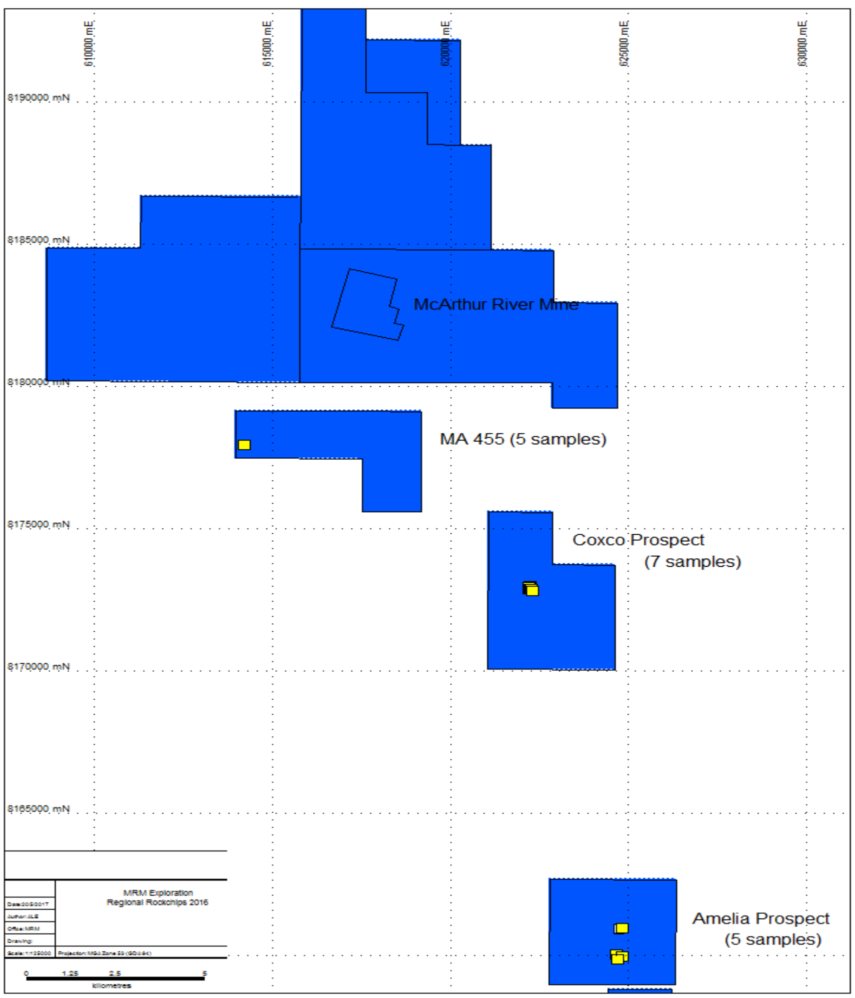


Figure 1 Regional Rock Chip Location

Sample	East GDA 94 53	Northing GDA 94 53	Descrition
MRMRGTH001	624818	8160934	Ferrug. Siliceous dolostone bxxx with silica /qtz veining and CO3 vughs. Tr. Pyrite. Two old drill holes eitehr side of outcrop on south side of N-S striking ridge
MA366_RC001	624818	8160934	As above
COXCORC001	622241	8172957	Heavily oxidised and argillically altered dolomite taken from spoil on shaft No1
COXCORC002	622225	8172952	Heavily oxidised ferrug. Dolomite 20m west of shaft no 1
COXCORC003	622193	8172941	Fine grained slightly oxidised dolomitic metased. Within small creek bed outcrop
COXCORC004	622194	8172862	Lightly ferruginous m.g dolomite in outcrop on W flank of Coxco prospect
COXCORC005	622230	8172887	Siliceous ferruginous sandstone / meta sediment outcrop, 50m W of southern most shafts
COXCORC006	622282	8172879	Gossanous spoil from Shaft No3. Coarse grained galena mineralisation and heavily argically altered
COXCORC007	622290	8172812	Siliceous dolomite from outcrop ~75m south of shaft No 3
Amelia001	624665	8160032	Gossanoeous dolomitic bxx. Qtz/CO3 late stage veining and lightly siliceous. Sulphide boxworks?
Amelia002	624809	8159941	1cm thick ferruginous CO3 vein with rose petal xtals in dlomitic shales.
Amelia003	624692	8159862	Gossanous bxx dolomite. Lim/qtz/CO3. late stage veining from large outcrop
MA455RC001	614224	8177942	Grab samples from spoil of unidentified shaft
MA455RC002	614224	8177942	Grab samples from spoil of unidentified shaft
MA455RC003	614224	8177942	Grab samples from spoil of unidentified shaft
MA455RC004	614224	8177942	Grab samples from spoil of unidentified shaft
MA455RC005	614224	8177942	Grab samples from spoil of unidentified shaft

Table 1 Rock Chip location and description

2.0 Prospect Description

2.1 Coxco Prospect

The Coxco prospect is a Zn/Pb project that has been explored on and off since the early 1900's. The area consists of several old shafts and is situated within the northerly plunging Coxco Anticline between the moderately east dipping Coxco Fault and the regional NS trending Emu Fault. Mineralisation is hosted in a localized carbonate (stromatolitic) dolomite in steeply angled tectonic fracture and breccia zones adjacent to the Emu Fault Zone (EFZ) developing in the footwall of reverse faulting. The mineralising zone is marked by strong silica and dolomite alteration within favorable dilation zones above and between the intersection of the Coxco Fault and EFZ.

Samples were selected for typical mineral representation as well as away from the known location in rocks that are to be considered unaltered/mineralised host rock to gain an understanding of differentiation between the two types.

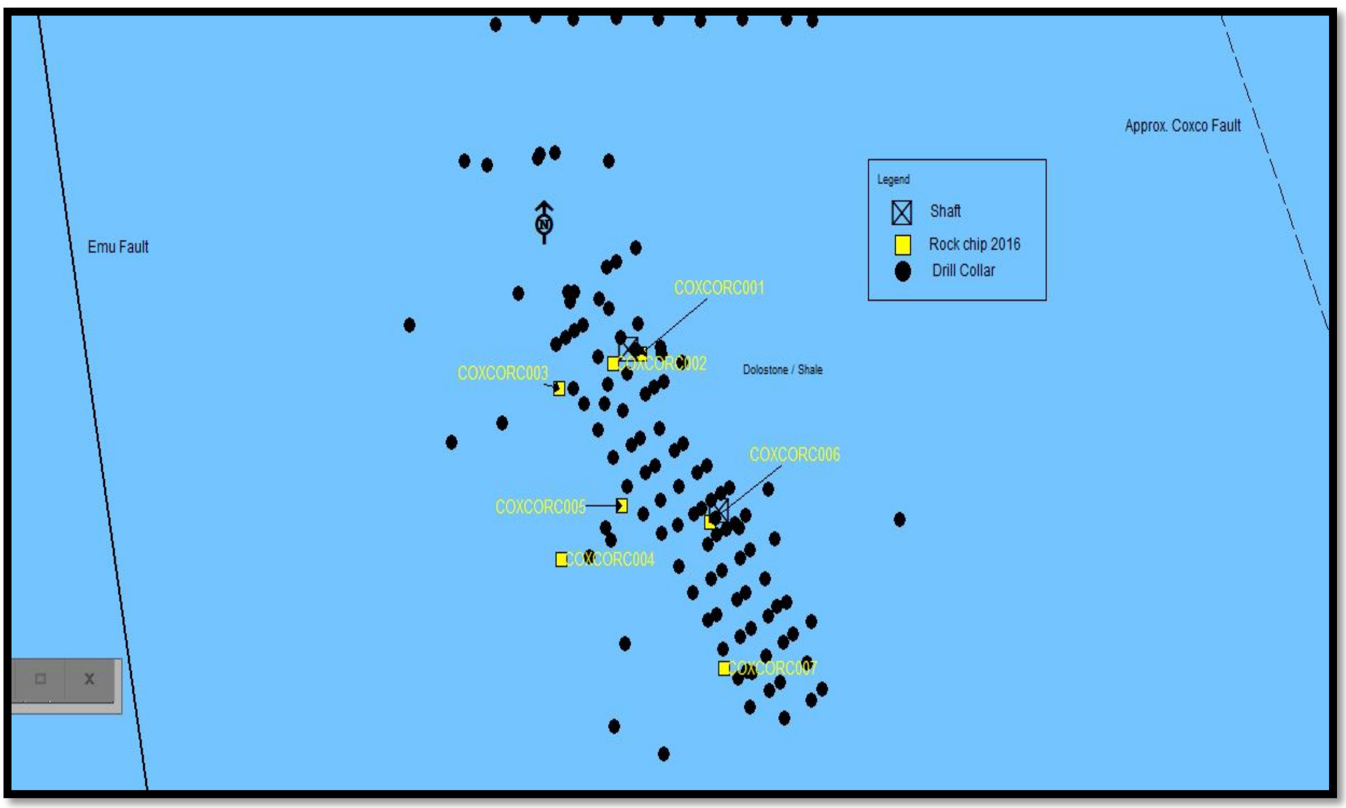


Figure 2 Coxco Prospect with 2016 rock chips and previous drilling.

2.2 Amelia Prospect

The Amelia prospect is located approximately 13km south of Coxco and 25km south of MRM operations. As with Coxco this area has been explored on and off since the 1960's previous reports contain further information with regards to historical exploration, geology and chronology. Like Coxco Pb/Zn mineralisation is linked tectonically with pregnant fluid flow being precipitated into breccia zones that have previously been formatted and the allowing precipitation of metals and associated alteration. Again, the structural setting by the EFZ and the propagation of subparallel faulting are the main conduits for fluid flow into surrounding country rock. A total of 4 samples were taken in the area for whole rock analysis, three within the immediate Amelia area and one to the north (~1km) on a ridge line above an old drilling pad.

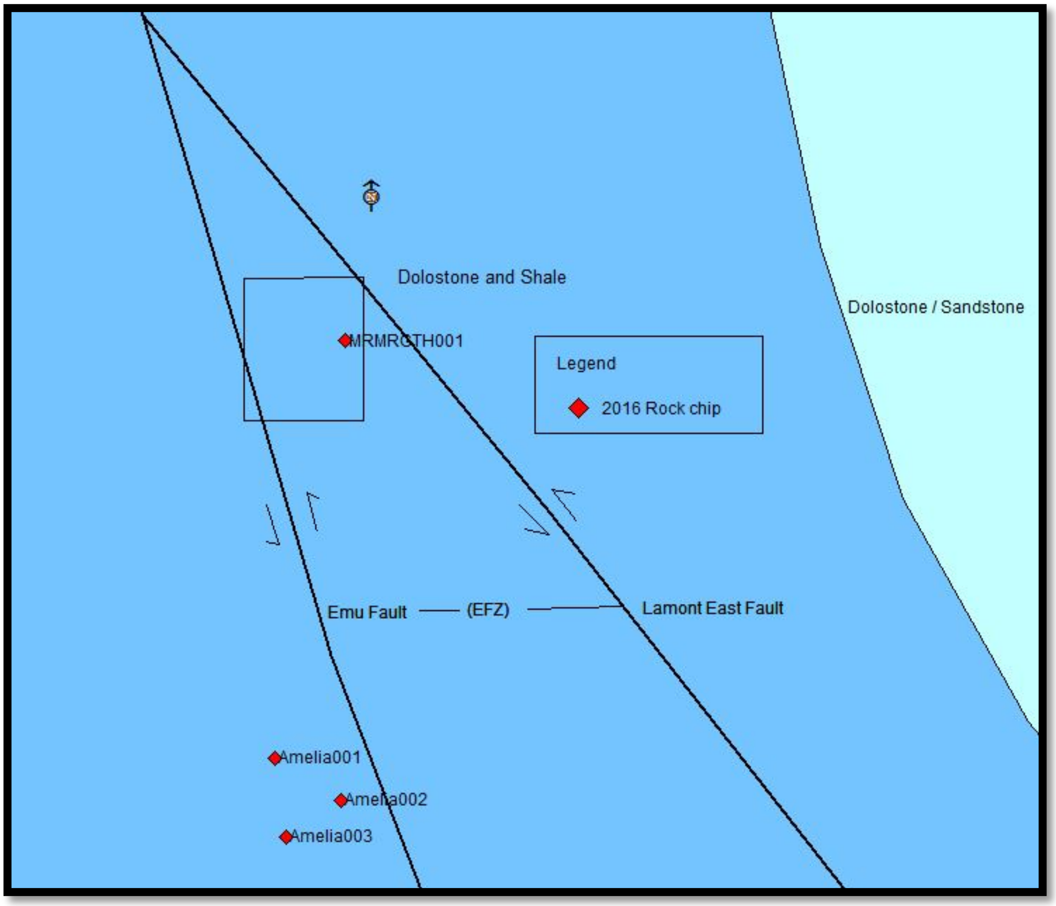


Figure 3 Amelia Project and 2016 rock chips

2.3 MA455

Five rock chip samples were taken from spoil above an unidentified shaft on the western boundary of MA455 and 5.5 km SW from the mine site. The tenement is mainly covered by transported sediments although a portion in the western area outcrops. Rock types in this area a series of thinly bedded dolomitic shales and more robust / massive units of dolomite dipping about 50 degrees to the NE. Little if any historical exploration seems to exist for this area.

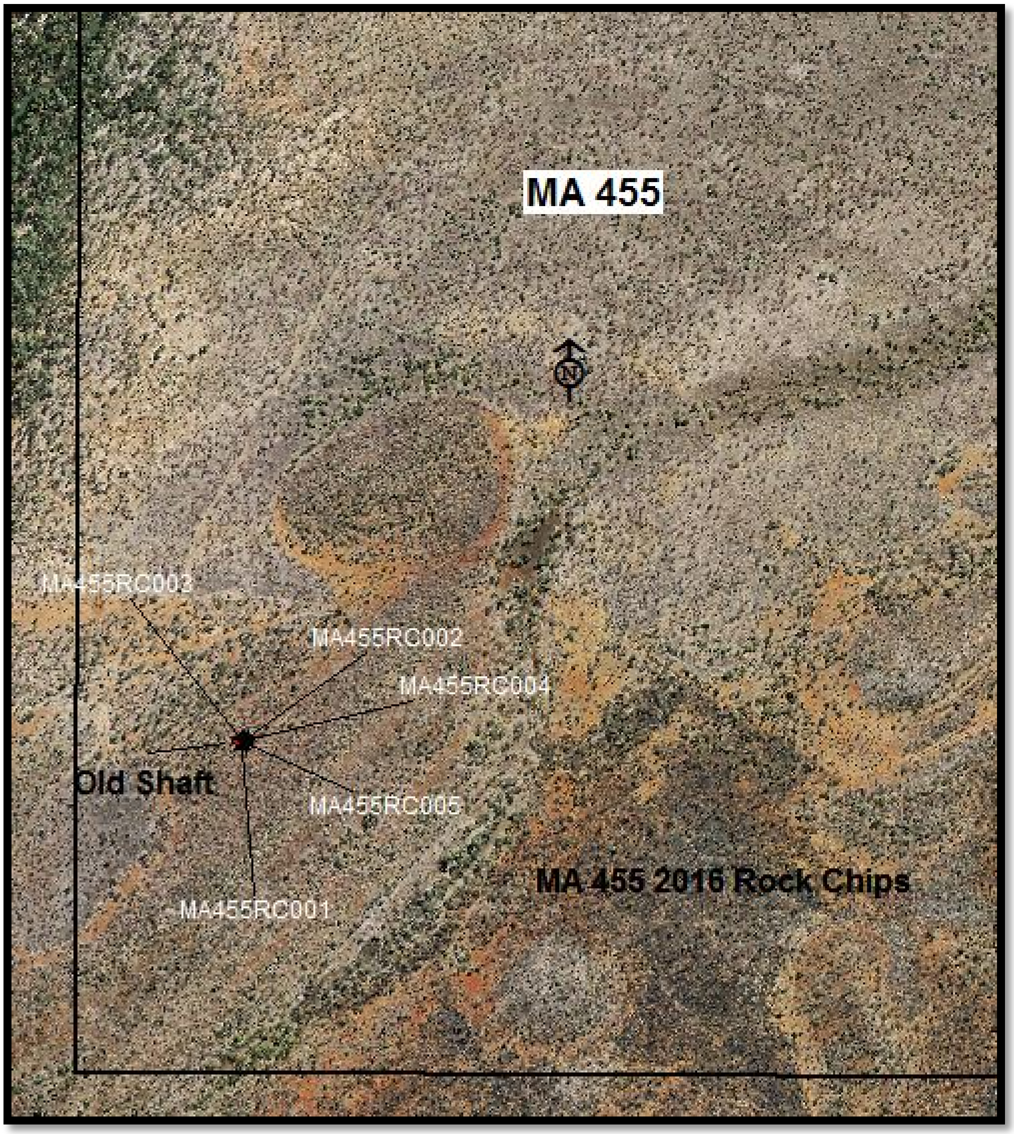


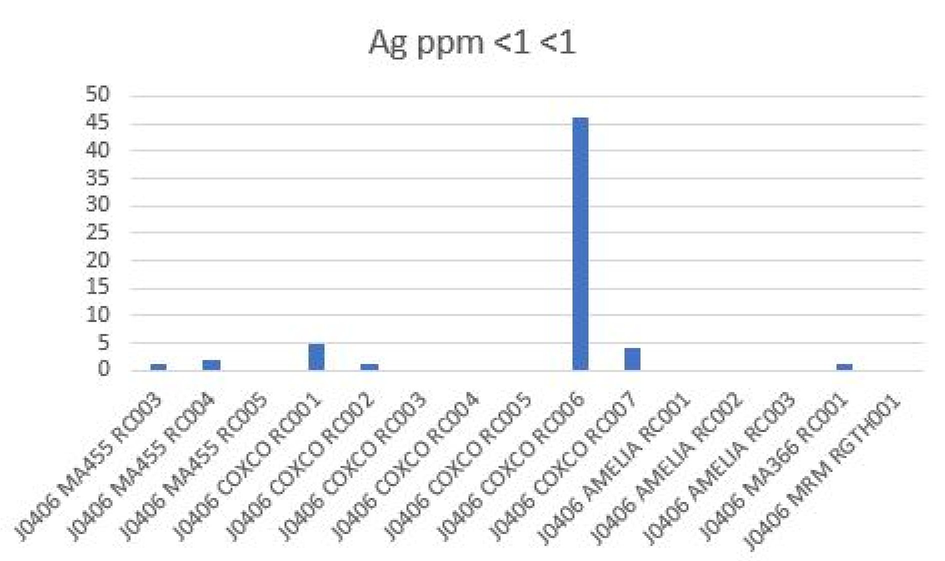
Figure 4 MA455 project (Walshie's)

3.0 ALS Report Summary

Results of the report show that two clear distinct styles of mineralisation exist between the Coxco samples and those of MA455. Geochemically Amelia seems to be in line with the Coxco model although no heavily mineralised sample of the area was obtained in order to for the analysis to compare.

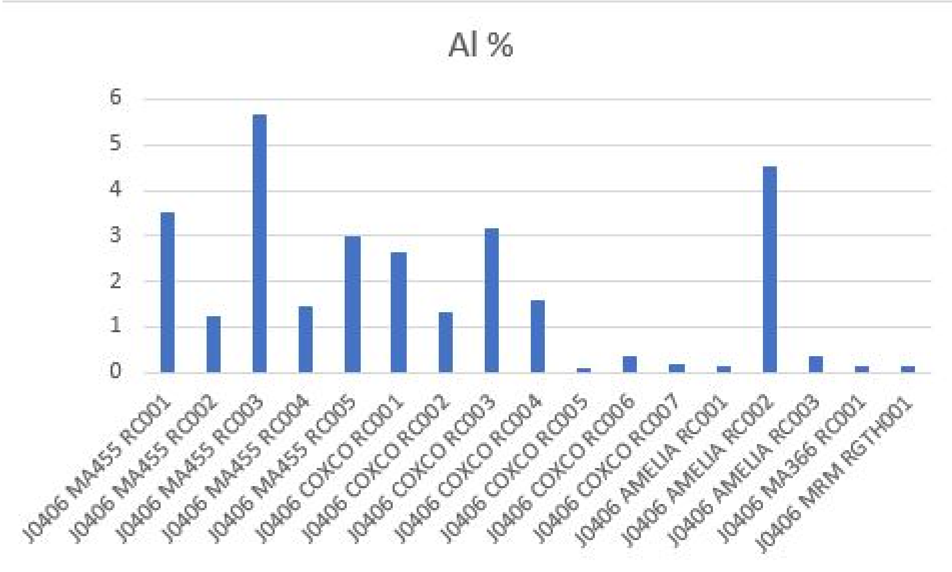
Below a series of bar graphs for the Chemical Assay data by Method ICP61a (%) are displayed with a descriptive take on what the levels within the sample tell us about the deposit style and ore fluid composition.

3.1 Silver (Ag)



As expected silver associated with Pb/Zn samples that clearly showed hand held mineralisation were significantly elevated to those samples that were not. MA455RC003 & 4 was taken from shaft spoil as well as Coxco001 & 6 although 007 was within more benign material albeit along strike to the south.

3.2 Aluminum (Al)

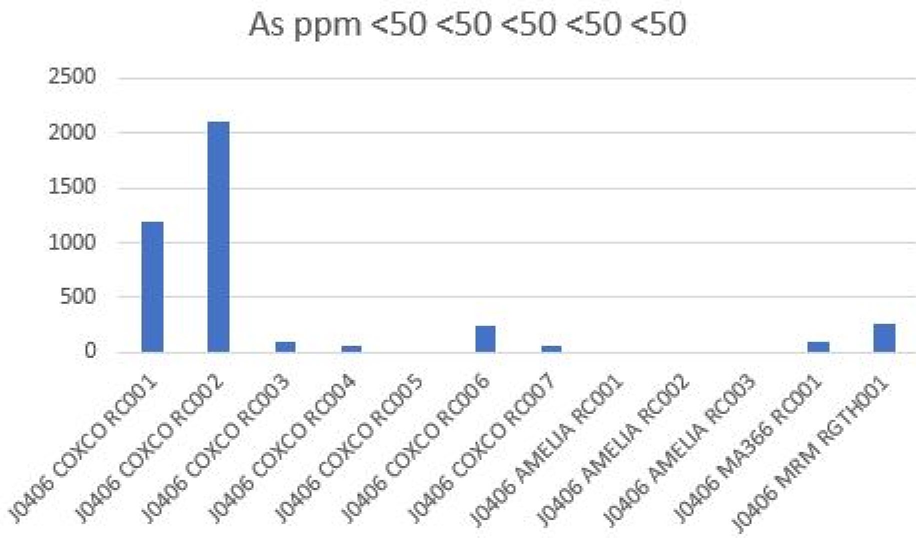


CoxcoRC001 – 4 all show elevated levels of Al. Reasons for this is the alumina-silicates such as Fraipontite and Lennilenapeite that have been recorded in the analysis. Fraipontite has an oxide association with other oxidized lead and zinc minerals such as Smithsonite and Cerussite whilst Lennilenapeite is a secondary mineral often associated with late stage low temperature hydrothermal, metamorphosed stratiform zinc deposits ie; HYC.

All the MA455 samples exhibit elevated levels this is probably derived from the high levels of potassium feldspar (orthoclase, microline) discovered in the sampling. Fraipontite and Lennilenapeite are not recognized in the analysis.

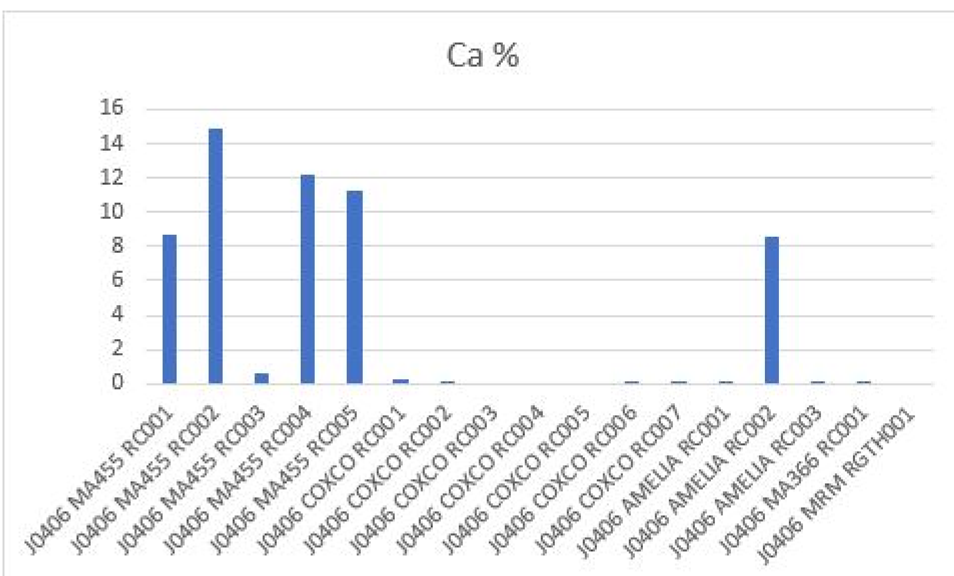
AmeliaRC002 also has high levels of K'spar and therefore elevated Aluminum as for MA455.

3.4 Arsenic (As)



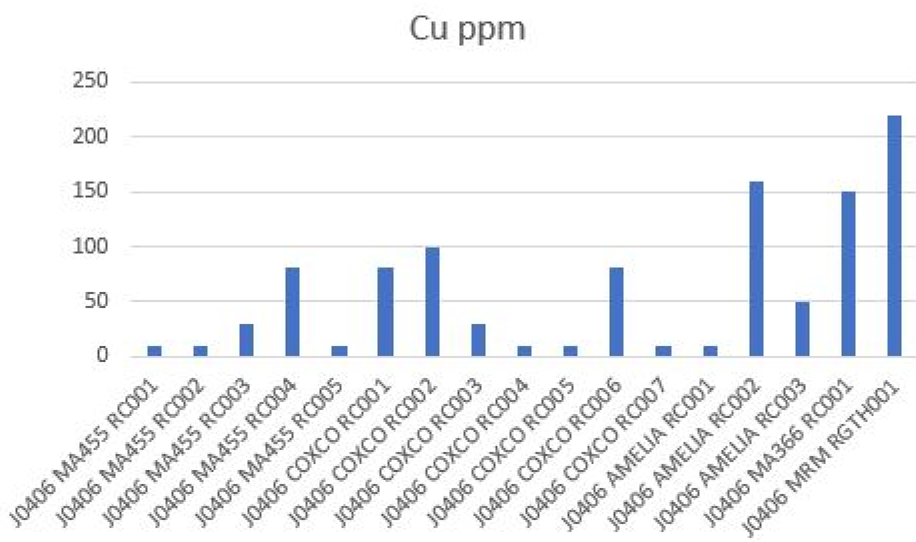
Arsenic correlates well with Pyromorphite within the Coxco samples (001 &2) that analysed up to 3.5 wt% pyromorphite. Interestingly the MA455 samples exhibited no trace of arsenic or pyromorphite (trace levels in MA455RC004) within the samples, suggesting a different mineralisation / ore fluid arrangement.

3.5 Calcium (Ca)



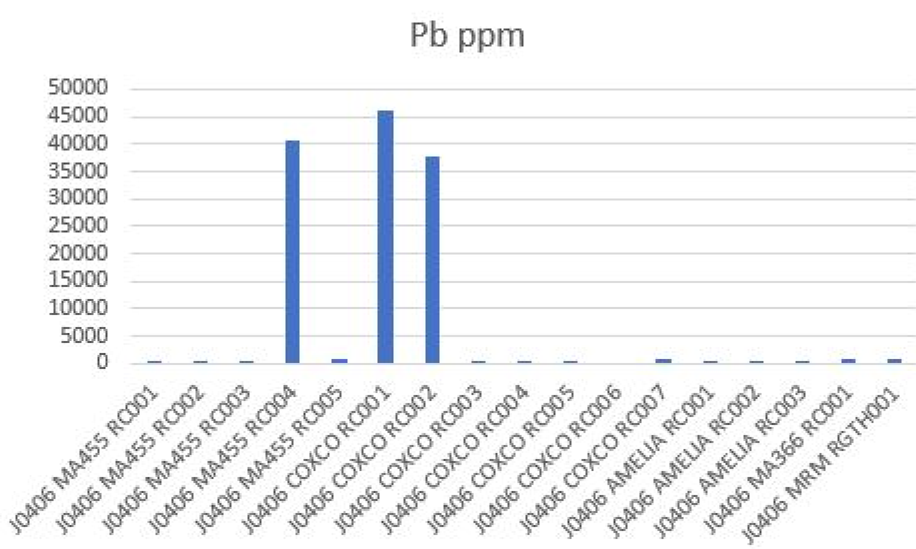
High levels of calcium in the MA455 samples due to high levels of dolomitisation of the surrounding country rock.

3.6 Copper (Cu)



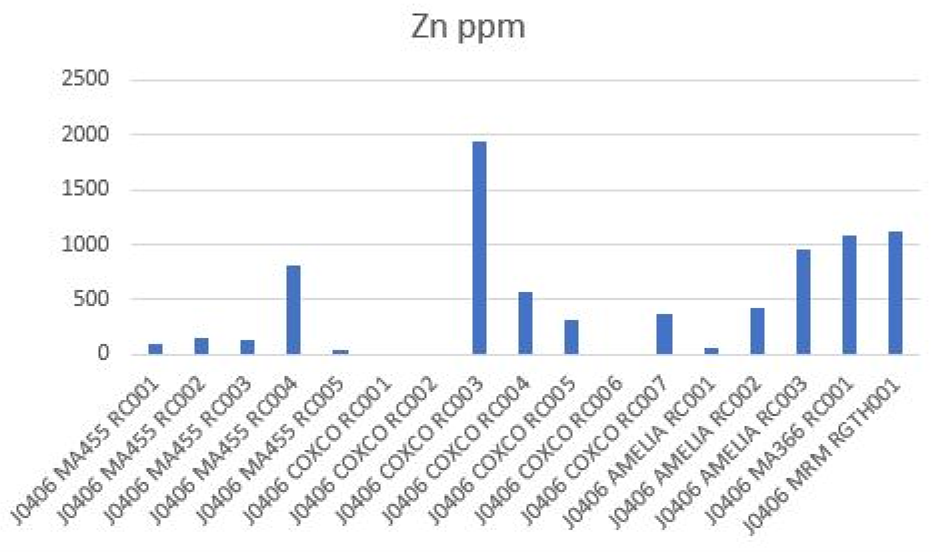
Higher levels of copper within the Amelia samples show that Cu is dominant within this localized system as where the Coxco and MA455 are Pb/Zn dominant with subordinate Cu mineralisation.

3.7 Lead (Pb)



As expected hand held visible lead mineralisation (galena) shows ore grade levels in those samples. Note Amelia samples quite subdued Pb poor. Nearly all samples showed some background to anomalous lead as expected.

3.8 Zinc (Zn)

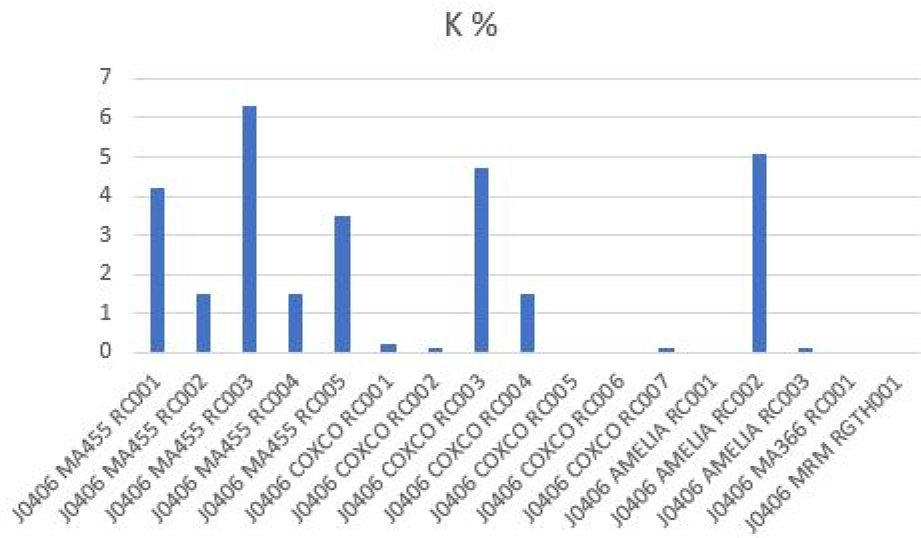


Nearly all samples showed anomalous to ore grade levels of zinc mineralisation due to the minerals high mobilisation characteristics. Both Coxco and MA455 samples exhibit strong Zn / Pb mineralisation whilst the Amelia samples show a lead poor and copper / zinc rich system. It is interesting to note that CoxcoRC001 and 006 taken immediately adjacent to the shaft and showing visible galena (006) have not registered well with regards to zinc. This could be explained that depletion of Zn locally within the oxide zone is prevalent and therefore increasing with depth.

Therefore, from the Cu/Zn/Pb analysis:

- Coxco and MA 455 are zinc dominant with subordinate lead
- Amelia is slightly copper dominant with subordinate zinc and even lower lead mineralisation

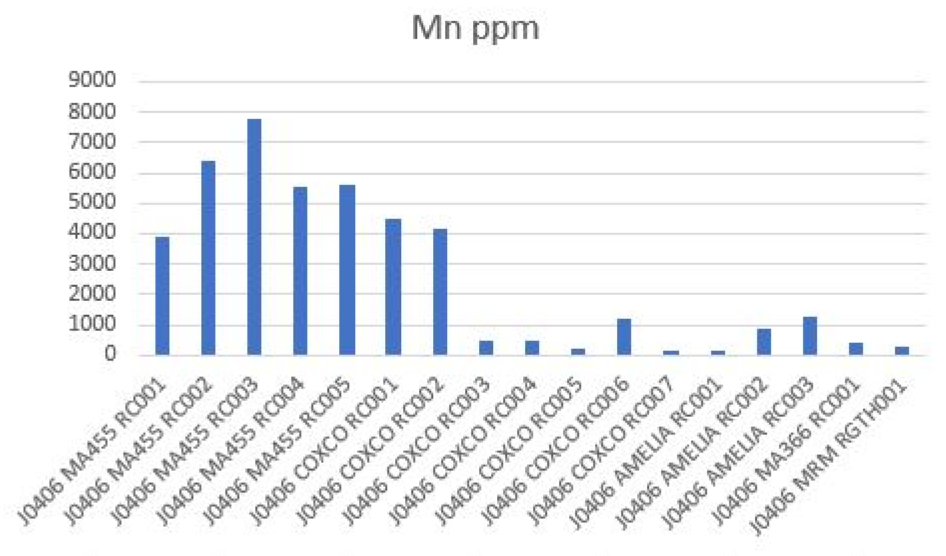
3.9 Potassium (K)

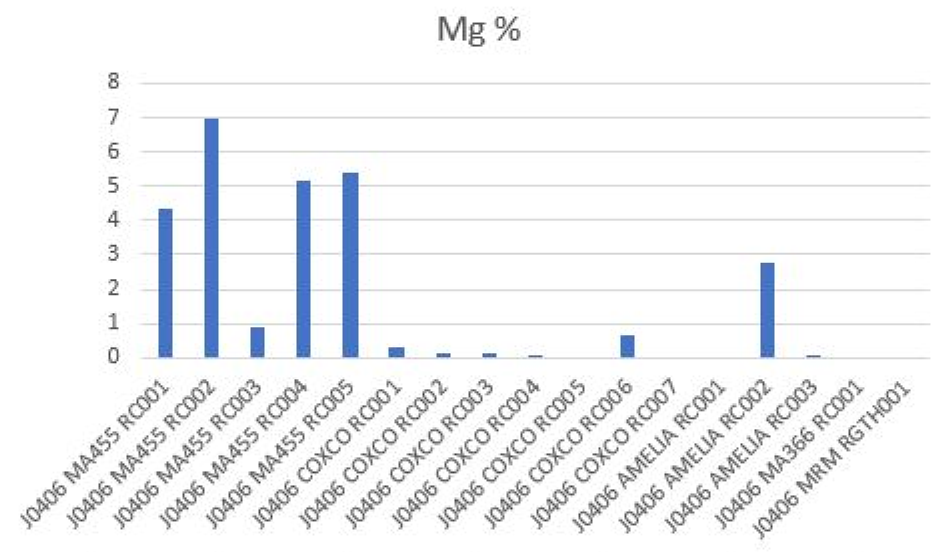


As with aluminum elevated potassium levels within the MA 455 and some of the Coxco and Amelia samples can be explained through the strong levels of K- feldspar reported; probably as orthoclase or microline.

This could have been introduced locally by structurally controlled hydrothermal fluid elevated in potassium sourced from potassium feldspar along route to emplacement.

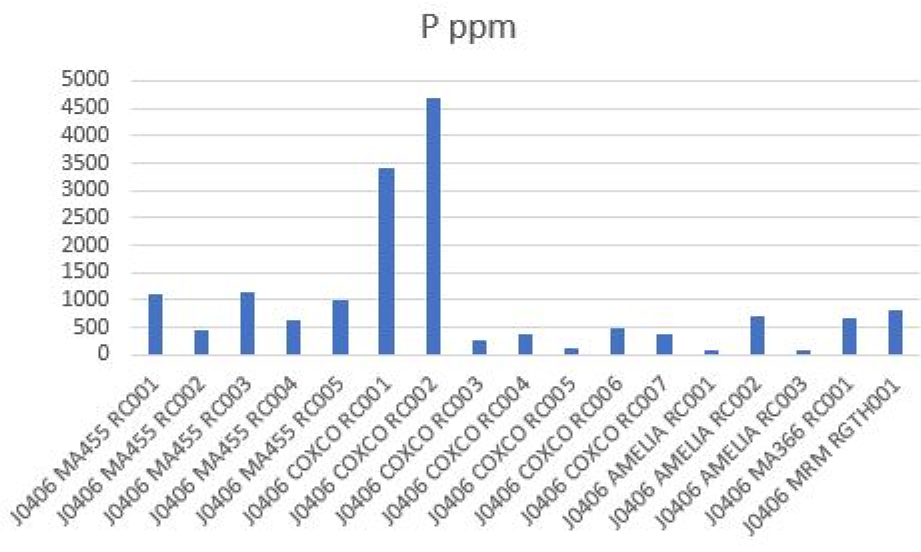
3.9.1 Manganese and Magnesium (Mn, Mg)





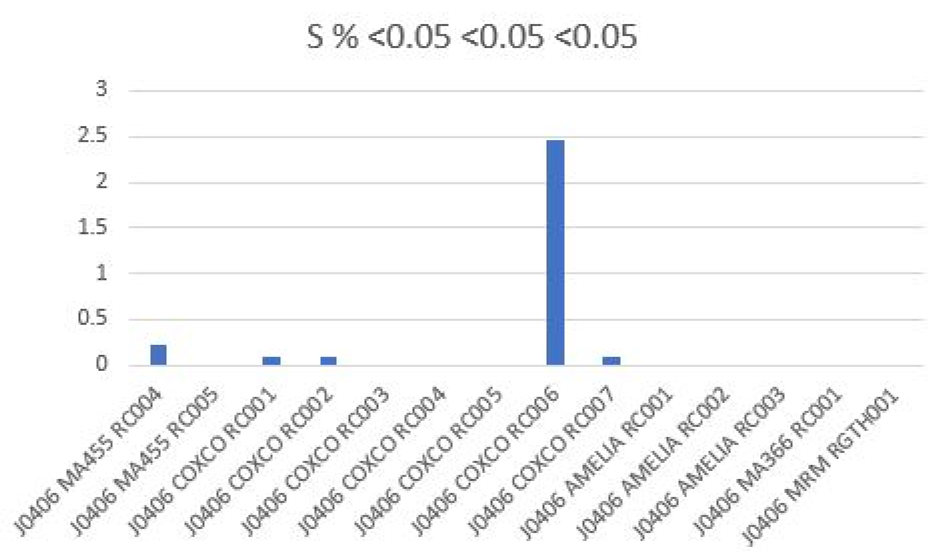
Strong correlation between the two elements with MA455 samples and sporadic through the Coxco and Amelia samples. The MA455 samples can be explained through dolomitisation as with other elevated elements whilst the sporadic nature of both the Coxco and Amelia samples could be due to the localized presence of assemblage minerals such as Fraiponite, Hemimorphite, Smithsonite and Iron hydroxides all of which have been analysed within these samples.

3.9.2 Phosphorous (P)



Sporadic levels of Phosphate are probably derived from the Iron hydroxides present as well as some apatite (MA455 samples).

3.9.3 Sulphur



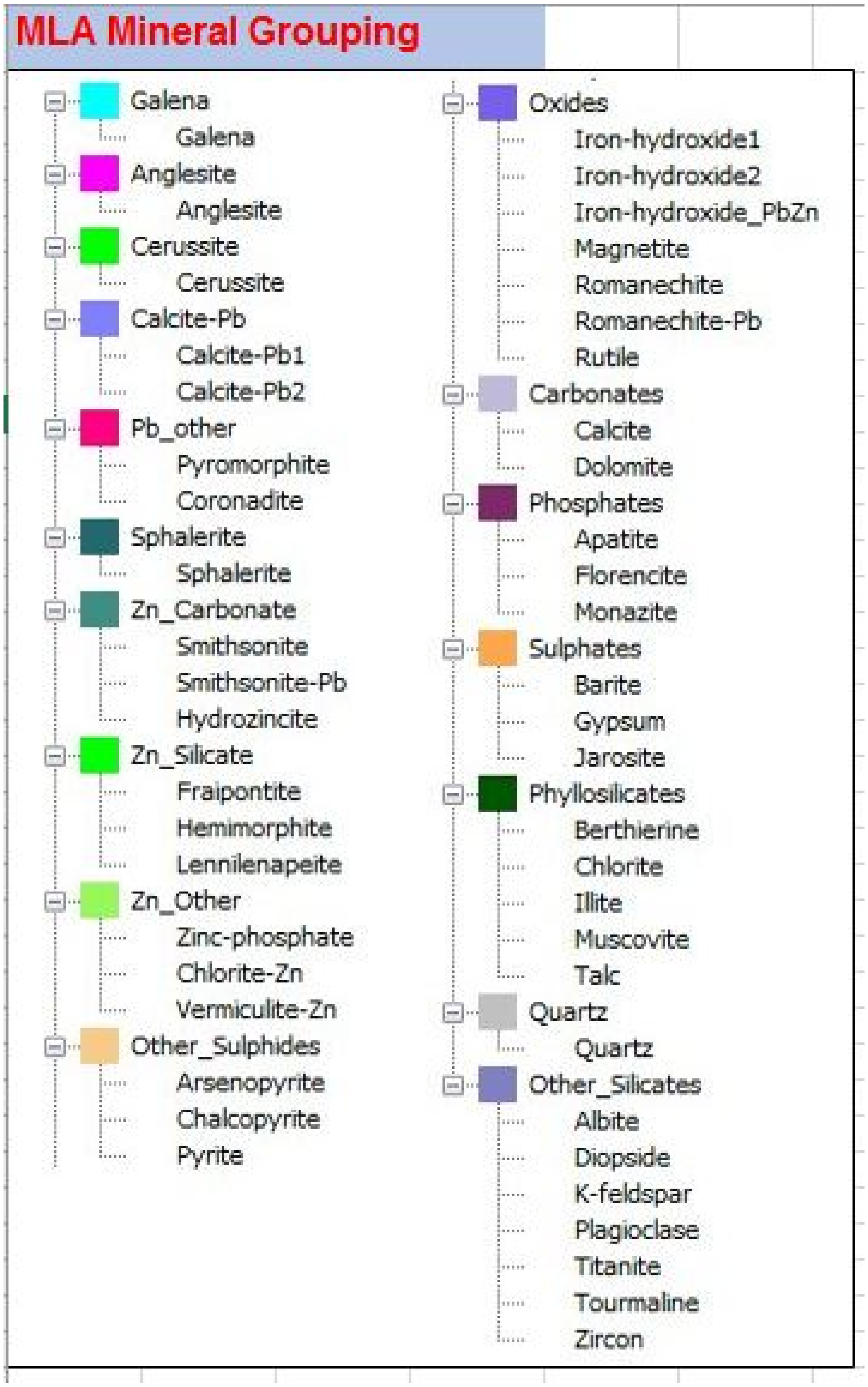
High level of Sulphur present in CoxcoRC006 due to strong galena (PbS) mineralisation within sample. Other sporadic levels also correlate well with the presence of galena recorded in analysis.

4.0 Conclusions

Basic conclusions that can be drawn from the exercise are:

- Coxco and Amelia are of differing mineralisation style to the MA455 prospect
- Coxco and MA455 are Zn/Pb dominated whilst Amelia is Zn/Cu dominated
- MA455 is a structurally controlled competency driven shear type deposit
- Coxco and to an extent Amelia are also structurally controlled but also metasomatic with wide scale carbonate alteration and subordinate silica alteration. The mineralisation is more ground format controlled; for example, areas of pre - mineralisation breccia and dilation. Both deposits are influenced strongly by the Emu fault Zone and associated secondary faults.
- The presence of Lennilenapeite (a late stage low temperature hydrothermal and metamorphic mineral associated with stratiform zinc deposits) could suggest later remobilization of HYC mineralisation fluids through the Emu Fault and deposited at Coxco/Amelia.
- Lead characterisation between HYC and Coxco/Amelia/MA455 could be interesting and useful.

Appendix 1 Mineral Grouping


MLA Mineral Grouping
Galena
Galena
Anglesite
Anglesite
Cerussite
Cerussite
Calcite-Pb
Calcite-Pb1
Calcite-Pb2
Pb_other
Pyromorphite
Coronadite
Sphalerite
Sphalerite
Zn_Carbonate
Smithsonite
Smithsonite-Pb
Hydrozincite
Zn_Silicate
Fraipontite
Hemimorphite
Lennilenapeite
Zn_Other
Zinc-phosphate
Chlorite-Zn
Vermiculite-Zn
Other_Sulphides
Arsenopyrite
Chalcopyrite
Pyrite
Oxides
Iron-hydroxide1
Iron-hydroxide2
Iron-hydroxide_PbZn
Magnetite
Romanechite
Romanechite-Pb
Rutile
Carbonates
Calcite
Dolomite
Phosphates
Apatite
Florencite
Monazite
Sulphates
Barite
Gypsum
Jarosite
Phyllosilicates
Berthierine
Chlorite
Illite
Muscovite
Talc
Quartz
Quartz
Other_Silicates
Albite
Diopside
K-feldspar
Plagioclase
Titanite
Tourmaline
Zircon

Appendix 2

MLA Mineral List

MLA Mineral List

Mineral	Density	Formula
Galena	7.54	PbS
Sphalerite	4.05	(Zn,Fe)S
Anglesite	6.37	PbSO4
Cerussite	6.26	PbCO3
Pyromorphite	7.07	(Pb,Ca,Zn)5(PO4,AsO4)3(Cl,OH)
Fraipontite	3.54	(Zn,Al,Pb,Fe,Co,Ti,K,Mg)3(Si,Al)2O5(OH)
Hemimorphite	3.45	(Zn,Fe,Mn)4Si2O7(OH)2.H2O
Lennilenapeite	2.72	K7(Mg,Fe,Zn)48(Si,Al,Ti)72(O,OH)216.16H2O
Smithsonite	4.27	(Zn,Mg,Fe,Ca)CO3
Smithsonite-Pb	4.35	(Zn,Fe,Pb)CO3
Hydrozincite	3.97	(Zn,Pb,Fe,Co)5(CO3)2(OH)6
Zinc-phosphate	3.21	(Zn,Mn,Fe)6(PO4)4.7H2O
Arsenopyrite	6.09	(Fe,Zn)AsS
Chalcopyrite	4.19	CuFeS2
Pyrite	4.90	FeS2
Calcite	2.79	CaCO3
Calcite-Pb1	3.14	(Ca,Sr,Pb)CO3
Calcite-Pb2	2.90	(Ca,Sr,Pb)CO3
Dolomite	2.92	Ca(Mg,Fe,Mn)(CO3)2
Apatite	3.21	Ca5(PO4)3(F,OH)
Florencite	3.56	(Ce,La,Nd,Pr,Ca,Sr)(Al,Fe)3(PO4,SO4)2(OH)6
Monazite	5.16	(Ce,La,Nd,Pr,Sm,Ca)(PO4,SiO4)
Barite	4.34	(Ba,Ca)SO4
Gypsum	2.34	CaSO4.2H2O
Jarosite	3.02	KFe3(SO4,PO4)2(OH)6
Coronadite	5.14	(Pb,Ba,K,Ca)(Mn,Fe,Zn)8O16
Iron-hydroxide1	4.30	(Fe,Mn)O(OH).ZnO.P2O5.Al2O3.SiO2
Iron-hydroxide2	4.30	(Fe,Mn)O(OH).ZnO.PbO.As2O5.P2O5.Al2O3.SiO2.SO2
Iron-hydroxide_PbZn	4.50	(Fe,Mn)O(OH).ZnO.PbO.As2O5.P2O5.Al2O3.SiO2.SO2
Magnetite	5.19	(Fe,Mn,Zn,Ti,Al,Cr)3O4
Romanechite	4.74	(Ba,K,Ca,H2O)2(Mn,Fe,Zn,Co)5O10
Romanechite-Pb	4.85	(Ba,Pb,Ca,H2O)2(Mn,Fe,Zn)5O10
Rutile	4.46	TiO2
Albite	2.62	NaAlSi3O8
Berthierine	3.00	(Fe,Al,Ca,Mg,K)3(Si,Al,Ti)2O5(OH)4
Chlorite	3.12	(Fe,Mg,K)5Al(Si3Al)O10(OH)8
Chlorite-Zn	3.18	(Fe,Mg,Zn)5Al(Si3Al)O10(OH)8
Diopside	3.33	Ca(Mg,Fe,Mn,Al,Ti)Si2O6
Illite	2.78	(K,Ca)0.65-1(Al,Mg,Fe,Mn,Ti)2(Si,Al)4O10[(OH)2,H2O]
K-feldspar	2.58	KAlSi3O8
Muscovite	2.86	(K,Na)(Al,Mg,Fe,Ti)2Si3AlO10(OH)2
Plagioclase	2.70	(Na,Ca)[Al]1-2[Si]3-2O8
Quartz	2.65	SiO2
Talc	2.69	(Mg,Fe,Ca)3Si4O10(OH)2
Titanite	3.51	Ca(Ti,Al)SiO5

Tourmaline	3.24	(Na,Ca)(Mg,Fe)3(Al,Ti)6(Si6O18)(BO3)3(OH)3OH
Vermiculite-Zn	2.30	(Mg,Fe,Zn,Al)3(Al,Si)4O10(OH)2.4H2O
Zircon	4.54	(Zr,Ca,Fe,Hf)(Si,Al)O4