

FIELD TRIP REPORT

Saturday 24th May 2014 - Mt. Tennyson

From March 8th to 11th, Peter Beddow and I made the first of two reccés looking into the mineral occurrences around the Oberon locality. A list of about 60 sites were selected. On the return journey back to Sydney, we decided to visit Mt Tennyson to see the landowner. After we discussed insurance, safety and access, we gained his approval to visit his property.

Some two phone calls and three emails later, the field trip was organised and many were excited about visiting the property which had not been available for many years. On Saturday 24th May, the Society members arrived at Yetholme assembly point for the sign on.

Peter Williams lead the convoy along 11 kilometres of all weather dirt road to the paddock where 26 cars and 37 members gathered. Peter gave an informative talk on the history and geology of the site. All then eagerly collected their gear and moved off to the mine site.

We moved through another gate and then began to explore the area for the mines. Well they weren't there were we thought. The last time members were there was some 43 years ago. The collective memories of the group had to adjust to the altered landscape. After some back tracking and cross-country rambling, the old chimney (see picture) was located and the Mammoth Mine was soon found at around 12 noon. Those present quickly moved to a spot on the mullock heaps and slopes that had tailings and began pounding the rocks with geological and sledge hammers. In the mean time, stragglers were found and by 1:00 pm all the party were accounted for and working around the mine site.

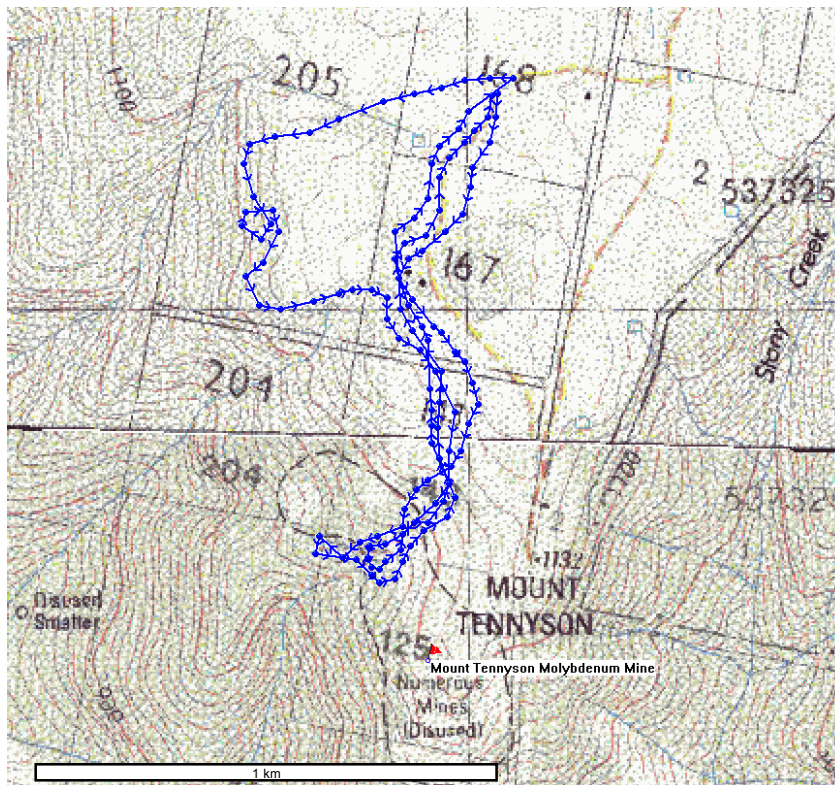


Figure 1 Mt. Tennyson Andradite

The adit into the open cut was a worthy climb. The open cut was a 20 metre diameter hole and about the same depth. Walls were shear drops with only the eastern side being terraced in 2 metre steps. A bed frame and table were remnants of prior occupancy. A large cavern opened up on the

western face and the cavern floor was covered with boulder fragments that could be easily

Mt. Tennyson & Cash Essington Cu Mine.

crossed and the floor was uneven. Those that brought along a UV lamp explored the walls to see the yellow fluorescence of Powellite. The cavern then continued into the hillside and eventually funnelled into a 3m wide drive. You could stand up in any part of the mine with ease. Some rail tracks were evident in the adit that had been used to take the ore out of the mine to be hand sorted into firsts (ore that goes to the concentrators) and the seconds, that formed the dumps.

Back on the dump site, another adit existed some 30m to the south that led into the hill side. Evidence of the ore crushing stamper's concrete footings could be seen and the steel metal crushing heads of the press were found scattered on the ground.

Members continued to collect samples and fill their buckets. Those with sledge hammers bashed into the skarn material and were able to find some good sized garnet crystals, some 20-25mm diameter.

Sunday 25th May 2014 - Cash Essington Mine.

Sunday saw us assemble and move onto the Cash Essington property. We all moved down to the main site and gathered specimens, resisting those which lay in the driveway onto the property. Malachite, chalcopyrite, native copper, pyrite, quartz with ore were found. There was an adit down by the creek. Many broken bottles had been thrown around the floor. The adit went some 40m into the hillside. The host rock was a schist that dipped 20° with much malachite staining. Nothing worthwhile was found here. Some panned for sapphire by the creek but no colour appeared.

On crossing the paddock, Tereska and I had a young bull and the rest of the herd follow us back to the site with where members were gathering specimens. After most members had left, the cattle moved onto the areas which had been worked and were observed licking the freshly broken rocks – adding to their dietary mineral intake!

From an administrative point of view:

Two other members in the party had current first aid certificates. My Remote First Aid Certificate is due for recertification.

Three members of the party knew Mt Tennyson very well, 43 years ago. We should have parked on the elongated doughnut track near the sheds (about 500m closer to the mine) but the wire fence across the road surprised us - that's why we had the extra long walk to pick the right ridge. Once the chimney was spotted, we had a good idea where to head. Peter Beddow and I had been as far as the land owner's house one late afternoon in March to get initial permission to visit the site. We depended on Meadow Flats Topographic map and Google for planning as well as emails with the landowner. DIGS had very little information as far as maps of the site could be found, except for the site coordinates taken by Moly Metals Ltd in a 2009 report.

Any coordinates given to the Society can be provided in AMG, MGA WS84, UTM & latitude/longitude. Google work by latitude/longitude. There will be a note in future field trips' pre-briefs that if anyone wants AMG (Old topos) or MGA/WS84 coordinates, they are available. All government agencies use MGA coordinated. (WS84 is close to MGA, UTM has elevation errors to MGA)

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The biggest risk considerations were:

- Members' health - We had the local police, Bathurst and Oberon Hospital phone numbers and addresses on the site listing.
- Next was rain / wet grass / 2WD + steep slope >15°(didn't happen).
- Scorpions & centipedes (seen but not touched).
- Stinging nettle (found on the tracks and terraces).

If we ever get into Work Safety Method Statements then working around quarry walls, slips and falls will become a recordable procedure to continuously monitor.

Society's members are excellent rock spotters and hopefully, are more aware of ground and rocks, balance and potential for mineral specimens, so we tend to tread more lightly and observe our immediate space more carefully.

The only mobiles that worked were between Graham Ogle ^(Telstra) and myself ^(Optus).

The Society may need to consider PLB (Personal Location Beacon) and Short Wave CB portable radios for leaders. Members may like to get their own. Jaycar & Dick Smith have CB sets/pairs with a range covering 5km in price range of \$50-\$100.

In the future, if the group cannot park at the site, then a base station, where feasible, of two 4WD's as close as possible to the noodling site. (Tracks in paddocks accelerate gully formation).

Risk assessment for the trip was LOW to MEDIUM. The Society's "Safety" and "Safety Specific to the Site" documents were made available to all members so they were aware of what could or may be encountered and steps to remedy them, based on the risk assessment. In future, the document will include the Code of Ethics from the Society's constitution.

The Society also has colours, which may be considered for display as ribbons on cars and crossroads in the future.

GEOLOGY NOTE

A similar deposit to Mt. Tennyson is King Island, Tasmania, which is a W Mo Skarn that had 14mt at 0.8% with a granite overburden whilst Mt. Tennyson totals 1.4mt at 0.11%Mo. (Cochrane and Marshall, 1964). At Mt. Tennyson, some 11,620t of ore was mined, yielding 29t Mo concentrate between 1914 and 1919. Mt. Tennyson caps the mountain and is subject to ongoing weathering. One of the break down products at Mt. Tennyson is Powellite that is much more difficult to extract than Molybdenite.

Etymology: SKARN

A metamorphic zone developed in the contact area around igneous rock intrusions when carbonate sedimentary rocks are invaded by and replaced with chemical elements that originate from the igneous rock mass nearby.

Peter Williams explained the ***Origin of the word SKARN***: Swedish, literally, filth; akin to Old Norse *skarn* dirt, dung, and scat.

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At Mt. Tennyson, the garnets are andradite-grossularite, and in the scheelite rich portions are often nearly euhedral and vary from a few mm to a few cm in diameter. They are usually colour zoned with brown outsides and green centres. The garnets are concentrated in layers in places, with glassy quartz in adjacent layers.

Extract: GS1980/465.R00015527

Site	Mount Tennyson Molybdenum Mine	Essington Mines
Locality	Yetholme	Cash Essington
MGAE	761033	749413
MGAN	6289453	6266733
MGA ZONE	55	55
LATITUDE	-33.502641	-33.71103
LONGITUDE	149.809911	149.68854
GENERAL LOCATION	9 km S of Yetholme	2km W of Essington. County: Westmoreland, Parish: Adderley.
MAP NO 25K	8830IN	8830-IV-S
GEOLOGICAL PROVINCE	Lachlan Fold Belt	Lachlan Fold Belt
OPERATION STATUS	identified prospect prospect/resource with economic potential, not operating	Extraction has ceased, not operating
METHOD OPERATION	pit(s), underground, adits	underground mine
TENURE	private land	private land
PRODUCTION DATE	1914 1919, mostly Mammoth Molybdenite Co.	pre-1877, 1905, 1907-08, 1920, 1958
WORKINGS DESCRIPTION	Mainly adits, small pits and small open cuts	Shafts to 75m depth, drives 60m; group of 6 workings within 300m radius area
RELATION	intrusive contact	discordant
OVERALL STRUCTURE	disseminated, massive	vein
ORE TEXTURE	massive	chloritic
ALTERATION	skarn	
AGE PERIOD	CARBONIFEROUS	ORDOVICIAN
SUMMARY DEPOSIT	Disseminated molybdenite etc in 1.512m thick calcareous cobble conglomerate. Metamorphosed to garnet quartz calcite diopside skarn (and in places underlying wollastonite garnet diopside quartz skarn) by Bathurst Granite. Note presence of Rhenium!	Several gold and base metal anomalies defined by drainage sampling.
SPECIFIC BEDDING	skarn	vein
FOLD BELT	skarn W Mo	porphyry Cu-Au
COMMODITY	Mo garnet industrial Cu W Re Au wollastonite	Cu
MAJOR MINERAL ORE	arsenopyrite chalcocite chalcopyrite covellite ferrimolybdenite garnet mn oxide molybdenite powellite pyrite pyrolusite psilomelane pyrrhotite scheelite sphalerite	chalcopyrite copper carbonate malachite pyrite pyrrhotite
GANGUE	calcite diopside host quartz wollastonite	Quartz
HOST ROCK	conglomerate skarn	andesite siltstone schist and tuff
ADDITIONAL	Re-Os dating gave Mo age of 330±40my (Lower Carboniferous)(Harding (1966) Mo mainly in quartz-garnet skarn. Wollastonite skarn is poor in Mo Au, Cu worked to 50'	"Hornblendic" schist (tremolite-actinolite)

Compiled from: DIGS, Min View, and Geo Science.

FIELD TRIP REPORT (MEMBERS' COMMENTS AND PHOTO DIARY)

Greg and Ann Andrew

We thoroughly enjoyed the weekend, although our legs are paying for it today. Although I haven't gone through the material that I bought home yet, I'm happy with what I collected, especially from Mount Tennyson, where I mostly found garnets.



Mt Tennyson Andradite on calcite



Mt Tennyson Mammoth Mine area



The dumps below Mt Tennyson



Mt Tennyson

In particular, I found one piece that has a calcite pod approx. 40 mm across, surrounded by visible garnets (I've attached a photo) – hopefully it will be a nice specimen once I etch out the calcite. I only found a few small pieces of malachite and some micro quartz coloured with copper mineralisation at Essington, but again it was worth the visit. The dinner at the RSL was a great idea and we thoroughly enjoyed the night.



Car park at Mt. Tennyson



Car park at Essington

Mt. Tennyson & Cash Essington Cu Mine.



Cash Essington Mine



Cash Essington Mine

Dennys and Janine Angove

http://archive.org/stream/mineralresources06geol/mineralresources06geol_djvu.txt

Rockley Division

Cash-Essington Mine, portion 2, parish Adderley, county Westmoreland, Native Dog Creek, Essington. — The Cash Shaft is a new opening on the southern extension of the old Essington lode in the adjoining portion. Strike N. 20° W., dip S. 70° W. at 30" to 40°.

In 1905 aid was granted to sink the 20-foot shaft to 100 feet, on a lode reported by Inspector D. Milne as 3 feet wide (P.B. f |-). Later, on sale of the mine to the Lloyd Copper Company, this aid was refunded.

The shaft is 250 feet deep and driven at the 150-foot level 100 feet north and 80 feet south. No stoping done. The lode averages 2 feet to 21 feet wide, making in places to 4 feet. At 200-foot level, driven 25 feet on course of lode.

The ore consists in the lower levels of sulphide of good quality, but mixed with quartz and country in part. During the above development, in 1906 and 1907, 121 tons of ore raised yielded an average of 8.7 per cent, of copper.

The Old Essington Mine is situated on the south bank of Native Dog Creek, a few chains along the northern strike from the Cash Shaft. On the opposite side of the creek is the original North Essington, also on the same lode, where a shaft was sunk 30 feet, and a tunnel driven from the bank for 30 feet. West of the Cash-Essington lode, three parallel lodes occur in portions 2 and 5, within a distance of about 20 chains. These appear to strike from N. 50° to N. 70° west, and are of silicious character. A fair amount of ore has evidently been extracted from some of them, judging by the dressing heaps.

The Essington lodes occur in a schistose rock of hornblendic character, which alternates with several quartz-felsite dykes; the copper ore is confined to the former. Definite particulars of early developments in the Essington and Western lodes are not available. The former is stated to have been sunk on for 100 feet, and driven south at that level for 80 feet or more. About 1899 this shaft was unwatered and cleaned out by C. Richardson, who extracted some ore. A tunnel was also driven in from the creek bank in the early days of copper-mining in this locality.

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Peter Beddow

38 Members signed in at 10.00 am Saturday for the Mount Tennyson fossicking visit and from all accounts found some interesting specimens especially Andradite Garnet and Molybdenite.

32 Members assembled at the Oberon R S L Club where the Catering staff did a mammoth job feeding us as well as Saturday night locals.

36 Members signed in at 9.30 am Sunday at the Cash Essington copper mine where all found various ores of copper except Azurite which proved to be scarce although Dieter Mylius found a single Micro crystal.

Frank and Gertraud Godeny sent in the following pictures:



The open cut and entrance to the Mammoth Mine



The Chimney, when sighted, gave us the direction to find the mine site.



Nearly all heads down, doing what you do when you're at a site like this.

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Brian Holden

Firstly thanks for your enormous efforts in preparation and organisation of the trip.

I have a few photographs of people mainly, but unfortunately can't get them to you in time.

The main item of conjecture resting with most people at present is the available time to be spent actually field-collecting, especially in the winter period when daylight is a premium.

Members travelling from as far afield as Victoria just to spend a couple of hours on the job must be a bit disappointing given the nature of access to the site (particularly Saturday).

If a revisit is possible down the track, at least we now know where we are headed - maybe numbers could be limited and an agreement realised with the landowner to get vehicles a little closer to the site.

We were extremely fortunate on Saturday we didn't have to carry at least one person up the hill at stumps due to a dehydration issue.

Highlights of the venture included some interesting specimens from Mt Tennyson, the views, the bushwalk (initially, at least), and of course the Social Dinner at Oberon on Saturday evening.

We should all be very grateful for Prof. Pete Williams' preamble on the site at Mt Tennyson.

I think all would agree the dinner was memorable - good to get together and relax over a few (?) drinks and enjoy good food.

Again, thanks for the weekend - as you say the more input you get from members on a certain site the better organised the trip will be in the end.

George Laking



Mt. Tennyson – the member's cars lined up

I can certainly make a number of comments although no doubt similar to everyone else. From compliments to the organisers for all your work, the amount of preliminary 'reccé' work, checking access, permits, routes etc etc, everything you and Peter had to do. Fairly comfortable weather for the trip, wet overnight but fairly bright during the days. Comfortable

Mt. Tennyson & Cash Essington Cu Mine.

accommodations that you recommended and a very successful get-together at the Oberon RSL on Saturday evening in a booked private room. Although their kitchen took a little time to serve everyone, the visitors all got their meals eventually and surely found it all delicious. In my case I found that the RSL beef fillet only comes as a 350 gram serving instead of 250 as I usually order but it definitely was ALL placed where it did the most good.

I took only a few pictures during the Trip and can attach here one of the cars, twenty-three of them, lined up in a paddock near the Mt Tennyson mine and then a shot of Bob Meyer-



**Mineral collectors hard at work !
Bob Meyer - Gleaves, Paul Meszaros and Lyn Hicks**

Gleaves, Paul Meszaros and Lyn Hicks, hard at work at the Essington site!. I took a number of other pictures but most were various views of the mineral sites.

I only collected a few samples from both sites and I do not think they will be the best that would have found by other members. On trips and visits to mineral sites I tend to walk around and watch what other people are finding.

One aspect of the Mt Tennyson visit intrigued me a little when thinking about it afterwards. In moving off from where the cars had been parked the entire party of thirty-six headed into the nearest tree-line to apparently disperse in all directions. Then after some time gradually all of us had somehow found our way down to the actual mine, well over a kilometre away down that slope on the other side of the mountain from where we had parked. Which says something about collectors being able to sniff out minerals. Of course Pete Williams may have had some idea of where to head for.

It was very interesting and enjoyable, except for walking back up those slopes; some of us are feeling our age!

Dieter Mylius



Mt Tennyson - colour on the slopes



Mt. Tennyson

Mt. Tennyson & Cash Essington Cu Mine.

The weather could not have been better as a caravan of 25 or so cars descended on the property that many of us had been wanting to visit for decades. However, finding the actual mines of Mt Tennyson was not as straight forward as we had hoped, but after an hour of rather pleasant rambling through the Yetholme country side with stunning views over the Oberon Bathurst area, dumps were spotted amongst the trees and soon 36 fluoro vested mineral collectors were hard at it.



Mt Tennyson Andradite

UV. This meant that we had also found some specimens containing scheelite and powellite, both minerals known to be there.

The skarn rock proved remarkably resilient to hammering, seeing the demise of my sledge within 10 minutes (note to self buy a better quality hammer). However, soon most of us started finding andradite garnets of various sizes up to 25mm (not perfect, but quite nice), with patches of molybdenite and diopside also showing up. A few UV lamps were used under various forms of clothing to reveal both blue-white and cream-white fluorescence under SW



Mt Tennyson Andradite

It was also suggested before the trip by Brian England that skarn with patches of calcite should be collected, the idea being that the calcite would be dissolved at a later date to reveal hidden treasures. This seemed a good idea because at least one specimen from a trip in late 1997 revealed a perfect 1.5mm scheelite octahedron perched amongst garnets and diopside. This was found in material from Mt Tennyson dumped at Wisemans Creek. However, sadly, the specimens collected by me this trip which had the calcite removed, showed little of interest other than garnets, quartz and diopside. Hopefully others had more success.

A few people climbed into the Mammoth mine with UV lights to see what would be revealed. The blue-white and cream of scheelite and powellite provided a stunning light show and in one area the bright yellow-green of an as yet unidentified colourless mineral prompted some limited sampling.

The uphill return walk back to the cars saw muscles strained as buckets and packs of skarn rock were hauled back to the vehicles. But a great day was had by all.

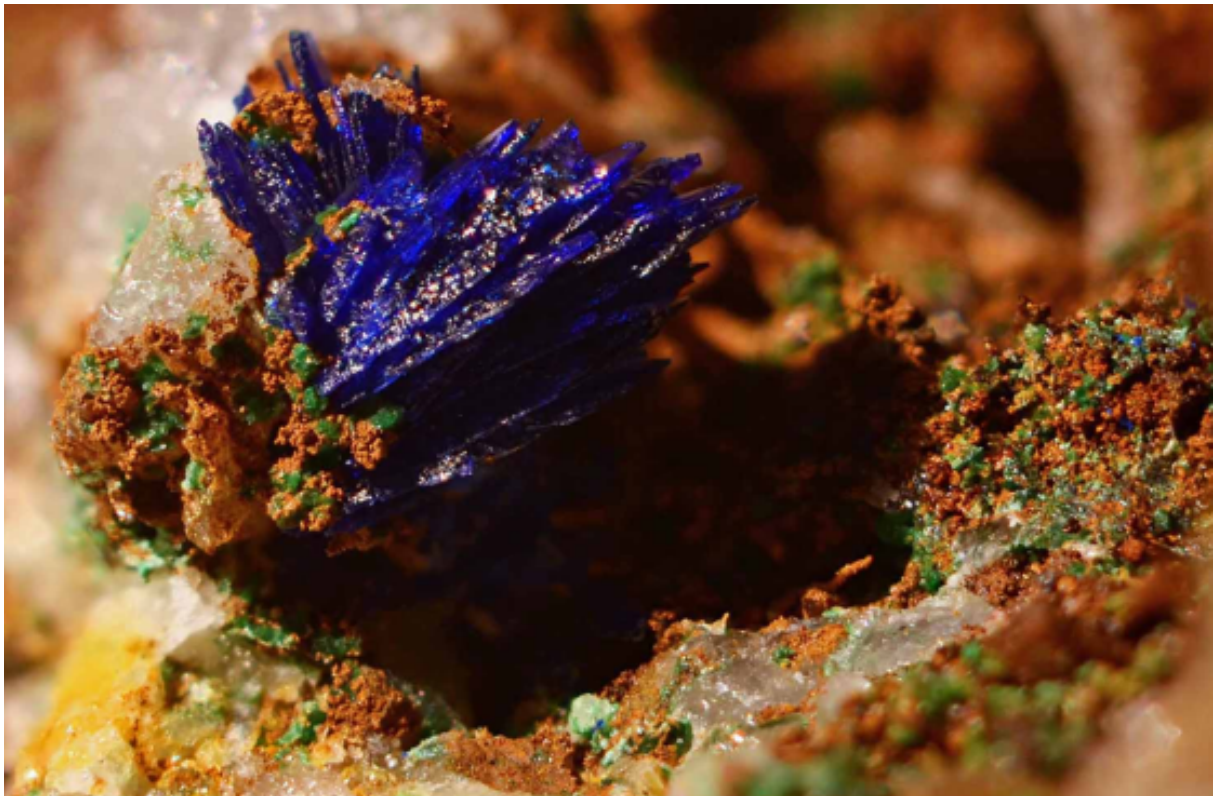
Mt. Tennyson & Cash Essington Cu Mine.

The following day, saw a shorter walk to the Cash Essington copper mine, where there was nearly as much green in the road to the mine, as on the mine dumps. Soon Society members were again reducing large rocks to small, in search of evasive copper minerals other than stains. Most found some green colour in quartz veins, but in the end it was small pockets in the schist that revealed the best specimens, including small lawns of malachite fibres and a couple of smallish azurite crystals. Massive sulphides and pyrite were plentiful.

All in all a great field trip, further enhanced by a lively social dinner at Oberon RSL attended by most participants. All who attended no doubt give their hearty thanks to Peter Beddow and Edward Zbik for organising this field trip, and the generosity of the property owners in letting us on their properties.



Cash Essington adit



Cash Essington Mine Azurite (FOV 2cm~)

Mt. Tennyson & Cash Essington Cu Mine.

John and Berenice Tottenham

My compliments to your organisation and documentation of the field trip. Sorry I have no relevant photos nor had time to look at what we collected.

Now to some nitty gritty comments which I hope can be taken in a positive way to assist future trips. These comments, are based on my personal experience of incidents and risk assessments encountered in dam construction, cave rescue and personal prospecting.

As I had loaded all your KML waypoints into my GPS using a GPX conversion, I had the ability to have guided everyone to Saturdays mine sites. Unfortunately I left my GPS in the car on the assumption that someone knew how to find the mines. A big mistake on my part! I had the GPS with me on the Sunday too and did not need it. Perhaps there needs to be an agreed navigator!

Normally when prospecting I load potential areas of interest into my GPS and then prior to leaving the car, record the position of my car. This means I can find both potential areas and my car despite wandering in circles looking at the ground and not the terrain. It's terribly easy to get lost in overcast conditions. Also I tend to use UTM coordinates instead of lat/long as these are easier to plot on maps.

At the mine sites in steep country there was potential for slips, falls and rock related injuries. However I am not sure I heard whether a first aid kit was with us at the mine sites or there were protocols of how a more disabling injury would have been addressed?

Full marks for the insistence on PPE gear. But what do you do if an attendee is not adequately equipped?

Perhaps attendees can bring their own name tags.

Edward Zbik

I am just blown away by the number of members who attended. Thank you for making this a successful and rewarding trip.

A big thank you to Peter Beddow for his company on the two trips where we visited the various mullock heaps and quarries around Oberon.

Most sites in the State Forests proved barren, whilst others had some potential for future trips. We barely covered 20 of the 60 sites planned on our reccés!