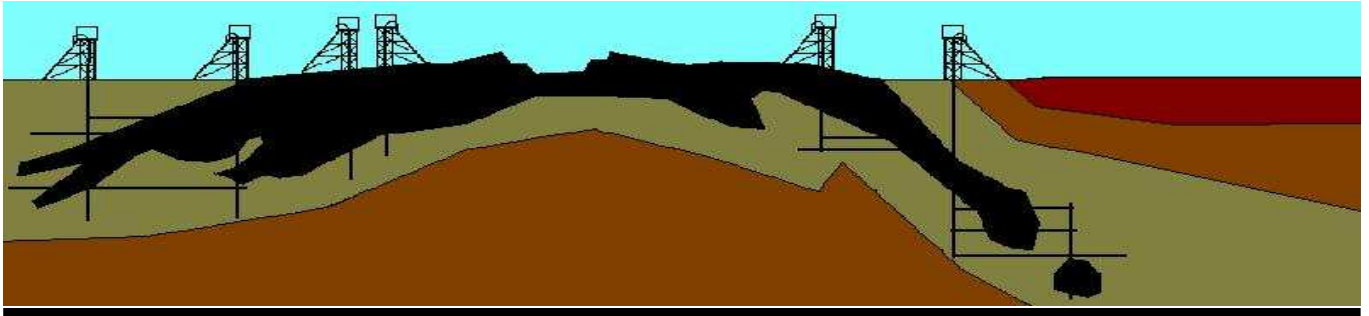


# THE LINE FROM THE LODE



Volume 9, Issue 1

March 2008

## The Newsletter of The Broken Hill Mineral Club Inc.

PO Box 747 Broken Hill. NSW. 2880. (ABN:11502101481)

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### SUBSCRIPTIONS

Annual Membership to the Broken Hill Mineral Club Inc. is as follows

Full Membership - \$20  
Associate Membership - \$15  
Family Membership - \$35  
Child Under 16 - \$5  
Newsletter Subscription - \$5

## NEW CLUBROOM - ALL ON TRACK

*Hello to All...*

Welcome to the first edition for 2008. This year we are officially moving into our new clubroom at the Centre for Community in Beryl Street. The clubroom will be set up as both a workroom and meeting room. It will have built in a large bench to accommodate the saws, polishing machines, and faceting machine. There will be display cabinets for the club mineral and gemstone collection and the library. We will also have a sink with tea and coffee, etc making facilities.

Prior to our moving in we need to do some serious work in regards to internal linings, painting, plumbing, electricity, setting up the benches and other fixtures.

Community Inc. have indicated that they are very happy to assist our club as part of their ongoing community programs, so this clubroom is a long term venture. In saying this we now need all members to help in the setting up of our new room.

Planned for this year we have our monthly field trips, meetings and mineral competitions. We also will restart workshops in cutting and polishing gemstones - once the clubroom is operational.

With the field trips we are planning a few out of town and full weekend trips, some of which are in conjunction with other clubs. There is a full calendar at the back of this edition of the newsletter for you to take off and put on the fridge.

At the end of last year we became affiliated with the Gem and Mineral Clubs Association of South Australia (GEMCASA) as we saw the benefits of being part of a larger group, particularly when it came to federal funding and grant applications. This means that when your membership is renewed you will now receive a membership card from GEMCASA as well as from the club. It also means that we are now covered under their insurance and are bound to follow their code of ethics.

Until next time...happy fossicking...

Trev

## CLUB CONTACT DETAILS

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## LOCATION UPDATE - GAHNITES OF THE NINE MILE

Apart from the main line of lode, the Broken Hill region is host to many explored mineral deposits, as hundreds of pits and shafts now dot the landscape, most long abandoned as early prospectors searched for their fortunes.

The Broken Hill deposit is defined as a stratiform silver / lead / zinc sulphide lode. Other similar but smaller lodes are classed as Broken Hill type deposits after the style of mineralisation of the main line of lode.

Hundreds of satellite Broken Hill type lead, zinc mines, mostly pegged in the late 1880's, are scattered throughout the Barrier Ranges. These followed identifiable similar lode horizons, acting as indicators to the possibility of rich ore, to the main Broken Hill deposit. Along with the sulphides they contain the following mineral assemblage – blue translucent quartz, fine grained pink garnet rock (locally called garnet sandstone), green coloured lead rich orthoclase feldspar and **gahnite**.

Gahnite is a rare mineral belonging to the spinel group and when pure has the chemical formula  $ZnAl_2O_4$ . It is therefore referred to as zinc spinel and forms octahedral crystals which are usually green to black in colour. It was named after the Swedish chemist, Johan Gottlieb Gahn (1745-1818) the discoverer of the element manganese.



The gahnite in the Broken Hill region contains around twelve percent iron and is almost always found in contact with quartz. In outcrop they appear grey with a studding of black-green crystals and are known to cover over 250 kilometres of strike length across the Broken Hill block making them the most extensive gahnite bearing rocks in the world. The gahnite crystals range from microscopic through to large fist sized masses. A general rule is that the larger the crystals the less perfect is their shape. These larger masses

are also heavily fractured and rarely can be retrieved intact. The best crystals recovered have been where the encasing quartz has broken away to leave the gahnite terminations standing proud.

Fossicking for gahnite crystals in the Broken Hill area is done via a few simple steps.

Do the background research first and obtain either a geological map or a metallogenic map of the Broken Hill region and look for the purple coloured quartz-gahnite outcrops (with the symbol 'qg') or the Broken Hill style deposits, identified by a purple rectangle.

These maps are available from the NSW Department of Mineral Resources office in Broken Hill for around \$11 each. The geological maps are at 1:25000 scale, while the metallogenic maps are at 1:50000 scale. Each of the four metallogenic maps have a full report, also available, and listed as Bulletin No. 32 parts 2-5.

Visit these areas and walk along the strike of the outcrop, looking for the blue-grey quartz horizons while checking that they contain the gahnite bands. Once found examine in more detail the centre of the quartz-gahnite outcrop, especially if there is pegmatite nearby, for the larger crystals, which more often occur in this zone.

One of the most accessible areas is the "Nine Mile" area north of the city along the road to Purnamoota Station. This area lies between five and twenty kilometres north of the city and incorporates the northern part of the town common, Limestone Station, Nine Mile Station and the southern portion of Purnamoota Station.

This area has a series of small Broken Hill style deposits that follow a north-south trend along two lines. The western line contains the Hidden Treasure, Great Western and Centennial mines, while the eastern line contains the Nine Mile, Southern Cross and Parnell mines.

At the Hidden Secret mine a small outcrop of quartz-gahnite rock has yielded sharp, up to 1cm sized individual crystals.

The Great Western Mine has a long outcrop of quartz-gahnite that has been opened up by a dozer scrape and a small open cut, over a length of around 100 metres.

The Nine Mile mine has good sharp gahnites up to 3cm in size, while at the Southern Cross and Parnell Mines the crystals are smaller. At each of these locations the best gahnite is in contact with quartz, however exposing them intact is often a problem as they tend to fracture easily

# LOCATION UPDATE - GAHNITES OF THE NINE MILE (CONTINUED)



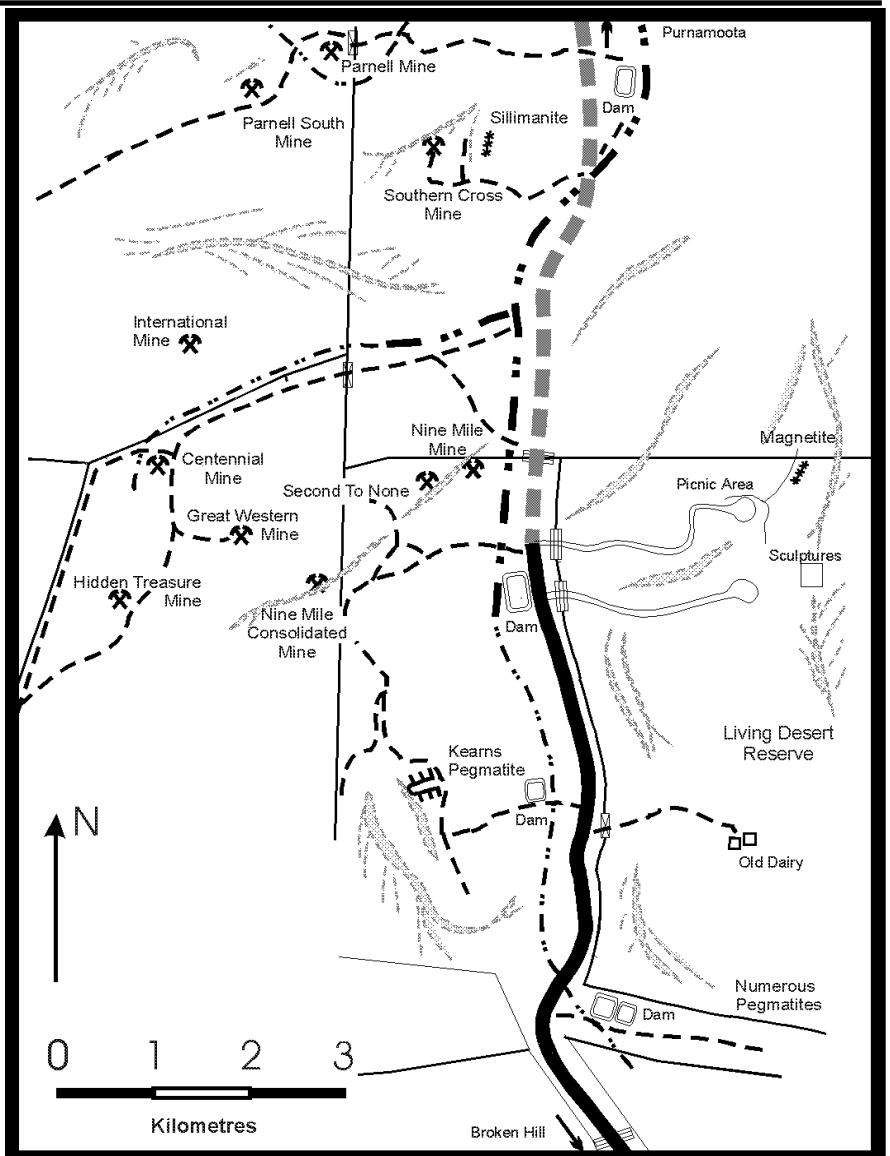
**Above :** Sharp Gahnite crystals in quartz - Southern Cross Mine

**Right :** Locality Map of the Nine Mile Area

**Below Left :** Outcrop of Gahnite bearing quartz about 500 metres south of the Nine Mile Mine

**Below Right :** The Nine Mile Mine looking up from the access road.

**Previous Page :** Gahnite in quartz from the Hidden Treasure Mine



# MINERAL PROFILE : BROKEN HILL'S MAGICAL MANGANESE MINERALS

The variety and range of colours found in minerals is mostly due to the presence of metal impurities. Manganese is one such metal known for its variety of colours when existing as an impurity in a mineral. The Broken Hill orebody is rich in manganese, where it is especially incorporated into a suite of rare silicate minerals. These exist within the sulphide zone of the orebody and are intermingled with the lead and zinc sulphides.

The two most common silicate minerals are the manganese garnet - spessartite, and the members of the rhodonite - bustamite series. Other rarer silicate minerals containing manganese include inesite, johannsenite, manganocummingtonite, manganogrunerite, and manganpyrosmalite.

Spessartite garnets are found throughout the orebody and the better specimens are those that formed in contact with coarse galena. They range from deep red to almost black depending on the percentage of manganese. One of the few gem quality garnets - that has now been cut into one large and four smaller superb faceted stones - was found embedded in a single lump of coarse Galena where it was shielded during mining from the shatter of the blasting. Sometimes the garnets formed plates with many small, around 1-2 cm, individual crystals, while some of the garnets, particularly near Brown's Shaft, were up to cricket ball size.



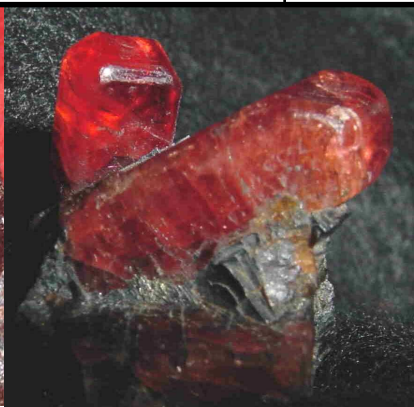
found embedded in shiny coarse galena, making a stark contrast.

The bustamite comes in several forms. Pink to brown blocky crystals are often found within the ore. Bladed crystals and intergrowths - locally called "corn beef rhodonite" form masses. Fine needles usually associated with fluorapophyllite and johannsenite form in some of the late stage cavities and veins. Bustamite is a rare mineral on a world wide scale and Broken Hill bustamites are the largest crystals known.

Sometimes associated with calcite veins is inesite.



**Above Left:** Spessartite - North Mine



**Above Centre:** Rhodonite on Galena - North Mine



**Above Right:** Bustamite in Calcite - Zinc / NBHC Mine

**Above Top:** Inesite with fluorapophyllite - Zinc / NBHC Mine

Rhodonite and bustamite form a series with pyroxmangite, where the increasing presence of calcium and then iron determines the final mineral. These minerals are most easily identified by their long columnar shape and brown to red colour. Pyroxmangite is just manganese, bustamite has some calcium while rhodonite has calcium and iron.

These minerals are spectacular from Broken Hill and the deep red rhodonites are classed as the best in the world. They are large and well formed and are often

This mineral forms radiating needles up to several centimetres long of a brown to pink colour. The best specimens came from the Zinc / NBHC mine and were covered with sharp, glassy fluorapophyllite.

One of the rarest of all minerals at Broken Hill, but also containing manganese is manganpyrosmalite. This mineral was usually found in cavities within massive rhodonite - bustamite or hedenbergite.

## BROKEN HILL'S MAGICAL MANGANESE MINERALS (CONTINUED)



**Above Left:** Johannsenite - Zinc / NBHC Mine  
**Above Centre:** Manganopyrosmalite - Zinc / NBHC Mine  
**Above Right:** Rhodochrosite with Sturtite - Zinc / NBHC Mine

**Below Top:** Manganoancalcite - Zinc / NBHC Mine  
**Below Bottom:** Alabandite on Calcite - Zinc / NBHC Mine

These crystals are orange-red in colour and form small hexagonal barrels.

Manganese also contributes to the colouring of the calcite family minerals. Broken Hill manganoancalcite has a distinctive pink hue and fluoresces orange under UV radiation. Manganoancalcite has formed spectacular radiating clumps, large plates of sharp crystals and seams of mamillary or botryoidal masses.

Sometimes the manganese content of the manganoancalcite is high enough to be called rhodochrosite. In truth most of the rhodochrosite found in Broken Hill should be called calcian-rhodochrosite as there is always some calcium present. This also applies to the so

called kutnohorite, which is technically the half way point between calcite and rhodochrosite. Most of this kutnohorite from the Broken Hill mines is probably calcian-rhodochrosite. Often associated with the manganoancalcite veins that cut through the orebody was a black manganese rich mineral locally called sturtite. This formed amorphous masses that cover the calcite, as it has probably formed via the fluid breakdown of other manganese silicates. It is still debated to whether or not it could be a recognised mineral.

One of the rarest manganese minerals found at Broken Hill is the sulphide alabandite. This mineral occurred as arborescent growths, often over calcite, but it was most notable as dendritic free standing masses.

In the upper levels of the orebody the silicate minerals have been oxidised and the manganese forms complex manganese oxides. The most common of these are coronadite and cryptomelane which form spectacular stalactitic growths. These regularly provide the base for on which other minerals grow as they are usually vuggy and riddled with cavities. The coronadite often grades into goethite and other iron oxides and forms the greatest mass in the gossanous leached upper zones.

In conclusion it is apparent that at Broken Hill some of the most spectacular and rare minerals owe their existence to that magical ingredient in the mixture - manganese.



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# FIELD TRIP REPORT - GEMBOREE 2008

The 2008 Gemboree was held over the Easter weekend at Murray Bridge in South Australia. Many of our members made the trip down to attend the event, where the latest material to come from around the world was on display and a chance was had to catch up with fellow collectors from around Australia.

Camping on site, it was a golden opportunity to meet with the organisers and converse with representatives of the other GEMCASA affiliated clubs.

This was the first time that the club has entered a showcase of minerals, this time with the theme - minerals from the collections of members of the Broken Hill mineral Club, with a second focus on Broken Hill minerals. Many comments were made about the display, most consistently about the quality of the samples on show. Thanks go to all the members who contributed and loaned their specimens for the display.

The 2009 Gemboree is to be held at Horsham Victoria, again over the Easter long weekend next year.



**Left :** The club display of Broken Hill Minerals  
**Above Top :** Bill and Yvonne Kettley of BK Minerals with their stand.

**Above :** Don and Lois McColl of Red Centre Rocks and Minerals at their stand.

**Below :** Martin Rosser from GEO Discoveries - winner of the best dealer stand display.

**Below Left :** Darryl and Josie Hill outside their camp.



# BROKEN HILL MINERAL CLUB - 2008 CALENDAR

<b>MONTH</b>	<b>FIELD TRIP</b>	<b>MEETING</b>
<b>February</b>	<b>No Field Trip</b>	<b>AGM</b> Monday 4th - 7:30 pm
<b>March</b>	<b>Gemboree – Murray Bridge</b> Friday 21 <sup>st</sup> – Monday 24 <sup>th</sup> March (Easter Holiday Weekend).	<b>Monday 3rd - 7:30 pm</b> <b>Native Metals</b>
<b>April</b>	<b>McDougall's Well Amethyst Field</b> Sunday 20 <sup>th</sup> – 8:00 am. (90km) Bring Hammers, Chisels, Carry Bags, etc. Meet – Opposite Rifle Club, Tibooburra Road	<b>Monday 7th - 7:30 pm</b> <b>Apatite</b>
<b>May</b>	<b>Adelaide / Barossa Valley / Tom's Phosphate Quarry– Overnight</b> Weekend 16 <sup>th</sup> /17 <sup>th</sup> / 18 <sup>th</sup> – time TBA Bring Hammers, Chisels, Carry Bags, Packing Boxes, Sleeping gear, Food, Water, etc. Meet – Adelaide Road Info Bay	<b>Monday 5th - 7:30 pm</b> <b>Wavellite</b>
<b>June</b>	<b>Thackaringa Garnet Locations</b> Sunday 15 <sup>th</sup> – 8:00 am. (40km) Bring Hammers, Chisels, Carry Bags, etc. Meet – Adelaide Road Info Bay	<b>Monday 2nd - 7:30 pm</b> <b>Garnet</b>
<b>July</b>	<b>Woolcunda Station – Desert Rose</b> Sunday 20 <sup>th</sup> – 7:00 am (140km) Bring Shovels, Hammers, Chisels, Carry Bags / Boxes, Buckets, etc. Meet – Wentworth Road in front of the Zinc Lakes.	<b>Monday 7th - 7:30 pm</b> <b>Gypsum</b>
<b>August</b>	<b>Purnamoota</b> Sunday 17 <sup>th</sup> – 8:00 am. (40km) Bring Hammers, Chisels, Carry Bags, etc. Meet – Corner Schlapp St and Nine Mile Road	<b>Monday 4th - 7:30 pm</b> <b>Feldspar</b>
<b>September</b>	<b>Olary District – Overnight Camp</b> Weekend 19 <sup>th</sup> / 20 <sup>th</sup> / 21 <sup>st</sup> – 4:00 pm. (220km) Bring Hammers, Chisels, Carry Bags, Packing Boxes, Sleeping gear, Food, Water, etc. Meet – Adelaide Road Info Bay	<b>Monday 1st - 7:30 pm</b> <b>Rutile</b>
<b>October</b>	<b>Tikalina Station – Radium Hill</b> Sunday 19 <sup>th</sup> – 7:00 am. (100km) Bring Hammers, Chisels, Carry Bags, etc. Meet – Adelaide Road Info Bay	<b>Monday 6th - 7:30 pm</b> <b>Kyanite</b>
<b>November</b>	<b>Limestone Station</b> Sunday 16 <sup>th</sup> – 8:00 am (15km) Bring Hammers, Chisels, Carry Bags, etc. Meet – Corner Brown St and Silverton Road	<b>Monday 3rd - 7:30 pm</b> <b>Spinel</b>
<b>December</b>	<b>No Field Trip</b>	<b>End Of Year Christmas Party</b> Monday 1st - 6:00 pm

**PLEASE NOTE:** These field trips are tentative – pending final negotiations with land / lease holders.