QUEENSLAND TUNGSTEN

THE MT. CARBINE TUNGSTEN MINE

A BRIEF HISTORY OF THE WOLFRAMITE MINE AT MT. CARBINE FROM 1895 TO 1988

The story of the Mt. Carbine wolframite mine is one of interrupted development spanning some 90 years.

It dates back to the 1880's when wolframite was first discovered on the slopes of Carbine Hill, develops with the arrival of the early prospectors and later the Irvinebank Mining Company, peters out after the collapse of the world's wolframite markets in 1919 and re-appears in 1968 when R.B. Mining negotiated option agreements to purchase the leases.

Although now on 'care and maintenance' because of low tungsten prices, Mt. Carbine was one of the world's largest producers of high grade wolframite. The most modern photometric ore sorting and treatment techniques were employed to produce 1,500 tonnes of wolframite and scheelite concentrate annually, a production rate that could continue for at least the next twenty years.

Wolframite, a tungstate of iron and manganese, and scheelite, a tungstate of calcium, are normally sold as a concentrate after beneficiation through a treatment plant. Both are essential to the steel industry for the manufacture of wear and high heat resistant steel as well as to the tungsten carbide industry for manufacturing cutting tools. One common application of tungsten is in the filaments of light globes.

Mt. Carbine, located nineteen miles west of Queensland's Port Douglas and some eighty four miles by road north-west of Cairns, is in dry grassland savannah country, separated from the tropical coast by a rugged chain of mountains (The Great Dividing Range).

The mining and treatment methods of the early prospectors were extremely primitive. Quartz containing wolframite was collected from the surface of the hill by hand, broken down by hammer and either panned or box jigged to produce a saleable concentrate.

As the surface material ran out, shallow trenches were dug following the quartz. Although the veins were only a few feet apart, each was worked separately. On a few claims, modest shafts were sunk and a little stoping was carried out.

The scanty records show that in 1896 two prospectors, Healy and Althous, sent 28 cwt. of wolframite to Sydney, receiving only £8 per ton - barely enough to cover expenses. Twelve months later the Australian price remained the same but a shipment sent to London returned £90 per ton clear of expenses after leaving Port Douglas.

Earlier, in 1895, the brothers Samuel and Joseph Baird were sluicing for tin on Station Creek, eight miles south-east of Manganese Creek, but while prospecting for further shows they gave some attention to the Manganese Creek area. It is not recorded how they gained initial knowledge of that area but they worked over the hill above the eluvial deposits and realised they were onto some good ore.

Having brought the 'Hill' into prominence by working and pegging their rich find, they lost it to a Port Douglas syndicate when Joe Baird, riding from Herberton to effect registration and to renew their Miner's Right, stayed too long in Mt. Molloy en route. As a result an application for Mining Lease 2225 'Mt. Carbine No. 1' (and taking in Baird's Bluff) was lodged before he arrived for Messrs. Kilpatrick, Grogan and others.

By 1907 most of the rich surface ore had been worked out and the population of the area began to drop from 150 people to 50 a year later.

It was also about this time that a rail connection between Mt. Molloy (25 miles away) and Biboohra was first mooted and John Moffat's Irvinebank Mining Company began to acquire control over the principal holdings.

This Company opened up some of the larger quartz reefs by driving several adits into Carbine Hill and systematically working them by overhand stoping. The ore was trucked to an adit opening directly above the mill's supply bins.

In 1911 the Company's battery began operation. By this time the weekly production of wolframite concentrates had risen to 5 tons and the town's population to 500 people.

To 1915 the Irvinebank Mining Company produced some 3,000 tons of concentrate at Mt. Carbine but the end of the first world war saw the collapse of the wolframite market and organised mining ceased until 1972.

In the intervening period the township slowly disintegrated and working deteriorated to a few miners basically using hand methods of mining, picking over old dumps and treating small amounts of eluvial material and underground ore.

Elsewhere in Australia during these years, a man by the name of Jim Roche was working to establish and develop Roche Bros. Pty. Ltd. Today it is a large family owned civil engineering construction company that has also been actively engaged in mining operations in many parts of Australia for over forty years.

It was Jim Roche who was the motivating force behind the establishment in 1968 of R.B. Mining Pty. Ltd. He, together with Harry Stevenson, a mining engineer with many years of experience, saw the potential within Australia for the exploration and mining of such metals as tin, wolframite and gold.

A programme of exploration led R.B. Mining to Mt. Carbine where the Company took an option over the leases while an intensive evaluation of the area was conducted.

The remaining early underground workings enabled a close inspection of the vein structure and when correlated with the information gained by diamond drilling nine test holes, the size, continuity and predictability of the deposit were confirmed.

R.B. Mining exercised its option in 1971 and the Stage 1 treatment plant to process eluvial material from the side of Carbine Hill and the surrounding flats was constructed.

Under Mine Manager Ellis Hughes, treatment of this eluvial material continued until 1974 while a detailed feasibility study and planning for Stage 2 were carried out.

The key to the second stage of development of the mine was the ability to economically and efficiently separate the barren grey-green schists from the quartz which contained the wolframite and scheelite.

Samples of the Mt. Carbine ore were sent to Ore Sorters, Africa and were successfully tested at the West Driefontein pilot plant.

The basic principle of the photometric ore sorter is that ore is fed onto a conveyor belt travelling at 4m/sec. to a laser beam reflected across the belt by means of a revolving mirror drum rotating at 6000 r.p.m.

The wet, washed rocks on the conveyor are scanned as they travel through the laser beam and the reflected light is picked up by a photo-multiplier via the rotating mirror. The impulses are then relayed to a computer that either activates the appropriate blast valve to take the ore-bearing quartz rock from the moving stream of material or allows the barren rock to pass.

As a large capital investment was reqiured for the installation of the ore sorting equipment and the necessary expansion of the mine, Queensland Wolfram Pty. Ltd. was formed in 1976 to buy the mining leases and existing facilities at Mt. Carbine from R.B. Mining. This then became the operating Company for Mt. Carbine, ensuring that management, control and majority ownership were retained in Australian hands.

An overseas group of Companies, Sandvik Aktiebolag, A. Johnson & Co. HAB (both of Sweden), and Treibacher Chemische Werke AG of Austria, purchased a minority interest in Q.W.L. and provided a significant proportion of the necessary funding for the Stage 2 expansion as well as a guaranteed sales contract for the production of the mine.

The Mt. Carbine treatment plant and associated facilities were built by R.B. Mining personnel and it was the first time in the world that photometric ore sorting technology had been applied to this type of ore body. The bank of three photometric ore sorting machines was the end result of a technical advance that made development of the mine economically feasible.

Capable of producing 1,500 tonnes of wolframite and sheelite concentrates per annum, the mine provided employment for approximately 100 people. They and their families were accommodated in the new village, located one hundred metres from the main Cairns to Cooktown highway.

When building the village, the Company included a large recreation hall, tennis court, store and general facilities along with 20 houses, accommodation for 80 single men and a caravan park with 40 sites.

Electrical power reticulation was extended from Maryfarms to Mt. Carbine and for the first time in its history the settlement had a permanent water supply.

Roads within the village were sealed by Q.W.L. and the Queensland Main Roads Department completed the sealing of the Cooktown Highway as far as Mt. Carbine, giving residents a safe and easy access to Mareeba and Cairns.

However, after enjoying some good years, tungsten prices started to fall from 1980 with the result that, from time to time over the ensuing years, it became necessary to reduce production and retrench employees. By November 1986 there were few options left and it was decided to place the mine on 'care and maintenance' and to stop the underground development programme which had started in mid 1985 until prices improved enough to warrant re-opening.

Other consequences of the weak market included the withdrawal in June 1985 by Sandvik, Treibacher and Axel Johnson from their joint venture with Q.W.L.; the acquisition of their interest by Poseidon Limited (the reorganised Mining House of the nickel-boom days) and then Poseidon's take-over of Q.W.L.'s share in November 1987 to give it total ownership of Mt. Carbine mine.