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THE LONG PLAINS SOUTH IRON ORE DEPOSIT

by P. Tetlow.

Abstract

An aerial magnetometer survey of north-western Tasmania carried out by the Bureau of Mineral Resources revealed three marked anomalies in the adjoining Magnet and Corinna Quadrangles. The larger Savage River deposits are now being examined by diamond drilling after preliminary ground magnetometer and geological surveys. The remaining areas, at Rocky River, and Long Plains South (R.T.A.E. Deposit) showed anomalies of very much smaller magnitude. The latter deposit was examined by the writer during February of this year. These pronounced anomalies lie within a narrow, northerly trending belt of sheared basic igneous intrusives.

A geological map, with accompanying sections was produced to help interpret the geophysical data.

Location and Access

Thirty-one miles from Waratah and eleven miles from Corinna on the Waratah-Corinna road a new road was constructed, in a westerly direction, by Rio Tinto Australian Exploration Pty. Ltd. during May of this year. It is some two miles in length and provides access for four-wheel drive vehicles. The road intersection lies approximately 150 yards north of the thirty-one mile P.W.D. hut. After a short incline it descends from the more open plateau (southern extremity of Long Plains) some 300 feet within a distance of one mile, and finally rises approximately 100 feet onto the main iron bearing ridge. This ridge lies within the area held by Rio Tinto Australian Exploration Pty. Ltd. under a Special Prospecting Licence. The ridge is two miles in length and trends about 10 degrees west of north, the northern apex standing approximately 940 feet above sea-level.

A number of well cleared straight traverses have been cut within the area by Rio Tinto Australian Exploration Pty. Ltd. They include a longitudinal base-line traverse some two miles in length, and a number of short cross traverses on the northern portion of the ridge where iron scree is in evidence. Geological boundaries were located as accurately as possible on these traverses. The datum point on the base-line traverse was located by trigonometrical survey of the ingoing track then present, from a base-line laid out on the Corinna road. Thick forest prevents the pinpointing of positions from aerial photographs.

History and Previous Literature

No mention is made of this deposit in any of the old records. Minor trenching attempts were noted at the northern extremity of the iron scree.

Topography

A feature of the region is the dissection of the southern extremity of Long Plains by the tributaries of the Savage River to the west and the Whyte River to the east. Rapid headwater erosion by youthful

streams is very evident. Such are Chinaman's Creek and Donnelly Creek which merge immediately to the west of the plain some 600 feet below it, and pass into the Savage River. Control of the erosion pattern by the steeply dipping shear faces of the amphibolite is also noticeable.

With decrease in elevation vegetation changes from grass and shrub on the upper plain to *Bauera* and cutting grass at the margin, and finally a thickly wooded myrtle covering of the lower zones. Creek beds are often completely covered by horizontal scrub interlaced with numerous large decaying logs.

Geology

The rocks of this locality are of two main types.

1. A Precambrian sedimentary series which has since been regionally metamorphosed and silicified. The rocks are now tightly folded and exhibit minor faults, folds, crenulations, and quartz veining. The series includes quartzites, phyllites, slates, and schists which may be graphitic, micaceous, or talcose. Outcrop extends along the Waratah-Corinna road where strikes range from 320° to 350° and dips from 60° to 80°E. Examples are specimen 6R from the road intersection, and specimen $1W_2$ taken approximately 850 feet along traverse W_2 (see appendix).

2. A massive, dark green, fine to medium grained, basic igneous rock which has since undergone low grade regional metamorphism. Intrusion of this material into the sediments occurred at some time between Late Precambrian and Mid-Cambrian. Differentiation and concentration of the magnetite probably occurred soon after. Large scale alteration including chloritization, serpentinization, and sericitization, has since resulted. Introduction of silica probably happened during the Devonian orogeny. Typical rocks seen as outcrop or floaters are hardly altered basic rocks, fine to medium grained amphibolites, albite-chlorite schists, sheared serpentinites, and limonitic quartzites (thought to be silicified dolomites).

The hard, coherent, less altered basic igneous rock can be seen in the headwaters of Chinaman's Creek. Even here local shears traverse the mass producing narrow zones of amphibolite schist. These shear zones vary from a few inches to many feet wide, and appear to strike in a direction approximating to the strike of the sedimentary series. Due to thick undergrowth and deep weathering of the amphibolite the sedimentary-amphibolite contact cannot always be accurately delineated. Typical examples are described by Mineralogist and Petrologist G. Everard, e.g. specimens 1S, 3S, and 1R (see appendix).

Iron Occurrence

The iron is seen as a local scree concentration on the northern extremity of the main ridge. It lies in a reddish brown clay soil which is the final weathering product of the sheared and altered amphibolite. Often small pebbles and grains of iron, chiefly hematite, become exposed at the surface after removal of the inter-mixed soil through which they were previously disseminated. Variation of soil colour from yellow brown to deep red and the nature of the iron pebble concentrations indicate a patchy distribution of the original surface ore in situ.

To the south the ridge is dissected by two small creeks which converge a little to the west and run into the deeply incut Chinaman's Creek. These creeks both traverse the soft schistose rock of the ridge

and have cut down 3-400 feet. At the intersection of the base-line traverse with the most southerly creek a steep easterly dipping lens of schistose magnetite-pyrite rock some 15 feet thick lies in a carbonated albite chlorite schist (see specimen 3S), which is itself extremely pyritic, on the western contact of the iron lens. A medium grained hard basic rock (massive serpentinised amphibolite) outcrops for 1200 feet further west. It is usually pyritic and talcose where shear zones are prominent. Further to the east a non-pyritous, magnetite rich, serpentiferous rock with gabbroic texture is seen about 10 feet from the baseline. This is from three to five feet wide and is followed by the massive basic rock for over 200 feet. Except for the narrow schistose shear zones it is hard and coherent.

Soft, pyrite rich, weathered and foliated schists occur in the creek immediately to the east of the northern iron scree.

Over all the iron of the locality is seen to be poorly represented. It occurs under similar conditions to that of the Savage River deposits seven miles to the north. A similar genesis could also be postulated here as the iron lies in the same intrusive belt of igneous rocks. Other than the leached hematite scree little original outcrop is present. An outcrop about 30 feet wide was revealed when the new road was constructed to the northerly drill site. Drilling commenced here early in July. No sulphide is found in the scree material, but pyrite is plentiful throughout most of the amphibolite and probably with the iron in depth. Some chalcopyrite crystals can sometimes be identified in the fresher igneous rock. It has been suggested that the pyrite is of a different generation to the magnetite, and was introduced at the time of shearing of the intrusive. There is no evidence to refute this idea. Because of the nature of the vegetation mapping is almost wholly restricted to cut traverses, the roads, and accessible creeks. Few unweathered outcrops exist and geological boundaries are usually difficult to interpret accurately. A change in soil type might be the only evidence present.

Conclusions

The aerial magnetometer and the ground geological evidence both indicate a deposit of minor proportions. In the northern region a lens in the order of 30 feet wide and 200 feet long may exist. Its behaviour with depth can only be ascertained by drilling. Unless extreme variations occur in depth, which is unlikely, no great iron reserves can be predicted. The pyrite rich (10%S) ore present in Chinaman's Creek some 300-400 feet below the top of the ridge indicates the likelihood of a high sulphur content with depth.

Appendix: Rock Specimens Described by G. Everard

The following are petrographic descriptions of specimens collected by Geologist P. Tetlow at Long Plains South Iron Ore Deposit:—

1S

Light greenish rock, weathering to a pale brownish yellow, with irregular dark patches. It is strongly sheared and is black on weathered surfaces.

In thin section the specimen is seen to consist of pale greenish, irregularly fibrous serpentine, stained brown or yellow in places with iron oxides. A little talc occurs in shreds and patches, and may be easily recognised by higher birefringence.

The dark patches are opaque black magnetite.

The rock is a sheared serpentine.

3S

Schistose greyish rock containing mica and mineralised with pyrite.

In thin section a granular structure is given to the rock by rounded and irregular crystals of albite and calcite interleaved with mica. The mica is a pale greyish green chlorite with low birefringence and no anomalous Berlin blue interference colours, intergrown sometimes with a little muscovite. Minute needles of rutile, some of which are geniculate twins, run in irregular lines and patches through the rock. They are particularly noticeable in the albite, but are common in the chlorite and calcite also.

The rock is a carbonated, albite-chlorite schist.

$1W_2$

Greenish schistose rock weathering to a yellow brown.

In thin section the rock appears as alternating bands of granular recrystallised quartz and platy sericite. The banding is irregular, however, as contortion and crenulation have been severe. Minute euhedral crystals of magnetite are plentifully disseminated through the rock, which is also heavily stained with oxides of iron.

Small euhedral crystals of tourmaline are common and the quartz contains many minute inclusions of rutile. There is also a little chlorite.

The rock is a quartz-sericite schist.

1R

Greenish, sheared, micaceous rock, somewhat weathered and iron stained.

In thin section the specimen consists of minute, oriented plates and books of sericite and chlorite with grains and granular masses of anhedral albite. Minute strings and masses of magnetite are present and the sericite is rather heavily iron stained. Opaque clayey minerals and limonite indicate the degree of weathering.

The rock is an albite-chlorite sericite schist.

6R

Fine grained, schistose, micaceous rock, grey in colour, but bleached in weathered parts.

In thin section the rock is seen to consist largely of small oriented plates of sericite with included lenticles of recrystallised quartz. There is some white opaque clayey mineral present as minute granules and inclusions between the mica laminae.

The specimen shows extreme crenulation and contortion. The rock is a quartz sericite schist.