

# TAURUS SOUTH GOLD MINERALIZATION, BULONG DISTRICT, WESTERN AUSTRALIA

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## LOCATION

The Taurus South Au mineralization in the Bulong district is located at 121°51'E 30°43'S, approximately 35 km E of Kalgoorlie on the Kurnalpi 1:250 000 map sheet (SH51-10; Williams, 1970).

## DISCOVERY HISTORY

Alluvial and bedrock Au deposits have been exploited in the area more or less continuously by prospectors since 1897, although historical records indicate only minor production prior to 1967 (66.6 kg Au from some 4500 t of ore at an average grade of 13.5 g/t; Williams, 1970). Exploration between 1987 and 1995 by Trafalgar Mining NL and Manor Resources Ltd (now Danae Resources Ltd) focused initially on eluvial resources and later on the underlying primary quartz stockwork mineralization. Manor Resources completed a comprehensive geochemical soil survey over the area that delineated a series of Au anomalies. Systematic drilling, based on the soil geochemistry, located several new occurrences of Au mineralization and aided in the delineation of a Au resource that was subeconomic at the time, but has potential for exploitation in the future.

## PHYSICAL ENVIRONMENT

The climate is semi-arid, with irregular rainfall averaging about 250 mm and evaporation of some 2300 mm annually. The Au deposits occur in low-lying terrain between a belt of pronounced hills occupied by the Bulong Mafic-Ultramafic Complex to the W, and Lake Yindarlgooda to the S and E. Eucalypt woodland is well developed in the upland areas, grading to saltbush plains with a few sand dunes on the margins of the

playa lakes.

## GEOLOGICAL SETTING

The project, as shown in Figure 1, is located on the W limb of the N-plunging Bulong Anticline, within the Gindalbie greenstone domain of the Kurnalpi Terrane of the Yilgarn Craton. The Au mineralization is hosted by felsic volcanics, volcanoclastics and intrusives of the Juglah rock assemblage (Ahmat, 1995), which is separated by the N-striking Goddard Fault from the Bulong Mafic-Ultramafic Complex to the W.

## REGOLITH

The regolith is highly variable throughout the mineralized area. The Central Anomaly and areas to the W and N are well exposed, with thin residual soils, characterized by abundant pedogenic carbonate, overlying bedrock. The depth of rock weathering, as indicated by drilling, typically ranges from 40 to 85 m. The prospective zone flanking the Goddard Fault is largely concealed by transported overburden to the S of the Central Anomaly. Here, the regolith includes extensive colluvial deposits, up to 5 m thick, derived from the Bulong Complex to the W, laterite and alluvial deposits. In the southern and western parts of the area, the terrain is typical of salt lake margins, with alternating zones of outcrop or residual soil, small dunes of windblown materials and alluvial cover. Mineralization is also exposed on the saprolitic floor of Lake Yindarlgooda, and is detectable by geochemical sampling where the overlying lake sediment is sufficiently thin (20-300 mm) to permit sampling. As there has been intensive prospecting and small-scale mining activities over more than 100 years, there are numerous small shafts and costeans, local contamination and extensive soil disturbance in some parts.

## MINERALIZATION

A complex and extensive shear and fracture system is developed within the felsic rocks adjacent to the Goddard Fault. This is accompanied by pervasive chlorite-carbonate alteration and an extensive complex of sheeted auriferous quartz veins within coalescing envelopes of intense carbonate-sericite-pyrite alteration. Native Au is relatively coarse within the quartz veins and high grades over narrow widths (generally less than 300 mm) have led to selective mining. Coarse Au, shed during weathering, makes the area popular with alluvial prospectors. However, in terms of bulk mining, the spacing between the veins and limited dispersion into the altered selvages result in a relatively low overall grade. Drilling of the geochemical anomalies is incomplete but, depending on the cut-off used, the resource calculated for the Central anomaly can be quoted as 2.28 Mt at a grade of 0.91 g/t Au or 209 000 t at a grade of 4.41 g/t Au. The ore blocks for the former figure are based on a cut-off of 0.15 g/t, reflecting the natural geological limit of the mineralization, and comprise both narrow quartz veins (generally less than 100 mm thick) and altered vein selvages (see Figure 4). Most individual intersections are of the order 1 to 2 m, grading 1-2 g/t Au, with a best result of 9 m at 43.4 g/t at a vertical depth of 110 m in DDH BD6. The sheeted vein complex, which has been partly defined, is more than 60 m thick and dips W at 20-30°. Much of the apparent discontinuity in the ore blocks is due to paucity of drilling, and it is considered that the resource could be quadrupled by selective infill drilling. Further augmentation could be achieved by drilling along strike.

## REGOLITH EXPRESSION

Smoothed contours of Au distribution in soils are shown in Figure 2. The <2 mm fraction of soil sampled from 100-200 mm depth was screened on site and analyzed by aqua regia digestion and graphite furnace AAS finish (detection limit of 1 ppb). A sampling grid of 160 x 80 m was employed initially, with anomalous zones defined by infill to 80 x 40 m and 40 x 40 m locally. The 30 ppb contour delineates a continuous anomaly trending NNW over a strike of some 2200 m and

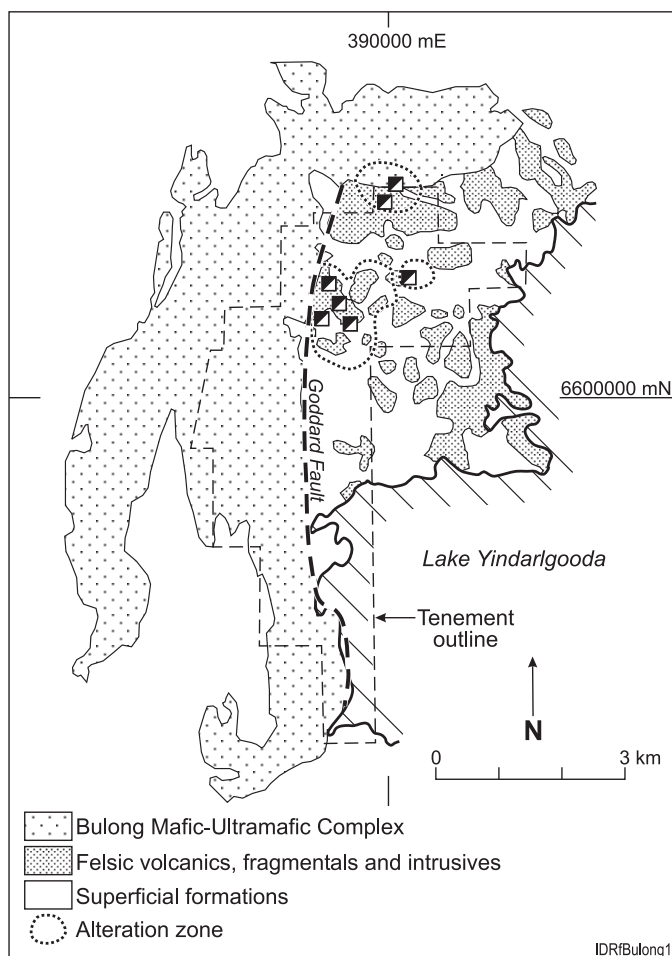


Figure 1. Geological setting of Taurus South gold mineralization.

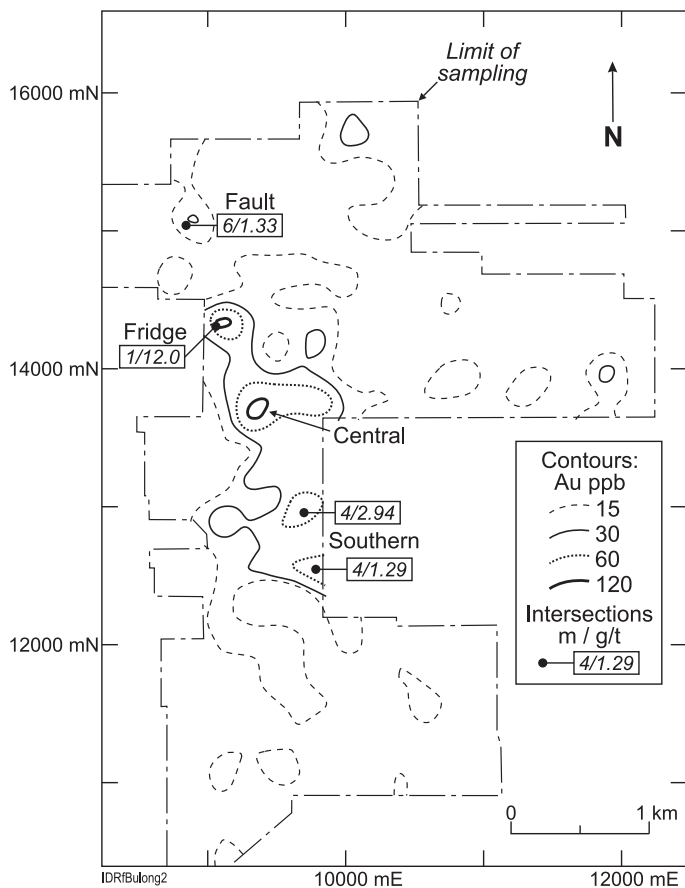


Figure 2. Smoothed contours for gold in <2 mm soil samples.

up to 750 m wide. Within this, three main peaks have been identified - the Fridge, Central and Southern anomalies. A fourth anomaly of lower tenor, which coincides with the trace of the Goddard Fault, is termed the Fault Anomaly. Significant indications of Au mineralization were obtained in all of the anomalies tested by drilling, as shown in Figure 2.

Resource drilling has, to date, been restricted to the Central Anomaly, shown in detail in Figure 3. An array of N-trending peaks in excess of 120 ppb (maximum concentration 350 ppb Au) can be seen within the overall ENE trend of the anomaly, as indicated by the 60 ppb Au contour in soils. Comparison with the resource cross-section (Figure 4) shows that the peak zones for Au in soil correspond to the subcrop of the N-striking, W-dipping sheeted vein system.

The relatively subdued response over the Southern Anomaly may reflect the increased thickness of colluvial cover, rather than any diminution in bedrock mineralization. The intersections of 4 m at 2.94 and 4 m at 1.29 g/t Au, obtained by preliminary drilling over peaks within the Southern Anomaly, confirm the significance of the anomaly in surface soils. This is despite up to 5 m of colluvium, derived from the Bulong Complex, overlying the felsic bedrock. Continuity of the bedrock mineralization over the full extent of the soil anomaly, as defined by the 30 ppb Au contour, has been confirmed by RAB drilling.

A study of primary dispersion on DDH BD6 indicates that As, Mo, Mg, Na, S and W are enriched in the mineralized zones; Ca, K and Rb are depleted. The ratios Ca/Mg and Na/K delineate the mineralized zone well, and suggest that the dominant alteration mineral may be a Na mica (presumably paragonite) rather than sericite. Strontium shows an antithetic relationship to Rb; the ratio Sr/Rb would also provide a strong indication of the mineralization.

## OTHER INFORMATION

The Taurus case history is an example of strong geochemical response in soil related to a somewhat atypical, low grade disseminated Au occurrence. In part it also demonstrates the effectiveness of near-surface sampling for mineralization concealed by moderate thicknesses of colluvial cover (up to 5 m thick).

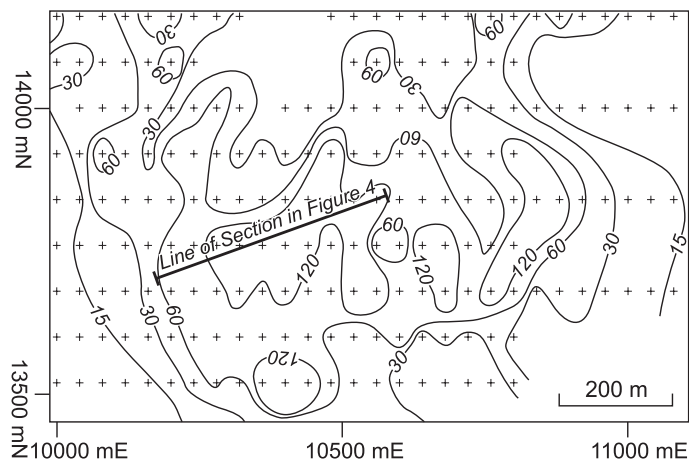


Figure 3. Detailed geochemical dispersion pattern for gold in soils over Central Zone Anomaly.

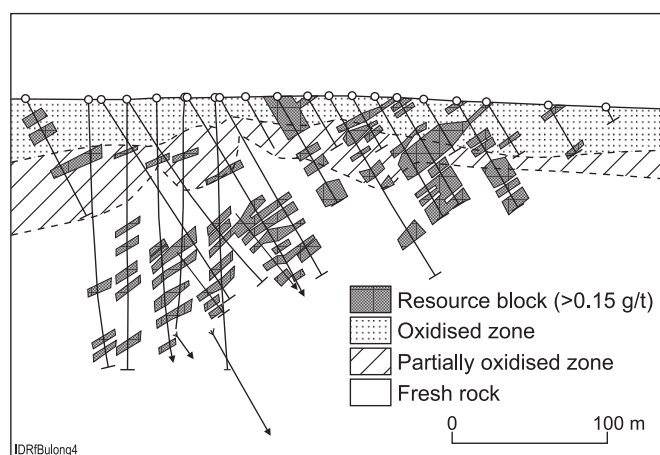


Figure 4. Drilling cross-section through Central Zone Anomaly, showing resource blocks.

## REFERENCES

- Ahmat, A.L., 1995. Geology of the Kanowna 1:100 000 Sheet. *Geological Survey of Western Australia, Explanatory Notes Series*
- Williams, I.R., 1970. Kurnalpi 1:250 000 Geological Sheet, SH51-10. *Geological Survey of Western Australia, Explanatory Notes Series*

SAMPLE MEDIA - SUMMARY TABLE

Sample Medium	Indicator Element	Analytical Method	Detection Limit (ppm)	Background (ppm)	Threshold (ppm)	Maximum Anomaly (ppm)	Dispersion Distance (m)
Soil	Au	AAS-GF	0.001	<0.001-0.015	0.015	0.545	300+
Fresh Rock	Au	AAS	0.01	<0.010--0.02	0.020	0.275	135
	As	MS	2	<2-2	2	12	50
	Mo	MS	0.5	0.5-2	2	10	50
	S	OES	10	0-1000	1000	7300	150
	W	MS	1	<1-5	5	145	60
	Na	OES	20	0.4-2.0%	2.0%	4.7%	60
	Mg	OES	20	0.5-2.0%	2.0%	2.5%	60
	K	OES	20	0.8-3.0%	1.2%*	0.2%	50
	Ca	OES	10	3-5%	3%*	1.2%	55
	Rb	MS	0.2	40-95	40*	10	55

**Note:** Elements with thresholds marked with asterisk form depletion anomalies.