

# Anomaly 370 Drilling 2014 (EL63/2004)

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## Introduction and Summary

TNT Mines Ltd. Drill tested a Tin (Sn) in C-Horizon soil and ground magnetic anomaly within EL63/2004. A Longyear 44 drill rig was helicopter mobilised on the 13/8/14. Drill hole 370DH1 (Azimuth 270TN/-50dip) commenced on 14/8/14 and was completed at 145m on 26/8/14, with demobilisation on the 28/8/14. GPS averaging locates the 370DH1 collar at 360854mE, 5366596mN (GDA94, Zone 55).

Two holes of 270/-5, EOH ~125m and 270/-70, EOH ~100m were originally planned. The second hole to be drilled as warranted. However, this wasn't undertaken as geological observation of 370DH1 identified only weak intensity alteration, mineralisation and XRF Sn (Max = 0.053%, Niton) analysis.

Overall, weak scattered indications of Sn are apparent from Niton XRF analyses (point max 0.053%Sn) and no significant Sn-related alteration or mineralisation was intersected in 370DH1. The hole seems to have intersected an upper fault zone bearing quartz-carbonate-chlorite veining and very sparse sphalerite bearing veins (3 to 4 by <1cm). An ~0.2SI magnetic susceptibility zone in the upper (20 to 60m) portion of the hole corresponds to weak pervasive silicification, accompanied by very fine grained pyrite and pyrrhotite (generally <0.5%), within volcanoclastic siltstone and sandstone. Siltstone and shale, with local silicified zones extends from ~90m to the end of hole. In general there's greater quartz-carbonate vein intensity at the top and at depth in the hole. Several minor faulted zones are apparent at depth and these may roughly correlate with the gossanous fault breccia projected from surface. However the quartz sandstone subcrop and float above the surface projected end of the hole was not intersected. Further vein and bedding orientation and interpretation is required to assess the structural regime.

Key intervals for potential laboratory analysis are identified in the attached drill log.

## Drilling Notes

Azimuth 270TN, -50dip EOH 145m (Collar GPS average 360854mE, 5366595mN GDA94, Zone 55).

The rig was mobilised to the Anomaly 370 site on 13/8/14. There was drizzle and low cloud early in the day, but it cleared enough by midday to enable sling loading. The operation ran smoothly with the collar being cased late afternoon in prep for coring on 14/8/14. Little progress was made on the first coring day due to a problem with a crack in the core barrel. It was initially slow going with short runs in broken rock to ~23m. The hole was caving in this upper zone and was cemented before shifts end, leaving it overnight to set. Core recovery improved markedly from 23m, following an extensive

moderate to strongly broken (Faulted) zone. No significant problems were encountered there on to holes end at 145m. HQ extended to 59.5m.

Surveys (Eastman Camera) were undertaken at 31, 66 and 100m. No significant lift or hole azimuth deviation was recorded.

## **Magnetic Susceptibility**

Magnetic susceptibility readings (average and peak) were recorded between core blocks at ~15 to 25cm intervals resulting in averages from 3 to 10 readings per interval. Some narrower intervals were re-sampled to cover peak zones, as well as notable lithology and alteration boundaries. Data is appended in 370DH1\_Drill Log.xls. Magnetic susceptibility varies from 0.1 to 0.2SI in fresh rock; peak values ~0.5SI.

Magnetic susceptibility in the weathered 0 to 13m interval was generally low at <0.08 but peaking at 0.14SI. Fresh rock returned <20SI from 13 to 20.8m, beyond which magnetic susceptibility rises to averages 0.22SI from 20 to 60m. Scattered elevated zones with spikey magnetic susceptibility readings extend to the end of hole.

The main ~0.2SI magnetic zone in the upper (20 to 60m) portion of the hole corresponds to weak pervasive silicification accompanied by very fine grained pyrite and pyrrhotite (generally <0.5%). The elevated magnetic susceptibility may also be in part lithology related, since the volcanoclastics regionally bear some mafic component. The stronger vein alteration commonly returns low magnetic susceptibility (<0.1SI) and appears to be magnetite destructive.

## **XRF**

A Niton XRF (on loan from Minemakers) was used to test 370DH1 core. Comparison to standards returned values similar but slightly elevated values; OREOS140 (1755ppm Sn) read 6 to 10% over, whilst OREOS141 (0.6016ppm Sn) was 14 to 24% over. Russell Fulton (pers. comm.) says the Niton XRF is good for Sn; no overlap with other elements being apparent on the spectrum.

Readings for Sn were recorded in the field, which is fortunate as when downloaded from the Niton XRF, the error associated with many readings resulted in a below detection limit (<LOD) value being returned.

Fresh rock with few breaks, from 23m to 60m was tested by drawing the Niton steadily down the core, sampling near full core tray runs of <1m length. Low level Sn was detected, ranging up to 0.008%. However, this technique is not an ideal application of the Niton, as demonstrated by analysis of the interval 90.1 to 90.5m which returned differing results when compared with spot analysis. See data appended.

Numerous spot XRF samples were recorded from a variety of lithologies and alteration. Spot magnetic susceptibility readings directly accompanied some XRF sampled points. Appended raw data has not been interpreted as yet. The best results define a number of zones of elevated Sn ranging up to 0.053% Sn. Some of these intervals, when considered with magnetic susceptibility and geological observation are tabulated as potential selections for laboratory analysis (See Drill Log370DH01.xlsx appended).

The clayey near surface weathered zone, extending to 13m was spot sampled returning Sn below detection. Comparatively the soil sample in that vicinity was 3-4ppm Sn). A zone of moderate to strongly broken core extending from 13 to 23m returned a maximum 0.001% Sn from un-veined siltstone.

The fault breccia subcrop with ferruginous matrix, located ~70m west of the hole was tested, returning detectable Sn (0.000, 0.004, 0.000 & 0.001%) and Fe to 28%. This rock also returned a magnetic susceptibility of 0.4SI, as did subcropping siltstone (Sn < LOD) 35m west of the collar. Both magnetic susceptibility and Sn values are similar to those returned from the drill hole.

## Geology

The stratigraphy changes from broken and faulted siltstone / shale (<26m) to dominantly volcanoclastic siltstone, with minor volcanoclastic sandstone (26 to 95m), then hematitic chert (95 to 100m), followed by interbedded dark grey shale and siltstone towards holes end. The volcanoclastics likely correlate regionally with the pelite –carbonate association of the upper Oonah formation. Comparison with the Crimson Creek Formation (volcanoclastics) and Red rock Member of the Renison stratigraphy (hematitic chert at Anomaly 370) is drawing a long bow, but could be explored.

Moderate to strong weathering with MnO on fractures extends to 11.5m, followed by total core loss to 13m. This loss zone apparently results from strong weathering at a faulted contact, as the driller noted that rock was drilled but not recovered. This is a potentially critical, although narrow zone, which may correspond to the peak 8ppm Sn in soil anomaly at surface. Core recovery improves markedly from 23m, following an extensive moderate to strongly broken (faulted) zone.

The interval 26 to 95m comprises fresh, moderately indurated mostly volcanoclastic siltstone and lesser grey siltstone/shale and volcanoclastic sandstone. The finer lithologies are locally laminar bedded with S0 mostly at high LCA. The coarser sandstone component is poorly sorted with minor disseminated black grains. The volcanoclastics in the upper part of the hole locally display weak pervasive silicification accompanied by very fine grained disseminated sulphide, over sub metre intervals. An example from 49.2 to 49.55m bearing 1% disseminated pyrrhotite(?) returned up to 0.58SI and 0.006% Sn from Niton XRF; the elevated magnetic susceptibility suggesting that the sulphide likely contains pyrrhotite).

Notably a zone from 131.4 to 134.5m displaying common coarse clots / blebs of pyrite, including framboidal like zones, in black shale returns very weak Sn and low magnetic susceptibility. This suggests that the pyrite present here maybe largely of diagenetic origin, comprised of pyrite with little pyrrhotite.

Quartz-carbonate veinlets are scattered, but most common through the upper ~20m and below the volcanoclastics (~90m). These are commonly <2mm, but veins displaying hydrofracture breccia to 15cm true width are evident. Chlorite forms vein selvages up to 5mm and locally the matrix of wider veins. Some are disseminated sphalerite bearing (<0.2% Zn Niton XRF), but in general, calcite-quartz veins and veinlets with chlorite selvages appear to bear minimal sulphide and few sulphidic fractures are present. Zones of stronger carbonate – quartz veinlets are commonly of low magnetic susceptibility (<0.15SI). This is likely later magnetite destructive alteration.

### Potential Analysis intervals:-

A combination of observed zones of elevated Sn, magnetic susceptibility and logged alteration and mineralisation was used as a guide for selection of potential laboratory analysis intervals. These are tabulated in DrillLog\_370DH1.xls.

Notable zones are:-

90 to 90.5m laminated bedded siltstone with carbonate – quartz veining (10-15%) and matrix replacement pyrite (5%, locally 20% over 10cm) bearing spot Sn to 0.02%.

A key zone of silicified pyritic (~1%) volcanoclastics from 109.05 to ~116.6m (Interval ~8m) returned elevated Sn (0.044, 0, 0.004, 0.023, 0.019 and 0.022%) +/- Cu (0.041, 0.02 & 0.09%). These volcanics bear bedding parallel coarse grained and blebby pyrite.

131.4 to 134.5m weakly silicified grey siltstone and minor shale with disseminated blebs (framboids?, diagenetic?) pyrite (7%) to 3cm diameter. Trace chalcocopyrite(?) is not supported by the Niton (0.01 to 0.022 % Sn).



Photo: showing quartz-calcite vein hydrofracture vein breccia at 27.1m



Photo: Showing pyrite and quartz – carbonate veining in laminar bedded volcanoclastic siltstone from the altered interval 90 to 90.5m.

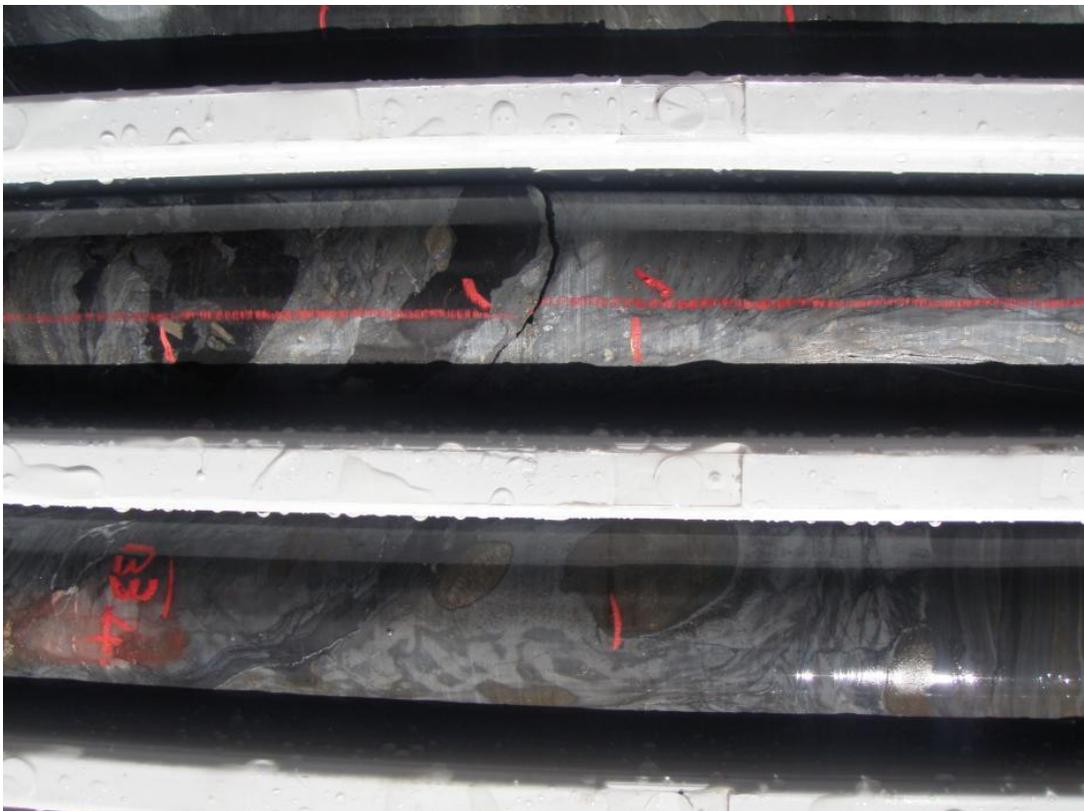


Photo: showing pyrite framboids? at ~133.5m in interbedded shale and siltstone

## Structure

Core orientation was undertaken utilising a spear at approximately half a dozen locations (See appended DrillLog\_370DH1.xlsx. Crude orientation measurements were undertaken by mounting select core in plastic core tray, orientated the same as the drill hole.

Two principal carbonate vein orientations at ~90degrees relative angle were noted commonly noted within the hole. A key structure bearing tapered tension gash carbonate veins (See Photo below) reveals potential information on the structural regime. Here, two vein sets appear to reflect R and P shears that potential relate to an approximately NE (45TN) principal strain orientation. i.e. faulting orientated ~NE with moderately SW dip, resulting from normal fault movement during extension. This observation from ~143m possibly explains why the quartz sandstone at surface some ~70m from the drill collar was not intersected.

Comparatively, at 59.1m ramped slickensides formed in quartz and chlorite possibly suggest dextral movement (reverse / compression) with the up hole moving to the north. (Perhaps the pervasive silica-pyrite results from lithology replacement during an earlier compression event?).

Further vein orientation and interpretation is required to assess the structural regime. There is potential to define fold axis orientation from the oriented core bedding readings (incl. 65/26E @75.8m, 25/90E @ 93.92m, 290/77W @101.7m, 285/75W @ 102m, 95/68E @ 103.1m, 50/82 E @ 120.85m, 72/54E @ 136.3m and 255/60W @ 142.9m). Open parasitic folds are evident at two locations; 102.8m and 101.5m in black shale. Whereas at 52.4m is a tight fold closure in volcanoclastic siltstone. No indication of folded repeats of the stratigraphy is apparent. All facing indicators viewed (incl. graded bedding and basal scour) were younging up hole. A hematitic chert from 94.6 to 99.7m is a key marker at the top of the shale unit that would illustrate potential folding.



Photo: Carbonate-quartz tension gash veins at ~142m; Orientated core Bottom Dead Centre (BDC) shown.



Photo: parasitic fold closure in volcaniclastic siltstone ~52.6m

## Exploration Potential Comments

The tenor of Tin mineralisation reflected by the Niton XRF is low (peak  $\sim 0.05\% \text{Sn}$ ), but regardless illustrates that a Sn mineralised system may exist at depth. NB: a spine of potentially Sn-bearing granite extends from the Renison area, beneath Anomaly 370, and toward Mount Heemskirk. Zonation to depth at Anomaly 370 maybe gradual given that low Sn values are generally located in lithology replacing pervasive silicification and not in high grade (Oonah-stlye) veins, and that significant veining bearing Zn is not present; thus maybe significant Sn could be located well beneath the drilled zone.

Current drilling extends to  $\sim 90\text{m}$  RL beneath surface. 3D magnetics inversion modelling during initial drill planning shows that the peak of the magnetics anomaly would be intersected by a  $-60\text{dip}$  drill hole (Figure below). Thus a significant deeper hole may be required to reach higher grade Sn at depth. Perhaps a steeper  $300\text{m}$  drill hole from the current drill pad or at  $-60\text{dip}$  from a drill collar east of 370DH1.

It'd be worth evaluating if the 20 to 60m 0.2SI zone explains the magnetic response.

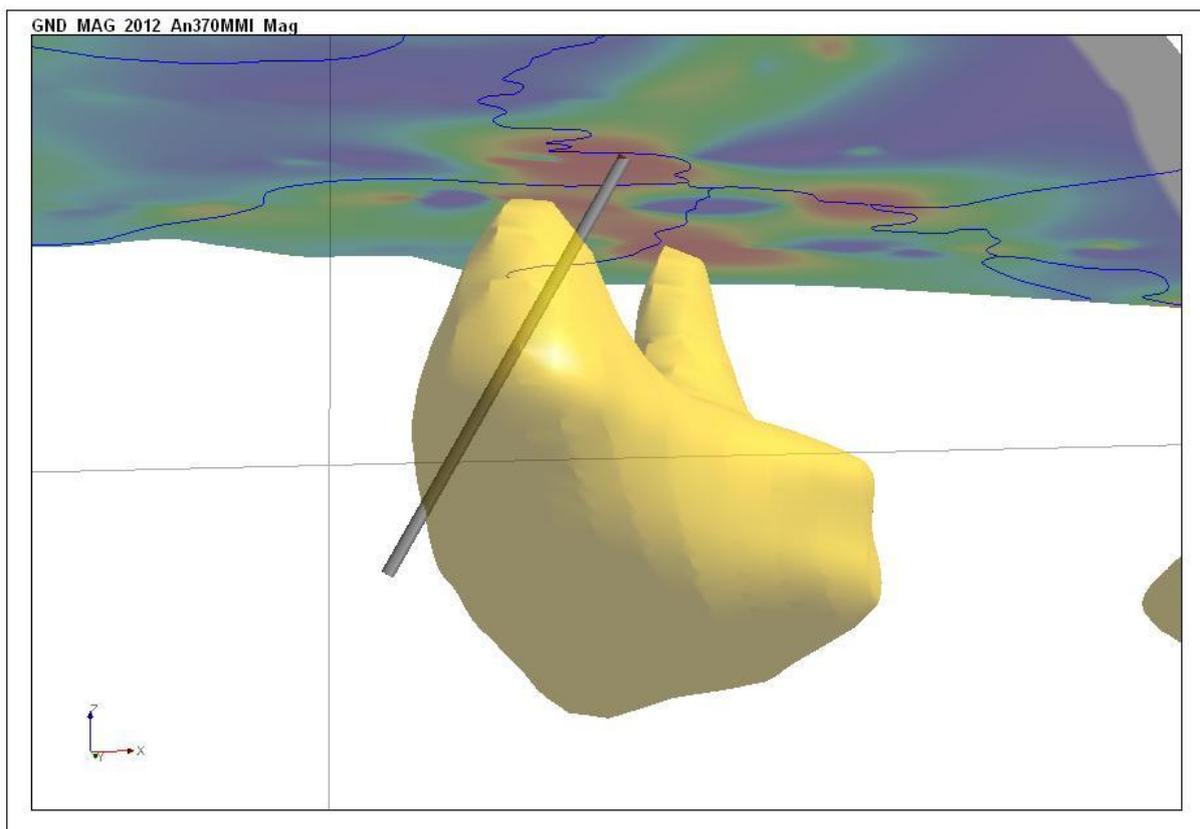


Figure 1: 3D inversion model showing ? isosurface, ground magnetics and a planned 270TN azimuth /  $-60\text{dip}$ , EOH  $\sim 200\text{m}$  drill hole.

## Environmental

Access was via quad bike to Dunkley's Tram, with the remainder being walked, resulting in a total travel time of ~30minutes each way.

All activities were undertaken within the guidelines outlined in the Mineral Resources Tasmania's Mineral Exploration Code of Practice. All equipment was washed down prior to mobilisation to minimise the threat of phytophthora infection.

A sump was dug to contain drill fines. A 30cm rusted bolt and nut was discovered when digging the drill fines sump. Further relicts were discovered under the drill rig upon clean up. These historic relicts are possibly related to a prospect noted to be in the general vicinity.



Photo: Sump for drill fines at completion of drilling.