ANNUAL REPORT 2018/19

EL15/2015 SULPHIDE CREEK

WESTERN TASMANIA

Exploration Licence held by: **Australian Mineral Resources**
2/29 Waruda St
Kirribilli NSW, 2061

Report compiled by: **Dean Delaney, April 2019**

EXECUTIVE SUMMARY

AMR has held Exploration Licence 15/2015 over the Sulphide Creek area since 4 March 2016.

The Licence is prospective for gold disseminated in shear stockworks and concentrated in vein shoots; small gold/antimony concentrations and residual alluvial deposits. Gold was discovered on the tenement in 1888 in stream sediments and veins, but grade continuity and volume were too unreliable for sustained mining, and exploration ceased after 1915 until 1984. In the past 30 years mid-tier explorers have sought mainly Carlin-type disseminated deposits and/or large structurally controlled 'Henty-style' ore bodies. Three disseminated Au/As anomalies have been explored by previous tenement holders.

Based on current information, AMR estimates the recoverable gold resource in El15/2015 to be of a scale of 50,000 to 100,000 ounces to 50 metres depth.

Exploration activities by AMR in the reporting period have included:

- search for historical prospects;
- field mapping, stream sediment sampling; and
- interpretation and further development of models for the Licence area as a whole and for four individual prospects.

The above activities, costing $27 000, suggest that vein-hosted gold shoots **in association** with disseminated prospects become the target for exploration. AMR's hypothetical model has rich shoots either as cores to the disseminated prospects or acting as vectors to them.

Two prospects associated with veins in fault-brecciated Fe/Si-altered sandstone, Coupon and Davies PA, were developed into small mines one hundred years ago. Neither has been located since and AMR was unable to find evidence of workings near currently recorded locations. Two Au/As anomalies drilled in the past 30 years have been named for these prospects, but neither site matches the historical descriptions. The Rinadeena antimony prospect has also probably been incorrectly recorded.

Drilling did, however, provide insight on the gold deposit types in EL15/2017. Anomalies appear to be centred on faulted contacts between altered sandstone breccias and limestone, providing specific conditions for drilling targets along the Harveys Creek Fault lineament. These target conditions and rigorous interpretation of historical accounts has enabled AMR to define target locations for the three lost prospects.

AMR continues to pursue its integrated exploration program to define the area's resources to a standard warranting development investment, commencing with location and test of near-surface ore concentrations, by:

- locating the historical Davies PA, Coupon (Harveys Creek) and Rinadeena deposits;
- soil, rock chip and sediment sampling for gold at the reviewed locations;
- stream sediment and soil sampling to determine if other sheet vein deposits or structurally controlled gold concentrations might occur on the Licence area; and
- testing the viability and feasibility of extracting combined disseminated/vein resources by drilling the most prospective deposits.

Estimated expenditure for exploration in Year 4 of the Licence is $80 000.

Cover photo:

The West Coast Wilderness Railway easement runs axially down the southern half of the Lease.

Contents

1. INTRODUCTION and BACKGROUND

Report brief

Tasmanian Exploration Licence EL 15/2015 has been held in entirety by Australian Mineral Resources Pty Ltd (AMR) throughout the reporting period 4 March 2016 to 4 March 2018.

To satisfy Section 204A of the *Mineral Resources Development Act*, 1995 (MRDA), AMR submits this document to report on mineral exploration investigations and expenditure undertaken in Year 3 of EL15/2015, and to update the nature of work proposed under the licence in the next two years.

Location

The area covered by Mineral Exploration Licence EL15/2015 Sulphide Creek is a 2 x 7 km block located 3 km south west of Queenstown on Tasmania's west coast. The Licence area lies around 225 km from Hobart on a west north-westerly bearing. Queenstown Aerodrome and Mount Lyell's Princess Creek tailings pond are located to the North. The Lyell Highway tracks along the western boundary before proceeding westward towards Strahan; and the West Coast Wilderness Railway enters the Licence area mid-way along the eastern boundary and tracks southward central in the tenement for 4 km before exiting to the south towards the King River.

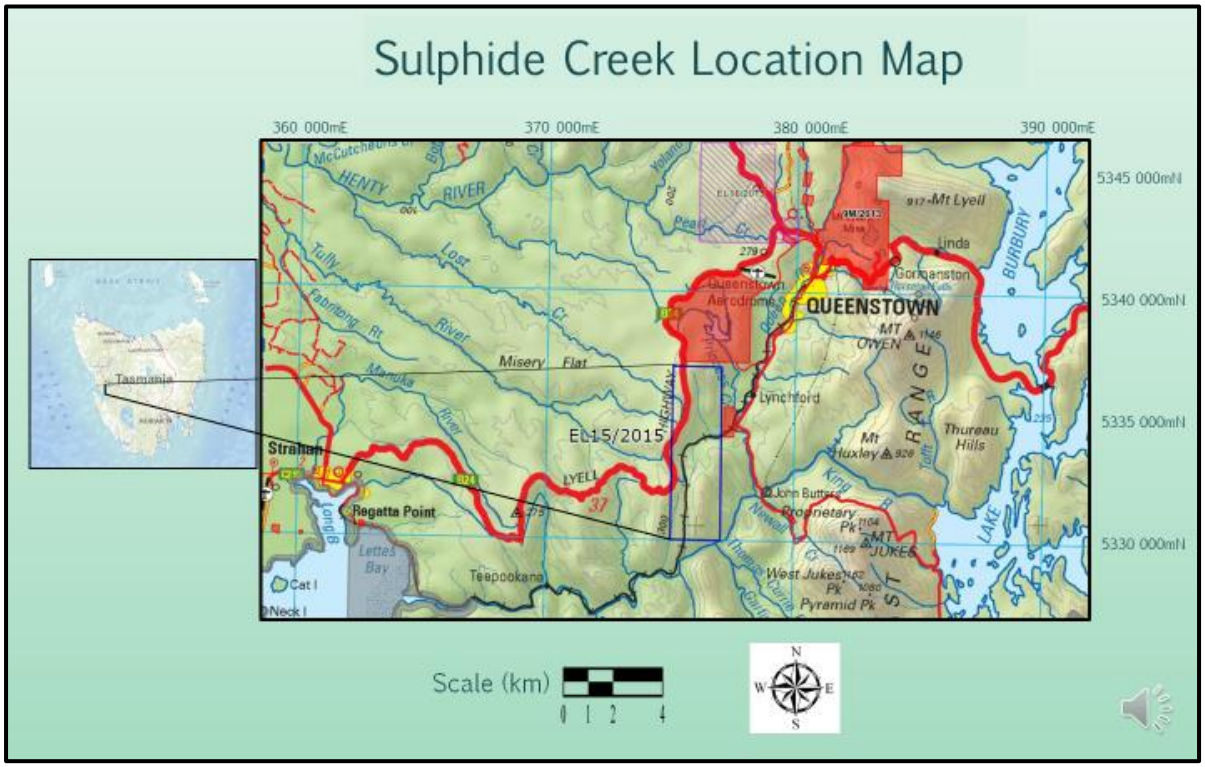


Figure 1.1: Location of EL15/2015 Sulphide Creek

Map conventions

Coordinates in this report and in digital data associated with this report are recorded as GDA94: UTM Zone 55.

Geographical setting

The topographic relief is moderate, presenting as a pattern of north-south striking valleys and ridges. One axial ridge in the south has an altitude of 400m AHD, and ridges in the far north and west attain 360m, whereas creek beds depart the Licence area at about 200m. The main creeks either join the westerly-flowing section of Halls Creek in the centre of the Licence, or flow northward into Princess Creek, or southward into the King River (see Figure 1.2). The interstitial ridges between creeks rise sharply (at slopes up to 30°) up to 180 m above the stream beds.

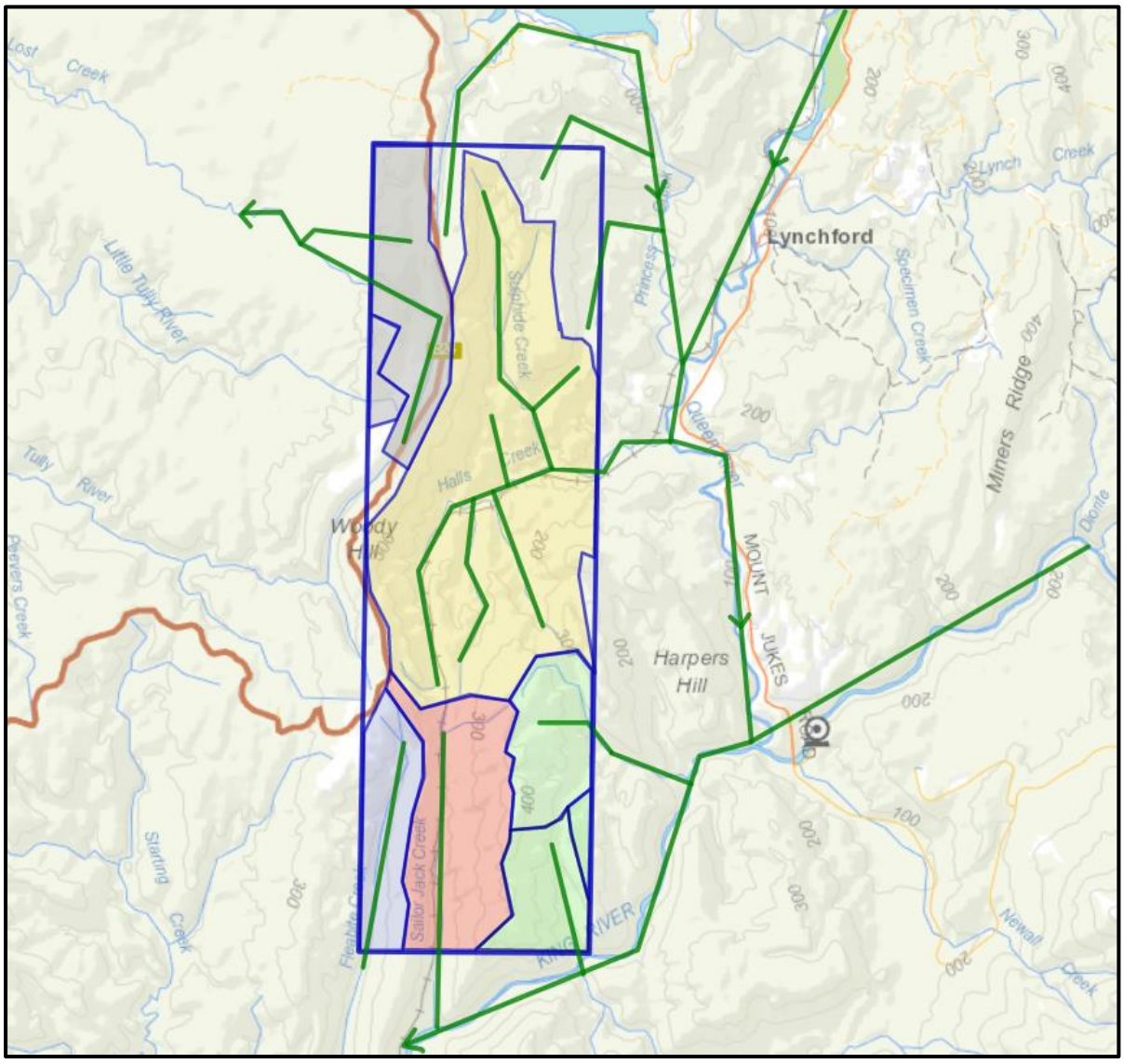


Figure 1.2: EL 15/2015 Topography and drainage pattern.

The bedrock is siliceous. Topsoil is shallow on the ridges, boggy and peaty on flats. Eluvium and humus are generally less than 30 cm deep on the gully slopes and colluvium/alluvium in the ravines is > 1 metre deep. The ravines are heavily vegetated with temperate rain forest and native and introduced understorey species, including blackberry. The ridges and plateaus are dominated by thick tea-tree and heath regrowth.

The Queenstown area has an annual average rainfall of about 2400 mm, with less than 30 days of clear skies annually, and a maximum daily temperature range of 12 to 20 degrees C.

Access

From Queenstown the tenement is accessed by road via the Lyell Highway 5 km south west of the Strahan turn-off. The highway tracks another 5 km southward through the tenement before switching westerly towards Strahan (Figure 1.1). Access from the highway for exploration is limited to an overgrown walking track some 300 m east up to the Davie prospect, and the 500m easterly road access to the Rinadeena railway stop. Access to the Coupon prospect and Harveys Creek is best arranged with the Abt Railway Ministerial Corporation to follow the easement from Bradshaw's Mill to the Halls Creek siding before veering off south to the prospects.

The density and height of tea-tree (manuka), cutting grass and scrub regrowth after logging and bushfire makes access difficult at the higher elevations, and in the gullies, access is restricted by rainforest species, bauera, felled wattle and banksia and the ubiquitous tea-trees.

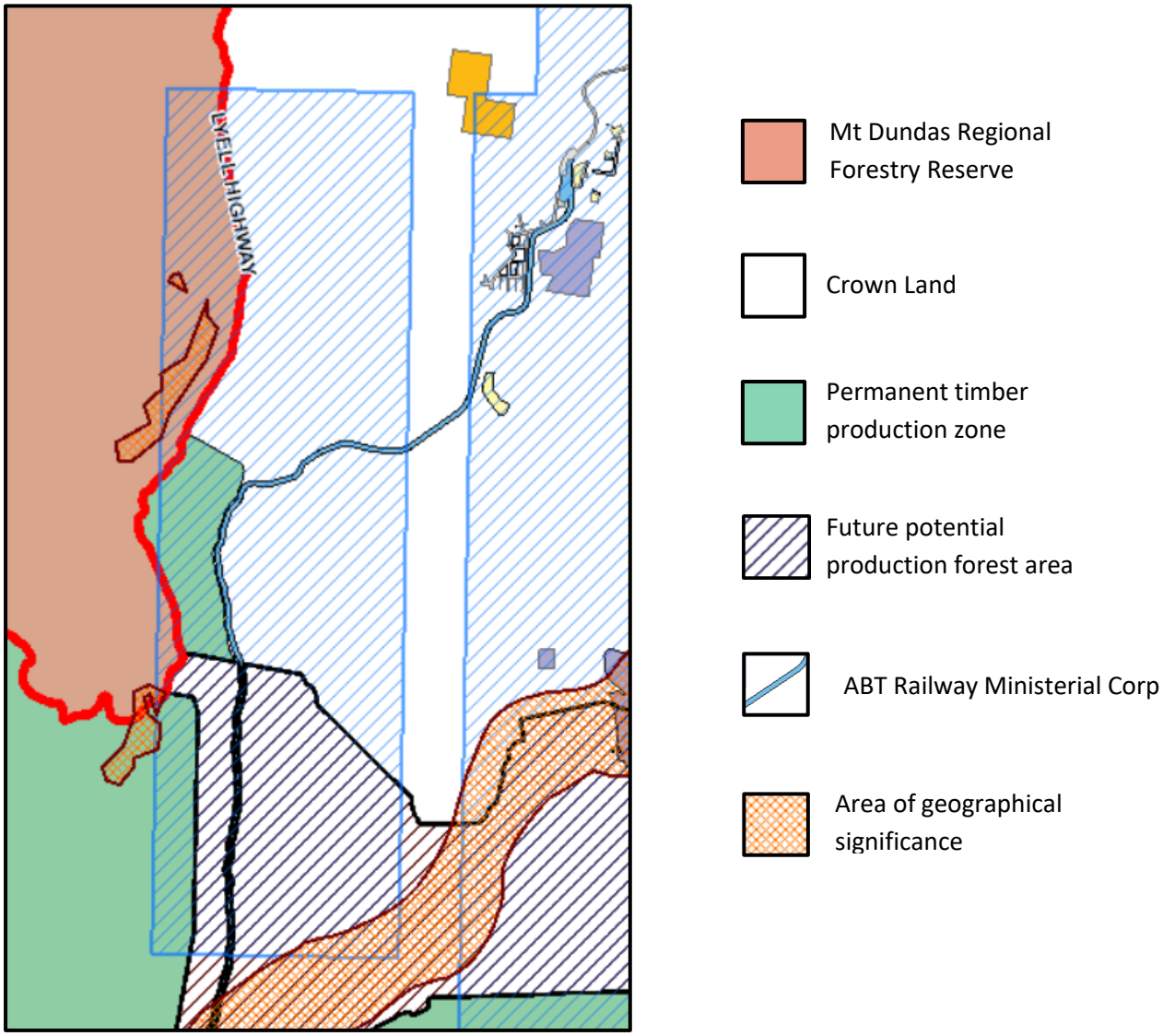


Figure 1.3: EL15/2015 Land tenure (Source MapList)

Current land tenure

Some 60% of the tenement is Crown land and another 20% in the south is earmarked by DPIPWE Central Plan Register as 'Future potential production forest area' (see Figure 1.3). Another about 8% in a strip along the south-western boundary is classified under the *Forests Management Act, 2013* as permanent timber production zone (State forest) making almost 90% of the area approved for exploration under the MRDA (1995).

The south eastern edge of the Mt Dundas Regional Forestry Reserve established under the *Nature Conservation Act, 2002,* is located on the north-western boundary of EL15/2015. Exploration programs and activities involving groundworks or clearing in the Regional Reserve would have to be sanctioned by the Mineral Exploration Working Group (MEWG) under the *Regional Forest Agreements Act,* 2002 (see Bacon & Pemberton, 2012).

The West Coast Wilderness Railway easement tracks centrally through the southern half of the Licence (Abt Railway Ministerial Corporation, *Abt Railway Development Act, 1999*). Authorisation for AMR to explore the easement and to use it as an access route to target areas has been arranged, with notification on each entry.

There are no Nature Reserves, State Reserves or National Parks that would exclude exploration and mining within the tenement. There are no residential blocks under private freehold in the Licence area. There are no mine leases and no exploration licences under *MRDA* (1995) categories other than EL15/2015 (Category 1).

Historical setting

It seems unlikely that people of the local Peternidic language group (Ryan,1996 in Huys, 2010, see Appendix E) ventured into the rugged inhospitable terrain of Sulphide/Halls/Sailor Jack creeks, more likely preferring to travel either through the Queen River Valley to the east (Corbett, 1980), or to range the heathy ridge along which the Strahan Highway now runs. No evidence of habitation or tool finds has been recorded on the area covered by the Licence. AMR acknowledges the ancestral first race inhabitants of the land and their descendants and undertakes exploration activities with due respect for Country and to elders both past and present.

The first European to explore the region on foot was Charles Gould who battled through the terrain in the 1860s. Gould experienced first-hand the inaccessible terrain that includes EL15/2015, taking more than two weeks to reach Macquarie Harbour from the West Coast Range – a journey he expected to complete in two days.

In 1881 the Conrad Lynch party found alluvial gold in the Queen River valley less than 3 km west of Sulphide Creek. Prospectors and miners migrated into the remote area after 1885 and by the late 1890's the alluvial deposits in the area had been worked for over 40,000 ounces of gold. Source lodes generally disappointed - 'did not live any depth' (Zeehan and Dundas Herald, 16th November 1891), yielding about 3,000 recorded ounces to 1923 (The Mercury 11/1/1933). Anecdotally, these yield figures are deemed minima, as miners achieved a better price for their gold by stowing it and cashing it in Victoria.

One kilometre to the north of the current Licence area, the Macquarie and Woody Hill gold mines operated between 1887 and 1907. The Madam Howards Gold Mine (1888 -1895) was another 2 km further north.

The May Gold Mine (1903-1906) lay 1 km to the north east of Sulphide Creek.

The Princess Gold Mine (1887-1891, 1897/98)) and the King River Gold Mine (1883-1895) were located one and two kilometres east (of north EL15/2015) respectively, with Harris' Reward (1895) 2 km east (of southern EL15/2015).

Within the EL15/2015 area, the Davie PA (1909-1911) and Coupon (1902-1906; 1911-1913) deposits were discovered and mined to up to 30 metres depth. Hall's Creek, Coupon, Princess

Creek and Gorings Creek were mined for alluvial gold, Halls Creek being the most productive alluvial site on the west coast.

An antimony/gold prospect near Rinadeena was explored in 1907.

Regional geological setting

The following notes can be referenced to the 1:250 000 South West Tasmania sheet (Brown et al, 2005), the Notes to the 1:50 000 Strahan (Baillie & Corbett, 1985) and 1:25 000 Strahan East (Vicary, 2004) sheets compiled by Mineral Resources Tasmania MRT (see Figure 1.4).

Exploration Licence 15/2015 is a 14 km^2 block in the east of the Henty Surface, which is a planar but eroded 250 km^2 surface gently sloping between the southern West Coast Range in the east and the Tasmanian west coast around Macquarie Harbour in the west (Gregory, 1903, in Baillie & Corbett). Slabs of steeply dipping northerly-striking Late Cambrian lower Owen Group strata and the Middle Cambrian Central Volcanic Complex (CVC) of the Mt Read Volcanics comprise the eastern edge of the surface and, combined, form the West Coast Range on its rim. On the northern and southern ends of the Henty Surface, the outcropping rocks are equivalents of the Owen Group and the ultimate Tyndall Group of the Mt Read Volcanics series. The central bulk of the Surface, however, is underlain by younger rocks of the Silurian-Devonian Eldon Group (Gill and Banks, 1950) set in a synclinal, fault-bounded basin or graben herein termed the Henty Basin (so-named in Newnham (1995)).

The Eldon Group in this basin consists of up to 1800 m of shallow-marine sedimentary rocks, divided into the following formations of regional average thicknesses:

Bell Shale	420 m
Florence Quartzite	490 m
Keel Quartzite	120 m
Amber Slate	240 m
Crotty Quartzite	490 m.

Stratigraphically below the Eldon Group, and outcropping narrowly between the basin and its eastern edge are elements of an older, lower Ordovician sedimentary sequence:

Rinadeena Shale Formation / Gordon Limestone; and

Owen Group and correlates.

Regionally there is evidence for a tectonic event in the Middle to Late Cambrian that established broad northerly trending folds and related fault trends in the area. The later rocks of the Henty Surface were deposited unconformably on this surface and were fractured and folded by Late Devonian (Tabberabberan) compression and wrenching (Cox, in Baillie and Corbett, 1985) in three episodes:

- DEV1 – steeply plunging major upright NNW open-to-tight folds with amplitudes of 4-5 km, axial surface cleavage. Bedding dips steeply WSW and ENE (e.g. Dubbil Barril Synclinorium of Solomon 1962, axial in the Basin) with associated upright NNW trending fault systems;
- DEV2 - WNW folds with shallow WNW plunge axial surface cleavage; and
- DEV3 - NW trending folds, plunging 30^o to 90^o NW, with NW sub-vertical axial surface cleavage.

At some stage, post-dating deposition and tilting of the Eldon Group, extensional stresses probably caused normal slippage along existing faults, forming the Henty Basin. The basin is broadly triangular, bound by the southerly dipping Firewood Siding Fault to the north, the easterly dipping Teepookana Fault to the south and westerly dipping Harvey Creek Fault System and related faults to the east. The Harvey Creek Fault traverses EL15/2015 axially and probably is part of a series of faults along the subsiding basin margin. The Great Lyell / Owen Fault system runs roughly parallel to the HCF some 4 km to the East of EL15/2015.

Recorded bedding orientations are sparse. Several records are consistent with the strong NNW near-vertical axial cleavage. Otherwise, the most common bedding records reflect a northerly or 10º NNE orientation with steep or overturned dips to the east and west.

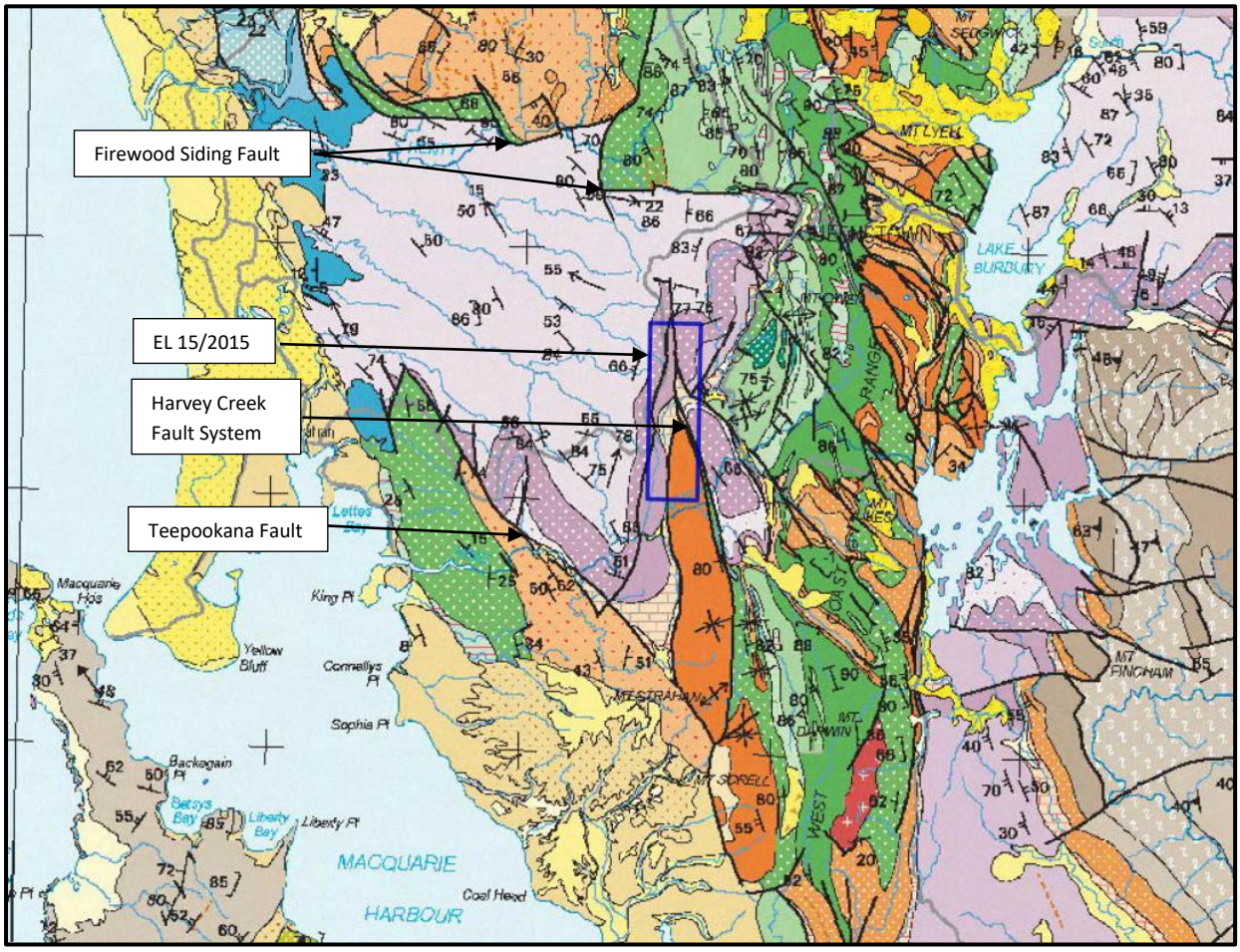


Figure 1.4: Regional Geology of EL 15/2015 (Excerpt from Brown et al, 2005)

SDb — Eldon Group – Bell Shale

SDf — Eldon Group – Florence Quartzite

SDc — Eldon Group – Crotty Quartzite

Ola — Rinadeena Shale (Ordovician)

€Oms — Owen Group – Middle Sandstone

€Ocl — Owen Group – Lower Conglomerate

Tyndall Group (MRV)

€dsv — Yolande/Dundas Sequence (MRV)

€dv — Central Volcanics Complex (MRV)

Four of the five neighbouring quartz reef gold mines (Woody Hill, Macquarie, May and Madam Howards) are mapped as being hosted by Florence Formation quartzites, whereas Coupon, Rinadeena, Halls Creek, Davie Prospect, Anomalies 24-28 and Harris Reward anomalies occur in rocks of the Rinadeena / upper Gordon 'dirty' carbonate sequence. The Crotty Quartzite Formation appears to have hosted only the Princess Mine. The Bell Shale regionally appears to be barren. The Flannigans Flat reef prospect 6 km south is on the HCF trend and hosted by micaceous quartzitic sandstones of the Owen Group like those mapped in EL15/2015 (Calver C. pers. comm. in Poltock, 1985). To the east, gold deposits occur in Cambrian volcanic rocks, notably rhyolitic and andesitic porphyries, associated with the Great Lyell Fault. The gold mineralisation in EL15/2015 could represent remobilised material from deposits occurring in underlying Cambrian sequences (Poltock, Newnham, 1995).

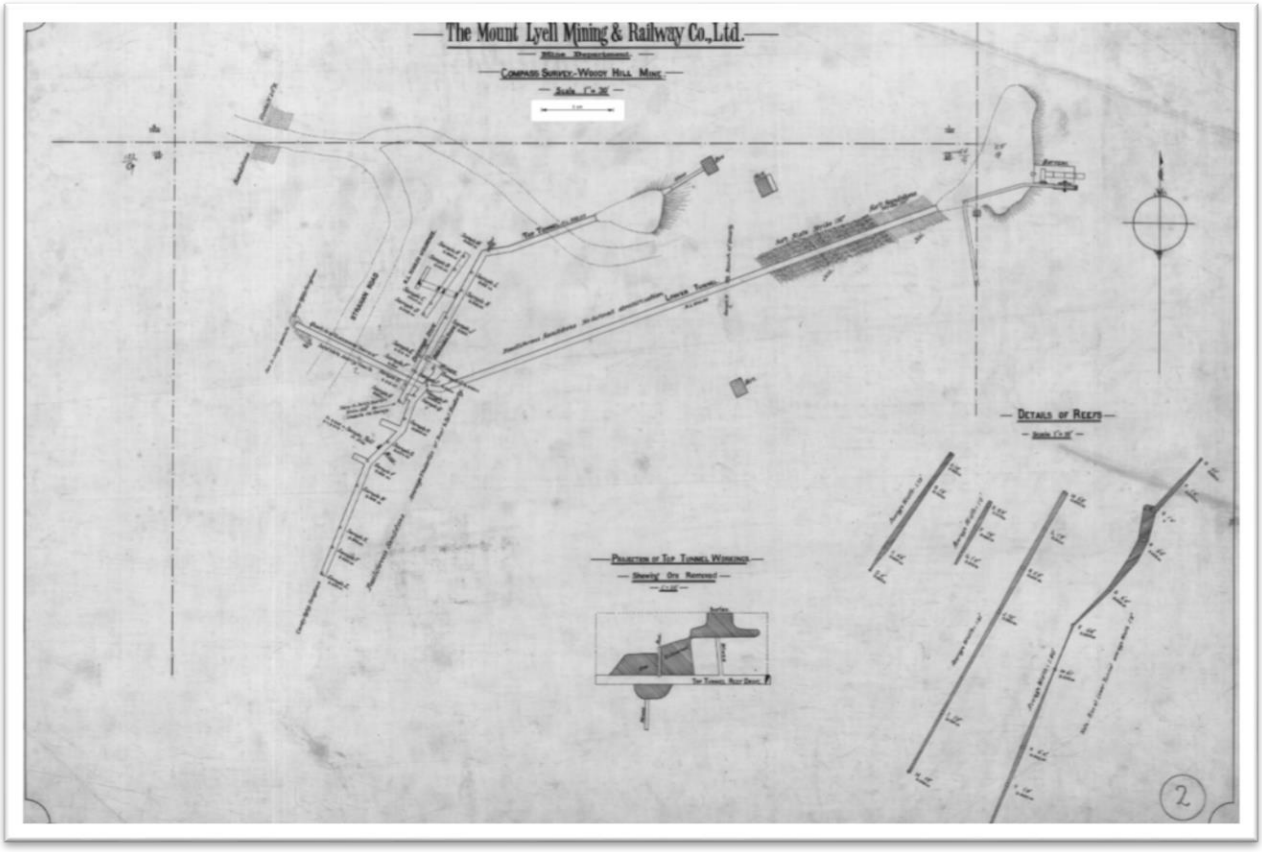


Figure 1.5: Detailed plan of the nearby Woody Hill Gold Mine (1893-1901) (from Green, 2003). Although of different strike, Woody Hill and the other lode deposits peripheral to EL15/2015 are the same type as described in records of Coupon and Davies PA mines (for which there are no graphic records).

2. GEOLOGY OF THE TENEMENT

The complex tectonic history, inaccessibility, and lack of good outcrop and marker horizons make the geology of EL15/2015 currently obscure. The following notes have been summarised from an investigation of source literature and recent field mapping. Figure 2.1 shows the distribution of rock types on EL 15/2015, sourced from TheLIST on the MRT website. A broad stratigraphy is presented as Figure 2.2.

Figure 2.1 - 1: 25,000 mapped geology (Vicary, 2004. Sourced TheList – MRT)

Stratigraphy

The pastel lilac colour with wavelet texture represents the Silurian-Devonian Florence 'Quartzite' Formation (coded SDf on Figure 2.1). Where the Florence is mapped in the west part of EL15/2015, it is underlain by Silurian sedimentary rocks that correlate with the Crotty 'Quartzite' Formation (SDc – mauve with closely-spaced white dots). A non-conformable contact has been inferred for the entire distance – as noted by Baillie (1985), "*At several places the Strahan - Queenstown road cuts across a (strike-slip) fault between correlates of the Florence Quartzite and Crotty Quartzite*". Elsewhere in the area, the Lower Eldon 'Crotty' and possibly the 'Amber' equivalents are mapped as 'undifferentiated' (SDu – mauve with wider-spaced white dots). The contact between this SDu and the Florence formation is probably conformable and is traceable to 2 km north of Queenstown.

The Ordovician Rinadeena Shale (Ola – light yellow) is stratigraphically beneath the Crotty Formation and the contacts between these units in the centre and south of the area, *might* be conformable. The Lower Owen 'Conglomerate' wedge (COcl – burnt orange in Figure 1.4) is probably faulted against the Rinadeena possibly on either side and is erosionally non-conformable with the Tyndall sliver (green) to its east.

Apart from this sliver of the Late Cambrian Tyndall marine volcaniclastic, there are no recorded igneous or volcanic rocks in the EL15/2015 area, although Leaman (2002) postulates a (probably Cambrian) granite mass some 4-5 km beneath to the east.

There is an outcrop of (possibly) the Gordon Limestone where Halls Creek departs the area. The Rinadeena Shale and Gordon Limestone are considered to be correlates (Baillie, 1985) with the Rinadeena perhaps a later, less pure stage.

The remaining lithology of interest is comprised by the quartz / quartz-carbonate Devonian veining that has proven to be sporadically auriferous in the area.

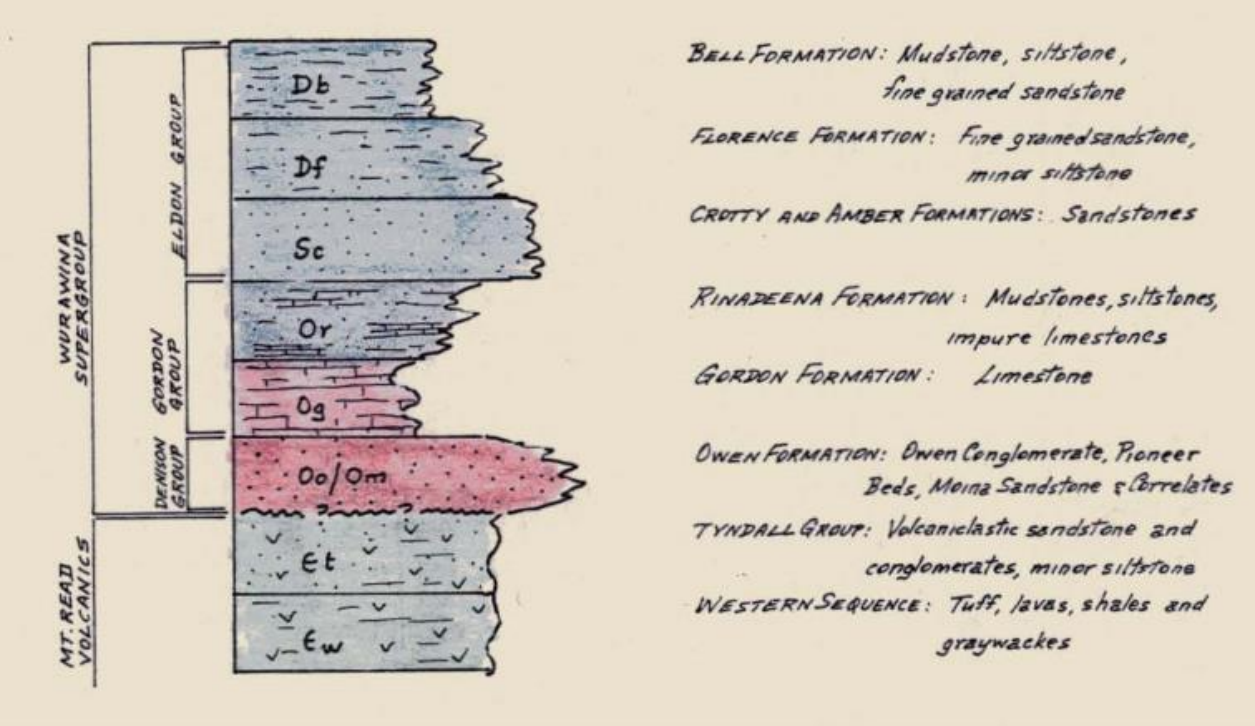


Figure 2.2: General stratigraphic column for rocks outcropping on EL15/2015 (source Newnham, 1993)

Lithology

The Florence Quartzite is exposed at several places on the Strahan (Lyell) Highway, often forming resistant strike ridges. It is a hard, fine-grained cream-beige quartzose sandstone. The Crotty Quartzite consists of a sequence of light coloured, often kaolinite-speckled fine-to-occasionally-coarse-grained orthoquartzite sandstone often thickly-bedded, with subordinate thin mudstone and grit beds, (Baillie, 1985). The contact between the the Crotty and underlying Rinadeena sequence is exposed along the track between the Rinadeena railway station and the Lyell Highway, but the top of the Crotty appears everywhere faulted against the overlying Florence Quartzite, which is discernible mainly by its 'cleaner appearance'.

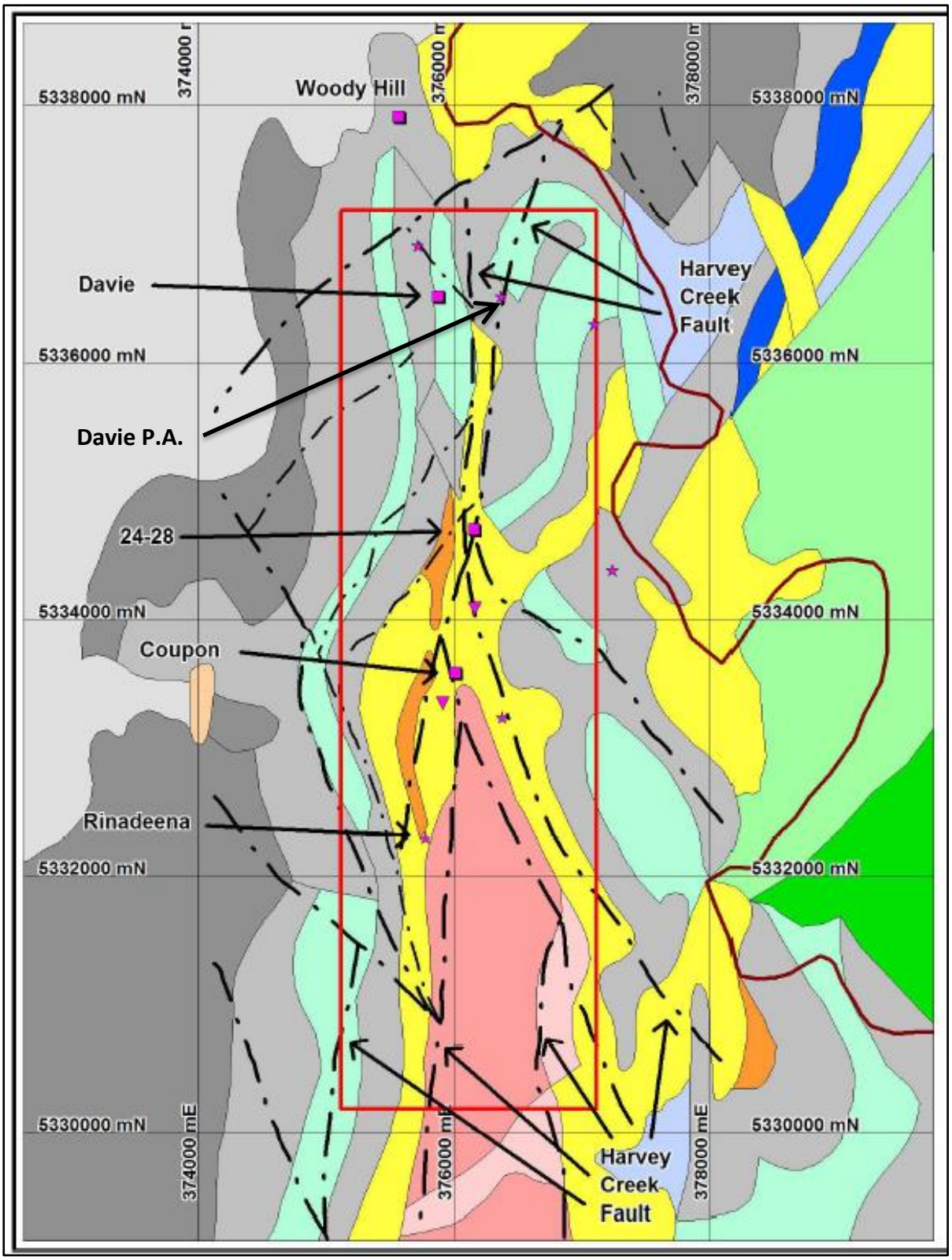
The Rinadeena 'Shale' consists of:

- slaty black calcareous, or brown-grey, siltstone (youngest);
- fine grained calcareous sandstone with resistant limonitic beds; and
- dirty often 'puggy' limestone beds laminated with mudstone (oldest).

The cleaner Gordon Limestone doesn't daylight on the block but does so at the neighbouring Lynchford Limestone Quarry 1 km north east and is probably present at depth.

The Owen Group rocks of EL15/2015, although correlated with the lower Owen Conglomerate, present as grey-cream micaceous silicified sandstones, and occasionally siltstones, making them difficult to distinguish from the Silurian quartzites (Poltock, 1985).

Topographically, the resistant Siluro-Devonian and Late Cambrian quartzitic sandstones form NNW ridges. The valleys signify erodible exposures of the Rinadeena limestone/shale sequence, however, where ferruginous the sandstones in the Rinadeena Formation can be cliff-forming (e.g. Davie anomalies).


Woody Hill
Davie
Davie P.A.
24-28
Coupon
Rinadeena
Harvey Creek Fault
Harvey Creek Fault
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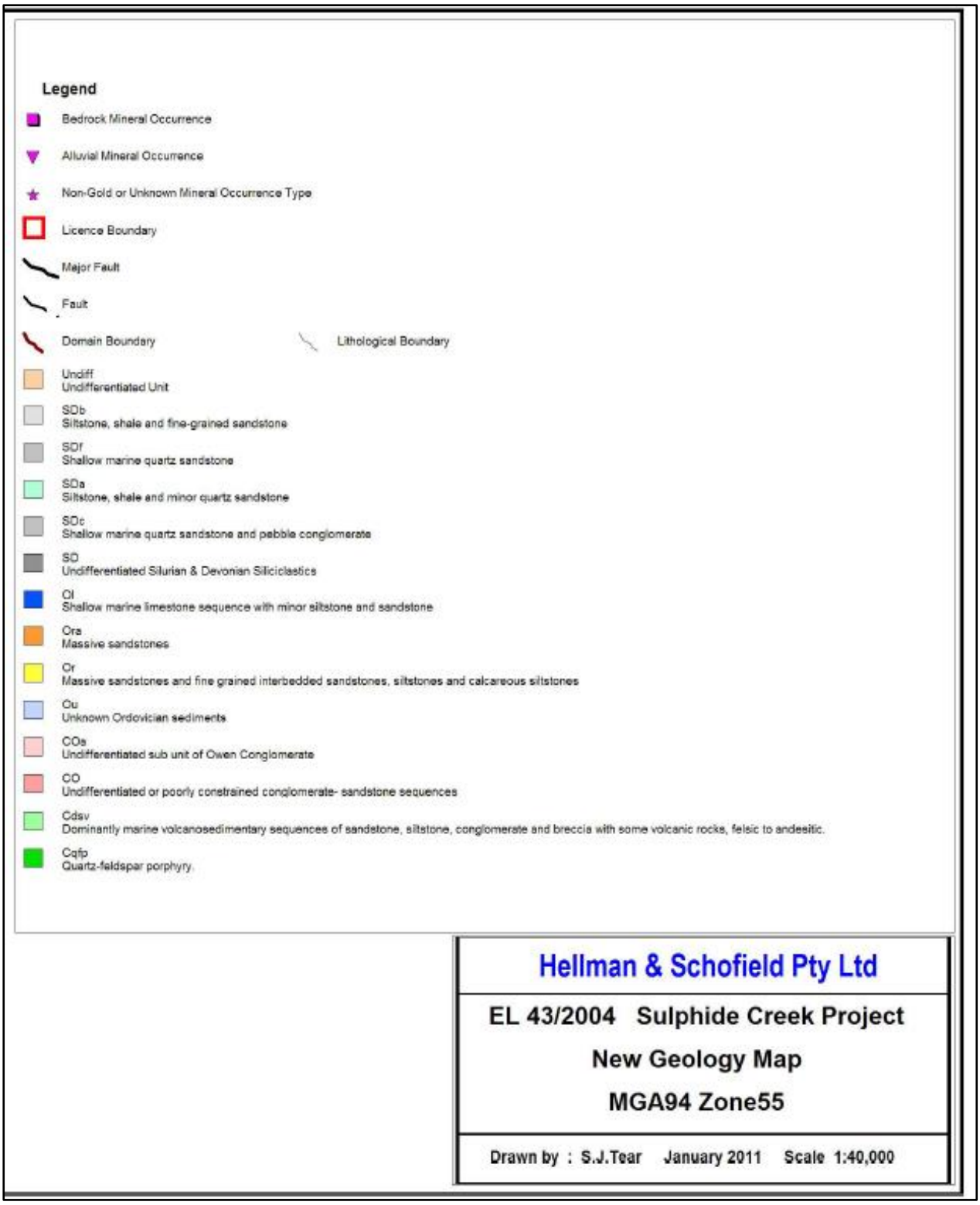

Figure 2.3 - 1: 40,000 New Interpretive Geology Map (Tear, 2011)

Structure

McDonald (1983) described the bedding at Gorings Creek as "a sequence of west facing rocks with a moderate-to-steep west dip and a strike slightly west of north." Outcrop observed elsewhere on the western side of the Licence is consistent with that observation, and the area has been postulated as part of the east limb of the northerly plunging Dubbil Barrel Synclinorium. It is conceivable, however, that the strata in the east of the Licence break that trend about the Harvey Creek Fault (HCF) and dip easterly in another syncline. This interpretation would explain the record of *easterly* dipping (60º) beds in the Rinadeena Shale at Coupon (Newnham, 1995) and would be consistent with Hellman & Schofield's 'New' Geology Map at Figure 2.3 above (Tear, 2011). This Map was reinterpreted from historical mapping and geophysical review particularly of magnetic and radiometric data (Cowan, 2011). It also displays newly interpreted faults, notably with NW and NE trending faults intersecting a strong North to NNE-trending fault.

Magnetic interpretation by Mitre Geophysics (Bishop, J. R., 1986) of the 'Tyndall' fault sliver at Harveys Creek shows a 50m to 60m wide body dipping steeply east and plunging north. "Further north in Sulphide Creek the faults coalesce, following shale and carbonate horizons, displacement primarily as bedding plane slip" (McDonald, 1983).

Mineralisation

The mineralisation is Devonian in age and appears to be controlled by a NNW trend, mapped as the HCF system, particularly where the trend obliquely intersects the Rinadeena Formation beds.

One documented style of mineralisation is (discontinuous) auriferous shoots in quartz-pyrite veining (McDonald, 1983) hosted in moderately silicified Florence quartzite. Historical accounts report such deposits at Coupon / Harveys Creek and Davies PA mines.

The drilling at Coupon Anomaly and Davies Prospect tested for, and found, disseminated low-grade gold-arsenic-iron associations to over 180m depth associated with iron oxide / quartz stockwork veining and/or pervasive silicification in either narrow (1-2m) shear zones in siltstones, or in fault breccias in fractured quartzites perhaps 40m total width and a 60-metre length open to the north. At Coupon Anomaly, these disseminated deposits were centred on the contact between silicified Rinadeena sandstone and limestone.

The prospects have been interpreted as possibly representing geochemical hydrothermal leakage via the deep-seated Harvey Creek Fault, remobilised from a deeper VHMS deposit (from Tear, 2011).

The Coupon anomaly

The Coupon Anomaly (Figure 2.4) occurs in the Ordovician calcareous shallow marine Rinadeena Formation that dips east at approximately 60º, concentrated in a limonitic sandstone-shale sequence in an area that has been disrupted by the northerly HCF and a series of east-west faults. Newnham (1995) suggests that diagenic and basin-tectonic hydrothermal solutions leached Au, As and iron sulphides (and sporadic elevated Sb values) from underlying Mt Read Volcanics and concentrated these metals near surface on encountering reactive limestones and permeable friable sandstones. Trikon suggested that this resulted in the low-grade disseminated Au-As geological anomaly that it defined by surface soil and rock sampling as a potential low-grade open cut resource.

The dark grey siltstones in the basal interbedded limestone / siltstone unit are calcite-veined and the limestones unveined but degraded to clays. This is overlain by a 70m-thick unit of leached limonitic friable quartz-veined light grey pyritic sandstone, interbedded with dark grey limestone weathered to orange clays, and puggy seams of dark grey shaly siltstone; in turn overlain by a thicker muddy-banded limestone.

Highest grade mineralisation (1-2 g/t Au) appears to be associated with the sandstone-limestone sequence up to 40m either side of one east-west sub-vertical fault. Mineralisation outside of this zone at Coupon is scattered low-grade and very limited in size, and probably largely confined to other shear zones. The shape of the soil anomaly is almost certainly dispersion of the mineralisation from the outcropping fault zones (Newnham, 1995). Tear (2011) adds that at Coupon "the most recent historical thinking is that gold mineralisation in fresh rock is associated with narrow (1-2m) shear zones in siltstones and narrow vein breccia zones in sandstones". Coupon anomaly is about 400m x 50m with a potential resource scale of 35,000 oz Au to 20m depth.

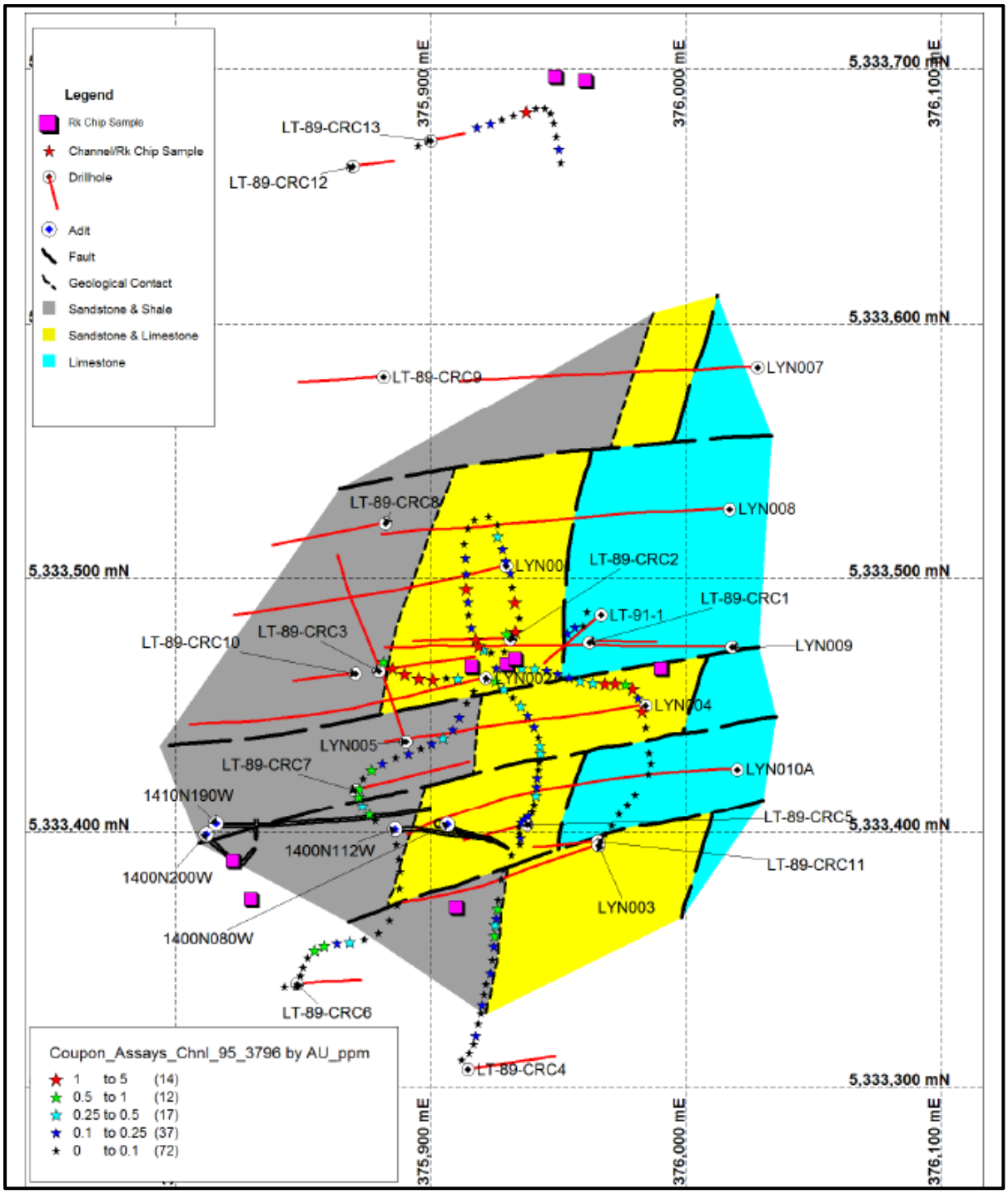

Figure 2.3: Coupon prospect exploration results map (source Reid, 2001; AGD66 Zone 55)

Davie Prospect

The bulk of the alteration at Davie Prospect is pervasive but sporadic veined iron oxide. Semi-pervasive silica alteration, of weak intensity, accompanied by quartz veinlets to 5mm width is often evident within indurated sandstones. Minor sericite is apparent locally and arsenopyrite and pyrite are disseminated throughout the sandstone below 75m. The deposit is marked by a cliff up to 25m high comprised by ferruginated, foliated sandstone and fault breccia. This outstanding landform is part of the Ordovician Rinadeena Formation, lying in faulted contact with fine to medium-grained quartz sandstone of the Silurian Crotty Quartzite.

The Harvey Creek and 'Harris' Faults are two significant NNW aligned structures separating these sedimentary units and (probably) intersecting in the prospect in a north-westerly direction. Mineralisation is possibly sandwiched between the two faults in an anticlinal fold closure, or it tracks a reidel shear extension fracture (R') caused by wrenching between the two faults (ref: Keele, 1994).

Reid (2010) surmises that potential for fault offset Au mineralisation on the eastern (footwall) side of the Harvey Creek Fault (and Sulphide Creek) remains undetermined but note that the historical description of the Davie PA Mine mineralisation matches Reid's description of Davie Prospect. If not one and the same, then the deposits are related.

This disseminated prospect probably contains less than 5,000 oz Au to 20m depth.

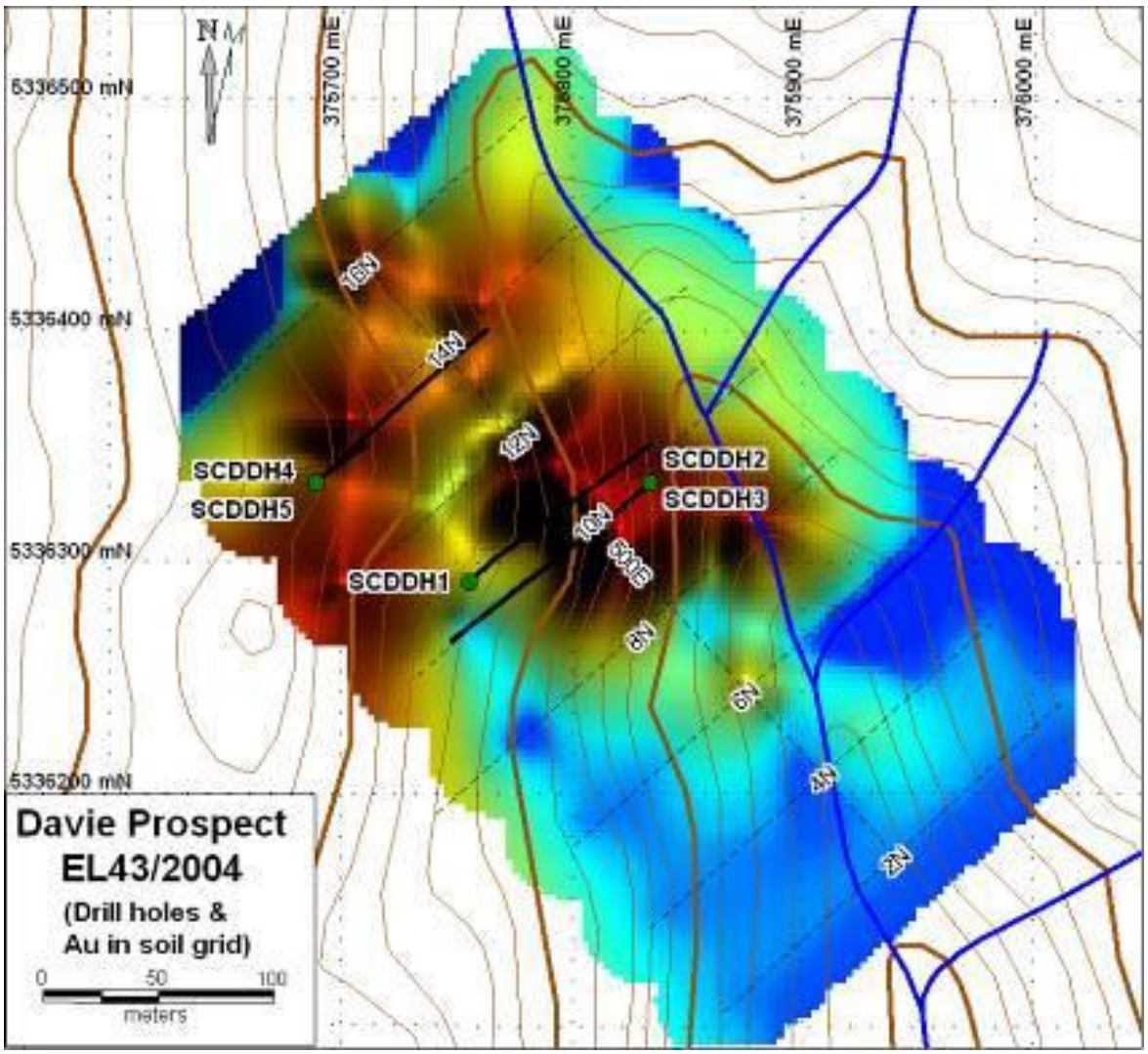

Figure 2.5: Davie Prospect plan view showing grid and drill hole locations over a gridded Gold in soils image (note: AGD66, Zone55) (from Reid, 2010).

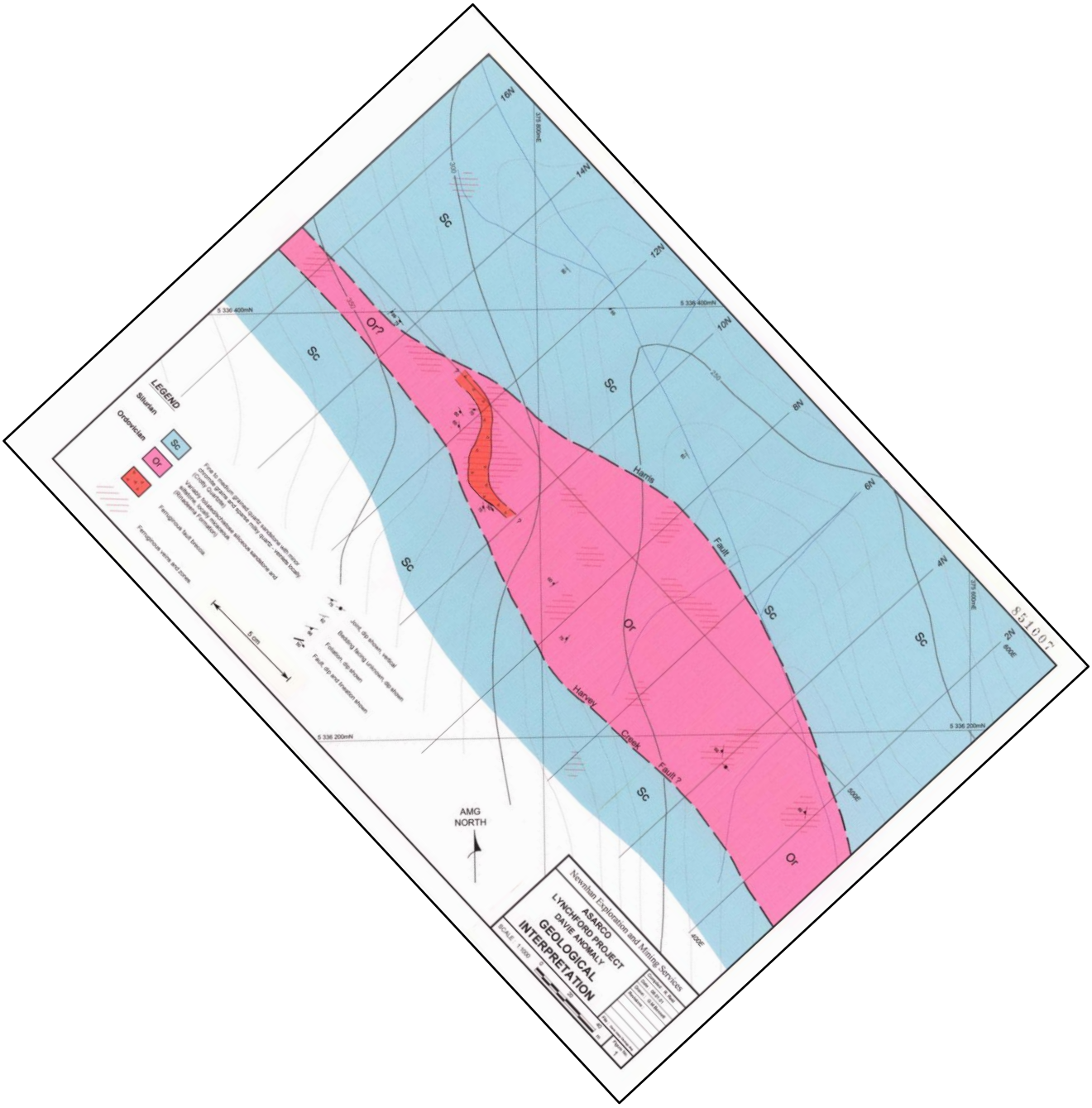

Figure 2.5: Interpretation of Davie Prospect (Reid, 2001) – Image tilted for north-south perspective.

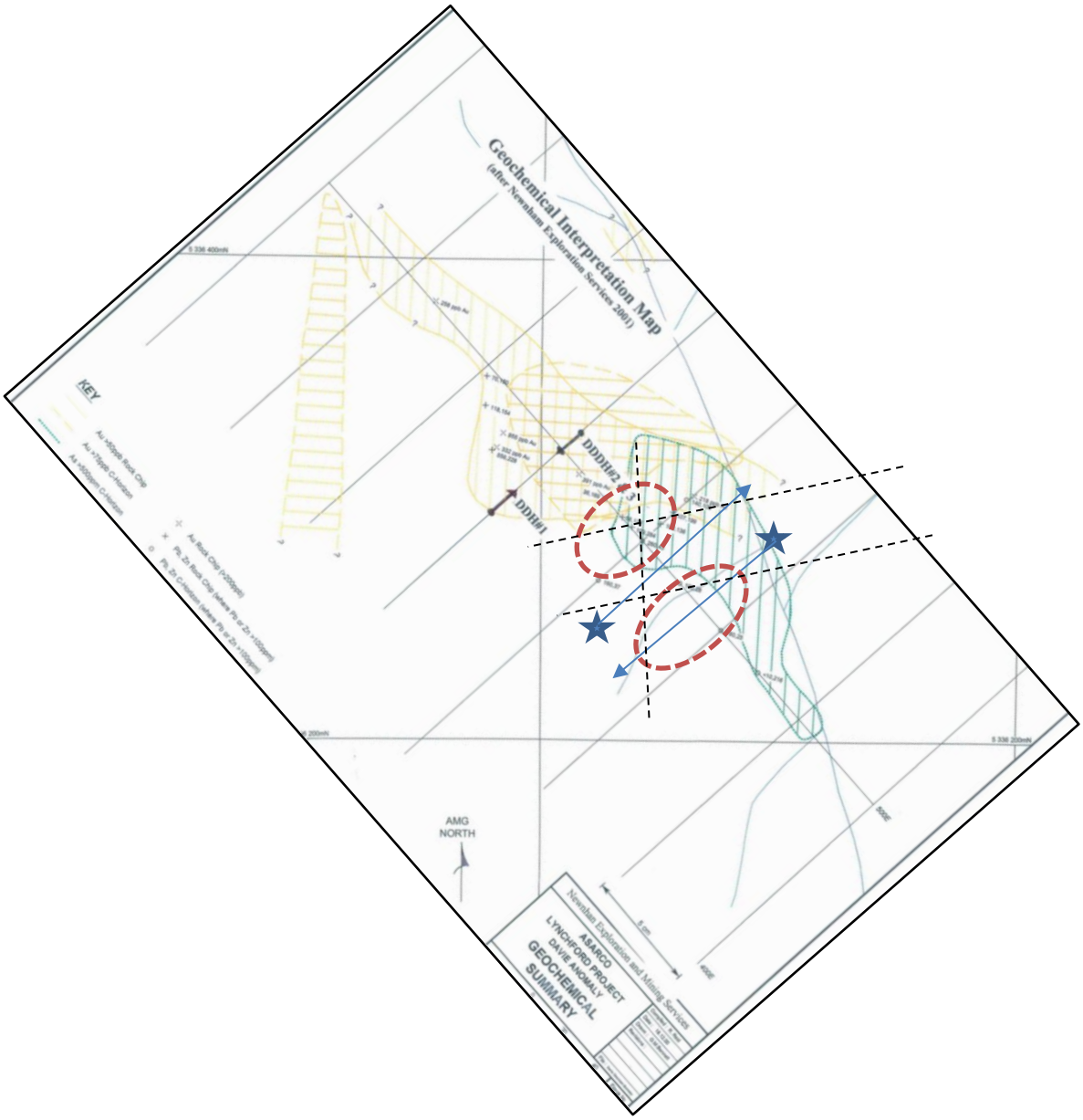

Figure 2.6: Interpretation of Davie Prospect Anomalies (Reid, 2001) – Image tilted for north-south perspective.

Other prospects

Anomalies 24-28 is a similar-style prospect to Coupon, in the same host rocks. The >100 ppb soil anomaly covers an area of 250m x 50m trending due north along an interpreted fault intersection. Size is likely less than 10,000 oz Au to 20m depth.

At Rinadeena, sparse historical records (Appendix A) suggest that a concentration of 50% to 60% antimony (stibnite nodules in weathered limestone pug) did not persist to a 12-metre depth. Samples from the deposit were reported as assaying up to 5 g/t gold, although other assays showed 'nil'.

Davies *P.A*. is likely to have been located (TIGER, MRT) on a ridge on the eastern headwaters of Sulphide Creek – across the valley from Davie *Prospect*. From historical accounts (Delaney, 2018, Appendix A) it demonstrated a combination of two rich quartz shoots and possibly disseminated ferruginous gold in a deposit almost identical, but perhaps richer than Davie Prospect. Tentatively Davie P.A. could have a potential of 20,000 oz Au to 50 metres depth, but how much has been already extracted is currently unknown.

3. PREVIOUS EXPLORATION

Past exploration work in the EL15/2015 licence area includes stream sediment sampling, soil sampling grids on anomalous prospects, airborne magnetics and a localised ground magnetic survey. Historical drilling consists of 23 RC and diamond drill holes for 2,683m on the Coupon prospect, and the drilling of five diamond cored holes for 742m at the Davie Prospect. Previous licence-holder, Shree commissioned an exhaustive data compilation of historical exploration (Tear, 2011) and an assessment of publicly available geophysical data including 3D interpretation (Cowan, 2011), with which it re-interpreted the geology of the area and proposed further exploration targets.

Devonian quartz veins

In the twenty years after 1883, it must be assumed that all creeks and adjacent tributaries of the Queen River were prospected thoroughly for alluvial gold. Exploration for the source reefs of alluvial concentrations generally followed alluvial discoveries. The Davie PA (Prospecting Association) and Coupon discoveries, and antimony/gold vein at Rinadeena were pursued with exploratory adits but despite initial optimism, no prospect progressed to full production.

McDonald, in 1983 identified the association of small gold prospects hosted by Silurian and Ordovician rocks with strong structural deformation on the eastern rim of the Henty Surface.

Woody Hill Gold Mine (1887) to the north, produced 4.6 kg of gold at 17.6 g/t, from adits developed along two NE-trending metre-scale quartz veins within Siluro-Devonian quartzites on the HCF trend.

The Davie P.A. exploratory workings consisted of a northerly 7m-long surface trench on a gossanous breccia, a 4m vertical shaft, an exploratory adit on a westerly quartz vein near the trench, and a 150m adit to access these surface concentrations at 30m depth. This 150m main drive was developed on northerly-striking hematitic sandstone and gold-bearing agglomerate/breccia, before chasing higher grade shoots in narrow westerly quartz reefs (14 to 150 g/t Au). These workings have not been properly located by contemporary exploration (Newnham 1993 / Reid 2010) and are not be the same as the ‘Davie Prospect’ drilled more recently.

The Coupon workings are situated on a ridge between Harvey's and Goring’s creeks. At least six tunnels, plus shafts and winzes were developed into gold-bearing limonitic zones. Production records are incomplete, but in 1913, 32 t of ore was extracted at recovered grade of 12 g/t gold. Although there is an adit at the Coupon Anomaly site, examination of historical records suggests that the Coupon Mine was in fact developed on the Harveys Creek deposit (see Trove reference in Delaney, 2018 – Appendix B).

The Rinadeena Reward Claim was developed on a 6m-wide stibnite-rich outcrop with veins up to 0.7m wide assaying 50%-60% antimony and gold between zero and 12 g/t Au. A 4m vertical shaft was driven at the surface and a 41m horizontal adit was driven into black pug, (presumably weathered Rinadeena Formation limestone, although the surface outcrop was reported as separating ‘slate and quartzite’) to intersect the lode at 10m depth. A mine was not developed. About ‘half a mile’ from the Mount Lyell Company Abt railway but plotted 100m from it on the TIGER database, the exact location of this claim is not known.

Metallic sulphides

There was no committed exploration in the half-century between the decline of the West Coast gold rush (say 1914) and 1965, when Pickands Mather held the ground for three years as part of a wider search for metallic sulphide minerals.

Carlin and remobilised structurally controlled gold (Henty-style)

Over the last 35 years, exploration has focused on finding gold in lower-grade sediment-hosted or blind, structural style (Henty) deposits (see Table below).

Summary of exploration prior to EL 15/2015

Period	Company	Activity and result
1883 - 1915	Prospecting	Alluvial gold prospecting and mining led to quartz reef explorations at Coupon and Davie P.A. Costs of access, transport and treatment plant exceeded anticipated resources of gold (as did mining at adjacent May, Woody Hill and Macquarie mines).
1965 - 1968	Pickands Mather	Regional stream geochemistry survey excluding gold sampling. No sulphide metal anomalies found.
1981 - 1987	Trikon and Electrolytic Zinc (EZ) SPL806 and EL9/84 McDonald I.R. (1983). (Poltock and Summons, 1985, Poltock, 1986)	Stream sediment and rock-chip sampling program exploring for Carlin-style deposit. Several tungsten anomalies (tungsten is correlated with gold in structurally active sedimentary basins). 1984 follow-up stream sampling identified gold anomalies in tributaries of Halls Creek (no anomalous As as indicator for Au at the headwaters of Sulphide Creek). A magnetic anomaly in the SE of the tenement was mapped and sampled to reveal the wedge of Cambrian (Tyndall) volcaniclastics. Geophysical / geological interpretation defined the HCF (Harvey Creek Fault). 1984 - rockchips and B-C horizon soil sampled along the HCF (155 samples). Significant gold-arsenic anomalies identified over a 3km strike length (original Coupon workings 'discovered' – 4 g/t Au in Qz; 'Anomalies 24-28' – 16 g/t Au; and '1415'– 3.4 g/t in siltstone). ['1415' yet unidentified – possibly Davie prospect]. "The study concluded that the zone of basin-margin faulting running down the eastern margin (of the Henty Basin) … could be a potential area of host rocks for fine grained gold mineralisation".
1988 - 1990	Cyprus Gold Australia Corporation. Poltock (1989)	Cyprus explored for Carlin-style, vein and Henty style gold mineralisation. 600 soil samples at 25m spacing successfully confirmed and defined the three As-Au anomalous areas. Coupon shown to be 400m x 150m, with soil samples exceeding 0.1g/t gold and 100 ppm arsenic, best chip samples from veined, fractured rocks. Anomalism commonly associated with limonitic weathering, probably after pyrite-arsenopyrite. Rock chip samples returned up to 21 g/t gold. As-Au anomalism at Anomalies 24-28 was 400m x 75m, with float samples up to 16 g/t Au and 0.44% arsenic. Anomaly defined at Davie prospect 400m x 100m with As values to 0.56% and Au to 14g/t in a grab sample from old workings (a 12m adit). 13 RC holes at Coupon, for a total of 737m. Most holes abandoned prior to reaching target depths, the deepest being 82m. Best results in CRC3 - 24m at 1.1g/t gold and 0.25% arsenic from 16 m depth. Strong levels of arsenic anomalism were encountered in other holes, but no significant gold intercepts.
1991 - 1992	Perilya-Noranda	Completed sample infilling of previous HCF grids to 200m spacing over 4km. Au-anomalous soil samples up to 0.17 g/t up to 300m south of the

		Coupon workings. Further sampling north and south of Anomalies 24-28 failed to define new targets. Remapping revealed Coupon as comprising steeply east-dipping quartzite/siltstone on the eastern limb of a northwest-trending anticline, cut by NW trending shears and faults with dips of 30 to 80° NE. These zones are characterized by shearing, quartz veins and limonite. Mineralisation seen as largely confined to the shear zones, with little penetration of wall rocks. Channel sampling of access tracks at Coupon gave (either of?) 5 m at 5.76 g/t Au, 8 m at 2.32 g/t, 25m at 2.00 g/t and/or 10 m at 1.45 g/t. Re-assessment of gold-bearing intervals in CRC3 showed pyrite-arsenopyrite in quartz veins, within a siltstone-shale sequence. DDH LT91-1 was drilled to test a mineralised shear zone but bad ground caused abandonment at 61m.
1993 - 1995	Goldstream Mining & Titan Resources	Channel sampling and 9 cored holes for 1886m at Coupon exploring for fine-grained sedimentary-hosted gold, suggesting Au-As anomalism in the area occurs in carbonate-rich lithologies in a folded sandstone / limestone unit (Rinadeena) adjacent to HCF. First 3 holes suffered poor recoveries and only one sample was >1.0 g/t Au but established that Au-As mineralisation obtained on the surface and in CRC3 is controlled by an east-trending shear zone. Surface channel sampling near this E-W fault returned >1.0 g/t Au over 100m strike length (Newnham, 1995). Next 2 holes tested the E-W shear zone, with LYN004 intersecting 70m of leached limonitic sandstone / siltstone, Au-As anomalous with best intercept of 8m @ 1.24g/t Au. The final 4 holes tested the shear zone target at depth but found mineralisation to be restricted to a narrow fault with little mineralisation pervading out into the wall rock sandstones. Goldstream's conclusion: drilling results were disappointing and despite suggesting a possible resource of 7,000 to 32,000 oz Au per 50m depth (Newnham 1995 – "*200,000 to 300,000 tonnes of mineralisation per 50 vertical metres, possibly grading in the 1 to 3 g/t gold range*"), the Licence was relinquished.
1996 - 1999	Aberfoyle - CRAE / RGC EL 2/94 & EL47/83	Sulphide Creek area acquired as part of a greater sediment-hosted gold exploration initiative, but no exploration work in the current Sulphide Creek tenement.
1999 – 2002	ASARCO EL 15/99 (35 km^2)	Review of previous exploration of Coupon concluded that: the depth of surface oxidation is variable; the gold correlates with mustard-coloured limonitic sandstone; carbonate (quartz) veining is barren; there might be supergene enrichment of the gold; and orientation of the mineralisation at Coupon is still uncertain. However, Coupon was considered to have been properly tested. Focus switched to the Davie (and 24-28) prospect(s) seeking a Carlin-style or a structurally controlled 'Henty-style' deposit. A ferruginous silicified cliff of breccia near Davie prospect was identified as a target, potentially a fault-breccia hosting sulphide mineralization. A foot access track was cut from the Lyell Highway to the

		anomaly and then 1950m of grid was cut comprising 200m-long 50m-spaced cross lines over a 400m baseline, oriented NW. 79 x 25m-spaced C-horizon soil and 46 rock chip samples obtained a peak gold soil value of 0.2 g/t and with a strong arsenic association, and a peak gold rock value of 0.86g/t. An area of overlap of the gold and arsenic anomalies became the target area for drilling. Reid (2001 Newnham Exploration Services report) suggested Davie gold hydrothermal alteration may have developed in a dextral wrench fault regime, associated with the intersection of the NNW-trending Harris Creek and Harvey Creek Faults. A wrench fault model would indicate potential for gold mineralisation in steeply plunging lensoidal shoots. Reid recommended the drilling of 3 inclined DDHs to test the geochemical target. At the 24-28 adit, grab sample material yielded less than 0.5g/t Au, whilst attempts to locate the old Davie workings and the recorded 41m long drive on the Rinadeena Antimony deposit were unsuccessful. Corporate goals relating to sediment-hosted disseminated gold and structural deposits were not met, and Asarco relinquished the tenement which became vacant.
2004 - 2008	Zinico NL (Zelos Resources EL 43/2004)	During 2005 Zelos Resources NL (Operator) drilled three HQ diamond holes at Davie Prospect for 350m, to intersect at depth the co-incident gold and arsenic soil geochemical anomalies. This drilling discovered a zone of weakly auriferous quartz-sulphide stockwork veining up to 50m true width, in silicified sandstones to a depth of 100m below surface. Drillhole SCDDH2 contained 16m @ 0.58g/t Au from 44m downhole and 4m @ 0.79g/t from 119m downhole. These two intervals are part of a coherent mineralisation zone of 82m @ 0.4g/t Au from 44m (peak gold value is 1m @ 1g/t). The Au-As mineralisation is in a vein stockwork system hosted in brecciated slightly-altered fine-grained siliceous sandstone proximal to a steeply dipping fault breccia interpreted as part of the HCF. SCDDH1 was drilled sub-parallel to ground surface and so remained within the oxidation zone <25m deep. It intersected the same gold zone at shallower depths albeit oxidised with possible *depletion* and giving a best grade of 6.5m @ 0.49g/t Au from 91m within a 62m auriferous zone (downhole width). DDDH3 was terminated at 69m, 30m short<?> because of bad drilling conditions possibly related to drilling down-dip along a major fault plane. The "Exploration Results" (JORC classification) show presence of gold at the prospect that 'would be mineable in other settings'. Multi-element assays indicated that arsenic correlates with gold in the Davie area. No significant work in 2006-2008.
2008 - 2013	Shree EL 43/2004	In 2010, Shree drilled two follow-up cored holes on Davie prospect, targeting down-plunge mineralisation 100m to the NW of SCDDH 1-3 to outline the potential size and gold concentration of the deposit. SCDDH4 targeted the 100m+ wide (to 107ppb) Au soil anomaly and confirmed the presence of low-grade gold mineralisation, best core

		sample result 3m section from 31.5m depth @ 1.26 g/t Au, in an 18.5m section from 19.0m @ 0.5 g/t. SC DDH5 confirmed the presence of low-grade gold mineralisation to >180m depth, best result 3m section from 164m depth @ 1.29 g/t Au, in a 10m section from 159m @ 0.83 g/t. Also a 14m section from 37m @ 0.52 g/t. In 2011 and 2012, Hellman & Schofield undertook a data compilation and geological review of all available information from Sulphide Creek tenement and recommended exploration targets. The study concluded that there are large zones of diffuse mineralisation including pervasive silica alteration associated with a complex fault pattern immediately proximal to the HCF. It suggested that although there is a lack of tightly controlled high-grade gold mineralisation, the broad low-grade mineralisation leaves potential for a series of low-grade gold deposits in the tenement. In 2011 Shree commissioned Cowan Geodata Services to study all available airborne radiometric and magnetic geophysical survey data from Sulphide Creek and environs. Cowan's study recommended sulphide targets and facilitated the generation of a new interpretation of the area's geology by Hellman & Schofield (Tear, 2011). A hyperspectral (HyLogger) study of 3 entire cores from Davies and Coupon holes was carried out in 2012 to help identify hydrothermal alteration haloes. A spatial association could be observed between the anomalous Au assays and spectroscopic signatures of an alteration assemblage comprising dickite plus hematite, minus white mica and kaolin, occurring at a boundary in mica chemistry composition. The dickite +/- iron oxide zones were interpreted to be structurally controlled fluid pathways and important vectors to future mineralisation search. No evidence was observed of alunite, pyrophyllite or topaz, as found in the high sulphide parts of the Mt Lyell and Henty mineral systems. Shree determined that while exploration results to date were geologically encouraging (with a strongly caveated potential resource figure of 30-50Mt @ 0.75-1g/t gold for 700,000 to 1 million oz Au) the mineralisation was weak and deep. Company resources were required elsewhere (Nelson Bay Iron Ore Project), and Shree surrendered the tenement.

4. AMR EXPLORATION RATIONALE

Philosophy

The objective of mineral exploration is to enable estimation of the quantity, quality and spatial dimensions of a resource to a defined level of confidence, prior to consideration for extraction. AMR believes that the most rigorous way to economically explore for mineral resources at regional, local and deposit/prospect scales is a scientific approach to mitigate uncertainty around the investment decision. There are three steps.

1. Integrate all accessible existing information and relevant evidence into a hypothesis and preferred geological models of the tenement and individual prospects.
2. Design and implement the exploration program itself, to test the premises of the hypothesis and fill information gaps in the draft geological model. The results of the exploration program prove, reinforce, adjust or discard the hypothesis and model.
3. If the premises can be assumed to be sufficiently true, then the hypothesis is supported, and the third stage is to apply the preferred model to the specific deposit(s) to reach a quantitative estimate of overall resources and economics (which might entail further proof by drilling).

Status

The updated facts arising from AMR's own desktop research and field validation to date are:

- there are zones of diffuse mineralisation including pervasive silicification associated with a complex fault pattern (NW, East-west and N-S structural interaction) immediately proximal to the Harvey Creek Fault within the Rinadeena Formation.
- there is shallow gold in anomalous but low-grade concentrations at three locations in the Licence area;
- a resource has not been convincingly quantified at any of these locations, but there is potential for two low-grade disseminated ore bodies;
- there are historical records of gold disseminated in brecciated shear zones also at the Davie PA Mine;
- Davie PA also discovered gold concentrated in two (probably discontinuous) east-west shoots in quartz veins (<1m wide, up to 5 oz/tonne);
- the historical Davies PA, Coupon (Harveys Creek) and Rinadeena Antimony prospects have not been located, validated or investigated. Likely sites have been identified for searches next field season;
- quartz vein shoots, often recorded as hosted between Florence Quartzite wall rocks, although possibly gold-rich have not historically proven to be economic if mined in isolation but offer value if they can be extracted along with the disseminated resources. FeO-rich quartz / pure quartz / stockwork vein parageneses remain ambiguous (Reid, 2010).
- historical finds of economic concentrations of gold at the surface (14 g/t) have not been tested at depth;
- there is uncertainty around the Coupon RC drill hole locations and recoveries;
- geochemical analysis of stream sediments has assumed an arsenic-gold correlation (gold content has rarely been assayed in stream sediments in EL15/2015) that appears relevant to disseminated deposits, but not to sheet veins. McDonald (1983) observes a correlation between raised As values in the area and higher concentrations of Fe and Mn known for fixing arsenic through oxidation reactions (rather than necessarily gold association);

- the anomaly styles have been interpreted, but the mechanism is not definite. Understanding of the ore-forming mechanism would enable better definition of the ore body composition, quantification of the resources and discoveries of further gold concentrations;
- structurally-controlled Henty-style deposits have been postulated for the area, but the nature and actual location of faults remains vague (i.e. mapped structures are interpreted only). Location of fault intersections is integral to this style of deposit;
- uninspiring historical, geophysical and geochemical data, and co-location of the West Coast Wilderness Railway Easement on the strip of only prospective ground make the southern 4 km^2 of EL15/2015 south of Rinadeena currently of low priority for minerals exploration.

Exploration objectives

To locate all places in and around the licence block where the conditions for ore deposition have occurred.

To estimate the quantity, quality and spatial dimensions of the ore deposits to a defined level of confidence, to inform decisions on extraction.

1. Define surface lithologies
2. Locate surface stream sediment gold and other concentrations in mini-catchments
3. Determine fault/vein orientations and geometry
4. Differentiate auriferous veins from barren veins
5. Adapt model
6. Sample and assay surface occurrences
7. Drill intersections.

AMR's specific exploration objectives for this tenement are drawn from the section above.

They are:

1) Further develop the knowledge base of the three known gold anomalies Coupon, Davie Prospect and Anomalies 24-28, to "enable estimation of the quantity, quality and spatial dimensions of the resource to a defined level of confidence, prior to consideration for extraction". There are two goals: (1) to define higher-grade shallow concentrations <50m deep in the disseminated bodies; and (2) to determine the deposits' potential as indicators of deeper ore deposits.
   a) Stage 1 is targeted field mapping and sampling to ground-proof AMR's draft model and depositional mechanism of each deposit.
   b) Stage 2 is to generate and justify a preliminary resource estimate.
   c) Stage 3 is drilling to define the nature of the most prospective ore bodies to JORC criteria.
2) Resolve the location of the Davie PA, Rinadeena Antimony and Harveys Creek prospects and include them as part of Objective 1.
3) Locate new, and confirm established, anomalous quartz-carbonate vein, structural and disseminated gold concentrations by targeted stream and soil gold assays. This program simultaneously can be used to assess alluvial prospects as part of an overall Lease resource picture. Note: the low-grade disseminated silicified quartz limonite/pyrite deposits shed weak stream gold and arsenic anomalies (max. 0.015 ppm Au, 20 ppm As). Any sheet vein shoots outcropping in catchments are expected to show stronger Au anomalies, but associated arsenic is not anticipated.
4) Scope and resource a geological structure study specifying mapping, photogeological and geophysical study of lineations, research on other structurally-controlled sites (e.g. Henty), regional (west coast) models, geophysics, association of ferruginous fault breccia with a

particular lineation, etc; and target mapping/drilling in combination with other objectives and field activities.

5) Incorporate Hellman & Schofield recommendations into the above objectives. The field work above incorporates 'delineation of structure, spatial distribution of likely host rocks and the recognition of alteration zones' recommended as the keys to possible success'. AMR will consider H&S proposed nine sites as part of Drilling at Stage 3.
6) Also recommended by H&S was a high resolution airborne magnetic and radiometric survey.
7) Assess mineral potential of the Owen/Tyndall/Florence contacts south of Rinadeena Saddle before considering partial relinquishment of the southern 4 km^2 block.

Company synergies

AMR is concurrently exploring for orogenic vein-hosted and fault-hosted gold on its EL16/2015 Diamond Hill / E12 Lake Margaret Road block 5 km to the north of the Sulphide Creek block. If Sulphide Creek offers further orogenic quartz reef prospects as explored historically, then economies of scale could make development viable across these Lease areas.

The presence of high-grade antimony in the same deposit type also offers synergistic value in concurrent exploration with the gold prospects, as is similar with barite shows at Diamond Hill and copper at Lake Margaret Road.

5. EXPLORATION RESULTS – Work completed in EL15/2015 for Year 3 (2018/2019)

Exploration during the third year of the Licence to 4 March 2018 consisted of:

1. refinement of Licence-wide structural model; and
2. development of three individual draft models to define prospect geometry and actual locations from historical records (Davies PA, Harveys Creek and Rinadeena Antimony prospects). These sites identified for detailed (subcrop) mapping and sampling, followed by drilling

and in the field:

3. ground search around plotted locations (TheList/TIGER) of Rinadeena and Davies PA prospects for evidence of workings;
4. arrangement of access, mapping and chip sampling of veins along the WCWR easement; and
5. continuation of a stream sediment gold sampling program.

AMR field resources in 2018 and 2019 have been allocated between EL15/2015 and EL16/2015 on an annual basis. That is, the 2018/2019 field season concentrated mostly on activities in AMR's Diamond Hill and Margaret River Road tenements, with the 2019 summer season being earmarked for a focus on Sulphide Creek (see Table 4.1 below).

2017/18 plan	2018/19 status
Continue stream sediment sampling program (50 sites = 10 man-days) targeting Davie PA and potential daylighting Henty style major fault intersections.	Sampled north west quadrant of EL15/2015 west of the Lyell Highway and the northerly extension of Davies Prospect for Henty style outcrop (15 sites = 3 man-days).
Locate and map Davie P.A. in detail (6 days)	Site could not be located. Desktop review of records, maps and aerial photographs has

Search for Rinadeena and Harveys Creek prospects (historical records and site investigations).	revealed possible locations of Davie PA, Rinadeena and Harveys Creek.
Design shallow drilling program for Davie P.A.	Draft model of Davie PA site and workings prepared using historical records.
Search for possible source lodes, vein outcrop mapping and rock samples.	Mapping and chip sampling of veins along the WCWR easement. Rock samples taken in north west quadrant.
Follow up implications of HyLogger survey to design next exploration at Coupon and Davie Prospect.	HyLogger survey indicates iron oxide as an indicator of auriferous fluid pathways at Coupon. Investigate potential for handheld or drone-mounted magnetometer survey to augment prospect mapping. This result transferable to other disseminated breccia-hosted deposits in area.
Targeted field mapping and sampling to ground-proof AMR's draft model and depositional mechanism at Coupon Anomaly and Davie Prospect	Yet to be commenced.
Review structural interpretation to identify potential significant fault intersections (Henty-style). Scope and resource a geological structure study.	Draft tenement model developed. Structural study to remain on AMR plans pending resourcing.
Assess mineral potential of the Owen/Tyndall/Florence contacts south of Rinadeena Station	Draft tenement model agrees there is limited potential. Expert identification of rock samples from area (confirming stratigraphic units) would provide motivation to relinquish.
Structure the draft model in freeware packages and populate with preliminary data. Obtain quote for VULCAN, Target or Datamine.	Current modelling and data being input and prepared digitally in Excel for future conversion into commercial package.

Table 4.1: Current status of activities planned for Year 3 2018/19.

Lithology and stratigraphy (including Years 1 and 2)

Outcomes:

Existing maps of EL15/2015 are open to improvement and have been reinterpreted by AMR and previous explorers. Field proofing is restricted because outcrops are obscured or inaccessible making detailed mapping difficult without clearing and/or excavation.

Historical interpretations cannot be assumed to be correct (e.g. extrapolated rock units, faults and boundaries).

Gold deposit types are likely to be associated with different host rock units – disseminated deposits with Rinadeena Formation and orogenic quartz veins with Florence Quartzite Formation.

The accepted interpretation of some rock units has been questioned, and not demonstrably resolved:

- Is the Owen equivalent in fact an Eldon Group equivalent? (Poltock, 1985)
- Is the 'Tyndall sliver' in fact Rinadeena Formation? (Tear 2011/ Cowan, 2011)

- The Rinadeena Formation might persist into the north east and/or north west corners of the Licence area.

Implications:

- Stratigraphy and lithology in the area remain of importance for achieving AMR's exploration objectives:
  - The 'Owen' wedge underlying much of the southern part of EL15/2015 might host orogenic quartz vein deposits; and the Tyndall sliver might contain disseminated deposits.
  - Davie PA is probably located south east of Davie Prospect.
  - Sharp linear lithological discontinuities/boundaries in outcrop indicate faulting or bedding changes, both of which enable conditions for hydrothermal vein deposits. Stratigraphy can help identify marker beds and structural geometry.
  - Concentration of gold in veins can be associated with rheology of adjacent rock types. Brittle lithologies (e.g. silicified silts and sandstones/quartzites) are more likely to host hydrothermally emplaced ore bodies whereas the more ductile lithologies may have acted to seal the traps.
  - In some areas (Victorian goldfields, Carolina Slate Belt) carbonate and carbonaceous lithologies (eg graphitic shales) are thought to chemically catalyse gold deposition.
- More needs to be known about surface and sub-surface geology. Despite paucity of data sites AMR should continue to refine geological maps through mapping and evidence-based reinterpretation.

Tectonics and structure – geological model

Outcomes:

- The block is comprised by mostly moderate to steep westerly facing NNW to North trending beds of post late Cambrian siliceous and often silicified rocks. Beds on the east side of the HCF dip east. The Draft Tenement Model is shown at Figure 4.1.
- The lower Eldon Group is expected to be at least 500m thick overlying theoretical Cambrian gold prospective source rocks. Any Mount Read Volcanics would be shallowest beneath the Owen/Tyndall wedge in the model.
- The strata are dissected by no less than six lineation orientations that may represent shears, thrusts, bedding, wrench faulting or combinations of these. There are almost certainly more faults than those already mapped or postulated.
- AMR considers that the HCF is a crustal scale fault system, but secondary in displacement scale to the Great Lyell Fault. Its trend follows the Tasmanian Devonian gold 'trend' (NNW) but at any chosen location it could strike north or north east. Its primary planes appear to dip west. If the HCF isn't the 'mother' gold conduit, then the gold-bearing fluids might have exploited instead the permeability of the Great Lyell Fault then ascended westerly-trending secondary faults to reach the shear-zones and jogs of the HCF and extensional, transcurrent fault traps in the area.
- Structural mapping at Coupon and Anomaly 24-28 by Shree revealed a west-dipping shear trend (as at Davie Prospect) which is poorly tested by much of the previous west directed drilling. The only east-directed drill holes are either short or outside the zone of main Au anomalism. Similarly, the west-directed drilling at Coupon would be unlikely to penetrate east-west trending veins or shears.
- Shree identified a shallow (30^{o}) southerly dipping quartz vein and stockworks in ferruginous sandstone at the Rinadeena Saddle and also north of Anomalies 24-28.

Implications:

- Geological maps, cross-sections and models will be inherently speculative.
- The HCF is modelled as striking a few degrees east of true north, so is sub parallel to bedding strike.
- Mapped curvilinear faults in the horizontal plane (MRT map) were probably caused by vectors of tectonic movement that exploited various pre-existing planes of weakness (e.g. NNW regional trend probably exploited a combination of more northerly bedding and north-westerly trending faults).
- The six structural trends recognisable in geophysical, topographical and geological lineaments result in a set of surface polygons of rock, bound by probable planes of relative displacements. In the vertical these planes dip at varying angles creating another dimension of complexity to the structure of the area. The model is a simplification.
- Fault traps probably trend at varying orientations that were extensional at hydrothermal injection or perpendicular to regional compression. That is, auriferous veins and gold shoots won't necessarily share a common trend.
- The Coupon RC drilling might have ineffectively targeted best mineralisation / anomaly sources.

Mineralisation mechanisms and patterns

AMR has not excluded any of the four types of gold deposit from being present in EL15/2015, in association:

- Sheet veins
- Fe-rich fault-fed stockworks in brecciated structural traps ABOVE fault intersections.
- Carlin-style replacement of carbonate in dirty limestones with silicification; and
- Erosionary alluvial deposits.

Outcomes:

- In EL15/2015, as in the west coast region, gold occurs in a NNW-trending belt that can be related to trends in deep crustal gravity differentials ('gravity worms' of Murphy et al, 2004). Also, regionally, the gold mineralisation rarely occurs beyond 5 km laterally from, and west of the northerly trending Great Lyell Fault.
- The quartz vein geometry will reflect the hashed permeability architecture (faults and lithologies) that existed prior to the injection of Late Devonian hydrothermal pulses. A lack of mineralised infill in the brecciated zone in SCDDH02 where it targeted a NW fault ('Harris Fault') means that the NW faults might post-date injection of auriferous fluids.
- No other minerals (apart from stibnite) have been found in economic quantities or concentrations.
- The Rinadeena Formation is lithologically, structurally and stratigraphically equivalent to the host rocks of the million-ounce Beaconsfield deposit (Tasmania Reef).

Implications:

- The prospective potential in EL15/2015 is gold in Devonian shear zones and veins.
- The central and north eastern parts of the Licence area probably hold the best potential for economic mineralisation.
- There are three known targets, Coupon, Davies Prospect and Anomalies 24-28 and at least two further targets (Davies P.A. and Rinadeena / Harvey's Creek gold/antimony) to be developed to at least preliminary resource figures.

- Despite previous resource aspirations of more than 700,000 ounces Au (Shree, 2013), AMR advises that a cursory assessment of data to date and conservative assumptions suggest a figure of 70,000 ounces in situ is a more realistic starting figure, based on open-cut extraction to 50 metres depth from surface. The Coupon anomaly, with its uncertain drilling results, and the un-relocated Davie PA together constitute 85% of this estimate. AMR's exploration Goal is to firm up such figures.
- Beaconsfield type deposits (large sheet veins in transverse shear faults) which could include the Ordovician Owen Conglomerate body should be included as exploration targets.

Historical records of mining, prospecting and exploration

Outcomes:

- Extensive searches of the Trove database revealed records of gold exploration from the 'West Coast Gold rush' of 1893-1915. Up to 1895, 3,000 ounces of hard rock gold and 40,000 ounces of alluvial gold were reported from western Tasmania (Delaney, 2018, Appendix A).
- None of the prospects proceeded to full production, the implication being that the gold concentrations deteriorated laterally and with depth. Similar deteriorations were recorded throughout the State (e.g. Princess, May, Lefroy, Macquarie/Woody Hill). Discontinuation of these ventures was most often because of ore shoots 'petering out', a lack of development capital (which implies that gold production wasn't paying its own way), costs (supplies, services, access and stamping plant), water ingress, lack of labour availability (War and Mt Lyell Copper), and poor reputation of the field (a Mt Huxley controversy, hardship, sporadic gold occurrences).
- Quartz vein lodes varied in orientation and, where auriferous averaged 2.5 feet wide.
- The obvious surface prospects in the region were discovered by searching creeks (e.g. May, King River) or chipping at outcropping quartz veins (e.g. Macquarie, Woody Hill).
- Subsequent exploration has uncovered disseminated mineralisation. The discovery of the Davie PA prospect drew the Launceston Daily Telegraph's mining journalist to express, "It is the opinion of many that if ever gold is found in appreciable and payable quantities in the Lyell district it will be contained in a gossanous formation like the present one; rather than in quartz reefs, where it is generally very fine and difficult to save".

Implications:

- AMR's choice of likely deposit model is lensoidal gold deposition about transverse feeder faults that intersect pressure-release ore traps (jogs, gapes, fault breccias). Repeats of the feeders would deposit other lenses further along the pipe or lode.
- AMR's exploration target is to exceed 50,000 ounces of resource. This will require:
    - Proving of existing disseminated deposits' grade and volume (tonnage) at mineable depths and establishment of a mineable, sensitive extraction method; and/or
    - discovery of the reason for spatial deterioration of auriferous ore concentrations in orogenic veins to establish the potential for extensions or further ore bodies; and/or
    - evidence of larger Beaconsfield or Henty-style deposits; and/or
    - exploitation of economies of scale through securing further ground prospective for gold.
- AMR must pursue a rigorous, methodical but inexpensive exploration program.

Catchment-based stream sediment pan-concentrate sampling program

Outcomes:

- During the reporting period, AMR commenced a stream sediment sampling program. Dense vegetation regrowth after 12 consecutive high-growth seasons hampered efforts.
- The north west quadrant of EL15/2015 west of the Lyell Highway was sampled (10 sites = 5 man-days). This area represents the Florence Quartzite in the Lost Creek catchments and Tully River headwaters east of the area prospected by Trikon/EZ (McDonald, 1983) for Carlin-type mineralisation in Eldon Group black shales. Three samples were located on the mapped (MRT) fault contact between the Florence and Crotty Quartzites (see Figure 4.1).
- Selected samples were assayed by multi-element analysis to identify to trace levels arsenic, antimony, lead, copper, silver, tungsten and iron as well as gold.
- No visible gold or sulphide was detected in the samples.
- Most recent sampling programs (Trikon, 1989; Shree 2010) have not sampled for gold on the assumption that arsenic is a better indicator of disseminated gold.
- The results (see Table 4.2 below) show no significantly anomalous mineral concentrations and only one gold value above background – 55 ppb Au at SC01.

SAMPLE			Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	K	La	Mg
DESCRIPTION			ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	ppm	%
SC01	375351	5336213	0.055	<0.5	0.52	<5	50	<0.5	<2	0.01	<0.5	1	78	3	0.31	<10	0.2	10	0.03
SC02	375333	5336617	0.001																
SC03	375333	5336693	0.001																
SC04	375380	5335718	<0.001																
SC05	375387	5335613	0.001	<0.5	0.58	<5	60	<0.5	2	0.01	<0.5	1	529	3	0.44	<10	0.2	10	0.05
SC06	375340	5335620	0.005																
SC07	375633	5335562	0.001																
SC08	375594	5335507	0.002																
SC09	375564	5336903	0.001																
SC10	374989	5336710	0.002	<0.5	0.75	<5	70	<0.5	<2	0.01	<0.5	<1	39	2	0.44	<10	0.3	10	0.05

SAMPLE			Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th	Ti	Tl	U	V	W	Zn
DESCRIPTION			ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
SC01	375351	5336213	33	<1	0.01	1	40	4	0	<5	1	6	<20	0.1	<10	<10	7	<10	<2
SC02	375333	5336617																	
SC03	375333	5336693																	
SC04	375380	5335718																	
SC05	375387	5335613	46	<1	0.01	1	40	3	0	<5	1	5	<20	0.2	<10	<10	10	<10	10
SC06	375340	5335620																	
SC07	375633	5335562																	
SC08	375594	5335507																	
SC09	375564	5336903																	
SC10	374989	5336710	38	<1	0.01	1	50	7	0	<5	1	6	<20	0.2	<10	<10	9	<10	<2

Table 4.2: Stream sediment assay results for north west EL15/2015.

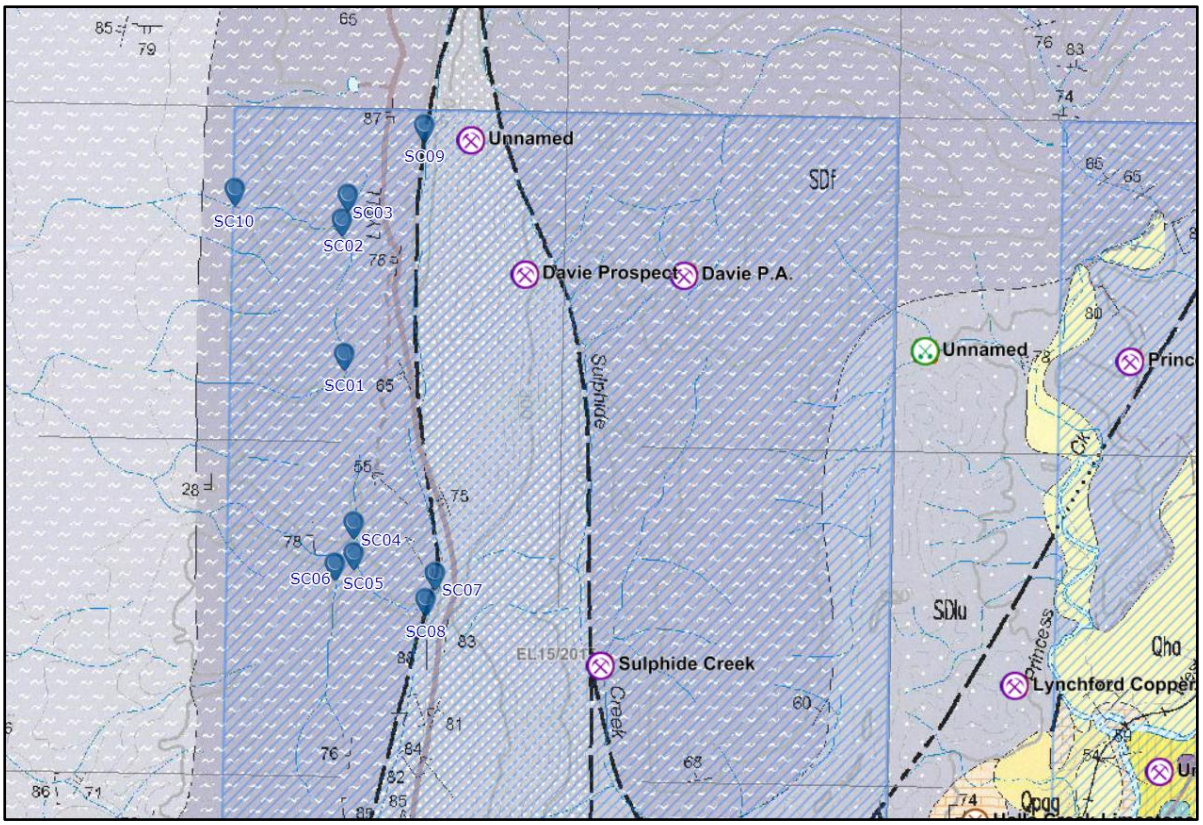

Figure 4.1: Stream sediment sample locations

Implications:

- Gold assays are not expected to exceed 20 ppb in samples that drain the disseminated deposits. Levels above 100 ppb will probably indicate quartz vein concentrations nearby in the catchment.
- Stream sediment sampling is an inexact analysis and values are relative only, not quantitatively comparable with historical results. These samples are indicative of anomalous gold concentrations and should not be used to infer economic value.
- The sample at SC01 is along the trend of an east-west feeder that could intersect Davies Prospect and possibly Davies PA. Conditions could exist for a modest gold shoot concentration at the Highway at the Florence/Crotty contact.
- SC09 sample site tested possible HCF intersection with a NW trending fault and is downslope of the 'Unnamed' (and unlocated) adit prospect. Its low gold reading is the most disappointing outcome.
- The results are otherwise to be expected, as the Rinadeena Formation stratigraphic target is several hundred metres east.
- The north west corner can be discounted from future exploration.

Interpretation and draft model

Outcomes:

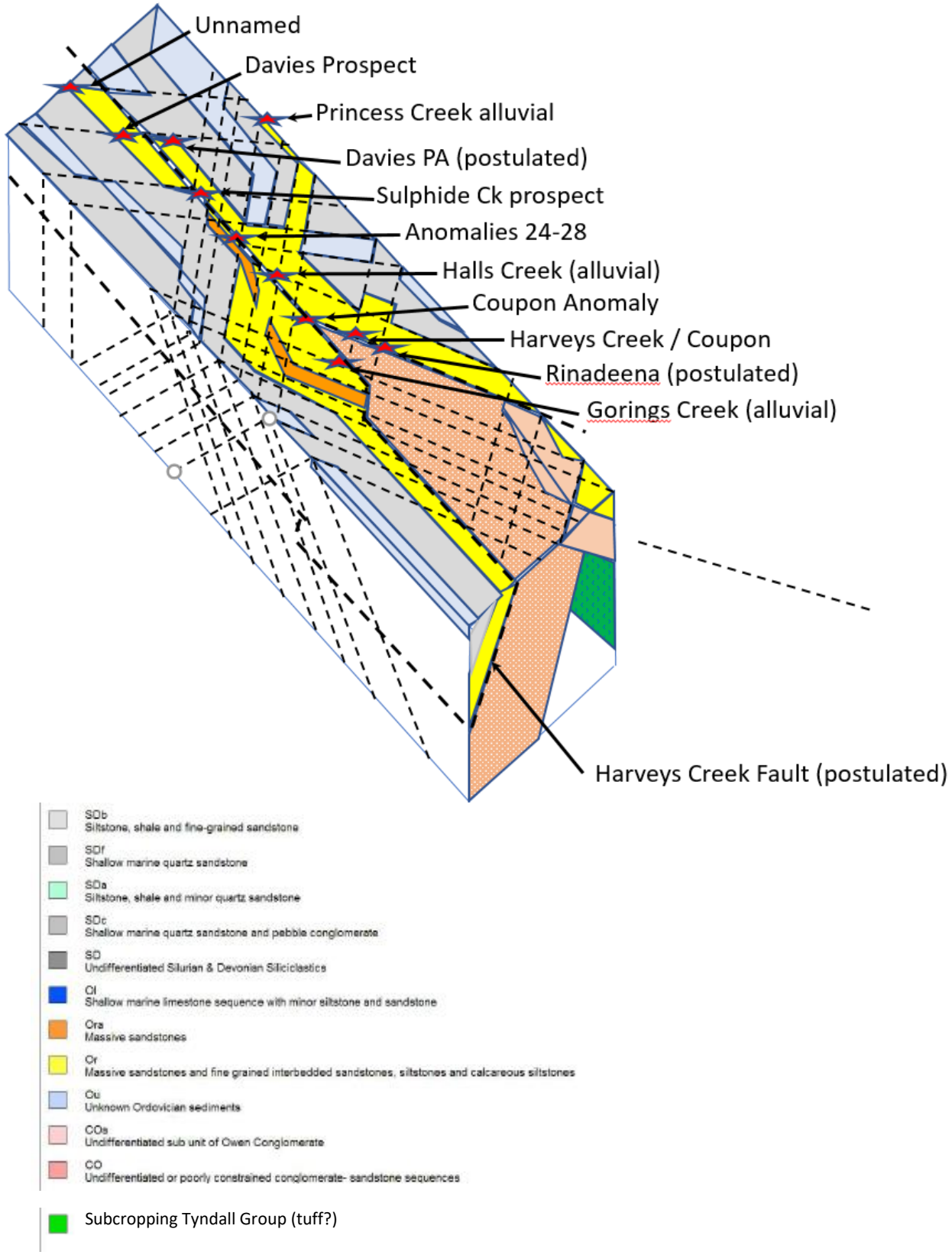

Figure 4.1: Draft block model (interpretive) of EL15/2015 Sulphide Creek tenement (surface and key based on radiometric map by Cowan, 2011)

- The draft model for the entire Licence area is a block of north-NNW steeply-dipping west facing beds of Silurian fine-grained siliciclastic and Ordovician fine grained interbedded siltstones and calcareous rocks, and Late Cambrian micaceous sandstones, multiply fractured by perhaps four fault trends:
    - The north-south Harvey Creek Fault (dipping steeply west)
    - NNW-trending shear zone ~ 1 km wide from SE corner
    - NE-trending shear zone ~ 1 km wide intersecting above NNW zone in the central west. These two zones are associated with the east-west antiform in that area.
    - NW faults across the north and probably uniform across the whole area.
- Newnham (1995) mapped closely-spaced east-west faults that are probably the cause of strong topographical lineations across the whole area (see Figure 4.2). He proposed that these faults included the auriferous feeder(s) for the Coupon prospect.
- The model plots ALL the gold prospects that have been identified to date, in the Rinadeena 'Shale' Formation, close to shear zones and the HCF north-south trend.
- Despite its complexity, the model is simplified and remains a hypothetical guide to further exploration.
- Evidence for the model is drawn from historical reports on geological mapping, radiometric images (Cowan, 2011), and regional geophysics surveys.
- Development of the regional model would benefit from further information on:
    - Location, dimensions and orientation of quartz-rich deposits in the 'plumbing' of the fracture system and accurate fault/vein locations and orientations
    - Location and persistence of gold concentrations in the quartz-vein geometry
    - Location and persistence of gold concentrations in brittle shear zones
    - Identification of marker beds within the recognised stratigraphic units
    - Accurate locations of key host lithologies
    - Mapping of fault strikes, trends and dips including nature and track of the 'Harvey Creek Fault'.
    - Net sense of faulting and accurate displacements on faults.

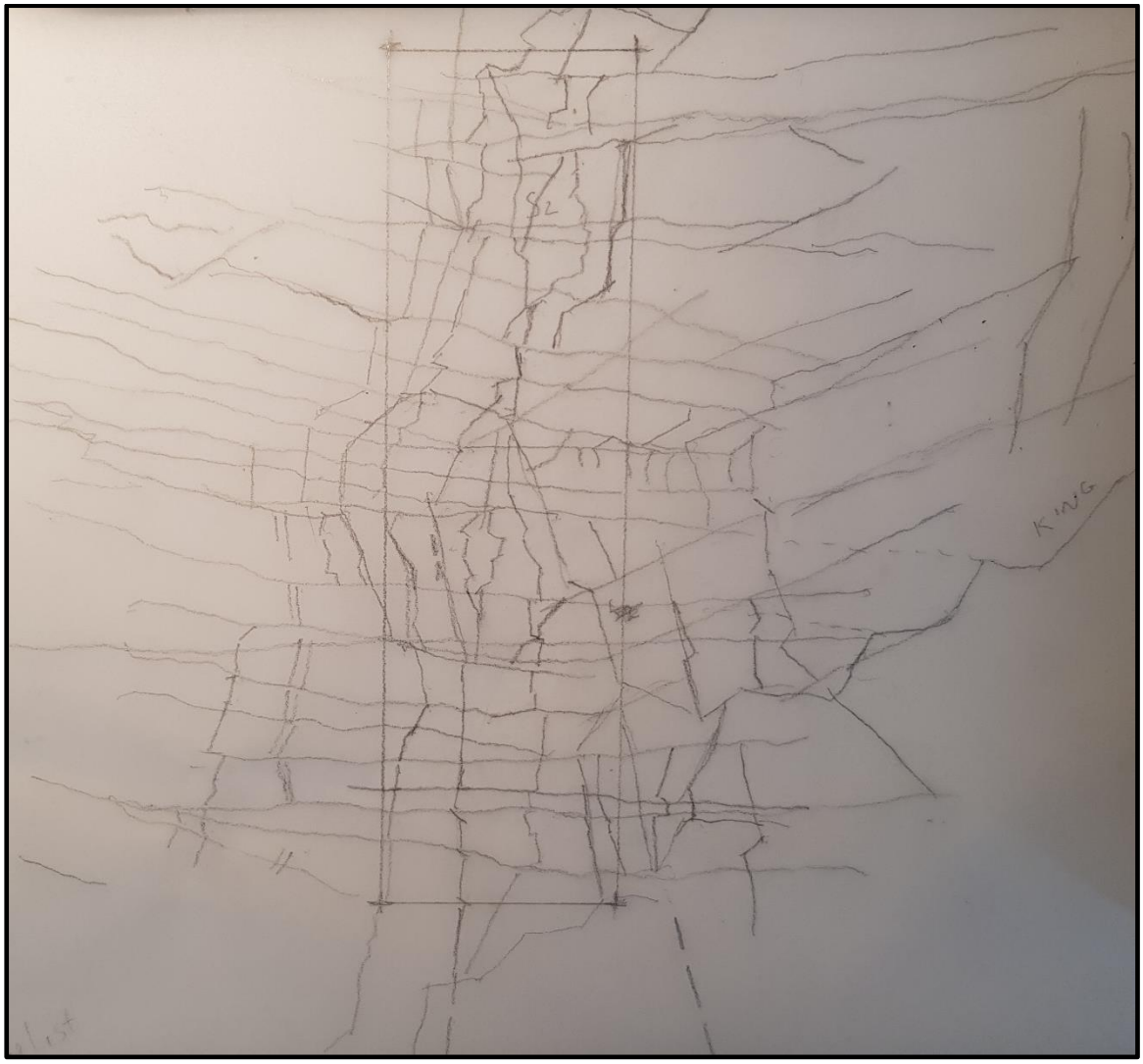

Figure 4.2: EL15/2015 Lineations from aerial photographic, topographic and geophysical maps

- Current gaps for generating deposit-scale models are:
    - Local surface geology (lithologies and faults)
    - Local location, dimensions and orientation of veins
    - Local location, dimensions and orientation of ore shoots
    - Gold concentrations in ore shoots/veins in three dimensions
    - Persistence of all features with depth (veins, shoots, concentrations, lithologies and structures)
- AMR developed a ballpark resource potential based on the model and exploration results to date of around 70,000 ounces Au in the top 20 m section across all known deposits on EL15/2015, with Coupon and Davie P.A. comprising some 85% of the estimate. This concurs broadly with Newnham's (1995) ballpark estimate for Coupon of 200,000 to 300,000 ounces Au per 50 vertical metres. Pal's (2012) estimate for the tenement's potential of 700,000 to 1 million ounces might be based on in situ resources at less-constrained depths (150+ metres).

Implications:

- AMR currently favours a structurally-controlled shear zone trap model for the stockwork-style disseminated gold deposits, more likely hosted in shear jogs than fault intersections. In this model the traps were fed by orogenic fluids exploiting transcurrent faults that thus might be spatially associated with the mineralisation. Exploration should target the information necessary to close the information gaps for computer-modelling prospects based on this model.
- Axial cleavage and fault wedge models should not be discarded; therefore, exploration should inform the potential for these styles of deposits to be present.
- Further regional and Licence-scale information should be compiled on location, dimensions and orientation of veins.
- Prospects should be mapped in detail for veins, shoots, concentrations, lithologies and structures.

6. PROPOSED WORK PROGRAM

1. Review logging of the five Sulphide Creek and Coupon core (Mornington Corestore), photograph core, sample for assay if useful. Geotechnically / structurally log core and prepare graphic logs and model input data (10 man-days).
2. Field South – Continue stream sediment sampling and lithological mapping program (50 sites = 10 man-days):
    - Locate Harveys Creek / Coupon and Rinadeena sites. Gorings and Harveys Creeks
    - Priorities are Harveys Creek, Rinadeena and any potential daylighting intersections on major faults (Henty style structural).
    - Integrate with search for possible source lodes, vein outcrop mapping and rock samples.
3. Field North – Continue stream sediment sampling and detailed mapping of prospects (50 sites = 10 man-days, Prospect mapping 10 man-days):
    - Locate Davies PA site.
    - Priorities are Davies PA, predicted mineralised sheet vein trends and any potential daylighting intersections on major faults (Henty style structural).
4. Integrate with search for other possible source lodes, vein outcrop mapping and rock samples, and ground-truthing of AMR's draft structural and depositional mechanism models.
5. Design shallow drilling program for Davie PA.
6. Assess mineral potential of the Owen/Tyndall/Florence contacts south of Rinadeena Railway Station.

Note that AMR is investigating funding opportunities and if successful the listed activities are anticipated to be intensified and expenditure commensurately higher.

Estimated costs Year 4

Stream sediments	$ 30,000
Mapping	$ 10,000
Geology	$ 35,000
Supplementary	$ 2,000
Tenement Admin	$ 3,000
Total Program	**$ 80,000**

7. ENVIRONMENTAL, CULTURAL HERITAGE

No works as specified by the *Mineral Exploration Code of Practice* (Bacon & Pemberton, 2012) or 'controlled actions' (*EPBCA,* 1999) were undertaken during the period.

Field work on public land consisted of outcrop recording and chip sampling, and stream sediment panning only (process description in Appendix B).

Access was by two persons by foot during Summer months only from roadside or fire trails, with minimal damage to regrown common native species (predominantly manuka, bauera and cutting grass) and blackberries. No track cutting, or gridding was undertaken, nor was there any risk to the registered listings of Geographical or Conservation Significance as identified on the Land Information System Tasmania.

Both the geologist and field assistant reviewed images of plants of conservational significance for familiarity prior to the Summer program. Movement through scrub and swampy areas was undertaken to alert fauna including frogs, lizards and snakes.

The nearest record of aboriginal relics is from the Queen River valley (Corbett, 1980) 2 km to the east of the Licence area. Aboriginal inhabitation of the steep heavily-vegetated ridges and gullies is unlikely (Appendix E). Apart from the restored West Coast Wilderness Railway, there is little known evidence of white cultural heritage elements of historical value on EL16/2015 despite a century of mineral exploration, gold panning, logging, and fettler and farm settlements. There are sparse, overgrown historical excavation depressions, trenching, exploration tunnels, at least eight adits and three recorded shafts.

8. EXPLORATION EXPENDITURE 2016/17 to 2018/19

Exploration Expenditure EL15/2015	April to March **2016/2017**	April to March **2017/2018**	April to March **2018/2019**	Total to **Year 3**
Field program	$5,705	$6,718	$4,965	**$17,388**
Geology	$6,677	$11,853	$17,600	**$36,130**
Exploration Equipment	$7,723	$21,531	$1399	**$30,653**
Tenement Administration	$3,634	$2,152	$2410	**$8,196**
Services	Nil	Nil	$870	**$870**
TOTAL EXPENDITURE	**$23,739**	**$42,226**	**$27,244**	**$93,209**

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