



Drilling Target defined at Golden Crown

(M37/475)

20th September, 2023

Highlights

- Exploration Target* at Golden Crown prospect of 150,000t to 120,000t at a grade range of 10-15 g/t Au
- High grade +10g/t Au RC intercepts to follow up.
- Geological modelling supports infill drilling campaign.
- Drilling Program aimed to infill and deliver a maiden Mineral Resource Estimate

Mt Malcolm Mines NL (ASX:M2M) (Mt Malcolm or the Company) is pleased to provide an update on recent exploration activities.

Golden Crown is the first of the Company's key prospects earmarked for model review and drill planning as part of the company's strategy to cumulatively build a high-grade resource base over the next two-years to deliver on the company goal of developing a sustainable production base from shallow mining opportunities.

The Golden Crown Exploration Target* is estimated in the range of 150,000t to 120,000t at a grade range of 10-15 g/t Au, not including upside from further extensional drilling.

** Note: The potential quantity and grade of the Exploration Target is conceptual in nature and as such there has been insufficient exploration drilling conducted to estimate a mineral resource. At this stage it is uncertain if further exploration drilling will result in the estimation of a mineral resource. This Exploration Target statement has been prepared in accordance with the JORC Code (2012).*

The Golden Crown workings are regarded as a significant historical gold producer, which yielded more than 1,720 high grade ounces (29 g/t Au) at the turn of last century. The prospect has been historically mined and subject to comparatively minor exploration conducted by companies such as Jubilee Gold Mines NL, North Ltd and Melita Mining NL who drilled a limited number of closely spaced shallow holes (maximum depth 40m) testing the lode extensions for gold mineralisation. These holes were followed up by M2M (ASX: 11 January 2022 and 1 December 2021). The proposed drill program will be the third RC drill program conducted on the Lease by M2M which is scheduled to commence during the December quarter.

A shallow closely spaced RC drill program has been designed to test the enable the estimation of a Mineral Resource at Golden Crown, being based on the current interpolation of reported and historic mineralised drill intercepts together with gold shoot repetition (evidenced from surface workings), historic mining head grades of 29 g/t Au (Kelly 1954), and the dimensions of the multiple mineralised envelopes (Fig. 1 and 2).



Photograph – Mined open Stopes at Golden Crown approximately 40m south of Main Shaft

Historical and previously announced, RC drilling conducted by Melita (MD series A25350), Jubilee (MRC series A39883) and M2M (21GCRC series ASX: M2M 1 December 2021) and RAB conducted by North (MSR series A53682)

4m @ 10.4 g/t Au (32-36m) in MSR 344

3m @ 11.97 g/t Au (37-40m) incl. 1m @ 33.61 g/t Au (37-38m) in 21GCRC001

4m @ 5.01 g/t Au (17-21m) in MRC 53

8m @ 3.2 g/t Au (29-37m) in MRC 67

4m @ 2.99 g/t Au (28-32m) incl. 1m @ 5.78 g/t Au (29-30m) within 10m @ 1.56 g/t Au (28-38m) in 21GCRC008

16m @ 1.63 g/t Au (8-24m) in MDRC 004 incl. 6m @ 3.12 g/t Au (18-22m).

12m @ 2.4 g/t Au (15-27m) in MRC 55

8m @ 1.3 g/t Au (40-48m) in MSR 345

Renewed confidence in taking Golden Crown to a minable resource follows several months of compiling and reviewing of historic exploration data, detailed surface mapping, lithological discrimination from multi-element geochemistry, alteration mapping using hyperspectral infrared, and consolidation of this data within a 3D geological model (Fig. 1. and Fig. 2). The geological model indicates shallowly plunging ore shoots that coincide with a new zone.

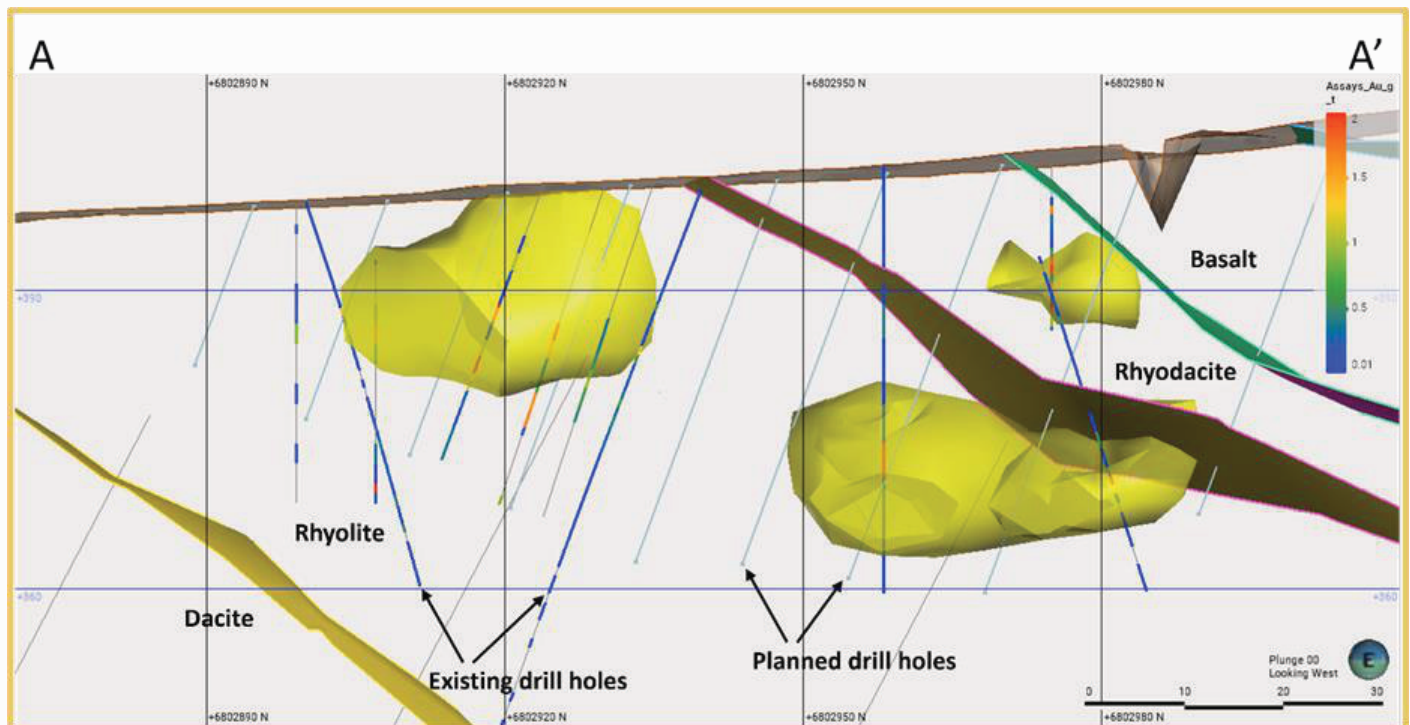


Figure 1 - Longitudinal cross section A-A' through the Golden Crown geological model, looking west. The location of the historical main shaft is positioned as the surface depression at the right side of the image

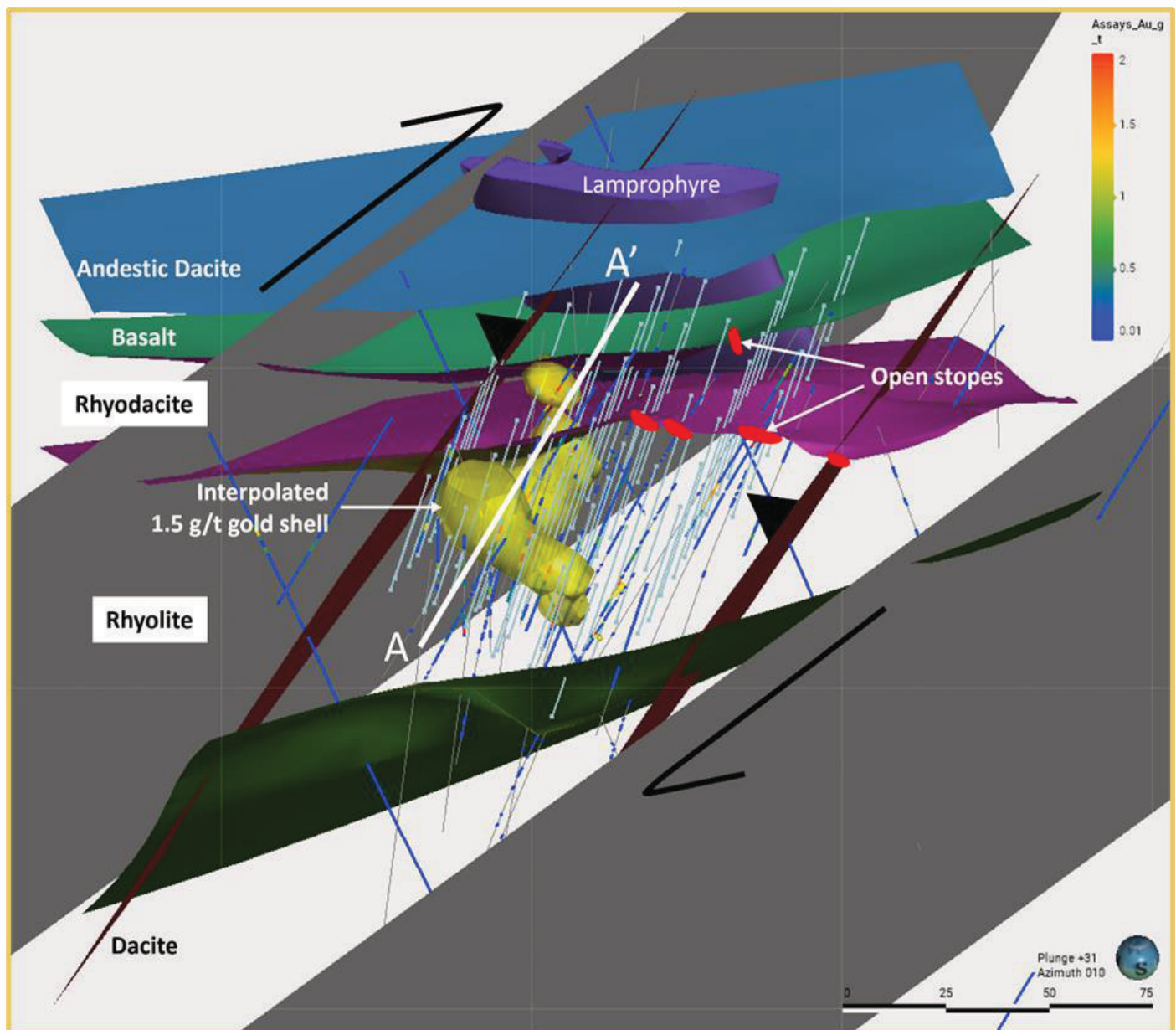


Figure 2 – Cross Section A-A' (refer Fig. 1). Oblique plan view through the Golden Crown geological model, looking north, with compiled drill traces, Red polygons depict the mapped surface expression of historic mined open stopes.

Geological Modelling

The main aim of constructing the Golden Crown 3D model was to define elements in the geology that demonstrate ore shoot geometry and thereby enabling the optimal placement of drill holes for resource delineation. All models start with the lithological framework that at prospect scale defines the first layer of architectural control and targeting constraints on mineralisation. On from that, alteration and structure are added as overlays to tighten-up the target window.

Lithology

Visual RC chip logging failed to recognise any consistent or meaningful distinctions to be of value; mainly due to colour and textural differences imperceptible to the naked eye and the effects of flooding by overprinting mineralised fluids. In this case lithological distinction was underpinned by the acquisition of hyperspectral data using a TerraSpec 4 Hi-Res visible to short

acquisition of hyperspectral data using a TerraSpec 4 Hi-Res visible to short wave infrared (VNIR) spectrometer. RC chips from the M2M 'GCRC' series were scanned directly within chip trays as well as surface rock chips collected in a series of mapping traverses. Differences between spectra were determined through measuring 'troughs' associated with light absorbed by minerals within various wavelength regions along the VNIR spectrum. These troughs – termed absorption features – were quantified through several algorithms – termed feature extractions – within 'The Spectral Geologist' software that calculated their depth (relative to a white reference standard), wavelength and asymmetry.

Potential lithological differences were assessed using three feature extractions – W_H2O01, W_MgOH01 and W_AIOH01 – that were selected due to their common representation within all samples. Classification by K-means clustering identified four classes, with each initially assigned a rock type according to their degree of correlation with respective feature extractions (Fig. 3).

Spatially, plotting of the clustered VNIR data on drill traces formed laterally traceable contacts between three of the four classes, broadly defining Mafic A, Mafic B and composite felsic-intermediate units from footwall to hangingwall (Fig. 4). The resultant N-NW dip of stratigraphy matches the orientation of ferruginous interflow sediments mapped at surface. The first iteration of the solid geology model was extended by laterally correlating where distinctions could be drawn within historic logging data and further differentiation made through incorporating additional VNIR feature extractions (Fig. 3).

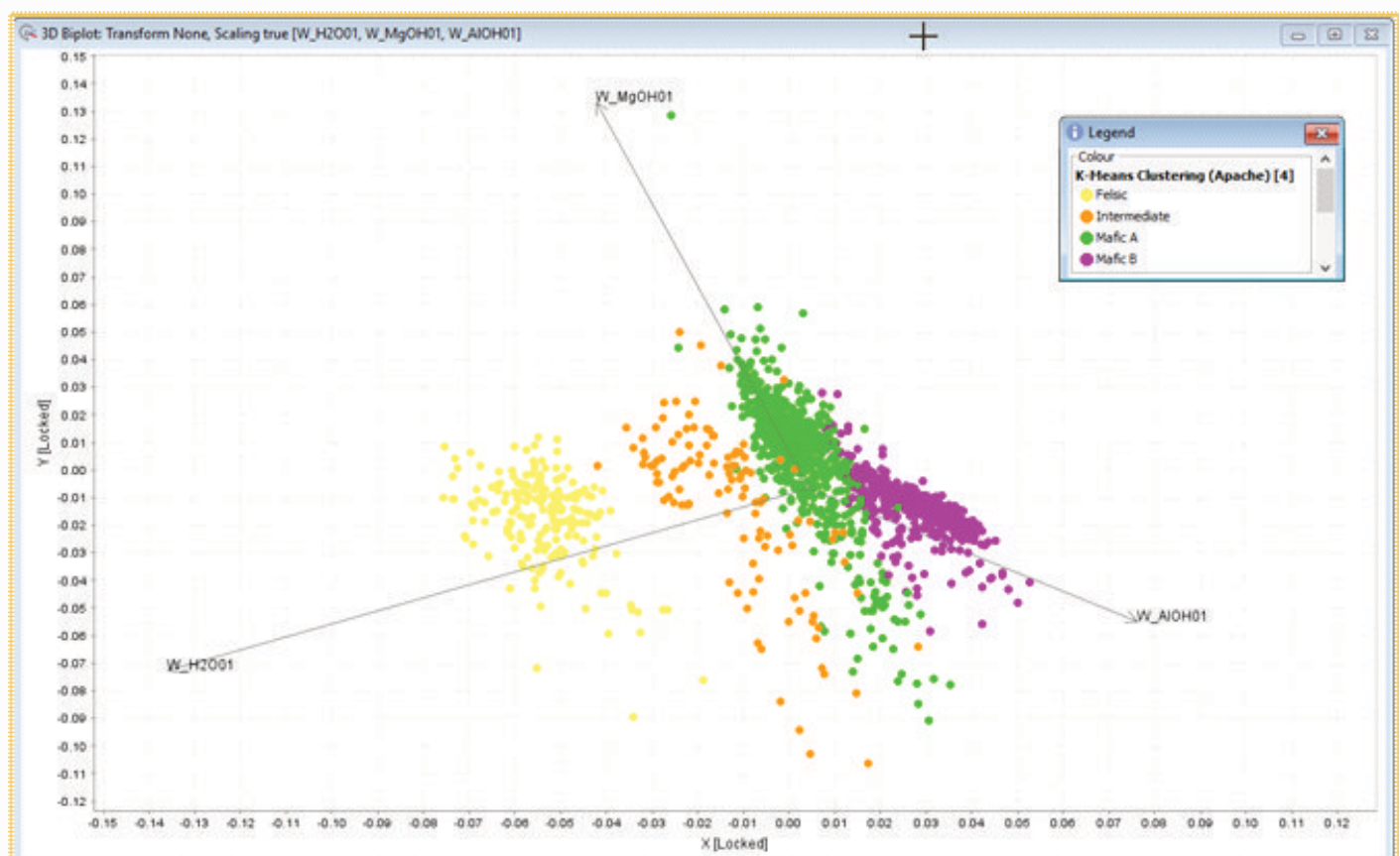


Figure 3 – Principal Components Analysis 3D biplot graphically demonstrating the relationship between K-Means Clustering classes and the input hyperspectral feature extractions; W_H2O01, W_MgOH01 and W_AIOH01. Classification utilised ioGAS software.

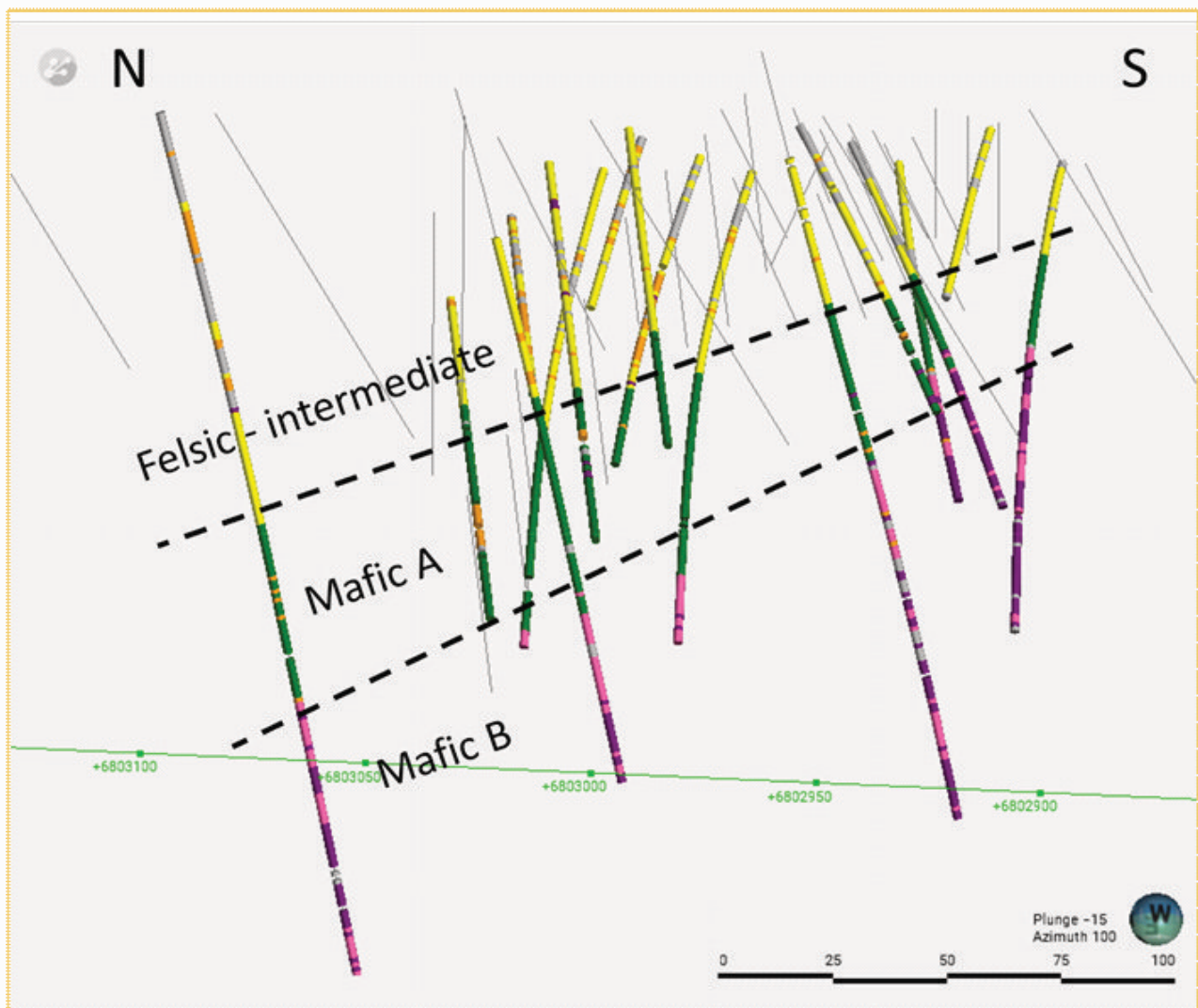


Figure 4 – Cross-section looking obliquely east at drill hole traces coloured by clustered hyperspectral representing pseudo-lithology classes.

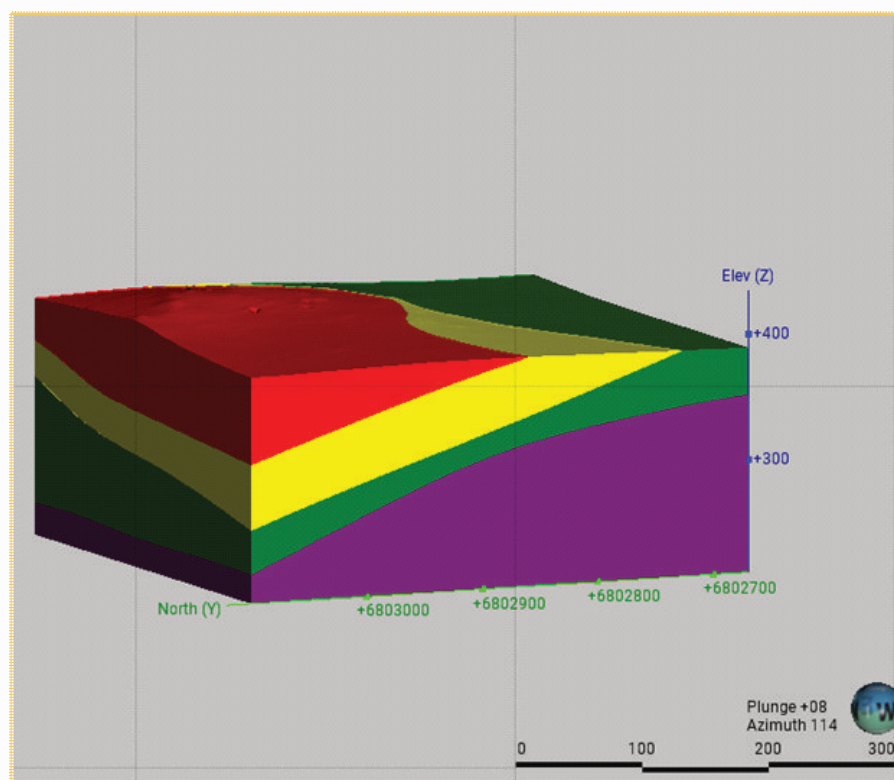


Figure 5 – Looking ESE at the first iteration of the solid lithology model derived from drill holes containing clustered hyperspectral data including an additionally-defined hangingwall unit in red.

The final phase of validating and refining the lithology model involved selecting samples for 4 acid multi-element geochemistry (ME) to test the existing lithological framework and distinguish between primary contacts and the effects of secondary alteration processes. The niche samples were limited to one either side of interpreted contacts in addition to samples analysed for multi-elements (ME) last year taken from intervals containing visible sulphide in RC chips (Fig. 6).

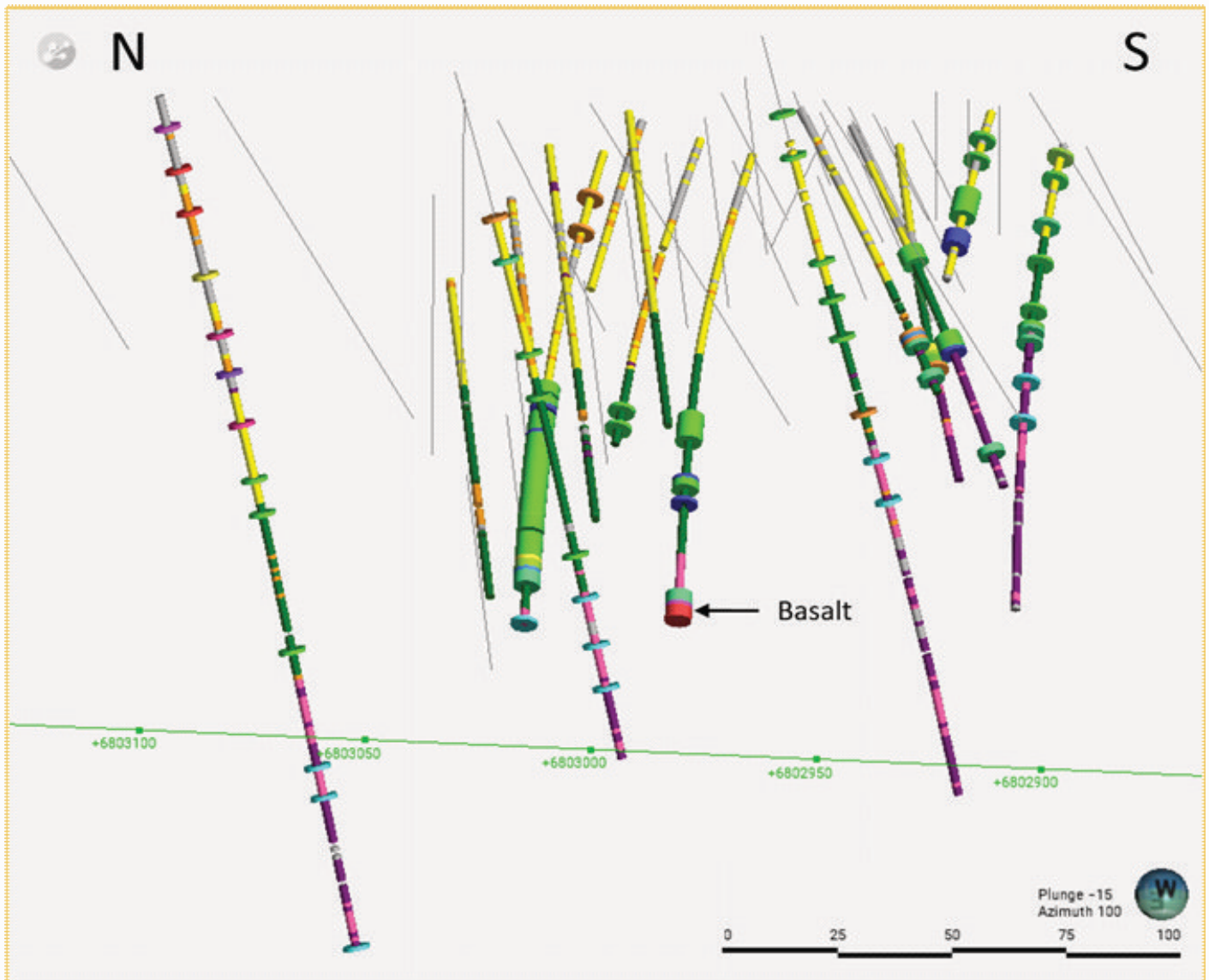


Figure 6 - Cross-section looking obliquely east at drill hole traces coloured by hyperspectral classes overlain by disks representing intervals analysed for 4 acid multi-element geochemistry (coloured by lithogeochem class).

On return of the niche ME analyses and a provisional update of the lithology model, a second field campaign was planned to follow-up unexplained anomalies in the VNIR, irregularities in the lithogeochem interpretation and to map the surface expressions of lithology contacts and controlling structures immediately surrounding the known mineralised zone in more detail. Surface mapping and relogging of RC chips confirmed an additional basalt unit overlying the predominantly felsic sequence. This unit is clearly visible within the main access shaft and has been noted in several of the historical geology maps. The sequence from footwall to hangingwall is dacite, rhyolite, rhyodacite, basalt and andesitic andesite (Fig. 7). Gold lodes represented by shallowly N-plunging shoots are focussed along the hangingwall of the rhyolite

unit with a repetition within the overlying rhyodacite. An additional out of sequence and laterally restricted basalt interval at the base of drill hole 21GCRC005 indicates further potential for differentiation of the volcanic pile at depth.

A mafic, magmatic intrusive body indicated from the ME was confirmed in drill chips and in outcrop as a lamprophyre dyke. Inspection around the periphery of the prospect revealed several other narrow lamprophyre intrusions, typically with an elongated horizontal axis parallel to primary volcanic contacts and in at least one case the vertical axis highly discordant to stratigraphy (Fig. 7). In addition, follow-up of a VNIR anomaly at depth in several of the M2M RC drill holes revealed a medium grained, haematite-altered feldspar-phyrlic rock containing abundant Mg-chlorite after hornblende or biotite with marginal magnetite surrounding the body. Texturally and compositionally the rock is a granodiorite that given the internal to external zonation of haematite to magnetite demonstrates the release of oxidised fluids upon magma cooling.

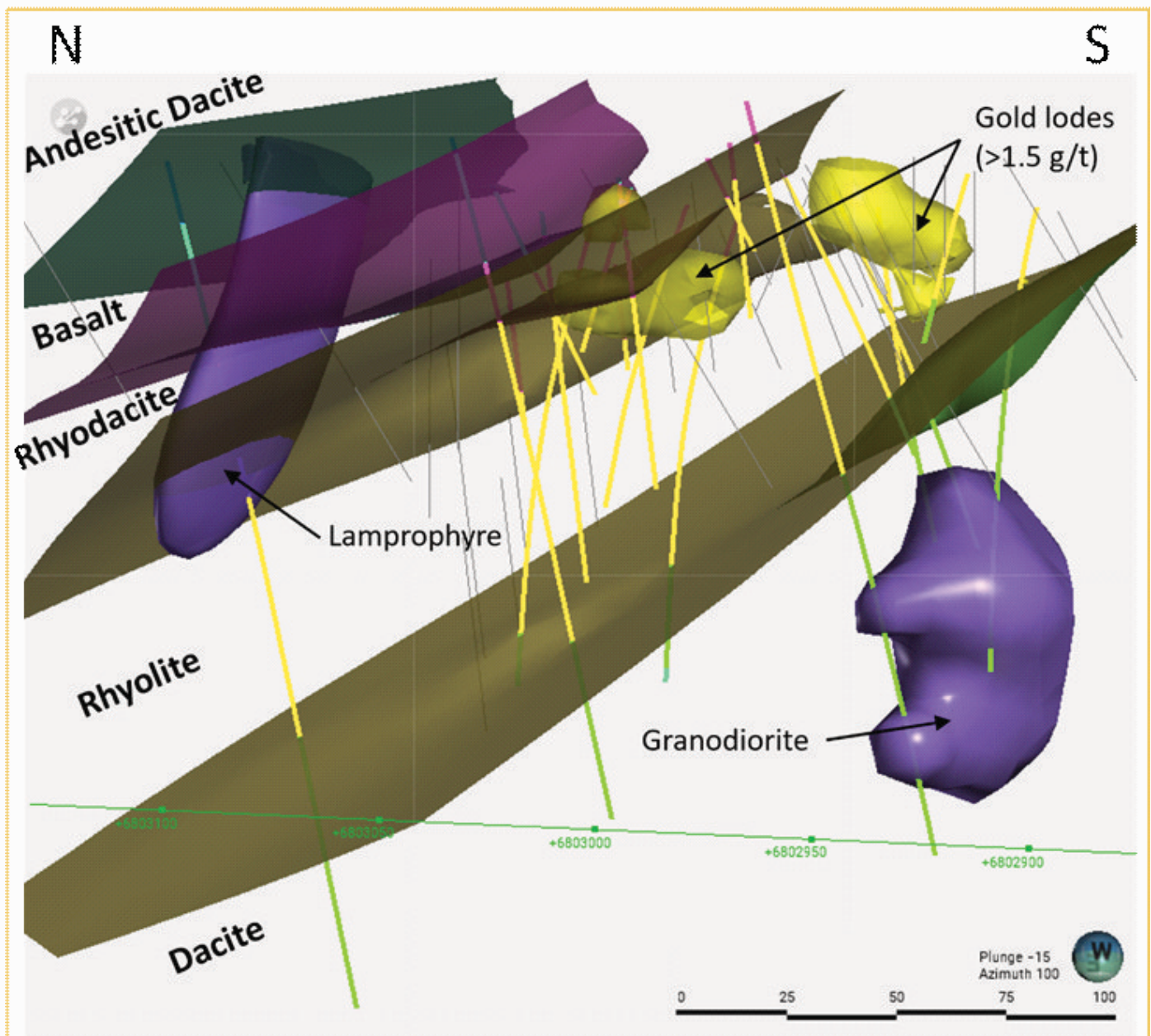


Figure 7 – Cross-section looking obliquely east at existing drill hole traces coloured by the final lithological classification. Semi-transparent contacts in volcanic stratigraphy dip to the left of image. Magmatic Intrusions are denoted by purple volumes.

Structure

Surface mapping provided the basis for defining the structural architecture of Golden Crown. Foliation orientations were compiled within the 3D modelling software (Leapfrog Geo). Jubilee Gold Mines NL mapped NE-trending shear zones that truncated, displaced and rotated the volcanic stratigraphy across the Malcolm Dam/Golden Crown prospect (Fig. 8 Davis 1993). The shear sense of the deformed markers confirms a large component of dextral strike-slip movement, albeit as previously noted by Davis (1993) several quartz vein arrays with similarly oriented shear boundaries suggest at least a small degree of sinistral shearing was part of the deformation history. Clustering foliation orientations acquired by M2M and plotting spatially confirms concentration of NW-dipping shear corridors bounding the NW and SE margins of known mineralisation (Fig. 9 & Fig. 10). WNW- and N-dipping foliation clusters that share a common great circle girdle with the NW-dipping shear set also define linearly distributed concentrations in plan view.

Within a NE-SW trending zone of dextral bulk shear, these subordinate features represent compressional and extensional structures formed during the same event. The most notable N-dipping shear zone parallels the dacite-rhyolite contact, thereby rendering lithological boundaries as a favourable plane for extensional reactivation and not newly-formed structure.

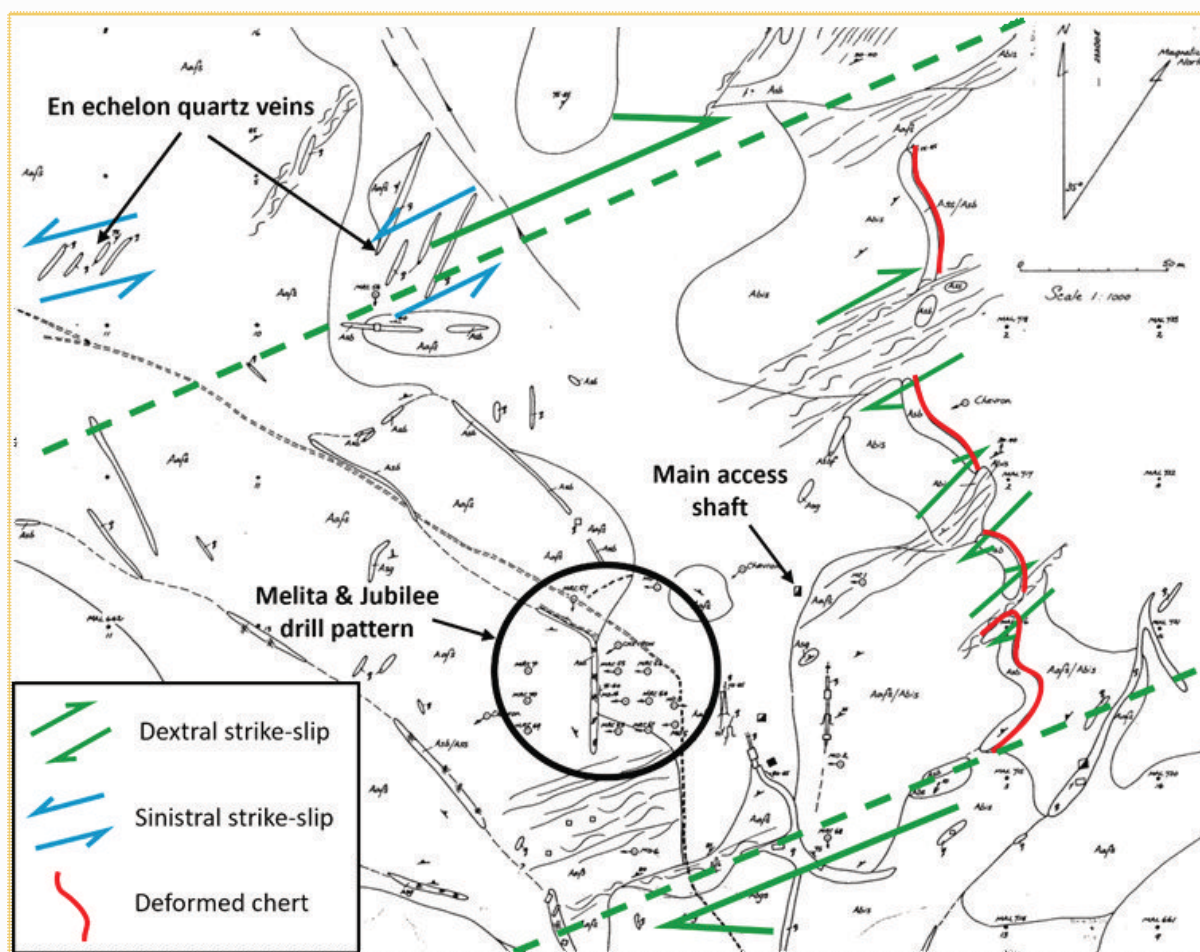


Figure 8 – Surface geology map of the Malcolm Dam (Golden Crown) Prospect by Jubilee Gold Mines NL (Annual Tenement Report - A39883). Multiple NW-dipping (magnetic north) foliation zones each demonstrating dextral shear through offsetting, drag folding and rotation of pre-existing chert layers. A broader zone of bulk dextral shear encompassing individual strain partitioning is marked by green dashed lines and large shear sense indicators. Early Melita Mining and subsequent Jubilee infill RC drill holes are circled.

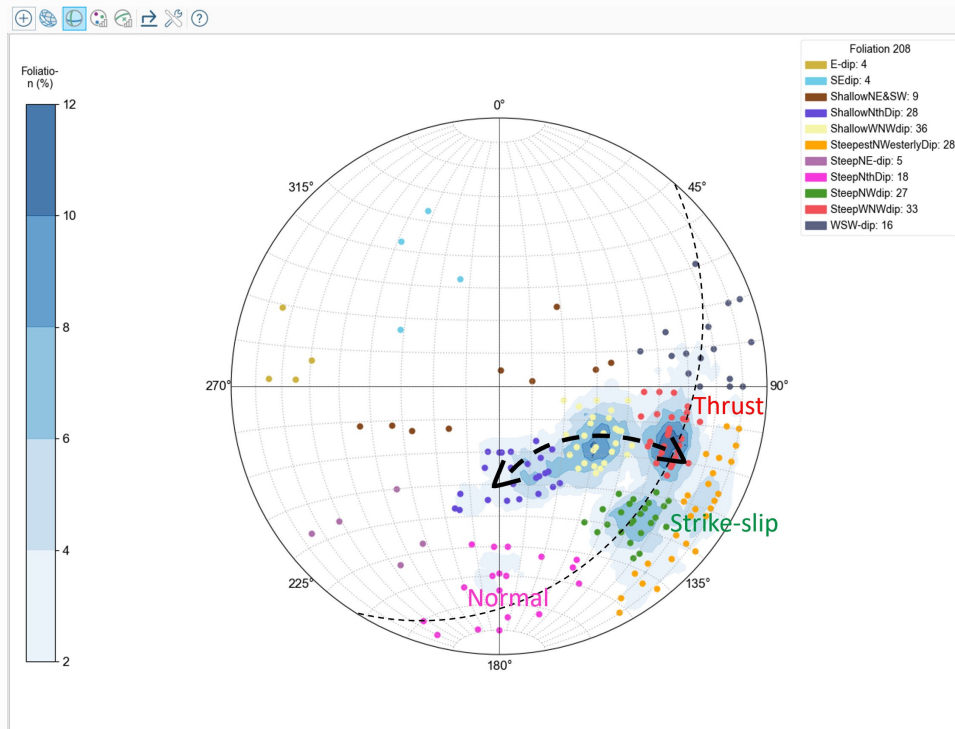


Figure 9 – Stereographic projection of poles to foliations from Golden Crown surface mapping. Three colour-defined clusters define a great circle girdle (thin dashed line) combining strike-slip (green), thrust (red) and normal shear (pink) components. Double-ended arrows on an arc delineated by a bold dashed line shows a partially-defined small circle distribution of poles to thrust shears; anti-clockwise and clockwise directions indicating entering and exiting the extensional site, respectively.

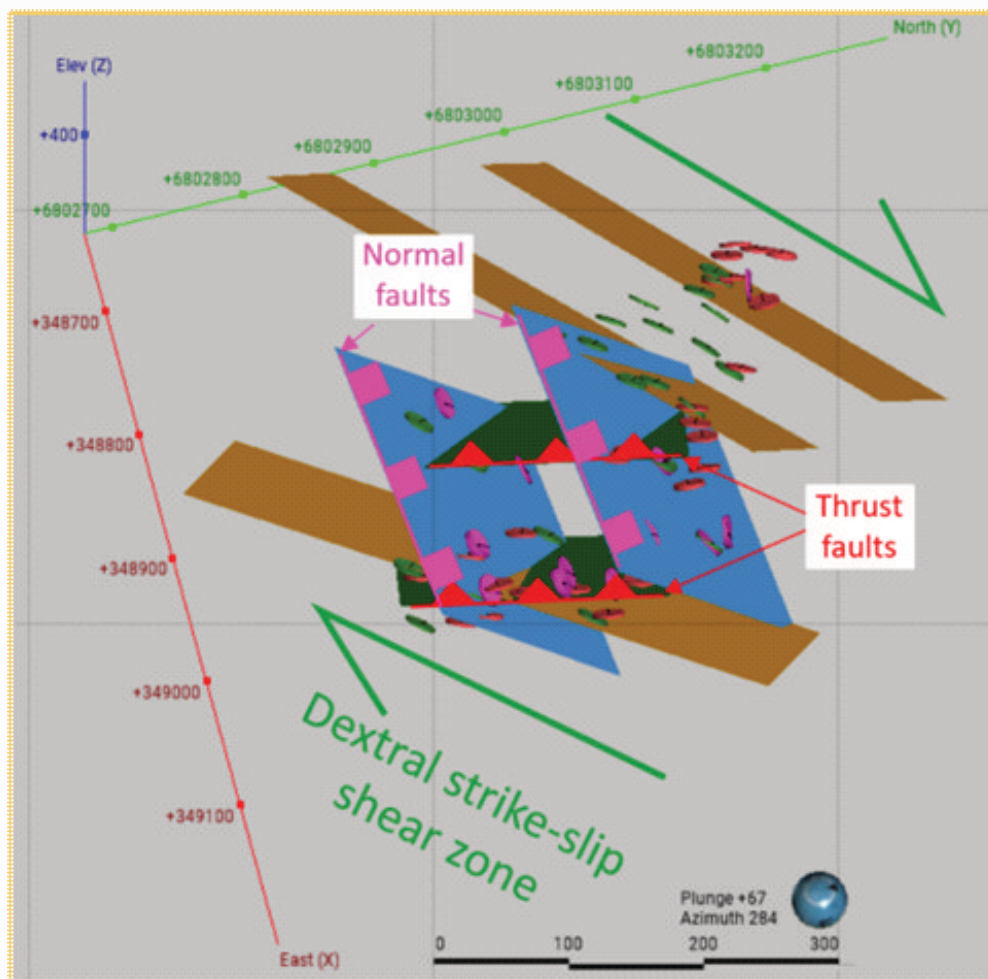


Figure 10 - Oblique view of the Golden Crown Model looking steeply down towards the west. Digitised surfaces representing the major structures, best-fit to the highest concentration of surface structural orientations (disks colour-coded to match strike-slip (green), thrust (red) and normal (pink) defining finite planes and hangingwall-footwall contacts of wide zones of deformation.

Follow-up 1:500 mapping discovered that the main outcropping quartz vein was coincident with the position of the rhyolite-rhyodacite contact determined through lithological modelling and optimally oriented to create space for deposition of mineralised fluids. For the large part the quartz vein was milky and bucky except at intermittent intervals where WNW-dipping shear zones (thrusts) crosscut the vein and the external shear zone foliation merged with laminations in the quartz. These sections of laminated quartz were the only mined portions of the reef. There is also a significant change in the orientation of thrust shears as they track across reactivated contacts and is demonstrated by a significant number of poles to foliation that are defined by a small circle distribution indicative of rotation (Fig. 9).

The dominant relationship between the multiple shear zone components surrounding mineralisation manifests in the field as a change in the orientation of thrust shears from steeply WNW-dipping on approach to a contact/vein, to moderately NW-dipping on the vein periphery, to shallowly N-dipping within the vein (Fig. 11).

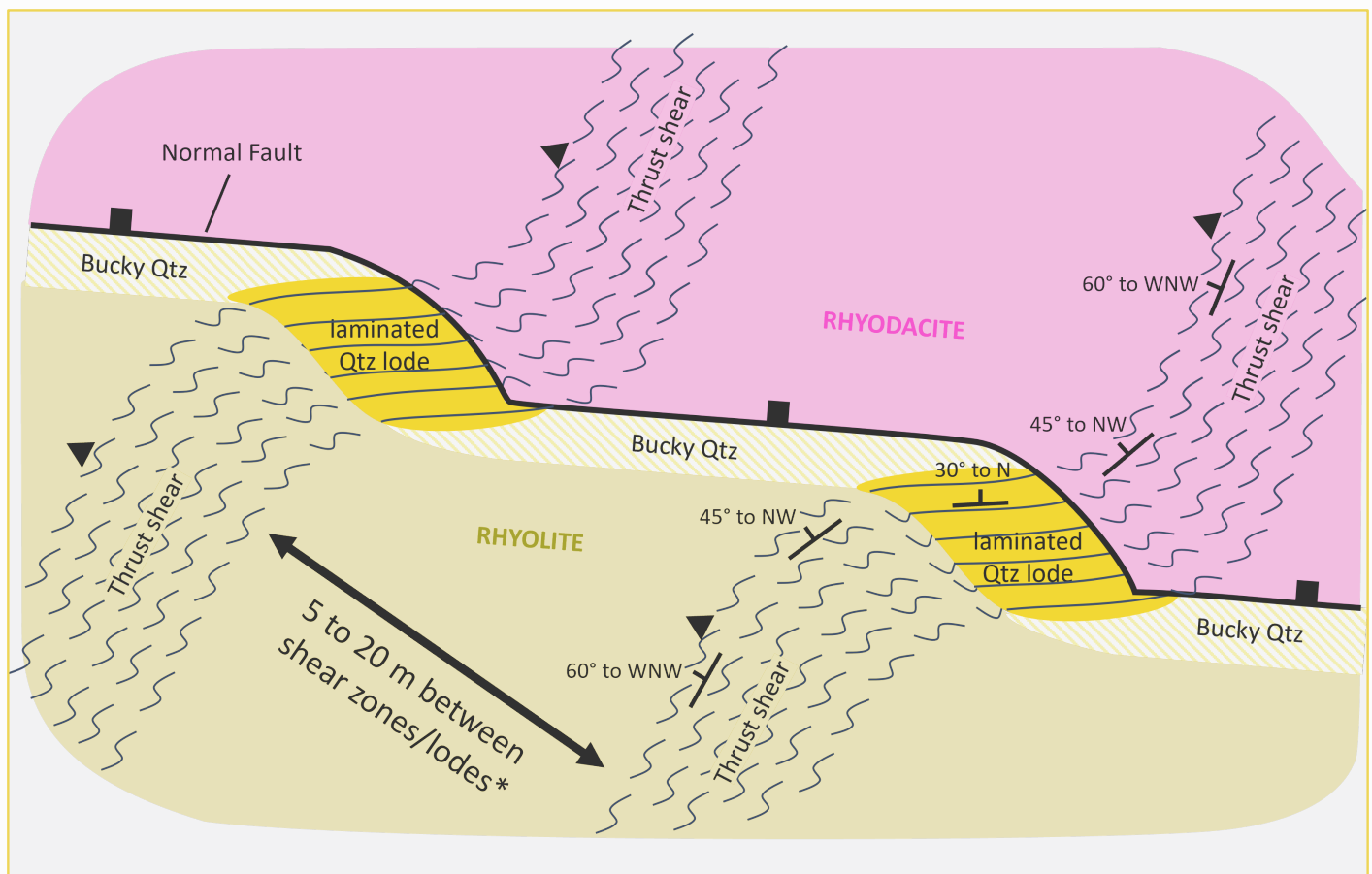


Figure 11 – Cartoon of the geometry and mechanisms needed for lode formation at Golden Crown. Normal fault coincident with contact in volcanic stratigraphy (Rhyolite-Rhyodacite). Change in orientation of thrust shears shown by dip (in degrees, e.g. 60°) and dip direction (e.g. WNW) between 5 to 20 metres spacing between minor thrust shears and individual lodes within a greater 50 metre panel enveloped between major thrusts

Rather than apparent clockwise rotation within the plane of the normal fault, stretching along extensional detachments coupled with shearing along the thrust plane formed most of the foliation asymmetries, with only the strongest partitioning of normal shear producing a shallowly N-dipping foliation. Nevertheless, the pre-existing weakness set-up by interflow volcanic contacts acted as a catalyst for fluid overpressure, ensuing brittle dilation and a preferential site for gold deposition within an otherwise predominantly transpressional, ductility-deformed rock package.

The spacing of minor thrust shears and associated formation of laminated sections of veining is between 5 and 20 metres depending on the size of the shear zone and corresponding quartz lode. Major thrust shears were mapped at 50 metre spacing and one of these intervening mineralised panels encompasses all quartz lodes mined from surface. Another 50-metre panel to the west encompasses most of the significant drilling intercepts including the pattern drilled by Melita and Jubilee. Altogether this constitutes a minimum 100-metre-wide target corridor following the dip of the volcanic stratigraphy.

Alteration

After finalising the lithology model, the VNIR data was revisited to differentiate hydrothermal alteration signatures from primary mineralogical responses. Three classes of zonation were identified (Fig. 12):

- 1) Secondary sulphate mineral (alunite) is a weathering product of sulphide and forms a sub-horizontal blanket within the regolith profile but is laterally restricted to around the rhyolite-rhyodacite contact. A good potential indicator to understand the extent of mineralisation at depth.
- 2) Reduced, acid alteration combining diagnostic tourmaline, chloritoid as well as anomalous As and continuous logged sulphide forming a domain cited at or above the dacite-rhyolite contact from 60m depth. Directly beneath currently known gold mineralisation. Fe-chlorite (reduced-acid) shear zones also coincide but are laterally more continuous outside this domain. An indicator of fertile shear zone-hosted fluids and reducing agent for gold precipitation.
- 3) Oxidised alteration within and surrounding the newly classified granodiorite zoned from proximal haematite-Mg Chlorite to magnetite halo. Key oxidised fluid source in the system along with lamprophyres to set-up REDOX gradient for precipitating a potentially significant volume of gold.

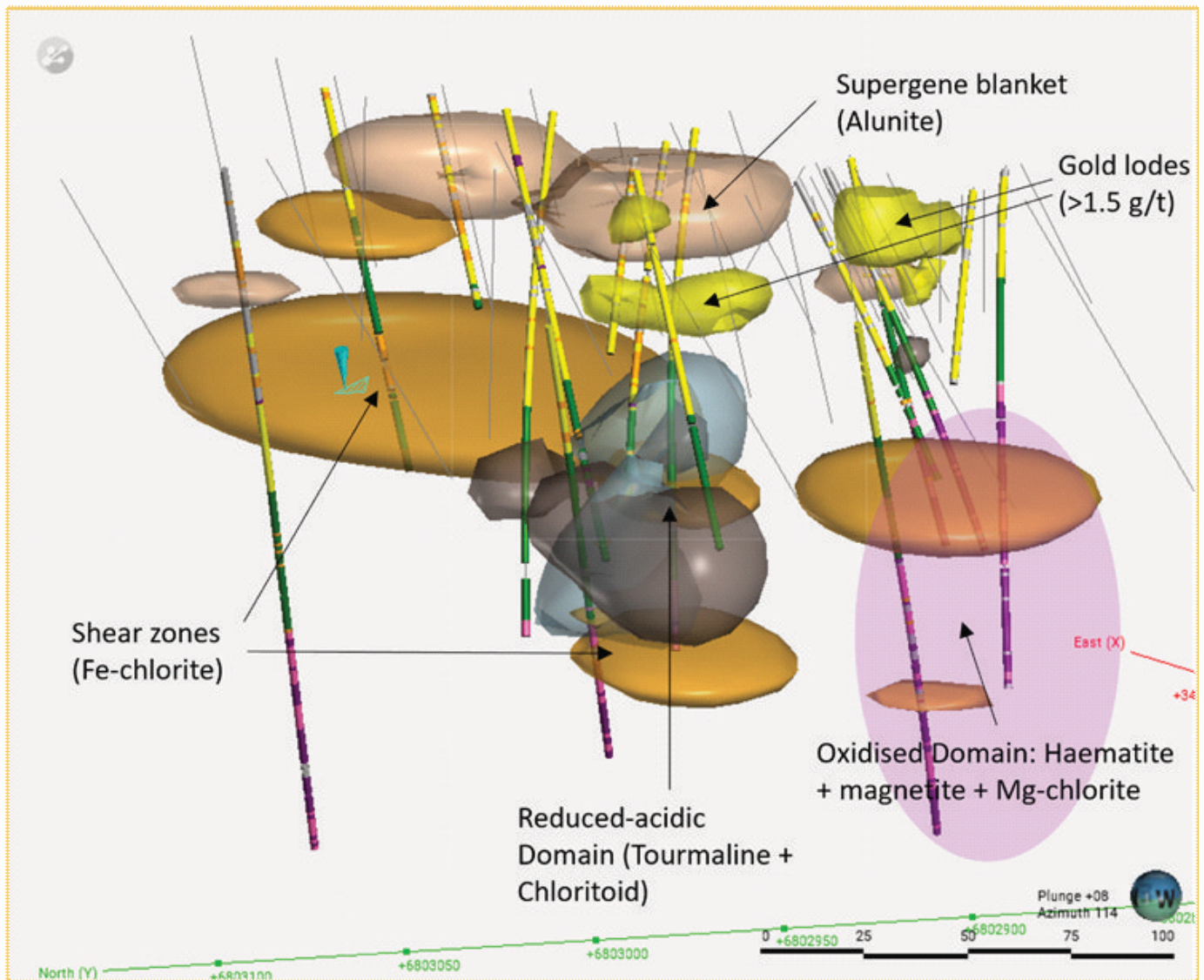


Figure 12 – Cross-section looking obliquely east at drill hole traces coloured by clustered hyperspectral. Semi-transparent volumes made from interpolated VNIR and gold assays defining alteration domains and gold lodes for reference.

Model Outcomes and Targeting

The Golden Crown prospect is hosted within a compressional jog in a NW-dipping dextral shear zone cross-cutting a felsic to mafic volcanic complex. North-dipping stratigraphy in combination with WNW-dipping thrusts control the location and geometry of shallowly north-plunging lodes (Fig. 2). Within the shear zone mineralised envelope, gold lodes are distributed along or at least parallel to lithological contacts arranged in an en echelon fashion in response to intersection of stratigraphy by deforming shear zones. Mined veins at surface and high-grade intercepts in drilling demonstrate multiple stratigraphic horizons for lode formation, most of which is insufficiently drill tested.

Open stopes at surface and intermittent high grade drill intersections demonstrate elongated, pod-like shoots that individually show limited plunge extent, but collectively constitute a substantial volume. To effectively delineate an inferred resource, the proposed drill spacing of (12m x 8m) takes precedence from Jubilee infill RC drilling that delineated the most continuous mineralised zone. Continuation of this pattern to the NE on lines parallel to enveloping hangingwall and footwall thrusts will infill and extend known

mineralised horizons. The drill pattern is designed to intercept new lode positions according to the predicted model (Fig. 2). The newly defined volcanic stratigraphy ordered from the currently known base starts with dacite, overlain by rhyolite and subsequently rhyodacite, basalt and andesitic dacite.

All the currently intersected mineralisation is hosted within the rhyolite and to a lesser extent the rhyodacite, although the basalt is particularly poorly tested.

A lamprophyre dyke validated by multi-element geochemistry was intersected in hole 22GCRC012 and traced through to surface on the north-eastern side of the prospect. The close spatial association between lamprophyres and many significant gold deposits in the Eastern Goldfields bodes well for upgrading the prospectivity of Golden Crown beyond a small high-grade deposit. Furthermore, a coarse-grained feldspar-phyrlic rock intersected in the deeper drilling that demonstrates a core of Mg-chlorite (TerraSpec) and haematite (visual) alteration with an outer zone of disseminated magnetite, potentially represents a biotite/hornblende granodiorite and an important oxidising agent in the precipitation of gold at Golden Crown. Future exploration efforts at Golden Crown will investigate the significance of this proposed magmatic system and understand the potential for upscaling the target.

References

- Davis G. (1993) Jubilee Gold Mines N.L. Malcolm Project Leonora, WA. ELs 37/225, 302; PLs 37/3494, 3509, 3515, 3545, 3559, 3590-91, 3606, 3704, 3977-78, 4081, 41v01-02, 4275, 4300-02, 4374, 4534, 4622. Annual Mineral Exploration Report No. 45 for the period Nov. 1992 – Nov. 1993 (A39883)
- Evans W.J (1998) North Limited. Report No. WA98/15S. Annual Mineral Exploration Report on the Malcolm South Joint Venture Tenements. Leonora Project, for the period 1/12/96 to 30/11/97. (A53682).
- Kelly L.F. (1954) List of cancelled gold mining leases which have produced. Mines Department of Western Australia.
- Wilkinson D.P. (1988) Melita Mining N.L. Malcolm Dam Prospect, Mt Margaret Mineral Field, WA. Mining Lease M37/114. Annual Mineral Exploration Report for the period Aug. 1987 – Aug. 1988 (A25350)

Competent Person

The information in this report that relates to Exploration Targets, Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr. Paul Maher, a Competent Person and a full-time employee of the company who is a Member of The Australasian Institute of Mining and Metallurgy in addition to being a shareholder in the company. Mr. Paul Maher has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Paul Maher consents to the inclusion in the report of the matters based on the information compiled by him, in the form and context in which it appears.

The company is not aware of any new information or data that materially affects this release.

Forward Looking Statements

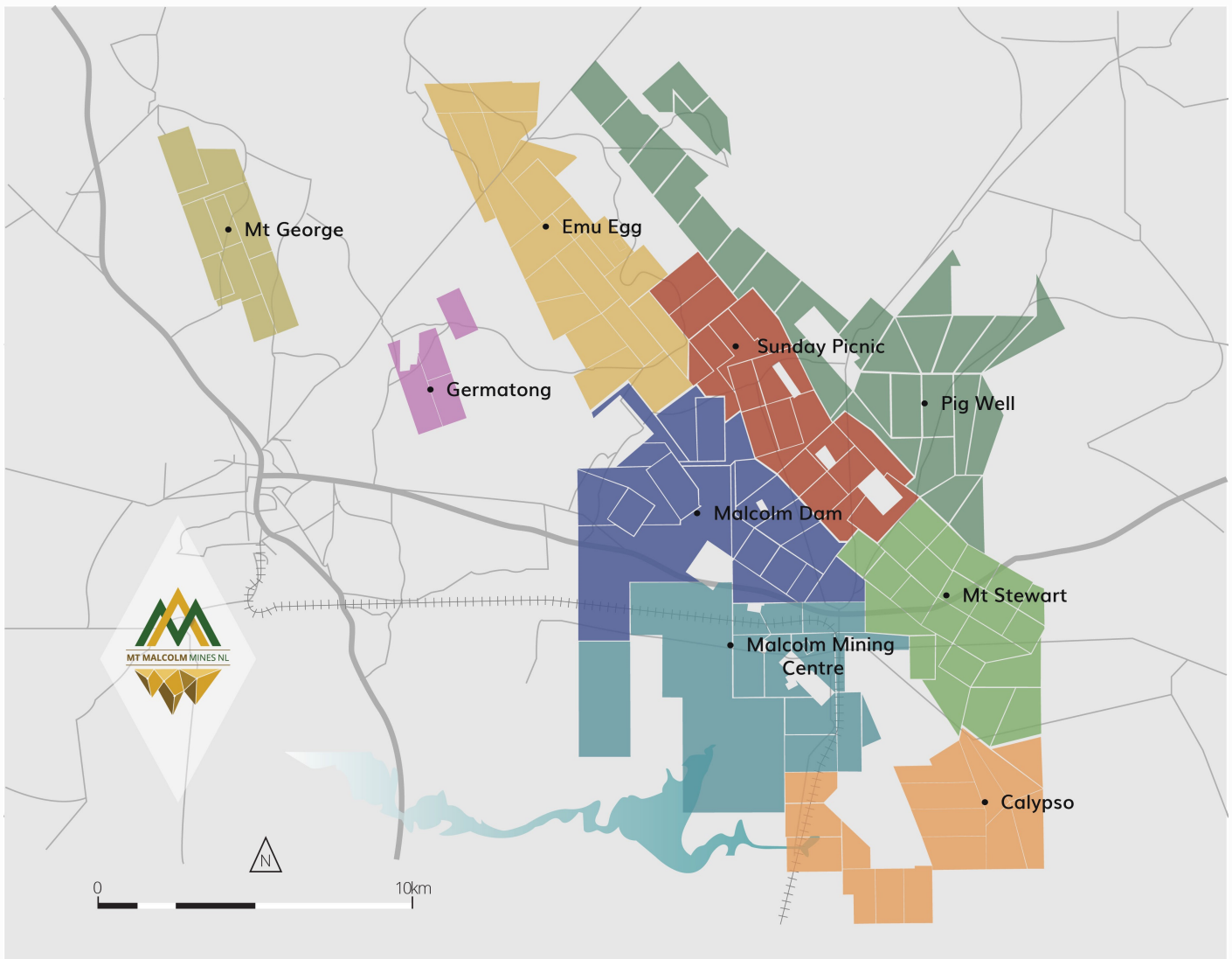
Forward-looking statements are only predictions and are not guaranteed. They are subject to known and unknown risks, uncertainties and assumptions, some of which are outside the control of the Company. Past performance is not necessarily a guide to future performance and no representation or warranty is made as to the likelihood of achievement or reasonableness of any forward-looking statements or other forecast. The occurrence of events in the future are subject to risks, uncertainties and other factors that may cause the Company's actual results, performance or achievements to differ from those referred to in this announcement. Given these uncertainties, recipients are cautioned not to place reliance on forward looking statements. Any forward-looking statements in this announcement speak only at the date of issue of this announcement. Subject to any continuing obligations under applicable law and the ASX Listing Rules, the Company, its directors, officers, employees and agents do not give any assurance or guarantee that the occurrence of the events referred to in this announcement will occur as contemplated.

his announcement has been authorised by the Board of Mt Malcolm Mines NL.

For further information please contact:-

Trevor Dixon

Managing Director trevor@mtmalcolm.com.au



About Mt Malcolm Mines NL:

Mt Malcolm Mines NL is managed by competent and experienced industry professionals with a strong background in mineral exploration and administration of mineral assets. Additionally, the company has many professional associations with and access to some of the industry's best corporate and mining resource consultants.

The projects and properties are in areas with a proven track history of exploration success and significant mining and production of gold and other minerals. The holdings are centred around the locale of Malcolm near Leonora WA. The Company believes that it's prospects offer excellent potential for the discovery of new economic mineral deposits and within the next (2) two years intends to:

- Conduct regional geological mapping and geochemical sampling programs.
- Undertake focused and systematic exploration and scientific research programs.

- Aggressively seek exploration and development opportunities of other targets and quality projects that meet the Mt Malcolm Mines development objectives and where appropriate and if opportunities arise, examine the possibilities of joint ventures and other related business and commercial opportunities that will create value and wealth for all its shareholders.

The 'Malcolm' Gold Project has the potential to host economic gold mineralisation and opportunities exist to further enhance and build on the substantial exploration data assembled to date. The project represents a large-scale district gold play.