Geological Assessment of Soil Geochemical Data
EL27629 and EL27642 UTOPIA, NT
for Oneva Exploration Pty Ltd, Alice Springs NT

Compiled by

MJ Pankhurst, Giaxiom Pty Ltd, Sydney, NSW
(Geochemical & field reconnaissance interpretation)

&

RJ Armit, PGN Geoscience Pty Ltd, Melbourne, VIC
(Structural images, maps & plot graphs)
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Summary of work rationale and work completed
Exploration license EL27629 + EL27642 (henceforth referred to as Utopia) were visited in August 2012. The project area comprise back-to-back licences ~200 km N-NE of Alice Springs. The field visit was part of an effort to link field and regional geologic data with partial leach soil geochemical data generated by Oneva Exploration Pty Ltd (Oneva). This forms a geologically valid rationale for further targeted work. Oneva’s range of target commodities include Au, W (+Ag) and REE.

The field visit was also designed to aid in exploration targeting and efficiency, by adding external knowledge and project review to Oneva’s understanding of local geology and mineralising systems. Another primary motivation for geologic consultation was to provide a geochemical and geographical information system (GIS) overview of the tenements prospectivity in terms of geodynamic processes and mapped geology.

Two days were spent assessing the local geology in areas sampled by Oneva. The assessment focussed upon searching for evidence for geologic systems conducive to significant mineralisation, namely thermal, chemical, redox and rheological gradients in the local vicinity of high response ratios of elements of interest. Additional areas were briefly visited upon recommendation of the consulting geologist. Oneva supplied published geological maps, previous exploration data and current analytical data.

Oneva’s partial leach sampling geochemical data was recalculated (by individual element) to local backgrounds (determined by field visit, a key outcome of linking the geochemistry to field data). Phase 2 recalculated datasets, expressed as response ratios (RR), are considered more robust than phase one orientation sampling due to localised differential dataset size and as such, a high degree of confidence is assigned to phase 2 grid sampling anomalies generated by Oneva.
Element RR maps for all groups of elements (precious, base metals, HFSE, LILE, REE etc) were generated and those that show the most identifiable trends were highlighted for focussed attention.

Summary of prospectivity and recommendations
Each of Oneva’s current projects (at Utopia and Epenarra) are located on major Proterozoic basin margins and are underexplored for mineralisation in each of the targeted regions. At Utopia, Oneva has generated high priority targets through detailed soil sampling that invite further work to test the extent and absolute abundance of Au anomalies, secondary W, Ag and REE. The most advanced Au targets are the highest priority, due to the current high price of Au. It is considered due to the Au activity in recent months (market/conferences/investment groups), that other elements of interest should be of secondary concern and to focus upon gold.

Future work is suggested to generate specific infill soil sampling around Au anomalies and rock chip sampling to advance these areas from “Au-in-soil” and “loosely-bound-Au-in-overlying-cover” to “Au-in-rock” (proof of mineralisation). In addition, very detailed interpretation of local geophysical data to provide more constraints on the sub-cropping geology could be undertaken. This review and additional sampling will allow confident drill targeting and efficient first-phase drill testing. A simplified economic auger drilling campaign of shallow (8-10 m) holes is recommended, save that Oneva may opt for a more precise aircore or RC method if budget allows. Drilling would be an ideal next phase of exploration to test the highest priority targets in each project area from follow-up infill work.

Assessment of regional geology
Oneva has selected regions of underexplored Palaeo- to Neoproterozoic basement across major basin margins of the Northern Territory to explore. Portions of the Palaeo- to Mesoproterozoic Arunta block (Aileron Province) within Utopia, unconformably overly Neoproterozoic- Palaeozoic Georgina Basin margins and are favourable regional target areas for significant mineralisation. In these zones, crustal rocks of differing lithology are more often juxtaposed than within stable basin or craton interiors and this juxtaposition can result in high thermal, chemical (including redox) and rheologic gradients across which fluids may interact (e.g. Chi and Savard, 1998). Importantly, margins accommodate strain associated with tectonic stress by the development of lithosphere scale structures, which are often the site of later reactivation. These controlling structures, across which high gradients of the types summarised above occur, are key zones for localised differential pressure distribution, resulting in dilational sites favourable for ore mineral precipitation (e.g. Groves et al., 1987; Morey et al., 2007).

Magnetic intensity data - structural context
A number of NW striking domains are observed at Utopia, separated by sigmoidal shaped boundaries providing evidence for sinistral transpressional kinematics. These domains correlate to mapped geology and in the project area a lens of Proterozoic basement is observed between two slices of Georgina Basin (shown in Figure 1). Within this lens is the highest priority target in the project area: Sandover Central Au anomaly, which also
strikes NW. At regional scale, the stair-stepping and asymmetrical sigmoidal shapes indicate sinistral shearing has occurred and has influenced the present day definition of the basin margins. Dilation zones in response to this transpression are predicted to occur at the local level.

Assessment of local surface geology
The rocks of the Alcoota 1:250,000 geologic map sheet covering Utopia has been subject to deep chemical weathering followed by landscape aridification during the Neogene. The resultant outcrop in Oneva’s target areas are generally sparse and comprises scattered low undulating pegmatite rises and sandy clay surfaces. Bedrock is most often indicated by the dominant rock type present in float where geologic relationships are tractable and form the focus of the assessments below.

Prospect Appraisals
Palaeoproterozoic gneisses, schists and amphibolites and potassic granites of the Aileron Province form basement to siltstone/sandstone dominate Georgina Basin sediments in the Utopia tenements. Each outcrop visited conformed to a ~northwest-southeast striking foliation and intrusive rocks (dolerite/pegmatite/granite) also followed this trend. Small ridges up to a few metres in height above the dominant sand and clay plains comprise muscovite-biotite gneiss and calcic amphibolite (epidotised/chloritised dolerite), with cross cutting NW-SE trending pegmatite dykes. These dykes attracted small scale historical mining for tantalite, however, exploration in the early 80’s including pitting and lines of shallow drilling (~50 m intervals, drilled to refusal; max a few m) adjacent to pegmatite outcrops, failed to indicate an economic Ta resource. Historical reports indicate gold was not tested across Oneva’s ground.

The trend of the dykes is similar to that of the local Aileron/Georgina margin best represented by aeromagnetic contrast (Figure 1), suggesting this may be a site of dilation and thus favourable for mineralisation.

At the Sandover Central area, Au anomalies extend on, around and between outcropping pegmatite dykes along strike from potassic granites. At one section, a ~500 metre length of identified Au RR zone strikes northwest, parallel to the regional structural grain.
Due to extensive homogenous cover (partial leach technique highly applicable) and no previous Au analysis, elevated results are extremely encouraging and suggest Au is associated with the dykes or related zone of alteration, supported by the concomitant Th and Ce anomaly (fluid mobile and water proxy respectively), see Figure 2. Co is used as a control. The pegmatites may be related to the intrusion of potassic granites along strike to the northwest. If this is the case, a large shear-intrusion system may be present at depths amenable by RC drilling.

![Localised surface ironstone lag, section of Rubicon Prospect Area – anomalous gold](image)

The Rubicon site was briefly visited (limited outcrop). Below 5x background in Au is shown in Figure 3. Both U and Th return concomitant anomalous values which suggest little fractionation of these two elements have occurred and their signals are due to relative levels of deflation (significant iron lag and quartzite was observed here).

![Section of Wild West Prospect Area](image)

The Wild West site was not visited because of time constraints. It is noted that occasional sections of a historical diamond drillhole (Centamin) at 436760 E 7539640 N was re-sampled by Uramet Pty Ltd and CRA but not for Au or REE. This drillhole is located directly to the north of Oneva’s N-S low level Au anomaly and is therefore of interest. Figure 4 shows Ag behaves similarly to Au, which is decoupled from Ce (water proxy) and...
HFSE (Zr), suggesting background sulphide may be the greatest influence on the precious metal distribution. Levels are overall low however.

**Additional sites at Utopia**

‘Hot’ granites that define radiometric highs (Otter Exploration NL), outcrop parallel with regional structures (e.g. pegmatite dykes, predominant foliation) and were visited to search for alteration systems. An intrusive contact with fine grained metamorphic rocks was noted on the western limit of outcrop in two sites visited. Small scale hydrothermal breccias were observed within the granite adjacent and parallel to this contact.

**Oneva’s Data − Targeting**

Targeting by Oneva to date across the licenses consists principally of using landscape anomalies and/or satellite imagery anomalies. The methods employed hold great value in helping to identify underlying geology and structure and are considered a complimentary technique to that of macroscale prospectivity based on identifying geologic systems.

**Partial Leach Geochemistry**

This method of orebody detection has a number of attractions, such as an increased success rate of detecting—and definition of—mineralisation under cover (Mann et al., 2005). The method is most useful and the resulting data most cogent, when as many degrees of freedom (natural conditions such as soil type, soil depth, cover depth, age of landscape etc) are as constant as possible. This is because the method measures accumulated loosely-bound ions rather than the elements of a total digest and in this way, a statistically robust dataset identifies samples with anomalous ions.

The landscape, regolith and soil nature across the licenses include a range of observable differences, however, observations within this data do make sense in terms of mapped geology, such as the distribution of REE with granites.

**Recommendations for data treatment and future work at Utopia:**

Sandover Central geochemistry links well with outcropping pegmatite. Li, Zr, Nb etc behave as predicted. Interestingly, Au also shares this trend and can be confidently attributed to pegmatite intrusion. Trenching and/or shallow drilling (8-10 m with ~50 m spacing) is recommended to test absolute abundances at depth. On Oneva’s Utopia tenements visited and after correlating the geochemistry data to field data, Sandover Central is the highest priority for focussed work. The pegmatites may have a genetic relationship with intrusive potassic ‘hot’ granites. These form radiometric highs along strike between clusters of anomalous Au at Rubicon and the optimistically attractive Au anomalies identified at Sandover Central.

The possibility of a larger Au halo in these areas can be tested by sampling with close spacing in SW-NE directed bands between the hot granite outcrops, as described above.

Diamond drillhole (CMS2) directly north of Wild West to be assessed (drillcore) and sampled for Au appropriately.
Utopia and Epenarra Areas References:

Figure Summaries:

**Figure 1. Utopia Magnetic Map**
A number of NW striking domains are observed, separated by sigmoidal shaped boundaries and provide evidence for sinistral transpressional kinematics. These domains correlate to mapped geology. The project is situated within a lens of Proterozoic basement between two slices of Georgina Basin. Within this lens is the highest priority target in the project area: **Sandover Central** Au anomaly, which also strikes NW. At the regional scale the stair-stepping and asymmetrical sigmoidal shapes indicate sinistral shearing has occurred and has influenced the present day definition of the basin margins. Dilation zones in response to this transpression are predicted to occur at the local level.

**Figure 2. Sandover Central**
Geochemical summary of Sandover Central: This map demonstrates the variation in Au RRs proximal to pegmatite intrusions. A strong association with fluid mobile elements (Th, Ce) is in contrast with trace metals (Cr).

**Figure 3. Rubicon**
Geochemical summary of Rubicon: This map shows that low Au RRs do not correlate with low Ag, suggesting in this area natural variation is detected, rather than mineralisation. U and Th are not fractionated, indicating deflation is an important surface process here.

**Figure 4. Wild West**
Geochemical summary of Wild West. Au RR are sympathetic with Ag, although do not reach very high values. Both fluid mobile (Ce) and high field strength elements (Zr) increase with proximity to outcropping rocks, indicating a strong depth-to-basement control.
Figure 1: Utopia EL’s – Magnetic Overview

Location of Oneva sampling grids with NW-SE striking Au anomalies

- A Sandover Central
- B Rubicon
- C Wild West

MGA94 (GDA94) Zone 53

Data: Re-gridded 100m reduced to pole first vertical derivative magnetic intensity, sun shaded (45° from NE).
Figure 2: Sandover Central – Utopia

Geology source: NTGS (100,000 map)
MGA94 (GDA94) Zone 53

Phase-2 Ionic Soil Anomaly/Summary Plots above Local Background

Au RR
- 8 to 13.7 (2)
- 5 to 8 (2)
- 2.5 to 5 (22)
- 0.5 to 2.5 (62)

Th RR
- 15 to 36.1 (7)
- 5 to 15 (22)
- 2.5 to 5 (24)
- 0.3 to 2.5 (35)

Ce RR
- 15 to 38.3 (5)
- 5 to 15 (18)
- 2.5 to 5 (20)
- 0.2 to 2.5 (45)

Co RR
- 10 to 21.9 (3)
- 5 to 10 (9)
- 2.5 to 5 (29)
- 0.4 to 2.5 (47)

(RR: Response Ratio above background)
Figure 3: Rubicon – Utopia

Geology source: NTGS (100,000 map)

Phase-2 Ionic Soil – Anomaly/Summary Plots above Local Background

**U RR**
- 20 to 49.2 (1)
- 5 to 20 (14)
- 2.5 to 5 (7)
- 0.8 to 2.5 (20)

**Th RR**
- 20 to 40.5 (6)
- 5 to 20 (12)
- 2.5 to 5 (7)
- 0.4 to 2.5 (17)

**Ag RR**
- 7 to 8.6 (1)
- 2.29 to 2.5 (4)
- 0.8 to 2.5 (37)

(RR: Response Ratio, above background)
Au RR (Phase 1 only)
- 5 to 9 (3)
  (not resampled Ph-2)

Au RR, all Phase 2
- 5 to 5.56 (3)
- 2.5 to 5 (10)
- 0.66 to 2.5 (20)

Ag RR
- 5 to 16.6 (2)
- 2.5 to 5 (7)
- 0.9 to 2.5 (24)

Zr RR
- 8 to 8.14 (1)
- 5 to 8 (1)
- 2.5 to 5 (8)
- 0.46 to 2.5 (23)

Ce RR
- 10 to 12.6 (1)
- 5 to 10 (3)
- 2.5 to 5 (9)
- 0.1 to 2.5 (20)

RR: Response Ratio above background

Figure 4: Wild West – Utopia

Phase-2 Ionic Surface Soil – Anomaly/Summary Plots above Local Background

CMS2: (Drillhole #2) * Woodgreen 100K Map Notes
1970 – Centamin diamond drillhole.
1 off 4 holes totalling 1780m, targeted by refraction seismic via 158 line km of resistivity, 31 x 300m spaced electrical readings. Anomalous Zn, Pb.
Mid 1990’s – CRA: Selected interval edge grind of Centamin core, CRA assays not released but confirmed Cu >3 x background, elevated Ag, As, Co, Mo, Ni, Pb, Zn.