Exploration Annual Report
EL 43/1992 – Melba Flats
April 2020 to April 2021

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On behalf of
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PO Box 62
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Abstract

A 250m diamond drill hole has been recently completed on the Melba Flats exploration licence. This hole (MF108) was designed to target potential extension of the Nickel Reward prospect to the north east. MF108 is yet to be logged and assayed but has intercepted unmineralized intrusives and sulphidic shales.

A review of previous exploration including geological, geochemical, and geophysical data was undertaken, and preliminary 3D modelling of historic drilling and old workings has commenced.

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1.0 Introduction

1.1 Exploration Rationale

The primary objective of Dundas Mining Pty Ltd (as primary operant of Allegiance Mining Pty Ltd's tenements) is to add to their nickel inventories as part of the Avebury Nickel Mine re-start project.

1.2 Location and Access

EL 43/1992 covers 6 square kilometers and is located approximately 6 Km to the north east of Zeehan (see Figure 1.2.1 below). Access to the license area is good with the Murchison Highway providing regional access immediately to the east and a series of gravel roads and forestry tracks within the tenement.

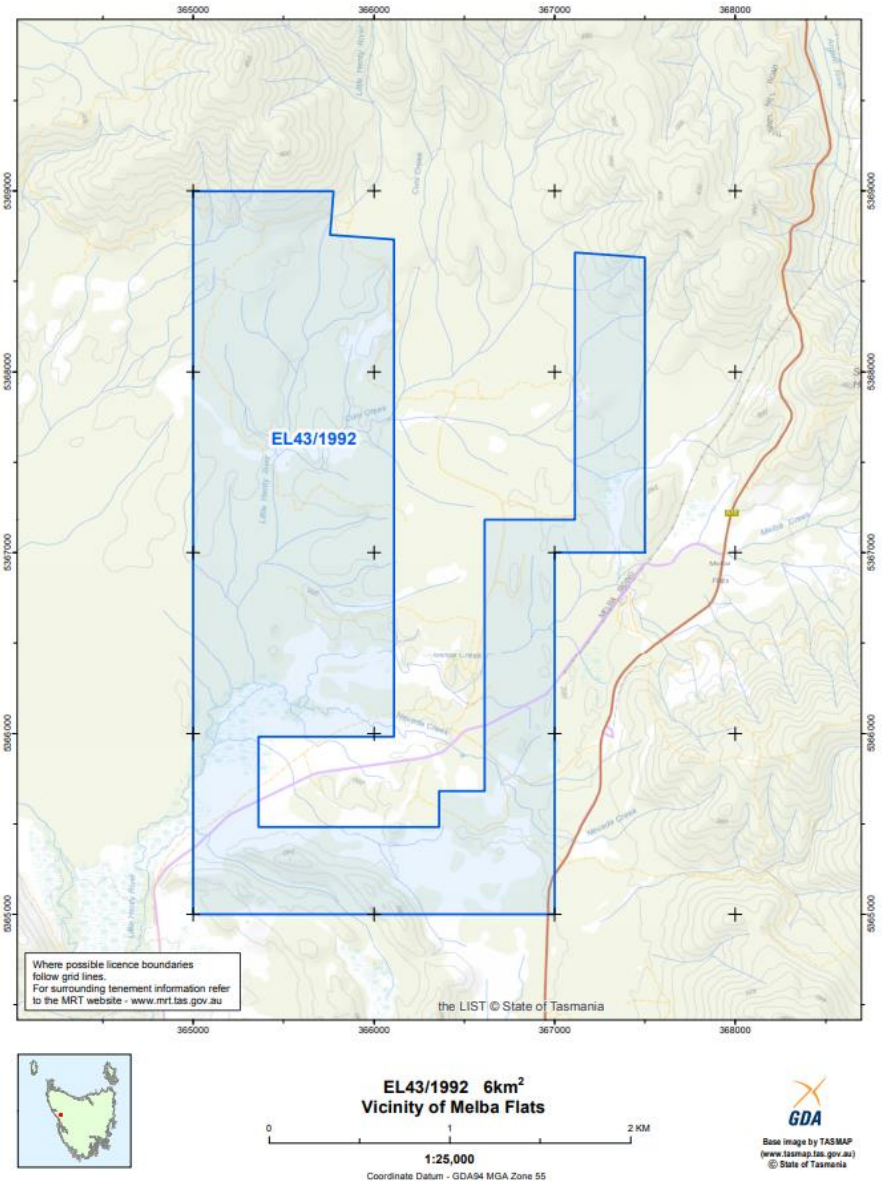

Figure 1.2.1 EL 43/1992 Location (Courtesy of LISTmap)

1.3 Land Status and Usage

Land usage within the tenement area is classified as Permanent Timber Production Land Zone managed by Sustainable Timber Tasmania.

1.4 Tenure

The Melba Flats tenement, EL 43/1992, is a category 1 exploration licence, held by Allegiance Mining Pty Ltd and managed by Dundas Mining Pty Ltd on behalf of Lottah Mining Pty Ltd. The tenement was originally granted to CRA Exploration in 1992 and was acquired by Allegiance Mining Pty Ltd in 1997. In 2008, Zinifex Ltd acquired the tenement through the take-over of Allegiance, and later that year merged with Oxiana to become OZ Minerals, who in turn sold the tenement to MMG Limited in 2009. Lottah Mining Pty Ltd acquired the tenement in 2018.

1.5 Geology

A series of comprehensive summaries of the regional and deposit specific geology have been outlined in numerous previous reports. Geology is also summarised below in section 4.1.

2.0 Summary of Previous Work

2.1 Prior to Current Tenement

Complete examinations and summaries of historic work carried out on the tenement area have been outlined in previous reports. A summary table of activities carried out in the area is below.

Year	Company	Tenement	Activities
1893			Discovery
1894			Nickel Reward Workings
1912	Dundas-Cuni Mining Company		North Cuni Workings begun
	Copper-Nickel Prospecting Syndicate		Vaudeau workings begun
1914	Dundas-Cuni Mining Company		North Cuni Workings closed
			South Cuni Workings closed
	Copper-Nickel Prospecting Syndicate		Blowfly workings closed
			Mosquito workings closed
			Vaudeau workings closed
1926	Department of Mines & Explosives		Investigating prospectivity
1929			Genet's working opened
	Copper-Nickel Mining Company		North Cuni workings re-opened
1930			Drilling
	Government Department		Drilling Recommendations
1931	Copper-Nickel Mining Company		Genet's workings closed
1932			North Cuni works closed
1933	Government Department		Summary Report
			Work Proposal

			Economic Evaluation
1938	Australian Nickel N.L.		Vaudeau workings re-opened
1940	Gold Mines of Australia		Drilling
1948	Lead Nickel Mining Company		Vaudeau workings closed
1951	Bureau of Mineral Resources		Geophysical Surveys
1952	Government Department		Summary Report
	Eagle Metals N.L.		Nickel revival
1953			Drilling
1955(?)	Montana Silver-Lead Company N.L.		Flotation Tests
1956	Government Department		Drilling Report
1956(?)	Montana Silver-Lead Company N.L.		Flotation Tests
1957	Bureau of Mineral Resources		Geophysical Surveys
	Government Department		Geological & Thin Section Report
			Core Logging Report
			Core Logging Report
			Core Logging Report
	Montana Silver-Lead Company N.L.		Drilling
1957(?)	Montana Silver-Lead Company N.L.		Ore Investigation
1958(?)	Rio Tinto		Drilling Review
1960			Magnetometer Survey
			Aerial mag
			Soil Sampling
1965	EZ	EL2/1965	Magnetometer Survey
			Magnetic Susceptibility Tests
			Drilling
1966			Drilling
1967			Magnetometer Survey
1968			Drilling
			Magnetometer Survey
			Geochemical Surveys
1969			Petrology & Mineralogy
1970			IP-Resistivity Survey
1971			Detailed Geological Mapping
			Geochemical Soil Sampling
			Turam Electromagnetic Surveys
			Magnetometer Surveys
1972			Diamond Drilling
			Geochemical Survey
1973			Soil Survey
			Magnetometer Survey
1975		SPL127	Review of Cuni Deposits
1977	CSR	EL15/1976	Mineralogical/Geochemical Appraisal
1978			Drainage Sampling
			Mineralogical Examination and Petrographic survey
1979			Bedrock sampling (Auger)
			Soil Sampling
			Drainage Sampling
1980			Diamond Drilling
			Petrology
1982			Soil Sampling (Auger)
			Magnetics
			VLF-EM
			Infil aeromagnetics
1983			Soil Sampling

			Drainage Sampling
			Magnetics
			VLF-EM
			DIGHEM
1984			Reduction of Licence area
			Ground Magnetic Survey
			CSAMT
			VLF-EM Resistivity
			Geochemistry
1985			Fixed Wing Magnetic Survey
			Ground Magnetic Survey
			Diamond Drilling
			Soil Sampling
			IP Survey
1986			Licence renewed
1987			Relinquished Licence
			Minor thin section work
1988	Tas Dep Mines	SR1987 No 216	Gravity Survey
1993	CRAE	EL43/1992	Fixed Wing Airborne TEM (QUESTEM) Survey
			Review of Tasmanian Mines Department Gravity Data
			Soil Sampling
			Rock Chip Sampling
			Petrology
1994			Diamond Drilling
			Petrology
			Whole Rock Geochem (Dolerite)
			Rock Chip Sampling
			Soil and Bedrock sampling (Auger)
			Bedrock sampling (Wacker)
			Ground PROTEM Survey
			Ground Magnetic Survey
			IP-Resistivity Survey
			Heliborne magnetic and Radiometric Survey
1995			Drilling review
			Diamond Drilling
			Soil Sampling
			Honours Project (Phil Greenhill)
			Heliborne magnetic Survey
1997	Rio Tinto		Application for partial Licence surrender
			Joint Venture agreement with Allegiance
1998	MRT		Archaeological Survey
1999	Allegiance		Diamond Drilling
2000			Downhole Geophysics
			Geophysics
			Geophysics Interpretation Report
			Petrology
			Aerial Photography
			Photogrammetric Plans
2001			Diamond Drilling
			Gradient Array IP Survey
			Grid Establishment

2002			Diamond Drilling
			Trenching
			Sampling
			Outcrop Mapping
2003			Diamond Drilling
2004			
2005			
			Resource Estimation
			Petrology
			Drill Hole Collar Surveys
2006			Gradient Array IP Survey
			Evaluation of Geophysical Data
			Data Review
2007			Diamond Drilling
2007			Mining Lease Application
2008		EL43/1992, ML2/2007	Diamond Drilling
			Trenching
			Aerial Photography
2009	OZ		Diamond Drilling
2010	MMG	RL5/2009	Geochemical Investigation
		EL43/1992	3D Magnetic data Inversion
	CRH	EL20/2002	Soil Survey ("Melba Flats" South), Airborne EM
2011	GHD (MMG)	EL43/1992, RL5/2009	Botanical survey and fauna habitat assessment
	MMG	RL5/2009	Aerial LIDAR
2012		EL43/1992, RL5/2009	Aerial LIDAR
		EL43/1992	Minor geochemical work
2014		EL43/1992, RL5/2009	Aerial LIDAR
			Photogrammetric Survey
2015			Masters Project Completion

Table 2.1: Summary of Previous Exploration

2.2 During Current Tenement

Lottah Mining Pty Ltd has carried out comprehensive literature and tenement reviews during the current tenement.

3.0 Exploration Completed During Reporting Period

A combined review of EL 43/1992 Melba Flats and RL5/2009 Melba Siding previous exploration, a target review, data base audit and preliminary modelling was undertaken by contract geologist Darin Evans from December 2020.

In March of 2021, Dundas Mining Pty Ltd engaged Wholecore Pty Ltd to carry out a small diamond drill program on the Melba Flats exploration licence and the Melba Siding retention licence (WPA21/6) targeting potential extension of the Nickel Reward prospect mineralization to the north-east.

Wholecore mobilized to Melba Flats on the 23rd of March and had successfully drilled the first 250m diamond drill hole (MF108) by the 7th of April.

Due to an unanticipated change in exploration logistics strategy on a corporate level, the second half of the drilling program (planned for RL5/2009 immediately following MF108) was postponed indefinitely and final demobilization of the Wholecore rig was complete by the 28th of April.

Rehabilitation of the MF108 drill site was completed on the 28th of April 2021.

4.0 Discussion of Results

Contract geologist Darin Evans was engaged to review previous literature on exploration including geological, geochemical, and geophysical data, review and audit the available data/database, review target areas and undertake preliminary 3D modelling. The literature review summarised previous exploration as tabled above.

Geology

The dominant lithology of the area is Crimson Creek turbidite sequence of mudstones, siltstones, sandstones and volcaniclastics of Cambrian age. Strike is generally north-south with a moderate 45º to 50º dip to the east. Further north towards Genet's Winze, the strike trends towards the northeast and the dip becomes more south-easterly, the change relatively abrupt and may be due to faulting (figure 4.1). These sediments are intruded by gabbroic sills or dykes genetically associated with the Serpentine Hill and Razorback Ultramafic bodies to the east, and dip approximately 50º to the east. They often exhibit chilled and brecciated margins. To the south near Nickel Reward and Deveraux the situation becomes more complex, and it is not clear how the strata are oriented. It is possible to model a steeply dipping SSE series of planar gabbro layers (figure 4.2), but this "feels" contrived and there is as much data that does not conform to the model as that which does. Rather than just intrusive sills of gabbro, is there a combination of sills and dykes like those interpreted further north at Genet's Winze?

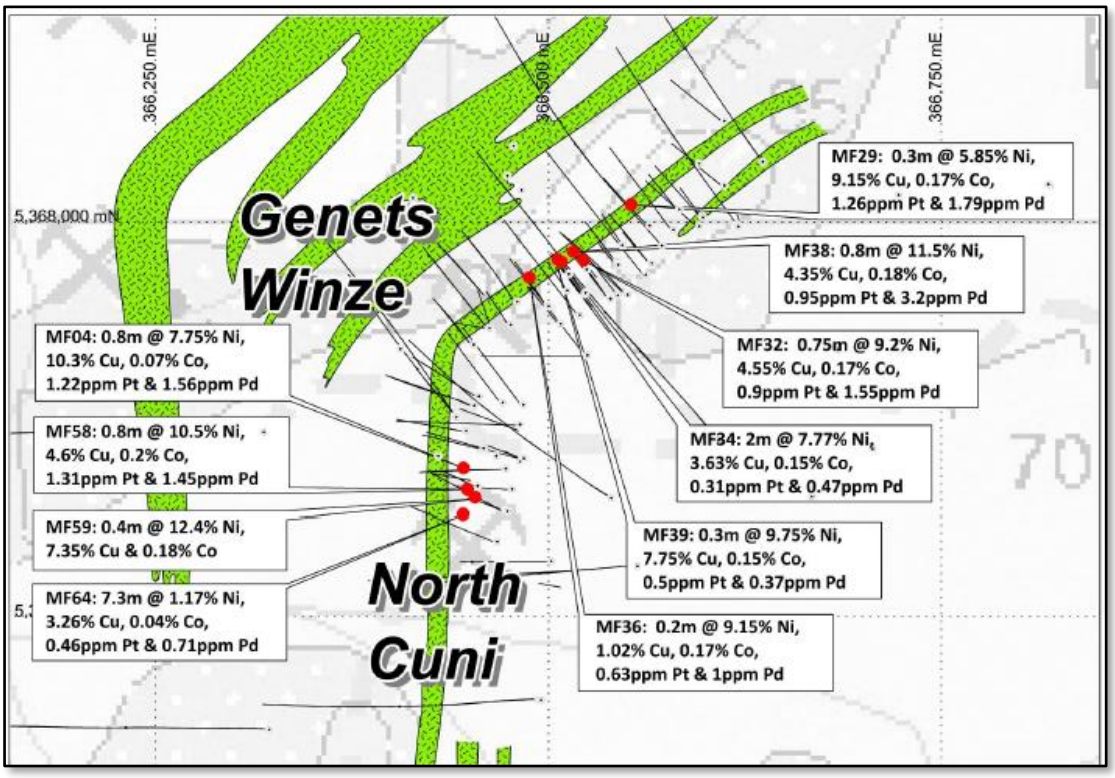

Figure 4.1: Generalised interpreted geology map of gabbroic sills in the Genet's Winze North Cuni area with drillhole intercepts.

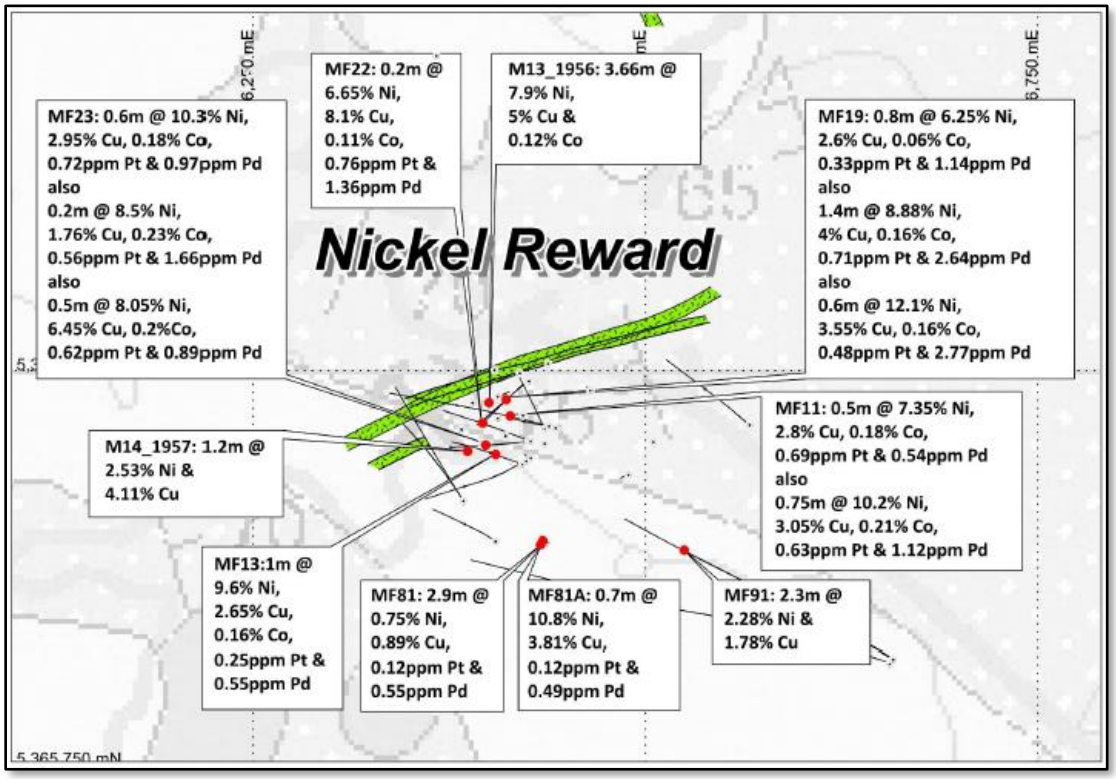

Figure 4.2: Generalised interpreted geology map of gabbroic sills in the Nickel Reward area with drillhole intercepts.

Mineralisation is principally pentlandite-millerite-chalcopyrite-pyrite. Significant cobalt, gold and PGEs are associated with either (or both) nickel and copper sulphides. Late-stage carbonate alteration and veining are accompanied by coarse galena-sphalerite-chalcopyrite occurrences. The body of existing petrologic data suggests the Melba Flats sulphides are hydrothermal replacement deposits, derived from a larger magmatic source (McGilvray, 2012).

Mineralisation largely occurs as disseminated Ni and Cu sulphides within lenses 0.5 to 5m thick situated in the lower levels of some of the gabbro sills, however some of the earlier drilling by CRA was remarkable for some outstanding intercepts of massive sulphide, which later drilling has failed to intercept. Reasons given were drill placement and proximity to, but this would indicate the poddy nature of sulphide mineralisation at Melba Flats. Notably the concentration of sulphides appears to increase towards the west i.e., up dip. Previous mining and drilling indicate that the lenses may have limited depth extent, however, due to the likelihood the sulphides are hydrothermal in origin, a larger magmatic source at depth has been suggested (Crawford, 2010).

Other reports suggest the mineralisation is associated with gabbro dykes and persistent to greater depths than previously interpreted. It is also mentioned that Au, Pt, Pd and Co accompany and vary in accordance with the Ni-Cu tenor (Wighton, 2010). This needs to be substantiated. Wighton also discusses target generation given the MMG takeover and reassessment of all data. Deeper drilling targets using Magnetic Inversion TMI (2009) – a single anomaly is discussed and referred to, but no images or further details given. Further potential for discovery of surface targets is low.

Geochemistry

Some geochemical work has been undertaken in the past. In 2010, Crawford and Keays studied a number of samples from 5 different gabbroic sills at Melba Flats and observed that the sills had formed from high MgO magmas with 12-13% MgO which is typical for all major Ni-Cu-PGE deposits, the magmas had undergone a significant amount of crustal contamination, the contaminant having been well homogenised with the magma indicating the magma was high energy and dynamic, the PGE contents of the sulphides indicating they are of magmatic origin. Keays et al later argued that the nickel from the Avebury deposit was hydrothermal in origin and had been sourced from magmatic Ni-Cu-PGE sulphides at depth. With Avebury and Melba relatively close to each other, it was suggested that the two systems may be linked. If Keays et al are correct, the nickel in the Avebury deposit may be sourced from disseminated sulphides, which would be more reactive in a hydrothermal fluid than massive sulphides, suggesting that more massive sulphides may be left at depth.

MMG geologists determined that the Melba Flats gabbro ranged between N-MORB and E-MORB composition but tending towards N-MORB, with a greater intensity of alteration associated with intrusion, and greater degree of nickel sulphide mineralisation when compared to the gabbro at Rayner (McGilvray, 2012). In 2015, work by MMG geologists suggested a working hypothesis that

two types of sulphides appear to be present at Melba Flats; those with high Pd contents formed from S-undersaturated magma and those with low Pd levels formed from S-saturated magma variably depleted in platinum group elements. This hypothesis was tested with by a Masters thesis completed at Melbourne University by Marcus Phua, supervised by Professor Reid Keays. A summary of the results of the research shows that the lithic greywacke of the Melba area had typical post Archean Australian sedimentary rock rare earth abundance; the maximum deposition age was around 576Ma; the Melba sediments are similar to the Avebury sediments with similar REE patterns, identical detrital Zircon age distribution and maximum ages; the Melba gabbro formed from primitive magma of high MgO content with a sub-alkaline tholeiitic affinity; The mafic intrusions of Melba have flat LREE patterns whereas the Avebury mafic intrusions of depleted LREE patters; there was little difference in petrogenetic trace patterns between Melba unmineralized intrusions and the mineralised intrusions; massive sulphides are of magmatic origin formed at depth with sulphides partially resorbed during transportation by high MgO magma, with moderate R factors, high Ni/Cu content and high PGE content and low S/Se ratios, whereas disseminated sulphides are of crustal origin formed during transportation and the interaction of sulphur bearing crust, have low Ni/Cu and PGE content but high S/Se ratios (Wallace, 2015).

Geophysics

The Melba Flats area has had numerous geophysical investigations over the years from ground magnetometer surveys, IP surveys and airborne surveys. The Electrolytic Zinc Company of Australasia Limited (EZ) conducted several geophysical surveys from as early as 1965 when a magnetometer survey identified an anomaly in the northern portion of the EL known as the western anomaly or anomaly “A” which was subsequently drilled but was unsuccessful in locating a recognisable source of the anomaly. Further ground surveys were carried out in 1969 and following petrographic analysis, the source of the anomaly was determined to be disseminated magnetite within tuffaceous sandstone.

Later work by Rio Tinto saw a fixed wing TEM (QUESTEM) survey flown but data was of poor quality due to a number of factors. The most prominent response was 2km strike length anomaly to the east corresponding to a 50m wide carbonaceous black shale. Poor conductors were associated with pods of massive sulphide at Nickel Reward, Vaudeau and North Cuni abandoned mines. A 300m moderate conductor was interpreted to extend south-east of the Nickel Reward deposit. In 1988 the Tasmanian Mines Department gathered gravity data which indicated a 0.6mgal anomaly coincident with mineralised gabbro west of the North Cuni Mine.

In 1995, Rio conducted ground PROTEM surveys over the North Cuni - Genet’s Winze area which identified several conductors, the most prominent corresponding to the “eastern sill” massive sulphide lode, with parallel conductors to the west that were not followed up with testing. An orientation IP-Resistivity survey was also undertaken in the same are. The weak chargeability responses from known mineralisation were too weak to distinguish from

background noise. In the same year, Rio also flew a heliborne magnetic and radiometric survey, the output confirming eastward dipping strata with trends towards to northeast in the northern extents and south-southeast in the southern extents of the area.

Later work has been reported and summarised in an evaluation for Allegiance Mining NL by Steve Webster Pty Ltd in 2006.

Modelling

Simple planes were constructed with vertices attached to drill holes with assay values broadly similar in value; in some cases, these very closely followed the orientation of the enclosing gabbro sills, but in other examples were transgressive across strata – this could be due to incorrect modelling or revealing a structural mineralisation emplacement. At Ni Reward there is a complex 3D structure, and a simple planar representation may not be the best outcome. The gabbro units were also modelled with some difficulty due to software limitations. The resulting structures showed reasonable agreement with previously interpreted local geology maps.

Initial modelling of the gabbro appears to identify three different stratigraphic styles; the central area between Ni Reward and Genet's appears to strike N/S, dips east at 45 degrees and is relatively planar; in the north near Genet's there is an abrupt alteration of strike to more NE and a slight upright open cylindrical folding with dip to the SE; to the south near Deveraux and Ni Reward the situation becomes more complex and it is not clear how the strata are oriented. It is possible to model a steeply dipping SE series of planar gabbro layers, but this "feels" contrived and there is as much data that does not conform to the model as that which does. Rather than intrusive sills of gabbro, do we have a mix of sills and dykes? Modelling of the Melba Flats area is ongoing.

Database

The prospect drillhole database (combined EL 43/1992 and RL 5/2009) was audited revealing inadequacies, with some of the historic holes only having collar and depth data, and drill hole identification generally not reflective of collar location but tending to be genetic for Melba Flats, i.e., M or MF prefix. The main drilling focus has been to the north (Genet's Winze and Cuni) and to the south at Nickel Reward and Devereaux where success has been highest in intercepting nickel and copper sulphides. Assay data includes Ni and Cu for all drill holes, with partial data collection for other elements; nine holes (MF24 to 26; MF97 to 99; and MF104 to 106) have full 16 element suites. Note that the vast majority of drilling is located in the Melba Siding RL – only 6 drill holes have collars within the currently defined EL of Melba Flats.

Field Work

MF108 was drilled to planned depth (250m) without intersecting significant sulphide mineralisation. Mafic intrusives were intercepted amongst the Cambrian turbiditic sediments but contain no visible mineralisation. Sulphidic black shales are intermittently common in MF108 and multiple phases of carbonate veining are commonly visible in apparent association.

MF108 has not been completely geologically logged or assayed yet and further discussion of results is premature without the complete processing of the core.

5.0 Conclusions

The Melba Flats and Siding areas remain of great interest as a significant potential source of nickel and require significant additional investigation. Given the somewhat sporadic nature of the shallower mineralisation a significant and concerted level of effort will be required to discern the relationships between the known prospect, not to mention the possibility of substantial source mineralisation at depth.

6.0 Future Exploration

Pending renewal of tenement, future work will consist of further diamond drilling to the south-east of Nickel Reward to test an EM anomaly and possibly to the south at the Nevada prospect. Database auditing and validation will be on-going. 3D modelling of geology and mineralisation of the Melba area will progress as well. A trial flora sampling program as an alternate low impact to soil sampling will also be considered.

7.0 Environment

Initial reconnaissance of the Melba Flats and Siding areas led to identification of gorse along the Nickel Reward/Scout Camp access road off the Murchison Highway. Initial spraying of the noted invasive flora species was carried out on the 11th of March and subsequent follow up is intended.

Unintended disturbance of a University of Tasmania camera trap early in the reconnaissance led to the identification of at least one feral cat residing in the area. Dundas personnel have initiated a consultative process with the University of Tasmania and Parks & Wildlife to determine the best course of action, but the preliminary plan is to attempt use of Tasmanian devil traps to catch the feral feline residents (so as to avoid potential injury to inadvertently captured devils that can be associated with the use of wire feral cat traps).

Rehabilitation of the MF108 diamond drill site was completed on the 28th of April 2021. Preparation for the drill site on the Melba Siding retention licence was not carried out and as such does not require any rehabilitation.

8.0 Expenditure

Expenditure Category	Cost ($)
Geology	14,507
Geochemistry	0
Geophysics	0
Remote Sensing	0
Drilling	67,670
Gridding	0
Land Access	550
Rehabilitation	300
Feasibility Studies	0
Other	0
Administration	8,300
TOTAL	91,326

9.0 References

Crawford A., Keays R.R. 2010. Magmatic Ni-Cu Sulphides in Mafic Sills at Melba Flats, Western Tasmania - A Geochemical Investigation. University of Tasmania, Monash University.

MacDonald, G., (2020). Annual Report on Exploration EL 43/1992 “Melba Flats” April 2019 to April 2020. Lottah Mining Pty Ltd (on behalf of Dundas Mining Pty Ltd).

McGilvray, C.T., (2012). Annual Report on Melba Flats EL43/1992 for the period ending 30th April 2012. MMG Limited.

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Wighton, K., (2010) Annual Report on Retention Licence RL5/2009, November 2010. MMG Limited.