

Darlot Gold Mine

Category 89 – Works Approval Application

Attachment 3B – Additional Information

Date	Purpose	Drafted	Reviewed	Approved
16/04/2025	To support Category 89 – Works Approval Application			

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1. INTRODUCTION

1.1 Background

Darlot Mining Company Pty Ltd is the owner and operator of Darlot Gold mine (Darlot). Alluvial gold was first discovered in the Darlot area in 1894, but largely ceased by 1920. In 1988 modern open pit mining commenced with the Darlot Pit. Underground mine operations commenced in 1995, following the completion of open cut mining and have remained in continuous operation until today. Access to site is via the Goldfields Hwy sealed road for 62km from Leonora and then northeast for 58km along the unsealed Darlot road.

1.2 Proposed Activities

This application specifically seeks approval for construction of the following activities as shown in Figure 2:

- Inert landfill to be located in an existing mining pit void; and
- Putrescible landfill (biosolids disposal pit).

Information presented in this document provides further information on proposed activities to assist DWER in assessment of the application.

1.3 Project Location and Land Tenure

Darlot is located 110km north of Leonora (Figure 1) on the Melrose Pastoral Lease, currently owned by Darlot Mining Company in the Yandal Greenstone Belt of the north-eastern Goldfields. Air access to the region is provided via the Leinster and Leonora airports.

1.4 Occupier of Premises

The occupier and proponent at Darlot is Darlot Mining Company Pty Ltd (ACN 165 235 245) which is a wholly owned subsidiary of Vault Minerals. Darlot Mining Company is the holder of all tenements associated with Darlot.

All compliance and regulatory requirements regarding this assessment document should be forwarded to:

Table 1: Applicant Details

Name:		
Company:	Darlot Mining Company Pty Ltd	
Title:		
Address:	Suite 4, Level 3, South Shore Centre	
	85 South Perth Esplanade	
	South Perth, Western Australia 6151	
Postal Address:	As above	
Phone:		
Email:		

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Figure 1: Location Plan

1.5 Other Approvals

Darlot has an exemption from the Department of Water and Environmental Regulation (DWER) under the *"Environmental Protection (Gold Extraction Operations) Exemption Order, 1993"*, and as such is exempt from the requirements of Sections 52 to 64 (Inclusive) of the Environmental Protection Act 1986, and is not required to hold a DWER Operating Licence.

A review of the exemption criteria has been undertaken, and all exemption requirements remain in place. Darlot currently has the following registrations issued under Part V of the EPA Act 1986:

- Category 89 Putrescible Landfill Site R2352/2013/1 (Issued 19 July 2013); and
- Category 85 Sewage Facility R2351/2013/1 (Issued 19 July 2013).

No clearing of native vegetation approvals are required to be sought from the proposed activities as the footprints will occur in previously disturbed areas as shown in Figure 2.

1.6 Environmental Protection Regulation Categories

This application is for prescribed activities as listed in Table 2.

Table 2:	Darlot	prescribed	activities	categories

Category No.	Category Description	Production Capacity	Infrastructure
89	Putrescible landfill site	Less than 5,000 tonnes per annual period	Putrescible landfill (biosolids disposal pit) Inert landfill (including tyres) into exhausted mining void



1.7 Timeline for Development

The Darlot life of mine is estimated to be +5 years, supported by ongoing exploration activities. The initial landfill construction is proposed to commence in July 2025.



Figure 2: Infrastructure layout

2. EXISTING ENVIRONMENT

2.1 Climate

2.1.1 Rainfall and Temperature

Climate in the Darlot region (Murchison) is arid. Mean annual rainfall is 235 mm, with annual rainfall recorded at the closest meteorological station (Laverton: Station 1205) ranging from 57.8 – 552.2 mm (Figure 5). Rainfall is influenced by decaying tropical cyclones that originate off the northwest coast in summer, and anticyclonic systems in winter. Evaporation greatly exceeds rainfall with annual average pan evaporation rate for the Leonora region at 2.8 m. The hottest month is January with an average maximum temperature of 37°C; however, temperatures above 40°C occur frequently when the hot and dry, north to northeasterly winds prevail. Winters tend to be cool; July is the coldest month with average maximum and minimum temperatures of 18.4 and 6.1°C, respectively (BOM 2024).

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Figure 3: Climate Date (Leonora Station 012046 - BOM 2024)

2.1.2 Wind

The prevailing wind direction at the Leonora BOM Site (number 012046) is from the east, especially in the morning. Winds are between 0 and 10 km/h for approximately 20% of the time and greater than 10 km/h for the remaining time in the morning. Wind direction in the afternoon is predominantly from the east, however, can be from the west and slightly stronger from this direction. The 9 am and 3 pm wind rose for the Leonora Meteorological Site (number 012046) are shown in Figure 6 and Figure 7 respectively.



Figure 4: 9am Wind Rose (Leonora Station 012046 - BOM 2024)





Figure 5: 3pm Wind Rose (Leonora Station 012046 - BOM 2024)

2.2 Geology and Soils

The Darlot gold deposit is located in the Yandal greenstone belt of the Yilgarn Craton, Western Australia. The Archaean Yandal greenstone belt comprises a lowermost banded iron formation, extensive basalt and dolerite sills, ultramafic rocks, intermediate to felsic volcanic rocks and variable clastic sedimentary rocks. It is dissected by early north-northwest trending shear zones which also form the greenstone belt margins, as well as north–south trends within the belt. Other significant gold deposits within the belt include Bronzewing, Jundee and Mount McClure (MBS, 2016).

Seventeen Land Systems associated with fourteen soil types have been recognised as being represented on Darlot tenements, based on descriptions presented in the Australian Soil Resource Information System (ASRIS 2016). In comparison with other gold mines in the northeastern Goldfields region, soil types and associated landforms at Darlot are variable and diverse.

2.3 Topography

The Darlot operation is positioned at the southern end of the Yandal Greenstone Belt in the northeastern part of the Yilgarn Archaean Craton located in the Eastern Goldfields Province of Western Australia.

Much of the land surface covering the Darlot Mine area is low relief and gently undulating with an average elevation of 455 metres above mean sea level. The landscape consists mainly of regolith covered terrains comprising in situ and transported material formed by long-lived weathering, erosional and depositional processes typical to the Eastern Goldfields Province. The cover profile lies directly over what is predominantly Archaean bedrock and ranges in thickness from 5-40 metres with the thickest profiles consisting of transported material located in the northwestern part of the Darlot tenure. The regolith material that makes up much of the low relief landforms is variable in type and formation and may consist of in-situ weathered bedrock, consolidated transported material or unconsolidated transported material.

Drainage networks are well developed across the tenure including the project area and are largely responsible for the formation of the extensive sandy plain alluvial landforms which dominant the landscape. The area lacks any permanent watercourse or natural water bodies and movement of rainwater when in sufficient amount is coordinated by small ephemeral creeks.

2.4 Water

2.4.1 Surface Hydrology

Surface runoff in the Darlot area is apparent only after heavy, high-intensity rainfall events. Surface water flow during these events is in a south-westerly direction, and some to the north via ephemeral drainage lines. There are no permanent creeks or other surface water bodies in the vicinity of this application.

2.4.2 Groundwater Quality

Groundwater in the Darlot area is saline to highly-saline (17,000-50,000 mg/L TDS) and is not suitable for human consumption or stock use. Groundwater levels in the vicinity of the proposed landfill areas are +10m below ground level and will not be impacted by the proposed activities.

2.5 Flora and Vegetation

Studies have been completed on flora and vegetation for the Darlot project, as follows:

- Mattiske Consulting & Ninox Wildlife Consulting (1995) Flora, Vegetation and Vertebrate Fauna of the Darlot Project Area. Report for Darlot Gold Mine, May 1995; and
- Mattiske Consulting (2010) Flora and Vegetation Survey of Darlot Gold Mine for proposed Tailings Facilities. Report for Darlot Mining Company, 2010).

There are no Environmentally Sensitive Areas (ESAs), Threatened Flora or Threatened or Priority Ecological Communities nearby to the Project. The nearest priority Flora species (Grevillia inconspicua P4) is located 2.5 km southeast of the proposed activity area. The proposed works will not impact any significant flora, fauna or communities. Additionally, no clearing is required as part of this works approval application as the proposed works make use of existing disturbed areas.

2.6 Social Environment

2.6.1 Land Use

The Darlot project is within the northeastern Goldfields region of Western Australia. This area contains Unallocated Crown Land, reserves, pastoral and mining leases and is used for grazing, tourism, exploration and mining.

2.6.2 Reserves

The Darlot Project lies within the Goldfields Proclaimed Groundwater Area and approximately 90km north of the northern boundary of the Leonora Water Reserve (LWR). The Weebo Aboriginal Reserve is located 16km to the West of Darlot as shown in Figure 1.

2.6.3 Pastoral Lease

The project is located on the Melrose Pastoral Lease (N049788), ownership of which is Darlot Mining Company Pty Ltd.

2.6.4 Native Title

The Darlot Native Title Claim (National native Title Tribunal file no. WCD2022/002) is recognised over the Darlot Project Area and administered by the Watarra Aboriginal Corporation.

2.6.5 Heritage

Several Archaeological and Ethnographic surveys have been undertaken of the Darlot project area as part of the mining approvals process since 1988. The key studies include:

• A Report of an Archaeological Survey of a Proposed Mineral Exploration Project at Darlot, Prepared for Barrick (Darlot) Ltd, Wayne Glendenning, April 2011

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- A Report of an Ethnographic Survey of a Mineral Exploration Project at Darlot with the Koara People, Wutha People and the Harris Family, Prepared for Barrick (Darlot) Ltd, Wayne Glendenning, April 2011
- A Report of an Ethnographic Survey of the Proposed TSF4 Project at the Darlot Mine, Northeast of Leonora, Prepared for Barrick Gold Ltd, Wayne Glendenning, June 2010
- A Report on the Archaeological Survey of the TSF3 Area at Darlot, Western Australia, Prepared for Homestake Gold of Australia LTD, by Thomas O"Reilly on Behalf of Macintyre Dobson & Associates Pty Ltd, August 2001
- A Report on the Archaeological Survey of the Discharge Pipeline Corridor at Darlot, Western Australia, Prepared for Homestake Gold of Australia LTD, by Thomas O"Reilly on Behalf of Macintyre Dobson & Associates Pty Ltd, August 2001
- Report on a work area Clearance Survey of Exploration Licence E37/420 South of Darlot Gold Mine, Prepared for Placer Dome Exploration by Macintyre Dobson and Associates Pty Ltd and Tom O"Reilly, February 2000
- A Report on a Work Clearance Survey of the Exploration Licence E37/420, South of Darlot Gold Mine, W.A., Prepared for McIntyre Dobson and Associates by Tom O"Reilly, February 2000
- Report on an Archaeological Site Survey of the Centenary East Area, Darlot, Western Australia, Prepared for Plutonic Operations Limited by Macintyre Dobson and Associates Pty Ltd and Steven O"Reilly, May 1998
- Report on an Aboriginal Site Survey of the Centenary Area, Darlot, Western Australia, Prepared for Plutonic Operations Limited by Macintyre Dobson and Associates Pty Ltd and Steven O"Reilly, April 1997
- Report on the Ethnographic Survey of the Darlot Gold Mine Target Areas, Darlot, Prepared for Forsayth NL by Macintyre Dobson & Associates Pty Ltd, August 1995
- Archaeological Report on "Horseman"s Gully, Site at Darlot, Prepared for Forsayth N.L by C.J Mattner, May 1995
- Archaeological Survey of the New Road Alignments at Darlot, Prepared for Forsayth N.L., by C.J. Mattner, June 1995
- Report on an Ethnographic Survey of the Proposed Diversion Road at the Darlot Gold Mine, Darlot, Prepared for Forsayth N L, by Macintyre Dobson & Associated Pty Ltd, September 1995
- Report Archaeological and Ethnographic Survey of the Darlot Project, North Leonora, Prepared by Sundowner Minerals by P. Veth and P. Moore, May 1988.

Nearby Heritage sites are shown in Figure 6 below. The closest known heritage site is Horsemans Gully (site ID 510) which is approximately 1.7km from the proposed landfill. No known heritage sites are impacted by the activities of this application, based on information from previous heritage surveys of the Darlot project. Any potential heritage sites identified will be managed in accordance with existing site requirements and tenement conditions.

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Figure 6: Heritage and priority flora locations in proximity to proposed activities

3. PROJECT OPERATIONS

3.1 Key Characteristics of the Activities

The following table details the category 89 (landfill) characteristics. Detailed information on each aspect is provided in the following section.

Table 3: Darlot Project Key Characteristics

Characteristic	Description	
Tenements	M 37/155	
Tenement Holder	Darlot Mining Company Pty Ltd	
Life of Project	+5 Years	
Putrescible Landfill (Biosolid Disposal Pit)		
Footprint	0.01ha	
Cell Size	20 meters x 8 meters	
Depth	4 meters below ground level (mbgl) Base of excavation pit will be greater than or equal to 5 m from groundwater at all times	
Safety Bund height	Minimum of 0.7 m safety bund around perimeter of excavation	
Covering of Waste	Following each disposal event	
Firebreak	At least 3 m in width around the boundary of the site	
Capacity	Up to 20 tpa	
Inert Landfill		

Footprint	0.41 ha
Cell Size	The approximate tipping area is 90 m x 40 m
Depth	The mining void that is proposed to be filled with inert waste is 4 m in depth.
Safety Bund height	Minimum of 1.3 m heigh windrow at the mining pit void tip head at all times.
Covering of Waste	Monthly
Firebreak	At least 3 m in width around the boundary of the site
Capacity	Up to 500 tpa

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3.2 Landfill Information

Currently, the Darlot Project has a registered Category 89 landfill (R2352/2013/1 - Issued 19 July 2013) that accepts approximately 1,500 tons per annum tpa of putrescible waste, with a registered capacity of up to 5,000 tpa.

The proposed Category 89 landfill sites will be developed and managed in accordance with the Environmental Protection (Rural Landfill) Regulations 2022.

Inert wastes, including tyres, will be placed into the inert landfill, which is be situated in an exhausted mining pit void adjacent to the waste dump, no earthworks construction will be required for the Inert facility. The disposal method involves depositing inert waste over a windrowed tiphead, with waste coverage progressing monthly as the tiphead extends. It is noted that the inert landfill is currently operated as a <20 tonne per annum facility. Increased usage of the landfill has been determined as preferential to the expansion of the registered landfill (R2352/2013/1) to negate the need for additional clearing of native vegetation. The expanded inert landfill facility shall be utilised in conjunction with the registered landfill.

Putrescible waste (biosolids), will be disposed of into an excavated trench measuring approximately 20 meters by 8 meters, with a depth of up to 4 meters. The designated biosolids disposal pit will be located within the Darlot Waste Rock Dump, as illustrated in Figure 2. This placement is strategic to ensure that biosolids are stored away from surface water flows, above the natural ground level and within low permeability waste material, thereby maximizing the distance from, and potential for seepage to, the aquifer. The biosolids will be produced from the registered sewage treatment facility as well as onsite septic tanks.

The anticipated throughput for the new facilities is estimated at 520 tpa, comprising up to 500 tpa of inert waste (including tyres) and up to 20 tpa of biosolids generated from Darlot operations. No change to the combined landfill throughput inclusive of the registered landfill (approximately 1,500 tonnes per annum) is anticipated.