Macraes Phase 4 Project

28 March 2024 (Updated 18 February 2025)

Resource Consent Application and Assessment of Environmental Effects

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LIST OF ACRONYMS

Acronym	Meaning
2GP	Dunedin City Second Generation District Plan
AEE	Assessment of Environmental Effects
AEP	Annual Exceedance Probability
AES	Acoustic Engineering Services Limited
Air Plan	The Regional Plan: Air for Otago
ANZECC	Australia and New Zealand Conservation Council
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018
BF	Backfills
BRWRS	Back Road Waste Rock Stack
CCP	Continuity Consents Project
CIA	Cultural Impact Assessment
CO5	Coronation Stage 5
CO6	Coronation Stage 6
DCC	Dunedin City Council
District Plan	Waitaki District Plan
DMP	Dust Management Plan
DoC	Department of Conservation
ED	Ecological District
EEA	Ecological Enhancement Area
EEAMP	Ecological Enhancement Area Management Plan

Acronym	**Meaning**
EGL	Engineering Geology Limited
ESCP	Erosion and Sediment Control Plan
FF	Footwall Fault
F&G	Fish and Game New Zealand
FMU	Freshwater Management Unit
FOS	Factor of Safety
FPIP	Freshwater Planning instruments Parts of the Proposed Regional Policy Statement
FRBF	Frasers Backfill Embankment
FRIM	Frasers-Innes Mills
FRUG	Frasers Underground mine
FTSF	Frasers Tailings Storage Facility
GB2	Golden Bar Stage 2
GBWRS	Golden Bar Waste Rock Stack
GPUG	Golden Point Underground mine
HAIL	Hazardous Activities and Industries List
KTONRMP	Kāi Tahu Ki Otago Natural Resource Management Plan 2005
LMP	Lizard Management Plan
LOM	Life of Mine
MEEA	Murphys Ecological Enhancement Area
MGP	Macraes Gold Project
MGPG	Macraes Gold Project Grid

Acronym	**Meaning**
MMPNZ	Macraes Mining Project Mineral Zone
MP3	Macraes Phase III Project
MP4 or The Project	Macraes Phase Four Project
MTI	Mixed Tailings Impoundment
MWM	Mine Waste Management Limited
MWMS	Macraes Mine Water Management System
NBWR	Waikouaiti River North Branch
NES-AQ	Resource Management (National Environmental Standard for Air Quality) Regulations 2004
NES-CS	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NES-FW	National Environmental Standards for Freshwater
NES-HDW	Resource Management (National Environmental Standard for Sources of Human Drinking Water) Regulations 2007
NOF	National Objectives Framework
NPS-FM	National Policy Statement for Freshwater Management 2020
NPS-HPL	National Policy Statement for Highly Productive Land
NPS-IB	National Policy Statement for Indigenous Biodiversity 2023
NZDSG	New Zealand Dam Safety Guidelines 2015
NZTCS	New Zealand Threat Classification System
NZTM	New Zealand Transverse Mercator 2000
OGC or OceanaGold	OceanaGold Corporation
OMS	Operations Maintenance and Surveillance Manual

Acronym	**Meaning**
ORC	Otago Regional Council
PIC	Potential Impact Classification
PRPS	Proposed Otago Regional Policy Statement 2021
PSM	Pells Sullivan Meynink
PTS	Passive Treatment Systems
RL	Relative Measure
RMA	Resource Management Act 1991
RPS	Otago Regional Policy Statement 2019
SEE	Safety Evaluation Earthquake
SNA	Significant Natural Area
SP10	Southern Pit Option 10 Tailings Storage Facility
SP11	Southern Pit Option 11A Tailings Storage Facility
TARP	Trigger Action Response Plan
TKTP	Tim Kelly Transportation Planning Limited
TSF	Tailings Storage Facility
TTTSF	Top Tipperary Tailings Storage Facility
Waste Plan	The Regional Plan: Waste for Otago
Water Plan	The Reginal Plan: Water for Otago
WBM	Water Balance Model
WDC	Waitaki District Council
WDP	Waitaki District Plan
Whirika	Ahika Consulting- now trading as Whirika Consulting

Acronym	**Meaning**
WRS	Waste Rock Stack
WQMP	Water Quality Management Plan
ZOI	Zone of Influence

B

PART B

Assessment of Environmental Effects

1. INTRODUCTION

1.1 OVERVIEW OF THE PROPOSAL

OceanaGold (New Zealand) Limited ("**OceanaGold**") owns and operates the Macraes Gold Project ("**Macraes Operation"** or "**MGP"**) which is located approximately 30 kilometres northwest[1] of Palmerston in the Otago Region (**Figure 1.1**). It is located in a rural area and surrounded by low intensity pastoral farming. Macraes township/village, which includes approximately 15 houses, a school and a historic hotel, is located immediately to the west of the MGP.

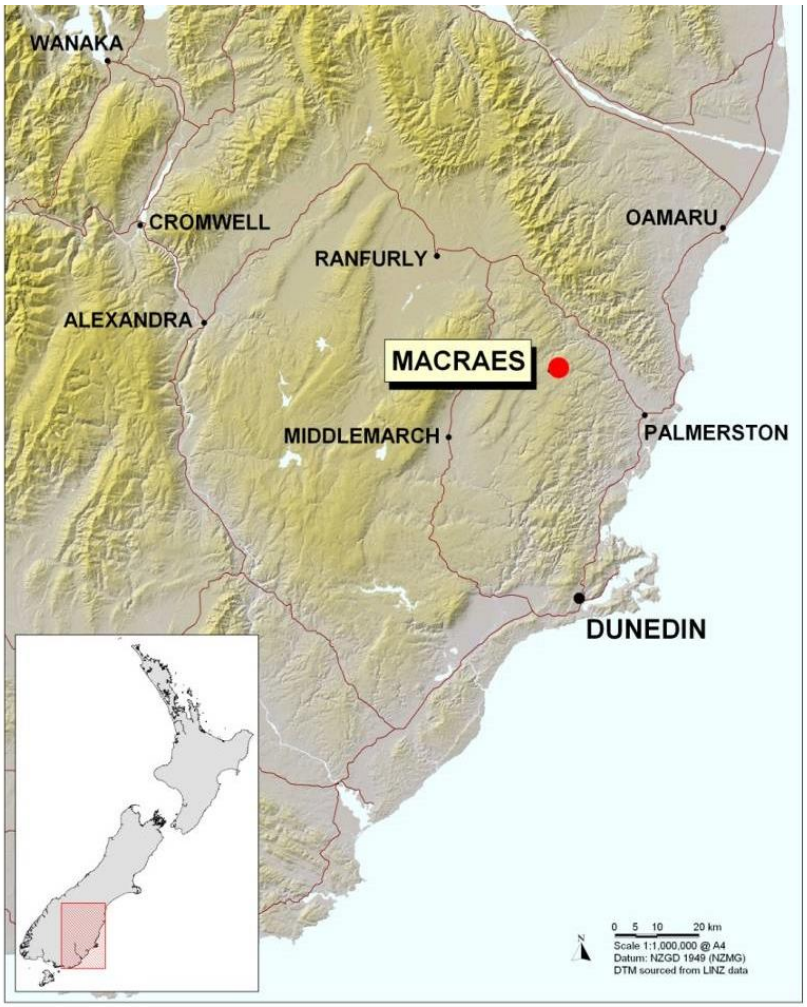

Figure 1.1: General Location of the Macraes Operation.

[1] Hereafter, compass directions referred to within this document use Macraes Grid not NZTM.

Macraes is the largest gold mine in New Zealand, and since it was commissioned in 1990, over 5 million ounces of gold have been produced. The existing and consented mining infrastructure at the Macraes Operation includes:

- Various open pits (operating and non-operational);
- Two underground mines (Frasers - being decommissioned and Golden Point - being actively mined);
- Several waste rocks stacks ("**WRS**") (active and rehabilitated, and one (Back Road Waste Rock Stack ("**BRWRS**")) yet to be constructed);
- A network of haul roads and general service tracks;
- A Processing Plant which extracts gold and produces tailings;
- Four tailings storage facilities ("**TSF"**), two of which are currently active (Top Tipperary TSF ("**TTTSF**") and Frasers TSF Stage 1);
- A comprehensive network of water management infrastructure including diversion drains, silt ponds, and water storage reservoirs;
- Two consented water storage reservoirs that have not yet been constructed being Camp Creek Dam and Coal Creek Dam; and
- Associated infrastructure to support ongoing operations in the form of district roads, powerlines, workshop facilities and offices and associated water and amenity facilities.

OceanaGold is continually reviewing the remaining life of mining at Macraes in light of current knowledge of the gold resource and the economics of mining the resource. Recent exploration success has highlighted opportunities to economically extend the life of mine from 2024 to around 2030 by expanding some areas of the current operation, and revisiting areas previously mined over the last 30 years.

The latest proposal to extend the mine life is referred to as the "Macraes Phase Four Project" ("**MP4**" or "**the Project**"). MP4 is a comprehensive project with three stages. OceanaGold has applied for the relevant resource and building consents for:

- Stage 1 – Renewals[2] for a limited number of consents associated with BRWRS, TTTSF, Frasers WRS, Frasers Underground Mine and Coronation Open Pit; and
- Stage 2 – Raising TTTSF to 570 mRL. and co-disposing of dry tailings and waste at Frasers Pit.

[2] Consent renewals were sought for a limited number of consents that expired in October 2022.

OceanaGold is now applying for resource consents for Stage 3, the largest stage of MP4. Stage 3 consent applications are split across three separate applications:

- The Golden Point Underground mine expansion and extension ("**GPUG**"), lodged 20 October 2023 with Waitaki District Council consents granted 28 February 2024 and Otago Regional Council consents granted 17 October 2024;
- The Continuity Consents Project ("**CCP**") to ensure continuity of the MGP operation while Stage 3 consents are obtained, involving an extension of Innes Mills Pit and development and initial disposal of tailings in Frasers TSF ("**FTSF**") in Frasers Open Pit, lodged 15 December 2023 and subsequently granted 28 March 2024; and
- This Assessment of Environmental Effects ("**AEE**"), which includes the following key components:
    - Down dip extension of three open pits (Innes Mills, Coronation and Golden Bar) and their associated backfills ("**BF**") and WRSs;
    - Backfilling of the Coronation North Pit following the completion of the mining currently authorised;
    - A second stage of tailings disposal in the FTSF to support the open pit extensions and current consented mines;
    - A minor realignment of the Golden Bar Road;
    - Rehandling of waste rock from Northern Gully WRS to Golden Pojnt Pit;
    - Ancillary features such as topsoil stockpiles, low-grade ore stockpiles, silt ponds, areas for pit infrastructure and access roading; and
    - Activities associated with the mitigation, remediation, and offsetting of the effects of the above activities, including amenity effects, water quality and ecological effects management (via the Murphys Ecological Enhancement Area).

A detailed description of the MP4 Project is provided in Section 3 of this AEE.

OceanaGold is seeking all necessary resource consents for the MP4 Project from Waitaki District Council ("**WDC**"), Dunedin City Council ("**DCC**") and Otago Regional Council ("**ORC**") and requests that the applications made herein be publicly notified.

1.2 COORDINATE SYSTEMS

In this AEE, some images are given in NZ Transverse Mercator 2000 ("**NZTM**") and some in Macraes Gold Project Grid ("**MGPG"**) coordinates. In some of the supporting reports, in particular those which address aspects of mine design (e.g. PSM, EGL and WSP), the coordinate system used is MGPG. Where MGPG is used, all plan grids, references and geological orientations are to 'mine north', which is approximately 45 degrees anti-clockwise from true north (**Figure 1.2**). Mine north follows the strike of the Hyde Macraes

shear zone which defines the ore body sub crop and surface exposures. Geographic directions are given in terms of mine north, unless stated otherwise.

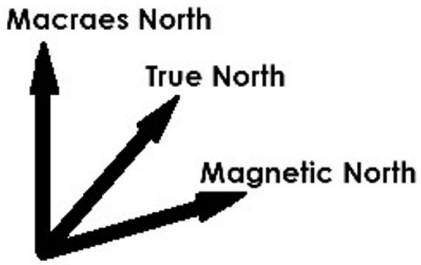

Figure 1.2: True North and mine north.

1.3 BACKGROUND

The MGP commenced operations in 1990 following the granting of initial permits in 1988 under the Mining Act 1971. In 1992, 1997, 2000, 2001, 2002, 2004 and 2006 further resource consents were issued under the Resource Management Act 1991 ("**RMA**") in relation to various expansions in both the production level and physical elements of the overall mine (including pits, WRS, and storage facilities for tailings and process water). The life of mine ("**LOM**")[3] is dynamic and is driven by four main factors:

- The mineral resource;
- The market price;
- The mine plan and schedule; and
- Obtaining the necessary consents / authorities to access and mine the land.

Accordingly, as has been the history of MGP, the LOM varies year to year.

In 2010, OceanaGold sought and was later granted consent for an extension to the life of the Macraes Operation. The extension, called the Macraes Phase III Project ("**MP3**"), was expected to take the consented mine life through to 2020, instead of the mine closing as previously proposed in 2012. Under MP3, production at the Frasers Underground Mine continued in parallel with the open pits and has now ceased. The Macraes opencast

[3] The LOM is the number of years that an operation (which can comprise one or more mines) is scheduled to mine and process ore, based on prevailing economics, the current mine plan and schedule. In practice, there are two LOM plans – one for consented operations and one that is extended but subject to obtaining all necessary authorities such as resource consents and/or building consents.

mining operations were to be scaled back towards the scheduled end of the mine's life (i.e. in 2019 – 2020).

In 2012, OceanaGold sought and was later granted another extension to the life of the Macraes Operation, with mining of the Coronation Pit at the northern end of the MGP, commencing in 2014. The Coronation Project was expected to add approximately one year to the overall mine life. In other words, rather than the Macraes opencast mining operations being scaled back in 2019 – 2020 as was previously proposed, this was to be delayed until 2020 – 2021. 2019 would see a continuation of the same level of mining activity at the site as was proposed previously for the period 2015 to 2018 under MP3.

In 2016, OceanaGold sought and was granted a further extension called the Coronation North Project. This extension was to add three full years to the operational life of the mine – i.e. in terms of the economic effects of the Project, the operating life of the mine was to continue at current levels into the years 2020, 2021 and 2022, with the scaling back of activities and rehabilitation pushed back to 2023 and 2024. A further extension to the Coronation North Pit was authorised in 2019 and OceanaGold intends to commence mining within this extension area in 2025.

In 2020, a further extension of the Macraes Operation was granted called the Deepdell North Stage III Project. The estimated duration of the operation and rehabilitation activities of this Project were approximately three years, with the Project effectively adding an additional full year to the operational life of the MGP. This meant that the operating life of the mine would continue into the year 2024, with the scaling back of activities and rehabilitation pushed back to 2025 and 2026.

In 2024, resource consents were obtained for the expansion and extension of the GPUG. These consents enable an additional 70 hectares of mine extent and provide for further underground mining until around 2030.

Currently consented activities are now (as at March 2024) expected to allow mining operations to continue at current levels into 2025, with the scaling back of activities and rehabilitation expected in the later part of 2025 and 2026. Recent exploration success and a sustained high gold price have resulted in OceanaGold reviewing its LOM plan for Macraes. As such, a further extension of the Macraes operational life is now proposed, called MP4. This Project can economically extend the mine life at Macraes to around 2030 by expanding some areas of current operations at mines or pits previously developed and mined to their former economic limit over the last 30 years.

To date, the mining footprint at MGP involves a total current disturbance area of ~2150 ha, of which ~650 ha has been rehabilitated.

Bearing in mind the separate GPUG and CCP projects referenced above, the proposed expansion necessitates the construction of a further stage of Frasers TSF, larger footprints

for three open pit areas, additional pit backfills, and increases to the extent and height of one WRS. Some waste rock will be placed into existing WRSs in a way that is consistent with the prevailing consents. The effects assessments address the cumulative effects of these activities.

All of the mining activities at the Macraes Operation, including those proposed as part of MP4, are located within the boundaries of current Crown minerals permits held and land owned by OceanaGold.

1.4 THE APPLICANT – OCEANAGOLD (NEW ZEALAND) LIMITED

OceanaGold is a wholly owned subsidiary of OceanaGold Corporation ("**OGC**"). OGC is a publicly listed company on the Toronto stock exchange and is a significant multi-national gold producer. In addition to assets owned in New Zealand, the company operates and owns a mine at Didipio in the north of the Philippines, and at Haile in South Carolina, United States of America.

As New Zealand's largest producer of gold, OceanaGold's current operating assets in New Zealand consist of two large open pit mining operations (Macraes in the South Island and Waihi in the North Island), and four underground mines (Frasers and Golden Point at Macraes, Favona, Trio and Correnso at Waihi). OceanaGold also has a large open pit mine at Reefton in the South Island which is currently in the closure phase and is largely rehabilitated.

OceanaGold commenced operations in New Zealand at Macraes Flat in 1990 and has been operating continuously since that time. Presently, the company directly employs over 600 people in Macraes, and a further 20 staff based in Dunedin.

OceanaGold considers that strong environmental performance, and its social licence to operate, are an integral part of being a successful business. The company is committed to working collaboratively with the local community to create employment opportunities, build resilience and leave a positive, long-lasting legacy well beyond mine closure. This commitment is detailed in a suite of company policies which are available on the OceanaGold website.[4]

1.5 RESOURCE CONSENTS REQUIRED

OceanaGold is seeking all necessary resource consents for the MP4 Project from WDC, DCC and ORC. The resource consents required include:

[4] OceanaGold's website: https://oceanagold.com/sustainability/.

New resource consent from WDC:

- Land use consent (non-complying activity) to authorise mining activities.

New resource consent from DCC:

- Land use consent (discretionary activity) to authorise mining activities, earthworks (large scale) and the use and storage of hazardous substances.

New resource consents from ORC:

At Frasers and Innes Mills Pits:

- A new discharge permit to authorise the discharge of tailings into Frasers TSF (discretionary activity);
- A new water permit to authorise the take and use of tailings return (supernatant) water from Frasers TSF (discretionary activity);
- A new water permit to authorise the damming of water within Frasers TSF (discretionary activity); and
- A new land use consent to authorise earthworks and land disturbance within 100m of a natural inland wetland that may result in partial drainage of the wetland (discretionary activity).

At Coronation Pit:

- A new land use consent to authorise vegetation clearance, land disturbance and earthworks within and within 100m of natural inland wetlands for the purpose of mining the Coronation Stage 6 Pit (discretionary activity);
- A new water permit to divert surface water around Coronation Pit and into unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Camp Creek for the purpose of preventing surface water ingress and managing surface water runoff (discretionary activity);
- A new discharge permit to authorise the discharge of waste rock to land within Coronation Pit (discretionary activity);
- A new discharge permit to discharge waste rock to land for the purpose of construction of the Coronation Waste Rock Stack (discretionary activity).
- A new water permit to take and use surface water for the purpose of dewatering Coronation Pit and use in the Mine Water Management System (discretionary activity); and
- A new water permit to take and use groundwater for the purpose of dewatering Coronation Pit and use in the Mine Water Management System (discretionary activity).

At Coronation North Pit:

- A new discharge permit to authorise the discharge of waste rock to land within Coronation North Pit for the purpose of backfilling the Coronation North Pit (discretionary activity);
- A new water permit to authorise the take and use of surface water from Coronation North Pit for the purpose of dewatering the Coronation North Pit and use in the Mine Water Management System (discretionary activity), replacing an expiring consent; and
- A new water permit to authorise the take and use of groundwater from Coronation North Pit for the purpose of dewatering the Coronation North Pit and use in the Mine Water Management System (discretionary activity), replacing an expiring consent.
- A new discharge permit to discharge waste rock to land for the purpose of constructing the Coronation North Waste Rock Stack and the Trimbells Waste Rock Stack (discretionary activity), replacing an expiring consent.

At Golden Bar Pit:

- A new water permit to authorise the diversion of surface water around the Golden Bar Pit, haul roads and stockpile area for the purpose of managing surface water runoff (discretionary activity);
- A new water permit to take and use surface water for the purpose of dewatering Golden Bar Pit and use in the Mine Water Management System (discretionary activity);
- A new water permit to take and use groundwater for the purpose of dewatering Golden Bar Pit and use in the Mine Water Management System (discretionary activity);
- A new discharge permit to discharge water containing contaminants to Golden Bar Creek for the purpose of disposing of water from dewatering of Golden Bar Pit (discretionary activity).
- A new land use consent to authorise vegetation clearance, land disturbance and earthworks within and within 100m of natural inland wetlands for the purpose of mining the Golden Bar Pit extension (discretionary activity);
- A new discharge permit to discharge waste rock to land in Golden Bar Pit for the purpose of disposing of waste rock (discretionary activity);
- A new water permit to take surface water for the purpose of creating the Golden Bar Pit Lake (discretionary activity);
- A new water permit to take groundwater for the purpose of creating the Golden Bar Pit Lake (discretionary activity); and
- A new discharge permit to discharge contaminants to air from mining operations and post mining rehabilitation (discretionary activity).

At Golden Bar WRS:

- A new discharge permit to discharge waste rock and contaminants from waste rock to land for the purpose of extending the Golden Bar Waste Rock Stack (discretionary activity);
- A new land use consent to reclaim part of an unnamed modified watercourse and to undertake vegetation clearance, land disturbance and earthworks within a natural inland wetland in the Clydesdale Creek catchment for the purpose of extending the Golden Bar Waste Rock Stack (discretionary activity);
- A new discharge permit to discharge silt and sediment to water for the purpose of extending the Golden Bar Waste Rock Stack (discretionary activity);
- A new water permit to permanently divert water around the Golden Bar Waste Rock Stack and into unnamed tributaries of Clydesdale Creek for the purpose of preventing surface water ingress and managing stormwater runoff (discretionary activity);
- A new discharge permit to discharge contaminants to water from the base and toe of the extended Golden Bar Waste Rock Stack for the purpose of waste rock disposal (discretionary activity); and
- A new water permit to dam water in Clydesdale Silt Pond for the purpose of operating Clydesdale Silt Pond (discretionary activity); and
- A new discharge permit to discharge water from a silt pond to Clydesdale Creek for the purpose of operating a silt pond associated with the Golden Bar Waste Rock Stack (discretionary activity).

At Golden Bar Road Realignment:

- A new discharge permit to authorise the discharge of waste rock to land for the purpose of constructing a road (discretionary activity).

At Northern Gully WRS:

- A new discharge permit to discharge silt and sediment to water in Northern Gully Silt Pond for the purpose of excavating waste rock from Northern Gully Waste Rock Stack (discretionary activity).

Activities associated with the mitigation of surface water quality effects:

- A new water permit to take and use surface water from Murphys Silt Pond, Frasers West Silt Pond, Redbank Silt Pond, and Clydesdale Silt Pond for the purpose of capturing waste rock stack seepage and preventing its release to the environment and for use in the Mine Water Management System.

Activities associated with the implementation of the Murphys Ecological Enhancement Area:

- A new water permit to divert surface water in an unnamed tributary of Murphys Creek for the purpose of installing a culvert associated with the Murphys Ecological Enhancement Area.

Variation to existing resource consents from ORC:

At Frasers Pit, Innes Mills Pit and Golden Point Pit:

- Variations to resource consents RM10.351.48.V3, RM10.351.50.V2, and RM10.351.51.V3 that provide for operational pit dewatering and diversion activities (discretionary activity);
- Variations to resource consents RM10.351.43.V3, RM10.351.44.V3, RM10.351.45.V2, RM10.351.46.V2, and RM10.351.47.V3 that provide for the creation of the Frasers and Innes Mills Pit Lakes (discretionary activity);
- A variation to resource consent RM10.351.49.V2 providing for the discharge of waste rock to land in Frasers and Innes Mills Pits (discretionary activity); and
- A variation to resource consent RM10.351.52.V3 providing for discharges to air from mining operations within the Frasers and Innes Mills Pits (discretionary activity).

At Coronation Pit:

- Variations to resource consents RM12.378.11, RM12.378.12 and RM12.378.14 provide for the creation of the Coronation Pit Lake (discretionary activity); and
- A variation to resource consent RM12.378.15 providing for discharges to air from mining operations associated with the Coronation Pit (discretionary activity).

At Coronation North Pit:

- Variations to resource consents RM16.138.06.V2, RM16.138.12.V1 and RM16.138.14.V1 RM16.138.17.V1 provide for the creation of the Coronation North Pit Lake (discretionary activity); and
- A variation to resource consent RM16.138.19.V1 providing for discharges to air from mining operations associated with the Coronation North Pit (discretionary activity).

As a result of “bundling”, the overall activity status of this application is to be considered be non-complying.

OceanaGold is also seeking any consequential changes to its WDC, DCC, and ORC resource consents that may be necessary as a result of the new consents and variations outlined above.

OceanaGold requests that this application is publicly notified.

Additional approvals will be required pursuant to the Building Act 2004 in connection with the FTSF, and an archaeological authority will be sought from Heritage New Zealand Pouhere Taonga for the removal of part of a historic fence line near Coronation. OceanaGold has also applied for a wildlife permit under the Wildlife Act 1953 for the salvage and relocation of lizards. These will be sought via separate processes.

1.6 DOCUMENT STRUCTURE

This document is an AEE in support of resource consent applications made by OceanaGold under the RMA to authorise the activities associated with MP4.

All matters required to be addressed in accordance with the RMA are contained within this AEE, and are set out in ten sections, as follows:

Section 1 Is this introduction.

Section 2 Describes the existing environment for the Project.

Section 3 Provides a detailed description of the activities that form the Project.

Section 4 Sets out the resource consent requirements for the Project.

Section 5 Addresses the actual and potential effects of the Project on the environment. It also sets out how OceanaGold proposes to avoid, remedy or mitigate the actual and potential environmental effects of the Project, and the measures proposed or agreed to by OceanaGold for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment.

Section 6 Outlines the management and monitoring of actual and potential environmental effects.

Section 7 Provides a consideration of alternatives in accordance with the requirements of the RMA.

Section 8 Describes the consultation undertaken by OceanaGold in relation to the Project, the feedback received during that consultation and how that feedback has been addressed.

Section 9 Sets out the statutory framework within which these applications have been made and describes the project in relation to the provisions of the RMA and the relevant statutory planning documents.

Section 10 Is a conclusion.

1.7 APPENDICES

All relevant Records of Title are provided in **Appendix 1** to this AEE.

Various technical assessments commissioned by OceanaGold provide the detailed technical information to support this AEE. In accordance with **Table 1.1** below, these are appended to this AEE as **Appendices 2-30** and are referenced throughout. Also appended and referenced throughout is the information exchanged with the Consent Authorities in accordance with s92 of the RMA (**Appendices 31-33** and their associated annexures outlined in **Table 1.1**). Any other documents referenced within this AEE, or the appended documents, that are not supplied with this application can be made available on request.

OceanaGold intends to provide the consent authorities with a suite of proposed conditions prior to the applications being heard.

A letter from Aukaha acknowledging lodgement of this application and providing an outline of the Cultural Impact Assessment (which is currently being prepared) is provided in **Appendix 34**.

Table 1.1: Supporting Technical Assessments for the Macraes Phase 4 Project.

Appendix #	Author	Topic	Title	Reference within AEE
Engineering Design, Dam Breach and Natural Hazard Reports				
Appendix 2	WSP	Frasers TSF Design	Frasers Tailings Storage Facility Feasibility Design Report	WSP (2024)
Appendix 3	Engineering Geology Limited	Frasers TSF Design – Peer Review	Frasers Tailings Storage Facility Feasibility Design Report – Peer Review	EGL (2024a)
Appendix 4	Engineering Geology Limited	GBWRS Design	Golden Bar Waste Rock Stack Design Report	EGL (2023)
Appendix 5	Engineering Geology Limited	Trimbells WRS	Trimbells Waste Rock Stack Closure Stability Assessment	EGL (2024b)
Geotechnical				
Appendix 6	Pells Sullivan Meynink	Open Pit Slope Stability	Macraes Phase 4 Consenting – Project Element 4.3.2: Open Pit Extensions	PSM (2024a)
Appendix 7	Pells Sullivan Meynink	Frasers TSF Pit Slope Stability	Macraes Phase 4 Consenting – Project Element 4.3.2: Open Pit Stability Assessment for Frasers TSF	PSM (2024b)
Geochemistry				
Appendix 8	Mine Waste Management Limited	Geochemistry	Macraes Mine Phase 4.3 Environmental Geochemistry Assessment	MWM (2024)

Appendix #	Author	Topic	Title	Reference within AEE
Appendix 9	Strata Geoscience	Geochemistry – Peer Review	Macraes Mine Phase 4.3 Environmental Geochemistry Assessment – Peer Review	SG (2023)
Water Quality and Quantity				
Appendix 10	Engineering Geology Limited	Erosion and Sediment Control	Macraes Phase 4 Project - Erosion and Sediment Control Report	EGL (2024c)
Appendix 11	GHD	Surface and Groundwater	Macraes Phase IV – Coronation – Surface and Groundwater Assessment	GHD (2024a)
Appendix 12	GHD	Surface and Groundwater	Macraes Phase IV – Golden Bar – Surface and Groundwater Assessment	GHD (2024b)
Appendix 13	GHD	Surface and Groundwater	Macraes Phase IV – Frasers TSF - Innes Mills – Golden Point and Cumulative Surface and Groundwater Assessment	GHD (2024c)
Appendix 14	GHD	Surface and Groundwater	Golden Bar Dewatering Assessment	GHD (2023)
Ecology				
Appendix 15	Ahikā[5]	Terrestrial Ecology	Assessment of Effects on Vegetation & Avifauna	Ahikā (2024)
Appendix 16	Whirika	Terrestrial Ecology	Macraes Phase 4 Project – Ecological Impact Management Plan	Whirika (2025)

[5] Since this assessment was completed Ahikā Consulting has rebranded to Whirika Consulting.

Appendix #	Author	Topic	Title	Reference within AEE
Appendix 17	Bioresearches	Herpetofauna	Herpetofauna Survey & Assessment – Macraes MP4	Bioresearches (2024a)
Appendix 18	Bioresearches	Herpetofauna	Lizard Management Plan – Macraes MP4 Projects	Bioresearches (2024b)
Appendix 19	Bioresearches	Invertebrates	Invertebrate Survey & Assessment – Macraes MP4	Bioresearches (2024c)
Appendix 20	Greg Ryder Consulting	Aquatic Ecology	Macraes Phase Four – Coronation Mine Proposed Expansion – Effects on Surface Waters	Ryder (2024a)
Appendix 21	Greg Ryder Consulting	Aquatic Ecology	Macraes Phase Four – Golden Bar Mine Proposed Expansion – Effects on Surface Waters	Ryder (2024b)
Appendix 22	Greg Ryder Consulting	Aquatic Ecology	Macraes Phase 4 – Frasers TSF - Innes Mils Proposed Expansion – Aquatic Ecology Assessment	Ryder (2024c)
Amenity				
Appendix 23	Origin Consultants	Historic Heritage	Archaeological and Heritage Assessment for OceanaGold MP4	Origin (2023)
Appendix 24	Tim Kelly Transportation Planning Limited	Transportation	Macraes Goldmine MP4 Proposal Transportation Assessment	TKTP (2023)
Appendix 25	Brown, Copeland & Co Limited	Economics	Assessment of the Economic Effects of OceanaGold's Proposed Macraes Phase 4, Stage 3 Project	Brown, Copeland & Co (2024)
Appendix 26	TechNick	Vibration	MP4 Project Stage 3 Blasting Vibration and Airblast Effects Assessment OGNZL Macraes New Zealand	TechNick (2023)

Appendix #	Author	Topic	Title	Reference within AEE
Appendix 27	WSP	Landscape and Visual	Macraes Phase 4 Expansion: Stage 3 Landscape and Visual Assessment	WSP (2023)
Appendix 28	Acoustic Engineering Services	Noise	OceanaGold Macraes Phase 4 Project Assessment of Environmental Noise Effects	AES (2024)
Appendix 29	Beca	Air Quality	Air Quality Technical Assessment – Life of Mine Extension MP4 Stage 3	Beca (2024)
Peer Review				
Appendix 30	WGA	Surface and Groundwater Modelling Peer Review	Technical Memorandum - MPIV Water Management Technical Documents Review Summary	WGA (2024)
Further Information Exchanged with the consent authorities in accordance with s92 of the RMA				
Appendix 31	OceanaGold	Response to s92 request for further information from ORC	ORC s92 response – Planning and overarching responses including the following supporting information: • Annexure 1: Macraes Water Quality Management Plan; • Annexure 2: Back Road WRS Geochemical Model – MWM; • Annexure 3: Back Road WRS Assessment – Surface water quality modelling – GHD;	Section 92 response to ORC, dated 15 October 2024

Appendix #	Author	Topic	Title	Reference within AEE
			• Annexure 4: Responses to s92 requests prepared by GHD in respect of surface and groundwater matters; • Annexure 5: Ryder (2024c) – MP4 Stage 3 – Cumulative Effects of Surface Water Ecology – Updated; • Annexure 6: Description of the Macraes Mine Water Management System; • Annexure 7: Figures showing approximate locations of clean water diversions; • Annexure 8: Delineation of Streams in the Macraes Context – Technical Note – Ahika; • Annexure 9: Wetland evaluation of Golden Bar Pit & Waste Rock Stack watercourses – Whirika; • Annexure 10: Responses to s92 requests prepared by EGL in respect of waste rock stack geotechnical matters; • Annexure 11: Responses to s92 requests prepared by PSM in respect of open pit geotechnical matters; • Annexure 12: Responses to s92 requests prepared by Beca in respect of air quality matters; • Annexure 13: Macraes Operation Dust Management Plan; • Annexure 14: Responses to s92 requests prepared by MWM in respect of geochemical matters; and	

Appendix #	Author	Topic	Title	Reference within AEE
			• Annexure 15: Responses to s92 requests prepared by Greg Ryder Consulting in respect of aquatic ecology matters.	
Appendix 32	OceanaGold	Response to s92 request for further information from WDC and DCC	WDC and DCC s92 response – Planning and overarching responses including the following supporting information: • Annexure 1: Responses to s92 requests prepared by Whirika in respect of terrestrial ecology matters; • Annexure 2: Responses to s92 requests prepared by Bioresearches in respect of terrestrial ecology matters; • Annexure 3: ChemAlert Hazardous Chemicals Register; • Annexure 4: Principal Hazard Management Plan – Hazardous Substances; • Annexure 5: Emergency Management and Control Plan; • Annexure 6: Responses to s92 requests prepared by WSP in respect of landscape matters; • Annexure 7: Responses to ORC s92 requests prepared by PSM in respect of open pit geotechnical matters.	Section 92 response to WDC and DCC, dated 15 October 2024
Appendix 33	OceanaGold	Response to s92 request for further information from ORC	ORC s92 response – Planning and overarching responses including the following supporting information:	Section 92 response to ORC, dated 5 February 2024

Appendix #	Author	Topic	Title	Reference within AEE
			• Annexure 1: Responses to s92 requests prepared by MWM in respect of geochemistry matters; • Annexure 2: Responses to s92 requests prepared by GHD in respect of surface and groundwater matters; • Annexure 3: Northern Gully Silt Pond Detailed Engineering Report; • Annexure 4: Northern Gully Silt Pond Embankment Construction Report; and • Annexure 5: Responses to s92 requests prepared by Whirika in respect of terrestrial ecology matters, including: a) Annexure 5a: Plan showing land cover within the MEEA; b) Annexure 5b: Plan showing rare plants within the MEEA; and c) Annexure 5c: List of plant species within the MEEA.	

2. ENVIRONMENTAL SETTING

2.1 LOCALITY

The MGP is located approximately 30 km inland from Palmerston, at Macraes Flat, East Otago (**Figure 1.1** above). Macraes Flat is flanked by the Taieri Ridge to the northwest, Shag Valley and Horse Range to the east, and the coastal hills and extinct volcanic cones of Palmerston and Waikouaiti to the southeast.

Macraes Flat is situated on an elevated plateau, at approximately 500 m above sea level, that is isolated from the main state highways and towns of East Otago. The local road, Macraes Road, connects Macraes Flat and the associated Macraes Operation with State Highway 85 to the east and State Highway 87 (SH87, the Middlemarch-Hyde Road) to the west.

2.2 CURRENT LAND OWNERSHIP

With the exception of some areas of unformed road reserve that intersect the Project area, OceanaGold is the sole owner of the land on which the proposed MP4 Project will be located (see **Figure 2.1**)[6]. OceanaGold leases some of that land to three farmers and some of OceanaGold's land is protected by ecological covenants. The leased properties are actively farmed.

The legal description of the land parcels affected by the MP4 Project are provided in **Table 2.1** below.

Table 2.1: MP4 Project land and legal description.

MP4 Project element	Land Parcel	Record of Title
Frasers TSF	Section 4 SO 24124; Section 5 SO 24124; Lot 2 DP 21220; Section 36 Block II Highlay SD; Part Section 6, Block II Highlay SD; Part Section 8, Block II Highlay SD; Section 7, Block II Highlay SD; Section 22, Block II Highlay SD; Section 27, Block II Highlay SD; Section 28, Block II Highlay SD; Section 29, Block II Highlay SD; Section 30, Block II	OT15C/961, OT13A/1228, OT170/220, 95327, OT6A/964, OT6A/777, OT6A/754, OT71/274, 843089, OT13A/1228.

[6] At the time of writing, road stopping processes for Frasers TSF are advanced and OceanaGold will further engage with the relevant territorial authorities in respect of other roads in to have the road reserve parcels amalgamated with adjacent OceanaGold land.

MP4 Project element	Land Parcel	Record of Title
	Highlay SD; Section 49, Block II Highlay SD; Part Lot 1 DP 21220; Section 10 SO 24927; Part Section 1 SO23828; Section 2 SO 23828; Section 12 SO 331188; Section 15 SO 331188; Section 16 SO 331188; Section 4 SO 429137 was Road Stopped and Amalgamated with OceanaGold's land (see New Zealand Gazette 2018 In 2602 Road Stopped and Amalgamated with CFR OT9C/1499); Road Reserve.	
Innes Mill Pit Extension	Part Section 6 Block II Highlay SD; Section 7 Block II Highlay SD; Section 19 SO 331188; Part Section 14 Block II Highlay SD; Sections 4-8 SO 331188 (Declared Road. New Zealand Gazette 2005 p 3969 Vested in Waitaki District Council); Part Section 8 Block II Highlay SD; Part Section 13 Block II Highlay SD; Sections 4 SO 459659; Part Section 16 Block II Highlay Survey District; Section 19-20 Survey Office Plan 459659; Part Section 15 Block II Highlay Survey District; Section 18 SO 459659; Road Reserve.	95327, OT6A/964, OT10D/152, 843083, 843085, 843086.
Coronation Stage 6 Pit	Part Section 2 Block V Highlay SD; Lot 1 DP 465577; Part Section 2 Block VII Highlay SD; Part Section 11 Block VII Highlay SD.	OT15A/514, OT620415, OT16B/855.
Coronation North Backfill	Part Section 2 Block V Highlay SD.	OT15A/514.
Coronation Haul Road – Pit to Processing Plant	Part Pt Section 2 Block V Highlay SD; Part Section 2 Block VII Highlay SD; Part Pt Sections 11 and 12 Block VII Highlay SD; Lot 3-4, 8 Deposited Plan 465577; Part Section 10 Block XII Rock & Pillar Survey District.	OT15A/514, OT16B/855, 620415, 620416.

MP4 Project element	Land Parcel	Record of Title
Golden Point Backfill	Section 29 SO 459659; Part Section 19 Block IX Highlay SD; Section 2 SO 23079.	843090, OT15A/594.
Northern Gully Waste Rock Rehandle	Section 23, 37-44 Block II Highlay Survey District; Part Section 25 Block II Highlay Survey District; Section 5-6 Survey Office Plan 429137; Section 1-2 Survey Office Plan 625; Section 45 Block II Highlay Survey District; Section 46 Block II Highlay Survey District; Lot 4 and Lot 5 Deposited Plan 21220; Section 35 Block II Highlay Survey District; Section 36 Block II Highlay Survey District; Part Section 29 Survey Office Plan 459659.	843084, OT13D/99, OT180/97, OT13A/1227, OT7D/614, OT170/220, 843090.
Golden Bar Pit Extension	Section 8 and Section 22 Block V Dunback Survey District; Section 1-4 Block VIII Dunback Survey District; Section 1, Section 3 and Section 6 Block IX Dunback Survey District; Section 4 Block IX Dunback SD; Section 26 and Section 28 Block V Dunback SD; Section 10 Block V Dunback SD; Part Section 7 Block VIII Dunback Survey District; Section 8 Block VIII Dunback Survey District.	OT12C/610, OT10A/121, OT80/200, 159928
Golden Bar WRS Extension	Part Section 7 Block VIII Dunback Survey District; Section 8 Block VIII Dunback Survey District.	159928
Golden Bar Haul Road – Pit to Processing Plant	Part Section 7 Block VIII Dunback Survey District; Section 8 Block VIII Dunback Survey District.	159928
Murphys Ecological Enhancement Area	Part Section 7 Block VIII Dunback Survey District; Section 8 Block VIII Dunback Survey District; Road Reserve	159928

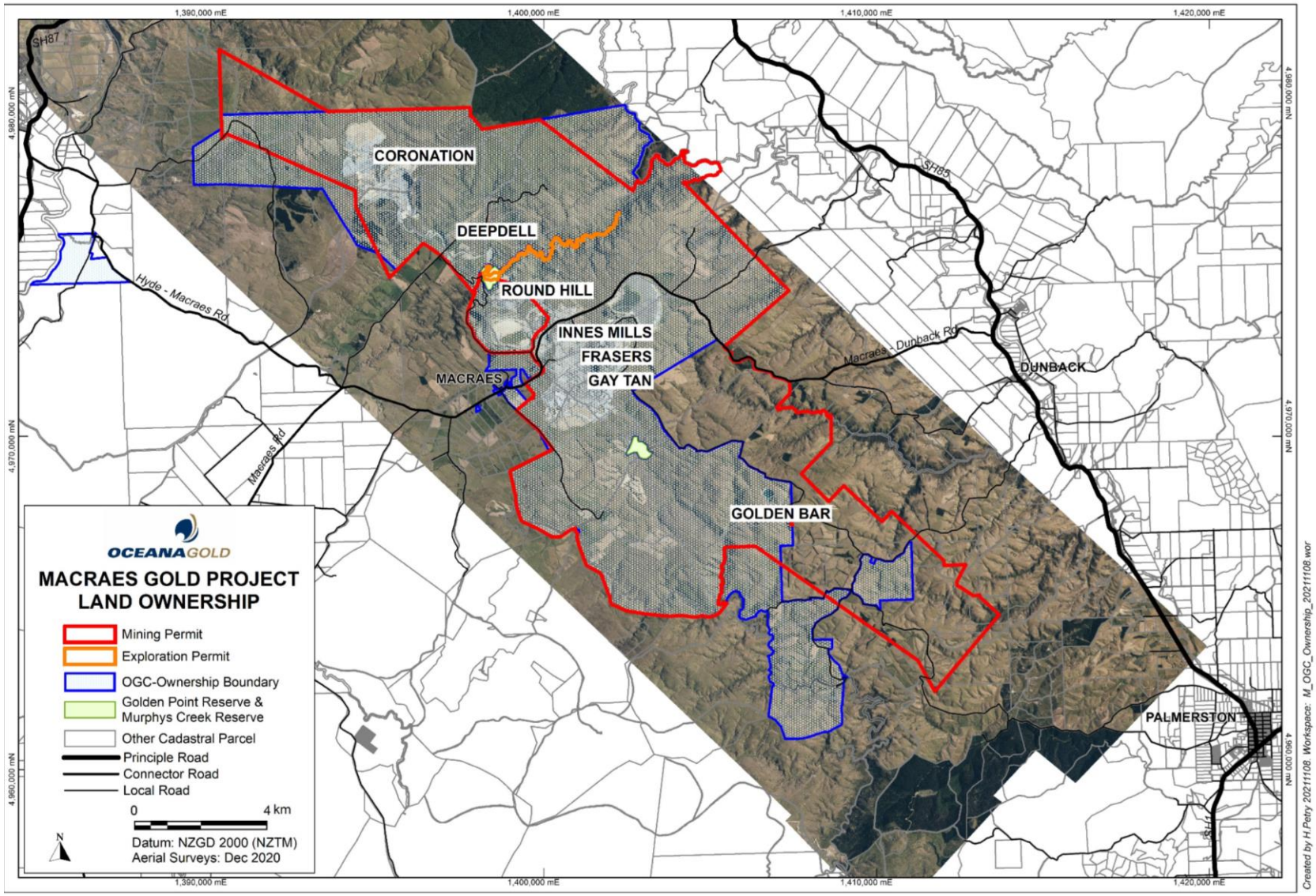

Figure 2.1: **OceanaGold land ownership at the Macraes Operation.**

2.3 CURRENT ZONING AND LAND USE

The Waitaki District Plan attributes different areas of land a specific zoning which reflects the intended purpose and dominant land use of that area.

The zoning attributed to the MP4 Project is as follows:

- The Frasers TSF is located entirely within the Macraes Mining Project Mineral Zone ("**MMPMZ**");
- The Innes Mills Pit extension and associated backfill is located entirely within the MMPMZ;
- The Golden Point Backfill and associated rehandling of waste from the Northern Gully WRS is located entirely within the MMPMZ;
- The Golden Bar Pit extension and associated WRS extension is located mostly within the MMPMZ and partially within the Rural Scenic Zone;
- The Coronation Stage 6 Pit is located partially within the MMPMZ and partially within the Rural Scenic Zone; and
- The Murphys Ecological Enhancement Area including the associated access track and facilities are located entirely within the MMPMZ.

The outline of the MMPMZ is provided in **Figure 3.1** in Section 3 of this AEE.

Part of the site where activities relating to the Coronation Stage 6 Pit and Coronation North Backfill will occur is located within the jurisdiction of the Dunedin City Council. This area is subject to the following planning overlays in the Dunedin City Second Generation District Plan ("**2GP**"):

- High Country Rural Zone; and
- Taieri Ridge and Mare Burn mapped area.

No other District Plan overlays or designations are located within the Project area.

2.3.1 Habitable Dwellings

The closest habitable dwellings to the MP4 are shown in **Figure 2.2** and include the following private properties inside a 2 km radius:

- 1668 Macraes Road;
- Former church at 1726 Macraes Road which is now a holiday home;
- 406 Horse Flat Road; and
- 47 Hyde Street.

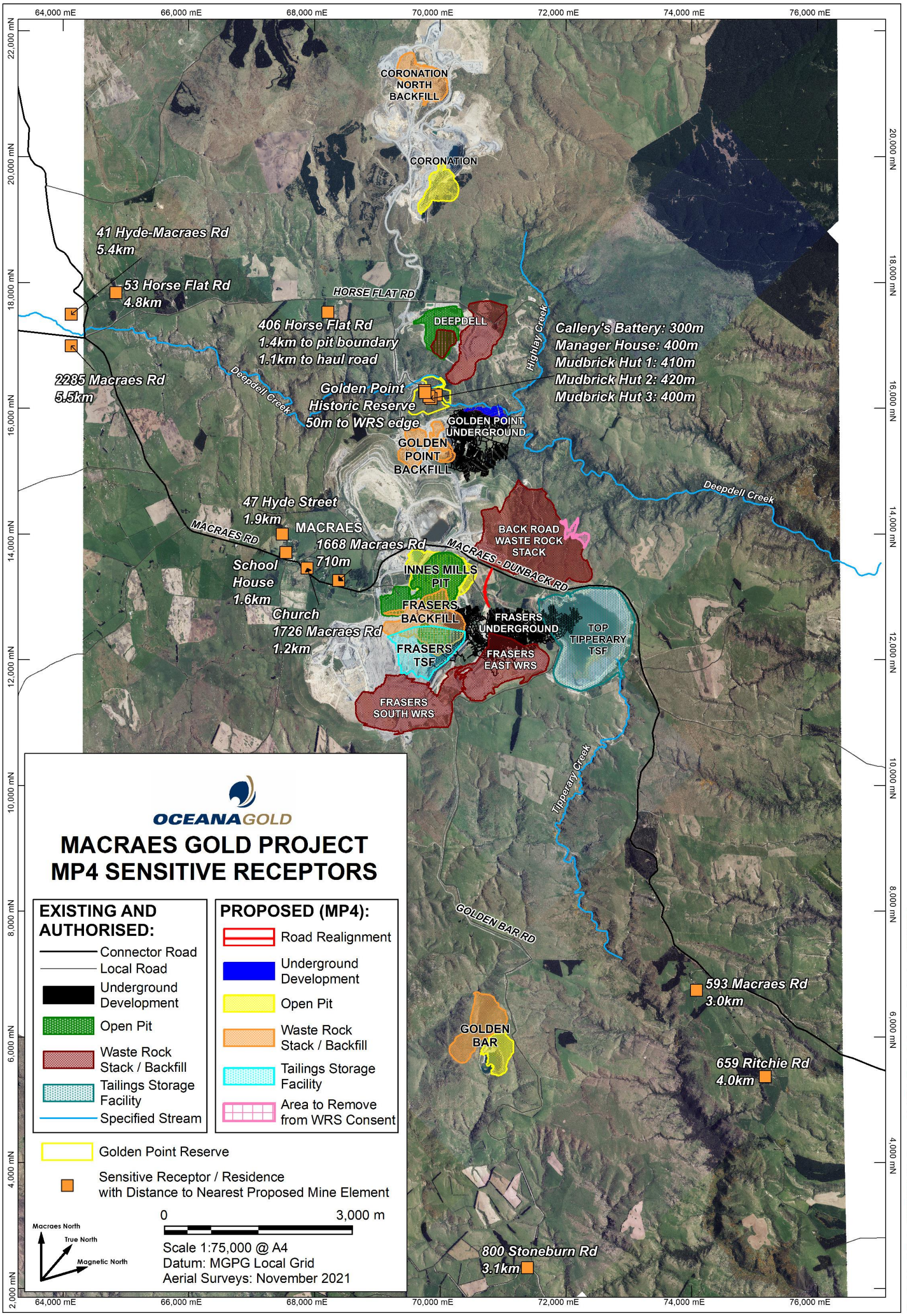

Figure 2.2: Closest habitable dwellings to the MP4 Project.

2.4 EXISTING AND AUTHORISED MINING ACTIVITIES

A dominant feature of the existing environment is the various mines and associated activities at the Macraes Operation. These activities include:

- Various open pits (operating and non-operational);
- Two underground mines (Frasers - being decommissioned and Golden Point - being actively mined);
- Various waste rock stacks (active and rehabilitated);
- A network of haul roads and general mine service tracks;
- A Processing Plant;
- Four tailings storage facilities (MTI and SP11 – both inactive, TTTSF – active, and Frasers TSF Stage 1 which is being constructed and is expected to receive tailings in March 2025);
- A comprehensive network of water management infrastructure including diversion drains, silt ponds, sumps, pit lakes and freshwater storage reservoirs;
- Two consented water storage reservoirs that have not yet been constructed being Camp Creek Dam and Coal Creek Dam; and
- Associated infrastructure to support ongoing operations in the form of district roads, powerlines, workshop facilities and offices and associated water and amenity facilities.

Figure 2.3 illustrates the arrangement on the existing major mine features at the MGP and a brief description of each is provided in the sections that follow.

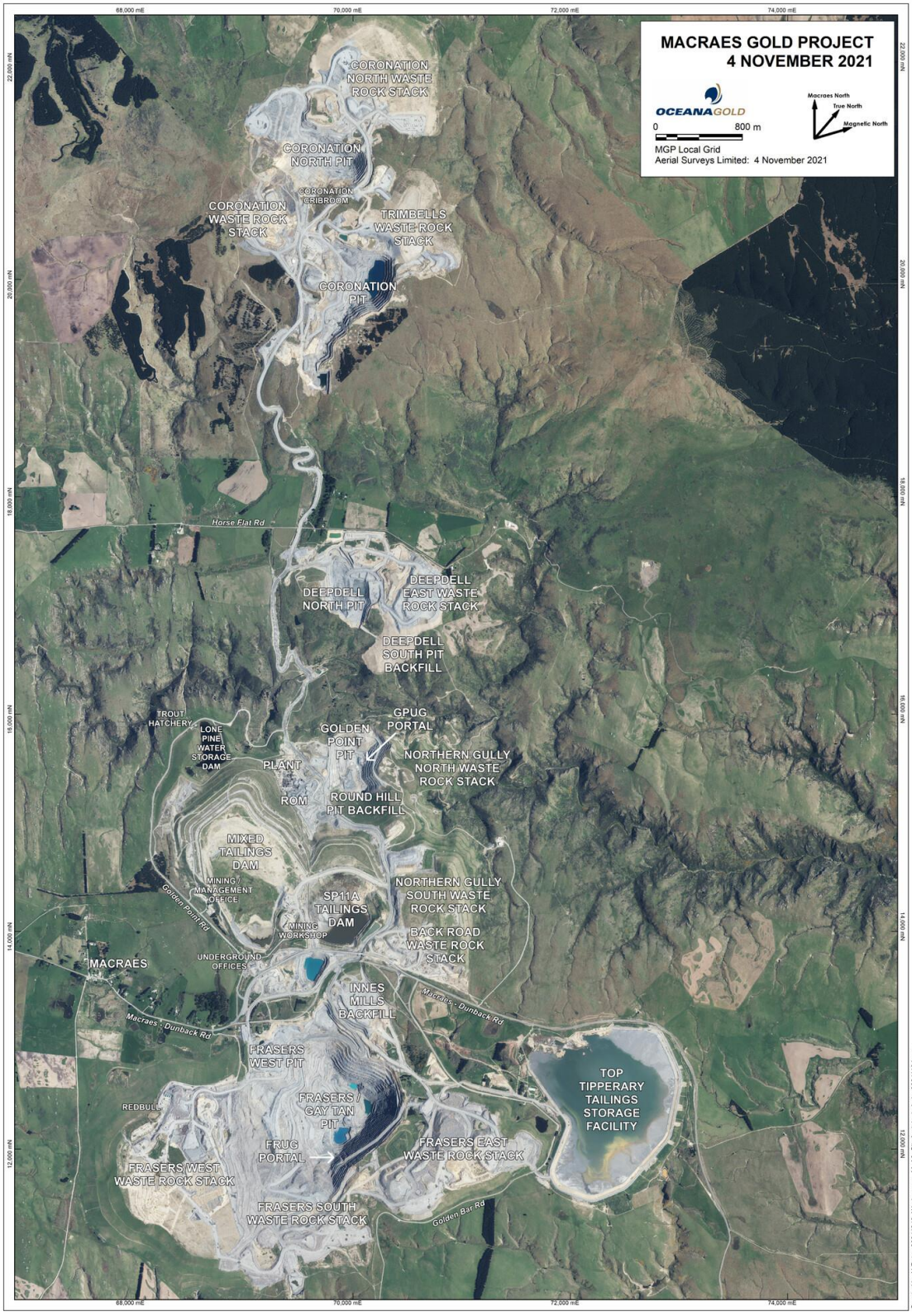

Figure 2.3: Major existing features of the Macraes Operation.

2.4.1 Open Pits and Waste Rock Stacks

There are currently two active open pits operating at the MGP. These are:

Frasers Pit (Gay Tan Stage 5); and

Innes Mills Pit (Stages 7-8).

These active pits currently utilise the Frasers West WRS, Frasers East WRS, Frasers South WRS, and Frasers Backfill.

There are also six currently inactive open pits at the MGP. These are:

- Round Hill Pit (also known as Golden Point Pit) in which the GPUG access portals are located;
- Innes Mills West Pit (currently a water storage sump);
- Golden Bar Pit (a pit lake);
- Deepdell North Pit (Stage 5);
- Coronation Pit (partially filled pit lake);[7] and
- Coronation North Pit (partially filled pit lake).

Associated with the above inactive open pits are the BRWRS (partially formed), Northern Gully WRS, Golden Bar WRS, Deepdell East WRS, Coronation WRS, Coronation North WRS, and Trimbells WRS.

2.4.2 Frasers Underground Mine

The Frasers Underground Mine is an underground mine operation which was commissioned in 2006. It consists of tunnels down to a depth of 800 m below the surface. This underground mine ceased production in 2024 and is now in a closure phase.

2.4.3 Golden Point Underground Mine

The Golden Point Underground Mine is an underground mine operation which was commissioned in 2020 and is currently operating. Ongoing review of ore reserves and redesign of the ore development and extraction layout to optimise the mine plan is standard practise for underground mines. Potential layouts for the GPUG have been revised several times since the resource consents were granted by the WDC and ORC in 2020 to both maximise possible ore extraction whilst ensuring that potential adverse

[7] Resource consents for the dewatering of Coronation Pit and for discharges of waste rock to land in Coronation Pit and at Coronation WRS have recently been granted, replacing resource consents that had expired.

effects are avoided where possible. Resource consent has been granted to expand and extend the mine enabling production until around 2030.

2.4.4 Haul Roads

There are active haul roads running in a north to south direction through the wider site area from Coronation North to the processing plant, from the processing plant south to Frasers Pit and out to the various waste rock stacks and pits. Where haul roads have no further use, they are rehabilitated.

A disused 6.8 km haul road on land owned by OceanaGold connects the current active haul road system at Frasers Pit to Golden Bar Pit. This haul road will be reactivated for MP4 to transport ore to the Processing Plant.

2.4.5 Processing Plant and Tailings Storage Facilities

The Processing Plant uses a large quantity of water and grinds the mined ore into fine particles before subjecting it to other physical, thermal, and chemical processing steps to remove and refine the gold. OceanaGold currently holds all necessary resource consents to authorise the operation and maintenance of the Processing Plant until 31 August 2032.[8]

After gold extraction, the resultant waste material (tailings) is pumped as a slurry to a TSF where settlement and enclosure allows safe and stable permanent storage. Excess processing water used to deliver the tailings slurry is generally decanted off to form a small surface pond (decant pond) and pumped back for reuse in the Processing Plant. Any additional water used in the Processing Plant comes from the Taieri River via the Lone Pine Reservoir or elsewhere within the Macraes Mine Water Management System as described in Section 2.4.6. On some occasions, excess water on the TSF's is force evaporated using water sprayers.

The Mixed Tailings Impoundment ("**MTI**"), Southern Pit Option 10 TSF ("**SP10**"), and Southern Pit Option 11A TSF ("**SP11**") are inactive (no current discharge of tailings but classified as resting impoundments as they are not closed). These TSF's do not have capacity to receive additional tailings and raising their respective embankments to create additional capacity is not a practicable option. Currently tailings are pumped to and stored at the TTTSF, which has (resource) consented capacity until approximately March 2025 at which point tailings will be discharged to Frasers TSF Stage 1.

[8] 96785_V5 that authorises discharges to air from the Processing Plant and 96784_V3 that authorises the take and use of up to 200 L/s of water from the Taieri River both expire on 31 August 2032.

2.4.6 Mine Water Management System and Infrastructure

The management of water within the Mine Water Management System ("**MWMS**") at the MGP is a key part of the mining operation. The MWMS involves the management of water within the mine to achieve the following objectives:

1. To enable the use of water at the MGP to support mining and activities ancillary to mining;
2. To ensure that a constant supply of water is available to the Processing Plant to enable unimpeded processing of ore;
3. To allow for the storage of water at locations across the mine prior to its use in the mining and processing of ore; and
4. To control discharges of mine impacted water to the wider environment such that compliance with instream water quality criteria is maintained.

Elements of the MWMS

The MWMS comprises of the following key elements:

- Open pits which collect and store surface water runoff and groundwater inflow and may be used for temporary storage of water pumped from other elements of the MWMS;
- Underground mines which collect groundwater inflow, including seepage from other mine features, and any operational water used in the course of developing or maintaining the underground mines;
- TSFs, which collect tailings slurry (including supernatant water) discharged from the Processing Plant, rainfall and seepage and are a primary source of water for the Processing Plant;
- Sumps and silt ponds which collect water from waste rock stacks, and other disturbed areas;
- Dams which provide for the temporary storage of water; and
- Above ground water storage infrastructure e.g. tanks, pipes and pumps.

The primary sources of water to the MWMS are:

- Rainfall and stormwater collecting in the elements listed above;
- Groundwater that is naturally intercepted by open pits and underground mines;
- Augmentation from OceanaGold's consented water take from the Taieri River which enters the MWMS at the Lone Pine Reservoir; and

- Seepages from mine related elements such as TSF and WRSs.

Management of the MWMS

OceanaGold uses water conveyance infrastructure (drains, primarily pumps and pipes) to move water between the various MWMS elements as required to meet its objectives. Water from the MWMS may be used in the Processing Plant, for dust suppression, to support ancillary mining activities e.g. vehicle wash down, fire suppression and use in workshops and yards or discharged from the site in accordance with the discharge permits. Any discharges from the MWMS are managed in accordance with the conditions of OceanaGold's existing discharge permits.

2.4.7 Camp Creek Dam

OceanaGold holds a suite of resource consents issued as part of MP3[9] that authorise the construction, operation and maintenance of a freshwater reservoir within the Camp Creek catchment at the location shown in **Figure 2.4**. The dam has not yet been constructed but remains an available option to provide a constant or seasonally varied water supply downstream to supplement naturally occurring low flows in Deepdell Creek for purposes of maintaining water quality. The consented dam consists of an embankment with an approximate height of 29 m behind which approximately 1.4 million m^3 of water can be stored when at full capacity, with a reservoir footprint of approximately 13.7 ha.

The consents that authorise the construction, operation and maintenance of Camp Creek Dam do not lapse and may be implemented at any time prior to their expiry on 1 October 2046.

[9] ORC consents RM10.351.35, RM10.351.36, RM10.351.37.V1, RM10.351.38, RM10.351.39.V1; and WDC consent 201.2011.35.

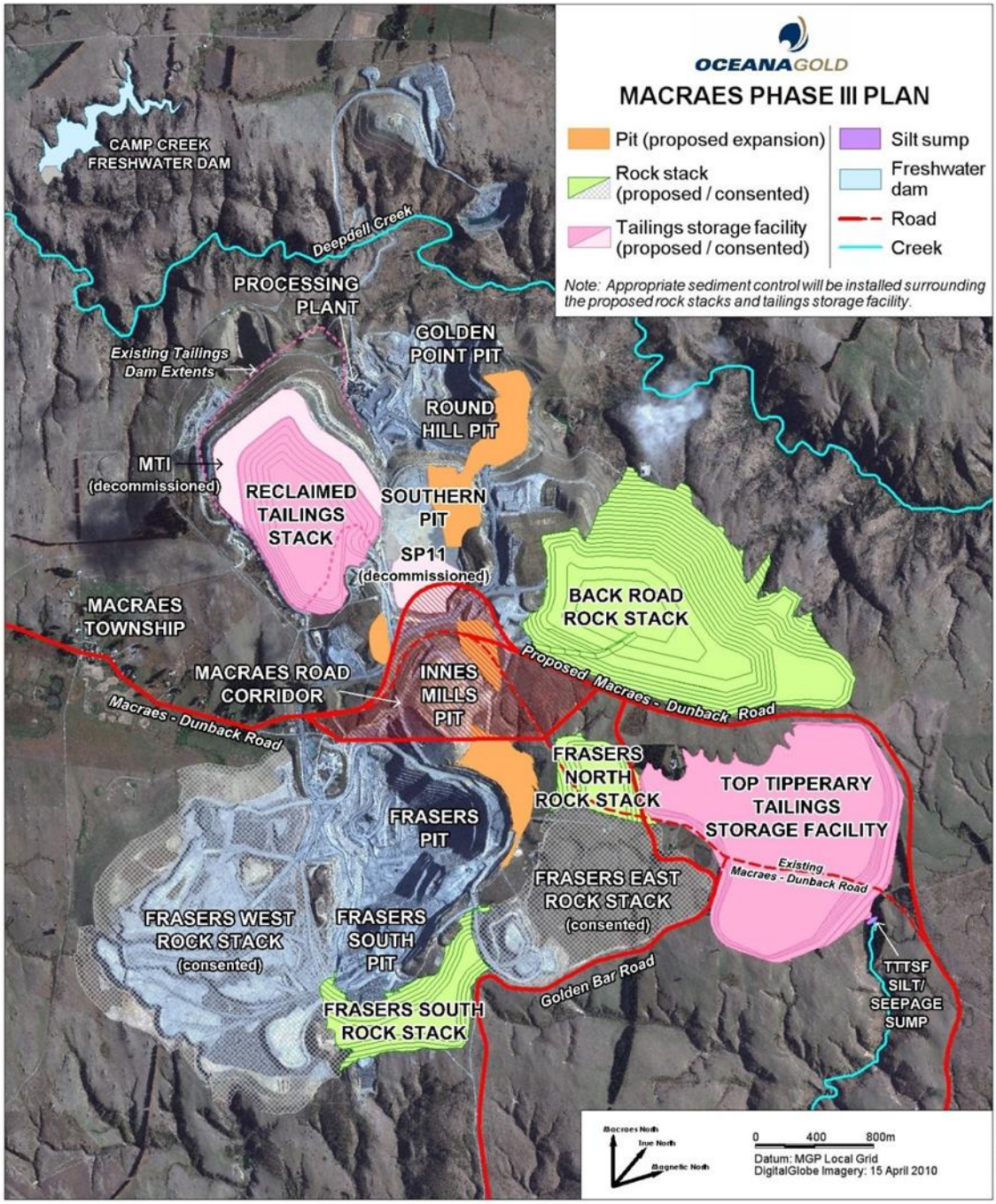

Figure 2.4: **Locality of the unconstructed Camp Creek Dam (top left of image).**

2.4.8 Coal Creek Dam

OceanaGold holds a suite of resource consents issued as part of the Coronation North Project[10] that authorise the construction, operation and maintenance of a freshwater reservoir within the Coal Creek catchment at the location shown in **Figure 2.5**. The dam has not yet been constructed but remains an available option to provide a constant water supply downstream, of approximately 5 litres per second, to supplement naturally occurring low flows in Coal Creek and Mare Burn for purposes of maintaining water quality. The consented dam consists of an embankment with an approximate height of 27 m behind which approximately 670 million litres of water can be stored when at full capacity, with a reservoir footprint of approximately 9.3 ha.

The consents that authorise the construction, operation and maintenance of Coal Creek Dam do not lapse and may be implemented at any time prior to their expiry on 24 April 2052.

[10] ORC consents RM16.138.02, RM16.138.07, RM16.138.08, RM16.138.16 and RM16.138.18; and DCC consent LUC-2016-234; and WDC consent 201.2016.779.

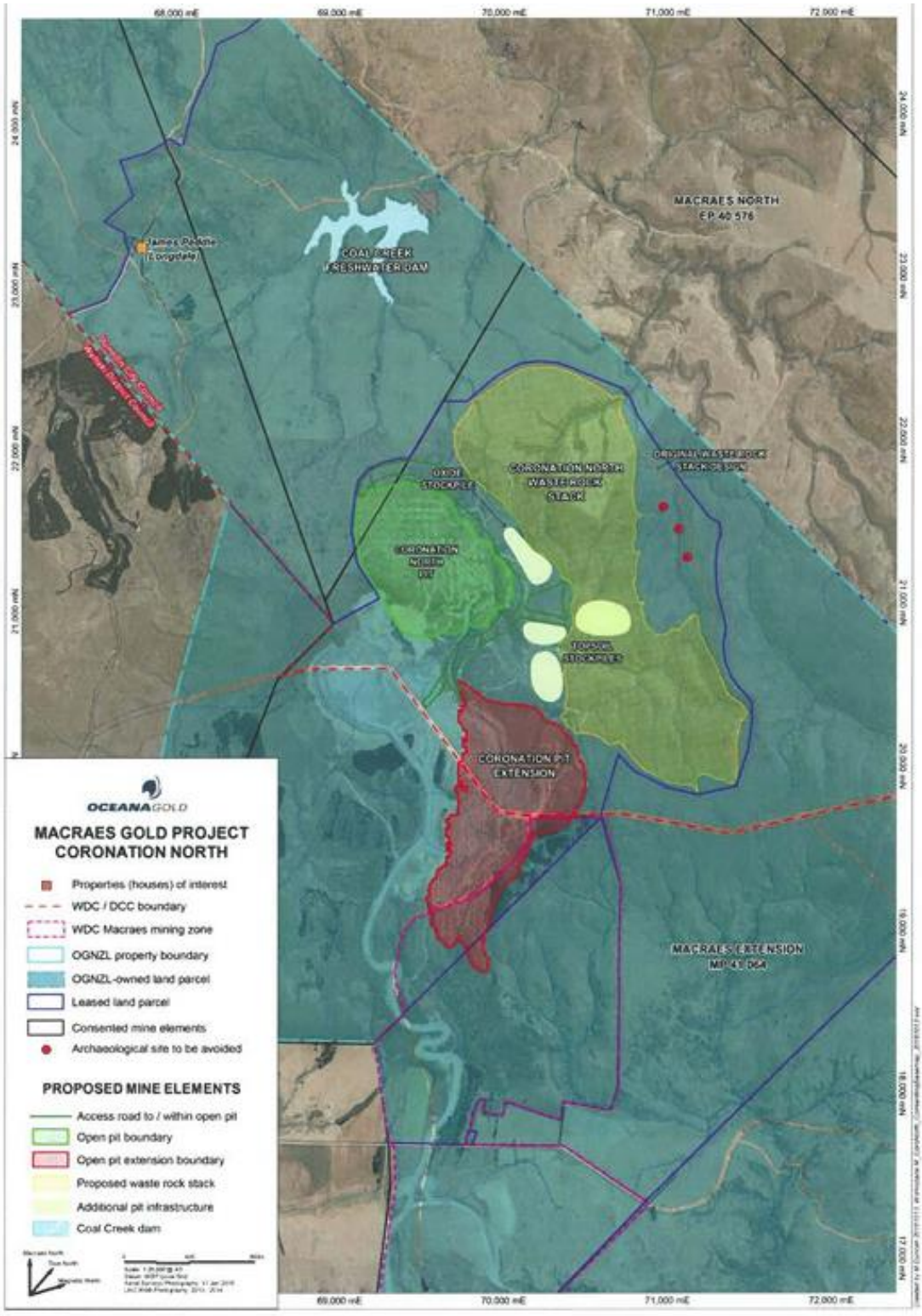

Figure 2.5: Locality of the unconstructed Coal Creek Dam.

2.4.9 Closure of the MGP

Closure of the MGP has been considered in each of the previous consenting phases and has generally been consented to the extent practicable, while acknowledging that some additional resource consents might be required at the time of final closure.

The currently authorised closure plan is for pit lakes to form in the mined-out open pits and for waste rock stacks and other operational areas to be rehabilitated to suitable, vegetated landforms that support appropriate post mining land uses, including pastoral farming, recreation, and ecological habitats.

The existing pit and WRS at Golden Bar provides a good example of what can be expected at closure, as shown in **Figure 2.6**.

Figure 2.6: Aerial image of the existing Golden Bar Pit and WRS, demonstrating the likely appearance of MP4 Project elements post closure.

2.4.10 Consent Applications Currently Being Processed

The following applications for activities at Macraes have been lodged by OceanaGold and continue to be processed:

- Back Road Waste Rock Stack
    - A resource consent application was made in 2022 to ORC to replace an expired resource consent (RM10.351.01) providing for the reclamation of streams associated with the construction of the proposed BRWRS. On 25 July 2022, ORC issued a second request for further information and that application remains on hold whilst OceanaGold considers its response.

- Frasers South Waste Rock Stack
    - A resource consent application was made in 2022 to ORC to replace an expired resource consent (RM10.351.09) providing for the reclamation of streams associated with the construction of the proposed Frasers South WRS. On 14 September 2023, ORC issued a section 91 determination requiring a further resource consent to be sought for earthworks within wetlands. OceanaGold has since applied for such a resource consent and this application was being processed at the time of writing.

2.5 CONDITION OF THE EXISITING ENVIRONMENT

The technical assessments outlined in **Table 1.1** each provide an overview of the existing environment with respect to the topic of each assessment. In general, the existing environment within and surrounding the MGP is affected to some degree by historic and current mining (carried out under existing resource consents) as well as by surrounding land uses. Notwithstanding the effects of mining operations, the existing environment maintains a strong rural character and amenity and the aquatic and terrestrial environments support a diverse range of indigenous species.

2.6 WATER QUALITY COMPLIANCE CRITERIA

OceanaGold utilises its existing Water Quality Management Plan to manage its existing activities to achieve the in-stream water quality criteria prescribed in its existing resource consents. Monitoring points are established in all catchments affected by the MGP. The catchments affected by the MP4 activities are primarily the Mare Burn, North Branch Waikouaiti River, and Deepdell Creek. Existing water quality compliance criteria at the key monitoring points within these catchments are identified in **Tables 2.2**, **2.3** and **2.4**. It is important to note that all criteria are expressed as maximum values unless otherwise stated.

Table 2.2: Existing compliance limits for the Mare Burn. All units m^3/sec (mg/L) except for pH

Compliance Parameter	Mare Burn (MB01)	Mare Burn (MB02)
Resource consent	RM12.378.04 RM12.378.05	RM16.138.04.V2 RM16.138.05.V2 RM19.085.03
pH (pH units)	6.0 - 9.5	6.5 - 9.5
Arsenic**	0.15	0.15
Cyanide (WAD)	0.1	0.1

Compliance Parameter	Mare Burn (MB01)	Mare Burn (MB02)
Copper*	0.009	0.009
Iron	1.0	1.0
Lead*	0.0025	0.0025
Zinc*	0.12	0.12
Sulphate	1,000	1,000
Nitrate-N	-	2.4
Ammoniacal-N	-	0.24
Turbidity	-	30-50% change in clarity
Suspended solids	-	30-50% change in clarity

* Metal limits hardness adjusted as per the equations below:

- Copper (g/m3) = (0.96exp0.8545[ln(hardness)] – 1.702) / 1000
- Lead (g/m3) = (1.46203 – [ln(hardness)(0.145712)]exp1.273[ln(hardness)] -4.705) / 1000
- Zinc (g/m3) = (0.986exp0.8473[ln(hardness)] + 0.884) / 1000

** The limit for arsenic is equivalent to the criterion continuous concentration (CCC) for arsenic identified in USEPA (2020) for freshwater aquatic life. The CCC is an estimate of the maximum concentration of a material in water that aquatic communities can be indefinitely exposed to without causing adverse effects.

Table 2.3: Existing compliance limits for the North Branch Waikouaiti River catchment at sites MC02, NB01 and NB03. All units m^3/sec (mg/L) except for pH.

Compliance Parameter	Murphys Creek (MC02)	Golden Bar Creek (NB01)	Waikouaiti River North Branch (NB03)
Resource Consent	2002.491, 2002.759 and 2002.763	2002.491, 2002.759 and 2002.763	96808, 2004.359, RM10.351.09, RM10.351.10 and RM10.351.11.
pH (pH units)	6.0 - 9.5	6.0 - 9.5	6.0 - 9.5
Arsenic**	0.15	0.15	0.01
Cyanide (WAD)	-	-	0.1
Copper*	0.009	0.009	0.009

Compliance Parameter	Murphys Creek (MC02)	Golden Bar Creek (NB01)	Waikouaiti River North Branch (NB03)
Iron	1.0	1.0	0.2
Lead*	0.0025	0.0025	0.0025
Zinc*	0.12	0.12	0.12
Sulphate	-	-	250

* Metal limits hardness adjusted as per the equations below:

- Copper (g/m3) = (0.96exp0.8545[ln(hardness)] – 1.702) / 1000
- Lead (g/m3) = (1.46203 – [ln(hardness)(0.145712)]exp1.273[ln(hardness)] -4.705) / 1000
- Zinc (g/m3) = (0.986exp0.8473[ln(hardness)] + 0.884) / 1000

** The limit for arsenic is equivalent to the criterion continuous concentration (CCC) for arsenic identified in USEPA (2020) for freshwater aquatic life. The CCC is an estimate of the maximum concentration of a material in water that aquatic communities can be indefinitely exposed to without causing adverse effects.

Table 2.4: Summary of current existing consented water quality criteria at key compliance monitoring sites in Deepdell Creek. All unites g/m^3 (mg/L) except pH.

Compliance Parameter	Deepdell Creek (DC07)	Deepdell Creek (DC08)
Resource Consent	2004.072_V1, 2004.092_V1	2006.303.V3 2006.304.V3 2006.306.V3 2006.307_V3 2006.308.V4 2006.305.V5 RM10.351.33.V4 RM10.351.31.V4 RM10.351.29.V4 RM10.351.04.V3 RM10.351.05.V3 RM10.351.34.V2 2003.640_V2 RM20.424.02 RM20.130.02 RM20.130.04 RM20.130.05 RM20.130.06 2005.341_V2 RM12.378.04 RM12.378.04 RM12.378.05 RM20.024.14
pH (pH units)	-	6.0 - 9.5
Arsenic**	0.02	0.15
Cyanide (WAD)	0.1	0.1
Copper*	0.009	0.009
Iron	1.0	1.0
Lead*	0.0025	0.0025
Zinc*	0.12	0.12

Compliance Parameter	Deepdell Creek (DC07)	Deepdell Creek (DC08)
Sulphate	-	1000
Nitrate-N	-	<2.4 median <3.5 95th %
Ammoniacal-N	-	0.24

* Metal limits hardness adjusted as per the equations below:

- Copper (g/m3) = (0.96exp0.8545[ln(hardness)] – 1.702) / 1000
- Lead (g/m3) = (1.46203 – [ln(hardness)(0.145712)]exp1.273[ln(hardness)] -4.705) / 1000
- Zinc (g/m3) = (0.986exp0.8473[ln(hardness)] + 0.884) / 1000

** The limit for arsenic is equivalent to the criterion continuous concentration (CCC) for arsenic identified in USEPA (2020) for freshwater aquatic life. The CCC is an estimate of the maximum concentration of a material in water that aquatic communities can be indefinitely exposed to without causing adverse effects.

Previous projects at the MGP have been consented on the basis that water quality in the existing environment could approach the limits prescribed in the above tables throughout the life of the Project and into closure. Significant investment has been made into the operation on the basis that these compliance limits will endure for at least the duration of the resource consents referred to in the tables above. The existing resource consents provide for these compliance limits until at least 2046.

OceanaGold utilises the MWMS to achieve the criteria compliance during operations. Various mitigation measures are prescribed in the Water Quality Management Plan to enable the above criteria to be met over the long term. These include:

- Rehabilitation of WRS surfaces;
- Implementation of passive treatment systems for WRS and TSF seepages; and
- Augmentation of stream flows using one or more freshwater sources.

3. PROJECT DESCRIPTION

3.1 INTRODUCTION

The MP4 Project seeks to enhance production and extend the life of open pit mining at Macraes from 2025 to around 2030 and includes the following elements:

- Further development of, and tailings deposition in, the FTSF in Frasers Pit;
- Down dip extension of three open pits (Innes Mills, Coronation and Golden Bar) and associated waste rock disposal;
- Transporting of ore to the Processing Plant for gold extraction;
- Backfilling of the Coronation North Pit following the completion of the mining currently authorised;
- Realignment of part of Golden Bar Road to facilitate additional mining in Innes Mills Pit;
- Ancillary features such as topsoil stockpiles, low-grade ore stockpiles, silt ponds, areas for pit infrastructure and access roading;
- Activities associated with the mitigation, remediation, and offsetting of the effects of the above activities, including amenity effects, water quality and ecological effects management (via the Murphys Ecological Enhancement Area);
- Partially infilling Golden Point Pit with waste rock rehandled from Northern Gully WRS and some waste from Innes Mills Pit to form buttressing on the west wall; and
- Establishment of an ecological enhancement area on the true right side of Murphys Creek, an access track and associated facilities.

The current processing capacity at the Processing Plant of approximately 6.5 Mt per annum will remain the same.

The current mine closure strategy for the Macraes Operation involves creation of pit lakes in mined-out pits, rehabilitation of other mining areas into vegetated landforms suitable for post mining land uses including ecological habitats, pastoral farming, recreational uses, re-establishment of public roads and establishment of a Community Trust focused on enhancing the future wellbeing of the Macraes community. This will remain the closure strategy following completion of the MP4 Project.

Figure 3.1 provides an overview of the MP4 mining areas and activities. Detailed descriptions of the above project elements are provided in the following sections.

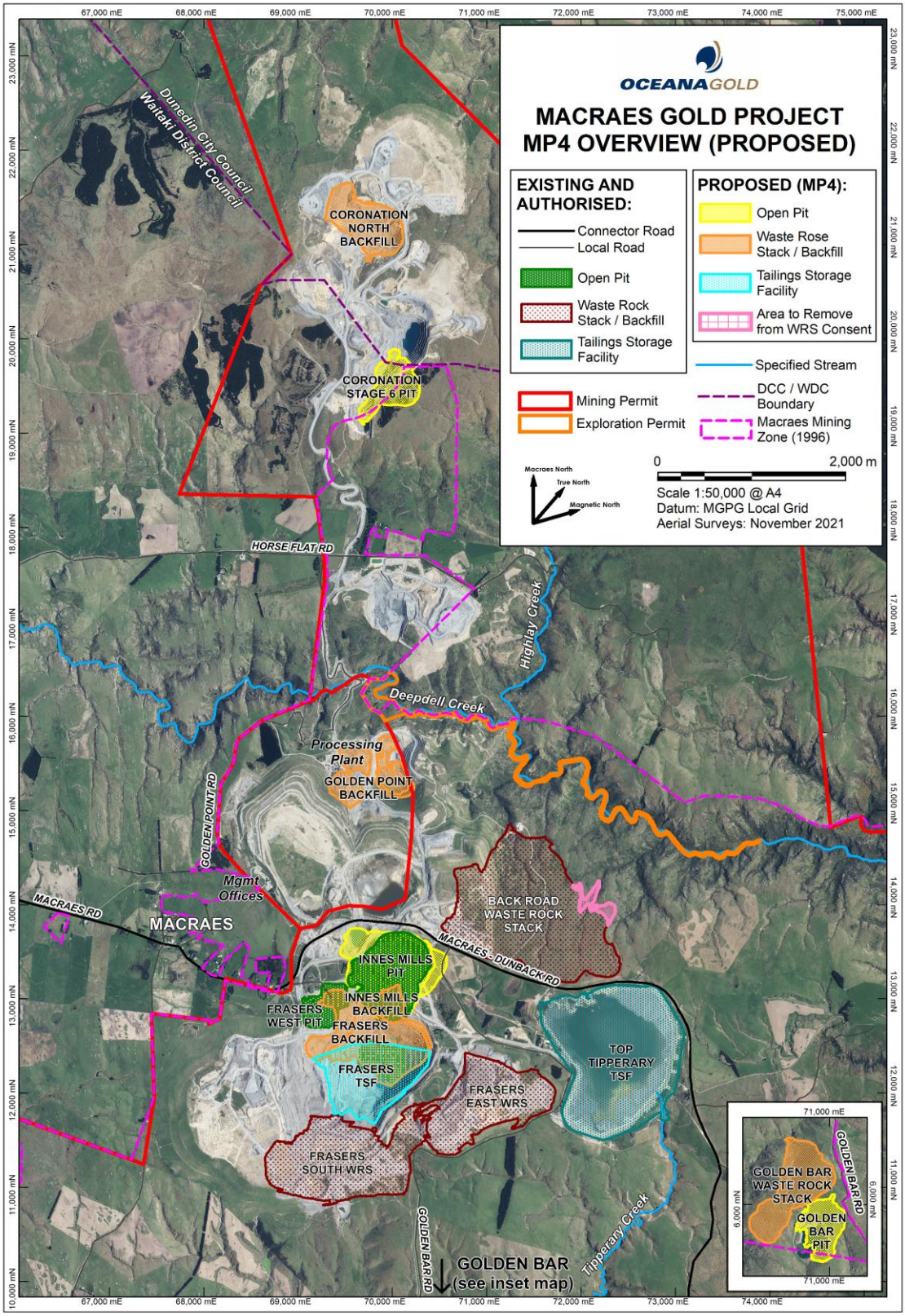

Figure 3.1: MP4 Overview Plan.

3.2 FRASERS TAILINGS STORAGE FACILITY

3.2.1 Overview

The TTTSF will reach full consented capacity in early 2025. To provide the necessary tailings storage capacity to support the current life of mine plan and the proposed life of mine extension, a new tailings storage facility is being established in the soon to be mined-out Frasers Pit, referred to as FTSF. Establishment of the FTSF Stage 1 is authorised and construction is underway. This proposal seeks to authorise the second, larger stage of FTSF development and storage required for the full LOM including the MP4 Project.

Construction of FTSF Stage 2 will involve increasing the height and width of the Frasers Backfill Embankment ("**FRBF**") at the northern end of Frasers Pit using backfilled waste rock stripped from the nearby Innes Mills Pit. This embankment will provide for increased storage of freshly milled tailings from 6 Mt to approximately 35.5 Mt.

Tailings stored in FTSF will be produced from the processing of ore from the authorised and proposed open pit extensions, authorised underground mining, stockpiled ore of varying grades, and potentially Third-Party Ore Concentrates.

3.2.2 FTSF Stage 2 Construction

Following Stage 1 of the FRBF at the northern end of Frasers Pit the embankment will be increased to a height of approximately 480 mRL. Discharge of tailings will continue during embankment raising with construction of FRBF projected to remain well ahead of the level of the rising tailings beach. As such, ample freeboard will be available to contain water from storm events and to prevent the saturated tailings, decant or pit lake water from overtopping into Innes Mills Pit should a highwall failure or earthquake initiate an unexpected displacement event.

The Stage 2 FRBF will be raised from 450 to 480 mRL with batter grades of approximately 3H:1V and a ~100 m crest width. **Figure 3.2** shows a schematic of the FRBF in plan. **Figure 3.3** shows a schematic cross section of the completed backfill embankment and tailings impoundment.

A total of 11.4 Mm^3 or 25 Mt of material is estimated to be required to extend FRBF to 480 mRL. Subject to obtaining the necessary approvals, construction of FRBF Stage 2 is scheduled to follow immediately on from Stage 1, commencing in 2026 and continuing until 2027.

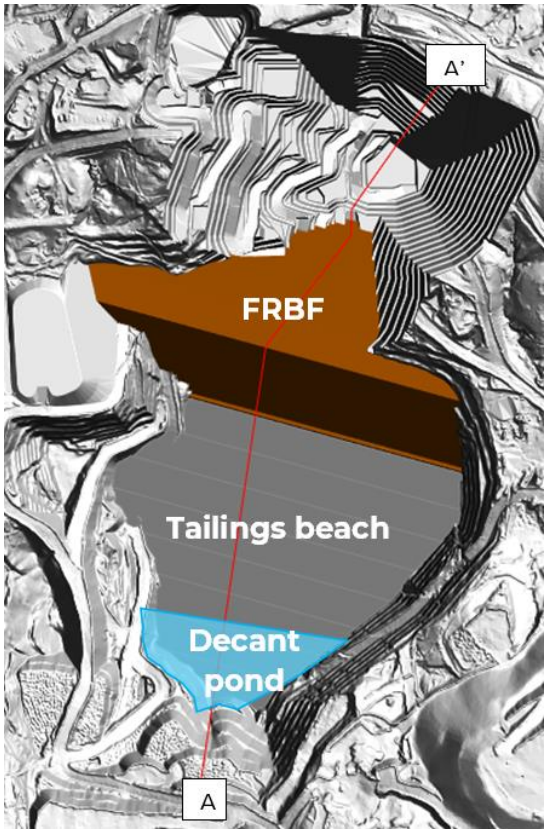

Figure 3.2: Proposed Frasers Backfill (Source: WSP (2024)).

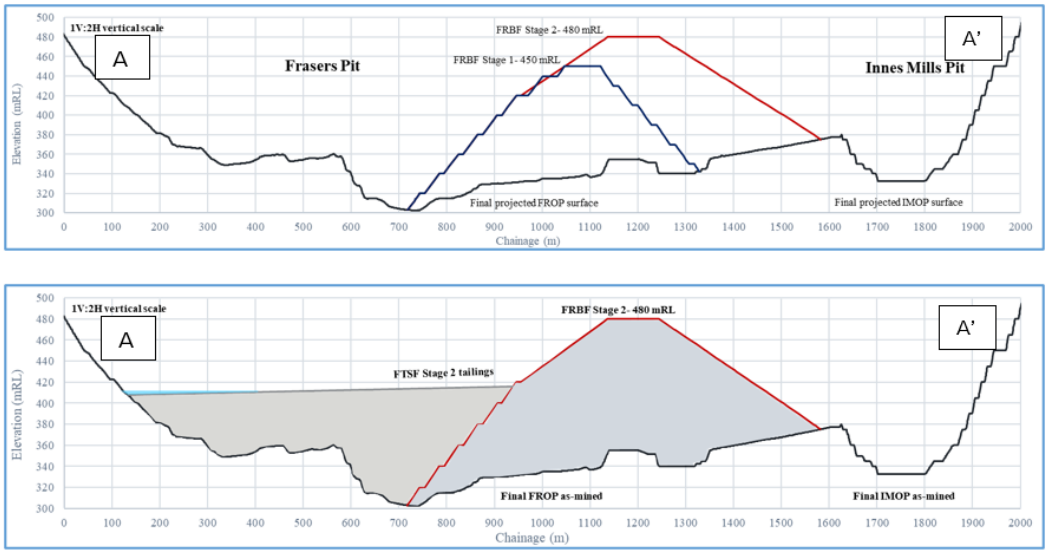

Figure 3.3: Schematic South-North cross section at the deepest part of the tailings showing Stage 2 relative to Stage 1 (top) and the completed FTSF (bottom) (Source: WSP (2024)). Note, the FRBF will extend across the Frasers Pit floor.

3.2.3 Tailings Delivery & Deposition

For Stage 2, an additional approximately 29.5 Mt of freshly milled tailings from the Processing Plant is proposed to be disposed of via a series conventional sub-aerial slurry discharge spigots along the FRBF to FTSF.[11] The route for the tailings delivery line will be the same as that established for Stage 1 as illustrated in **Figure 3.4**.

As for Stage 1, tailings slurry will be discharged from at or below the crest line of the FRBF to create a tailings beach and thus maintaining a wet beach. The beach slope is expected to have a slope of 1 in 100 to the south, away from the backfill embankment. This will generate a decant pond to maximise process water recovery.

Upon completion of Stage 2 tailings deposition, the final tailings beach level is planned to achieve an elevation of approximately 417 mRL. However, due to a range of operational factors (such as the tailings production schedule, tailings density, consolidation and changes in available pit geometry) the final tailings level may vary by a few metres, however a more than adequate freeboard will be present. Stage 2 will provide for approximately 5 years of additional tailings storage subject to an assumed Processing Plant ore processing rate of 6 - 6.5 Mt per annum.

Frasers Pit will continue to receive mine impacted water such as WRS and tailings seepage water and water from dewatering of pit lakes (for example Golden Bar and Coronation) on an ongoing and as required basis, respectively, to support the operation of the Mine Water Management System.[12]

Further details regarding the construction and operation of the FTSF are provided in WSP (2024) (refer **Appendix 2**).

[11] Discharge of contaminants to land and to water – Section 15 RMA.

[12] Discharge of water containing contaminants to land and water as currently provided for by RM10.351.47.V2 and RM10.351.43.V2.

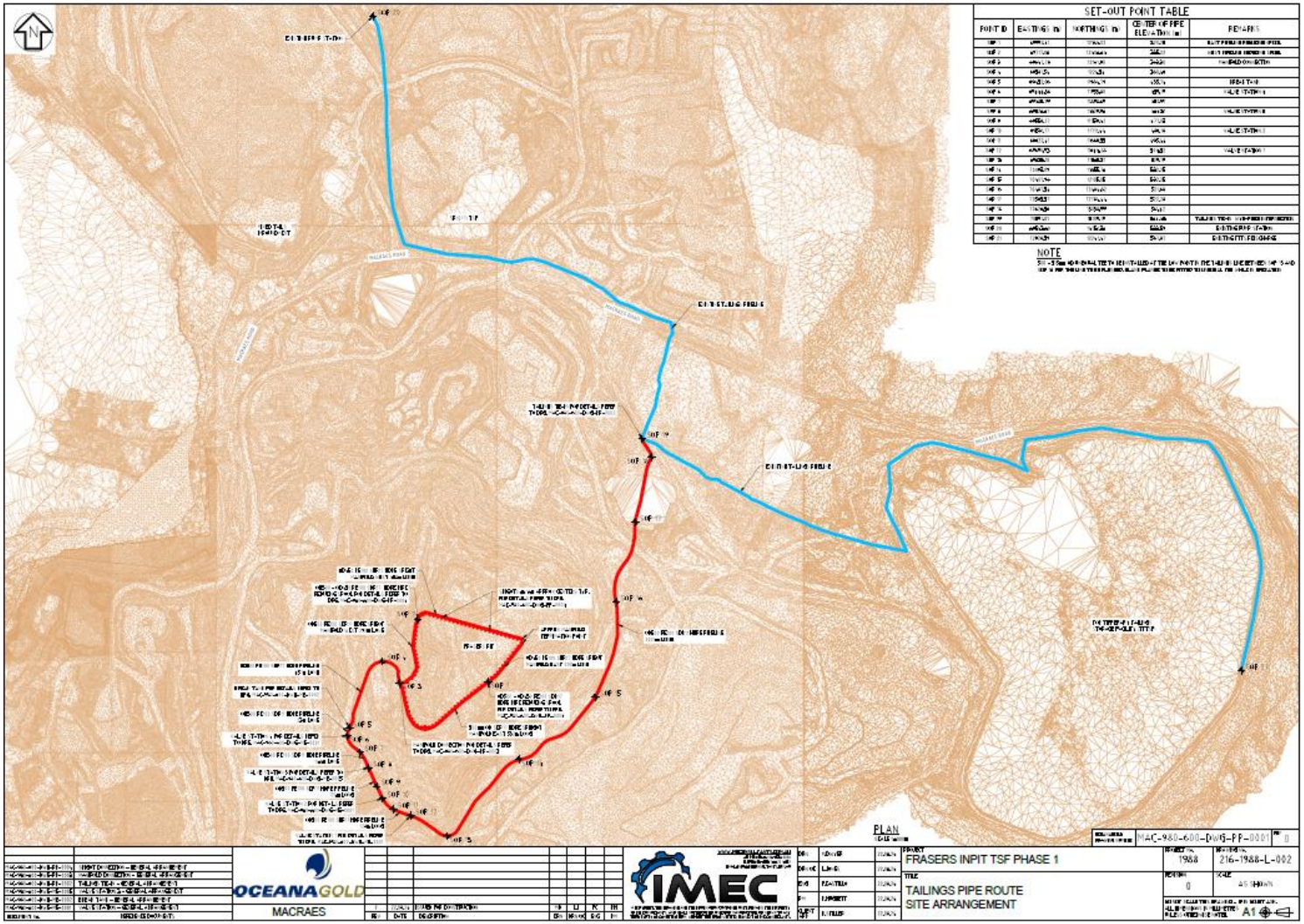

Figure 3.4: Alignment of the tailings delivery line established for FTSF Stage 1 (red line)

3.2.4 Tailings Return Water

Tailings return water, stormwater and influent mine impacted water will be pumped out of the pit and returned to the process circuit or used elsewhere in the Mine Water Management System using a floating pump system in the tailings decant pond.[13] Return water will be pumped at a rate of up to 500 L/s and will be returned to the Processing Plant via a series of stage storage ponds (up to four including the decant pond). This is necessary due to the very high head that the decant pond and other water will be pumped. Each stage will raise water from the decant pond and Processing Plant in three to four lifts and water will be discharged from the previous stage, then retaken and pumped through to the next stage. The pumping route will be the same as that established for Stage 1 as illustrated in **Figure 3.5**.

[13] Take and use of surface water – Section 14 RMA.

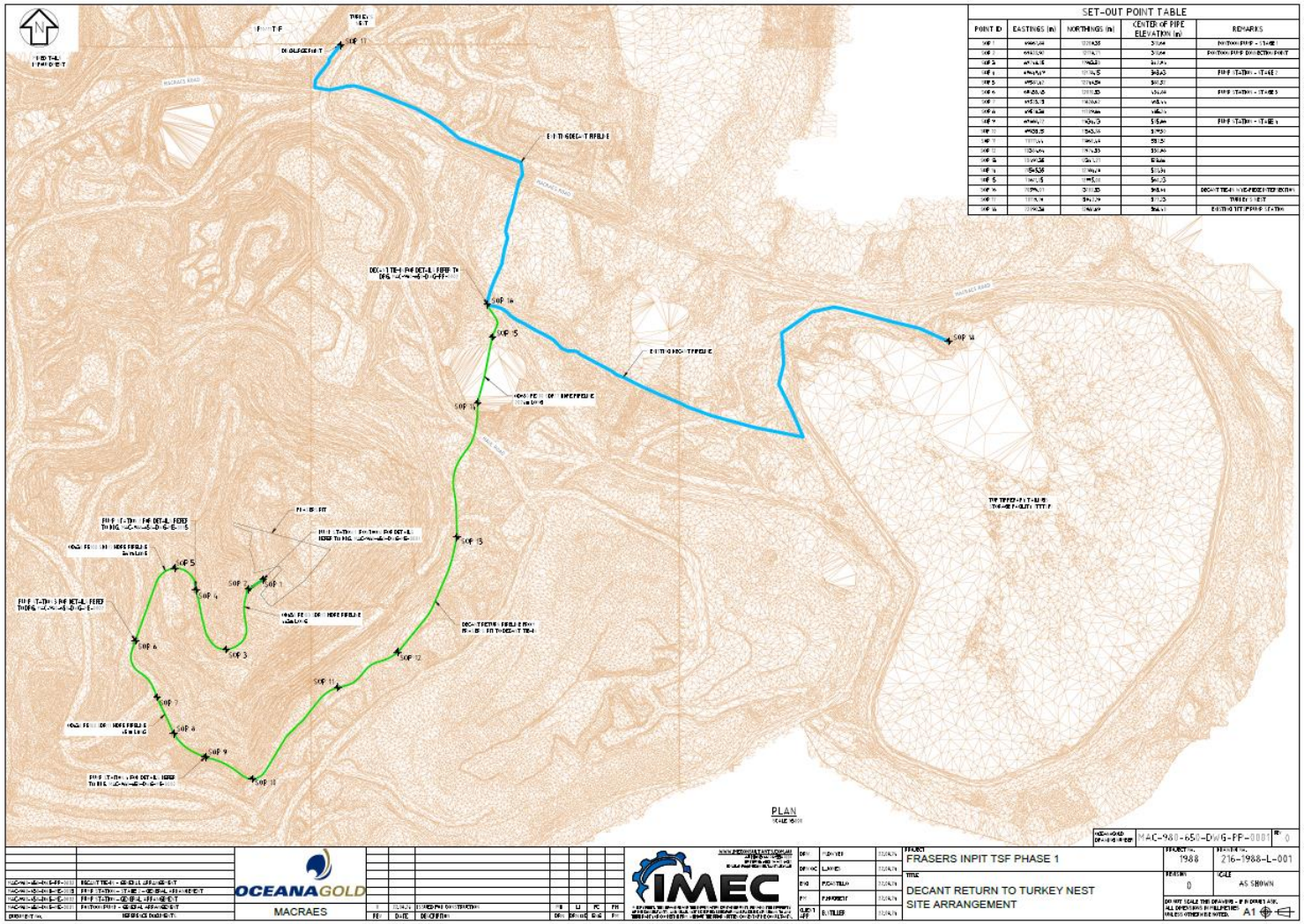

Figure 3.5: Alignment of the tailings return water line established for FTSF Stage 1 (green line).

3.3 INNES MILLS OPEN PIT EXTENSION

3.3.1 Overview

Innes Mills Pit is currently being actively mined. A small expansion to both sides of the pit was authorised as part of the Frasers Co-Disposal Project in July 2023.[14] A further small expansion has been sought as part of the Continuity Consents Project for which resource consent applications were lodged in December 2023. The MP4 Project proposes a further extension at the east and west to enable the recovery of downdip ore. The proposed extensions (illustrated in **Figure 3.6**) will result in an overall increase to the Innes Mills Pit footprint of approximately 12.5 ha increasing the total pit footprint to approximately 71 ha – an increase of 21%.

The proposed extension footprint extends over existing mine haul roads and access roads, Golden Bar Road, mining disturbed areas and very small remnant patches of rank pasture/tussock. A small area of natural wetland exists within 100 m of the proposed eastern extension and indications are that this area may eventually be completely or partially drained as a result of the proposed pit extension.[15]

Approximate additional material quantities expected from the mining of the extended Innes Mills Stages 9 & 10 pit are:

- Ore: 6.1 Mt;
- Waste: 84.2 Mt; and
- Total additional movement: 90.3 Mt.

[14] 201.2022.2047.

[15] Land use consent – Section 9 RMA.

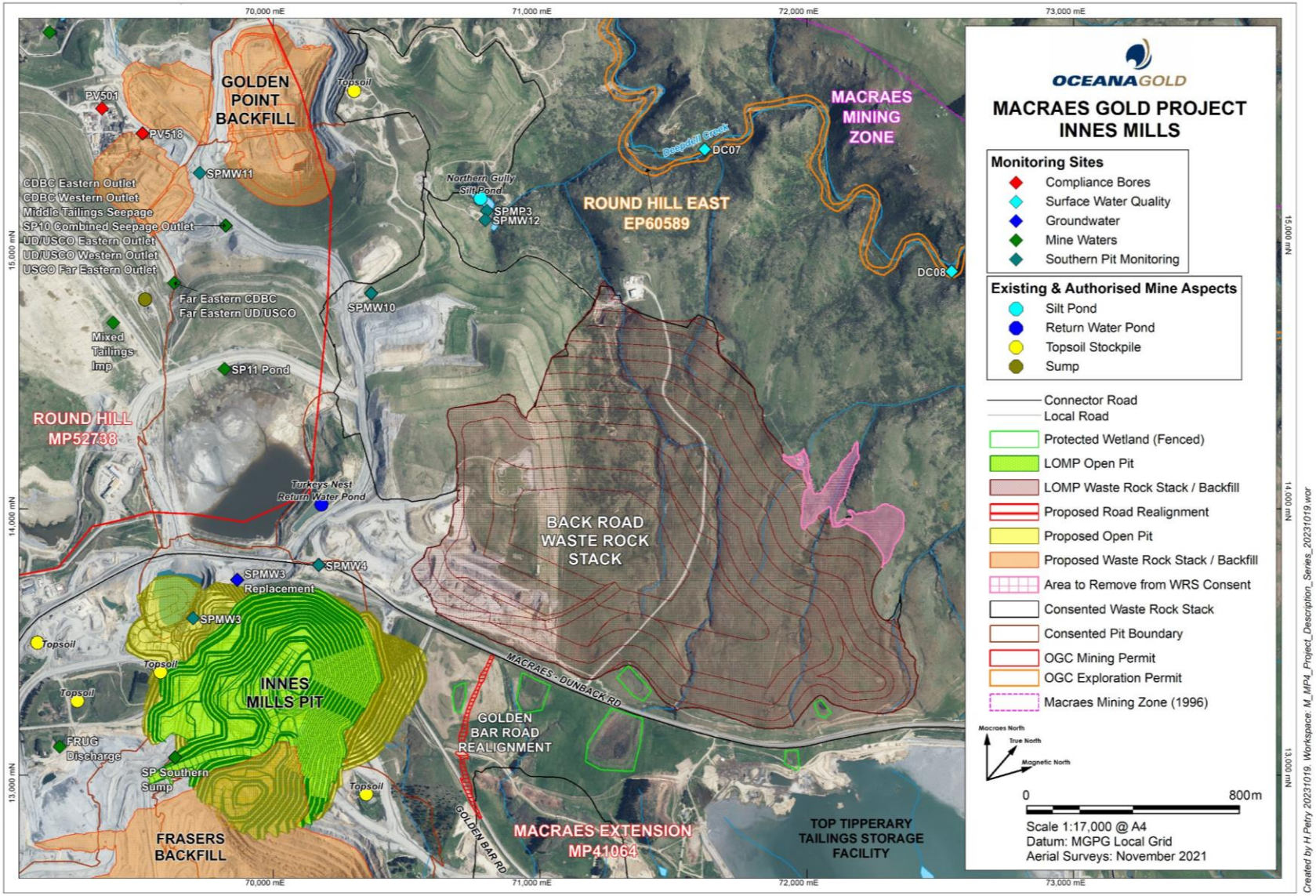

Figure 3.6: Proposed Innes Mills pit extension.

3.3.2 Mining Methods

In accordance with existing open pit mining at Macraes, mining operations will use standard drill and blasting methods, with excavators, and haulage trucks and various ancillary mobile plant (dozer, grader) to maintain haul roads and tip heads. Ore will be blasted in 7.5 m high benches[16] and excavated in three, nominally 2.5 m high flitches.[17] Waste rock will be blasted in 15 m high benches and excavated in three to four 3.5 m high flitches. Typical blasthole designs and configurations may have up to three holes per delay for re blasts and two holes per delay for waste blasts.

3.3.3 Waste Rock Disposal

Waste rock from the mining of the Innes Mills Pit extension is primarily planned to be placed within FRBF.[18] Excess waste rock beyond that required to complete construction of FRBF will be placed on the existing consented Frasers WRS.

A quantity of Innes Mills waste rock (approximately 5 Mt) may be used to partially backfill Golden Point Pit.

3.3.4 Ore Stockpiling and Transport

Ore will be transported directly to the Processing Plant with mine trucks using existing haul roads and new in-pit / backfill haul roads.

3.3.5 Equipment and Hours of Work

Mining and ore transport will require:

- 2 x 360 tonne excavators and up to eight Cat 789 haulage trucks per Innes Mills stage.

Waste rock haulage truck numbers will increase over time to maintain productivity as the pit deepens and haulage routes are extended. Supporting equipment, such as drill and blast drills, grader, track dozer, water cart, fuel truck, pit pump and portable lighting towers will be required.

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[16] A bench is the mining terminology used to describe a narrow strip of land cut into the side of an open mining pit, normally through blasting.

[17] A flitch is the mining terminology used to describe a pass by mining equipment to remove rock material in an open mining pit.

[18] Discharge to land – Section 15 RMA.

While mining activities will be undertaken 24 hours a day / 7 days per week, in accordance with current practice at Macraes, blasting will be restricted to within the following hours for the Project:

- Monday – Friday 9:00am – 5:30pm.
- Saturdays, Sundays and public holidays 10:00am - 4:30pm.

3.3.6 Support Infrastructure

Initially no new infrastructure will be required as relevant support infrastructure is currently in place for mining Innes Mills Pit.

A new location for a truck fuel bay will be established to replace the existing one in Frasers pit when it is backfilled. The new truck fuel bay will be located within the mining footprint in the bounds of Frasers West Pit.

Between the time of writing and project commencement, some of this infrastructure may be relocated to other parts of the mining operation and may need to be re-established to mine Innes Mills.

3.3.7 Water Management

Dewatering of the pit extensions is required before mining of the pit extensions can commence. This will occur as a continuation of existing pit dewatering for the duration of mining operations.

Water collected in pit sumps from stormwater runoff or groundwater ingress will be used in the Mine Water Management System.[19] Groundwater may also continue to be abstracted from horizontal drainage holes drilled into the pit walls and from existing groundwater bores located within 200 m laterally of the pit rim as required for pit stabilisation. No new groundwater bores are expected to be required to facilitate dewatering of the pit during operations.

Existing surface water diversions will be maintained or extended as required to prevent surface water runoff from the surrounding land from entering the pits during mining operations.[20]

Abstracted water may be transferred between pits for temporary storage if practicable or otherwise to other parts of the Mine Water Management System. Due to the increased size of the pit, there will likely be a need to establish an additional ex-pit water storage pond west of Innes Mills West pit, south of Mixed Tailings Impoundment following the removal of

[19] Take and use of surface water and groundwater – Section 14 RMA.

[20] Diversion of surface water – Section 14 RMA.

the Innes Mills West pit sump to support the management of water during mining. Storage capacity of the storage pond will be no more than 19,500 m^3. Water from the storage ponds will be used to supply the Processing Plant or could be transferred within the Mine Water Management System.

As part of the existing Mine Water Management System, Innes Mills Pit may continue to receive mine impacted water such as WRS seepage water on an as required basis, as necessary to support the management of water at existing mine facilities.[21]

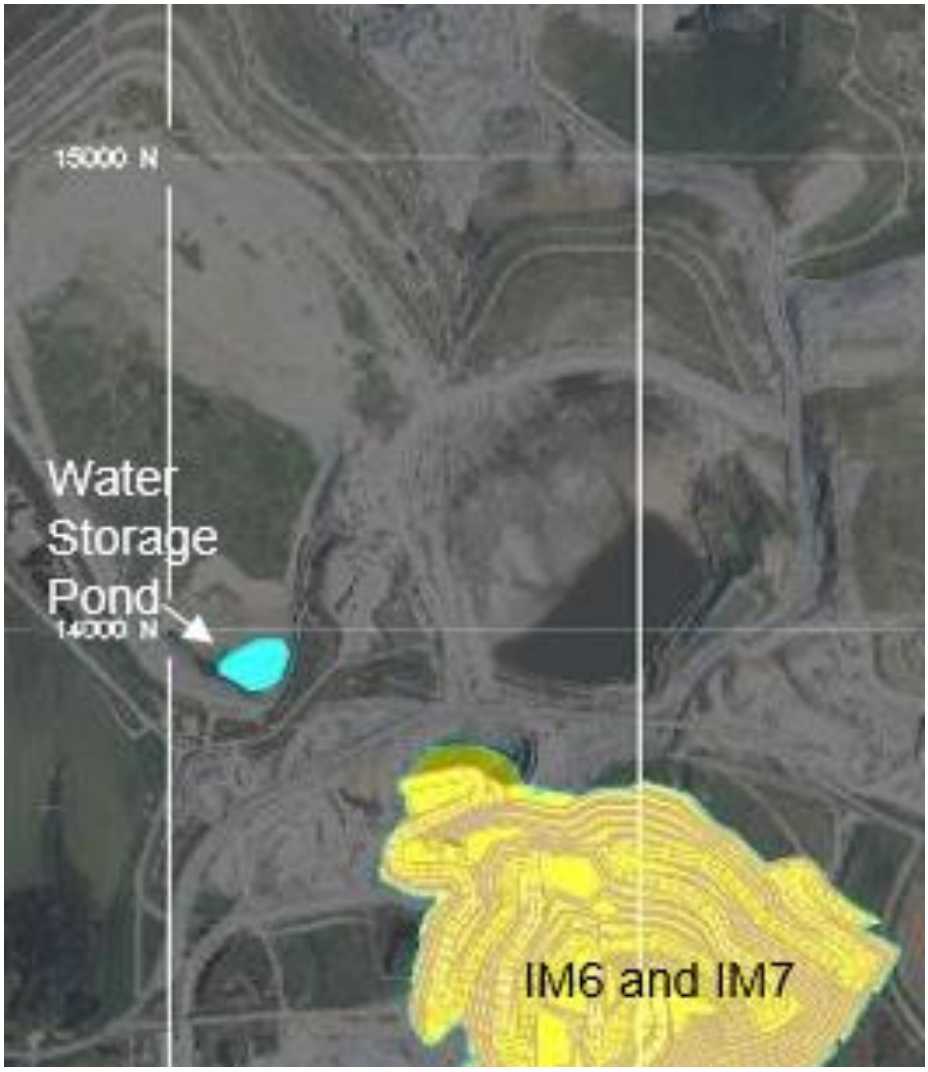

Figure 3.7: Proposed water storage reservoir associated with Innes Mills mining.

[21] Discharge of water containing contaminants to land and water as currently provided for by RM10.351.47.V2 and RM10.351.43.V2.

3.4 GOLDEN POINT BACKFILL AND NORTHERN GULLY WRS REHANDLE

A relatively small quantity (approximately 5 Mt) of waste rock from the Innes Mills Pit extension will be disposed of within and adjacent to Golden Point Pit to provide buttressing for geotechnical instability identified with the MTI.[22] Further buttressing will then be completed using approximately 5.4 Mt of waste rock to be rehandled from Northern Gully WRS upon completion of mining in Golden Point Underground around 2029 – 2030. The location of Northern Gully WRS is shown in **Figure 3.8** and it is centred on NZTM 2000 E1399785 N4974655.

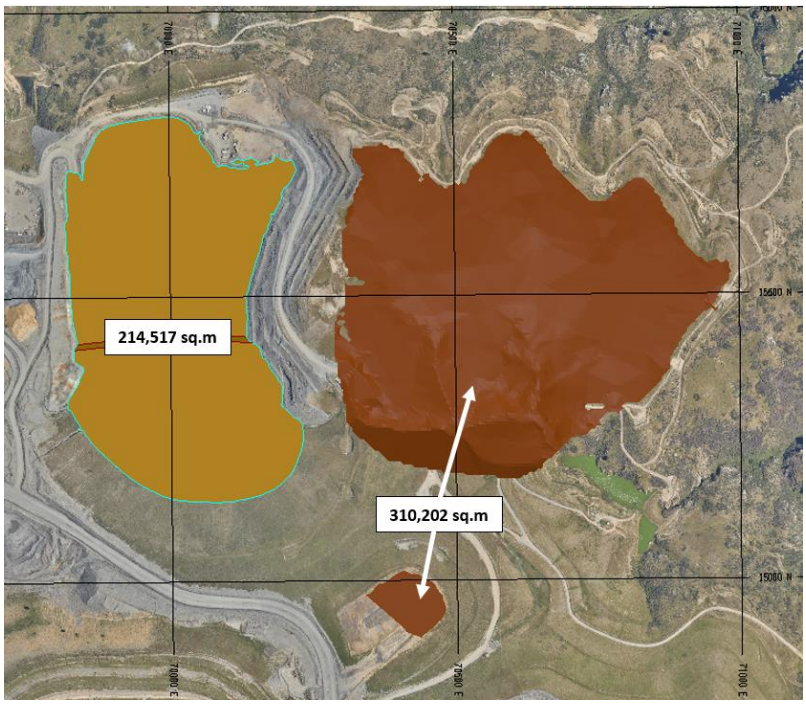

Figure 3.8: Location of Northern Gully Waste Rock Stack rehandle (right) and Golden Point Pit (left)

3.5 GOLDEN BAR ROAD REALIGNMENT

To facilitate the proposed extension of Innes Mills Pit described in Section 3.3, the northern section of Golden Bar Road will be realigned to the east. The realignment will remove a section of Golden Bar Road approximately 730 m in length and replace this with a road section approximately 160 m shorter, with an intersection at Macraes Road approximately 250 m northeast of the existing intersection. The proposed realignment is further described in the transportation assessment undertaken by Tim Kelly Transportation Planning Limited ("**TKTP**"), attached as **Appendix 24**, and illustrated in **Figure 3.9**.

[22] Discharge to land – Section 15 RMA.

The design of the new road alignment will comply with current Austroads standards. The design will be submitted to WDC for approval prior to construction.

At this stage, the design of the realignment is indicative only and details will change as refinements occur closer to the time of construction. For this reason, the indicative realignment has been identified within a 300 m wide corridor (of which the centreline is illustrated in **Figure 3.9**) which provides for any adjustments in response to engineering and / or environmental requirements. The alignment of the new road will potentially be located within 100 m of a natural inland wetland being that which is fenced and protected in accordance with the WDC land use consent for MP3, however no drainage effects are anticipated on the wetland. No works will occur within 10m of any natural inland wetlands. This includes the wetlands that have been identified and fenced as a result of earlier consent processes.

Construction of the road platform will require removal of vegetation and topsoil from the alignment to expose a stable rock base on which a road base will be developed using waste rock from Innes Mills Pit.[23]

Some settlement of the underlying fill may occur for a period of up to 2 – 3 years from construction. To manage this, OceanaGold will follow all procedures stipulated by WDC including a period of post-construction monitoring to ensure that the new road surface is performing satisfactorily prior to its hand-over to WDC.

[23] Discharge to land – Section 15 RMA.

Figure 3.9: **Indicative alignment of the proposed Golden Bar Road realignment. Nearby wetlands are shown as green polygons.**

3.6 GOLDEN BAR OPEN PIT EXTENSION

3.6.1 Overview

Golden Bar Pit is located approximately 10 km south of the Processing Plant. It is located near the boundary of OceanaGold owned land, within the area covered by mining permit MP41064 (refer **Figure 3.10**).

The Golden Bar pit was mined from 2004 – 2006 and has been partially rehabilitated to form a pit lake that is currently spilling water to a tributary of Murphys Creek, locally known as Golden Bar Creek.

There is a disused haul road running adjacent to Golden Bar Road on land owned by OceanaGold, which connects Golden Bar Pit to the wider MGP haul road network at Frasers Pit.

The Golden Bar Pit extension involves:

- Establishment of temporary support infrastructure;
- Recommissioning of the private haul road;
- Dewatering of the existing Golden Bar Pit and mining of the pit extension;
- Expansion of the existing Golden Bar Waste Rock Stack ("**GBWRS**"); and
- Rehabilitation and closure.

The proposed pit and WRS will modify a previous area of successful rehabilitation.

Overall, the Golden Bar Pit extension and associated WRS extension covers an area of approximately 40 ha, increasing the total disturbance area to approximately 68 ha.

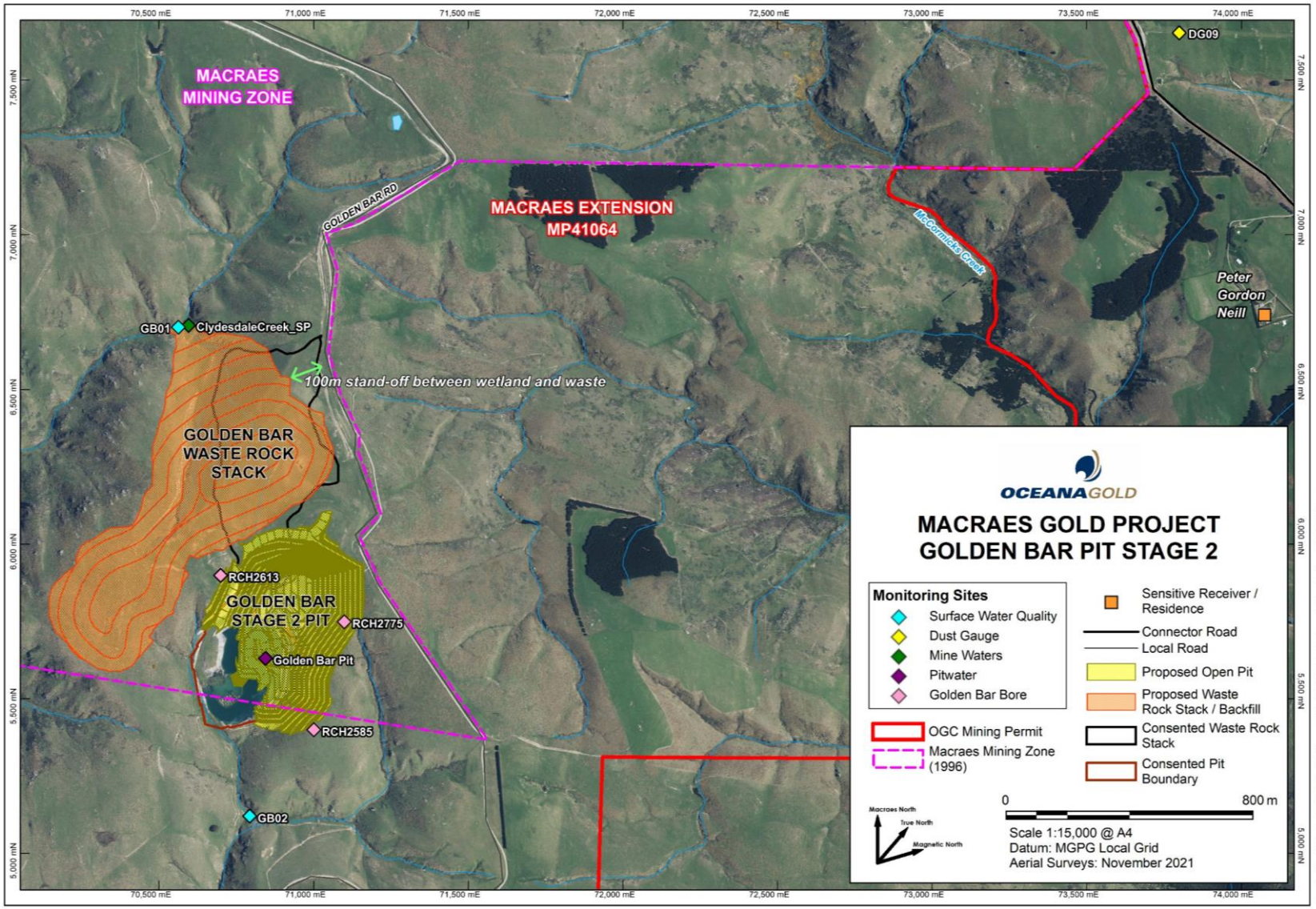

Figure 3.10: Location of the proposed Golden Bar pit extension.

3.6.2 Open Pit Excavation

The proposed Golden Bar Stage 2 ("**GB2**") pit extension consists of an approximate 200 m expansion to the east and northeast, as shown in **Figure 3.10**.

The current Golden Bar Pit has a footprint of 13 ha. The extension will involve some disturbance within the existing pit plus 14.4 ha of new disturbance.

Much of the expanded footprint is previously disturbed ground from the first stage of mining at Golden Bar in 2004-2006 which has been rehabilitated. This land was previously used for equipment park up areas and crib facilities.

The highest point of the pit is approximately 580 mRL and the deepest part is at 420 mRL, about 45 m deeper than the previous pit. This results in a 160 m high east wall.

Approximate material quantities expected from the mining of the extended Golden Bar Pit are:

- Ore 2.2 Mt;
- Waste 32.6 Mt; and
- Total additional movement 34.8 Mt.

GB2 encroaches into an area of headwater gully approximately 120 m in length that contains a mosaic of riparian and wetland vegetation including up to 0.008 ha of natural inland wetland (assuming it contains animals adapted to wet conditions). It does not contain any environment that can be classified as river. This 120m section of headwater gully will be permanently removed as a result of the proposed pit extension.[24]

3.6.3 Waste Rock Disposal

The proposed GBWRS consists of an approximately 450 m south western extension of the existing WRS, and a 120 m extension of its northern face. The final WRS toe will be located at the current silt pond.

The proposed extension involves approximately 26 ha of disturbance outside the footprint of the existing rehabilitated WRS and requires the reclamation of approximately 430 m of river extent in the Clydesdale Creek catchment that runs along part of the toe of the existing rehabilitated WRS (95 m of which is described as natural bed, and the remaining 335 m is described as modified river bed resulting from the establishment of the existing Golden Bar WRS).[25] A small area of natural wetland vegetation (approximately 0.114 ha)

[24] Land use – Section 9 RMA.

[25] Reclamation – Section 13 RMA.

also exists near the juncture of the modified river bed and the existing Clydesdale silt pond.[26]

The top level of the proposed WRS extension is 610 mRL, about 60 m above the current WRS. The storage capacity of the WRS extension is just over 30 Mt.

3.6.4 Ore Stockpiling and Transport

Ore from the GB2 pit will be stockpiled adjacent to the WRS and then be loaded out onto smaller haulage trucks and transported to the Processing Plant.

The haul route to the Processing Plant will utilise the previously used private haul road which will be reinstated. This haul route is immediately adjacent and west of the public Golden Bar Road until it gets to the Frasers South WRS where it then joins the Macraes haul road system in and around Frasers Pit.

3.6.5 Equipment and Hours of Work

During mining, one EX3600 / 789 dig fleet will be utilised. Truck numbers will increase over time as the pit deepens, ranging from three to five. Supporting equipment will be required including drills, grader, track dozer, water cart, fuel truck, pit pump and portable lighting towers. This fleet will operate 24 hours per day / 7 days per week.

Ore transport is proposed to consist of smaller off-road rigid dump trucks (e.g. Cat 773), loaded with a wheel loader (e.g. Cat 988). The 11 km private haul road will require maintenance with a grader and water cart. It is assumed that five Cat 773s (or equivalent) will be required. This fleet is expected to commence operations on a single shift basis but then proceed to operate 24 hours per day / 7 days per week.

While mining activities will be undertaken 24 hours a day / 7 days per week, in accordance with current practice at Macraes, blasting will be restricted to within the following hours for the Project:

- Monday – Friday 9:00am – 5:30pm.
- Saturdays, Sundays and public holidays 10:00am - 4:30pm.

3.6.6 Support Infrastructure

The following support infrastructure will be established prior to mining commencing and will remain onsite until mining is completed:

- A pipeline between Golden Bar Pit and Frasers Pit (as close as practicable to the existing haul road) to facilitate dewatering of Golden Bar Pit;

[26] Land use – Section 9 RMA.

- A portable smoko room located near the proposed ore stockpile;
- A fuel tank (electric powered, double skinned);
- A small ablution facility and septic tank;[27]
- Potable water will be delivered via tankers for drinking and ablutions;
- A wireless comms repeater will be installed for fleet management system data, communications; and
- Power can be supplied either via generator or from the adjacent overhead lines.

No workshop or maintenance facility is proposed for the Golden Bar development. All machinery and vehicle maintenance will be serviced in the field, or, for more demanding maintenance or repairs, the machines will be transported / driven back to the main workshop.

3.6.7 Water Management

The Golden Bar Pit is currently filled with water to its maximum capacity and is passively discharging to Golden Bar Creek. Dewatering of the pit is required before mining of the proposed pit extension can commence. GHD (2023) has completed as assessment of possible dewatering methods which indicate that local discharge is feasible whilst maintaining compliance with existing instream water quality criteria.

Approximately 2 years prior to commencement of mining, Golden Bar Pit lake water is intended to be pumped from the pit[28] and either:

- Pumped to Frasers Pit via a temporary pipeline installed adjacent to the Golden Bar haul road for reuse in the Mine Water Management System;[29] and/or
- Discharged to local waterways Golden Bar Creek, subject to stream hydrology and compliance with instream water quality criteria.[30]

Dewatering of the Golden Bar Pit will continue during operations and will be achieved by abstracting surface water and influent groundwater from the pit sump.[31]

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27 There will be no discharge of human waste on site.

28 Take and use of surface water – Section 14 RMA.

29 In accordance with RM10.351.43.

30 Discharge to water – Section 15 RMA.

31 Take and use of groundwater – Section 14 RMA.

Operational water from stormwater runoff or groundwater ingress will be used in the Mine Water Management System or pumped into the silt control structures and stored prior to discharge in accordance with silt pond discharge permits.

Perimeter drains will be required around parts of the extended GBWRS to direct surface runoff into the silt control structures, subsequent treatment if necessary and then ultimately discharge to the local waterways.[32]

3.7 CORONATION OPEN PIT EXTENSION

3.7.1 Overview

The Coronation Pit is located approximately 5 km north of the Processing Plant (refer **Figure 3.11**). The pit is well within OceanaGold owned land and within the area covered by mining permit MP41064.

The Coronation Pit was mined from 2013 – 2019 and is currently used as a temporary water storage reservoir as part of the MWMS.

The Coronation Pit extension involves:

- Dewatering of the existing Coronation Pit and mining of the pit extension;
- Haulage of waste to, and backfilling of, the Coronation North Pit;
- Haulage of ore to the Processing Plant along the Coronation haul road; and
- Rehabilitation and closure.

[32] Diversion of surface water – Section 14 RMA.

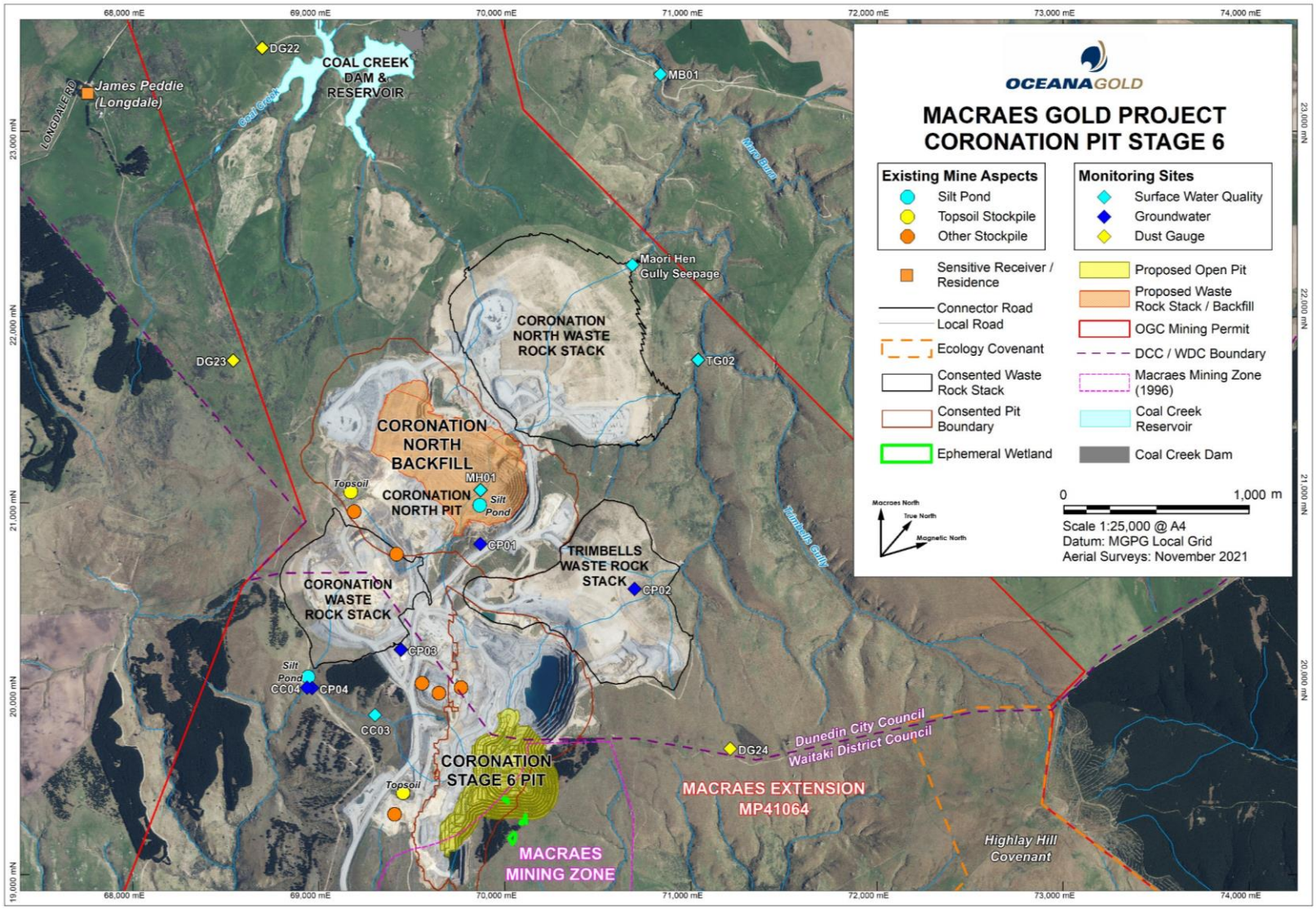

Figure 3.11: **Proposed Coronation Pit extension and associated Waste Rock backfill.**

3.7.2 Open Pit Excavation

The proposed Coronation Stage 6 Pit ("**CO6**") consists of an approximate 250 m expansion to the southeast as shown in **Figure 3.11**, over predominantly tussockland and three small natural inland wetlands.[33]

The currently authorised Coronation Stage 5 ("**CO5**") Pit has a footprint of 85 ha. The MP4 mine extension will involve some disturbance within the existing consented pit area plus six ha of new disturbance being Stage 6.

Approximate material quantities expected from the mining of the extended Coronation Pit are:

- Ore 2.2 Mt;
- Waste Rock 26.7 Mt; and
- Total movement 28.9 Mt.

3.7.3 Waste Rock Disposal

The planned waste rock disposal consists of backfilling Coronation North Pit,[34] as shown on **Figure 3.11**, once the authorised mining of Coronation North Pit has been completed. A small quantity of selected waste material will be used as a downstream toe drain and buttress at the Trimbells WRS seepage outlet near the Maori Hen / Trimbell's Creek confluence. Engineering of a barrier to exclude the advective flow of oxygen in the WRS basal layers is also proposed subject to feasibility assessment and detailed design and will be completed as part of WRS rehabilitation. The total capacity of the Coronation North Pit for backfilling to a height of 600 mRL, is 34.5 Mt. At a height of 600 mRL, the backfill will be approximately the same level as the crest of the Coronation North Pit, however, completion of further authorised mining at Coronation North Pit prior to backfilling may reduce the final backfill level to below the pit crest.

No additional disturbance is required for Coronation North Backfill beyond that which will occur to complete the authorised mining at Coronation North Pit. Temporary stockpiles for rehabilitation materials are to be formed in close proximity to the backfill for subsequent use in WRS rehabilitation (refer **Figure 3.11** above).

If required to manage mine scheduling, some waste rock may be disposed of to the existing WRS's in the Coronation Mining area,[35] being Coronation WRS, Coronation North

[33] Land use consent – Section 9 RMA.

[34] Discharge to land – Section 15 RMA.

[35] Discharges to land – Section 15 RMA.

WRS and Trimbells WRS. These facilities are yet to be fully rehabilitated and have approximate residual capacity as follows:

- Coronation WRS: 5.3 Mt / 2.5Mm^3
- Coronation North WRS: 36.3 Mt / 16.7Mm^3
- Trimbells WRS: 8 Mt / 3.7Mm^3

Any waste rock placed in these facilities will be done so in accordance with the relevant Operations and Management Plan which exists for these facilities.

Existing regional resource consents enabling the deposition of waste rock to these locations expire in 2026 and are proposed to be renewed as part of the MP4 Project to ensure adequate temporal coverage of the MP4 Project and to enable waste rock and rehabilitation material to be deposited in these facilities utilising the residual capacity in their authorised designs. No changes are proposed to the footprints of these facilities.

3.7.4 Ore Stockpiling and Transport

Ore will be transported directly to the Processing Plant with mine trucks using the existing Coronation haul road.

3.7.5 Equipment and Hours of Work

Mining and ore transport is anticipated to require two EX3600 / 789 dig fleets. To maintain production, truck numbers will increase over time as the pit deepens and the backfill increases in height, lengthening the haulage route. Truck numbers will be similar to those that were required for CO5 mining.

Supporting equipment will include drills, grader, track dozer, water cart, fuel truck, pit pump, and portable lighting towers.

While mining activities will be undertaken 24 hours a day / 7 days per week, in accordance with current practice at Macraes, blasting will be restricted to within the following hours for the Project:

- Monday – Friday 9:00am – 5:30pm.
- Saturdays, Sundays and public holidays 10:00am - 4:30pm.

3.7.6 Support Infrastructure

No new infrastructure will be required as this is all in place currently for Coronation and Coronation North mining. However, between the time of writing and project commencement, some of this infrastructure may be relocated to other parts of the mining operation and will need to be re-established to mine the Coronation Pit extension.

3.7.7 Water Management

The Coronation Pit is currently being used as a water storage reservoir and is consented to receive water pumped from Deepdell North Pit and Innes Mills West Pit.[36] This will need to be emptied prior to CO6 mining commencing. This is expected to take 4 months pumping at 200 L/s.

CO5 Pit water will be pumped from the pit[37] to another open pit within the Mine Water Management System.

Dewatering of the Coronation Pit will continue during operations and will be achieved by abstracting surface water and influent groundwater from the pit sump.[38]

Operational water from stormwater runoff or groundwater ingress will be dealt with as per CO5 water management plan and used in the Mine Water Management System.

Existing surface water diversion drains around Coronation Pit may be extended or repositioned to accommodate the proposed pit extension.[39]

3.8 MURPHYS ECOLOGICAL ENHANCEMENT AREA

After implementing measures to avoid, remedy and / or mitigate adverse effects, some residual adverse effects on terrestrial and aquatic ecology are expected as a result of the MP4 Project. These residual adverse effects will be offset or compensated for by undertaking specific protective or improvement actions including within designated Ecological Enhancement Areas.

An offset and compensation package that addresses the residual adverse ecological effects of the MP4 Project and to provide a protective benefit to lizards has been prepared and will be implemented (refer **Appendix 16**).

Central to the offset and compensation package is the proposed establishment of an Ecological Enhancement Area in the Murphys Creek catchment referred to as the Murphys Ecological Enhancement Area ("**MEEA**"). The 'working' location of MEEA is indicatively illustrated in **Figure 3.12**. The MEEA has been selected on the basis of its proximity to the Golden Bar and Innes Mills pits, the similarity of vegetation to that being affected, diversity of habitat types, enhancement potential and also best fulfilment of site selection criteria for lizard salvage or translocation activities. This is referred to as a 'working' location as although OceanaGold has had some discussions with the leaseholder farmer, DoC and Councils about the proposed location, OceanaGold will continue to work with DoC, iwi,

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[36] RM21.272.01 and RM21.433.01.

[37] Take and use of surface water – Section 14 RMA.

[38] Take and use of groundwater – Section 14 RMA.

[39] Diversion of surface water – Section 14 RMA.

Councils and the leaseholder about not only the final dimensions but also the exact location. Once the final area is determined, then OceanaGold will be able to have a detailed design completed.

Indications are that the MEEA needs to provide at least 45 ha of predator fenced lizard habitat, at least 39 ha of tussock grassland and space to establish 0.5 ha of new shrubland including areas on riparian / wetland vegetation.

Activities proposed as part of the offset and compensation package include:

- Legal protection of the MEEA;
- An all-weather access track;
- Fencing of the MEEA to exclude stock and installation of predator fencing around part of the EEA, including maintenance tracks around the perimeter and culverts at the points where the predator fence crosses major drainage gullies;
- Construction of a site office, equipment sheds and park up area;
- Revegetation (including the rescue and replanting of identified rare plants) and lizard habitat enhancement within the MEEA (including the creation of replacement rock tors);
- Weed management within the MEEA;
- An intensive mammalian predator control operation inside part of the MEEA the purpose of which will be to protect and greatly enhance lizard survival and will be the primary recipient site for lizards salvaged as part of the MP4 activities;
- Baseline monitoring of lizard populations and long-term monitoring to measure lizard response against population enhancement targets; and
- Contingency triggers and adaptive management procedures to ensure lizard response targets are achieved in the desired timeframes.

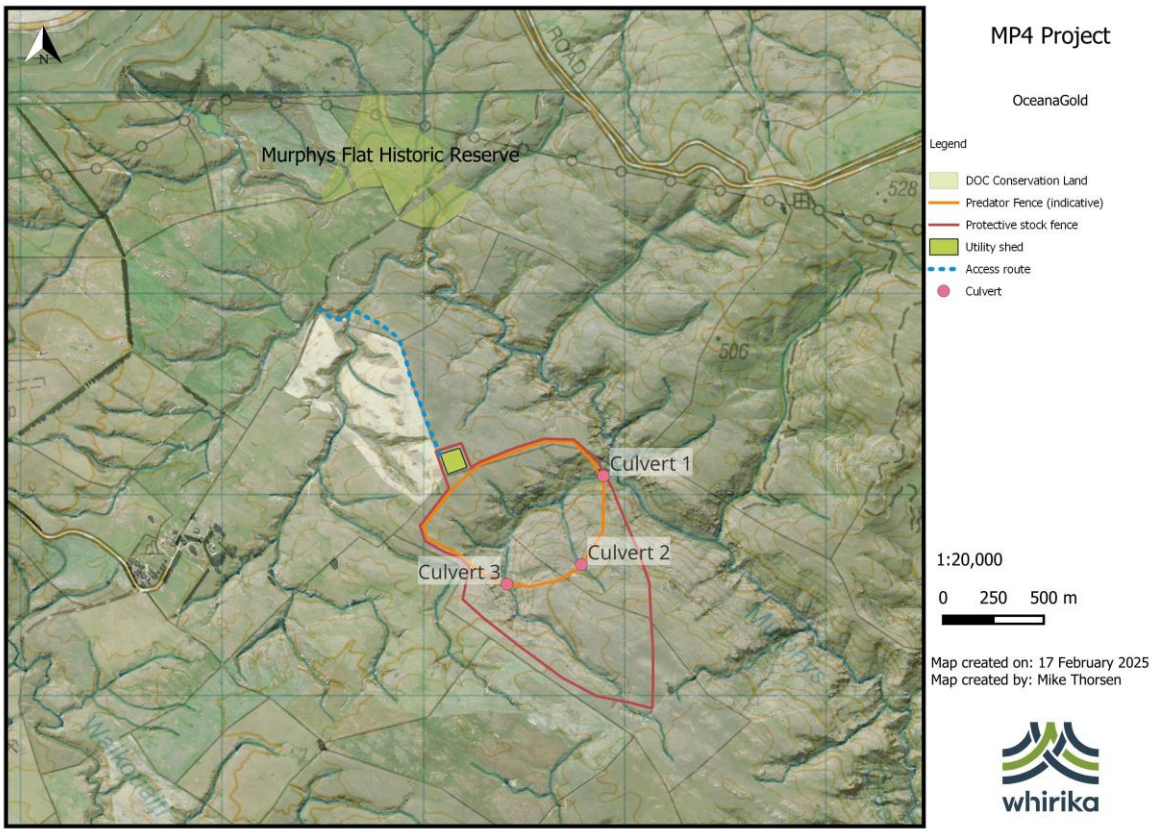

Figure 3.12: Indicative location of MEEA. Some adjustments may be necessary based on lease holder feedback.

The proposed predator fence around part the MEEA (indicatively shown in **Figure 3.12** above) will likely include three crossings of unnamed tributaries of Murphys Creek. Crossings will require the installation of culverts to provide safe access, stream flows, and to protect the proposed fence and to enable all weather vehicle access around the fence perimeter for construction and maintenance purposes.

Figure 3.12 above shows the indicative location of culverted crossings, the exact location of which will be confirmed during detailed design of the MEEA and could end up being 200 m or so upstream or downstream of the indicative locations shown. Culverts will be laid parallel to the existing stream bed, where practicable, and be appropriately sized and designed to not impede existing fish and sediment passage whilst preventing pest entry inside the fence. Construction of culverts will utilise temporary stream diversion and good practice methods to minimise sediment bed disturbance and sediment discharges. Alternatively, culverts will be established in the dry bed of ephemeral streams.

3.9 OTHER ECOLOGICAL ENHANCEMENTS

In addition to the activities proposed within and in conjunction with the MEEA, OceanaGold also proposes to create an area of ephemeral wetlands covering approximately 0.3 ha on

the flat sloping exotic grassland dominated spur on the Taieri Ridge, 3.5 km west of the Coronation 6 Pit (refer **Figure 3.13**). This will be achieved by excavating shallow (c. 1m below relative ground height) gently sloping concave scrapes into the bedrock, filling these to 10 cm depth with commercial peat material and seeding these with ephemeral wetland and wetland plant species onto the peat base to form a near continuous cover of native plant community before weed species become established. Two of these will be excavated to a deeper depth and with a deeper peat base to recreate the more intact impacted wetland example.

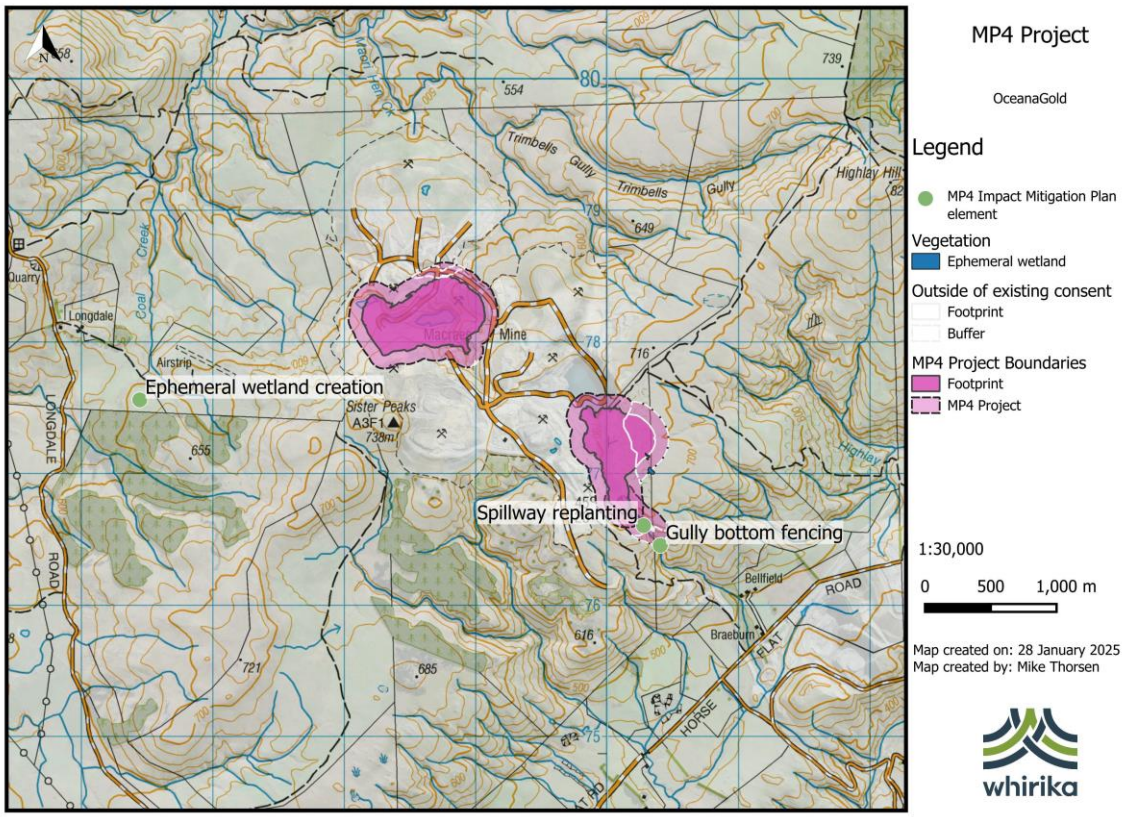

Figure 3.13: Approximate location of ephemeral wetland creation relative to Coronation Pit.

There will also be an offset for the two wetlands totalling 0.07 ha in the Innes Mills Stage 10 buffer which are expected to be dewatered as a result of the Project. This loss will be offset by creating a new wetland of 0.1 ha and with 50% cover by indigenous wetland species at the margin of the MEEA predator fence.

3.10 MINE CLOSURE AND REHABILITATION

3.10.1 Overview

The current mine closure strategy for the Macraes Operation involves creation of lakes in mined-out pits, shaping and rehabilitation using soils and plantings of other mining areas

for a range of suitable post mining land uses, and establishment of a Community Trust focused on enhancing the future wellbeing of the Macraes community. This will remain the closure strategy following completion of the MP4 Project.

To provide for suitable post mining land uses, the rehabilitation objectives that are specified in existing resource consent conditions relating to the Macraes Operation are:

(a) To ensure short and long term stability of all structures and works and their surrounds;

(b) To avoid maintenance after completion of rehabilitation requirements;

(c) To protect soil from erosion and to protect water from contaminants affected by mining operations;

(d) To stabilise and rehabilitate the banks and surrounds of any waterbodies;

(e) To return land as closely as possible to its original condition, including any exotic pastoral and indigenous species appropriate to the area;

(f) To visually integrate finished structures, land-forms and vegetation into the surrounding landscape so they appear to be naturally occurring features; and

(g) To control invasive environmental weeds, including wilding conifers, in the Disturbed Land for the Life of the MGP.

Standard site rehabilitation techniques employed to achieve the above objectives involve the use of stockpiled soils (weathered schist or brown rock and top soils) to undertake progressive rehabilitation of disturbed sites and revegetation of those sites with exotic pastoral species and tussock species[40] as required by any relevant Ecological Management Plan.

A description of the closure activities associated with each of the MP4 Project elements is provided in the following sections.

3.10.2 FTSF

Should no further stages of FTSF proceed, closure of Frasers Pit will occur in a manner consistent with the current and consented closure plan which is for a pit lake to form from groundwater inflows,[41] rainfall, surface water runoff from nearby surfaces,[42] and discharges of contaminated mine water from other parts of the mine.[43] After approximately 50 years,

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[40] Tussock species are as far as practicable sourced from the Macraes Ecological District.

[41] Take and use of groundwater – Section 14 RMA.

[42] Take and use of surface water – Section 14 RMA.

[43] Discharge to land and to water – Section 15 RMA.

the Frasers Pit Lake will form above the tailings surface and will coalesce with the Innes Mills Pit Lake above the FRBF crest at 480 m RL.[44]

A conceptual pit closure plan is shown in **Figure 3.14**.

Figure 3.14: Golden Point Pit, SP11 TSF, Innes Mills Pit and FTSF at closure.

3.10.3 Innes Mills Pit

Closure of the Innes Mills Pit will be consistent with the current MP3 and CCP closure plan (**Figure 3.14**). That is, a pit lake forming in the balance of the pit from groundwater inflows,[45] rainfall, surface water runoff from nearby surfaces[46] and discharges of contaminated mine water from other parts of the mine[47] (for example, tailings seepage water). After approximately 50 years, the Innes Mills Pit Lake will coalesce with the Frasers

[44] Damming or surface water – Section 14 RMA.

[45] Take and use of groundwater – Section 14 RMA.

[46] Take and use of surface water – Section 14 RMA.

[47] Discharge to land and to water – Section 15 RMA.

Pit lake above the FRBF crest level of 480 m RL, forming the Frasers-Innes Mills ("**FRIM**") Pit Lake.[48]

Long-term (>200 years) the FRIM Pit Lake levels are expected to reach a water level of up to 494 m RL. These levels are below the north west pit rim spill point of 497 m RL and therefore no direct surface water discharge from the lake to the Waikouaiti River North Branch ("**NBWR**") is predicted. When pit lake levels are in excess of 487m RL, some seepage is expected to report to the Murphys Silt Pond through the waste stored in the south of the Frasers Pit. This seepage will be captured and treated prior to release to the NBWR.

A barrier (nominally fencing and signage) will be installed around the final FRIM pit crest at an appropriate set back distance determined by geotechnical assessment after mining to ensure safety of future land users in perpetuity (**Figure 3.14**).

3.10.4 Coronation Pit

Upon completion of mining operations at Coronation Pit, dewatering will cease and the CO6 pit void will be left to fill with water from rainfall, groundwater inflows from the pit walls, WRS seepage water and surface runoff. This represents a similar closure arrangement to what is currently anticipated by current resource consents. From the cessation of dewatering, pit lake filling is anticipated to take 90 years to the point at which seepage flows through the Trimbells WRS to Trimbells Gully and approximately 200 years to the point at which the lake would overflow to the headwaters of Highlay Creek.

Prior to site decommissioning, a spillway will be cut in the southern end of Coronation Pit to facilitate future pit lake overflow to a tributary of Camp Creek. The total spillway will consist of an approximately 1.27 ha excavation around 370 m long and 33 m wide and down to approximately 660m RL as illustrated in **Figure 3.15**.

[48] Damming or surface water – Section 14 RMA.

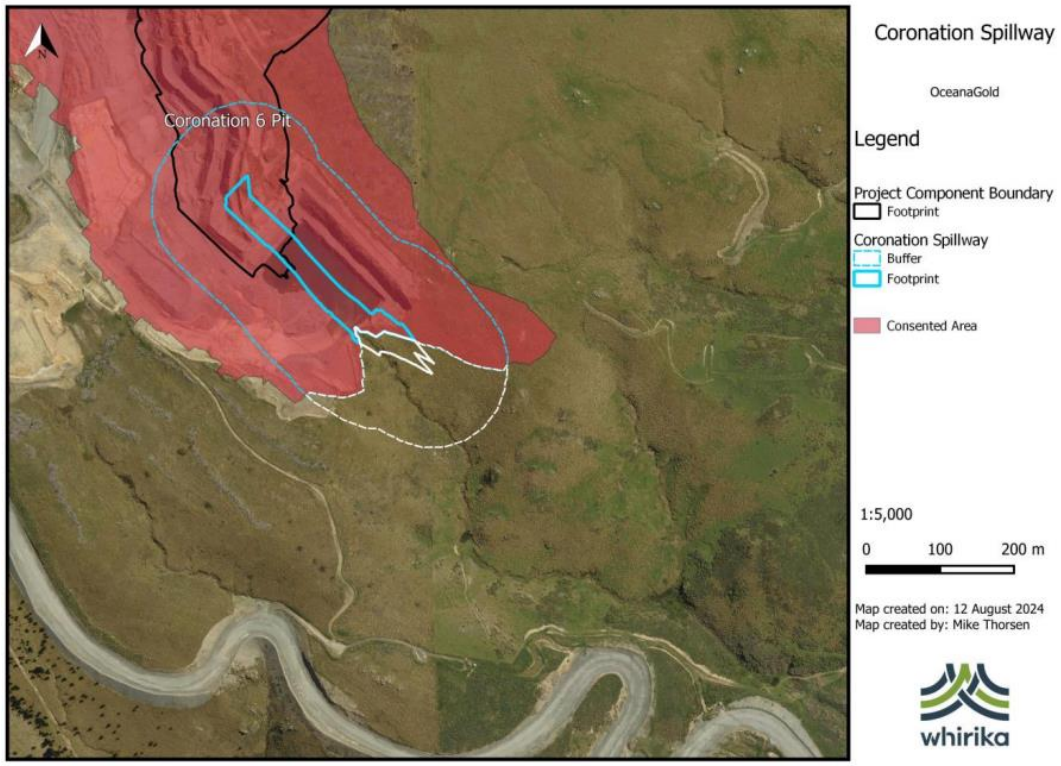

Figure 3.15: Indicative location of the Coronation Pit Spillway Cut

Figure 3.16 provides an overview of the Coronation Pit closure concept and illustrates the general arrangement of the anticipated pit lake.

A barrier (nominally fencing and signage) will be installed around the final Coronation pit crest at an appropriate set back distance determined by geotechnical assessment after mining to ensure safety of future land users in perpetuity (**Figure 3.16).**

Figure 3.16: Coronation and Coronation North Pit Closure Concept

3.10.5 Golden Bar Pit

Upon completion of mining operations at Golden Bar Pit, dewatering will cease and the pit void will be left to fill with water from rainfall, groundwater inflows from the pit walls,[49] WRS seepage water and surface runoff.[50] This represents a similar closure arrangement to that previously implemented at Golden Bar. From the cessation of dewatering, pit lake filling is anticipated to take between 35 – 42 years at which time water will slowly drain to Golden Bar Creek to the south as it does currently.

Figure 3.17 provides an overview of the Golden Bar Pit closure concept and illustrates the general arrangement of the anticipated pit lake.

A barrier (nominally fencing and signage) will be installed around the final Golden Bar pit crest at an appropriate set back distance determined by geotechnical assessment after mining to ensure safety of future land users in perpetuity (**Figure 3.17**)

[49] Take and use of groundwater – Section 14 RMA.

[50] Take and use of surface water – Section 14 RMA.

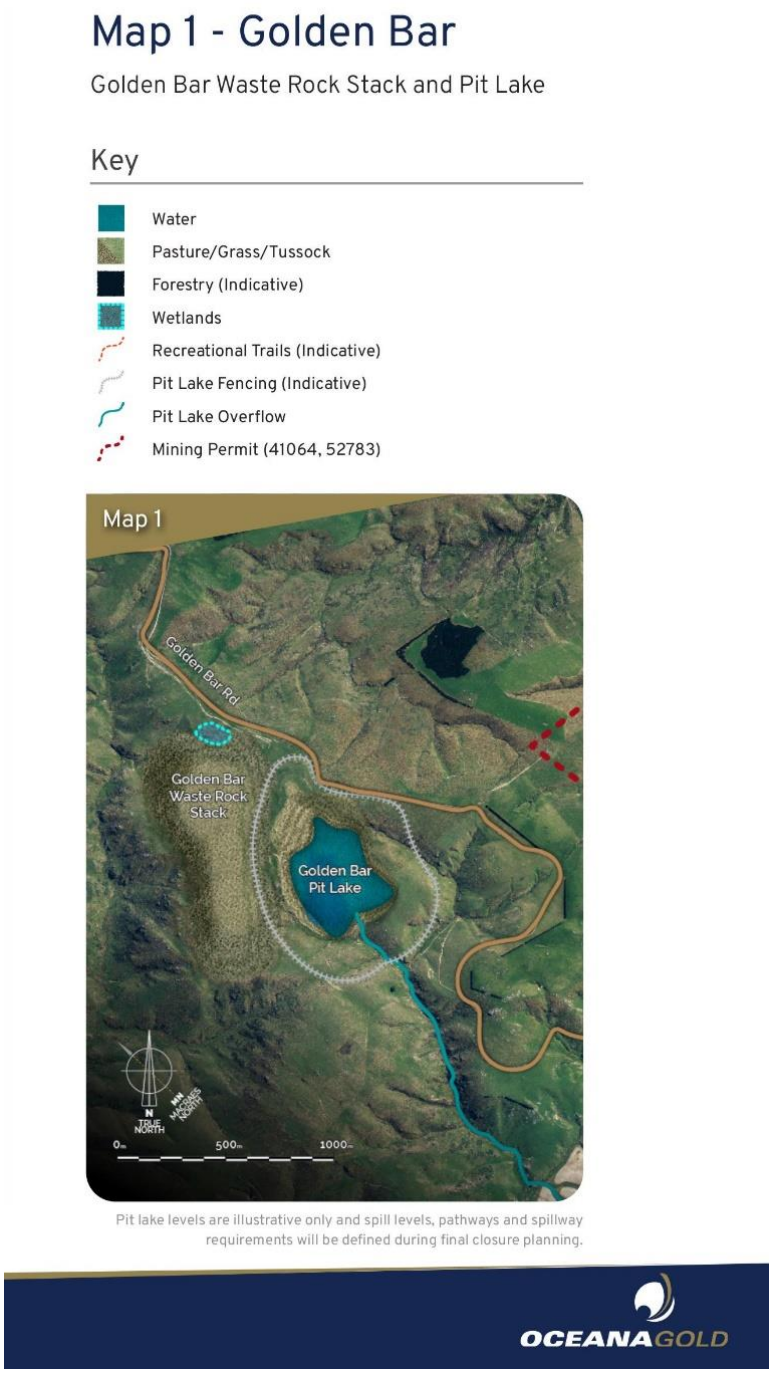

Figure 3.17: Golden Bar Pit Closure Concept

3.10.6 Backfills, Waste Rock Stacks and Other Operational Area

Consistent with current practices, WRS slopes will be designed and constructed in accordance with the following principles and revegetated progressively to ensure that they are complementary to the existing landforms upon closure:

(a) Slopes shall be suitably concave or convex in cross-profile to match nearby natural slopes;

(b) Slope gradients shall be no steeper than nearby natural surfaces;

(c) Transitions between natural and formed surfaces shall be rounded and naturalised;

(d) Contours should be curvilinear in plan form, in keeping with original natural contours in that area;

(e) The skyline shall be variable and curved, simulating natural skylines;

(f) New landforms shall be aligned and located so they seem to continue, not cut across, existing landscape patterns; and

(g) Silt ponds shall be removed and the site rehabilitated or be converted to stock water drinking ponds following completion of mining operations and rehabilitation.

All other disturbed areas will be rehabilitated using the standard site rehabilitation techniques described above and in accordance with the rehabilitation objectives.

3.11 INDICATIVE PROJECT TIMELINE

Timing of the various project elements is contingent on a range of factors including securing of all necessary authorisations and implementation of all required pre-start actions required by those authorisations, notwithstanding general delays or changes to mine planning that occur routinely at complex multi-pit operations such as Macraes. However, the below provides a general indicative timeline for the various project elements. It should not be relied upon explicitly for determining consent terms or lapse periods.

The indicative MP4 mining schedule involves the following sequence:

- The continuation of Innes Mills Open Pit mining from 2024 including the proposed pit extension to 2029;
- Mining of the Golden Bar pit extension from 2027 to 2030;
- Mining of the Coronation pit extension in 2026 to 2028; and
- Movement of waste rock from Northern Gully WRS to Golden Point Backfill in 2029 to 2030.

The following activities are required to enable the above mining schedule to proceed as intended:

- FTSF
    - Discharge of freshly milled tailings continuously from completion of Stage 1 in early 2026 through to 2030;
- Realignment of Golden Bar Road in 2026;
- Establishment of Murphys Ecological Enhancement Area;
    - Commencement of monitoring mid 2025;
    - Commencement of intensive predator control 2025;
    - Fencing and predator control Q42025 – Q1 2026; and
    - Translocation of lizards from CO6 mining area from Q1 2026.

Full site rehabilitation would commence in 2030 and be complete by approximately 2032.

4. RESOURCE CONSENT REQUIREMENTS

OceanaGold is seeking all necessary resource consents from Waitaki District Council ("**WDC**"), Dunedin City Council and Otago Regional Council ("**ORC**") for the MP4 Project as described in Section 3 of this AEE.

OceanaGold also holds numerous existing consents from the respective councils which, of relevance to this project, authorise activities in and around Frasers and Innes Mills Pits, Coronation and Coronation North Pits, and Golden Bar Pit. These consents have been issued as part of various preceding projects. In addition to the new resource consents required, OceanaGold seeks all necessary variations to the existing resource consents to authorise the MP4 Project.

4.1 WAITAKI DISTRICT COUNCIL

The activities associated with the MP4 Project are located predominantly within the Macraes Mining Project Mineral Zone and partially within the Rural Scenic Zone. The proposal requires a land use consent for mining activities.

The District Plan definition of mining activity is as follows:

> *Mining Activity means the use of land and buildings for the primary purpose of the extraction, winning, quarrying, excavation, taking and associated processing of minerals and any ancillary activity related to mining but does not include prospecting and exploration.*

This encompasses all activities proposed as part of the MP4 Project, as described in Section 3 of this AEE.

4.1.1 Macraes Mining Project Mineral Zone

Rules for the activities within the MMPMZ are set out in Chapter 6 of the operative Waitaki District Plan ("**WDP**"). The relevant rules for the MP4 Project are:

> ***Rule 6.3.2*** *Discretionary Activities*
>
> *The following activities shall be Discretionary Activities:*
>
> 1. *The excavation and construction of pits, pit margins, waste rock stocks and embankments, tailings impounds and any other dams, roads and tracks associated with mining.*
>
>   *The exercise of the Council's discretion being restricted to the following matters:*
>
>   a) *Rehabilitation of disturbed ground and vegetation;*
>   b) *Landscaping includes the siting and shaping of the pits, pit margins, waste rock stacks and embankments, tailings impoundments and any other dams, roads and tracks.*

c) *Long term structural stability, environmental integrity, and safety of the pits, pit margins, waste rock stacks and embankments, tailings impoundments and any other dams, roads and private tracks.*

d) *The modification or destruction of features of historic or archaeological value or any nature conservation value provided no conditions imposed be inconsistent with any heritage plan in existence.*

e) *Methods to avoid any discharge to water.*

f) *Effects on Grand and Otago Skinks.*

It is noted that proposed Mining Activities will not meet Critical Zone Standard 6.5.1 (noise) as the activities will be undertaken close to the Macraes Mineral Mining Project Zone boundary, and the relevant noise standards for activities in the Macraes Mineral Mining Project Zone apply at the zone boundary (not at the boundary of habitable dwellings). The Project will exceed critical zone standards for noise at some places along the zone boundary with the Rural Scenic Zone.

In accordance with Rule 6.3.3(3), the Project is therefore a non-complying activity.

4.1.2 Rural Scenic Zone

Rules for the activities within the Rural Scenic Zone are set out in Chapter 4 of the operative WDP. Mining Activities (as per the above definition) are listed in Rule 4.3.3 as being a Discretionary Activity and are not explicitly required by that rule to meet critical zone standards. However, the proposed Mining Activity overall will not meet Rural Zone Critical Zone Standard 4.5.1 (Noise) because night-time noise levels at the notional boundary of two residential dwellings in the Rural General Zone are predicted to exceed 40 dBA on occasions (due to hauling of waste rock and ore).

Following the direction in Section 1.8.4 of the Waitaki District Plan, the proposed Mining Activities located in the Rural Scenic Zone are therefore a non-complying activity.

4.1.3 Chapter 10 Temporary Buildings

In addition to being a “Mining Activity”, the temporary buildings located on-site for the MP4 Project are also covered by the Temporary Building land use rules. The buildings will remain on-site for longer than 12 months and therefore will not meet permitted Activity Rule 10.1.1.1(1) or (2), they are therefore a Discretionary Activity under Rule 10.1.1.2.

4.1.4 Chapter 16 Hazardous Substances

In addition to being a “Mining Activity”, the use and storage of hazardous substances on site as part of the MP4 Project is also covered by the Hazardous Substances land use rules. The MP4 Project requires the storage and use of a range of hazardous substances, including diesel, sodium cyanide, sodium isobutyl (also known as SIBX), sodium metabisulphite, copper sulphate stores and explosive magazines. The storage and use of these hazardous substances will contravene the Permitted Activity Site Development

Standards specified in Rule 16.1.1 and is therefore a Discretionary Activity under Rule 16.1.2. Existing land use consents authorise the use of these substances at the site and consent is being sought under these rules for consistency.

4.2 DUNEDIN CITY COUNCIL

Part of the site where activities relating to the Coronation Stage 6 Pit and Coronation North Backfill will occur is located within the jurisdiction of the Dunedin City Council as shown in **Figure 2.6**. This area is subject to the following planning overlays in the Dunedin City Second Generation District Plan ("**2GP**"):

- High Country Rural Zone; and
- Taieri Ridge and Mare Burn mapped area.

Rules for the activities within the High Country Rural Zone are set out in Chapter 16 of the 2GP.[51]

In accordance with Rule 16.3.3.15, mining in Rural Zones (not located in a Residential Transition Overlay Zone) requires resource consent for a discretionary activity. In addition, the Project requires resource consent for a restricted discretionary activity in accordance with the following rules:

- Rule 8A.3.2.3 – Earthworks – large scale
- Rule 9.3.4(4) – The storage and use of hazardous substances described in Section 4.1.4 contravenes the performance standards for hazardous substances quantity limits and storage requirements in Appendix A6.2 of the District Plan. This includes the storage and use of explosive magazines that exceed the quantity limit in A6.2.1(3).

The proposed vegetation clearance within the Dunedin City Council boundary is all exotic and therefore, no consideration of indigenous vegetation clearance in Rule 16.3.4 (21-22) is required. Clearance of vegetation within the Dunedin City boundary is a permitted activity in accordance with Rule 16.3.4 (23) as the activity complies with all vegetation clearance standards in Rule 16.6.11. Notably, the area to be cleared is **not**:

- Located within an urban biodiversity mapped areas (16.6.11.1);
- Covered by indigenous vegetation (16.6.11.2);
- Located in a protected area (16.6.11.3) including within a minimum setback from a water body (Rule 10.3.2.2);

[51] All provisions that are relevant to the proposed activity are not subject to an appeal, and therefore, there is no need to consider the Operative Dunedin City District Plan.

- Populated by any protected species (16.6.11.4); or
- Located within a hazard overlay zone or dune system mapped area (16.6.11.5).

For completeness, it is confirmed that there are no wetland communities affected by the project within the Dunedin City District boundary.

Overall, in accordance with the requirements of the 2GP, the Project requires a land use consent for a discretionary activity.

4.2.1 Changes to the conditions of existing District Council land use consents

OceanaGold is seeking to ensure the proposal is compatible with all existing land use consents issued for the wider Macraes Gold Project by varying some of the conditions of consents issued by the WDC and DCC via section 127 of the RMA. The conditions requiring variation are identified in **Table 4.1** (proposed variations are shown in the text).

OceanaGold notes that the condition changes primarily relate to public access and roading in the vicinity of the Coronation Mining Area. Each existing land use consent for Coronation Mining Area includes slightly different public access and roading conditions. By reference to various plans, these conditions are confusing and unclear. However, the intent is to simply maintain public access to the extent practicable during mining, and where appropriate, reinstate public roads following completion of mining. OceanaGold has compiled a plan that consolidates the public access and roading requirements in the context of the MP4 Project (refer **Figure 4.1**). The proposed variations set out in **Table 4.1** seek to retrofit this plan to the underlying land use consents to ensure a consistent interpretation going forward. This plan will also be included in the proposed MP4 land use consent conditions.

The proposed change to Condition 4.5 of the Coronation North Extension Project land use consent seeks to ensure the stability of the southwest wall of Coronation North Pit is appropriately remediated following further authorised mining and proposed backfilling. PSM has indicated that a minimum backfill level of 560 mRL will ensure appropriate long-term stability of the current southwest pit slope.[52] Further mining as authorised by the existing consent may alter the minimum backfill requirement. Therefore, the proposed condition change is to allow the minimum backfill level to be determined by future stability assessment prior to site decommissioning.

The environmental effects of these variations will not be additional to the environmental effects of the MP4 Project as described in Section 5 of this AEE. That is, there is no need to consider the adverse effects of these condition changes in isolation.

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[52] Refer OceanaGold's response to the District Council's s92(1) Request for Further Information, dated 15 October 2024.

Table 4.1: Proposed changes to existing District Council land use consent conditions

Coronation Project Land Use Consent WDC Reference: 201.2013.360 DCC Reference: LUC-2013-225	
Condition 13.1	Within 12~~6~~ months of all stages of Coronation Pit, Coronation North Pit, Coronation WRS, Coronation North WRS and Trimbells WRS excavation and rehabilitation~~pit excavations~~ ceasing, the consent holder shall reinstate for public use that part of Golden Point Road south of Horse Flat Road shown on "~~Coronation Project October 2013 WDC/DCC LUC Consents Map 1"~~the map titled "Macraes Gold Project Coronation Area Roading" annexed.
Condition 13.3	The consent holder shall provide unformed legal public access of a width not less than 15m that generally follows the blue line, and orange line north of Horse Flat Road shown on "~~Coronation Project October 2013 WDC/DCC LUC Consents Map 1"~~the map titled "Macraes Gold Project Coronation Area Roading" annexed.
Condition 13.4	The consent holder shall provide unformed pedestrian access that generally follows the ~~orange~~yellow dashed line south of Horse Flat Road shown on the map titled "Macraes Gold Project Coronation Area Roading" ~~"Coronation Project October 2013 WDC/DCC LUC Consents Map 1"~~ annexed.
Coronation North Project Land Use Consent DCC Reference: LUC-2016-234 and LUC-2013-225A WDC Reference: 201.2016.779 and 201.2013.360.1	
Condition 13.1	Within 12 months of all stages of Coronation Pit, Coronation North Pit, Coronation WRS, Coronation North WRS and Trimbells WRS excavation and rehabilitation ceasing, ~~the Coronation North and Coronation Pits ceasing excavation~~ the consent holder shall reinstate for public use that part of Golden Point Road south of Horse Flat Road shown on "~~Coronation Project 2013 WDC/DCC LUC Consents Map 1"~~the map titled "Macraes Gold Project Coronation Area Roading" annexed. At the same time the consent holder shall define and take steps to vest to the Council (and make lawfully available to the Council pending completion of vesting) the legal road.
Condition 13.3	Within 6 months of completion of mining operations ~~in~~ associated with all stages of Coronation North and Coronation Pits and rehabilitation of the project areas to the point of decommissioning silt ponds, the consent holder shall define and take steps to vest to the respective Councils (and make lawfully available to the Councils pending completion of vesting) a legal road of no less than 20 m wide that approximately follows the ~~green~~purple line shown as "Post Mining Matheson Road" on the map titled "Macraes Gold Project Coronation Area Roading" annexed ~~Figure 2~~ (as a replacement for the unformed Matheson Road). Depending on the extent of pit excavations, the road may be modified to be south or southwest of the ~~green~~purple line. The grade of Matheson Road shall be no more than 1 Vertical, 6 Horizontal at any location of the alignment. Prior to vesting, the road shall be graded to a standard enabling it to be used as a fine weather track for four wheel drive vehicles. The consent holder shall not have any

	ongoing responsibility to maintain the track or any form of public access along this unformed road as a consequence of this grading.
Condition 13.4	Within 6 months of completion of mining operations ~~in~~ associated with all stages of Coronation North and Coronation Pits ceasing and rehabilitation of the project areas to the point of decommissioning silt ponds, the consent holder shall define and take steps to vest to the Waitaki District Council (and make lawfully available to the Council pending completion of vesting) a legal road of no less than 20 metres wide that approximately follows the Coronation haul road alignment (~~as~~ indicatively shown marked in orange as "Post Mining Golden Point Road" on the map titled "Macraes Gold Project Coronation Area Roading" annexed ~~Figure 2~~) between Horse Flat Road and Matheson Road (as a replacement for the unformed Golden Point Road). Prior to vesting, the road shall be graded to a standard enabling it to be used as a fine weather track for four wheel drive vehicles. The consent holder shall not have any ongoing responsibility to maintain the track or any form of public access along this unformed road as a consequence of this grading.
Condition 13.5	The consent holder shall provide unformed access that generally follows the ~~orange~~yellow dashed line south of Horse Flat Road shown on the map titled "Macraes Gold Project Coronation Area Roading" ~~"Coronation Project 2013 WDC/DD LUC Consents Maps"~~ annexed.
Coronation North Extension Project Land Use Consent WDC Reference: 201.2019.1241 DCC Reference: LUC-2019-42	
Condition 4.5	Backfilling of Coronation North pit shall achieve a minimum Factor of Safety for the southwest pit slope of 1.0 under Maximum Design Earthquake seismic loading. Confirmation of this Factor of Safety must be provided in the form of peer reviewed findings of a geotechnical assessment submitted to the consent authority as part of the Site Decommissioning Plan required by Condition 5.1~~occur in the west section of the pit to a minimum height of mRL 575 as shown on 'Macraes Gold Project Coronation North Extension Figure 1' attached to and forming part of this consent~~.
Condition 13.1	Within 12 months of all stages of Coronation Pit, Coronation North Pit, Coronation WRS, Coronation North WRS and Trimbells WRS excavation and rehabilitation ceasing, ~~the Coronation North ceasing excavation~~ the consent holder shall reinstate for public use that part of Golden Point Road south of Horse Flat Road shown on ~~"Coronation North Extension WDC/DCC LUC Consents Map 1"~~the map titled "Macraes Gold Project Coronation Area Roading" annexed.
Condition 13.3	Within six months of completion of mining operations ~~in~~ associated with all stages of Coronation North and Coronation Pits and rehabilitation of the project areas to the point of decommissioning silt ponds, the consent holder shall define and take steps to vest to the respective Councils (and make lawfully available to the Councils pending completion of vesting) a legal road of no less than 20 m wide that approximately follows the ~~blue~~purple line shown as "Post Mining Matheson Road" on the map titled "Macraes Gold Project Coronation Area Roading" annexed ~~Figure 2~~ (as a replacement for the unformed Matheson Road).

	Depending on the extent of pit excavations, the road may be modified to be south or southwest of the ~~blue~~purple line. The grade of Matheson Road shall be no more than 1 Vertical, 6 Horizontal at any location of the alignment. Prior to vesting, the road shall be graded to a standard enabling it to be used as a fine weather track for four wheel drive vehicles. The consent holder shall not have any ongoing responsibility to maintain the track or any form of public access along this unformed road as a consequence of this grading.
Condition 13.4	Within six months of completion of mining operations ~~in~~ associated with all stages of Coronation North and Coronation Pits ceasing and rehabilitation of the project areas to the point of decommissioning silt ponds, the consent holder shall define and take steps to vest to the Waitaki District Council (and make lawfully available to the Council pending completion of vesting) a legal road of no less than 20 metres wide that approximately follows the Coronation haul road alignment (~~as~~ indicatively shown marked in orange as "Post Mining Golden Point Road" on the map titled "Macraes Gold Project Coronation Area Roading" annexed ~~Figure 2~~) between Horse Flat Road and Matheson Road (as a replacement for the unformed Golden Point Road). Prior to vesting, the road shall be graded to a standard enabling it to be used as a fine weather track for four wheel drive vehicles. The consent holder shall not have any ongoing responsibility to maintain the track or any form of public access along this unformed road as a consequence of this grading.
Deepdell North Stage 3 Project Land Use Consent WDC 201.2019.1454	
Condition 15.1	Within 6 months of all stages of Coronation Pit, Coronation North Pit, Coronation WRS, Coronation North WRS, Trimbells WRS, ~~Coronation North Extension and~~ Deepdell North Stage III pit and Deepdell East WRS excavations and rehabilitation ceasing, the consent holder shall reinstate for public use that part of Golden Point Road south of Horse Flat Road shown on ~~"Appendix I – Map 1 – Deepdell North Stage III proposal areas"~~ the map titled "Macraes Gold Project Coronation Area Roading" annexed to this consent.

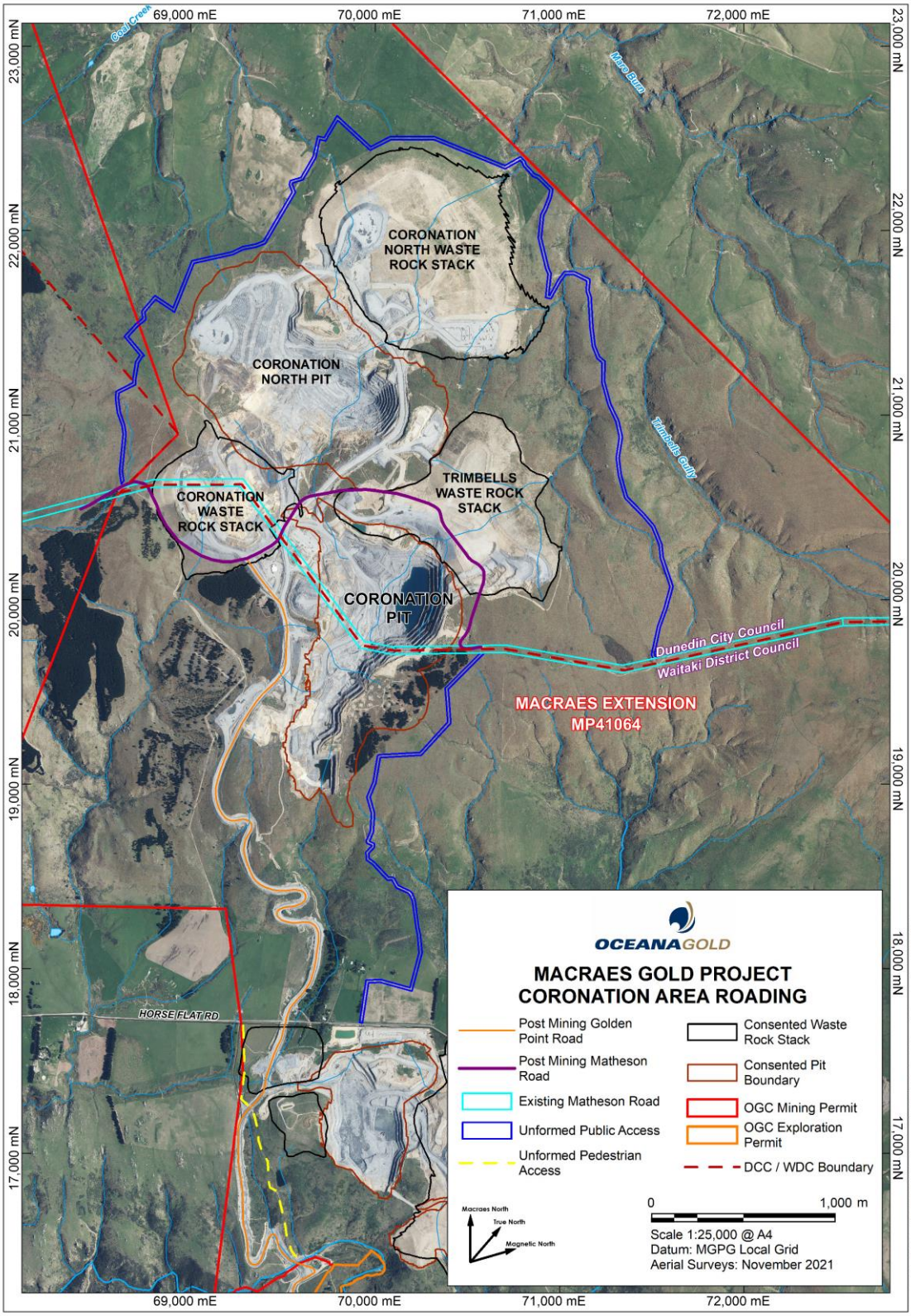

Figure 4.1: Proposed Roading Requirements at the Coronation Mining Area

4.3 OTAGO REGIONAL COUNCIL

Table 4.2 below provides an overview of the activities associated with each project component described above and an assessment of the ORC resource consent requirements for the respective activities. Sections 4.3.1 and 4.3.2 describe the rationale for the outcomes reached in **Table 4.2**.

Also included in **Table 4.2** is an overview of the methodology for each particular activity, including reference to further details, and an index for where within this document and its supporting appendices, the effects of that activity have been assessed.

Table 4.2: Summary of MP4 activities and their ORC consent requirements (new consents highlighted blue).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Frasers TSF and Innes Mills Pit Extension							
Disposal of mine process tailings within Frasers TSF	Discharged via conventional sub-aerial slurry discharge spigots predominantly along the south face of Frasers Backfill as described in Section 3.2.3 and further in (WSP 2024).	**RM23.868.01** **Discharge permit (to land and water)**	To discharge mine tailings and contaminants from mine tailings to land and to water for purpose of disposing of mine process tailings in Frasers Tailings Storage Facility.	New Discharge Permit – RM24.184.01 To discharge mine tailings and contaminants from mine tailings **to land** and **to water** for the purpose of disposing of mine process tailings in the Frasers Tailings Storage Facility.	A term of approximately 22 years is sought to align with the expiry of other consents held for Frasers Pit which expire in 2046.	RPW Rule 12.B.4.2 **Discretionary** Waste Plan Rules 5.6.1(2) & 5.6.1(3) **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 13 – GHD (2024c).
Abstraction of surface water for the purpose of dewatering Frasers TSF and use in the Processing Plant.	Pumping of water from the tailings decant pond at a rate of up to 500 L/s using two ~500 kW electric decant pumps (or similar). Water is then staged through ponds back to the Processing Plant as described in Section 3.2.4.	**RM23.868.02** **Water permit (take and use)**	To retake surface water from Frasers Tailings Storage Facility and to retake water from staging ponds for the purpose of dewatering the Frasers Tailings Storage Facility and recycling water for use in mine processing and for dust suppression.	New Water Permit – RM24.184.02 To take surface water from Frasers Tailings Storage Facility for the purpose of dewatering the Frasers Tailings Storage Facility and use in the Mine Water Management System.	A term of approximately 22 years is sought to align with the tailings discharge permit above and the expiry of other consents held for Frasers Pit which expire in 2046.	RPW Rule 12.1.5.1 **Discretionary**	Refer Section 5.4 and Appendix 13 – GHD (2024c).
Damming of water within Frasers TSF	Impoundment of tailings and water behind the Frasers Backfill Embankment as described in Section 3.2.3 and further in (WSP 2024).	-	-	New Water Permit – RM24.184.03 To dam water within the Frasers Tailings Storage Facility for the purpose of operating Stage 2 of the Frasers Tailings Storage Facility.	A term of approximately 22 years is sought to align with the expiry of other consents held for Frasers Pit which expire in 2046.	RPW Rule 12.3.4.1 **Discretionary**	Refer Section 5.4, Appendix 2 – WSP (2024), Appendix 8 – MWM (2024) and Appendix 13 – GHD (2024c).
Earthworks within 100 m of a natural inland wetland that may result in the partial drainage of the wetland	Excavation of Innes Mills Stage 10 extension and potential reduction of phreatic surface in the groundwater profile	-	-	New Land Use Consent – RM24.184.04 To undertake earthworks and land disturbance within 100 m of a natural inland wetland for the purpose of mining Innes Mills Stage 10 Pit	An unlimited term is sought pursuant to section 123(b) of the RMA.	NESFW Regulation 45D(3) **Discretionary**	Refer Section 5.6, Section 6.2.1, Appendix 15 – Ahikā (2024) and Appendix 16 – Whirika (2025).
Disposal of mine impacted water to the open pit lakes following completion of mining operations within the pits.	Pumping and flow of water to Frasers Pit and Innes Mills Pit from various mine sources including tailings decant and seepage water and waste rock stack runoff and seepage water.	RM10.351.43.V3 Discharge Permit (to water)	To discharge water containing contaminants to water in open pits and Frasers Underground mine for the purpose of disposal of water and the creation of lakes (the Golden Point - Round	Variation to authorise extended Innes Mills Pit. RM10.351.43.V4	-	Section 127 RMA **Discretionary**	The only change to this activity is the extended margin of the Innes Mills Pit. The extension does will not result in any change to the discharge activity. Effects of the change in pit extent have been considered in Section

[53] Bolding indicates those consents that will be surrendered assuming the requested consent is granted and exercised.

[54] This column addresses Q1.8 of the ORCs s92 request issued on 24 July 2024.

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
			Hill Pit Lake and the Frasers - Innes Mills Pit Lake)				5.4 and Appendix 13 – GHD (2024c).
Impoundment of water in the open pit lakes following the completion of mining operations within the pits.	Containment of pit lakes by backfill (until submerged) and the pit walls.	RM10.351.44.V3 Water Permit (dam)	To dam water in open pits for the purpose of creating the Golden Point - Round Hill Pit Lake and the Frasers - Innes Mills Pit Lake	Variation to authorise extended Innes Mills Pit. RM10.351.44.V4	-	Section 127 RMA **Discretionary**	Water effects: Refer Section 5.4 and Appendix 13 – GHD (2024c). Stability effects refer to section 5.3.3, Appendix 2 – WSP (2024), and Appendix 3 – EGL (2024a).
Filling of the open pit lakes via groundwater inflow following the completion of mining operations within the pits.	Seepage of groundwater from the pit shell into the open pit void (rewatering).	RM10.351.45.V2 Water Permit (groundwater take)	To take groundwater for the purpose of creating the Golden Point - Round Hill Lake and Frasers - Innes Mills Pit Lake	Variation to authorise extended Innes Mills Pit. RM10.351.45.V3	-	Section 127 RMA **Discretionary**	The only change to this activity is the extended margin of the Innes Mills Pit. Effects of the change in pit extent have been considered in Section 5.4 and Appendix 13 – GHD (2024c).
Filling of the open pit lakes via surface water inflow (ceasing diversions) following the completion of mining operations within the pits.	Overland flow of surface water into the open pits.	RM10.351.46.V2 Water Permit (surface water take)	To take surface water for the purpose of creating the Golden Point - Round Hill Lake and Frasers - Innes Mills Pit Lakes	Variation to authorise extended Innes Mills Pit. RM10.351.46.V3	-	Section 127 RMA **Discretionary**	The only change to this activity is the extended margin of the Innes Mills Pit. Effects of the change in pit extent have been considered in Section 5.4 and Appendix 13 – GHD (2024c).
Disposal of mine impacted water to the open pit lakes following completion of mining operations within the pits.	Pumping and flow of water to Frasers Pit and Innes Mills Pit from various mine sources including tailings decant and seepage water and waste rock stack runoff and seepage water.	RM10.351.47.V3 Discharge Permit (to land)	To discharge water containing contaminants to land in open pits and Frasers Underground mine for the purpose of disposal of water and the creation of lakes (the Golden Point - Round Hill Pit Lake and the Frasers - Innes Mills Pit Lake)	Variation to authorise extended Innes Mills Pit. RM10.351.47.V4	-	Section 127 RMA **Discretionary**	The only change to this activity is the extended margin of the Innes Mills Pit. The extension does will not result in any change to the discharge activity. Effects of the change in pit extent have been considered in Section 5.4 and Appendix 13 – GHD (2024c).
Dewatering of Frasers Pit prior to placement of backfill and disposal of tailings. Dewatering of Innes Mills and Innes Mills West Pit during mining. Ongoing, as required, abstraction of water from the pit during filling of the pit lakes	Pumping of water contained in open pits as described in Section 3.3.7.	RM10.351.48.V3 Water Permit (surface water take)	To take surface water for the purpose of dewatering Frasers Pit, Innes Mills Pit, Southern Pit, Round Hill Pit and Golden Point Pit.	Variation to authorise extended Innes Mills Pit. RM10.351.48.V4	-	Section 127 RMA **Discretionary**	Refer Section 5.4 and Appendix 13 – GHD (2024c).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Construction of Frasers Backfill prior to and during the deposition of tailings in Frasers Pit. Partial backfilling Golden Point Pit.	End tipping of waste rock to form an embankment within Frasers Pit as described in Section 3.2.2 and further in (WSP 2024). End tipping of waste rock to partially backfill Golden Point Pit as described in Section 3.3.3.	RM10.351.49.V2 Discharge Permit (to land)	To discharge waste rock to land in Frasers Pit, Innes Mills Pit, Southern Pit, Round Hill Pit and Golden Point Pit for the purpose of disposing of waste rock.	Variation to authorise extended Innes Mills Pit. RM10.351.49.V3	-	Section 127 RMA **Discretionary**	Refer section 5.3.3 and Appendix 2 – WSP (2024), and Appendix 3 – EGL (2024a).
Surface water diversions associated with extension of Innes Mills Pit and ongoing mining operation of Frasers Pit including ongoing diversion of North Branch Waikouaiti River around Frasers Pit.	Some diversions of water exist around the open pits, for example at Frasers Pit where water from the upper reach of the Waikouaiti River North Branch has been cut off by Frasers Pit. Other diversion drains do exist but are not affected by the changes to the Innes Mills pit limit.	RM10.351.50.V2 Water Permit (diversion)	To divert water around the open pits known as Frasers Pit, Innes Mills Pit, Southern Pit, Round Hill Pit and Golden Point Pit for the purpose of preventing surface water ingress and managing surface water runoff	Variation to authorise extended Innes Mills Pit. RM10.351.50.V3	-	Section 127 RMA **Discretionary**	N/A No change to this activity is anticipated as a result of the changes to the Innes Mills Pit limit.
Maintain groundwater levels in and around Frasers Pit and Innes Mills Pit as required.	Pumping of water from pit sumps and from bores within pit walls (horizontal drainage) and within 200m of the pit margins as described in Section 3.3.7	RM10.351.51.V3 Water Permit (groundwater take)	To take groundwater for the purpose of dewatering Frasers Pit, Innes Mills Pit, Southern Pit, Round Hill Pit and Golden Point Pit	Variation to authorise extended Innes Mills Pit. RM10.351.51.V4	-	Section 127 RMA **Discretionary**	Refer Section 5.4 and Appendix 13 – GHD (2024c).
Discharges to air associated with operation of Frasers TSF Stage 2, the extension of Innes Mills Pit, disposal of waste to waste rock stacks and backfills, transporting ore to the processing plant, Realignment of Golden Bar Road, and Backfilling of Golden Point Pit.	Emission of dust or particulate matter from the handling and transport of waste rock and ore and from the storage of tailings. Emission of combustion related contaminants from machinery. As described in Beca (2024).	RM10.351.52.V3 Discharge Permit (to air)	To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations	Variation to existing consent to authorise extension to Innes Mills Pit and FTSF Stage 2 and to impose total suspended particulate matter trigger limits at DG15. RM10.351.52.V4	-	Section 127 RMA **Discretionary**	Refer section 5.11 and Appendix 29 – Beca (2024).
Coronation Pit Stage 6 Extension							
Vegetation clearance and land disturbance	Surface ripping and excavation associated with mining of the Coronation Pit Stage 6 extension.	-	-	New Land Use Consent – RM24.184.05 To undertake vegetation clearance, land disturbance and earthworks within and near natural wetlands for the purposes of	An unlimited term is sought pursuant to section 123(b) of the RMA.	NESF Regulation 45D(1) and (2) **Discretionary**	Refer Section 5.6 and Appendix 15 – Ahikā (2024a).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
				mining the Coronation Pit Stage 6 extension.			
Surface water diversions associated with extension of Coronation Pit and ongoing mining operations within Coronation Pit.	Surface water diversions exist around the Coronation Pit and these will be extended as required to facilitate the proposed pit extension.	**RM12.378.09** **Water Permit (diversion)**	To permanently divert water around Coronation Pit and into unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Camp Creek for the purpose of preventing surface water ingress and managing surface water runoff.	New Water Permit – RM24.184.06 To divert water around Coronation Pit and into unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Camp Creek for the purpose of preventing surface water ingress and managing surface water runoff.	A term of 24 years is sought to align with existing consents that authorise activities in Coronation Pit which expire in 2048.	RPW Rule 12.3.4.1 **Discretionary**	Refer Section 5.4.2 and Appendix 11 – GHD (2024a).
Placement of waste rock within Coronation Pit.	End tipping of waste rock within Coronation Pit for temporary storage of waste rock, construction of in pit haul roads, and disposal of waste rock as pit backfill as described in Section 3.7.3.	**RM23.648.02** **Discharge Permit (to land)**	To discharge waste rock to land in Coronation Pit for the purpose of disposing of waste rock.	New Discharge Permit – RM24.184.07. To discharge waste rock to land in Coronation Pit for the purpose of disposing of waste rock.	A term of 24 years is sought to align with existing consents that authorise activities in Coronation Pit which expire in 2048.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 11 – GHD (2024a).
Placement of waste rock within Coronation WRS.	End tipping of waste rock within the existing confines of the Coronation WRS for disposal of waste rock as described in Section 3.7.3.	**RM23.648.01** **Discharge Permit (to land)**	To discharge waste rock and contaminants from waste rock to land, or into land in circumstances which may result in contaminants entering water, for the purpose of constructing the Coronation Waste Rock Stack.	New Discharge Permit – to replace existing consent that expires in 2026 – RM24.184.08 To discharge waste rock and contaminants from waste rock to land, or into land in circumstances which may result in contaminants entering water, for the purpose of constructing the Coronation Waste Rock Stack.	A term of 24 years is sought to align with existing consents that authorise activities in Coronation Pit which expire in 2048.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024), Appendix 11 – GHD (2024a), Appendix 13 – GHD (2024c).
Dewatering of Coronation Pit prior to and during mining. Ongoing, as required, abstraction of water from the pit during filling of the pit lakes.	Pumping of water contained in the Coronation Pit as described in Section 3.7.7.	**RM23.648.04** **Water Permit (surface water take)**	To take surface water for the purpose of dewatering Coronation Pit and use for the purpose of dust suppression or in the mine water management system.	New Water Permit – RM24.184.09 To take surface water for the purpose of dewatering Coronation Pit and use in the Mine Water Management System.	A term of 24 years is sought to align with existing consents that authorise activities in Coronation Pit which expire in 2048.	RPW Rule 12.1.5.1 **Discretionary**	Refer Section 5.4 and Appendix 11 – GHD (2024a).
Maintain groundwater levels in and around Coronation Pit as required.	Pumping of water from pit sumps that has accumulated from groundwater inflows as described in Section 3.7.7.	**RM23.648.03** **Water Permit (groundwater take)**	To take groundwater for the purpose of dewatering Coronation Pit and use for the purpose of dust suppression or in the mine water management system.	New Water Permit – RM24.184.10 To take groundwater for the purpose of dewatering Coronation Pit and use in the Mine Water Management System.	A term of 24 years is sought to align with existing consents that authorise activities in Coronation Pit which expire in 2048.	RPW Rule 12.2.4.1 **Discretionary**	Refer Section 5.4 and Appendix 11 – GHD (2024a).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Filling of the Coronation Pit Lake via groundwater inflow following the completion of mining operations within the pit.	Seepage of groundwater from the pit shell into the open pit void (rewatering).	RM12.378.11 Water Permit (groundwater take)	To take groundwater for the purpose of creating the Coronation Pit Lake.	Variation to authorise extended Coronation Pit. RM12.378.11.V1	-	Section 127 RMA **Discretionary**	The only change to this activity is the extended margin of the Coronation Pit. Effects of the change in pit extent have been considered in Section 5.4 and Appendix 11 – GHD (2024a).
Filling of the Coronation Pit Lake via surface water inflow (ceasing diversions) following the completion of mining operations within the pit.	Overland flow of surface water into the open pits.	RM12.378.12 Water Permit (surface water take)	To take surface water for the purpose of creating the Coronation Pit Lake.	Variation to authorise extended Coronation Pit. RM12.378.12.V1	-	Section 127 RMA **Discretionary**	The only change to this activity is the extended margin of the Coronation Pit. Effects of the change in pit extent have been considered in Section 5.4 and Appendix 11 – GHD (2024a).
Impoundment of water in the open pit lakes following the completion of mining operations within the pits.	Containment of the Coronation Pit lake by the pit walls.	RM12.378.14 Water Permit (damming)	To dam water in Coronation Pit for the purpose of creating the Coronation Pit Lake	Variation to authorise extended Coronation Pit.[55] RM12.378.14.V1	-	Section 127 RMA **Discretionary**	Water effects refer Section 5.4 and Appendix 11 – GHD (2024a). Stability effects refer Section 5.3 and Appendix 6 – PSM (2024a).
Discharges to air associated with the extension of Coronation Pit.	Emission of dust or particulate matter from the handling and transport of waste rock and ore. Emission of combustion related contaminants from machinery. As described in Beca (2024).	RM12.378.15 Discharge permit to air	To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations	Variation to authorise extended Coronation Pit and to impose total suspended particulate matter trigger limits at DG07. RM12.378.15.V1	-	Section 127 RMA **Discretionary**	Refer section 5.11 and Appendix 29 – Beca (2024).
Coronation North Backfill							
Surface water diversions associated with the ongoing mining operation of Coronation North Pit.	Maintenance of existing surface water diversion drains to prevent surface runoff entering the open pit.	RM16.138.15.V1 Water Permit (diversion)	To divert water around the open pit known as Coronation North Pit and into unnamed tributaries of Māori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of preventing surface water ingress and managing the surface water runoff	Utilise existing consent	-	-	No changes to the existing surface water diversion are necessary to facilitate the backfilling of Coronation North Pit.

[55] Being an existing consent, a variation to RM12.378.14 is sought although it is now understood that a water permit is not required for the impoundment of water by in situ ground. On that basis, OGNZL may consider surrendering this consent with ORC's agreement to do so.

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Placement of waste rock within Coronation North WRS and Trimbells WRS.	End tipping of waste rock within the existing confines of the Coronation North WRS and Trimbells WRS for disposal of waste rock as described in Section 3.7.3.	**RM19.085.03** **Discharge Permit (to land)**	To discharge waste rock and contaminants from waste rock to land, or into land in circumstances which may result in contaminants entering water for the purpose of constructing the Coronation North Waste Rock Stack and the Trimbells Waste Rock Stack	New Discharge Permit – to replace existing consents that expire in 2026 – RM24.184.11 To discharge waste rock and contaminants from waste rock to land, or into land in circumstances which may result in contaminants entering water for the purpose of constructing the Coronation North Waste Rock Stack and the Trimbells Waste Rock Stack	A term of 28 years is sought to align with existing consents that authorise activities in Coronation North Pit which expire in 2052.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 11 – GHD (2024a).
		RM16.138.09.V1[56] **Discharge Permit (to land)**	To discharge waste rock and contaminants from waste rock to land, or into land in circumstances which may result in contaminants entering water for the purpose of constructing the Coronation North Waste Rock Stack				
Backfilling of Coronation North Pit.	End tipping of waste rock within Coronation North Pit to backfill the pit as described in Section 3.7.3.	**RM16.138.10.V1** **Discharge Permit (to land)**	To discharge waste rock to land within the Coronation North Pit for the purpose of disposing of waste rock	New Discharge Permit – RM24.184.12 To discharge waste rock to land within the Coronation North Pit for the purpose of disposing of waste rock and backfilling Coronation North Pit	A term of 28 years is sought to align with existing consents that authorise activities in Coronation North Pit which expire in 2052.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 11 – GHD (2024a).
Dewatering of Coronation North Pit prior to and during mining. Ongoing, as required, abstraction of water from the pit during filling of the pit lakes.	Pumping of water contained in open pits as described in Section 3.7.7.	**RM16.138.11.V2** **Water Permit (take and use)**	To take surface water for the purpose of dewatering Coronation North Pit and use for the purpose of dust suppression	New Water Permit to replace existing consent that expires in 2026 – RM24.184.13 To take surface water for the purpose of dewatering Coronation North Pit and use in the Mine Water Management System.	A term of 28 years is sought to align with existing consents that authorise activities in Coronation North Pit which expire in 2052.	RPW Rule 12.1.5.1 **Discretionary**	Refer Section 5.4 and Appendix 11 – GHD (2024a).
Maintain groundwater levels in and around Coronation North Pit as required.	Pumping of water from pit sumps and from bores within pit walls (horizontal drainage) and within 200m of the pit margins as described in Section 3.7.7	**RM16.138.13.V1** **Water Permit (take and use)**	To take groundwater for the purpose of dewatering Coronation North Pit and use for the purpose of dust suppression	New Water Permit to replace existing consent that expires in 2026 – RM24.184.14 To take groundwater for the purpose of dewatering Coronation North Pit and use for the purpose of dust suppression or in the mine water management system.	A term of 28 years is sought to align with existing consents that authorise activities in Coronation North Pit which expire in 2052.	RPW Rule 12.2.4.1 **Discretionary**	Refer Section 5.4 and Appendix 11 – GHD (2024a).

[56] Note that this consent should have been surrendered prior to the exercise of RM19.085.03, however an error in Condition 2 of RM19.085.03, referring incorrectly to RM16.138.01 rather than RM16.138.09, means that RM16.138.09 remains active.

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Filling of the Coronation North Pit Lake via surface water inflow (ceasing diversions) following the completion of mining operations within the pit.	Overland flow of surface water into the open pits.	RM16.138.12.V1 Water Permit (take and use)	To take surface water for the purpose of creating the Coronation North Pit Lake	Variation to authorise backfilling of Coronation North Pit. RM16.138.12.V2	-	Section 127 RMA **Discretionary**	Refer Section 5.4 and Appendix 11 – GHD (2024a).
Filling of the Coronation North Pit Lake via groundwater inflow following the completion of mining operations within the pit.	Seepage of groundwater from the pit shell into the open pit void (rewatering).	RM16.138.14.V1 Water Permit (take and use)	To take groundwater for the purpose of creating the Coronation North Pit Lake	Variation to authorise backfilling of Coronation North Pit. RM16.138.14.V2	-	Section 127 RMA **Discretionary**	Refer Section 5.4 and Appendix 11 – GHD (2024a).
Impoundment of water in the open pit lakes following the completion of mining operations within the pits.	Containment of the Coronation North Pit Lake by the backfill and pit walls.	RM16.138.17.V1 Water Permit (damming)	To dam water in Coronation North Pit for the purpose of creating the Coronation North Pit Lake	Variation to authorise backfilling of Coronation North Pit.[57] RM16.138.17.V2	-	Section 127 RMA **Discretionary**	Water effects refer Section 5.4 and Appendix 11 – GHD (2024a). Stability effects refer Section 5.3 and Appendix 6 – PSM (2024a).
Overflow of the Coronation North Pit Lake	Overflow of water from the Coronation North Pit Lake to unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek.	RM16.138.06.V1 Discharge Permit (to water)	To discharge water containing contaminants from Coronation North Pit Lake to unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of pit lake overflow	Variation to authorise backfilling of Coronation North Pit. RM16.138.06.V2	-	Section 127 RMA **Discretionary**	Refer Section 5., Appendix 8 – MWM (2024) and Appendix 11 – GHD (2024a).
Discharges to air associated with the backfilling of Coronation North Pit.	Emission of dust or particulate matter from the handling and transport of waste rock. Emission of combustion related contaminants from machinery. As described in Beca (2024).	RM16.138.19.V1 Discharge Permit (to air)	To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations	Variation to authorise backfilling of Coronation North Pit and to impose total suspended particulate matter trigger limits at DG07. RM16.138.19.V2	-	Section 127 RMA **Discretionary**	Refer section 5.11 and Appendix 29 – Beca (2024).
Golden Bar Pit Stage 2 Extension							
Surface water diversions associated with extension of Golden Bar Pit.	Surface water diversions will be established around the Golden Bar Pit and adjacent stockpile areas as required to facilitate the proposed pit	**2002.489** **Water Permit (diversion)**	Divert water around the Golden Bar Pit and haul roads for the purposes of managing surface water runoff in the catchment of Golden Bar Creek.	New Water Permit – RM24.184.15 Divert water around the Golden Bar Pit and adjacent stockpile areas for the purposes of managing surface water runoff.	A term of 35 years is sought.	RPW Rule 12.3.4.1 **Discretionary**	Refer Section 5.4 and Appendix 12 – GHD (2024b).

[57] Being an existing consent, a variation to RM16.138.17.V1 is sought although it is now understood that a water permit is not required for the impoundment of water by in situ ground. On that basis, OGNZL may consider surrendering this consent with ORC's agreement to do so.

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
	extension and ancillary activities.						
Take surface water for the purpose of dewatering Golden Bar Pit	Pumping of water contained in open pits as described in Section 3.6.7.	**2007.552** **Water Permit (take surface water)**	Take and use up to 300m3/day of surface water for the purpose of pit dewatering	New Water Permit – RM24.184.16 To take and use surface water for the purpose of dewatering Golden Bar Pit and use in the Mine Water Management System.	A term of 35 years is sought.	RPW Rule 12.1.5.1 **Discretionary**	Refer Section 5.4 and Appendix 14 – GHD (2023).
Take groundwater for the purpose of dewatering Golden Bar Pit	Pumping of water from pit sumps and from bores within pit walls (horizontal drainage) and within 200m of the pit margins as described in Section 3.6.7	**2007.510** **Water Permit (take groundwater**	Take and use groundwater for the purpose of pit dewatering as part of ongoing mining operations	New Water Permit – RM24.184.17 To take and use groundwater for the purpose of dewatering Golden Bar Pit and use in the Mine Water Management System.	A term of 35 years is sought.	RPW Rule 12.2.4.1 **Discretionary**	Refer Section 5.4 and Appendix 14 – GHD (2023).
Discharge water from Golden Bar Pit to Golden Bar Creek for the purposes of draining Golden Bar Pit	Direct discharge via an overland pipe or drain as described in Section 3.6.7 and GHD (2023).	-	-	New Discharge Permit – RM24.184.18 To discharge water containing contaminants to Golden Bar Creek for the purpose of disposing of water from dewatering of Golden Bar Pit.	A term of 35 years is sought.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4 and Appendix 14 – GHD (2023).
Mining of the Golden Bar Pit extension including the bed of a tributary to Golden Bar Creek.	Excavation of the bed using mining excavators.	**2002.493** **Land use consent**	Disturb the bed of Golden Bar Creek for the purpose of constructing a pit as part of mining operations within the Golden Bar Development area.	New Land Use Consent – RM24.184.19 Land use consent for vegetation clearance, land disturbance and earthworks within natural wetlands for the purposes of mining the Golden Bar Pit extension.	An unlimited term is sought pursuant to section 123(b) of the RMA.	RPW Rule 13.5.3.1 **Discretionary** NESF Regulation 45D(1) and (2) **Discretionary**	Refer Section 5.5, Appendix – 21 Ryder (2024b) and Appendix 31.
Placement of waste rock within Golden Bar Pit.	End tipping of waste rock within Golden Bar Pit for temporary storage of waste rock and construction of in pit haul roads as described in Section 3.6.3.	-	-	New Discharge Permit – RM24.184.20 To discharge waste rock to land in Golden Bar Pit for the purpose of disposing of waste rock.	A term of 35 years is sought.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 12 – GHD (2024b).
Filling of the Golden Bar Pit Lake via surface water inflow (ceasing diversions) following the completion of mining operations within the pit.	Overland flow of surface water into the open pits.	**2002.763** **Discharge Permit (to water)**	Discharge water into Golden Bar Pit for the purpose of establishing long-term drainage patterns after completion of	New Water Permit – RM24.184.21 To take surface water for the purpose of creating the Golden Bar Pit Lake.	A term of 35 years is sought.	RPW Rule 12.1.5.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 12 – GHD (2024b).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Filling of the Golden Bar Pit Lake via groundwater inflow following the completion of mining operations within the pits.	Seepage of groundwater from the pit shell into the open pit void (rewatering).		mining operations in Golden Bar Development Area.	New Water Permit – RM24.184.22 To take groundwater for the purpose of creating the Golden Bar Pit Lake.	A term of 35 years is sought.	RPW Rule 12.2.4.1 **Discretionary**	Refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 12 – GHD (2024b).
Golden Bar Waste Rock Stack Extension							
Construction of the Golden Bar Waste Rock Stack Extension Discharge waste rock to land.	End tipping of waste rock within Golden Bar WRS and its extension footprint as described in Section 3.6.3.	**2002.490** **Discharge Permit (to land)**	To discharge to land contaminants from waste rock, stockpiled ore, and soil for the purpose of storing or disposing of waste rock, stockpiled ore and soil.	New Discharge Permit – RM24.184.23 To discharge waste rock and contaminants from waste rock to land for the purpose of extending the Golden Bar Waste Rock Stack.	A term of 35 years is sought.	RPW Rule 12.B.4.1 **Discretionary**	Water quality effects refer Section 5.4, Appendix 8 – MWM (2024) and Appendix 12 – GHD (2024b). Terrestrial ecology effects refer Section 5.6.2, Appendix 15 – Ahikā (2024), and Appendix 16 – Whirika (2025)
Construction of the Golden Bar Waste Rock Stack Extension.	End tipping of waste rock into the bed of a modified watercourse.	**2002.760** **Land use consent**	To disturb and deposit rock on the bed of Clydesdale Creek for the purpose of disposing of waste rock as part of mining operations within the Golden Bar Development area	New Land Use Consent – RM24.184.24 To reclaim an unnamed modified watercourse and to undertake vegetation clearance, land disturbance and earthworks within a natural inland wetland in the Clydesdale Creek catchment for the purpose of extending the Golden Bar Waste Rock Stack.	An unlimited term is sought pursuant to sections 123(a) and 123(b) of the RMA.	NESF Regulation 57 **Discretionary** RPW Rule 13.5.3.1 **Discretionary** NESF Regulations 45D(1) and 45D(2) **Discretionary**	Refer section 5.5, Appendix 21 – Ryder (2024b), and Appendix 31.
Discharge silt and sediment to Clydesdale silt pond associated with the disturbance and extension of Golden Bar WRS.	Excavation of waste rock with mining excavators. Refer Section 3.4.	-	-	New Discharge Permit – RM24.184.25 To discharge silt and sediment to water for the purpose of extending the Golden Bar Waste Rock Stack.	A term of 35 years is sought.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Section 6 and Appendix 10 – EGL (2024c).
Divert surface water around Golden Bar WRS	Establish clean water diversion drains around the Golden Bar WRS.	**2002.758** **Water Permit (Diversion)**	To divert water around Golden Bar Pit, the waste rock stack, ore stockpiles and haul roads for the purposes of managing surface water runoff in the catchment of Clydesdale Creek.	New Water Permit – RM24.184.26 To permanently divert water around the Golden Bar Waste Rock Stack and into unnamed tributaries of Murphys Creek for the purpose of preventing surface water ingress and managing stormwater runoff.	A term of 35 years is sought.	RPW Rule 12.3.4.1 **Discretionary**	Refer Section 5.4, and Appendix 12 – GHD (2024b).
Operation of Clydesdale Silt Pond	Impoundment of water within Clydesdale Silt Pond	**2002.757** **Water Permit (damming)**	To dam Clydesdale Creek for the purposes of sediment control, treatment of stormwater runoff and mine dewatering.	New Water Permit – RM24.184.27 To dam water in Clydesdale silt pond for the purpose of sediment control, treatment of stormwater runoff and mine dewatering.	A term of 35 years is sought.	RPW Rule 12.3.3.1(i) **Restricted Discretionary**	Refer Section 5.4, Appendix 12 – GHD (2024b), Appendix 4 – EGL (2023).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Operation of Clydesdale Silt Pond	Passive discharge of water from the base and toe of Golden Bar WRS including to Clydesdale Silt Pond, groundwater, and surface water.	-	-	New Discharge Permit – RM24.184.28 To discharge contaminants to water from the base and toe of the Golden Bar Waste Rock Stack for the purpose of waste rock disposal.	A term of 35 years is sought.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, and Appendix 12 – GHD (2024b).
Operation of Clydesdale Silt Pond	Discharge Water from Clydesdale Silt Pond to Clydesdale Creek as described in GHD (2024c).	**2002.759** **Discharge Permit (to water)**	To discharge to water up to 30,000 cubic metres per day of water from the Clydesdale silt pond to Clydesdale Creek for the purpose of releasing surface water runoff	New Discharge Permit – RM24.184.29 To discharge water from silt ponds to Clydesdale Creek for the purpose of operating silt ponds associated with the Golden Bar Waste Rock Stack.	A term of 35 years is sought.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, and Appendix 12 – GHD (2024b).
Discharges to air associated with the extension of Golden Bar Pit and construction of the Golden Bar WRS extension and use of the Golden Bar haul road.	Emission of dust or particulate matter from the handling and transport of waste rock and ore, including to the processing plant. Emission of combustion related contaminants from machinery. As described in Beca (2024).	**2007.511** **Discharge Permit (to air)**	To discharge contaminants to air for the purpose of carrying out mining activities and post mining rehabilitation.	New Discharge Permit – RM24.184.30 To discharge contaminants to air for the purpose of carrying out mining activities and post mining rehabilitation.	A term of 8 years is sought to align with the sites existing air discharge permits to enable site wide consideration or air discharges in 2032.	Regional Plan: Air for Otago Rule 16.3.5.9 **Discretionary**	Refer Section 5.11 and Appendix 29 – Beca (2024).
Golden Bar Road Realignment							
Construction of a road platform from waste rock from nearby open pit mining.	End tipping and dozing of waste rock to establish a road platform. Refer Section 3.5.	-	-	New Discharge Permit – RM24.184.31 Discharge waste rock and contaminants from waste rock to land for the purpose of constructing the Golden Bar Road realignment.	A term of approximately 22 years is sought to align with the expiry of other consents held for mining at Innes Mills Pit (which facilitates the road realignment) which expire in 2046.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.6, Appendix 15 – Ahikā (2024), and Appendix 16 – Whirika (2025).
NGWRS Rehandle							
Discharge silt and sediment to NGWRS silt pond and to Golden Point Pit associated with the rehandling of waste rock from Northern Gully Waste Rock Stack.	Excavation of waste rock with mining excavators. Refer Section 3.4.	-	-	New Discharge Permit – RM24.184.32 To discharge silt and sediment to water in Northern Gully silt pond for the purpose of excavating waste rock from Northern Gully Waste Rock Stack.	A term of approximately 22 years is sought to align with the expiry of other consents held for backfilling of Golden Point Pit (which facilitates the waste rehandling) which expire in 2046.	RPW Rule 12.B.4.1 **Discretionary**	Refer Section 5.4, Section 6 and Appendix 10 – EGL (2024c).

Proposed MP4 Activity	Proposed Method	Relevant Existing Consents[53]	Existing Consent Description	Resource Consent Requirements	Consent Term Sought[54]	ORC Rule reference and activity status	Effects Assessment Index
Activities Associated With Mitigation of Surface Water Quality Effects							
Take surface water from silt ponds at Frasers South, Frasers West and Golden Bar to facilitate capture of WRS seepage water and return to the mine water management system.	Pumping of seepage water collected in WRS silt ponds for return to open pits for the purpose of capturing WRS seepage and preventing its discharge to the environment.	-	-	New Water Permit – RM24.184.33 To take and use surface water from Murphys Silt Pond, Frasers West Silt Pond, Redbank Silt Pond, and Clydesdale Silt Pond for the purpose of capturing waste rock stack seepage and preventing its release to the environment and for use in the Mine Water Management System.	A term of 35 years is sought to enable silt ponds to be managed well into the post closure phase	RPW Rule 12.1.5.1 **Discretionary**	Refer Section 5.4 and Appendix 13 – GHD (2024c).
Activities Associated With Implementation of the Murphys Ecological Enhancement Area							
Temporary damming and diversion of surface water associated with construction of a culvert	Use of sandbags, temporary barriers or similar measures to divert the flow of an unnamed tributary of Murphys Creek during construction of "Culvert 1" shown in Figure 3.12 and as described in Section 3.9.	-	-	New Water Permit – RM24.184.34 To temporarily dam and divert water within an unnamed tributary of Murphys Creek for the purpose of constructing culverts associated with establishing the Murphys Ecological Enhancement Area.	A term of 10 years is sought to provide sufficient flexibility in the timing of culvert construction.	RPW Rule 12.3.4.1 **Discretionary**	Refer Sections 5.4.1 and 5.7
Construction and use of culverts on the bed of a tributary of Murphys Creek	Laying of preconstructed culvert sections on the bed of a tributary of Murphys Creek including associated preparatory works as described in Section 3.9.	-	-	**Permitted Activity** The construction, operation and maintenance of culverts including alteration of the bed and associated discharge of bed material in unnamed tributaries of Murphys Creek for the purpose of establishing a predator fence and associated access at the Murphys Ecological Enhancement Area will comply with the conditions of the rules referred to adjacent.	-	RPW Rule 13.5.1.1 **Permitted** RPW Rule 13.2.1.7B **Permitted** NESF Regulation 70 **Permitted**	-
Temporary damming and diversion of surface water associated with construction of culverts	Use of sandbags, temporary barriers or similar measures to divert the flow of the tributary of Murphys Creek during construction of "Culvert 2" and "Culvert 3" shown in Figure 3.12 and as described in Section 3.9	-	-	**Permitted Activity** The temporarily damming and diversion of water within unnamed tributaries of Murphys Creek for the purpose of constructing "Culvert 2" and "Culvert 3" associated with establishing the Murphys Ecological Enhancement Area will comply with the conditions of the RPW Rule 12.3.2.1.	-	RPW Rule 12.3.2.1 **Permitted**	-

4.3.1 New Resource Consents

The proposed activities that are not provided for by existing consents or variations to existing consents require consideration under the rules of the Regional Plan: Water for Otago (the "**Water Plan**") and where relevant, the NESF regulations. Assessment against these provisions where relevant is set out in the sections below in relation to the activities requiring new consents outlined in **Table 4.2**.

4.3.1.1 Discharge Permits

As set out in **Table 4.2**, new discharge permits are sought for:

- The discharge of tailings to Frasers TSF (Stage 2);
- The discharge of waste rock to land in Coronation Pit, Coronation North Pit, Golden Bar Pit, Golden Bar WRS, Coronation WRS, Coronation North WRS and Trimbells WRS, and associated with the Golden Bar road realignment;
- The discharge of water from Golden Bar Pit to Golden Bar Creek;
- The discharge of silt and sediment to water at Golden Bar WRS and Northern Gully WRS;
- The discharge of contaminants from the base and toe of Golden Bar WRS to water;
- The discharge of water from Clydesdale Silt Pond to Clydesdale Creek; and
- The discharge of contaminants to air from the activities at Golden Bar.

Freshly milled tailings material to be deposited and discharged into the Frasers TSF contains material considered to meet the definition of hazardous substance under the Water Plan. The rule relevant to the discharge of this material into Frasers Pit is Rule 12.B.4.2.

> ***Rule 12.B.4.2***: *The discharge of any hazardous substance to water or onto or into land in circumstances which may result in that substance entering water is a discretionary activity, unless it is:*
>
> *(a) Permitted by a rule in 12.B.1; or*
>
> *(b) Provided for by a rule in 12.B.2 or 12.B.3.*

The activity is not permitted or provided for by rule 12.B.1, 12.B.2 or 12.B.3 and the proposed discharge is therefore a **discretionary activity** under the Water Plan.

Also applicable are rules set out in the Regional Plan: Waste for Otago ("**Waste Plan**").

Tailings are considered to meet the definition of "hazardous waste" under the Waste Plan and the rules relevant to the discharge of this material into Frasers Pit are rules 5.6.1(2) and 5.6.1(3):

Rule 5.6.1: *Hazardous wastes at contaminated sites (discretionary activity).*

1. *… .*
2. *The discharge of hazardous waste into water; or*
3. *The discharge of hazardous waste onto or into land in circumstances that may result in that hazardous waste (or any other hazardous waste emanating as a result of natural processes from that hazardous waste) entering water; or*
4. *…*
5. *….*

is a discretionary activity.

The proposed tailings discharge is therefore a **discretionary activity** under the Waste Plan.

In accordance with the Water Plan and the Waste Plan, the discharge of tailings in Frasers Pit requires a new discharge permit pursuant to Section 15(1)(a) and 15(1)(b) of the RMA.

All other discharges including discharges of waste rock, discharges of contaminants from waste rock, and discharges of water are assessed to require resource consent in accordance with Rule 12.B.4.1 to be **discretionary activities**.

Rule 12.B.4.1*: The discharge of water (excluding stormwater) or any contaminant from an industrial or trade premises or a consented dam to water or to land is a discretionary activity, unless it is permitted by Rule 12.B.1.6, 12.B.1.7, 12.B.1.10 or 12.B.1.11.*

In accordance with the Water Plan, the proposed discharges of waste rock, contaminants from waste rock, silt and sediment, and discharges of water require new discharge permits pursuant to Section 15(1)(b) of the RMA.

Discharges to air associated with the Golden Bar pit extension will primarily involve dust and vehicle emissions. Such discharges require consideration under the Regional Plan: Air for Otago ("**Air Plan**"). Rule 16.3.5.3 permits discharges to air from mineral extraction and processing subject to standards. The MGP does not comply with those standards, and as the MGP meets the definition of an industrial or trade process, the discharges to air associated with the Golden Bar pit extension require resource consent for a **discretionary activity** in accordance with Rule 16.3.5.9.

Rule 16.3.5.9*:* ***Other discharges from industrial or trade processes – discretionary activity***

Except as provided for by Rules 16.3.5.1 to 16.3.5.8 and 16.3.6.1, 16.3.6.2, 16.3.7.1, 16.3.9.2, 16.3.10.1, 16.3.10.2, 16.3.11.1, 16.3.13.1 and 16.3.13.2, or prohibited by Rule 16.3.3.1, the discharge of

*contaminants into air from industrial or trade processes is a **discretionary activity**.*

In accordance with the Air Plan, the proposed discharge of contaminants to air associated with the development of the Golden Bar pit extension requires a new discharge permit pursuant to section 15(1)(c) of the RMA.

4.3.1.2 Water Permits

As set out in **Table 4.2**, new water permits are sought for:

- The take and use of tailings decant water from Frasers TSF;
- The damming of water within Frasers TSF;
- The take and use of surface water from Coronation Pit, Coronation North Pit, and Golden Bar Pit for the purpose of dewatering the respective pits;
- The take and use of groundwater water from Coronation Pit, Coronation North Pit, and Golden Bar Pit for the purpose of dewatering the respective pits;
- The take and use of surface water from silt ponds for the purpose of managing water quality;
- The diversion of surface water around Coronation Pit, Golden Bar Pit, and Golden Bar WRS;
- The take and use of surface water for filling of the Golden Bar Pit Lake; and
- The take and use of groundwater for filling of the Golden Bar Pit Lake;
- The damming of water in Clydesdale Silt pond; and
- The temporary damming and diversion of water associated with the installation of a culvert at the MEEA.

All taking and use of surface water is subject to Rule 12.1.5.1 of the Water Plan.

> ***Rule 12.1.5.1*** *Except as provided for by Rules 12.1.1.1 to 12.1.4.7, the taking and use of surface water is a discretionary activity.*

The proposed surface water takes are therefore **discretionary activities** and require new water permits pursuant to Section 14(3)(a) of the RMA.

All taking and use of groundwater is subject to Rule 12.2.4.1 of the Water Plan.

> ***Rule 12.2.4.1(i)*** *Except as provided for by Rules 12.2.1.1 to 12.2.3.5 the taking and use of groundwater is a discretionary activity.*

The proposed groundwater takes are therefore **discretionary activities** and require new water permits pursuant to Section 14(3)(a) of the RMA.

The damming of water for the purpose of operating the FTSF, and the diversion of surface water around Golden Bar Pit and Golden Bar WRS is subject to Rule 12.3.4.1 of the Water Plan.

> ***Rule 12.3.4.1(i)*** *Except as provided for by Rules 12.3.1.1 to 12.3.3.1 and except in the Waitaki catchment, the damming or diversion of water is a discretionary activity.*

The proposed damming and diversions of water are therefore **discretionary activities** and require new water permits pursuant to Section 14(3)(a) of the RMA.

Rule 12.3.4.1(i) also applies to the temporary damming and diversion of water associated with the construction of one of the required culverts at the MEEA. That being the eastern most (downstream) culvert shown in **Figure 3.12**. The catchment area above this location is greater than 50 ha and therefore the temporary damming and diversion does not comply with clause (a) of Rule 12.3.2.1. While all other clauses of Rule 12.3.2.1 will be met, the proposed damming and diversion of water is assessed as **discretionary activities** and requires a new water permit pursuant to section 14(3)(a) of the RMA.

4.3.1.3 Land use consents

As set out in **Table 4.2**, new land use consents are sought for:

- Earthworks and land disturbance proximal to natural wetlands activities at Innes Mills Pit;
- Vegetation clearance, land disturbance and earthworks within natural inland wetlands at Coronation Pit, Golden Bar Pit, and Golden Bar WRS; and
- Reclamation of streams at Golden Bar WRS.

Earthworks at Innes Mills Pit will occur within 100 m of an identified natural inland wetland and may result in partial drainage of that wetland. As such Regulation 45D(3) of the NESF applies and a land use consent is required for a discretionary activity pursuant to Section 9(1)(a) of the RMA.

Vegetation clearance and land disturbance at Coronation Pit will occur directly within identified natural inland wetlands. As such, Regulations 45D(1) and 45D(2) of the NESF apply and a land use consent is required for a discretionary activity pursuant to Section 9(1)(a) of the RMA.

Vegetation clearance, land disturbance and earthworks at Golden Bar Pit will occur directly within identified areas of natural inland wetland vegetation. As such, Regulations 45D(1) and 45D(2) of the NESF apply and a land use consent is required for a discretionary activity pursuant to Section 9(1)(a) of the RMA.

The reclamation of a modified watercourse in the Clydesdale Creek catchment as a result of the Golden Bar WRS extension is assessed in accordance with Rule 13.5.3.1 of the Water Plan and Regulation 57 of the NESF.

> ***Rule 13.5.3.1*** *Except as provided for by Rules 13.5.1.1 to 13.5.2.1 the alteration of the bed of any lake or river is a discretionary activity.*

The proposed reclamation is therefore a **discretionary activity** and requires a new land use consent pursuant to section 9(1)(a) and section 9(2)(a) of the RMA.

The proposed Golden Bar WRS extension also involves vegetation clearance, land disturbance and earthworks directly within identified areas of natural inland wetland vegetation. As such, Regulations 45D(1) and 45D(2) of the NESF apply and a land use consent is required for a **discretionary activity** pursuant to section 9(1)(a) of the RMA.

4.3.2 Changes to the conditions of existing consents

Whether an application should be treated as seeking a variation or consent to a materially different activity is a question of fact and degree to be determined by comparing the activity for which consent was granted and the nature of the activity if the variation were approved. Where the variation would result in a fundamentally different activity, or one having materially different adverse effects or would expand or extend the original activity it should be treated as a new application.[58] An analysis of the variations being sought by OceanaGold and the underlying rationale is given below.

In relation to activities at Frasers Pit and Innes Mills Pit, the existing consents to which variations are sought were issued for the MP3 project and are global consents applying broadly to the existing activities within these pits as follows:

- RM10.351.43.V3 – Discharge Permit (to water) – Global consent for the creation of pit lakes;
- RM10.351.44.V3 – Water Permit – Global consent to dam water for the creation of pit lakes;
- RM10.351.45.V2 – Water Permit – Global consent to take groundwater for the creation of pit lakes;
- RM10.351.46.V2 – Water Permit – Global consent to take surface water for the creation of pit lakes;
- RM10.351.47.V3 – Discharge Permit (to land) – Global consent to discharge water to land for the creation of pit lakes;

[58] Body Corporate 970101 v Auckland City Council [2000] NZRMA 202 upheld in Body Corporate 97010 v Auckland City Council [2000] 3 NZLR 513.

- RM.10.351.48.V3 – Water Permit – Global consent to dewater open pits;
- RM.10.351.49.V2 – Discharge Permit (to land) – Global consent to discharge waste rock to land in open pits;
- RM10.351.50.V2 – Water Permit – Global consent to divert water around open pits;
- RM10.351.51.V3 – Water Permit – Global consent to take groundwater to dewater open pits; and
- RM10.351.52.V3 – Discharge Permit (to air) – Global consent to discharge contaminants to air.

These consents provide for activities in broad terms including water management activities associated with the development, maintenance and closure of the open pits and for operational discharges to air associated with mining activities at MP3 locations including the Continuity Consents Project activities discussed in Section 2.4.10. The proposed expansion of the Innes Mills Pit does not require a change to how the activities authorised by the above consent are undertaken. Water takes and discharges will continue to occur at similar rates, within the same or similar locations, using methodologies anticipated by these consents. The only change will be the extent of the completed Innes Mills pit limit (an increase of approximately 21% to Innes Mills Pit surface area). Noting that Innes Mills is one of five open pits provided for by the suite of related consents which together cover an area of approximately 386 ha, the proposed extension of Innes Mills Pit equates to an increase of less than 2.2% to the overall consented area. Furthermore, the proposed variations will remove approximately 15 ha of the authorised global pit extension at Frasers Pit where mining is no longer feasible due to the establishment of Frasers TSF. As a result, the proposed variations will result in a net reduction of consented global pit areas of approximately 6.5 ha.

The diversion of water for the purpose of preventing surface water ingress and managing surface water runoff around open pits is anticipated by RM10.351.50.V1. As the footprint of Innes Mills Pit is proposed to be expanded by only approximately 8.5 ha, the diversion of water will not cause materially different effects than those consented. It is also considered appropriate for the diversion to be managed in accordance with the broader site water management scheme, due to the proximity of other pits.

The global air discharge consent (RM10.351.52) enables the discharge of contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations. Whilst the construction of Frasers TSF was not previously provided for as part of the MP3 or Frasers Co-Disposal projects, it is considered that the proposed activities will not result in a fundamentally different activity, or one having materially different adverse effects or would expand or extend the original activity. Beca has assessed the effects of discharges to air associated with the Frasers TSF and has not identified any change in effect or change in risk for sensitive receivers as a result of storing

mine process tailings in Frasers Pit. It is also considered that air discharges arising from the expanded Innes Mills Pit footprint and the Golden Bar Road Realignment do not constitute a fundamentally different, expanded, or discarded activity or have materially different effects. Notwithstanding, in keeping with current good practice, OceanaGold proposes to monitor for trigger limits at the existing dust monitoring sites that best reflect the sensitive receptor locations with potential to be exposed to dust emissions (DG15 and DG07). Amendments to conditions are proffered in **Appendix 31** to reflect this commitment.

Variations to these consents also has the benefit of keeping resource consents for the activities in and around the open pits consolidated.

In relation to activities at Coronation and Coronation North Pits, the existing consents to which variations are sought enable discharges to air and rehabilitation activities (closure of the pits as pit lakes).

The proposed expansion of the Coronation Pit, and proposed backfilling of Coronation North Pit does not require a fundamental change to how the activities authorised by the relevant consent are undertaken, only the extent of the completed Coronation pit limit (an increase of approximately 7% to currently authorised Coronation Pit surface area), and the placement of backfill within Coronation North Pit. Water takes will continue to occur at similar rates, within the same or similar locations, using methodologies anticipated by these consents.

Similar to Innes Mills Pit, it is considered that air discharges arising from the expanded Coronation Pit footprint and the backfilling of Coronation North Pit will not constitute fundamentally different activities or have materially different effects from those activities that are authorised by the current air discharge permits at these sites. The current permits all expire in 2032 at which time it may be appropriate to consider replacement of all air discharge permits with a global permit for all air discharges at the site.

The proposed changes to the conditions necessary to provide for the MP4 Project activities are outlined in **Appendix 31** and are generally limited to amendments to the reference documents listed in conditions, changes to the map appended to each consent, the addition of proposed monitoring obligations, and other administrative changes as necessary. The proposed changes to the conditions do not alter any of the core effects management obligations inherent in the resource consents.

Under s127(3)(a) of the RMA, changes to consent conditions are to be considered as if the application were an application for a **discretionary activity**.

4.3.3 Consents to be sought at a later date

The following activities that are anticipated to occur as a result of the MP4 project may require resource consent, however these consents will need to be sought at a later date,

likely by a Trust or other entity responsible for managing closure of the mine as the expected timing of these activities is beyond the 35 year maximum term of consent allowable by the RMA:

- Damming of water in Coronation Pit against the Trimbells WRS.
- Passive discharges of water from the pit lakes to local waterways post closure.
- Potential consents required to establish new water quality mitigation options described in Section 5.4 should OceanaGold wish to depart from capturing and management of seepage water.

4.4 SUMMARY OF CONSENT REQUIREMENTS

The MP4 Project requires the following resource consents:

New resource consent from WDC:

- Land use consent (non-complying activity) to authorise mining activities.

New resource consent from DCC:

- Land use consent (discretionary activity) to authorise mining activities, earthworks (large scale) and the use and storage of hazardous substances.

New resource consents from ORC:

At Frasers and Innes Mills Pits:

- A new discharge permit to authorise the discharge of tailings into Frasers TSF (discretionary activity);
- A new water permit to authorise the take and use of tailings return (supernatant) water from Frasers TSF (discretionary activity);
- A new water permit to authorise the damming of water within Frasers TSF (discretionary activity); and
- A new land use consent to authorise earthworks and land disturbance within 100 m of a natural inland wetland that may result in partial drainage of the wetland (discretionary activity).

At Coronation Pit:

- A new land use consent to authorise vegetation clearance, land disturbance and earthworks within and within 100 m of natural inland wetlands for the purpose of mining the Coronation Stage 6 Pit (discretionary activity);

- A new water permit to divert surface water around Coronation Pit and into unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Camp Creek for the purpose of preventing surface water ingress and managing surface water runoff (discretionary activity);
- A new discharge permit to authorise the discharge of waste rock to land within Coronation Pit (discretionary activity);
- A new discharge permit to discharge waste rock to land for the purpose of construction of the Coronation Waste Rock Stack (discretionary activity), replacing an expiring consent;
- A new water permit to take and use surface water for the purpose of dewatering Coronation Pit and use in the Mine Water Management System (discretionary activity); and
- A new water permit to take and use groundwater for the purpose of dewatering Coronation Pit and use in the Mine Water Management System (discretionary activity).

At Coronation North Pit:

- A new discharge permit to authorise the discharge of waste rock to land within Coronation North Pit for the purpose of backfilling the Coronation North Pit (discretionary activity);
- A new water permit to authorise the take and use of surface water from Coronation North Pit for the purpose of dewatering the Coronation North Pit and use in the Mine Water Management System (discretionary activity), replacing an expiring consent;
- A new water permit to authorise the take and use of groundwater from Coronation North Pit for the purpose of dewatering the Coronation North Pit and use in the Mine Water Management System (discretionary activity), replacing an expiring consent; and
- A new discharge permit to discharge waste rock to land for the purpose of constructing the Coronation North Waste Rock Stack and the Trimbells Waste Rock Stack (discretionary activity), replacing an expiring consent.

At Golden Bar Pit:

- A new water permit to authorise the diversion of surface water around the Golden Bar Pit, haul roads and stockpile area for the purpose of managing surface water runoff (discretionary activity);
- A new water permit to take and use surface water for the purpose of dewatering Golden Bar Pit and use in the Mine Water Management System (discretionary activity);
- A new water permit to take and use groundwater for the purpose of dewatering Golden Bar Pit and use in the Mine Water Management System (discretionary activity);

- A new discharge permit to discharge water containing contaminants to Golden Bar Creek for the purpose of disposing of water from dewatering of Golden Bar Pit (discretionary activity);
- A new land use consent to authorise vegetation clearance, land disturbance and earthworks within and within 100 m of natural inland wetlands for the purpose of mining the Golden Bar Pit extension (discretionary activity);
- A new discharge permit to discharge waste rock to land in Golden Bar Pit for the purpose of disposing of waste rock (discretionary activity);
- A new water permit to take surface water for the purpose of creating the Golden Bar Pit Lake (discretionary activity);
- A new water permit to take groundwater for the purpose of creating the Golden Bar Pit Lake (discretionary activity); and
- A new discharge permit to discharge contaminants to air from mining operations and post mining rehabilitation (discretionary activity).

At Golden Bar WRS:

- A new discharge permit to discharge waste rock and contaminants from waste rock to land for the purpose of extending the Golden Bar Waste Rock Stack (discretionary activity);
- A new land use consent to reclaim part of an unnamed modified watercourse and to undertake land disturbance and earthworks within a natural inland wetland in the Clydesdale Creek catchment for the purpose of extending the Golden Bar Waste Rock Stack (discretionary activity);
- A new discharge permit to discharge silt and sediment to water for the purpose of extending the Golden Bar Waste Rock Stack (discretionary activity);
- A new water permit to permanently divert water around the Golden Bar Waste Rock Stack and into unnamed tributaries of Clydesdale Creek for the purpose of preventing surface water ingress and managing stormwater runoff (discretionary activity);
- A new discharge permit to discharge contaminants to water from the base and toe of the extended Golden Bar Waste Rock Stack for the purpose of waste rock disposal (discretionary activity);
- A new water permit to dam water in Clydesdale Silt Pond for the purpose of operating Clydesdale Silt Pond (discretionary activity); and
- A new discharge permit to discharge water from a silt pond to Clydesdale Creek for the purpose of operating a silt pond associated with the Golden Bar Waste Rock Stack (discretionary activity).

At Golden Bar Road Realignment:

- A new discharge permit to authorise the discharge of waste rock to land for the purpose of constructing a road (discretionary activity).

At Northern Gully WRS:

- A new discharge permit to discharge silt and sediment to water in Northern Gully Silt Pond for the purpose of excavating waste rock from Northern Gully Waste Rock Stack (discretionary activity).

Activities associated with the mitigation of surface water quality effects:

- A new water permit to take and use surface water from Murphys Silt Pond, Frasers West Silt Pond, Redbank Silt Pond, and Clydesdale Silt Pond for the purpose of capturing waste rock stack seepage and preventing its release to the environment and for use in the Mine Water Management System.

Activities associated with the implementation of the Murphys Ecological Enhancement Area:

- A new water permit to divert surface water in an unnamed tributary of Murphys Creek for the purpose of installing a culvert associated with the Murphys Ecological Enhancement Area.

Variation to existing resource consents from ORC:

At Frasers Pit, Innes Mills Pit and Golden Point Pit:

- Variations to resource consents RM10.351.48.V3, RM10.351.50.V2, and RM10.351.51.V3 that provide for operational pit dewatering and diversion activities (discretionary activity);
- Variations to resource consents RM10.351.43.V3, RM10.351.44.V3, RM10.351.45.V2, RM10.351.46.V2, and RM10.351.47.V3 that provide for the creation of the Frasers and Innes Mills Pit Lakes (discretionary activity);
- A variation to resource consent RM10.351.49.V2 providing for the discharge of waste rock to land in Frasers and Innes Mills Pits (discretionary activity); and
- A variation to resource consent RM10.351.52.V3 providing for discharges to air from mining operations within the Frasers and Innes Mills Pits (discretionary activity).

At Coronation Pit:

- Variations to resource consents RM12.378.11, RM12.378.12 and RM12.378.14 provide for the creation of the Coronation Pit Lake (discretionary activity); and

- A variation to resource consent RM12.378.15 providing for discharges to air from mining operations associated with the Coronation Pit (discretionary activity).

At Coronation North Pit:

- Variations to resource consents RM16.138.06.V2, RM16.138.12.V1 and RM16.138.14.V1 RM16.138.17.V1 provide for the creation of the Coronation North Pit Lake (discretionary activity); and
- A variation to resource consent RM16.138.19.V1 providing for discharges to air from mining operations associated with the Coronation North Pit (discretionary activity).

As a result of "bundling", the overall activity status of this application is to be considered be non-complying.

4.5 CONSENTS TO BE SURRENDERED

Table 4.2 above indicates those consents that the following resource consents will be surrendered should the relevant replacement consents be granted on acceptable terms and should those consents be implemented.[59] The proposal to surrender these consents prior to the commencement of any relevant replacement consent will be reflected in the proposed conditions of consent to be provided prior to the applications being heard.

[59] This list responds to the s92 request made by ORC on 24 July 2024 – refer Q1.7.

5. ASSESSMENT OF ENVIRONMENTAL EFFECTS

5.1 INTRODUCTION

When processing a resource consent application, the consent authority must have regard to what constitutes the "environment" to inform the assessment of effects. This includes existing use rights, existing activities carried out under existing consents and resource consents which have been granted where it appears those consents will be implemented. The environment includes:

- The future state of the environment as it might be modified by the utilisation of rights to carry out permitted activities; and
- The environment as it might be modified by implementing resource consents that have been granted at the time a particular application is considered, where those consents are being exercised or where it appears likely that those resource consents will be implemented.

Therefore, the 'environment' upon which effects should be assessed is the existing and reasonably foreseeable future environment.

In the context of this application, the existing environment includes the following:

- The existing mine elements, including infrastructure on the site;
- The unimplemented parts of the resource consents that OceanaGold holds which enable mining activities on the site. Relevant to the Project are:
    - The unimplemented part of the suite of resource consents for the Frasers Co-Disposal Project and CCP; and
    - The unimplemented parts of the suite of MP3 consents that authorise additional mining at Innes Mills Pit that is beyond the scope of the Frasers Co-Disposal consents; and
    - The unimplemented parts of the suite of resource consents held for the Coronation mining area that authorise additional mining at Coronation Pit and Coronation North Pit, and additional waste rock disposal to Coronation WRS; Coronation North WRS and Trimbells WRS.
- The state of the environment within which the Project will operate, for which a description is provided in the relevant technical reports that support this AEE.

Section 104(2) of the RMA affords a consent authority discretion to disregard a potential adverse effect if the relevant plan permits an activity with that effect:

Section 104

...

(2) When forming an opinion [on any actual and potential effects on the environment of allowing the activity], a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.

In relation to the land affected by the MP4 Project that is within the Waitaki District, the permitted baseline in the MMPMZ includes the following relevant activities:

- Farming activities;[60]
- Service activities;[61]
- The ground disturbance of up to 100m^2, including the clearance of any vegetation, for the purpose of exploration drilling[62] and
- Mining activities that comply with the relevant site and zone standards, excluding the excavation and construction of pits, pit margins, waste rock stacks and embankments, tailings impoundments and any other dams, roads and tracks associated with mining.[63]

This chapter addresses the actual and potential effects of the MP4 Project against the existing environment. A number of technical assessments have been prepared to inform this assessment, as outlined in **Table 1.1**. These technical assessments are attached as appendices and referenced, as relevant, in Sections 5.2 – 5.18 below, which address the effects of the Project on the following matters:

Section 5.2 Positive Effects

Section 5.3 Geotechnical and Stability Matters

Section 5.4 Surface Water and Groundwater

Section 5.5 Aquatic Ecology

Section 5.6 Terrestrial Ecology

Section 5.7 Effects on River Extent and Values

Section 5.8 Noise

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[60] Rule 6.3.1.2, Part 3, Chapter 6, Waitaki District Plan.

[61] Rule 6.3.1.3, Part 3, Chapter 6, Waitaki District Plan.

[62] Rule 6.3.1.6, Part 3, Chapter 6, Waitaki District Plan.

[63] Rule 6.3.1.7, Part 3, Chapter 6, Waitaki District Plan.

Section 5.9 Blasting and Vibration

Section 5.10 Landscape and Visual Amenity

Section 5.11 Air Quality

Section 5.12 Historic Heritage

Section 5.13 Hazardous Substances

Section 5.14 Contaminated Land Effects

Section 5.15 Cultural Effects

Section 5.16 Roading and Traffic

Section 5.17 Open Space and Recreation Effects

Section 5.18 Greenhouse Gas Emissions

Section 5.19 Summary and Cumulative Effects Assessment

Within these sections, a number of measures to avoid, remedy or mitigate the actual and potential effects of the MP4 Project are identified, as are additional actions proposed by OceanaGold which are intended to further minimise or compensate for residual potential adverse effects of the project. These measures are also summarised in Chapter 6 of this AEE, and they will form the basis of resource consent conditions for the MP4 Project. OceanaGold intends to circulate a suite of proposed conditions prior to the applications being heard.

5.2 POSITIVE EFFECTS

An economic impact assessment for the MP4 Project is contained in the Brown Copeland & Co (2024) report attached as **Appendix 25** of this AEE.

Since the mine commenced operations at Macraes in 1990, the MGP has been and continues to be a significant contributor to levels of employment, incomes and expenditure for north-east Otago, metropolitan Dunedin and the Otago Region.

Sense Partners Limited completed an assessment on the economic contribution of Macraes gold mine in 2021 for evidence for the Proposed Otago Regional Policy Statement (2021).[64] The analysis showed that Macraes exported $343 million of gold at a national level in 2021. In addition, Macraes paid royalties of $4.1 million in 2021, and

[64] Link to evidence on ORC website: https://www.orc.govt.nz/media/13301/oceana-gold-shamubeel-eaqub.pdf

Macraes' GDP contribution in 2021 was $237 million. It is the opinion of Brown Copeland & Co that:

- The extraction of minerals at Macraes provides a significant national public benefit and a level of land and labour productivity that could not otherwise be achieved using resources within New Zealand; and
- The extension of life of open pit mining operations will help provide a continuation of these significant national level economic benefits from the Macraes site.

Further, Macraes employs around 600 people directly, and in total, supports 2,200 jobs across New Zealand, and is a large economic entity for the Waitaki District, Dunedin City and Otago Region, notably:

- It injects $36 million into the Waitaki District and supports 333 jobs directly and indirectly;
- It injects $82.2 million into Dunedin City and supports 757 jobs directly and indirectly; and
- It injects $122.7 million into the Otago Region and supports 1,132 jobs directly and indirectly.

Under existing consents, all open pit mining operations would cease around the end of 2026. Underground mining could continue at GPUG until around 2030, however, the ability to process ore beyond 2026 would be constrained by tailings storage facility (FTSF Stage 1 consented as part of CCP) reaching capacity. The MP4 Project will enhance gold production by providing for additional open pit mining and additional tailings storage at the FTSF until at least 2030. A summary of the direct economic impacts of the Project outlined by the Brown Copeland & Co report is provided below.

As a result of the MP4 Project, there will be an average of 64 additional local jobs[65] created at the Macraes site over the life of the Project. In turn, resulting in wage and salary payments to these employees averaging $7.7 million per annum, and other expenditure in the local economy averaging $7.4 million per annum. For the wider Otago region, the MP4 Project will create and maintain an average of 177 jobs over the period 2025 to 2029. It is expected to pay wage and salary payments to these employees averaging $21.3 million per annum and other expenditure averaging $16.3 million per annum.

In addition to these direct economic impacts, there will be additional indirect positive impacts of the Project arising from:

[65] Local jobs created do not include those jobs created for the portion of the Macraes workforce that live in Dunedin.

- Effects on suppliers of goods and services provided to the Project; and
- Supply of goods and services to employees of OceanaGold and its contractors and to those engaged in supplying goods and services to OceanaGold and its contractors. For example, there will be additional jobs and incomes for employees of retail stores, restaurants, and bars as a consequence of the additional expenditure by employees.

District and regional multipliers can be estimated to gauge the size of these indirect effects.

At the District level, Brown Copeland & Co considers that the following will result as both direct and indirect economic impacts associated with this Project:

- 96 retained jobs;
- $11.6 million per annum retained wages and salaries; and
- Retained other expenditures of $11.1 million per annum.

Total regional economic impacts as a result of the Project are estimated as follows:

- 354 retained jobs;
- $42.6 million per annum retained wages and salaries; and
- Additional or retained other expenditure of $32.6 million per annum.

In addition, Brown Copeland & Co reports that the Government will receive additional royalty payments estimated to be worth approximately $1 million per annum over the life of the Project, whilst the New Zealand economy will benefit from higher GDP and exports.

The Project will also contribute to ensuring the local and regional economy maintains diversity. The Waitaki District economy is primarily driven by the agricultural sector and processing of agricultural products. The Project will extend the life of the MGP, providing greater economic diversity and balance, retaining employment opportunities and income that are less dependent upon returns to the primarily beef and sheep based agricultural sector. It will also help strengthen the local economy's resilience to agricultural commodity price cycles.

Brown Copeland & Co have also considered the loss of agricultural production as a result of the Project (an opportunity cost). The reporting finds that the contribution to GDP of the MGP is substantially larger than an alternative dairy farm operation would contribute to the wider mine area. Comparative analysis shows that it would take 767 years of dairy production on an equivalent area of land to match the revenue earned by the mine in 30 years (1990 – 2010). Farming in the Macraes area is dominated by beef and sheep farming which is considerably less profitable than diary.

Overall, Brown, Copeland & Co concludes that the MP4 Project will:

- Provide significant regional and national benefits;
- Maintain significant levels of local and regional employment, incomes and expenditure;
- Maintain population levels in north east Otago, thereby maintaining the quality of some local and central Government provided services;
- Extend the period of time for the local economy to benefit from greater diversity and resilience; and
- Extend the period of time the mine and its workforce will contribute to local community activities and socio-economic benefits.

5.3 GEOTECHNICAL AND STABILITY MATTERS

5.3.1 Pit Wall Stability

Pells Sullivan Meynink ("**PSM**") completed an assessment on the pit wall stability for the proposed pit expansions at Innes Mills Stages 9-10, Coronation Stage 6 and Golden Bar Stage 2 (attached as **Appendix 6**). PSM's assessment provides a description of the geotechnical setting of each of the open pits including the main fault structures.

Two-dimensional limit equilibria analyses were undertaken for each of the proposed pit expansions, selected to represent the most adverse pit wall and geological structure geometries and rock mass conditions. Analyses were completed for both the operational stage and post closure stage under static and seismic loads. The assessment analysed the Factor of Safety ("**FoS**") for each of the identified sections under static and appropriate earthquake loading conditions.

Overall, PSM concluded that for each of the proposed pit expansions, FoS for highwalls with typical hard rock conditions are generally greater than 1.5. Where potential highwall instabilities have been identified, the failure extents are contained within the immediate bounds of the respective pits and do not present a risk to the wider environment at closure. Where adversely oriented geological structures are present, bench to inter ramp scale instabilities may be expected during mining. Any rapid movement is likely to initiate prior to pit lake filling where a change in condition has occurred, such as active mining, blasting or rapid water ingress. Block sliding along adversely oriented geological structures is a known instability within the open pits at Macraes, and OceanaGold actively manages such instability during mining through routine geotechnical mapping, stability monitoring and Trigger Action Response Plans ("**TARPs**") via the site's geotechnical principal hazard management plan.

During closure conditions, the hydrostatic pressure of water in the pit lakes against the pit walls generally improves the walls' stability. Furthermore, rapid, large scale pit wall failures are not expected during closure, movements are expected to be progressive creep style events and therefore the likelihood of a seiche[66] event is low.

PSM modelled the pit walls' stability under a 1:2,500 Annual Exceedance Probability ("**AEP**") earthquake (low probability strong ground shaking). The analysis showed potential for a failure scarp to extend behind the design pit crest in some locations. It is also noted that there are likely to be many natural slopes in the surrounding area that will also deform at this level of shaking.

A geotechnical slope management framework is already utilised at Macraes, and it is considered that it can be utilised to appropriately manage the movement rates associated with mining the western footwall slopes, using the following methods:

- Limiting blast sizes to minimise disturbance and triggering of slope movement;
- Considered pit design geometries including:
    - Limitation of west wall strike lengths to minimise exposure of the Footwall Fault ("**FF**");
    - 'Stepping off' in areas where the resource model indicates low ore grades to maintain FF offsets;
    - Active backfilling and buttressing of completed pit workings prior to the development of new mining area;
- A cautious production approach allowing for staged mining sequences and stand down periods;
- Rigorous slope monitoring procedures using radar, GPS, and prisms to capture real time slope movements during mining;
- A documented history of geotechnical model development, stability analysis and external advice throughout all stages of mining; and
- Development, review, and implementation of TARPs with regular risk assessments.

Some ongoing deformation, such as tension cracking, slumping, ground loss could occur behind the pit crest post-closure. PSM recommends defining a strip of land / zone of influence around the crest of the combined pits to isolate hazards associated with ground movement and falling from height. It is proposed that post closure fencing is a condition of consent, as per existing consents, with the appropriate exclusion zones to be determined

[66] A seiche is a standing wave in an enclosed or partially enclosed body of water.

by future geotechnical assessment. No changes to the conditions of existing resource consents are required to reflect these recommendations.

Existing instability in the southwest wall of Coronation North Pit will be managed during further authorised mining using the slope management framework described above. Following the completion of authorised mining, the southwest pit slope will be remediated by backfilling of the pit to achieve a FoS for the southwest pit slope of at least 1.0 under Maximum Design Earthquake seismic loading prior to site decommissioning.

5.3.2 Waste Rock Stacks

5.3.2.1 Golden Bar Waste Rock Stack

As part of the MP4 Project, OceanaGold will extend the existing Golden Bar WRS by approximately 26 ha and increase its height by 60 m up to 610 mRL. Engineering Geology Limited ("**EGL**") have completed a report on the Golden Bar WRS design which is attached as **Appendix 4**. EGL considers the Golden Bar WRS has been designed in accordance with accepted engineering practices and notes that existing WRSs at Macraes that have been designed to similar standards have demonstrated satisfactory performance to date.

Construction procedures, including supervision and quality control practices for the extension of the Golden Bar WRS will meet accepted engineering standards. Construction of the Golden Bar WRS will be staged, starting from the downstream toe of the northern side of the WRS. Waste rock will be placed in layers up to the top elevation of the existing Stage 1 WRS, before expansion of the WRS to the southwest. Waste rock will be placed out to the perimeter and the WRS raised in layers covering the full footprint until it reaches the design height.

EGL also considered the risks associated with the Golden Bar WRS and potential mitigation for these. All of the final slopes of the proposed extension to the Golden Bar WRS have been checked to confirm they can achieve a long-term static FoS exceeding 1.5. Further to this, EGL recommends the following measures as a means of mitigating stability risks:

- Any rehabilitation material on the Stage 1 Golden Bar WRS shall be removed and stockpiled for stability and rehabilitation purposes of the Stage 2 Golden Bar WRS profile;
- Any foundation soils over rock shall be removed and stockpiled prior to rock placement for stability and rehabilitation purposes;
- The area between the Golden Bar WRS toe and Clydesdale Silt Pond is cleaned out of any accumulated sediment to rock before the placement of fill;
- Foundation conditions are inspected and recorded by OceanaGold's geotechnical engineer during construction to confirm that all soils have been stripped and that

there are no unfavourable fault structures within the rock which could affect the stability of the Golden Bar WRS; and

- Ephemeral gullies beneath the Golden Bar WRS footprint be filled with coarse size, free draining waste rock material, either through high tip-head segregation or direct placement to promote under drainage of the Golden Bar WRS.

An assessment of the earthquake performance of the Golden Bar WRS has also been undertaken and indicated satisfactory performance under both operating and safety evaluation (maximum credible) levels of earthquake shaking.

In addition, as the Golden Bar WRS is located immediately adjacent to the pit, the effect of the open pit on the stability of the WRS has been incorporated into the geotechnical stability assessment by PSM (discussed in Section 5.3.1). The pit stability will be reviewed by OceanaGold following completion of the detailed design and any instability of the pit affecting the WRS during operation will be mitigated by reprofiling and rehabilitating prior to closure.

An erosion and sediment control plan will also be developed prior to commencing any work on the site. This will include details on the management of surface water within the WRS working area, which will be controlled within the existing Clydesdale Silt Pond and Golden Bar Pit. Undercut of the foundation soils will be controlled or directed to silt ponds or the pit and local surface water control bunds and sediment retention bunds or ponds will be constructed as required.

Given the above, it is considered that the Golden Bar WRS design will meet the relevant standards and ensure stability of the WRS slopes.

5.3.2.2 Trimbells WRS

Trimbells WRS is an existing WRS located at the northern margin of Coronation Pit. Any use of this WRS will remain in accordance with its consented design to ensure the discharges of waste rock do not give rise to any new geotechnical risks.

The insitu Coronation Pit crest beneath the Trimbells WRS is at a height of approximately 640 mRL. As described in Section 3.8.4, in closure the Coronation Pit Lake is expected to fill to a level of approximately 660 mRL, resulting in approximately 20 m of water being locally impounded against the Trimbells WRS. This is expected to result in seepage through the Trimbells WRS, ultimately entering the Trimbells Gully Creek as illustrated in the schematic below (**Figure 5.1**).

The potential for post-closure pit lake seepage through Trimbells WRS is a feature of the existing consented environment and not an issue that is exacerbated by the MP4 Project. However, to ensure that the Trimbells WRS achieves a long term static FoS exceeding 1.5 and acceptable seismic performance, EGL recommends that a toe drain and filter buttress

is designed and constructed at the downstream toe of the WRS with slope rehabilitation and foundation soils removed prior to its placement.

Seepage through Trimbells WRS is unlikely to occur during the consent term, however, OceanaGold intends to engineer seepage control structures during the operational phase to ensure appropriate long-term management of seepages, both on water quality and WRS stability. OceanaGold may also consider constructing a low permeability facing layer on the upstream face of Trimbells WRS as part of its eventual rehabilitation to minimise seepage of Coronation Pit Lake water through the WRS. The preferred engineering solution needs to consider both the stability objectives discussed here and the water quality objectives discussed in Sections 5.4.3 and 6.2.3 of this AEE. This will require feasible options assessments and detailed design to occur during the consent term such that an appropriate engineered solution can be implemented as part of Trimbells WRS rehabilitation and closure.

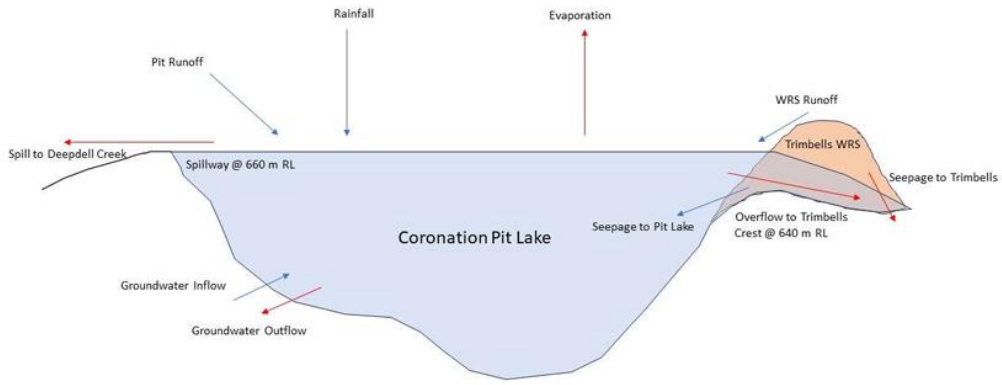

Figure 5.1: Coronation Pit Lake water balance – long term conceptual summary (Source: GHD 2024).

5.3.3 Other Waste Rock Stacks

As noted in Section 3 of this AEE, the MP4 Project will utilise existing WRS storage capacity at Frasers WRS, Coronation WRS and Coronation North WRS. Any use of these facilities will remain within their already consented parameters such that the proposed discharges of waste rock to land at these locations does not give rise to any additional geotechnical risks. It is noted that the final slopes of all WRSs are required by existing consents to have a minimum factor of safety against instability of 1.2 (under the worst combination of events). The proposed discharges of waste rock will all be undertaken in accordance with that obligation.

5.3.4 Frasers Tailings Storage Facility Stability and Dam Safety

WSP has completed an assessment on the feasibility design of Stage 2 of the FTSF. This report is attached as **Appendix 2**.

As described in Section 3.2 of this AEE, tailings will be contained in Frasers Pit by the FRBF Stage 2 placed within northern Frasers Pit and southern Innes Mills Pit. The FRBF Stage 2 design has been undertaken in accordance with the New Zealand Dam Safety Guidelines ("**NZDSG**") and includes analysis and assessment of the following:

- Potential failure modes;
- Potential Impact Classification ("**PIC**");
- Geotechnical design;
- Geotechnical pit wall risks;
- Tailings management;
- Dam safety management; and
- FTSF closure.

The findings of WSP's assessments are described below.

No credible failure modes of the FTSF with potential catastrophic failure[67] were identified with the current design assumptions. Credible failure modes with potential containment loss[68] are limited to either tailings dust exposure or seepage issues during long-term closure, and the risk of these is considered appropriately low and satisfactory.

A PIC assessment for the Stage 2 design found the PIC to be low over both the operation and closure lifecycle phases, with limited activity downstream during operations and no external loss of containment or persons at risk during closure as the pits fill with water.

The geotechnical design of the FRBF includes consideration of waste and tailings material parameters and the analysis of seepage, static stability, seismic stability, settlement and deformation. The results of these analyses indicate the FRBF meets stability requirements of the NZDSG. In closure, large deformations and downstream embankment failures may occur due to saturated backfill during Safety Evaluation Earthquake ("**SEE**") seismic loadings, however no release of contents outside of the Innes Mills Pit would occur under any scenario.

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[67] Catastrophic failure is defined as a failure mode that diminishes structural integrity to the extent that the facility cannot continue to operate to store tailings and allow a significant release of contents.

[68] Containment loss refers to an uncontrolled release of either tailings (can be slurried or dry tailings) or contaminated water (through seepage or overflows) outside of the TSF boundary.

Backfill and tailings placed in the pit will improve the stability of the west wall in comparison to end of mining, however ongoing creep of the west wall is expected and highwall movement on the east and west wall is anticipated under SEE seismic loadings. The main risks associated with highwall movement, which is unlikely to be rapid, (sub-aqueous sliding resulting in potential seiche waves) can be managed by the large freeboard between the top of the tailings, and later the pit lake and the pit rim projected throughout operations and after closure. OceanaGold has demonstrated that highwall movement risks can be controlled at Frasers Pit through its current geotechnical management programme that includes radar monitoring, visual inspections / mapping and associated trigger action response plan, and remedial works as required.

The proposed tailings deposition operating plan consists of discharging the tailings slurry from one of three spigots set along the discharge pipeline, laid along benches on the upstream slope of the FRBF, with the supernatant water contained in the south-east corner of Frasers Pit. Floating pumping infrastructure will recycle the water back to the Processing Plant for reuse via a series of staged pump stations. The spigot pipeline will be lifted onto higher benches as the tailings inundate the lower benches. An assessment of the forecast tailings production schedule indicates deposition will commence while the FRBF is being raised, but there is no risk of overtopping the FRBF as the rising tailings beach level will be significantly lower than the crest of the FRBF, providing in excess of 60 m operating freeboard. Modelling projects a final Stage 2 tailings level of approximately 417 mRL relative to a final FRBF crest of 480 mRL.

Water balance modelling estimates the FTSF pit lake will reach the FRBF crest 65 years after closure, where it will commence overflowing into the rising Innes Mills Pit lake. FRBF is forecast to be inundated by the combined FTSF and Innes Mills Pit lake 95 years after closure. The pit lake reaches a long-term level that fluctuates between 486 and 494 mRL. Whilst the in-situ pit crest is at 497 mRL, the pit crest open spill level is at 505 mRL therefore, the maximum lake level is 11 m below the pit rim, resulting in a contingency lake capacity of 22 Mm^3. The lake is therefore always contained within the pit extent with no risk of overtopping.

WSP recommends the establishment of an Operations Maintenance and Surveillance ("**OMS**") Manual, which includes appropriate emergency preparedness information, to ensure all dam safety requirements outlined in the NZDSG are addressed and actively managed during operations. This recommendation will be adopted in the proposed conditions of the relevant FTSF resource consents**.**

5.3.5 Clydesdale Silt Pond

A replacement resource consent is sought to dam water in Clydesdale Silt Pond. Clydesdale Silt Pond has a storage volume of less than 20,000 m^3 and an embankment height of about 7 m and has been in operation since 2003. No physical changes to the silt

pond are required to facilitate the Golden Bar WRS extension. Whilst Clydesdale Silt Pond is not a classifiable dam[69], the silt pond will continue to be operated in accordance with OceanaGold's Silt Ponds and Reservoirs Operations, Maintenance and Surveillance Manual, which specifies the dam safety management measures applied to the site's silt ponds and reservoirs. Of note, silt ponds are inspected quarterly, and appropriate emergency preparedness and emergency response procedures are followed. Continued operation of Clydesdale Silt Pond in accordance with the Silt Ponds and Reservoirs Operations, Maintenance and Surveillance Manual is expected to ensure any adverse effects from the ongoing damming are less than minor.

5.3.6 Geotechnical Effects Summary

Based on the assessments completed by WSP and PSM the existing and proposed management measures are considered to be sufficient to ensure that adverse effects associated with the stability of pit and waste rock slopes and dam safety are kept to a level that is less than minor both during the operational and post-closure phases.

5.4 SURFACE WATER AND GROUNDWATER

5.4.1 Introduction

The potential adverse effects of the MP4 Project on surface and groundwater have been assessed primarily by analytical and numerical modelling which includes consideration of existing facilities modelled to their full authorised extent. While BRWRS is not currently included within the scope of the MP4 Project, OceanaGold acknowledges that it holds existing resource consents in respect of BRWRS that could be exercised concurrently with the MP4 Project should other necessary approvals be obtained.[70] To ensure these consents are retained, OceanaGold has included BRWRS in its cumulative effects modelling.

The surface and groundwater assessments completed by GHD (2023, 2024a, 2024b and 2024c), and discussed in Sections 5.4.2, 5.4.3 and 5.4.4 of this AEE have been peer reviewed by WGA (refer **Appendix 30**). WGA considers that the modelling of all components is fit for purpose, and that the mitigation measures proposed (discussed further in Section 6 of this AEE) are appropriate based on the modelling output. WGA recommend that the implementation of the long-term mitigation package be informed and optimised based on the results of mitigations applied during the operational period of the mine. Therefore, the design of the package of long-term mitigation measures is subject to optimisation and modification.

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[69] As per the Building (Dam Safety) Regulations 2022.

[70] OceanaGold requires a new land use consent for stream reclamation which has been applied for and is currently on hold.

Modelling of surface and groundwater primarily accounts for the effects of seepages from waste rock stacks and tailings storage facilities to surface water and groundwater, as well as direct discharges of mine impacted water from silt ponds and seepage sumps. Modelling does not account for the potential effects of erosion and sedimentation.

Activities with the potential to result in erosion and sedimentation effects include:

- Extension of WRSs;
- Clearance of vegetation associated with pit extensions;
- Civil works such as road realignments and reinstatements;
- Construction or extension of clean water diversion drains; and
- Installation of culverts.

These activities will be undertaken in accordance with the Erosion and Sediment Control Principles outlined in Section 6.1 of this AEE and **Appendix 10**. Furthermore, the MGP includes extensive existing infrastructure for managing these effects, much of which can be relied upon for the MP4 Project. Where open pits are being extended, new clean water diversion drains will be established, tying into existing ones to the extent practicable.Notably, much of the Golden Bar WRS extension disturbance catchment will report to the existing Clydesdale Silt Pond and the disturbance catchment associated with rehandling of waste rock from Northern Gully WRS will report to the Northern Gully Silt Pond.

With continued implementation of appropriate erosion and sediment control measures across the site, adverse erosion and sedimentation effects are expected to be less than minor.

5.4.2 Geochemical Analysis

A geochemical analysis was undertaken by Mine Waste Management Limited ("**MWM**") to inform the assessment of the effects of the Project on the surface water and groundwater, described in Sections 5.4.2 and 5.4.3. The geochemical analysis is summarised below and attached as **Appendix 8**.[71]

The analysis found that acid base accounting data supports earlier investigations that waste rock at Macraes is generally non-acid forming, with low sulphide sulphur, and is unlikely to generate acid rock drainage.

[71] Additional geochemical analysis is provided in respect of BRWRS in Annexure 2 to OceanaGold's s92 response to Otago Regional Council, dated 15 October 2024.

MWM undertook modelling to understand the potential effects of the MP4 pit lakes on groundwater and surface waters during both the filling and overflow phases. The modelling work showed that the final pit lakes will have a circumneutral pH yet will be elevated in sulphate and arsenic. Some pit lakes may also have elevated levels of Nitrate-Nitrogen and Ammoniacal N in the early stages of pit lake development before biogeochemical processes remove the nitrogenous compounds. The concentration of sulphate in WRS seepage was found to increase with WRS height. WRS seepage is expected to have a circumneutral pH, with elevated concentrations of Nitrate-Nitrogen, Ammoniacal N, sulphate, and zinc.

Table 5.1 shows the modelled water quality in each pit lake when spilling commences. As Frasers – Innes Mills pit lake does not spill directly to surrounding waterways, water quality is shown at 290 years post closure.

Table 5.1: Pit lake water quality when overflow commences (spilling).

MINE DOMAIN	GOLDEN BAR STAGE 2	CORONATION STAGE 5/6	FRIM
Year post cessation of mining when overflow commences	35[2]	97[3]	No spill (data from Year 290)
Average discharge flow (L/s) to receiving environment when stable	3.3	1.46	-
pH	8.38	8.41	8.06
Dissolved solids	793	1,101	1,815
Alkalinity	182	238	108
Ca	60.9	80	181
Mg	92.7	131	167
Na	20.9	27	71
K	5.6	8	31
Fe	<0.001	<0.001	<0.001
Cl	12.9	14.2	4.7
NO_3-N	0.03	0.0036	0.09
Amm-N	0.00015	0.00005	0.0001
SO_4	373	545	1,209
Mn	0	-	0.05
Zn	0.0073	0.0034	0.0025
As	0.145	0.25	0.04
Sb	0.0033	0.005	0.03
Cyanide	-	-	0.0057
Pb	0.00003	0.00004	0.000008

All units in mg/L except for pH and where indicated.

1. seepage water quality

2. Predicted by GHD (2023a) when discharge of the pit lake to a tributary of the North Branch of the Waikouati River occurs (with stable flow at Year 40).

3. Predicted by GHD (2023b) when the pit lake will discharge though the Trimbells WRS.

Red text indicates parameter values above the reference water quality reference value (see Section 2.6). No hardness modification was conducted.

It is proposed that variance from the expected water quality in the initial closure phase should be managed by Trigger Action Response Plans and should utilise adaptive management principles. As per existing pit lake consents, it is considered that these

measures can be captured in the Water Quality Management Plan required by Condition 9 of RM10.351.43, Condition 8 of RM12.378.14 in respect of FRIMPit Lake. A similar approach is recommended for the Golden Bar Pit Lake and the Coronation Pit Lake. The pit lake water quality variance will be known prior to the pit lakes reaching their respective spill levels and any variance will be managed in accordance with the certified Pit Lake Water Quality Management Plans.

5.4.3 Coronation and Coronation North Pits

GHD has completed an assessment of the effects of the proposed mine expansion on surface and groundwater, within the Mare Burn and Deepdell Creek catchments. This report includes a description of the existing surface water environment and is attached in full as **Appendix 11**.

The groundwater modelling provides predictions of groundwater inflow and outflow into and out of the existing and proposed Coronation Pit and Coronation North Pit, as well as groundwater seepage from Trimbells WRS, Coronation WRS, Coronation North Pit WRS and Coronation North WRS (these features in the Coronation area are shown in **Figure 5.2**), with the majority of seepage expected to move laterally within the near surface weathered schist and be captured in silt ponds and/or report to the receiving surface water catchment.

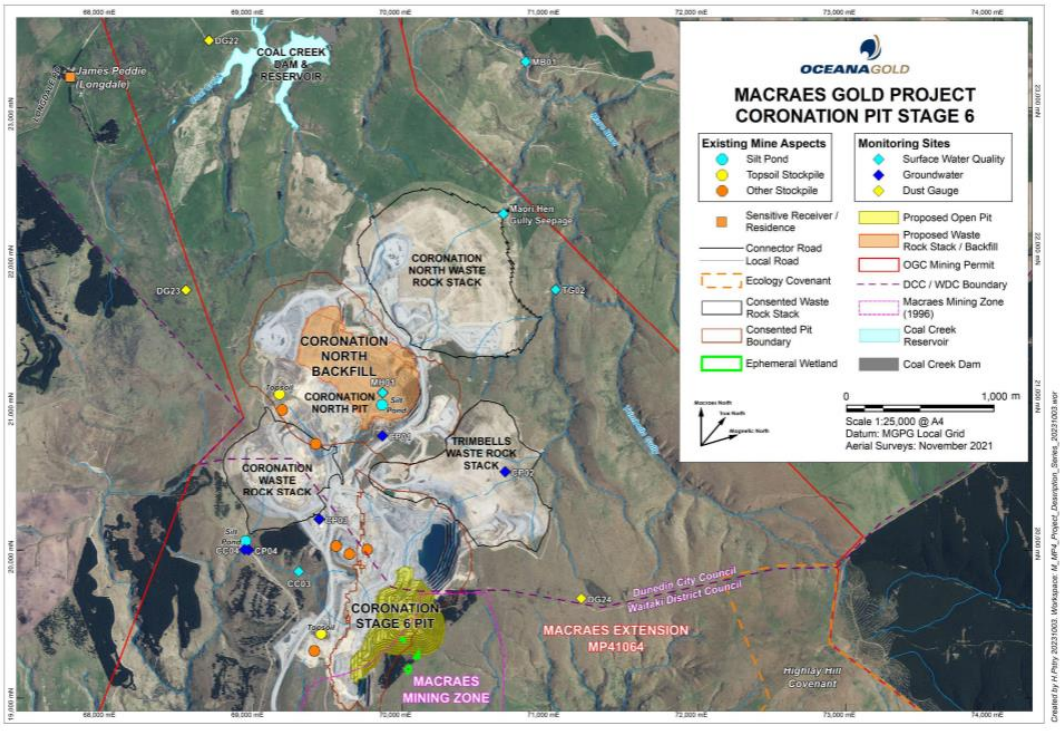

Figure 5.2: Coronation Open Pit mining area – existing and proposed.

The groundwater contaminant plume is predicted to reach a maximum extent of approximately 1,600 m to the northwest and approximately 1,000 m to the southeast from these sources in approximately 400 years. The upper reaches of the Mare Burn and Trimbell's Gully are likely to receive higher concentrations of contaminants relative to the Deepdell catchment, with an estimated sulphate seepage flux of between 183 and 696 kg/day (20 and 230 years post closure respectively). The Deepdell catchment is expected to have an insignificant sulphate flux from the Coronation area relative to the northern catchments (approx. <1 kg/day).

The Water Balance Model indicates that the Coronation Pit Lake overflow (spill) level could be reached after a period of approximately 200 years post closure, following which, water from the Coronation Pit Lake would spill into the Deepdell Catchment via the topographic low point to the south. Prior to the pit lake reaching its overflow level, it is expected that pit lake water will seep through the Trimbells WRS to the north, via the pre-waste placement topographic low point after a post closure period of approximately 90 years. The volume of water discharging through this flow path is predicted to increase as the lake level rises.

Pit lake water draining through the Trimbells WRS is assumed not to deteriorate further as it flows through the WRS to Trimbell's Gully. This is based on the view that advective flow of oxygen through the WRS is limited / prevented via the saturation of the WRS toe and capping of the WRS surface via rehabilitation. In the event that advective flow is not limited / prevented, the pit water could become a significant source of sulphate to the Mare Burn. Therefore, OceanaGold proposes to manage this potential effect by engineering a suitable advective flow barrier or similar as part of rehabilitation of Trimbells WRS. This is further discussed in Section 6.2 of this AEE.

Based on GHD's modelling, dilution water from the consented (but not yet constructed) Coal Creek Dam is not considered necessary to meet the existing in stream maximum compliance limits. However, the potential construction of the dam and the potential for flow augmentation (and dilution of impacted waters during low flows) provides contingency to address the modelled compliance exceedances. GHD considers an adaptive management approach is appropriate and OceanaGold will continue to apply its adaptive management approach as detailed in Section 6.2.1 of this AEE.

The Water Balance Model completed by GHD shows that in general, sulphate and nitrate-N concentrations within the immediate receiving environment (Trimbell's Gully and Mare Burn) are predicted to increase post closure relative to the mining phase due to the increase in sulphate and Nitrate-N mass from seepage water with time. This is consistent with the expectations of the current consented situation. Median modelled sulphate concentrations are predicted to increase (from mining to closure) from 80 g/m^3 to 129 g/m^3 and 60 g/m^3 to 89 g/m^3 at the Mare Bare compliance locations MB01 and MB02, respectively. During low flows, the concentrations of both sulphate and Nitrate-N in the receiving environment are buffered by the capture of seepage in both the Trimbells and

Maori Hen Silt Ponds. Some minor increases in trace elements are also expected. Ammoniacal N concentrations are predicted to reduce post closure relative to the mining phase due to the increased presence of rehabilitated surfaces (compared to non-rehabilitated surfaces which provide a higher relative contribution of these parameters before the closure period).

Compliance with the current water quality conditions within the Mare Burn catchment is expected to be within the consented limits (refer **Table 2.1**). In general, the modelling shows a low (<1%) probability of compliance exceedance for sulphate at MB01 and sulphate and nitrate at MB02 during prolonged low flow periods.

The modelling undertaken by GHD conservatively assesses compliance for peak contaminant concentrations and has informed the assessment of the effects of the proposed Coronation 6 extension on surface water and aquatic ecology, undertaken by Greg Ryder Consulting (refer **Appendix 20**). As discussed further in Section 5.5.1, current and predicted long-term metal concentrations as modelled by GHD will meet the Australian and New Zealand guidelines for fresh and marine water quality, 2018 ("**ANZG**") values for protection of 95% of aquatic species.

In summary, as is the expectation for the existing consented operations, the development of the Stage 6 Coronation Project is considered to result in increasing sulphate concentrations within the upper tributaries of the Mare Burn relative to the current in stream water quality. However, these concentrations are likely to remain below the currently consented limits. Post closure, improvement in Nitrate N and Ammoniacal N concentrations (relative to the mining phase) are expected due to rehabilitation efforts within the catchments.

5.4.4 Golden Bar

5.4.4.1 Golden Bar Dewatering

The Golden Bar Pit Lake is currently spilling water to Golden Bar Creek. Dewatering of the Golden Bar Pit will be required before mining of the pit extension can commence. Dewatering of the open pit will remove water that has accumulated within the pit and draw down the surrounding groundwater table.

GHD completed an assessment on the water quality outcomes in the receiving environment associated with the discharge of this pit water to local waterways (attached as **Appendix 14**). The assessment found that should all pit lake water be discharged to local waterways, management measures such as reduced discharge rates, multiple discharge points, or pre-treatment would be required to ensure sulphate and arsenic concentrations do not exceed the existing water quality criteria.

To avoid adverse effects on local waterways to the extent practicable, and to achieve a dewatering rate that is acceptable to operations, OceanaGold plans to pump the majority

of Golden Bar Pit water to Frasers Pit for use in the MWMS. A small quantity (up to approximately 5 L/s) may be discharged to Golden Bar Creek at approximately the same location as the current pit lake overflow to maintain flows in Golden Bar Creek. Any discharge to Golden Bar Creek will occur in a manner that ensures that existing consented in-stream water quality criteria (refer **Table 2.2**) are met, thus appropriately mitigating any adverse effects.

5.4.4.2 Golden Bar Mining

GHD has completed an assessment on the proposed extension of the Golden Bar Pit and Golden Bar WRS within the Golden Bar and Clydesdale Creek catchments and this is attached in full as **Appendix 12**. The assessment includes a description of the existing surface water environment.

The results of the groundwater modelling provide predictions of groundwater inflow and outflow of the existing and proposed Golden Bar Pit, as well as groundwater seepage from the Golden Bar WRS. The majority of this seepage is expected to move laterally within the near surface weathered schist and will be captured in silt ponds, the pit sump and / or report to the receiving surface water catchment.

The groundwater contaminant plume (conservatively illustrated using sulphate due to its low potential for attenuation within the groundwater system and existing elevated nature in some receiving surface water bodies as a result of past mining activity associated with MGP) is modelled to primarily impact Clydesdale Creek (located in the upper reaches of the NBWR catchment) with an estimated sulphate seepage flux of between 26 and 80 kg/day (approximately 20 and 400 years post closure respectively). The McCormicks River catchment to the north of the Golden Bar development is expected to receive a negligible component of contaminants from the Golden Bar development area (estimated sulphate flux of <0.1kg/day).

An existing sitewide Goldsim Water Balance Model ("**WBM**") has been utilised by GHD to estimate future impacts on the receiving water quality as a result of mining and rehabilitation activities. Key updates to the WBM include revised WRS seepage and pit lake water quality estimates, recalibration of key monitoring and compliance points utilising revised catchment boundaries and water quality and revised groundwater inflow / outflow estimates from the groundwater model.

Using calibration from the previous pit lake filling phase, the WBM indicates that the Golden Bar Pit Lake overflow level is likely to be reached after a period of approximately 35-42 years post closure, following which, water from Golden Bar Pit Lake would spill into the Golden Bar Creek, and ultimately the NBWR as it does currently.

The WBM shows that in general, sulphate concentrations within the immediate receiving environment (Clydesdale Creek and Golden Bar Creek) are predicted to increase post

closure relative to the mining phase due to the increase in sulphate mass from seepage water (from the Golden Bar WRS and Golden Bar Pit Lake) with time. This is consistent with the expectations of the current consented situation. Median modelled sulphate concentrations are predicted to increase (from mining to closure) from 213 to 368 g/m^3 at the monitoring location in the Clydesdale Creek immediately downstream of the Clydesdale WRS, 10 to 276 g/m^3 at the monitoring location in the upper Golden Bar Creek immediately downstream of the Golden Bar Pit overflow and 10 to 76 g/m^3 at the current compliance monitoring location in Golden Bar Creek, immediately prior to the confluence with the NBWR. Ammoniacal N and Nitrate N concentrations are generally predicted to reduce post closure relative to the mining phase due to the increased presence of rehabilitated surfaces (compared to non-rehabilitated surface which provide a higher relative contribution of these parameters before the closure period).

Current consented parameters (arsenic, copper, iron, lead and zinc) remain within their respective compliance limits at both the compliance and monitoring locations within the tributaries of the NBWR throughout both the duration of the operational period and post closure period. Water quality at the current compliance locations GB02 (downstream of Golden Bar Pit) and NB01 (downstream of Golden Bar Creek NBWR confluence) appear to be acceptable. GB01 is located immediately downstream of Clydesdale WRS silt pond and contaminant levels, notably sulphate is relatively high. Mitigation of the Clydesdale WRS water quality downstream of the silt pond is proposed to ensure Murphys Creek contaminant levels are acceptable and compliance at NB03 is maintained.

The modelling undertaken by GHD conservatively assesses compliance for peak contaminant concentrations and has informed the assessment of the effects of the proposed Golden Bar activities on surface water and aquatic ecology, undertaken by Greg Ryder Consulting (refer **Appendix 21**). As discussed further in Section 5.5.3, Greg Ryder Consulting considers that the predicted changes in water quality during the operation and post closure of the Golden Bar mine will generally comply with the ANZG values for protection of 95% of species and are unlikely to alter the make-up of the benthic invertebrate and fish communities of Clydesdale Creek and Golden Bar Creek.

In summary, modelling completed by GHD indicates that the development of stage two of Golden Bar as outlined will result in a predicted increase in sulphate concentrations associated with WRS development and pit lake spill waters within tributaries of the NBWR. Post closure, improvements in Nitrate N and Ammoniacal N concentrations (relative to the mining phases) are expected as a result of rehabilitation efforts within the catchments. The current water quality standards within Golden Bar Creek and Murphys Creek are expected to be maintained. No (or limited) impact is expected within the McCormicks catchment to the north.

5.4.5 FTSF, Innes Mills and Golden Point Pits

GHD has completed an assessment on surface water and groundwater cumulative effects of the proposed FTSF Stage 2 and Innes Mills mine extension within the Deepdell and the NBWR catchments. This includes the effects from the GPUG expansion and extension, Coronation and Golden Bar Pit developments and associated waste rock disposal, including partial backfilling of Golden Bar Pit. GHD's report is attached in full as **Appendix 13**. The assessment includes a description of the existing surface water environment.

Revised model outcomes for the MP4 proposal referred to as the "base case" are provided in **Appendix 31** (refer Annexure 4) and incorporate more recent surface water quality monitoring data that was not available at the time **Appendix 13** was prepared. Further assessment was completed to account for construction of BRWRS in parallel with MP4 activities. This assessment is provided in **Appendix 31** (refer Annexure 3) and demonstrates that BRWRS can be constructed in addition to the MP4 Project without a material change in the probability of compliance exceedance in Deepdell Creek provided a source of dilution water is available to provide a variable dilution discharge of up to 20 L/s to Deepdell Creek. OceanaGold proposes to investigate potential sources of dilution water prior to BRWRS construction occurring, noting that resource consent is held to construct Camp Creek Dam should that be found to be necessary. The groundwater modelling provides predictions of groundwater flows into and out of the existing and proposed pit walls, respectively, as well as seepage from the pit lakes, backfills and WRSs. The majority of these seepages are expected to move laterally within the near surface weathered schist and be captured in silt ponds, pit sumps and / or report to the receiving surface water catchment.

The groundwater contaminant plume is modelled to primarily impact Deepdell Creek (from a combination of WRS seepage and pit lake seepage through the natural schist and Golden Point Pit Lake overflow) with an estimated sulphate seepage flux of between 24 and 861 kg/day (20 and 200 years post closure respectively). The NBWR is modelled to receive an estimated sulphate seepage flux of between 5 and 116 kg/day (20 and 200 years post closure, respectively) with the majority of the mass sourced directly from the Frasers and Golden Bar WRS seepage.

The Water Balance Model indicates that pit lake water levels in the Frasers and Innes Mills pits could reach the top of the FRBF at 480 m RL approximately 51 years post closure, upon which the lake levels would combine to form a single combined pit lake – Frasers / Innes Mills Pit Lake ("**FRIM**"). Long-term (>200 years) lake level projections suggest that the FRIM lake is expected to reach a level of between approximately 486 and 494 m RL when taking conservative climate change scenarios into consideration. These levels are below the northwest pit rim 'spill' level (i.e. the interface between the in-situ schist and waste rock) of 497 m RL and therefore no direct surface water discharge from the lake to the receiving surface water bodies is predicted.

A higher volume of seepage reporting to the Murphy's Silt Pond through the waste stored in the south of the Frasers Pit is considered possible for the pit lake above 487 mRL, which is the level of the interface between the in-situ schist and waste rock. GHD recommend that this increase in seepage be captured and treated in the same manner as currently occurs (refer to Section 6.2 of this AEE).

Modelling results indicate that the development of the MP4 project will potentially result in a predicted increase in sulphate concentrations associated with seepages that result from WRS development and seepage through the underlying schist into Deepdell Creek. Much of this expected increase is already realised in the existing environment associated with the existing TSFs, WRS and open pits in the Deepdell Creek catchment. As noted in Section 2.6 of this AEE, previous projects have been consented on the basis that water quality in Deepdell Creek could approach the limits prescribed in existing resource consents (refer **Table 2.4**). Modelling indicates there is a low modelled risk of compliance exceedance of the current consented criteria within Deepdell Creek and the Shag River.

If water quality monitoring in the Deepdell Creek shows a departure from modelled, contaminant levels, such effects can be addressed by flow augmentation with dilution water from a suitable source, such as the consented Camp Creek Dam. The bottom line is construction of the Camp Creek dilution reservoir offers a contingency against unexpected exceedance concentrations within Deepdell Creek during prolonged low flow periods, however its necessity has yet to be confirmed, except potentially in association with BRWRS construction. The site water management plan will address this via an adaptive management approach, further details of which are described in Section 6.2 of this AEE.

Post closure, Nitrate N, Ammoniacal N and other assessed trace element concentrations are expected to continue at similar levels or reduce as a result of rehabilitation efforts within the catchments.

In the NBWR, the implementation of selected mitigation measures within the catchment (including rehabilitation of WRSs, implementation of Passive Treatment Systems ("**PTS**"), collection and controlled release of all seepage from the Frasers West, South and Clydesdale WRSs backed up by selective pumping of waters back to Frasers and Golden Bar pits) during the operation and post closure are likely to result in a low risk of compliance exceedance within the receiving surface water environment. Post closure elevated arsenic at compliance location NB03 is a result of the Golden Bar Pit and could be managed by controlled discharge (during high flows) and / or treatment (for example, dosing the pit lake with ferric chloride) if required.

Overall, the results of the groundwater and surface water modelling of cumulative effects in the Deepdell Creek and NBWR catchments, indicate that the proposed development can be undertaken within the currently consented surface water compliance criteria limits provided that WRS seepage water from Fraser WRS and Golden Bar WRS is captured and returned to the Mine Water Management System and appropriate mitigation options are

implemented during to allow OceanaGold, in the case of the NBWR catchment, to move away from pumping of seepage water back to pits in perpetuity:

- The Frasers West / South and Golden Bar WRSs are rehabilitated progressively during the operation so that infiltration reduces to a rate of approximately 29 mm/year to limit seepage;
- Passive Treatment Systems (or an equivalent treatment system) are installed ‘in line' with captured seepage water, treating that seepage water from the Frasers West, Frasers South and Golden Bar WRS and reducing sulphate loads by 30% before discharge to the respective silt ponds / collection sumps;
- The Frasers West Silt Pond, Clydesdale Silt Pond and Murphys Silt Ponds are converted to sumps and discharge their water to the receiving surface water environment during times of elevated catchment flows. The sumps are equipped with a system that ensures excess water is returned back to the open pits to avoid uncontrolled overflow;
- A new sump is constructed capturing seepage along the toe between the Frasers West and South WRSs at or near the monitoring location NBWRTR. E.g. in the location of the previously used Redbank Silt Pond. This sump will operate in a similar manner to the Frasers West, Murphys and Clydesdale silt ponds (sumps) in terms of proposed discharge to the NBWR and return to Frasers; and
- Operations adaptively manage water quality during the operational and early stages of closure using the process outlined in Section 6.2 of this AEE and the existing Water Quality Management Plan.

In addition, it is recommended that options to either limit and /or decrease the leachate volumes and contaminant loadings entering the surface water receiving environment together with potential remedial measures should be considered as part of the site water management plan. These options could include, but are not necessarily limited to, the following:

- Installation of flow monitoring on the NBWR to support design, construction and operation of discharge controls;
- Alternative WRS construction methodologies and / or reducing overall WRS heights could be considered to reduce the sulphate and trace element loadings entering the surface water environment from seepage waters;
- Targeted passive and / or active treatment of seepage sources could be investigated and implemented in areas where the discharge loadings are elevated; and

- Further optimisation of flow augmentation from Camp Creek reservoir (and / or other potential dilution sources) to Deepdell Creek can be carried out to ensure there is sufficient dilution water available during low-flow periods.

The modelling undertaken by GHD conservatively assesses compliance for peak contaminant concentrations and has informed the assessment of the effects of the FTSF Stage 2 and Innes Mills proposed expansion on surface water and aquatic ecology, undertaken by Greg Ryder Consulting (refer **Appendix 22**). As discussed further in Section 5.5.2, current and predicted long-term metal concentrations as modelled by GHD will meet ANZG values for protection of 95% of aquatic species in most instances.

In summary, as is the expectation for the existing consented operations, MP4 is expected to result in increasing sulphate concentrations in Deepdell Creek relative to the current in stream water quality, but modelling indicates a low risk of exceeding compliance with the current consented criteria within Deepdell Creek and the Shag River. If needed, flow augmentation may be used to reduce concentrations within Deepdell Creek enabling receiving water compliance to be met and provides contingency during periods of prolonged low flow.

In the NBWR, base case modelling shows compliance exceedance at the surface water compliance locations NBWRRF and NB03. By implementing a package of selected mitigation measures within the catchment (as described above, and included in **Appendix 13**), the risk of compliance exceedance is largely removed with concentrations of sulphate, Nitrate N, Ammoniacal N and copper substantially reduced. Modelled elevated arsenic at compliance location NB03 as a result of the Golden Bar pit spill could be managed by controlled discharge (during high flows) and / or treatment (e.g. dosing the pit lake with ferric chloride).

5.5 AQUATIC ECOLOGY

5.5.1 Mare Burn Catchment

Greg Ryder Consulting has completed an assessment on the effects of the proposed Coronation 6 extension on surface water and aquatic ecology. This is attached as **Appendix 20** and summarised below.

Algae and Plants

The aquatic plant and periphyton communities of the Mare Burn of Trimbells Gully are not assessed to be unique. Historically this catchment has been influenced by farming activities, with no protection of watercourses from stock access, resulting in nutrient inputs into surface waters and associated proliferations of plants and periphyton under favourable conditions. The proposed Coronation 6 extension will not exacerbate this situation.

Benthic Invertebrates

The benthic invertebrate communities of the Mare Burn have not altered materially since mining has commenced in the catchment. Indicators of ecosystem health (mayfly densities and QMCI scores), while fluctuating from year to year and season to season, have not shown any clear declining trend over time. The invertebrate community at monitoring site TG01 showed signs of degradation in 2021 and 2022 relative to 2017, however, data for 2019 and 2020 indicate the community was at least as healthy then as it was in 2017, and it is too early to establish whether any long-term trend is developing. There is no evidence to suggest that any ongoing or future mine-induced water quality will significantly alter the composition of the benthic invertebrate community at Mare Burn monitoring sites.

Kōura remain common at all Mare Burn catchment monitoring sites.

Fish

Galaxiid population densities at MB01 and MB02 between 2017 and 2022 appear to be trending up despite the occurrence of several consented discharges from the Coronation mines. Predicted changes in water quality over the short to very long-term appear to remain largely within existing compliance limits for the Mare Burn, apart from some occasional exceedances of the sulphate compliance limit for MB01, due to one-off operational events. However, there is no evidence to suggest that fish populations will be adversely affected as a result of the proposed Coronation expansion.

Sulphate concentrations in Trimbells Gully silt pond are predicted to increase, as is expected from modelling work, however they will be diluted by water contributions from the Trimbell's catchment flow further upstream and progressively downstream, so actual sulphate concentrations in Trimbells Gully will be much lower than those in the silt pond. Toxicity testing conducted using Taieri flathead galaxias (eggs and larvae), BRWRS seepage water and Mare Burn water, showed no effects at a sulphate concentration equivalent to the existing compliance limit for MB02 of 1,000 g/m^3. The toxicity testing work also indicated that current and predicted nitrate concentrations are not a threat to the local galaxiid population.

Summary

Overall, Greg Ryder Consulting considers that existing water quality compliance limits for the Mare Burn appear to be met both now and in the long-term future. Currently, there is no evidence to indicate that they are posing a threat to the local aquatic ecological community. Furthermore, current and predicted long-term metal concentrations will meet the ANZG values for protection of 95% of species.

While not specific to this site, ANZG's default guideline values can be used to signal the onset of minor adverse effects. As such, the effects of the Project on the waters of the Mare Burn will be less than minor on the basis that:

- Existing consents authorise the discharge of contaminants to the Mare Burn and these form part of the existing environment against which the proposed activities should be assessed;
- When the proposed activities are considered in a cumulative context, modelling indicates that the water quality will generally meet the ANZG's default guideline values that are used to signal the onset of minor adverse effects; and
- There is no evidence to suggest that water quality during low flow events is having an adverse effect on aquatic ecology in the Mare Burn catchment.

5.5.2 Deepdell Creek

Greg Ryder Consulting has completed an assessment on the effects of the proposed FTSF Stage 2 and Innes Mills extension on surface water and aquatic ecology. This is attached as **Appendix 22** and summarised below. This considers the effects of cumulative discharges into the Deepdell Creek from the northern (Coronation) side and southern (Golden Point) side of the catchment.

Aquatic Biota

The most recent reported monitoring of benthic macroinvertebrates at Deepdell Creek monitoring sites (2022) indicated molluscs (snails), specifically the common New Zealand mud snail (Potamopyrgus antipodarum), dominated the benthic community composition at all Deepdell Creek monitoring sites in 2021, followed by trichopterans (caddisflies) and dipterans (true-flies). Trichopterans and dipterans were the most diverse orders.

Taxa belonging to caddisflies, mayflies (Ephemeroptera) and stoneflies (Plecoptera) are collectively referred to as EPT taxa and collectively are indicative of good water quality and habitat conditions. The proportion of EPT abundance varied among Deepdell Creek sites in all seasons in 2021, however there was no consistent significant difference between control and impact sites. In general, EPT taxa represent a relatively small proportion of the total invertebrate community at Deepdell Creek monitoring sites.

Quantitative electric fishing surveys have been undertaken at Deepdell Creek monitoring sites in late summer for many years (over three decades). The Taieri Flathead galaxiid (Galaxias depressiceps) is by far the dominant fish species in Deepdell Creek, and site DC07, located downstream of the mine, typically supports a large population. The Taieri flathead galaxias has been classified by the Department of Conservation as 'Threatened – Nationally Vulnerable', with criteria C (3) (moderate population, with population trend that is declining, total area of occupancy ≤ 100 ha (1 km2), predicted decline 10–50%) and the qualifiers 'Conservation Dependent' and 'Data Poor'.

For the 2020 survey, the highest population estimate was found at site DC02, followed by site DC01, then site DC08. Apart from DC07, all sites within or downstream of mining

operations had higher population estimates compared to the 2019 survey. Population estimates in 2020 at all sites were within the respective estimate ranges of previous years. In addition to galaxiids, the 2020 fish survey found shortfin eels (Anguilla australis) at DC00 (body length 600 mm) and longfin eels (Anguilla dieffenbachii) were observed at DC03 (body length 700 mm) and DC07 (body length 260 mm). Longfin eels have been classified by the Department of Conservation as 'At Risk – Declining', while shortfin eels have been classified as 'Not Threatened'. Unidentified eels were also observed but not caught at DC01 and DC03 in 2020.

Comparison of results with compliance limits and default guidelines

Greg Ryder Consulting used the modelling completed by GHD (2024c) and the updated base case modelling presented in **Appendix 31** (Annexure 4)[72] to compare the predicted water quality with existing consent compliance limits, ANZG values for 95% species protection, British Columbia Ministry of the Environment guidelines for sulphate (hardness dependent – noting that there are no New Zealand default guidelines for sulphate), and National Policy Statement for Freshwater Management ("**NPS-FW**") National Objectives Framework ("**NOF**") band attribute states for ammoniacal-N and nitrate-N.

Ryder (2024c) considers that for mining and long-term scenarios, virtually all modelled parameters (contaminants) at all surface water compliance sites meet the ANZ default guidelines for 95% species protection, and for sulphate they will meet the British Columbia guidelines when hardness is taken into account (as well as remaining below existing sulphate compliance limits). There are a few parameters which are predicted to just exceed ANZ default guideline values at some monitoring sites, however Greg Ryder Consulting considers these 'exceedances', to be minor and within the margin of error associated with the modelling.

Summary

Overall, Greg Ryder Consulting does not expect that the Project will result in changes in the composition of the aquatic fauna of the affected streams and rivers. Provided the mitigation measures described in Section 5.4.4 above are implemented and managed, Ryder (2024c) does not anticipate material changes to the physical character of the receiving waters as a result of the cumulative effects of the proposed mining expansion, or any material changes to the hydrological character of the receiving waters. Predicted short

[72] Greg Ryder Consulting has not directly considered the modelled implications of BRWRS construction, however, the modelled statistics for the BRWRS scenario are comparable to those associated with the MP4 base case considered in Ryder (2024c). Therefore, the construction of BRWRS will not result in any meaningful changes to the conclusions drawn in relation to adverse effects on aquatic ecology subject to the effects of BRWRS construction being mitigated in accordance with the expectation of GHD (refer Appendix 31 (Annexure 3).

and long-term changes in water quality in the Deepdell Creek and Shag River largely satisfy default (conservative) guideline values.

As such, the effects of the Project on the waters of the Deepdell Creek catchment will be no more than minor on the basis that:

- Existing consents authorise the discharge of contaminants to the Deepdell Creek catchment and these form part of the existing environment against which the proposed activities should be assessed;
- When the proposed activities are considered in a cumulative context, modelling indicates that the water quality will in most cases meet the ANZG's default guideline values that are used to signal the onset of minor adverse effects; and
- There is no evidence to suggest that water quality during low flow events is having an adverse effect on aquatic ecology in the Deepdell Creek catchment.

5.5.3 Waikouaiti River North Branch Catchment

Greg Ryder Consulting has completed an assessment on the effects of the proposed Golden Bar extension on surface water and aquatic ecology in the NBWR Catchment, including Golden Bar Creek and Murphys Creek. This assessment is attached as **Appendix 21** and summarised below. In addition, Greg Ryder has assessed the cumulative effects of discharges from Frasers-Innes Mills Pit lake. This assessment is attached as **Appendix 22** and summarised below.

5.5.3.1 Pit Dewatering

As described in Section 5.4.3.1 above, the Golden Bar Pit will need to be dewatered before mining can begin. OceanaGold proposes to dewater most of the pit lake to the MWMS with any discharge to Golden Bar Creek limited to small volumes similar to the rate of current pit lake overflow (around 5 L/s). Any discharge will be managed adaptively to ensure in-stream water quality remains within consented parameters.

Recent sampling of the pit water quality (MWM, 2024) found good oxygen levels throughout most of the water column and oxygen levels in the discharge are likely to be suitable for discharge into surface water provided water is not drawn from the bottom half of the pit. Water column temperatures in the pit in March 2023 were <13 °C and suitable for supporting stream aquatic life.

Discharge of small quantities of Golden Bar Pit water to Golden Bar Creek is not expected to result in adverse effects on aquatic ecology that are more than minor.

Algae and Plants

The aquatic plant and periphyton communities of the Clydesdale, Golden Bar or Murphys creeks are not unique, and there is nothing to suggest that the NBWR at NB03 is any

different. Historically this catchment has been influenced by farming activities, with no protection of watercourses from stock access, resulting in nutrient inputs into surface waters and associated proliferations of plants and periphyton under favourable conditions.

Benthic Invertebrates

The benthic macroinvertebrate fauna of the upper NBWR, including Murphys Creek, is not noted for its ecological significance. No taxa have been identified as having high conservation value and monitoring sites are mostly dominated by taxa that are tolerant of average to poor water and habitat quality conditions. Kōura are present in tributaries of the upper NBWR catchment although they do not appear to be as abundant as in Deepdell Creek, Mare Burn and Tipperary Creek catchments.

Fish

Fish communities in the NBWR in the vicinity of NB03 and further downstream are typical of that found in the wider NBWR catchment (common bully, upland bully, flathead galaxias, longfin eel, brown trout).

Greg Ryder Consulting concluded that the proposed discharge of water from the Golden Bar Pit will not materially alter the physical habitat of the river and water quality will remain similar to the current situation. Consequently, changes to the benthic flora and fauna and fish communities are not expected.

5.5.3.2 Effects of the extended Golden Bar Pit and WRS

As described in Section 5.4.3.2, GHD predicts that sulphate concentrations within Clydesdale Creek and Golden Bar Creek will increase post closure relative to the mining phase. Median modelled sulphate concentrations are predicted to increase (from mining to closure) from 213 to 368 g/m^3, 10 to 276 g/m^3 and 10 to 76 g/m^3 at locations GB01, GB02 and NB01, respectively.

Benthic Invertebrates

The benthic invertebrate community in this area is relatively healthy with a higher presence of EPT taxa than at other monitoring sites in the upper NBWR catchment. Toxicity testing of sulphate concentrations under controlled laboratory conditions found that a concentration of 360 g/m^3 had no effect on mayfly larvae relative to control stream water containing almost no sulphate (2 g/m^3).

Fish

Golden Bar Creek appears to support a very small fish population in its headwaters near the Golden Bar Pit, most likely due to a seasonal lack of water during drier months of the year. Toxicity testing conducted using Taieri flathead galaxias (eggs and larvae), seepage

water from the Back Road Waste Rock Stack and Mare Burn water, showed no effects at a sulphate concentration greater than 1,000 g/m^3.

Greg Ryder Consulting concluded that the predicted changes in water quality during the operational and post closure of the Golden Bar mine are unlikely to alter the make-up of the benthic invertebrate and fish communities of Clydesdale Creek and Golden Bar Creek.

5.5.3.3 Summary for Golden Bar

Overall, Greg Ryder Consulting consider the management measures described above, along with the proposed offsetting and retention of the existing consent compliance limits are suitable to ensure there will be no more than minor adverse effects on aquatic ecology in Golden Bar Creek and Murphys Creek relative to the existing environment. Furthermore, current and predicted long-term metal concentrations will generally comply with the ANZG values for protection of 95% of species. While it is possible that arsenic maximum concentrations may exceed the default guideline for long-term scenarios, Greg Ryder Consulting highlights that the predicted maximum concentration of 0.076 mg/L is similar to the recent recorded maximum concentration of 0.052 mg/L and the benthic fauna of Golden Bar Creek is in good condition.

5.5.3.4 Cumulative effect of NBWR water quality

Greg Ryder Consulting does not expect that the Project will result in changes in the composition of the aquatic fauna of the NBWR. Provided the mitigation measures described in Section 5.4.4 above are implemented and managed, Ryder (2024c) does not anticipate material changes to the physical character of the receiving waters as a result of the cumulative effects of the proposed mining expansion, or any material changes to the hydrological character of the receiving waters. Predicted short and long-term changes in water quality in the NBWR largely satisfy default (conservative) guideline values.

5.5.4 Summary

GHD and Greg Ryder Consulting have assessed the effects of MP4 on water quality and aquatic ecology, respectively. The latter assessment demonstrates that the ecological values of the surrounding catchments have remained generally stable and persistent since operations at Macraes commenced. There is no evidence that OceanaGold's activities have caused any more than minor detrimental effects to the ecological values of these rivers, and the water quality and aquatic ecology values have been maintained, as anticipated by the criteria that is set out in the existing consent conditions. Accordingly, Greg Ryder Consulting concludes that if water quality management measures, recommended in GHD (2024c) are implemented, undertaking MP4 within similar discharge and receiving water quality standards will generally comply with the ANZG values for protection of 95% of species, and therefore not result in detrimental effects on the ecological values in downstream water bodies.

5.6 TERRESTRIAL ECOLOGY

Ahika Consulting- now trading as Whirika Consulting "**Whirika**") has completed an assessment on the impact of the proposed activity on vegetation and avifauna values within the MP4 Project Area. This report is attached as **Appendix 15** and is summarised in the sections below. This assessment has also been supplemented by information provided to the consent authorities in response to s92 requests for further information (refer **Appendices 32** and **33**).

To determine the ecological impact of the Project, Whirika used the project footprint (area affected by the Project) and a 100 m buffer which, together, form a Zone of Influence ("**ZOI**") within which some impact on ecological features might be expected.[73]

5.6.1 Coronation Stage 6

The proposed activities in the Coronation 6 area involve the extension of Coronation Pit and the excavation of a spillway channel to direct future pit lake overflow into a tributary of Camp Creek.

The activities at Coronation 6 will result in clearance, and permanent removal, of approximately 3 ha of semi-natural or indigenous vegetation. This includes 3 ha of narrow-leaved tussock grassland which represents 0.1% of the extent of this vegetation community in the Macraes Ecological District ("**ED**"). In addition, there may be some effect on the surrounding vegetation resulting from project activities extending to 100 m buffer beyond the disturbance limit on 7.3 ha of indigenous vegetation. The proposed Coronation 6 activities are therefore assessed as having an adverse, local impact on the tussockland vegetation community present in this area, however, the magnitude of the Project's impact on this vegetation community at a local scale is assessed as low.

Excavation of the Coronation 6 Pit will also result in the permanent loss of 0.03 ha of riparian / wetland vegetation mosaic. Pit dewatering is likely to result in changes to around 0.2 ha of the vegetation community within the buffer area. This will shift the vegetation community in this area towards a drier community with higher preponderance of pasture grasses and a reduction, and eventual loss, of more water dependent species such as the pukio. The proposed Coronation 6 activities are assessed as having an adverse, local impact on the riparian wetland vegetation community present in this area, however the overall level of the Project's effect on this vegetation community is assessed as low.

Further, excavation of the Coronation 6 Pit will result in the permanent loss (removal) of one previously impacted ephemeral wetland, 0.06 ha in area. Dewatering of the Coronation Pit will also result in further changes to 0.16 ha of ephemeral wetland within the

[73] Further rationale for the 100m buffer is provided in OceanaGold's response to WDC's s92 request, dated 15 October 2024.

buffer area. This will likely shift the vegetation away from a community typical of long-inundation ephemeral wetlands to one more characteristic of short-inundation ephemeral wetlands mostly comprising the same species as currently, but at lower stature, with a higher preponderance of exotic pasture grasses such as Yorkshire fog and browntop. It is therefore assumed that these wetlands will be lost entirely. Whirika anticipates the impact of this Project on ephemeral wetlands will result in an approximate 0.9% reduction in extent of the vegetation community in the Macraes ED and about a <1.1% reduction in the number of sites within the Macraes ED. The residual adverse effects on the ephemeral wetland vegetation community are considered to be more than minor. The management of ecological effects is discussed further in Section 6.3 of this AEE and explained in detail in the Ecological Impact Management Plan prepared by Whirika, attached as **Appendix 16**. The management outcomes will be reflected in the proposed conditions of consent.

5.6.2 Golden Bar Pit and Waste Rock Stack

The Golden Bar component of the MP4 Project will involve the clearance, and permanent removal, of approximately 28.2 ha of semi-natural or indigenous vegetation. Development of Golden Bar Pit extension and the Golden Bar WRS extensions will lead to the permanent loss of 27.3 ha of narrow-leaved tussock grassland, with some effect on the 35.9 ha in the 100 m buffer. In addition, 0.06 ha of shrubland is expected to be permanently lost from the area.

The Golden Bar Pit activities are also expected to result in the permanent loss of 0.8 ha of riparian / wetland vegetation mosaic which includes approximately 0.008 ha of natural wetland vegetation. Dewatering is likely to result in changes to around 0.1 ha of similar vegetation in the buffer area. This will shift the vegetation community in this area towards a drier community, with a higher dominance of pasture grasses, and reduction and eventual loss of more water dependent species, such as the pukio.. There is potential for sediment run-off from the unconsolidated fine rock and dust that will be deposited with the rock material into the WRS to enter waterways and impact riparian vegetation that could extend for 100 m or more downstream. This is expected to have a moderate effect on 0.12 ha of the riparian vegetation in the gullies existing in the Golden Bar WRS.

The loss of vegetation described above will subsequently result in loss of habitat for the New Zealand falcon, pipit, harrier hawk, spur-winged plover and paradise shelduck. Therefore, the proposed activities will result in some disruption to local bird populations. At a local scale, Whirika considers the impact of the Golden Bar Pit activities on New Zealand falcon and pipit is moderate. At a national scale, the impact on these species is considered negligible. The Bird Enhancement Project (discussed further in Section 6.3.8) will focus on enhancement of local population of pihoihoi NZ pipit as a surrogate for other bird species in the area. This will be through the landscape scale predator control and site rehabilitation activities.Overall, Whirika considers the effects of the Project on shrubland and riparian vegetation communities are no more than minor, while the Project will have a

more than minor residual adverse effect on the tussockland vegetation community and potentially a more than minor residual adverse effect on *Orocrambus sophistes,* discussed further in Section 5.6.7. The management of the effects on the tussockland vegetation community, avifauna, invertebrates and lizards will follow the Ecological Impact Management Plan prepared by Whirika, attached as **Appendix 16**, and discussed further in Section 6.3 of this AEE.

5.6.3 FTSF and Innes Mills Pit

The proposed activities in the Frasers-Innes Mills area will lead to the permanent loss of 0.2 ha of tussock grassland, 0.07 ha of wetland, and 0.03 ha of riparian vegetation as well as 7.3 ha of pasture communities. The loss of vegetation described above will lead to the temporary loss of habitat for pipit, spur-winged plover and paradise shelduck.

Overall, Whirika considers that the effects of the Project on vegetation communities in the Frasers-Innes Mills area will be low, while the proposed activities will result in temporary moderate disruption to local bird populations.

5.6.4 Golden Point Backfill Buttress and Northern Gully WRS

Whirika considers the construction of the Golden Point Backfill Butress will not create any adverse effect on the site's avifauna or vegetation provided rockfall into the shrubland from the buttress slopes is managed. In addition, Whirika considers it is unlikely excavation of the Northern Gully WRS will result in impacts on pipit.

5.6.5 Golden Bar Road Realignment

Roadworks associated with construction of the Golden Bar Road realignment will result in the permanent loss of 0.1 ha of narrow-leaved tussock grassland. There may also be some potential effects on 0.3 ha of sparse narrow-leaved tussock grassland in the buffer area.

In addition, the proposed activity could increase sediment inflows to one fenced example of a moderate-diversity Naturally Uncommon ephemeral wetland of 0.7 ha in the buffer area. However, this type of habitat is not sensitive to sediment deposition, and any effect is likely to be manageable using commonly used mitigation techniques such as silt-intercept barriers. Overall, Whirika considers that the effect of the Golden Bar Road Realignment on the narrow leaved tussock grassland and ephemeral wetland communities are no more than minor. Optimisation of the road alignment and detailed design will further mitigate potential adverse effects.

5.6.6 Herpetofauna

Bioresearches has completed an assessment on the impact of the proposed activities on herpetofauna. This report is attached as **Appendix 17** and is summarised below.

Three species of native lizards were identified in areas that will be impacted by the proposed activities, including McCann's skink (Not Threatened), tussock skink (At Risk) and kōrero gecko (At Risk). The proposed activities will result in direct impacts on approximately 90 ha of land that supports suitable lizard habitat. In the absence of mitigation measures, the levels of effect on native lizards are considered to range from very low to high.

Bioresearches has prepared a Lizard Management Plan ("**LMP**") detailing measures to reduce the level of impact on native lizards, attached as **Appendix 18**. These measures (discussed further in Section 6.3 of this AEE) will be guided by the IMP and carried out in accordance with the requirements of a Wildlife Act Authority.

5.6.7 Terrestrial Invertebrates

Bioresearches also completed an assessment on the impact of the proposed activities on terrestrial invertebrates. This report is attached as **Appendix 19** and is summarised below.

Fourteen taxonomic orders, and 56 genus or species level identifications were recorded across the Project area. The invertebrate community was generally represented by common endemic, native, and exotic invertebrate species. One threatened 'Nationally Vulnerable' moth species (Crambidae: *Orocrambus sophistes*) was found in the Golden Bar WRS extension area. This species is endemic to New Zealand and is confined to the inland drier Mackenzie and Central Otago areas of the South Island. It is thought to feed exclusively on tussock grasses.

In the absence of mitigation measures, the levels of effect of the Project on terrestrial invertebrates are considered to range from very low to high. If the presence of *Orocrambus sophistes* is confirmed in pre-development surveys, it is assessed that the project could result in adverse effects on this species of a high impact. Measures that OceanaGold will take to avoid, mitigate, remedy, offset, or compensate for adverse effects on terrestrial invertebrates are addressed in the Ecological Impact Management Plan, and further described in Section 6.3 of this AEE.

5.6.8 General Project Activities

Whirika has identified general Project activities that may generate adverse effects on the terrestrial ecology within the MP4 Project area and these are summarised below. Management of these effects is considered in the Ecological Impact Management Plan discussed in Section 6.3 of this AEE.

Weed Populations

Importation of weed species, either directly through seed contamination of equipment or material, or indirectly by creating favourable establishment sites could transform habitats in the surrounding area, making them unsuitable for some species. The severity of this effect

depends on the nature of the weed species and the ability to detect and manage an emerging weed problem. This could have a particular impact on the more natural plant communities at Golden Bar and Coronation 6. Without mitigation measures in place, this could consequently have an effect on bird species, potentially transforming habitat and making the area unsuitable.

Displacement of Pests

MP4 Project activities have the potential to cause resident pests, such as pigs, rabbits, hares, mustelids and rodents, to move into undisturbed areas outside the MP4 or other mining areas within the wider site. This is expected to have a minor effect on the fauna and plant communities at all Project sites, as these pest species are already present in the surrounding area. The effect is expected to be temporary, as pest species leave the area. Mustelids and rodents displaced by the mining activities will have a temporary minor effect on populations of surrounding birds, particularly ground-nesting birds such as pipits.

Displacement of Resident Animals

Some species, particularly birds, may be displaced as a result of the MP4 Project activities due to the loss of habitat. This will lead to increased competition for both space and food in the surrounding area, which could eventually result in the mortality of either the displaced or resident individuals.

Noise and Vibration

Activities associated with blasting and the operation of heavy machinery will generate noise and vibration. Any effects associated with these activities on terrestrial ecology will likely be species-specific, depending in part on the auditory ability of the species and the frequency and proximity of the noise. Whirika anticipate noise and vibration will have a negligible effect on the bird populations in the surrounding area as most of the species appear to habituate to regular disturbance. It is also anticipated that during the establishment and construction phase of the Project, harrier hawks will avoid hunting the surrounding area, and paradise shelducks will not nest within sight of the Project.

Wind-blown Dust

Dust is actively managed within the existing Macraes mining operations, and as a result, the activities onsite produce little wind-blown dust. Any noticeable dust accumulation occurs within the immediate vicinity (<100 m) of the mine works. Within this zone, dust accumulation may result in a reduction in a plant's photosynthetic capacity, potentially resulting in a loss of growth and reproductive output. However, most lowland to montane plant communities do not seem to be affected by dust at the sites where they occur close to gravel roads, and these results are also expected for the MP4 Project activities.

The effect of dust on vegetation surrounding existing mine operations appears to be confined to less than 100m where dust coating can be obvious, however, no obvious effects have been observed on plant health or mortality. Beyond as little as 10 m, the dust coating is visibly less and is regularly removed by rainfall. Negligible effects are expected on bird species as dust-fall is minimal at distance, however, there may be some avoidance of dusty fruit by frugivorous species.

Artificial Lighting

Artificial lighting may be used during night operations. Moths can be drawn to lights which could attract nocturnal predators, such as the exotic little owl. Other nocturnal species are likely to avoid brightly lit areas. Overall, the effects associated with artificial lighting on bird species are expected to be no more than minor.

Accidental Fire

As the Macraes environment is often dry, an accidental fire would have the potential to burn large areas. Depending on a number of variables, such as the moisture content of the vegetation community and whether it occurs in a natural fire refugia where it is unlikely that heat levels would reach a level sufficient to affect plant health, this could have a minor to major effect on the surrounding area. An accidental fire could therefore have a minor to moderate effect on bird species, depending on the timing of the fire. If a fire was to burn during the nesting season, bird's nests would be at risk, particularly those of ground-nesting birds, such as the pipit.

Changed Hydrological Regimes

Excavation activities may result in drainage or decreased surface and subsurface flow of water into, or away from, some water courses or ephemeral wetlands affecting the vegetation communities that occupy these areas. Changes to hydrological regimes are expected to have a nil to moderate effect, depending on the vegetation community. and location. Water draw-down and altered subsurface flow is expected to result in a limited degree of drying of the unimpacted downstream areas of the riparian vegetation and on ephemeral wetlands in the Coronation 6 buffer area.

5.6.9 Summary of Project Effects on Terrestrial Ecology

The MP4 Project will result in the removal of 37 ha of indigenous or semi-natural vegetation comprised of narrow-leaved tussock grassland, shrubland, riparian / wetland vegetation mosaic (including portions totalling 0.008 ha classified as natural inland wetland), and ephemeral wetlands inhabited by 128 indigenous plant species (including 14 rare species), and which also provides habitat for 11 indigenous bird species, (including one Threatened and two At Risk species). The indigenous vegetation communities at Coronation 6 and Golden Bar and the tussockland at Innes Mills are all significant under the representativeness, rarity or distinctiveness criteria of the RPS and 2GP, as well as

under the representativeness or rarity criteria of the Waitaki District Plan. No ecological features of importance are known to be present at the Northern Gully WRS, excepting the possible presence of lizards and possible occurrence of ground-nesting birds.

For the most part, the MP4 Project is assessed as having a low or moderate effect on the terrestrial ecological features. The exceptions to this are:

- An adverse effect on three ephemeral wetlands at Coronation 6 which is assessed as a very high impact;
- Adverse effects on tussockland, desert broom, NZ falcon, pipit and potentially the moth *Orocrambus sophistes*, if its presence is confirmed, at Golden Bar which are assessed as a high impact; and
- Adverse effects on native lizards which are assessed as having a high impact.

These effects will be managed using the effects management hierarchy, as outlined in the Ecological Impact Management Plan and discussed further in Section 6 of this AEE.

Table 5.2 below provides an overview of the ecological features, their scale of importance and an assessment of the impact arising from the MP4 Project activities.

Table 5.2: Quantity and importance of ecological features within the site and impact of the MP4 Project.

Ecological Feature Class	Ecological Feature Type	Ecological Feature	Classification of Feature	Footprint	Buffer	Amount Affected	Unit Measurement	Accuracy of Measurement	Ecological Importance Feature	Magnitude of Project Impact on Feature		Overall Project Effect
										Local Scale	National Scale	
Coronation 6 (including spillway)												
Bird	Community	Indigenous Species Diversity				5	Species	Estimated				
Bird	Rare Species	Pipit	Declining			Unknown	Pairs	Estimated	High	Moderate		High
Bird	Rare Species	Banded dotterel	Declining			1-2	Pairs	Estimated	High	Low		Low
Environment	LENZ	Threatened LENZ with indigenous vegetation				2.77	Hectares	Measured				
Flora	Community	Ephemeral Wetland	Critically Endangered Historically Uncommon ecosystem type, National Priority for Protection	0.06	0.16	0.22	Hectares	Measures	High	High	Moderate	Very High
Flora	Community	Riparian / wetland vegetation mosaic		0.03	0.2	0.04	Hectares	Measured	Moderate	Low		Low
Flora	Community	Tussockland		3.0	7.0	3.35	Hectares	Measured	High	Low		Low
Flora	Community	Natural Inland Wetlands	National Priority for Protection	0.02	0.1	0.12	Hectares	Measured				
Flora	Community	Extent of semi-natural & natural communities		3.0	7.3	3.4	Hectares	Measured				
Flora	Rare Species	*Deschampsia cespitosa*	Declining	3		3	Individuals	Counted	High	Low		Low
Flora	Rare Species	*Agrostis pallescens*	Naturally Uncommon			506	m^2	Estimated	Moderate	High		Moderate
Flora	Rare Species	*Celmisia hookeri*	Naturally Uncommon	300			Individuals	Estimated	Moderate	Moderate		Moderate
Kāi Tahu Taoka	Bird	Kārearea / Falcon	Taonga Species			1?	Pairs	Estimated				

Ecological Feature Class	Ecological Feature Type	Ecological Feature	Classification of Feature	Footprint	Buffer	Amount Affected	Unit Measurement	Accuracy of Measurement	Ecological Importance Feature	Magnitude of Project Impact on Feature		Overall Project Effect
										Local Scale	National Scale	
Kāi Tahu Taoka	Bird	Kāhu / Harrier	Taonga Species			Present		Estimated				
Kāi Tahu Taoka	Bird	Pīhoihoi / Pipit	Taonga Species			Unknown		Estimated				
Kāi Tahu Taoka	Bird	Riroriro / Grey Warbler	Taonga Species			Present		Estimated				
Kāi Tahu Taoka	Plant	Pātōtara / *Leucopogon fraseri*	Taonga Species			Occasional	Plant	Estimated				
Kai Tahu Taoka	Plant	Taramea/Aciphylla aurea	Taonga species			Occasional	Plant	Estimated				
Kāi Tahu Taoka	Plant	Wiwi / *Juncus edgarae* and *Juncus distegus*	Taonga Species			Local	patch	Estimated				
Frasers – Innes Mills												
Bird	Community	Indigenous Species Diversity				3	Species	Estimated				
Bird	Species	Pipit	Declining			Unknown	Pairs	Estimated	High	Low		Low
Flora	Community	Pasture communities		7.3	12.6	7.3	Hectares	Measured	Moderate	Low		Low
Flora	Community	Tussockland		0.2	0.7	0.2	Hectares	Measured	Moderate	Low		Low
Flora	Community	Wetland		0.0	0.07	0.07	Hectares	Measured	Moderate	Low		Low
Flora	Community	Riparian / wetland vegetation mosaic		0.3	0.3	0.6	Hectares	Measured	Moderate	Low		Low
Kāi Tahu Taoka	Bird	Pīhoihoi / Pipit	Taonga Species			Unknown		Estimated				
Kāi Tahu Taoka	Bird	Pūtakitaki / Paradise Shelduck	Taonga Species			Present		Estimated				

Ecological Feature Class	Ecological Feature Type	Ecological Feature	Classification of Feature	Footprint	Buffer	Amount Affected	Unit Measurement	Accuracy of Measurement	Ecological Importance Feature	Magnitude of Project Impact on Feature		Overall Project Effect
										Local Scale	National Scale	
Golden Bar												
Bird	Community	Indigenous Species Diversity				5	Species	Estimated				
Bird	Rare Species	Falcon	Vulnerable	1		1	Pairs	Estimated	Very High	Moderate		High
Bird	Rare Species	Pipit	Declining	Unknown		Unknown	Pairs	Estimated	High	Moderate		High
Invertebrate	Rare Species	Orocrambus sophistes	Vulnerable	1			Individual	Measured	High	Potentially High		High
Environment	LENZ	Threatened LENZ with indigenous vegetation		28.2		28.2	Hectares	Measured				
Flora	Community	Riparian / wetland vegetation mosaic		0.8	0.1	0.9	Hectares	Measured	High	Low		Low
Flora	Community	Shrubland		0.06	0	0.06	Hectares	Measured	Low	Low		Low
Flora	Community	Tussockland		27.3	35.9	29.1	Hectares	Measured	High	Moderate	Low	High
Flora	Community	Extent of Semi-natural & Natural Communities		28.2	37.8	30.1	Hectares	Measured				
Flora	Rare Species	*Carmichaelia petriei*	Declining	100		100	Individuals	Estimated	High	Moderate		High
Flora	Rare Species	*Discaria toumatou*	Declining	Common		Unknown	Individuals	Estimated	High	Negligible		Very Low
Flora	Rare Species	*Epilobium insulare*	Declining	6		6	Individuals	Counted	High	Low		Low
Flora	Rare Species	*Mentha cunninghamii*	Declining	0.25		0.25	m^2	Estimated	High	Negligible		Very Low

Ecological Feature Class	Ecological Feature Type	Ecological Feature	Classification of Feature	Footprint	Buffer	Amount Affected	Unit Measurement	Accuracy of Measurement	Ecological Importance Feature	Magnitude of Project Impact on Feature		Overall Project Effect
										Local Scale	National Scale	
Flora	Rare Species	*Cardamine grandiscapa*	Naturally Uncommon		3	3	Individuals	Counted	Moderate	High		Moderate
Flora	Rare Species	*Celmisia hookeri*	Naturally Uncommon		150	150	Individuals	Estimated	Moderate	Low		Low
Flora	Rare Species	*Gingidia grisea*	Naturally Uncommon, Otago endemic		6	6	Individuals	Counted	Moderate	Low		Low
Flora	Rare Species	*Juncus distegus*	Naturally Uncommon	6		6	Individuals	Estimated	Moderate	Low		Low
Flora	Rare Species	Melicytus 'Otago'	Data Deficient	20		20	Individuals	Estimated	Moderate	High		Moderate
Flora	Rare Species	Ranunculus 'Peel'	Data Deficient		1	1	m^2	Estimated	Moderate	Moderate		Moderate
Flora	Rare Species	*Fuchsia perscandens*	Uncommon E.D.	1		1	Individuals	Counted	Moderate	Low		Low
Flora	Rare Species	*Sophora microphylla*	Uncommon E.D.		1	1	Individuals	Counted	Moderate	Low		Low
Kāi Tahu Taoka	Bird	Kārearea / Falcon	Taonga species			1	Pairs	Estimated				
Kāi Tahu Taoka	Bird	Kāhu / Harrier	Taonga species			1?	Pairs	Estimated				
Kāi Tahu Taoka	Bird	Karoro / Black-backed gull	Taonga species			Colony in lake		Estimated				
Kāi Tahu Taoka	Bird	Pīhoihoi / pipit	Taonga species			Unknown		Estimated				
Kāi Tahu Taoka	Bird	Pūtakitaki / Paradise shelduck	Taonga species			Present		Estimated				
Kāi Tahu Taoka	Plant	Aruhe / Bracken	Taonga species			Scattered	Patches	Estimated				

Ecological Feature Class	Ecological Feature Type	Ecological Feature	Classification of Feature	Footprint	Buffer	Amount Affected	Unit Measurement	Accuracy of Measurement	Ecological Importance Feature	Magnitude of Project Impact on Feature		Overall Project Effect
										Local Scale	National Scale	
Kāi Tahu Taoka	Plant	Taramea / *Aciphylla aurea*	Taonga species			Occasional	Plant	Estimated				
Kāi Tahu Taoka	Plant	Wī / *Poa cita*	Taonga species			Rare	Plant	Estimated				
Kāi Tahu Taoka	Plant	Wiwi / *Juncus edgarae* and *Juncus distegus*	Taonga species			Rare	Plant	Estimated				
Golden Bar Road Realignment												
Flora	Community	Tussockland		0.1	0.3	0.1	Hectares	Measured	Low	Very Low		Low
Flora	Community	Ephemeral Wetland	Critically Endangered Historically Uncommon ecosystem type National Priority for Protection		0.7	0	Hectares	Measured	High	Low		Low
Golden Point Buttress and Northern Gully WRS Rehandle												
No ecological features of importance are known to be present excepting the possible presence of lizards (Bioresearches 2024a) and possible occurrence of ground-nesting birds												

5.7 EFFECTS ON RIVER EXTENT AND VALUES

The proposed Golden Bar WRS extension will result in the loss of approximately 95 m of natural orphaned stream channel and approximately 335 m of the previously modified channel in the Clydesdale Creek catchment. Stream ecology values associated with these watercourses has been assessed as low. To compensate for the loss of stream length at Golden Bar WRS, at least 860m of equivalent or better watercourse habitat will be protected within the MEEA as per Greg Ryder Consulting's recommendation. Subject to confirmation of the MEEA boundaries, there is ample stream length to provide for this outcome within the indicative MEEA location (refer **Figure 3.12**).

5.8 NOISE

An assessment of the actual and potential noise effects resulting from the MP4 Project has been completed by Acoustic Engineering Services Limited ("**AES**"). The report is attached in full as **Appendix 28** and describes the existing noise environment and expected noise emanating from the activities of the Project. The noise effects from existing and consented mining activities form part of the existing environment which the MP4 Project is to be assessed against.

The approved consent conditions for both the MP3 Project, CCP, GPUG expansion / extension, and the Coronation mining area, currently operating in similar locations to the areas of proposed activities require that all construction and mining activities associated with the operations ensure the following noise limits are not exceeded at any point within Macraes Village, or at the notional boundary of any dwelling not owned by OceanaGold:

- On any day between 7am and 9pm (daytime): 50 dB L_{Aeq}; and
- On any day between 9pm and 7am the following day (night-time): 40 dB L_{Aeq}; and/or 70 dBA L_{max}.

AES has modelled noise levels arising from the various activities associated with the MP4 Project including the use of the main mining equipment, haulage trucks, temporary surface level operations, such as drilling holes for blasting and ground surface level excavation, and the ongoing removal of extracted rock. The AES assessment identified three nearby privately owned residential dwellings that may be affected by the noise generated from the proposed activities (using noise levels at or exceeding 40 dB L_{Aeq}).

AES predict that noise associated with the MP4 operations is expected to be less than 40 dB L_{Aeq} at most nearby residential properties. However, at the notional boundary of the dwelling at 1668 Macraes Road, Macraes, there is potential for:

- Levels of up to 45 dB L_{Aeq} received during 2026-2027, primarily due to concurrent operation of the Innes Mill pit extensions operations with the ore haulage trucks on the haul road between the Golden Bar Pit and the Processing Plant; and

- Levels of up to 41 dB L_{Aeq} received during the year 2028.

In addition, at the notional boundary of the private dwelling at 406 Horse Flat Road, there is potential for levels of up to 43 dB L_{Aeq} to be received in 2024-2027, primarily due to ore haulage trucks on the haul road between the Coronation 6 Pit, and the Processing Plant.

Given extensive mining activities are already existing or authorised on the site, the AES assessment also considers cumulative effects. This includes activities associated with current operations in Frasers Pit (Gay Tan stage mining, GPUG and Frasers Underground mine ("**FRUG**")), the Innes Mills Stage 8 mining and FTSF Stage 1 associated with CCP, and the GPUG expansion and extension. The expected worst-case cumulative noise levels from concurrent activities during the night-time period are provided in **Table 5.3** below. Levels that exceed the Waitaki District Plan night-time limit for the Rural General Zone and Rural Scenic Zone are highlighted.

Table 5.3: Expected cumulative noise levels during the night time period.

Location	Maximum expected noise level (dB L_{Aeq})						
	2024	2025	2026	2027	2028	2029	2030
1668 Macraes Road, Macraes	44	44	45	45	41	34	30
406 Horse Flat Road, Macraes	43	43	43	43	36	36	37
47 Hyde Street, Macraes	40	40	40	40	35	30	28

The cumulative noise levels in the table above show that at the notional boundary of 1668 Macraes Road, there is potential for up 45 dB L_{Aeq} to be received during 2026-2027. Levels of up to 44 dB L_{Aeq} may be received during 2024-2025, and up to 41 dB L_{Aeq} in 2028. Noise levels are predicted to reach up to 43 dB L_{Aeq} at the notional boundary of 406 Horse Flat Road during 2024-2027. Cumulative noise levels of 40 dB L_{Aeq} or less are expected at all other notional boundaries of all neighbouring dwellings, not owned by OceanaGold.

Where predicted noise levels are 45 dB L_{Aeq} or less, this is still consistent with the World Health Organisation *Guidelines for Community Noise* and NZS6802:2008 *Acoustics – Environmental Noise* recommendations to allow occupants to sleep with windows open for

ventilation. As the predicted noise levels do not exceed 45 dB L_{Aeq}, these standards will be achieved. Further, the above predictions are based on worst-case scenarios and are not expected to occur frequently.

Noise levels at the Macraes Mining Project Mineral Zone boundary are expected to exceed 40 dB L_{Aeq} on occasion due in part to activities occurring at or across the zone boundary. These noise levels are not expected to result in adverse effects on any person as the nearest notional boundary at these locations is some distance from the zone boundary and where noise levels at the notional boundaries exceed 40 dB L_{Aeq}, those properties have been identified above.

Overall, AES conclude the noise effects associated with the Project, as with similar effects in recent Frasers Co-disposal and CCP, will not create unacceptably unpleasant living conditions for the neighbouring properties and would not cause a significant deterioration of the quality of the rural environment of the nearby Macraes township. As such, AES consider the noise effects at these locations to be no more than minor.

5.9 BLASTING AND VIBRATION

TechNick Consulting has prepared an assessment on the potential effects of blasting and vibration associated with the Project. The assessment is attached as **Appendix 26**.

The proposed pit extensions involve drilling and blasting using the same equipment and processes as are currently used in active areas of the Macraes mining operation. The existing land use consent conditions limit the ground vibration levels measured at any point within the notional boundary of any dwelling located outside the MMMZ and not owned by OceanaGold to not exceed 5 mm/s peak particular velocity (although up to 10 mm/s is permissible up to 5% of the time). Additionally, air blast (overpressure) levels at sensitive sites including all Historic/Heritage sites must not exceed 120 dB L.

The existing Noise, Airblast and Vibration Management Plan for mining operations at Macraes allows for the following management and mitigation measures to be employed to reduce vibration and airblast levels and impacts:

- Style of blast - OceanaGold employs “Paddock” or “Choke” blasting rather than free face blasts. This type of blasting generates less airblast than alternative free-face blasting;
- Accurate survey and layout of drill hole positions;
- Checking depths and angles of holes after drilling (lower airblast);
- Rechecking hole depths immediately before charging (lower vibration);
- Control maximum explosives charge per delay (lower vibration);
- Suitable priming practices including the location of primer;

- Continuous monitoring of explosives charging (lower vibration);
- Ensuring stemming quality and quantity are as per design (lower airblast);
- Charge confinement - Depth of burial / Stemming length (lower airblast);
- Designing blast initiation sequence to avoid excessive timing overlaps (lower vibration);
- Considering the effect of topography, bunds, deep pits (lower airblast);
- Minimise exposed detonating cord initiation system (lower airblast); and
- Adapt to atmospheric conditions – inversions or strong, unfavourable wind direction and choice of blast time (lower airblast).

The above practices will continue to be adopted for the MP4 Project. TechNick Consulting assessed the vibration and blasting effects of each proposed pit expansion, and these are outlined below.

Airblast levels will reduce as the mine benches get deeper with time. As such, the airblast levels are expected to remain less than 115 dB L at the nearest residences and 120 dB L at any sensitive historical site throughout the mining life of all of the proposed open pit expansions.

In relation to the Coronation Pit expansion, the only sensitive receptor that has been identified as a sensitive area is the residence at 406 Horse Flat Road. Vibration levels are expected to remain below the prescribed limits for normal blasting. Therefore, TechNick Consulting concluded that there will be no adverse effects generated from the blasting and vibration associated with the expansion of the Coronation Pit that are beyond those that are currently anticipated at the site.

Blasting and vibration predictions associated with the Golden Bar Pit extension are anticipated to be lower than the consented limits. There are no privately-owned residences or historic sites that have been identified as being within any range of concern from the potential blasting activities. Any effects associated with blasting, such as flyrock, fumes and dust generation, will be adequately addressed by continuing to apply the mitigation measures successfully used at the site over recent years, to ensure that no additional adverse effects arise. These measures are outlined in Chapter 6 of this AEE and detailed in **Appendix 26**.

One privately owned residence (1668 Macraes Road, Macraes) has been identified as being within a distance that could be impacted by potential blasting activities associated with the Innes Mills Pit extension. This is located 1170 m from the Innes Mills Open Pit. Vibration levels at this location are predicted to exceed the base 5 mm/s residential level, reaching 6.1 mm/s during full production blasting. However, the predicted levels will comply with the consent conditions, as blasting is permitted to exceed 5 mm/s 5% of the

time, and never exceed 10mm/s, which will be achieved. Further, where vibrations approach the 5 mm/s limit, 'proximity' blasting options will ensure that no permissible limits will be exceeded for nearby residences. Airblast levels will be below the 115 dB L safe limits stated in the relevant standard. Furthermore, all blast will comply with existing consent conditions and District Plan standards for vibration and airblast at the Golden Point Historic Reserve.

It is concluded that given compliance with existing consent conditions and District Plan rules which have been derived from New Zealand and International Standards, adverse effects associated with blasting will be no more than minor and likely indiscernible from current operations.

5.10 LANDSCAPE AND VISUAL AMENITY

WSP has completed an assessment of the MP4 Project on landscape and visual amenity values. The assessment is attached in full as **Appendix 27**.

The WSP report provides an extensive description of the existing environment and associated landscape and visual amenity values. The effects of the Project were assessed relative to those effects already consented for the existing mining activities at Macraes.

The MP4 Project will add a relatively small component of additional mining activity to the broader area, where large-scale, open cut mining is currently present on an extensive scale. The site does not include any outstanding natural features or landscapes identified in the Waitaki District Plan or the Dunedin City District Plan that require protection. Further, many of the visitors to the area are visiting to see the mine and associated activities. As such, the mining activities at the Project site are a major part of the visual character and amenity of the Macraes Flat landscape.

5.10.1 Landscape Effects

Landscape effects associated with the Project include:

- Vegetation removal, including that growing on successfully rehabilitated areas from previous mining operations;
- Excavation / mining, including the formation of deep pits, highwalls and benched pit walls;
- Construction of new, or additions and changes to existing waste rock stacks;
- Partial (Frasers / Innes Mills) to complete (Coronation North) infilling of pit voids with tailings, capping and flooding to form pit lakes;
- Formation of, or changes to the alignment of haul roads;
- Realignment of a short section of Golden Bar Road;

- Alteration of natural drainage patterns including the formation of pit lakes and silt dams; and
- Mitigation planting, including integration with ecological aspects.

Most of the landscape effects will be associated with increasing the heights and footprints of existing WRSs, while the activities related to the open cut pits primarily occur below ground level, and as such, have smaller effects on landscape character.

WSP consider the proposal will also generate positive landscape effects including the substantial backfilling of, and remediation of existing pits and the formation of lakes in mined out pits.

Overall, WSP conclude that the adverse landscape effects of the proposed Golden Bar WRS are moderate as it will alter the skyline where it is located. Landscape effects generated from all other aspects of the proposal will be low.

5.10.2 Visual Effects

Aspects of the proposal will be visible from various points along Macraes-Dunback Road and the other local roads in the area, notably Golden Bar Road. Thus, the proposed activities will primarily be visible for motorists travelling along these roads. WSP analysed the visual effects associated with the MP4 Project from five viewpoints. The location of each viewpoint and the level of change and effect is outlined in **Table 5.4** below.

Table 5.4: Ranking of visual effects relative to specific viewpoints.

View point	Location	Visual Effect
1	Stock yards, Longdale Road	Very low to nil
2	Golden Point Road	Nil
3	Macraes Dunback Road – Golden Point Road intersection	Low
4	Macraes Dunback Road high point	Nil
5	Golden Bar Road to Golden Bar Mine	Moderate to Moderate - Low or Nil

Overall, for most viewpoints from which the aspects of the Project will be visible, the potential visual effects will not exceed a moderate adverse effect. The greatest visual effect will be on the viewpoint on Golden Bar Road before the WRS is remediated. Due to

the scale of the WRS and changes to the skyline, any potentially adverse visual effects will be 'Moderate', and following remediation (shaping and rehabilitation, including planting of tussock), 'Moderate-Low' or nil depending on the viewer's familiarity with the landscape. This viewpoint is relatively isolated on a local gravel road that is infrequently used. Further, WSP anticipate that once the WRSs have become well established, any adverse visual effects will reduce to low in the longer term.

In summary, once the final shaping and revegetation of the proposed backfilled areas, WRSs and are completed, the visual simulations illustrate that the general shape, slope and colour of the completed and revegetated landforms will be in sympathy with the natural topography and land cover patterns of the area.

5.10.3 Cumulative Effects

WSP also considered the cumulative landscape and visual effects associated with the proposal. There will be no cumulative effects at viewpoints 1-3, and 5 (identified in **Table 5.4** above). At viewpoint 4, the coalescing of two pits will be seen, resulting in a low cumulative landscape effect. However, given that viewpoint 4 is not a publicly accessible viewpoint, and the proposed and existing pits are not visible from Macraes Dunback Road, the assessment concludes that there will be no cumulative visual effect upon the public.

5.10.4 Summary

Mitigation measures will be adopted by OceanaGold to minimise the potential landscape and visual effects, including:

- Progressive rehabilitation of the WRSs;
- Careful design of the form of the WRSs to integrate them with the existing landform character of the area using the following principles:
    - Slopes shall be suitably shaped in cross-profile to match nearby natural slopes;
    - Slope gradients shall be no steeper than nearby natural surfaces;
    - Transitions between natural and formed surfaces shall be rounded and naturalised;
    - Contours should be curvilinear in plan form, in keeping with original natural contours in that area;
    - The skyline shall be variable and curved, simulating natural skylines; and
    - New landforms shall be aligned and located so they seem to continue, not cut across, existing landscape patterns;
- Restoration of the areas disturbed around the margins of the Project site;
- Removal and restoration of the haul roads during the closure phase of the Project;

- Ultimately, removal of mine infrastructure, hard stands and the like, followed by planting; and
- Establishment of vegetation cover types suited to the long term land use and reflecting the optimal use of rehab soil, water drainage paths and access to ecological areas.

WSP consider these measures are effective in mitigating or remediating the potential visual effects of the WRSs, the most visible and elevated mining element at Macraes. Overall, with these measures in place, WSP conclude the cumulative landscape and visual effects of the Project will be less than minor from viewpoint 4 and from all other four viewpoints, will either be negligible or less than minor.

5.11 AIR QUALITY

An air quality assessment has been undertaken by Beca to determine the potential effects of the discharge of dust and other contaminants associated with the proposed activity. This report includes a description of the meteorology, climate and existing air quality at the site, and is attached as **Appendix 29**.

The predominant discharges from the proposed activity will be dust, or particulate matter, from the handling and transport of waste rock and ore. The primary environmental effect associated with the discharge of dust is the potential nuisance effects on neighbouring properties.

In addition, combustion-related emissions (sulphur dioxide, nitrogen oxides, carbon monoxide and carbon dioxide) will also be emitted from the operation of machinery and vehicles. However, these emissions will be relatively small, will not increase in scale to those currently used on the site and will actually be less due to the use of a recently introduced electrical powered excavator. Therefore, vehicle emissions are highly unlikely to have an adverse effect beyond the site boundary.

In general, dust discharged from mining activities typically falls into the larger size fractions, with an aerodynamic diameter of 100 micrometres (0.1 mm) or greater. In steady wind conditions, with wind speeds of less than 10 m/s, such dust particles would travel only a few tens of metres from the source. Therefore, dust nuisance is more likely to occur within such proximity of a significant dust source. The closest sensitive receptor (dwelling) in the vicinity of the Project is approximately 1 km from the Innes Mill Pit. Sensitive receptors in other areas are more than 2.2 km from the Coronation Pit and Golden Bar Pit. Receptors at this range in some situations may experience a slight adverse effect. However, Beca considers that provided the dust mitigation specified in the Site Dust Management Plan ("**DMP**") is implemented, any dust emitted from the proposed activities will be well dispersed before reaching these receptors.

Beca assessed the potential effects of dust on vegetation and concluded that the vegetation surrounding the Project area is predominantly comprised of pasture and pine trees. Farmland has a low sensitivity to dust and provided OceanaGold continue to carry out the dust mitigation measures outlined in the DMP, any adverse effects on vegetation will be negligible. The effects of dust on indigenous vegetation have been assessed in Section 5.6.8 above.

Dust emissions at the Macraes site are currently managed in accordance with a DMP that has been prepared in accordance with previously consented discharge permits.[74] The DMP is reviewed at least annually and updated as required.

Monitoring undertaken by OceanaGold indicates that site dust emissions typically comply with consent limits at the boundary. The proposed activities are not expected to have any substantial impact on site emissions or offsite contaminant concentrations. Consequently, future dust emissions would also be expected to comply with the existing consent conditions, which Beca consider remain fit for purpose. However, in keeping with current good practice, OceanaGold proposes to monitor for trigger limits at the existing dust monitoring sites that best reflect the sensitive receptors with potential to be exposed to dust emissions (DG15 and DG07).

The concentrations of contaminants, including particulate matter (PM_{10}), respirable crystalline silica, nitrogen oxides (NO_2 and NO) and carbon monoxide are expected to remain well within the National Environmental Standards for Air Quality, guideline/standard values, and current consent limits beyond the boundary of the Project.

Due to the infrequency of winds which exceed 5 m/s in the direction of the sensitive receptors and the large distances between sensitive receptors and the proposed Project activities, the potential nuisance effects from dust deposition from the MP4 Project are assessed as negligible. Further, the potential health effects of discharges of PM_{10}, $PM_{2.5}$ and respirable crystalline silica on the residents of the nearby dwellings have been assessed as being negligible.

Overall, Beca concluded that provided OceanaGold continue to manage dust within the location of the Project activities, using the methods outlined in the report and the DMP, any dust from the site can be adequately avoided and mitigated such that discharges beyond the property boundary will not be offensive or objectionable and any adverse effects, including health effects, will be minimal and the relevant standards and guidelines will not be exceeded.

[74] 96785_V5, RM10.351.52, RM12.378.15, RM16.138.19 and RM20.024.12.

5.12 HISTORIC HERITAGE

The nature and significance of the historic heritage values in the vicinity of the MP4 Project has been assessed by Origin Consultants (Origin, 2023). A copy of this assessment is provided in **Appendix 23** of this AEE.

Historic and contextual research has identified various historic heritage features in the Macraes area linked to an extensive history of pastoral farming and gold mining from the 1860s to the present. These heritage features and archaeological sites are almost entirely unaffected by the proposed works.

Origin completed an assessment of the proposed expansion of the Frasers, Coronation, Innes Mills and Golden Bar pits. Origin found one historic feature within these sites that will be affected by the proposed activity. No archaeological sites of Māori origin were found in the MP4 Project area.

The proposed works at Frasers Pit, Innes Mills Pit and Golden Bar Pit are not considered to have an adverse effect on known historic heritage identified in the assessment, as all of the archaeological sites affected by the proposed works have been previously destroyed and any identified heritage features are situated away from the proposed works. As such, no specific heritage conditions are recommended in relation to the activities at the Frasers Pit, Innes Mills Pit, or Golden Bar Pit.

Origin identified a historic fence line running north-south through the proposed Coronation Pit expansion area. This fence line likely dates to the 1880s and is comprised of flat iron standards with six wires and top notch to hold barbed wire. More recently, waratahs and barbed wire have been added to increase the fence height. The fence runs along a boundary that was initially surveyed in the 1880s. Accordingly, Origin states the fence was likely constructed circa the 1888 division of the Deepdell Run. The expansion of the Coronation Pit will only cross a small portion of the fence line. The remainder of the fence line will be restrained and remain intact, which will mitigate the effects on the heritage values of the fence. As such, Origin considers the proposed works will have a minor effect on the heritage values of the fence line.

Origin recommends an archaeological authority be sought for the partial removal of the fence and the extent and features of the fence line should be recorded to a Level III standard. Further, the fence should be restrained and preserved beyond 50m either side of the proposed pit extension. OceanaGold will adopt these recommendations for the proposed activity.

Origin also recommend that all works should be carried out under an accidental discovery protocol to ensure that historic heritage is dealt with appropriately if encountered. All contractors will be briefed on the Accidental Discovery Protocol attached as Appendix A to the Origin report, prior to works proceeding.

Overall, Origin concludes that any potential adverse effects of the MP4 Project on historic heritage features and values are likely to be less than minor.

5.13 HAZARDOUS SUBSTANCES

Activities on site include the use of hazardous substances, including explosives and other substances. Mining explosives used on site for blasting and associated blasting caps and detonation cord will not be stored on site, but will be brought to site from other authorised magazine(s) close by, subject to the appropriate precautions and protocols.

The use of hazardous substances for the MP4 Project will be undertaken in accordance with the existing management practices employed at the Macraes Operation and the existing mines operated by OceanaGold. Those existing practices comply with the relevant New Zealand Standards, Codes of Practice and the Health and Safety at Work (Hazardous Substances) Regulations 2017.

In accordance with current practice, OceanaGold will continue to maintain a register of all hazardous substances held and used on site (ChemAlert – Hazardous Chemicals Register) in addition to maintaining a Principal Hazard Management Plan for Hazardous Substances which sets out the details of the substances used, containment measures, risk management and emergency responses. Copies of these documents are provided in **Appendix 32** (refer Annexures 3 and 4).

As a result, it is considered that any effects on the surrounding environment or on human health due to the use of hazardous substances associated with the MP4 Project will be less than minor.

5.14 CONTAMINATED LAND EFFECTS

The Macraes Operation is technically considered to be a HAIL site due to the activities currently and previously undertaken at the site, including mining, mineral processing activities and the disposal of waste rock and tailings.

Mining on site to date has demonstrated that the effects of extracting waste rock and ore from the ground (essentially large-scale earthworks) on the site is able to be controlled adequately using established on-site methodologies.

While this proposal will create additional land area that has been subject to HAIL activities, it will not create any adverse contaminated land effects that exceed a level considered to be minor.

The backfilled pits and WRSs will have topsoil applied and will be rehabilitated into pasture following the completion of the mining activities, to effectively remediate the site for grazing or other suitable post mining land uses. The proposed approaches to site rehabilitation are established and widespread across the Macraes Operation and are demonstrated to be effective in re-establishing topsoil and vegetation. The waste rock

disposed of on-site, while technically being classed as contaminated waste and being subject to faster natural oxidisation processes, has relevant contaminants at similar or the same levels, as the surrounding bedrock. Further, it is encased within rehabilitation materials, including oxidised 'brown rock' and respread topsoil. Therefore, risks of contaminated land effects are assessed to be adequately mitigated through site rehabilitation and no more than minor.

5.15 CULTURAL EFFECTS

OceanaGold understands that it is for Rūnaka to describe any cultural or historical associations with the site. OceanaGold has engaged with Aukaha on behalf of behalf of Te Rūnanga o Moeraki, Kāti Huirapa Rūnaka ki Puketeraki and Te Rūnaka o Ōtākou (Kā Rūnaka) in relation to the MP4 Project. This includes commissioning Aukaha to prepare a Cultural Impact Assessment ("**CIA**") for the Project. OceanaGold also recently signed a process agreement with Rūnaka to guide ongoing engagement on mining projects and is continuing to engage with Rūnaka as per the process agreement. It is expected that identification of any specific cultural values will occur in the near future through the completion of the CIA. OceanaGold will provide the completed CIA to WDC, ORC and DCC upon its receipt. Any values or issues that need particular redress or response will be worked through with Aukaha in the first instance. A letter from Aukaha acknowledging lodgement of this application and providing an outline of the CIA is provided in **Appendix 34**.

However, to the extent that cultural values may align with water quality and ecological values, the technical assessments that have been commissioned by OceanaGold confirm that the Project will not have any more than minor effects on water quality, and adverse effects on ecological values and indigenous biodiversity will be managed using the effects management hierarchy, with measures such as the creation of the MEEA, as outlined in the Ecological Impact Management Plan and discussed further in Section 6.3 of this AEE. As such it can be considered that the adverse effects of the Project on cultural values are likely to be no more than minor.

5.16 ROADING AND TRAFFIC

Tim Kelly Transportation Planning Ltd completed a transportation assessment for the proposed activity. The report includes a comprehensive description of the existing road network and public access arrangements and is attached in full as **Appendix 24**.

A realignment of the northern section of Golden Bar Road is required to facilitate the proposed Innes Mills pit extension. The realignment would remove a section of Golden Bar Road approximately 730 m in length and replace this with a road section approximately 160 m shorter, with an intersection at Macraes Road approximately 250 m northeast of the existing intersection. The proposed realignment of this section of Golden Bar Road will not

in any way restrict public access between Macraes Road and Golden Bar Road to the south, and the changes would have negligible impact upon overall travel times in this area.

Potential adverse effects relating to the safe and efficient operation of the Golden Bar Road realignment will be precluded by:

- Designs compliant with the current Austroads and Waka Kotahi NZTA standards and requirements;
- Waitaki District Council approvals;
- Low levels of traffic activity in this area;
- The ability to construct the replacement section and switch to it without major disruption to traffic movement;
- A requirement for a safety audit of the final design and a post-construction safety audit; and
- A likely maintenance period before hand-over to, and acceptance by, WDC.

The proposal will not significantly affect the operating hours of mining operations, staff numbers or associated vehicle movements as there will be no material change to staffing numbers or vehicular activity on the external road network than what is currently taking place at the site. Procedures applicable to the safe operation of the internal site haul routes will also be unchanged.

Golden Point Road and Matheson Road – which are currently closed to the public – will be reinstated to the standard required by existing land use consents once operations on site are completed.[75]

Given the above, it is considered the adverse effects of the proposal on roading and traffic will be less than minor.

5.17 OPEN SPACE AND RECREATION EFFECTS

The MP4 Project does not create any demand for open space or recreation or interfere with these matters in any way. Accordingly, the effects of the proposal on these matters are assessed to be nil.

Eventual closure of the mine may present an opportunity for the provision of open space and recreational areas. However, such details are yet to be confirmed.

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[75] Waitaki District Council and Dunedin City Council Land Use Consent "Coronation North Pit and Trimbells Waste Rock Stack" – OceanaGold (New Zealand) Ltd, WDC Reference: 201.2019.1241; DCC Reference: LUC-2019-42.

5.18 GREENHOUSE GAS EMISSIONS

OceanaGold has a target of net zero emissions by 2050 and an interim goal to reduce carbon emissions per ounce of gold produced by 30% by 2030. Targets will be achieved through the implementation of four key strategic areas: improved energy efficiency and energy reduction; decarbonisation of electrical energy supply; decarbonisation of mobile equipment fuel; and carbon sequestration.

In the 2019 baseline, the Macraes operation was responsible for approximately 92,000 tonnes of scope 1 and 2 carbon dioxide emissions.[76] As at 2022, those emissions had reduced to approximately 77,000 tonnes of carbon dioxide emissions.

OceanaGold has identified options to reduce energy usage and greenhouse gas emissions including the following:

- Purchase of certified renewable electricity;
- Electrification of one overburden excavator;
- Electric Processing Plant water heating;
- Plant heat recovery;
- Waste oil in explosives; and
- Solar light towers.

OceanaGold will also consider introducing a second electric excavator and offset the increased emissions associated with extending the mine through the procurement and use of sustainably produced biodiesel.

In addition, OceanaGold will investigate the following actions with potential to further reduce its carbon footprint:

- Developing a transitional fuel strategy to determine the pathway to moving away from a reliance on diesel for mobile equipment (including trucks, boggers, and excavators);
- Ascertaining the viability of onsite solar generation and gravity process water supply;
- Leveraging on existing studies to develop the feasibility of large-scale forestation to offset emissions;
- The potential for sequestration of atmospheric carbon dioxide;

[76] Scope 1 emission are direct emissions that are owned or controlled by the company. Scope 2 emissions are emission that the company causes indirectly and come from where the energy it purchases is used and produced.

- Potential efficiency savings (supported by the implementation of energy monitoring systems);
- Implementing a process to elicit, assess and act on new opportunities to improve energy efficiency and reduce emissions; and
- Participating in industry consortiums focused on collaboration and information sharing to drive down emissions.

OceanaGold will continue to review and update its climate strategy to meet its net zero goals.

5.19 SUMMARY AND CUMULATIVE EFFECTS ASSESSMENT

The environmental effects of the MP4 Project are summarised in **Table 5.5** below.

Table 5.5: Summary of environmental effects of the MP4 Project.

Topic	Cumulative Effects	Overall Level of Effect
Economic and Social	The potential economic effects are discussed in section 5.2 and Appendix 25. The Project will provide for an additional 6 years of open pit mine life and tailings storage to support the processing of underground ore. This will result in a significant positive cumulative economic and social effect.	Positive
Geotechnical and Stability	Section 5.3 and Appendices 6 and 7 discuss the geotechnical effects of the Project. This includes stability and dam safety assessments during both the operation of the FTSF and into post closure, considering the probabilistic maximum long-term lake level within the Frasers and Innes Mills Pits joined pit lake. Based on stability assessments completed by WSP and PSM, the existing and proposed management measures are considered to be sufficient to ensure that adverse effects associated with the stability of slopes and dam safety are kept to a level that is less than minor both during the operation and post-closure phases.	Less than minor
Surface Water and Groundwater	Section 5.4 and Appendices 10 to 14 discuss the water quality and quantity effects of the Project. This includes the potential effects of the MP4 pit lakes on groundwater and surface waters during both the filling and overflow phases, and the effects of the proposed activities on groundwater and the surface water quality within the Mare Burn, Deepdell Creek, Golden Bar, Clydesdale Creek and NBWR catchments. All of the modelling work undertaken considered the cumulative effects of the existing and consented mining activities, including BRWRS, in addition to potential effects of the Project. In summary, the activities are likely to result in increasing contamination levels relative to current in stream water quality. The current water quality standards in Mare Burn, Golden Bar Creek and Murphys Creek are expected to be maintained.	No more than minor

Topic	Cumulative Effects	Overall Level of Effect
	In the absence of mitigation measures, it is possible that compliance levels may be exceeded at Deepdell Creek in low flow conditions and will be exceeded at locations in the NRWR. However, by implementing a package of mitigation measures (as described in Section 5.4.4) the risk of compliance exceedance is considered to be low. Once mitigation measures are implemented, current and predicted cumulative long-term metal concentrations as modelled by GHD will meet ANZG values for protection of 95% of aquatic species in most instances.	
Aquatic Ecology	As described above, water quality and quantity modelling considered the cumulative effects of the existing and consented mining activities, including BRWRS, in addition to potential effects of the Project, and this modelling informed the assessment of effects on aquatic ecology, included in Section 5.5 and Appendices 20-22. The aquatic ecology assessment found that when considered in a cumulative context, current and predicted long-term metal concentrations will meet the ANZG values for protection of 95% of species in most cases, and potential 'exceedances' are considered to be minor and within the margin of error associated with the modelling. There will be some loss of stream extent as described in Section 5.7 in the Cydesdale Creek catchment as a result of the Golden Bar WRS extension, but the ecology values associated with these water courses has been assessed as low. OceanaGold will compensate the effects of this loss by protecting and enhancing at least twice the length of small stream habitat within the MEEA. Stream loss is otherwise avoided by the siting of the proposed activities. Overall, the project is not expected to result in changes to the composition of the aquatic fauna in the affected streams and rivers.	No more than minor

Topic	Cumulative Effects	Overall Level of Effect
Noise	Potential noise effects, including cumulative effects of noise from other activities operating at the site, are discussed in section 5.8 and Appendix 28. The continuous operation of haulage trucks, including night-time operation will have the greatest effect on nearby properties. However, when the increased noise levels are considered in a cumulative context with other sources of noise on site, such as processing plant noise, noise levels are not expected to be increased above the levels generated from the Project. This is because the haulage trucks are the dominant noise source with other activities unlikely to result in an appreciable increase in noise when operated in conjunction with the haulage of waste rock.	No more than minor
Blasting and Vibration	Section 5.9 and Appendix 26 discuss the potential effects from vibration and blasting associated with the proposed activity, while considering existing authorised activities. OceanaGold's existing Noise, Airblast and Vibration Monitoring Plan will ensure a time separation between blasts in close proximity to ensure there are no cumulative effects associated with blasting across the site. The continuation of these practices will ensure nearby dwellings do not experience vibration levels above the currently consented and District Plan limits, which have been proven acceptable to the residents.	No more than minor
Landscape and Visual Amenity	Landscape and visual amenity effects are considered in section 5.10 and Appendix 27. In a cumulative context, the Project results in an increase to the open pit extent and overall disturbed area at the site. Accounting for the existing mining dominated landscape, the proposed pit and WRS extensions are not expected to result in any appreciable visual effects. All other changes to the landscape will not be readily visible from public view points.	Less than minor

Topic	Cumulative Effects	Overall Level of Effect
Air Quality	Section 5.11 and Appendix 29 discuss the potential effects on air quality, while considering existing authorised activities. Combustion-related emissions will be relatively small and will not change significantly from those currently used occurring at the site. Dust emissions from the proposed activities are expected to be well dispersed and diluted before reaching sensitive receptors, and the nearest sensitive receptors are not expected to be adversely affected by dust from the Project. Therefore, there is unlikely to be any cumulative air quality effects as a result of the Project.	Less than minor
Historic Heritage	Historic heritage effects are considered in Section 5.12 and Appendix 23. The proposed works are not considered to have any adverse effects on any scheduled heritage items. The loss of part of a historic fenceline is assessed as a less than minor effect and appropriate measures will be taken to record the fenceline prior to its removal. The cumulative effects on historic heritage are therefore the loss of part of one further heritage item.	Less than minor
Terrestrial Ecology	Terrestrial ecology effects are considered in Section 5.6 and Appendices 15 – 19. In a cumulative context, the MP4 Project is generally assessed as having a low or moderate effect on the terrestrial ecological features examined by Whirika. The exception to this is an adverse effect on tussockland, lizards and lizard habitat, birds and bird habitats, invertebrate habitat and ephemeral wetlands. These effects will be managed using the effects management hierarchy, with measures such as the creation of the MEEA, as outlined in the Ecological Impact Management Plan and discussed further in Section 6.3.	No net loss

Topic	Cumulative Effects	Overall Level of Effect
Hazardous Substances	Section 5.13 considers the storage and use of hazardous substances associated with the Project. The type and quantity of hazardous substances used will be no different to that provided for by existing land use consents although the use and storage may occur in slightly different locations. The same controls applying to the existing use and storage of hazardous substances on site will continue to apply to the proposed activities, therefore, there will be no cumulative effects associated with the storage or use of hazardous substances.	Less than minor
Contaminated Land Effects	Contaminated land effects are discussed in Section 5.14. In the cumulative context, while this proposal will create additional land area that has been subject to HAIL activities, it will not create any adverse contaminated land effects that exceed a level considered to be minor.	No more than minor
Mana Whenua Values	Cultural effects are discussed in Section 5.15. OceanaGold understands that it is for Rūnaka to describe any cultural or historical associations with the site. OceanaGold has commissioned a CIA for the Project, which when received will be worked through with Aukaha and provided to the consent authorities. In the interim, to the extent that cultural values may align with water quality and ecological values, the technical assessments that have been commissioned by OceanaGold confirm that in a cumulative context, the Project will not have any more than minor or significant adverse effects on water quality or quantity, and the adverse effects on ecological values and indigenous biodiversity will be managed using the effects management hierarchy to achieve positive ecological outcomes, as outlined in the Ecological Impact Management Plan and discussed further in Section 6.3.	No more than minor

Topic	Cumulative Effects	Overall Level of Effect
Roading and Traffic	Traffic effects are considered in Section 5.16. There will be no external transportation effects arising from the Project and thus no cumulative effects.	Less than minor
Open Space and Recreation	Open space and recreation effects are considered in section 5.16. There will be no adverse effects on recreation and thus no cumulative effects.	No effect
Greenhouse Gas Emissions	Greenhouse gas emissions are considered in Section 5.18. OceanaGold has a target of net zero emissions by 2050 and an interim goal to reduce carbon emissions per ounce of gold produced by 30% by 2030. Between 2019 and 2022, carbon dioxide emissions from the Macraes operation reduced from approximately 92,000 tonnes of scope 1 and 2 carbon dioxide emissions to approximately 77,000 tonnes of carbon dioxide emissions. OceanaGold has also identified further options to reduce energy usage and greenhouse gas emissions as outlined in Section 5.18. By implementing actions to meet its target of net zero emissions by 2050, OceanaGold is addressing the cumulative effects of the proposed activities.	No more than minor

6. MANAGEMENT AND MONITORING OF ACTUAL AND POTENTIAL ENVIRONMENTAL EFFECTS

Section 5 of this AEE provides an assessment of the actual and potential effects of the MP4 Project, which is based on the various independent expert assessments commissioned by OceanaGold (**Appendices 2-33**). This assessment includes consideration of the positive effects associated with the Project, which will include extending the life of mine by 6 years to around 2030 and economic benefits for the region, including providing employment, incomes and expenditure.

With respect to potential adverse effects on the environment, the MP4 Project can be undertaken in a manner that will appropriately avoid, remedy, or mitigate adverse effects to ensure that the sustainable management purpose of the RMA is achieved. That said, after avoidance, remediation and mitigation, some residual adverse effects associated with the Project will be of a level that require offsetting and compensation.

OceanaGold is proposing that the Project be undertaken using the same approaches that have been successfully used at Macraes for mining activities in recent years, and will be applied in accordance with a range of consent conditions which will limit the potential for adverse effects on the environment to acceptable levels and which, in many instances, align with the permitted activity standards for mining in the Waitaki District Plan and / or the existing resource consents held by OceanaGold. The proposed conditions of consent to be circulated prior to the applications being heard will reflect existing management obligations to the extent that is appropriate. A number of management plans will also be utilised to ensure that OceanaGold undertakes practicable measures to constrain the operations and minimise potential disturbance and control the risk of (unplanned) adverse effects from the Project. In most cases, these management plans exist already and will be updated to account for the MP4 activities prior to those activities commencing.

With regard to mitigating adverse effects, the proposed consent conditions will be largely based on the existing measures used for the existing and consented mining activities undertaken by OceanaGold at Macraes. There have been recent media reports about audits by the Otago Regional, Dunedin City and Waitaki District Council which identified non-compliance by OceanaGold. Not all of the non-compliance raised in the audit were within the scope of consent conditions, nevertheless OceanaGold is working with the Councils to address issues which are within the scope. No enforcement action has been taken and case law says that past conduct of an applicant is not relevant to deciding whether to grant consent.[77] Notwithstanding the issues raised in the audit, the existing

[77] See for example in *NZ Suncern Construction Ltd v Auckland CC* [1997] NZRMA 419 (HC), *Guardians of Paku Bay Assn Inc v Waikato RC* [2012] 1 NZLR 271 (HC) and *Walker v Manukau City Council* (unreported, Environment Court, C213/99, Skelton J and Commissioner Dr Hackett and Mc Intyre, 7 December 1999).

measures in the consent conditions have been effective in managing the actual and potential effects of the existing mining activities. OceanaGold intends to provide the consent authorities with a suite of proposed conditions prior to the applications being heard.

Key management measures include:

- Limits on the hours of works (for certain activities);
- Limits on the generation of noise and vibration;
- The preparation of a number of environmental management plans (including dust, ecological impact, erosion and sediment control and water quality) which will further detail how potential effects associated with key activities will be managed and monitored. These environmental management plans allow mitigation and monitoring measures to be refined and updated over time as best practice evolves, and as additional information on the receiving environment and the effectiveness of the mitigation measures is gathered via monitoring; and
- Mitigation and offsetting to manage effects on both terrestrial and aquatic ecology.

The key management measures proposed by OceanaGold are summarised further in **Table 6.1** below.

Further detail on erosion and sediment controls, management of adverse effects on water quality, and the management and approach to ecological effects is provided in the sections that follow.

Table 6.1: Summary of Key Management and Monitoring Measures for the MP4 Project.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
Landscape and Visual Amenity		
Potential landscape and visual amenity effects.	Progressive rehabilitation of the WRS.	Monitor rehabilitation success and adapt method if necessary.
	Height limits and careful design of the landform of the WRSs to integrate them with the existing landform character of the area.	Engineering design of the WRSs to be in harmony with the natural environment.
	Restoration of the areas disturbed around the margins of the Project site.	Progressive rehabilitation of the Project.
	Removal and restoration of the haul roads during the closure phase of the Project.	Rehabilitation of haul roads.
	Ultimately, the removal of mine infrastructure, hard stands and the like, followed by planting.	Rehabilitation of the site following completion of mining activities.
	Establishment of vegetation cover types best suited to the long-term land use and the site.	Rehabilitation of the site following completion of mining activities.
Vibration and Noise		
Potential for increased noise at immediately adjacent properties.	Monitoring requirements outlined in the Noise, Airblast and Vibration Management Plan.	Conditions regarding noise and vibration limits. Implementation of the Management Plan, including monitoring.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
Effects of vibration on amenity values.	Blasting will be restricted to within the following hours: Monday – Friday 9:00am to 5:30pm, Saturday, Sunday and public holidays 10:00am to 4:30pm. Email notification to closest residents on morning of days with blasting. Management of blast designs to achieved specified vibration and air blast over pressure limits which are protective of amenity and property at the notional boundary of neighbouring residences. Baseline inspection of heritage structures in Golden Point Reserve.	Monitoring requirements and actions will be set out in a Noise, Airblast and Vibration Management Plan. Conditions regarding noise and vibration hours and limits.
Potential for blasting, drilling, hauling and other noise to disturb nearby residences.	Continued implementation of the Noise, Airblast and Vibration Management Plan. Limiting times when blasting can occur on site.	
Roading and Traffic		
Realignment of Golden Bar Road	Traffic management and road construction design standards, intersection design as per Austroads.	Monitoring of road surface performance and transfer to WDC at agreed time after demonstration that performance standards have been met.
Reduced public access due to occupation of paper roads	Maintain the existing managed haul road crossings. Provision of unformed public access (i.e. pedestrian) routes during operations.	Reinstatement of Matheson Road and Golden Point Road following the completion of mining.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
	Use of a Temporary Traffic Management Plan with provision for pedestrians if needed.	
Surface Water		
Fine sediment discharges to water.	Implementation of Erosion and Sediment Control Plans.	Condition requiring development or updating of Erosion and Sediment Control Plan(s). Routine maintenance of silt ponds and drains.
Degradation of water quality due to WRS and TSF seepage.	WRS construction methods to exclude oxygen ingress as far as practicable. Capping and vegetation to minimise water ingress and to promote clean water run-off. Slope and drain designs to control water velocities, hence erosion. Dilution of flows using water reservoirs. Capture of WRS seepage from Frasers South WRS, Frasers West WRS and Golden Bar WRS and pumping to open pits until appropriate alternative mitigations options can be established after mining, if and where needed, such as: • The Frasers West / South and Golden Bar WRSs are rehabilitated progressively during the operation so that infiltration reduces to a rate of approximately 29 mm/year to limit seepage; • Passive Treatment Systems (or an equivalent treatment system) are installed 'in line' with captured seepage	Continued monitoring of instream water quality in accordance with Compliance and Monitoring Schedules.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
	water, treating that seepage water from the Frasers West, Frasers South and Golden Bar WRS and reducing sulphate loads by 30% before discharge to the respective silt ponds / collection sumps; • The Frasers West Silt Pond, Clydesdale Silt Pond and Murphys Silt Ponds are converted to sumps and discharge their water to the receiving surface water environment during times of elevated catchment flows. The sumps are equipped with a system that ensures excess water is returned back to the open pits to avoid uncontrolled overflow; and • A new sump is constructed capturing seepage along the toe between the Frasers West and South WRSs at or near the monitoring location NBWRTR. This sump will operate in a similar manner to the Frasers West, Murphys and Clydesdale silt ponds (sumps) in terms of proposed discharge to the NBWR and return to Frasers.	
Groundwater		
Potential for groundwater levels and quality to be adversely affected by dewatering of the pit and discharges of contaminants from the proposed activities.	Update to the Water Quality Management Plan.	Continued monitoring of groundwater including consideration of additional monitoring discussed in Section 6.2.6 below.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
Aquatic Ecology		
Potential for aquatic ecology to be adversely affected by degraded water quality due to pit dewatering and discharges of contaminants from the proposed activities.	Actions to manage water quality effects as described above.	Continued monitoring of aquatic ecology.
River and Wetland Loss		
Loss of wetland extent	Creation of ephemeral wetlands covering 0.3 ha on the Taieri Ridge, and creation of 0.1 ha of wetland at the perimeter of the MEEA.	Monitoring and reporting on created wetland condition and values as part of annual ecological monitoring reports.
Loss of river extent	Protection of streams within the MEEA as an offset for stream loss and Golden Bar WRS.	Monitoring and reporting on stream condition and values as part of annual ecological monitoring reports.
Air Quality		
Potential for unmitigated dust discharges to adversely affect the amenity of surrounding neighbours.	Updated Dust Management Plan. On-going air quality monitoring. TARPS for investigation and management actions in response to monitoring results. Dust suppression using on-site water sources during operations.	In accordance with current practice on the site, a comprehensive ambient air quality monitoring programme will continue for deposited particulate matter and total suspended particulate matter. Use of trigger limits at specific monitoring sites in accordance with current dust management guidelines. Exceedance of specified trigger limits will result in an alert being sent to OceanaGold and subject to observed weather conditions at the time of the exceedance, will be followed by an investigation into potential dust sources and mitigation measures.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
Terrestrial Ecology		
Loss of indigenous plant species within the Project footprint, some of which have threatened status.	The loss of shrubland and tussockland is to be offset to at least no net loss through the creation of the Murphys EEA. Development of the Ecological Enhancement Area Management Plan. Development of the Predator Control Plan. Implementation of the Lizard Management Plan. Conditions regarding rescue and salvage of plants.	Monitoring and maintenance of vegetation in Murphys EEA and constructed wetlands in accordance with the IMP.
Excavation of pits and deposition of WRS material, resulting in loss of vegetation and invertebrate communities, displacement of birds and potential mortality of reptiles.	Re-create lizard and bird habitat through WRS rehabilitation, recreation of exotic plant communities inhabited by lizards and the creation of the pest controlled Murphys Ecological Enhancement Area. New pit lakes will produce replacement habitat. Golden Bar WRS narrow-leaved tussock rehabilitation. Rescue of threatened invertebrates and lizard salvage to the proposed MEEA in accordance with the wildlife authority.	Conditions requiring rehabilitation of WRS slopes and mine workings, including lizard rock stacks and bird habitat. Conditions requiring Golden Bar WRS narrow-leaved tussock rehabilitation.
Encroachment of weeds (if unmanaged).	Regular inspection of the site for new weed species. Continuation of OceanaGold's annual environmental weed control operation.	Condition detailing weed surveillance and control.
Potential displacement of resident indigenous animals through mining	Noise, Air blast and Vibration Management Plan.	Conditions pertaining to noise levels and lighting.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
activities, noise, vibration and lighting.	Use of natural and artificial noise barriers where essential. Direct lighting downwards/ inwards.	
Wind-blown dust accumulation affecting or covering plant species.	Suppressing dust created during construction and mining activities. Updated site Dust Management Plan.	Implement Dust Management Plan practices. Monitor dust fall rates at existing sites.
Potential for accidental fire (if unmanaged).	Site fire avoidance protocol. Rapid response to any suspected fires.	Maintain Macraes Gold Operation emergency response capability. Condition regarding fire prevention.
Changed hydrological regimes resulting in potential decreases in surface and subsurface flow in some wetlands and water courses.	Target water abstraction activities to within 200 m of the pit crest. Limits of the overall rate at which water can be abstracted from the pits.	Conditions requiring monitoring of surrounding groundwater.
Potential for effects on ecology after avoidance, remedy and mitigation measures are implemented.	Offsetting via the creation of the Murphys Ecological Enhancement Area. Ecological compensation including predator control, lizard enhancement project, rock tor replacement, bird enhancement project.	Establish covenant and fund to protect and maintain MEEA. Conditions regarding offsetting and compensation requirements.
Heritage		
Accidental discovery and disturbance of archaeological items.	Continued use of appropriate accidental discovery protocol.	Conditions relating to accidental discovery protocol.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
Partial removal of a historic fence line.	Obtain an archaeological authority. Retain and preserve the fence beyond 50m either side the proposed pit extension.	Conditions relating to protection of the fence.
Hazardous Substances		
The release of hazardous substances into the environment. Adverse effects on human health.	In line with current practice, all hazardous substances will be stored in approved and bunded containment in accordance with the relevant New Zealand Standards and Codes of Practice and the Health and Safety at Work (Hazardous Substances) Regulations 2017. Refuelling, lubrication and any mechanical repairs will be undertaken in a manner that provides sufficient mitigation measures to ensure that no spillages onto the land surface or into water occur. Compliance with existing requirements that all fuels and oils used at the site will be contained in appropriately bunded or double skinned facilities and that all fuel/oil dispensers are fitted with non-return valves. Existing Hazardous Substance Principal Hazard Management Plan.	Maintenance of existing Hazardous Substance Principal Hazard Management Plan.
Post-Closure Effects		
Risk of OceanaGold defaulting on its rehabilitation obligations.	The combination of the Project Overview and Annual Work and Rehabilitation Plan, contingency plan, and the bonds ensures that rehabilitation and closure of the site will occur	Bond conditions for rehabilitation.

Actual or Potential Effect	Planned Mitigation / Management	Recommended Monitoring / Future Action
	under all circumstances, and that the costs associated with both the rehabilitation of the land and its long-term management will be met.	
Risk of pit or WRS slope failure.	The geotechnical reports outline that the pit and WRS designs are appropriately stable in the long term. Update the Geotechnical Hazard Management Plan.	Public exclusion zone to be determined following further geotechnical investigation and installation of fencing to exclude public. Normal pit wall stability monitoring during mining.
Risk of water quality decline in receiving environment as a result of long-term discharges from site.	Water quality monitoring in receiving water bodies. Trial and implementation of passive treatment system to supplement water quality management. Investigate active management systems if water quality results indicate that further treatment is required.	Use of compliance criteria to ensure ongoing protection of aquatic ecology. Monitoring and adaptive management via the Water Quality Management Plan to ensure compliance with appropriate criteria. Bonding conditions.

6.1 EROSION AND SEDIMENT CONTROL

The Erosion and Sediment Control Plan ("**ESCP**") prepared by EGL (refer **Appendix 10**) provides an overview of the measures available to manage the potential adverse effects of erosion and sedimentation. As with the current operation, some aspects of the Project have the potential to discharge sediment laden run-off to land where it may enter water, and as such, will require implementation of appropriate erosion and sediment control measures to prevent this. Such measures will also intercept sediment laden run-off and prevent it from entering water courses or ensure that it is appropriately treated. The ESCP follows the principles embodied in the Environment Canterbury Erosion and Sediment Control Guidelines. Good erosion and sediment control practices are well understood from years of mining at Macraes.

The existing erosion and sediment control practices that are used on the site, include:

- Silt ponds to allow settlement of suspended solids associated with runoff from disturbed areas;
- Diversion drains to divert runoff from disturbed areas to silt ponds;
- Clean water diversion to divert runoff from undisturbed areas away from disturbed areas;
- Progressive stripping of WRS footprints only as required;
- Steep gullies are not stripped beneath WRSs, except in the base of gullies at the toe of the WRSs, so as to leave a buffer that acts to intercept sediment from areas stripped above;
- Stripping of topsoil and loess soils is only undertaken in the summer months;
- Management of surface water on the surface of the WRSs including preventing runoff from discharging over the outside shoulder, excavation of soak pits to allow surface runoff to soak into the waste rock (which acts to filter out fines) and end-tipping to create a coarser rock in gullies which act as underdrains;
- Progressive rehabilitation of WRSs and TSF embankments consisting of approximately 0.3 m of oxidised waste rock and approximately 0.2 m of topsoil and grassing to minimise bare areas;
- Benches were provided on the shoulders of WRSs and TSF embankments at 20 m vertical intervals to control runoff;
- Adoption of appropriate sediment control practice (e.g., silt fences, decanting bunds) in accordance with the Environment Canterbury and Auckland Council Guidelines;
- Monitor discharges as required by consent conditions; and

- Regular inspections of silt ponds and diversion drains to check the condition and undertake maintenance, if required.

In addition to the continued implementation of the above measures, following detailed design and prior to the commencement of construction, OceanaGold will prepare a project specific ESCP. This will include the following sediment control measures:

- Clean water diversion drains with small dams (<20,000 m^3) located in gullies where necessary to divert runoff into the diversion drains. Where necessary (e.g. steeper ground, erosive soils) the drains will be lined (e.g. rockfill, geotextile) and energy dissipation will also be provided at high energy locations;
- Silt ponds downstream of disturbed areas;
- Shoulders of WRSs will have benches every 20m vertical height to control runoff; and
- Perimeter surface water drains located around the perimeter of WRSs where appropriate, to ensure runoff is conveyed to the base of gullies without erosion. Such drains will be lined where necessary and energy dissipation will be provided at high energy locations.

6.2 MANAGEMENT OF ADVERSE EFFECTS ON WATER QUALITY

6.2.1 Current Operational Management

Current operational management environmental water quality primarily involves the capture of seepage and other mine impacted water that would otherwise discharge to the environment and return it via pumping to the MWMS. This method of managing water quality during the operational phase relies on an extensive network of drains, pipelines, silt/sediment ponds and pumps that have been progressively installed over the life of the mine.

The existing Water Quality Management Plan ("**WQMP**") for the site (refer **Appendix 31** – Annexure 1) outlines the following specific operational control measures that are currently in place at the site:

- Capture TTTSF seepage from drains and in silt ponds/sumps. Pump back into the TSF decant pond (refer Table 48 of the WQMP);
- Pump WRS runoff and seepage from Murphys Silt Pond to Frasers Pit (refer Table 51 of the WQMP).

In addition to the above:

- OceanaGold actively manages the level of the Round Hill Pit sump to prevent discharges from the Golden Point adit (as discussed in Section 6.2.2);

- Discharges from Northern Gully Silt Pond are only permitted during heavy rainfall events. Water is otherwise held in the pond and reused in the MWMS to prevent its release to the environment.

In reality, OceanaGold employs numerous methods to control the release of water containing contaminants to ensure compliance with in-stream water quality criteria via the existing water management infrastructure. OceanaGold operates and manages this infrastructure in an adaptive way using the following procedure:

- Water quality data is reviewed monthly to identify and monitor trends in order to be able to respond to potential water quality issues prior to any exceedance of the relevant water quality compliance limits occurring. As part of this analysis data is compared with past data for that site with consideration of fluctuations related to seasonable variations, climatic conditions, and stream flows. The focus of this review is to identify if any results appear unusual or are trending towards levels which may indicate management action is required to prevent a compliance exceedance.
- Where a trend of concern is identified, the Environmental team start an investigation to determine the source/reason for the result or trend. This may involve undertaking additional monitoring, reanalysis by the lab, further sampling or catchment-based enquiries (e.g. has fertiliser been applied to paddocks, etc).
- The investigation will determine whether a management response is required and if so, what type of management response is appropriate. In some circumstances, external water quality experts may also be consulted.
- If a management response is required, solutions are tailored based on the environmental conditions of the particular site, compliance limits, past actions which have been undertaken, and contaminant levels/trends. Management actions may involve one or a combination of the following:
    - capturing and pumping of water to the MWMS;
    - maintenance of existing infrastructure/equipment or upgrading or installation of new infrastructure; or
    - updating water management procedures or undertake additional training relating to water management procedures.
- The management steps undertaken are then documented and followed up with additional monitoring to confirm effectiveness.

The following is an example of this procedure being implemented at Murphy's Creek silt pond. Discharges from this silt pond were causing elevated sulphate levels at the downstream monitoring sites, this was identified and a pump and genset was installed to pump the water back to the MWMS. Pump failures causing continued high levels, picked

up in both field monitoring and sampling. Upgrades were made including mains power installed, telemetered monitoring equipment and alarms, the purchase of spare pumps, regular pump maintenance, regular field monitoring on top of monthly sampling requirements and the management of freeboard within the pond, especially for dry periods.

A different procedure applies to observed compliance exceedances, as follows:

- Exceedance of instream Water Quality compliance criteria are identified two ways onsite;
    - An exceedance notification email is sent out to specified users by our Environmental database software, once the lab file has imported (automatic process through an email listener); and
    - Manual review of lab PDF's issued by Hill laboratories.
- When an exceedance notification is received, a notification detailing the specifics of the exceedance is sent to ORC via email, this is sent to both of the compliance officers and the generic ORC compliance email address.
- An investigation into the cause of the exceedance then commences. This investigation is tailored to the site, and is likely to include things such as infrastructure checks (such as pumps or collection sumps), lab queries or reanalysis, re-sampling, field parameter checks.
- A follow up email to council is then sent within 5 working days to update on either the findings of the investigation or the status of the investigation and any proposed mitigation actions. Mitigation actions may involve one or a combination of the following:
    - Capturing and pumping of water to the MWMS;
    - Maintenance of existing infrastructure/equipment or upgrading or installation of new infrastructure; or
    - Updating water management procedures or undertake additional training relating to water management procedures.
- When further investigation is required, this is followed up either as information is available or reported in the monthly meetings between ORC and OceanaGold.
- Any progress on mitigation actions is reported to council as those actions are completed.
- If an investigation shows that the exceedance is an erroneous result and resampling confirms this, the investigation is closed out.

The current WQMP also includes a number of additional mitigation options outside of those discussed above and signals the potential timing of these (refer to Section 10 of the WQMP which describes the implementation timeline). In most cases, these mitigation options are required to be in place for closure to allow OceanaGold to move away from the active management of site discharges discussed above.

OceanaGold proposes to maintain active management of site discharges during the operational phase to allow for other mitigation options to be reserved for closure when it is more appropriate to implement these. The overall approach proposed to water quality management is therefore consistent with the current WQMP.

6.2.2 Golden Point Adit Discharges

A key assumption in the surface and groundwater modelling is that discharges from the historic Golden Point adit are controlled and do not contribute contaminants to Deepdell Creek. Whilst discharges from the adit have been observed from time to time, OceanaGold has a firm understanding of the cause of these discharges. The primary driver of increased flows through the adit is a driving head which is dependent on the level of water in the Round Hill Pit sump. When the pit sump water level exceeds a certain level, increased hydraulic connection can occur between the Round Hill Pit sump and the Golden Point historic underground workings connected to the adit. This increased hydraulic connection can cause an increased flow from the adit to occur, even during dry periods. OceanaGold works consistently to keep water levels in Round Hill Pit sump low and below the level at which hydraulic connection occurs, which in turn minimises the potential for increased flows through the adit.

OceanaGold has updated procedures and technology relating to the operation of the Round Hill Pit sump and continues to ensure the sump level is routinely monitored and actively managed to an operational level that is set below the level at which hydraulic connection to the adit occurs. Management of the pit sump level will remain an operational water management measure. Potential long-term solutions involve plugging/sealing the opening on the Deepdell Creek side and/or a grout curtain along the ridge line between Round Hill Pit and Deepdell Creek to isolate the adit from Round Hill Pit. Capture of adit seepages and return pumping to the MWMS is also a feasible option subject to land access, noting that any physical works the adit would encroach on land administered by the Department of Conservation as part of the Golden Point Historic Reserve.

OceanaGold has a new procedure in place to ensure the Round Hill pit sump level is routinely monitored and actively managed to an operational level that is set below 344.5 mRL. Management of the pit sump level will remain an operational water management measure. Potential long-term solutions involve plugging/sealing the opening on the Deepdell Creek side and/or a grout curtain along the ridge line between Round Hill Pit and Deepdell Creek to isolate the adit from Round Hill Pit. Capture of adit seepages and return

pumping to the MWMS is also a feasible option subject to land access, noting that the adit daylights on land administered by the Department of Conservation as part of the Golden Point Historic Reserve.

Given it is OceanaGold's intention to avoid a hydraulic connection between Round Hill Pit and the adit, it is considered appropriate to exclude potential adit flows from the surface and groundwater model.

6.2.3 Coronation Pit Lake Seepage

Another key assumption in the surface and groundwater model is that seepage of pit lake water from Coronation Pit does not deteriorate in quality as it flows through the Trimbells WRS. OceanaGold notes that the potential for seepage flows through Trimbells WRS is a feature of the existing environment and not a potential effect that is expected to be exacerbated by the MP4 Project. It is noted that Trimbells WRS is an existing WRS and the currently consented closure scenario for Coronation Pit is development of a pit lake. Furthermore, as noted in Section 5.3.2.2 of the AEE, it is reiterated that seepage of pit lake waters through the Trimbells WRS is not expected to occur during the consent term. Pit lake filling to the level where seepage occurs is expected to take approximately 90 years. Notwithstanding, OceanaGold intends to engineer seepage control structures during the operational phase to ensure appropriate long-term management of seepages, both on water quality and WRS stability.

Potential engineering solutions and the effect of these on water quality outcomes, and the limitations of these are discussed by MWM in **Appendix 33** (refer Annexure 1). OceanaGold proposes to undertake feasibility studies and detailed design for the preferred engineering solution during the consent term such that an engineered solution can be implemented as part of Trimbells WRS rehabilitation and closure. On this basis, the assumption that the seepage of Coronation Pit Lake water through the Trimbells WRS does not deteriorate is considered reasonable.

6.2.4 Closure water management

During the closure period, the site will transition from the current water management systems and processes discussed above to a mitigation water management system that has less reliance on active management.

WRS seepage mitigation outlined in GHD (2024c; **Appendix 13**) addresses (modelled) compliance exceedance of the current management approach which assumed pumping of water from Murphys Creek Silt Pond back to Frasers Pit but no other active control of silt pond discharges. GHD determined that in such circumstances, additional mitigation measures are required to mitigate adverse effects on water quality from pits and WRSs. These mitigation measures include:

- Rehabilitation of WRSs: The Frasers West, Frasers South and Golden Bar WRSs are rehabilitated during and immediately after mining to achieve an average annual infiltration rate reduction to 29.2 mm/year (the infiltration rate for Macraes land surfaces); drains along the toe of the WRSs will direct seepage and run-off water to storage sumps.
- Passive Treatment Systems (PTS): Prior to discharge to the silt ponds/storage sumps, 'in line' PTSs will treat this seepage water to reduce sulphate loads (assumed to be by 30%).
- Storage sumps: Following active mining and once suspended solids are at background run-off levels, silt ponds will be converted to storage sumps. A new sump near monitoring location NBWRTR (likely coinciding with a previously used silt pond referred to as Redbank Silt Pond) will be added to capture WRS seepage between Frasers West and Murphys sumps via extended drains along the intervening WRS toe. Sumps will store and discharge the water to the NBWR when flow rates are sufficient to dilute the contaminants to maintain compliance levels. In the event storage reaches 90% capacity some or all of the sump water will be returned back to the nearby pit. This will ensure sumps do not overtop releasing contaminated mine water in an uncontrolled way to the receiving catchment, and risk breaching compliance limits.

It is acknowledged implementing these options may require additional resource consents. Any additional consents will need to be sought at a later date once detailed design of the selected options has been completed. In lieu of those consents or other approvals to establish the required mitigation options, OceanaGold will pump seepage back to the MWMS as necessary to ensure compliance with instream water quality criteria, as it does currently. This approach is currently accepted as part of the WQMP (refer **Appendix 31**, Annexure 1).

6.2.5 Management of long-term effects

Surface and groundwater modelling completed by GHD contemplates potential effects up to 400 years into the future. Long-term effects have long been considered by OceanaGold and the potential for these is already realised in the existing environment. The MP4 Project does not raise any new or novel types of enduring adverse effects. Previous developments at the Macraes Gold Project have all considered the potential for long-term effects and the result has been the requirement to establish permanent management solutions or to provide bonds in respect of uncertainties. Where there is potential for adverse effects to occur beyond the consent term, all relevant resource consents include bonding conditions that obligate the consent holder to provide and maintain a bond in favour of the relevant consent authority, the amount of which must (amongst other things) provide for:

- Monitoring for and of any adverse effect of the activity authorised by the consent which may become apparent during or after expiry of this consent; and

- Dealing with any adverse effect on the environment which may become apparent after the surrender or expiry of this consent.

The bond is required to be maintained for a period of 20 years from the expiry or surrender of the relevant consent(s). This mechanism provides for the adverse effects to be monitored and addressed well beyond the duration of the consent such that any unforeseen effects can be identified, or expected effects can be better characterised and managed or otherwise rectified. This existing approach to bonding is proposed to be utilised for the MP4 consents.

It is also acknowledged that some activities may require resource consents to be renewed on an ongoing basis. For example, where there are enduring discharges of contaminants from detention sumps or pit lakes, unless those discharges are permitted by the relevant plans and regulations, resource consents will be required on an ongoing basis. In those circumstances, the resource consent process enables the adverse effects of those activities to be periodically evaluated and addressed by appropriate conditions. Following closure of the mine, obtaining and implementing those consents may become the responsibility of a Trust or some other long-term management 'vehicle' or entity established by OceanaGold to manage its relinquishment of the site after mining has ceased. Nonetheless, in relation to such consents there will remain a consent holder on whom any conditional obligations are enforceable.

OceanaGold also notes that some measures to manage adverse effects on water quality can be developed with a certain level of permanence and automation (e.g. operation of Camp Creek Dam if required, passive treatment systems, and detention sump discharges to receiving waters) such that only routine maintenance is required. That maintenance obligation could be tied to the relevant consents that are required on an ongoing basis or otherwise secured by legal instrument attaching to the relevant land.

Whilst it is acknowledged that modelled sulphate plumes eventually reach the Deepdell Creek via groundwater flows, especially along the reach between the MTI and NGWRS, the impact of this on overall water quality and aquatic ecology is not regarded as 'significant'. Greg Ryder (2024) provides the following conclusions:

- There is not expected to be any changes in the composition of the aquatic fauna of the streams and rivers affected by the MP4 mine expansion;
- Provided GHD's proposed water mitigation options are implemented and managed (GHD 2024), there are no anticipated material changes to the physical character of the receiving waters as a result of the cumulative effects of the proposed mining expansion; and

- No material changes to the hydrological character of the receiving waters. Predicted short and long-term changes in water quality in Deepdell Creek-Shag River and North Branch Waikouaiti River satisfy default (i.e. conservative) ANZG guideline values.

Monitoring of groundwater and surface water during the 20 year bond period will provide an opportunity for the model expectations that inform the above assessment to be verified.

6.2.6 Additional Monitoring

GHD outlines additional monitoring that would assist model validation (refer **Appendix 33**, Annexure 2). The following is a summary of the recommended additional monitoring requirements.

- Groundwater monitoring well installation within the modelled contaminant plume extent. This will aid in improving the understanding of contaminant mobilisation and transport within the underlying aquifer, assist in future model calibration and confirm the envelope of assessed effects. Areas in which coverage could be improved (based on the modelled contaminant plume) are located down hydraulic gradient of the existing Frasers WRS and the FTSF, and to the south of Deepdell Creek in the vicinity of the proposed BRWRS.
- Flow and water quality monitoring at locations targeting specific seepage discharges to better confirm site specific contributions and validate the model representation of those contributions. This should be undertaken at specific existing discrete and cumulative seep locations. Toe construction of future WRSs should allow for seepage flows to be captured at discrete / cumulative locations for monitoring (i.e. a pipe capturing seepage flows that concentrate at WRS toes in valleys, prior to mixing with surface water runoff). Flow and water quality monitoring should commence as soon as reasonably practicable following WRS construction.
- Continuous flow monitoring within the NBWR, Deepdell Creek and Mare Burn below the mine site.
- Continuous electrical conductivity monitoring in the NBWR, Deepdell Creek and Mare Burn catchments to better understand the current range and distribution of water quality parameters within these surface water bodies and catchments.
- Establishment of a control site for background water quality monitoring within the NBWR should be investigated.

OceanaGold intends to incorporate this additional monitoring into its WQMP when it is updated to reflect the MP4 consents. In some instance, implementation of this additional monitoring will be subject to feasibility analysis and detailed design. For example, flow monitoring in the NBWR.

6.3 MANAGEMENT AND APPROACH TO ECOLOGICAL EFFECTS

The effects assessments identify that terrestrial ecology and waterbodies in the area have already been extensively modified by past and existing farming and mining activities. There will be a small loss of wetlands, watercourses, and terrestrial vegetation within the Project footprint. Individually some of these features trigger significance criteria under the relevant statutory plans and considerations. It is noted however that none of these features are specifically listed or scheduled sites and there are limited provisions in both Regional and District Plans that would ensure their protection from other permitted activities[78] that could occur as of right on the site. It is also evident that terrestrial vegetation, ephemeral drainage systems and wetlands currently in the area are vulnerable to damage from the effects of farming (for example, grazing and soil pugging by stock).

Notwithstanding this existing or permitted environment, OceanaGold is proposing a series of measures to manage adverse effects on terrestrial and wetland ecology values within the site by applying the effects management hierarchy. The effects management hierarchy firstly seeks to avoid, then remedy, then mitigate adverse effects, before contemplating offsetting or compensation for more than minor residual adverse effects that remain. . It is noted that this is consistent with the approach that is promoted in the National Policy Statement for Indigenous Biodiversity ("**NPSIB**"), the National Policy Statement for Freshwater Management ("**NPS-FM**") and the Otago Regional Policy Statement 2019 ("**RPS**"), regarding the management of adverse effects arising from mining activities. The provisions of these documents are discussed further in Section 9 of this AEE in the context of s104 of the RMA.

6.3.1 Avoidance

The following activities have been (or will be) undertaken to avoid the impact of the Project on terrestrial ecology:

- **Location and shape of pits and WRS:** Following the identification of higher ecological value areas within the site, the proposed Round Hill Stage 5 extension was removed from the Project. The location of the proposed Golden Bar WRS was also adjusted to avoid a rocky area providing habitat for lizards and rare plants and a nearby ephemeral wetland;
- **Siting of infrastructure:** The location of new project infrastructure (haul roads, buildings, WRSs) is mostly sited on areas disturbed during previous mine projects.
- **Golden Bar Road realignment:** The planned new route of the Golden Bar Road intersection with the Macraes – Dunback Road traverses mostly lower-value ecological

[78] For example, farming operations could clear some areas of indigenous vegetation for farming purposes as of right within the Macraes Mining zone, and also in some instances within the Rural Scenic Zone.

areas. The exception is 0.1 ha of narrow-leaved tussock grassland within the footprint and three small ephemeral wetlands within the buffer area. The effects on the tussock grassland will be incorporated into the tussock offset and the potential effects of road construction on the ephemeral wetlands in the 100 m buffer will be managed by including a requirement to avoid sediment during development of the road engineering design.

- **Isolating high ecological value area in the buffer:** Areas in the buffer area with higher ecological values (**Figure 6.1**) will be isolated from unintended effects by clearly delineating these areas on maps provided to mine operations staff and on the ground by using well-maintained flagging tape, temporary fencing, and signage. Any sites with high ecological values within 10 m of the boundary of a WRS will be protected by rock-intercept fencing or barrier at the base of the WRS if stability assessments suggest there is an unacceptable risk of rock fall threatening the adjacent ecology.
- **Avoiding disturbance of ground nesting birds:** Implementing a "ground nesting birds" protocol which is included in the IMP to avoid impacting on the nests of protected ground-nesting pipit and (if they become present at site) South Island pied oystercatcher or banded dotterel.[79]

[79] No other indigenous species are known or likely to nest within the ZOI.

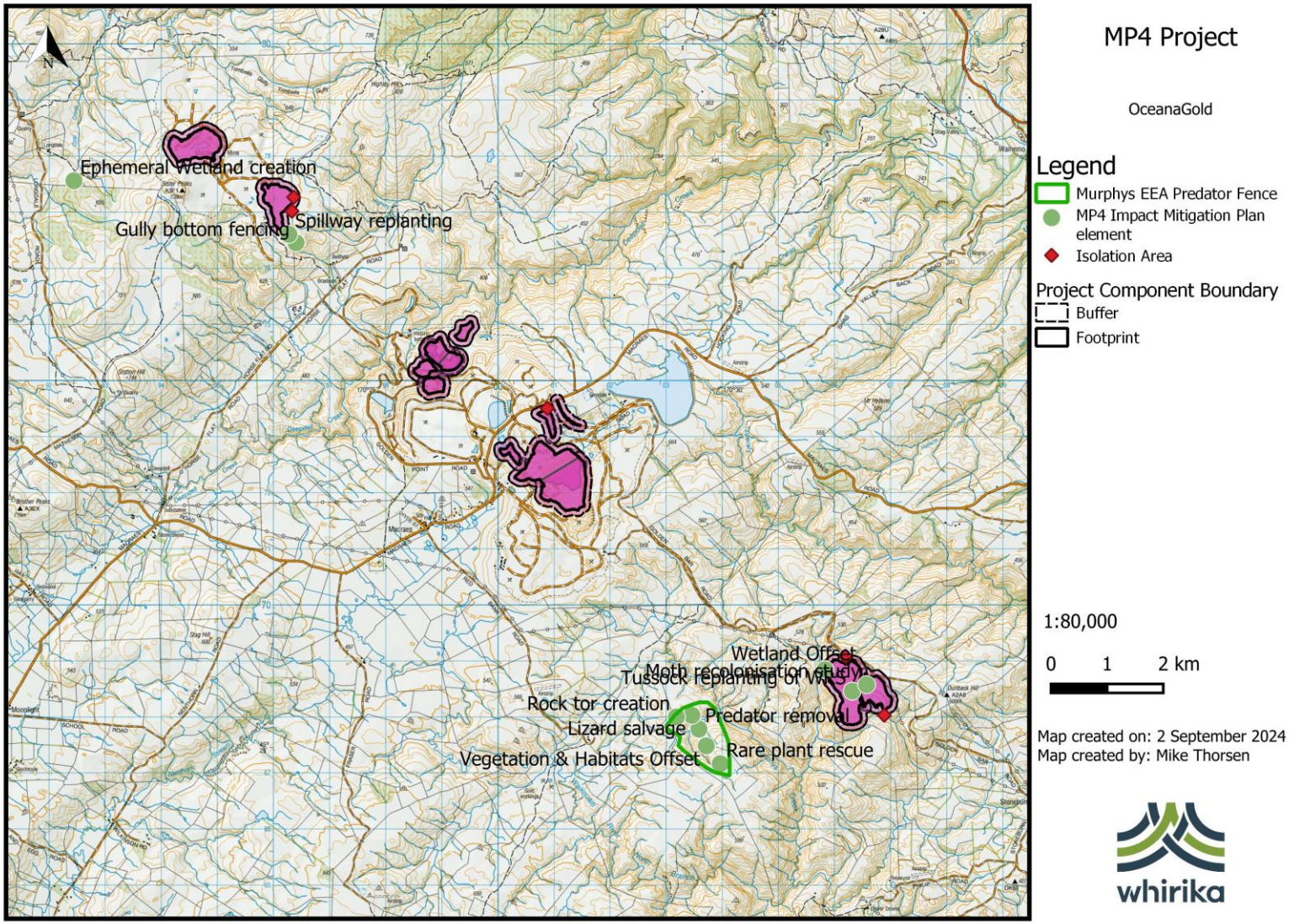

Figure 6.1: Locations of higher value ecological areas requiring isolation from Project activities.

6.3.2 Remediation

For those adverse effects that cannot be avoided, OceanaGold proposed the following by way of remediation:

- WRS lizard habitat rehabilitation;
- Golden Bar WRS tussock rehabilitation - 23 ha of the 48 ha extension of the Golden Bar WRS will be rehabilitated to 80% cover;
- New pit lakes in the Golden Bar, Innes Mills and Coronation pits;
- Rehabilitation of exotic vegetation communities inhabited by lizards; and
- Replanting the Coronation Spillway with narrow-leaved tussock grasses and *Celmisia hookeri* plants.

6.3.3 Mitigation

Where potential adverse effects cannot be avoided or remedied, OceanaGold has explored a range of potential mitigation measures to reduce the level of adverse effect. The following are proposed:

- Dust management via dust suppression;
- Noise management;
- Weed surveillance;
- Fire avoidance strategies and response measures;
- Erosion and sediment controls;
- Management to prevent accidental spillages;
- Protect against nuisance weed/algae introduction into waterways;
- Rescue of rare plants;
- Rescue of threatened invertebrate species;
- Salvage of lizards; and
- Salvage of the host plant for the moth *Orocrambus sophistes*, if presence of the moth is confirmed in pre-development surveys.

6.3.4 Management of residual adverse effects

The residual adverse effects following avoidance, remediation and mitigation are impacts on tussockland, riparian vegetation, lizards and lizard habitat, birds and bird habitats, invertebrate habitat, ephemeral wetlands and stream extent. Where residual adverse effects remain on areas within the Project footprint which exhibit significance, and these

effects are expected to be of a degree which is more than minor, OceanaGold is proposing to offset and compensate for these effects.

The details of the proposed offset and compensation package are contained within the Ecological Impact Management Plan prepared by Whirika (**Appendix 16**) and will be included in the proposed consent conditions, which OceanaGold intends to provide to the consent authorities prior to the applications being heard. The reporting in **Appendix 16** confirms that the proposed offsetting will be designed to achieve at least a no-net-loss outcome, and preferably, a net gain in indigenous biological diversity for those components which are being offset over 10 years.

The offsetting proposed by OceanaGold involves a shrubland offset, a tussockland offset and the creation of wetlands in a nearby area and creating an Ecological Enhancement Area. These are described further below.

6.3.5 Ephemeral wetland and wetland creation

The Coronation 6 pit extension will result in the loss of three existing ephemeral wetlands and may have some hydrological impact on a wetland in the buffer area. To manage this effect, OceanaGold propose to create up to five ephemeral wetlands, covering 0.3 ha, on the exotic grassland dominated spur on the Taieri Ridge west of the Coronation mining area (and away from the orebody) (refer **Figure 3.13**) by excavating shallow (approx. 1m below ground level) gently sloping, concave scrapes into the bedrock and seeding these with ephemeral wetland and wetland plant species into a peat base to form a continuous cover of native plant community before weed species become established. Two of these will be excavated to a deeper depth and with a deeper peat base to recreate the potentially impacted wetlands.

The location of the sites where the wetlands will be created will be selected to remove the risk that the wetland will be affected by potential future mine extensions and avoid damage to other ecological values. The sites will be fenced using a cattle exclusion fence and ongoing weed control will be implemented using the techniques found most effective at the Middlemarch Ephemeral Wetland EEA.[80]

The impacted wetlands within the buffer area will also be fenced using a cattle-exclusion fence, as above, to maintain accessibility to sheep to retain their role in preventing the short-stature native plant communities being overtopped by weeds.

The ephemeral wetland offset is expected to accrue biodiversity gains once the sites have been excavated and native plants reintroduced. The species that occupy this habitat are capable of rapid increase in numbers and covers (at some sites all plants die over summer

[80] The Middlemarch Ephemeral Wetland EEA was established as a compensatory measure in relation to the Deepdell North Stage 3 Project.

and the site is completely reclothed by growth from seed during spring). Therefore, the maturity of the offset may be as short as 3 years. However, weed invasion may delay this and require an extra 3-5 years before the local weed sources is depleted and the natural vegetation community becomes resilient to weed invasion.

A further wetland offset will be undertaken for the two wetlands (0.07 ha total) in the Innes Mills Stage 10 buffer area which may be dewatered as a result of MP4. The potential loss of these wetlands will be offset by the creation of a new wetland of 0.1 ha at the perimeter of the MEEA. The new wetland will be designed to have 50% cover of indigenous species. The wetland offset is expected to accrue biodiversity gains once waterflow is impeded and once planting of indigenous wetland species begins and maturing within five years.

6.3.6 Establishment of The Murphys Ecological Enhancement Area

OceanaGold currently manages 13 ecological covenants and eight protected wetlands near the Macraes site, covering a total of 655 ha. Other protected areas in the vicinity of the Project site include the Deighton Creek Nature Reserve (590 ha), the Redbank Scenic Reserve (1,452 ha) and the Manuka Stream Conservation Area (332 ha). These areas are identified in **Figure 6.2** below. Combined, these areas provide for a total of 3,029 ha of legally protected land in the Macraes ED. This protected land equates to 2.4% of the Macraes ED and is similar to the proportion protected in the ecologically similar nearby Manorburn Ecological District.

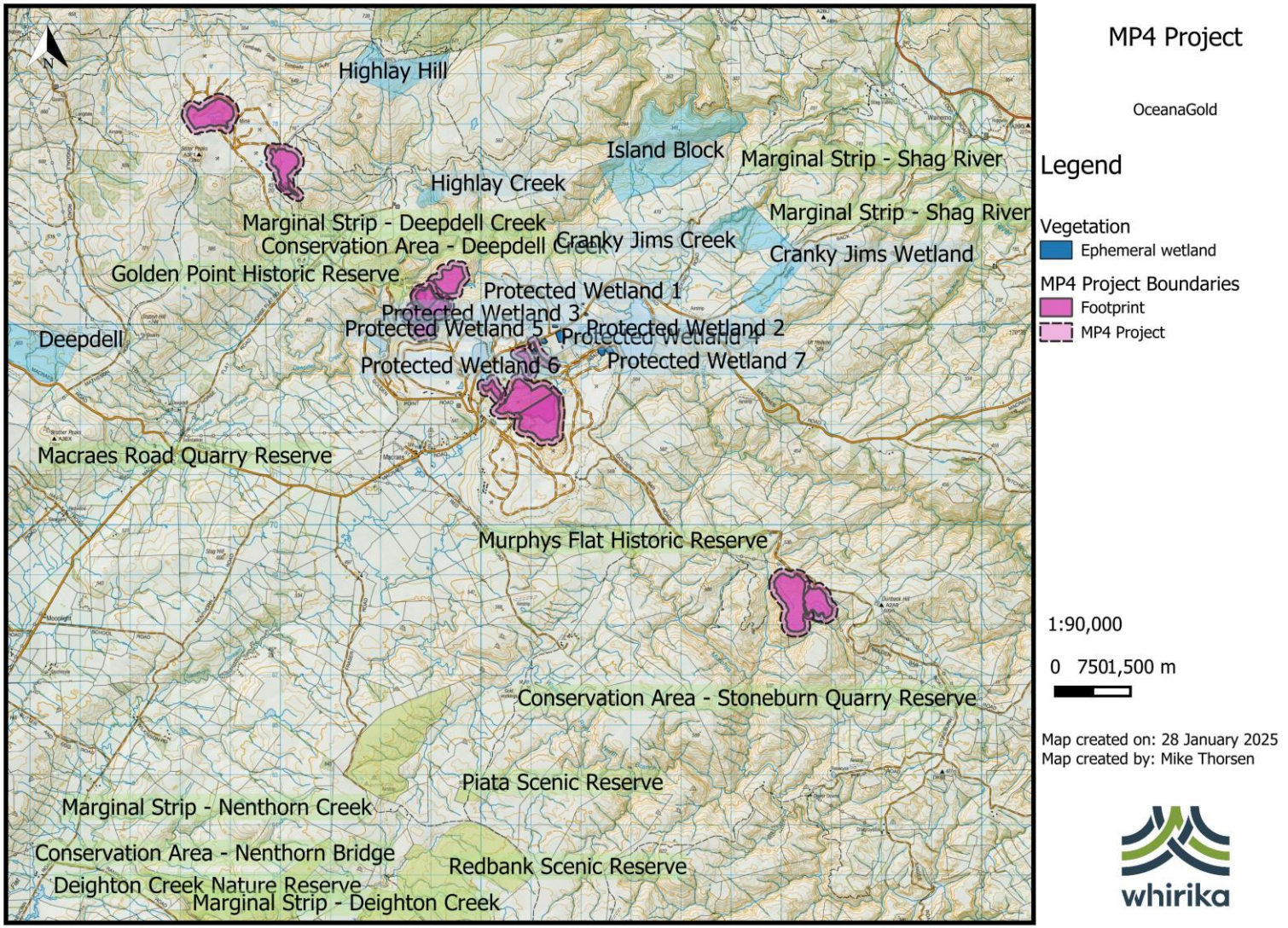

Figure 6.2: Location of OceanaGold (blue) and DOC (green) protected areas relative to the MP4 Project components (purple).

OceanaGold proposes to develop a further multi-use ecological enhancement area – The MEEA to offset and compensate for the majority of residual adverse effects. Activities proposed in this area will address the impacts of the project on narrow-leaved tussock grasslands, streams riparian / wetland vegetation mosaics, shrubland and to provide habitat for birds (including taoka species), invertebrates, and reptiles. This will also be the relocation site for the lizards which will be salvaged, under a wildlife permit, from the MP4 Project area footprint.

The MEEA will be established in the Murphys Creek catchment. The 'working' location of MEEA is indicatively illustrated in **Figure 6.3** and the general condition of the area captured in **Figure 6.4**. It will involve setting aside an area of at least 45 ha which also meets the following requirements:

- Supports the construction of a predator fence around at least 45 ha of suitable lizard habitat;
- Contains at least 39 ha of tussock grassland at 15% average cover;
- Contains space to establish 0.5 ha of new shrubland, and adjoining areas of riparian / wetland vegetation mosaic; and
- Protects at least 860 m of ephemeral watercourse.

Seven potential sites were considered for the location of the EEA, including Deepdell Station Ecology Covenant, Highlay Creek Ecology Covenant, Highlay Hill Covenant, Cranky Jim's Ecology Covenant, Cranky Jim's Wetland Open Space Covenant, Island Block Covenant and MEEA. MEEA was selected on the basis of its proximity to the Golden Bar and Innes Mills pits, the similarity of habitat to that being affected by the Project, and also best fulfills site selection criteria for lizard salvage or translocation activities. It is an area of farmland that retains areas of semi-natural vegetation that has been degraded by ongoing grazing, weed invasion (particularly by gorse) and a recent fire that has severely damaged the shrublands and tussock grassland. The site is comparable in elevation (excluding the higher elevation Coronation 6 area) and general character to the sites within the Project area, though there is a greater predominance of rock outcrops and tors. This is viewed as a positive attribute and the site was known to recently harbour Otago skinks at two sites and these may still be present. A number of other features are present in the site, including populations of other rare plants.

The working area for the MEEA contains biodiversity that is of similar character to that being lost, and visually appears to be of better quality, showing a higher diversity of species and other inherent ecological values.

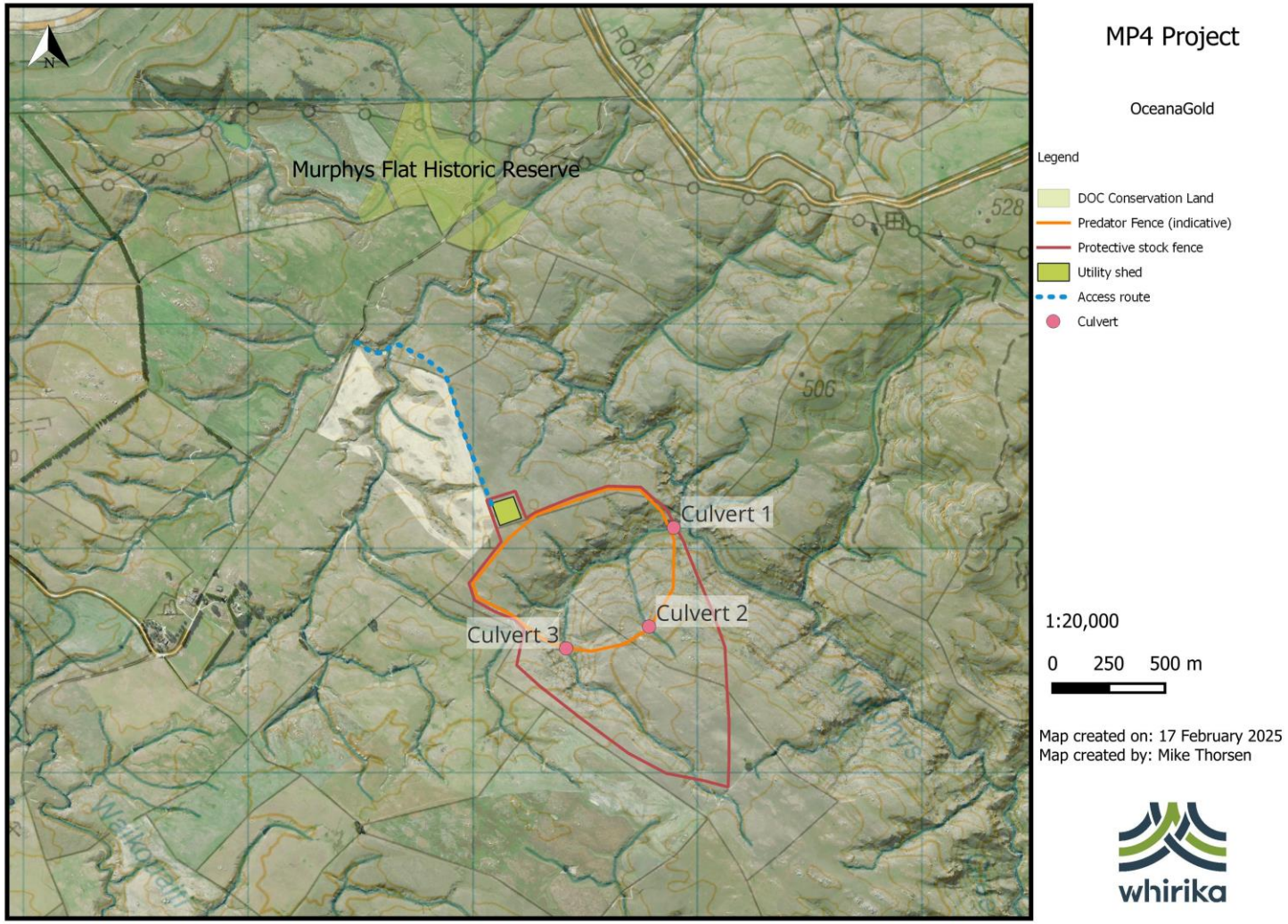

Figure 6.3: The proposed location of Murphys Ecological Enhancement Area. Golden Bar Road is at the top of the figure.

Figure 6.4: Photo overlooking the proposed Murphys EEA. View is down the main valley in the north.

6.3.7 Offsetting actions at the MEEA

The actions proposed at the MEEA are described in detail in the Ecological Impact Management Plan and are summarised below. Whirika used a disaggregated accounting model to calculate the extent of works required within the EEA to achieve at least a state of no net loss of biodiversity, and preferably a net gain in biodiversity, over the 10-year timeframe of the offset.

Important components of the offsets and offset site are:

- Legal protection in perpetuity;
- sufficient size to compensate for uncertainties in ecological outcomes;
- Satisfy the offset criteria detailed in the RPS;
- Will have funding to support the management over the term of the offset;
- Will involve the Macraes community and Iwi together with DOC and Councils in the offset design and placement;
- Will incorporate the Science and Traditional Knowledge offset principle by including matauraka Māori and Macraes community knowledge of biodiversity management in the Macraes Area;

- Will incorporate the Equity offset principle by sharing the risks and benefits between the farming community, DOC and Councils; and
- Will be managed with ecological oversight.

The Murphys EEA will provide offsets for tussockland, riparian vegetation and shrubland, and a large part of the Lizard Enhancement Project. This will also address the impact on the 'Declining' matagouri and some components of the invertebrate and bird communities through protecting areas inhabited by these species.

To offset the effects on 0.06 ha of shrubland in the Golden Bar WRS footprint and the indirect effects on 0.31 ha of shrubland bordering the Golden Bar Pit and WRS and the Golden Point Backfill Buttresses, a 0.5 ha area of shrubland, will be created by planting with additional diversity of shrub species at one site in Murphys EEA to produce a gain in both species diversity (to five additional species) and resulting in a canopy cover of 75% within ten years. The offset site will be protected from woody weeds for the 35 year term of the offset. For the shrubland offset, the gains will begin to accrue once the shrubs are planted, and it is expected that maturity of the shrubs will take 10-20 years and by that time they will be providing a shaded habitat for understory herbs.

The residual effect of the Project on 21.2 ha of the affected 32.6 ha of tussockland and its inhabitants will be addressed by creating a tussockland offset of at least 39.3 ha over an area of existing tussock grassland that is currently at 15% tussock cover increasing average tussock cover to 50% by increasing stature of existing tussock plants (that have previously been damaged by fire) by managing the degree of grazing and, if necessary, creating new areas of tussock grassland by facilitating natural regeneration and/or planting of nursery-grown eco-sourced and appropriately hardened stock within 30 years. The offset will be achieved by:

- Managing or excluding stock to allow natural tussock regrowth and regeneration and recovery of inter-tussock diversity as a shade-providing tussock canopy;
- Removing gorse and keeping the area free of woody weeds and other environmental weeds; and
- Regular control of pigs, goats (if present), rabbits and hares using either shooting or poisoning campaigns.

For the tussock grassland offset, gains are expected to accrue once destocking has occurred and the necessary increase in tussock cover will mostly through regrowth of existing tussock plants and will be reached in 5-10 years. Further increases in cover will be through a combination of natural regeneration and direct planting as it will be 10-20 years before the tussock would be 'mature'. If necessary, enhancement planting will be undertaken in areas where tussock cover is not reaching offset targets.

The implementation and management of the offsetting actions at the MEEA will be documented in an Ecological Enhancement Area Management Plan ("**EEAMP**"). The EEAMP will include:

- A description of the offset, the calculation basis, locations and management activities at which enhancements will be generated;
- Securing the ability to undertake enhancement works within management sites by way of landowner agreements or covenants;
- The technical detail of the management activities;
- The financial costs of site management into bond calculations or other similar instruments as required by Council that secure financial delivery of biodiversity enhancements;
- A monitoring programme to assess the degree to which enhancement targets are being achieved and the ability to adjust biodiversity management to ensure that gains are achieved and maintained for the long term;
- The roles and responsibilities of those carrying out the work, and the governance and management structures relating to the operation of the enhancement site(s); and
- Reporting the results of monitoring and a process for undertaking actions if enhancement targets are not being achieved as anticipated.

6.3.8 Ecological Compensation

Because it is technically complex to calculate lizard and bird populations at the impact sites, in some cases, No Net Loss or a Net Gain cannot be reliably calculated and an offset cannot be proven. Therefore, in addition to the offsetting described above, OceanaGold also propose ecological compensation to address residual adverse effects on lizards and birds. It is considered that the compensation planned for lizards will benefit birds as well. Ecological compensation that will be adopted by OceanaGold is described in the sections below.

Predator Control

Pest control will be one of the main tools employed to address the effects on lizard and bird population. This will also provide benefits for vegetation and supports the lizards salvage action described in the LMP.

The focus of the proposed predator control will be using predator removal within a predator fence around at least 45 ha of suitable lizard habitat within the MEEA. The predator removal area will extend over the entire MEEA within which the populations of all target predators will be practically eradicated and maintained as close as reasonably practicable to zero (this may require episodic control of mice 'breakouts' within the area).

All predator control activities, including their eradication within the fence, will be directed by a Predator Control Plan.

Lizard Enhancement Project

While classified as compensation, the effect of the MP4 Project on lizard populations will be addressed under an offset framework and will involve predator control to benefit lizard populations and to achieve a target, Net Gain lizard population size. The lizard population target has several components including addressing uncertainty, measuring the impact on affected populations, measuring baseline population and change, and averted loss. These aspects are all addressed in the Lizard Management Plan ("**LMP**") and the Ecological Impact Management Plan and together these are part of the lizard offset calculation.

Additional details of contingency measures regarding lizard salvage that will be employed as (and if) required are outlined in the LMP.

Rock Tor Replacement

While the effectiveness of rock tor creation is unknown, it is currently the only technique available to address the loss of rock tor habitat of lizards (and also invertebrates and birds to a degree). At least two rock tor designs are currently being trialled at Macraes. The initial results of these trials will be used to inform the best design for replacement rock tors. It is proposed to use locally sourced plate schist to create approximately 35 replacement rock tors to an agreed design at MEEA along the existing access road (to minimise the impact of rock transport).

Bird Enhancement Project

The bird enhancement project will focus on enhancement of the local population of pīhoihoi / New Zealand pipit as a surrogate for other bird species that occur in the area. While site rehabilitation and many other activities outlined in the Ecological Impact Management Plan are also likely to benefit pīhoihoi, the predator removal within the proposed predator fence will be used to achieve a net gain in the number of pīhoihoi. The Net Gain target will be informed using the number of pīhoihoi recorded in pre-works walk through counts during the breeding season to produce an estimate of the territorial pair population resident within the MP4 Project area.

Research into invertebrate community response to habitat protection

The response of the invertebrate communities of the MEEA to changes in their tussockland habitat will be monitored. This monitoring will start at the commencement of the Project to establish a baseline, and occur for three years, every 10 years.

If the presence of Threatened moth *Orocrambus sophistes* is confirmed at Golden Bar WRS by pre-development surveys, a specific research programme into this species will be

undertaken. The research programme will be centred around understanding the habitat usage and population dynamics of the moth.

Riparian / wetland vegetation mosaic protection and enhancement

The effects on 1.63 ha of riparian / wetland vegetation mosaic and on 430 m of stream bed will be addressed by:

- including at least 2.15 ha of riparian / wetland vegetation mosaic with 38% cover by indigenous species in the MEEA; and
- the protection of at least 860 m of equivalent or better watercourse habitat within the MEEA.

The site 2.15 ha site will be managed by removing all fringing woody weeds and keeping the site clear of woody weeds and wetland weeds. To achieve a no net loss offset target of 40% improvement from the current state, planting of 500 riparian shrub species is proposed along the margins of the riparian / wetland mosaic in the lower reaches of MEEA to produce stream reaches with shaded margins.

The 860 m of stream length will be at a site protected by a stock fence and protected from invasion by woody riparian tree weed species (e.g. willow).

A monitoring programme will be implemented as part of the Ecological Impact Management Plan and EEAMP. This monitoring will focus on:

- Documenting long-term changes in lizard populations within the MEEA, particularly in areas where salvaged lizards have been released;
- Documenting long-term changes in bird populations, particularly of uncommon or taoka species, in the MEEA;
- Long-term monitoring of invertebrate communities in the MEEA and Golden Bar WRS tussock rehabilitation in comparison with un-managed site(s) utilising pitfall trapping and light trapping;
- Monitoring the quality of vegetation (community composition, ground cover, structure, weediness, pest damage) in the MEEA in comparison with un-managed site(s) using permanent plots;
- Monitoring of establishment and survival of rescued plants;
- Monitoring of re-establishment of tussock grassland at Golden Bar WRS measuring community composition, ground cover, structure, weediness, pest damage;
- Environmental weed surveys and monitoring;
- Annual inspections of MEEA to increase knowledge of the biodiversity at the site; and

- Pest animal removal effectiveness.

6.3.9 Rehabilitation

OceanaGold is required by its existing resource consents to rehabilitate disturbed areas at closure of the mine and progressively throughout operations. Whilst the dominant post mining land use is likely to be pastoral farming, this rehabilitation also provides the opportunity for biodiversity values to be re-established on the rehabilitated land where appropriate. In addition to the targeted rehabilitation outlined in Table 6.1 for the purpose of managing ecological effects, general mine rehabilitation may provide additional biodiversity benefits that are not quantified or accounted for.

7. ASSESSMENT OF ALTERNATIVES

7.1 INTRODUCTION

Under the RMA, consideration of alternative locations and methods is relevant in certain respects, including:

- Schedule 4 requires an AEE to include a description of any possible alternative locations or methods for undertaking the activity where it is likely that the activity will have a significant adverse effect on the environment;
- Where an activity includes the discharge of a contaminant, Schedule 4 also imposes an obligation on an applicant to provide a description of any possible alternative methods of discharge, including discharge into any other receiving environment; and
- Similarly, section 105 of the RMA requires decision makers to have regard to various matters including "*any possible alternative methods of discharge, including discharge into any other receiving environment*" and section 108 sets out that a condition may be imposed on a discharge permit requiring the consent holder to adopt the best practicable option in order to prevent or minimise any actual or likely adverse effects on the environment associated with the discharge.

7.2 PROJECT OBJECTIVES AND ALTERNATIVES ASSESSMENT

OceanaGold is continually reviewing the expected life of its mining operations at Macraes in light of factors such as the ore/gold resource, the cost of mining and the forecast price of gold. Near mine exploration success has highlighted opportunities for expansion of several mine areas. The MP4 Project has been developed as a result of this, and it is expected that if it proceeds, it will supplement production from consented mines, and extend the mine life at Macraes to around 2030.

Mining activities by their nature are constrained by the location of the (gold bearing) ore body – the mineral resource. Macraes mines a well-defined, low grade ore body in the Hyde-Macraes Shear Zone. Extending established pits, whether underground or open pit, to take advantage of the historic investment in mine development, infrastructure assets and resource consents represents the most feasible approach to mining. This means Macraes Life of Mine ("**LOM**") plan is predicated on a brownfield mine development strategy which mines deeper ore at marginal cost. Greenfield sites would be much more challenging to justify economically and are therefore not practicable alternatives to the current proposal.

OceanaGold is however conscious that this important mineral resource is co-located with other important values within the natural environment and the extraction of the mineral resource needs to be undertaken in a manner that avoids, to the extent that it is able and

practicable to do so, significant adverse effects on those other values. With this in mind, OceanaGold has assessed alternatives, including differing mining methodologies and the siting of infrastructure associated with the proposed mining activities.

7.2.1 Mining Methodology – Open pit vs Underground

The proposed open pit mining is not expected to have any significant adverse effects on the environment, however, it is acknowledged that underground mining has a number of advantages to open pit mining, including reduced surface effects, and a reduction in amenity issues such as noise, dust and visual effects. However, underground mining is considerably more technically challenging and expensive and less productive and less flexible, or scalable, than open pit mining) and the average ore grade for the MGP, including MP4 is not sufficient to make underground mining of the ore body targeted by the proposed open pit extensions economically feasible. Underground mining is often used to target areas of ore body that cannot be accessed by open pit mining due to technical, environmental or economic barriers, or is used to maximise ore recovery where economic circumstances permit.

7.2.2 Frasers Tailings Storage Facility

The proposed activities at Frasers Open Pit involve the discharge of freshly milled tailings into the FTSF Stage 2. While the discharge of tailings to FTSF Stage 2 will not result in any significant adverse effects on the environment, the alternatives considered by OceanaGold for Frasers TSF Stage 1 remain relevant to Stage 2. These alternatives included constructing a new TSF within the Cranky Jims or Lower Tipperary catchments. However, these options were not taken further as they would require substantial new surface disturbance which would have resulted in greater environmental effects, particularly on freshwater resources and indigenous biodiversity.

7.2.3 Waste Rock

As an alternative to discharging waste rock from Golden Bar pit extension to the existing Golden Bar WRS, OceanaGold considered disposing of the waste rock in the headwaters of the stream to the north of the site. This had some advantages in that the waste rock would not need to be hauled as high, therefore, resulting in lower operating costs and less visual impact. However, this option was discounted due to the greater ground disturbance and stream bed / water course disturbance that would result from this activity. Priority was given to avoiding these areas as discussed in Section 6.2.

At the Coronation Pit, OceanaGold had initially considered disposing of waste rock by backfilling the C05 pit void which resulted in a much shorter waste rock haulage route. The proposal to infill the existing Coronation North Pit void will address some pit wall instability and also has the benefit of retaining contaminants from the waste rock largely

within the existing pit, considerably limiting the potential release to the environment via seepage.

7.2.4 Section 105 of the Resource Management Act 1991

Section 105 of the RMA sets out additional matters which must be considered by a consent authority when considering an application for a discharge permit. Section 105(1) of the RMA states:

> *"If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—*
>
> *a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
>
> *b) the applicant's reasons for the proposed choice; and*
>
> *c) any possible alternative methods of discharge, including discharge into any other receiving environment."*

All of the relevant matters set out in section 105(1) of the RMA are addressed in this AEE and are summarised in **Table 7.1** below. In particular, the nature of all discharges to the environment are detailed in Section 3 of this AEE, while the sensitivity of the receiving environment to adverse effects is discussed in Section 5 and in the appended technical assessments. However, it is concluded that the proposed discharge of contaminants to air, land and water (via seepage, runoff, and overflow) are the best practicable option for managing the activities associated with the MP4 Project and any potential effects on the environment.

Table 7.1: Alternative effects assessment for the proposed discharges.

Discharge	Receiving Environment	Alternative Methods of Discharge
Discharge of contaminants to air.	The rural airshed within which the MGP is located.	There are no practicable alternative methods for discharging particulate matter and machinery exhausts to air.
Discharge of tailings to land and to water within Frasers Pit.	Frasers Pit void	The effects arising from the discharge to land and to water and potential for seepage into the downstream receiving environment in the preferred location for the Tailings Storage Facility are considered to be less than minor. Alternative locations for tailings disposal have been considered, as

Discharge	Receiving Environment	Alternative Methods of Discharge
		discussed above, and it was determined that alternative locations would give rise to a higher degree of impact on adjoining streams and areas of biodiversity value.
Discharge of waste rock and contaminants from waste rock to land in existing pits where it may enter water.	Open pit voids at Coronation, Coronation North, Golden Bar, Frasers Pit, Innes Mills Pit and Golden Point Pit.	The effects arising from the discharge to land and potential for seepage and runoff into the downstream receiving environment in the preferred location for backfilling activities are considered to be less than minor. Alternative locations for the waste rock disposal have been considered as discussed above, and it was determined that alternative locations could potentially give rise to a higher degree of impact on amenity values and adjoining streams and areas of biodiversity value.
Discharge of waste rock and contaminants from waste rock to land outside existing pits where it may enter water.	Land currently occupied by the Frasers WRSs, Coronation WRS, Coronation North WRS, Trimbells WRS, and Golden Bar WRS, including land adjacent to the Golden Bar WRS within the Murphys Creek (Clydesdale Creek) catchment, including an ephemeral watercourse and a very small area of natural wetland vegetation.	The effects arising from the discharge to land and potential for seepage and runoff into the downstream receiving environment in the preferred locations for waste disposal in existing Waste Rock Stacks (Frasers WRSs, Coronation WRS, Coronation North WRS and Trimbells WRS) are already authorised by existing consents. Where new areas of waste rock disposal are required (Golden Bar WRS), alternative locations have been considered as discussed above. While the proposed WRS extension at Golden Bar has some more than minor residual adverse effects on areas of significance it was determined that an alternative location for the Golden Bar WRS extension would give rise to a

Discharge	Receiving Environment	Alternative Methods of Discharge
		higher degree of impact on other significant features such as higher value wetlands, adjoining streams and areas of biodiversity value (including potential lizard habitat and areas occupied by rare plants). The WRS was redesigned to avoid these features to the extent practicable.
Discharge of contaminants from the base of toe of the WRS.	As above.	As above.
Discharge of water containing contaminants from silt ponds to local waterways.	Tributaries of Deepdell Creek and the Waikouaiti River North Branch.	Silt ponds are a tried and proven method for managing both seepage and runoff from WRSs. At times of particularly low flow, there is potential for the discharge of untreated silt pond water to local waterways to result in significant adverse effects on water quality and associated effects on aquatic ecology. OceanaGold proposes to continue controlling the discharge of seepage water from select silt ponds during times of low flow in waterways to avoid significant adverse effects (refer Section 6.). The alternative method considered is to let all silt ponds overflow naturally.
Discharge of water containing contaminants from Golden Bar Pit to local waterways.	Tributaries of the Waikouaiti River North Branch.	OceanaGold proposes to pump the majority of water currently contained in Golden Bar Pit to other locations for use in the Mine Water Management System. Some of this water will be discharged to local waterways in a manner that does not result in more than minor degradation of water quality whilst ensuring compliance with existing in stream compliance criteria. The alternative is to pump all pit water to local waterways which may

Discharge	Receiving Environment	Alternative Methods of Discharge
		result in significant adverse effects on water quality and associated effects on aquatic ecology, particularly if the rate of discharge is too high.

8. CONSULTATION

8.1 STATUTORY MATTERS

Consultation in the RMA sense has been clearly articulated through case law over time as follows:

> *"Consulting involves the statement of a proposal not yet finally decided upon, listening to what others have to say, considering their responses and then deciding what will be done."* [81]

And;

> *"(i) The nature and object of consultation must be related to the circumstances.*
>
> *(ii) Adequate information of a proposal is to be given in a timely manner so that those consulted know what is proposed.*
>
> *(iii) Those consulted must be given a reasonable opportunity to state their views.*
>
> *(iv) While those consulted cannot be forced to state their views they cannot complain, if having had both time and opportunity, they for any reason fail to avail themselves of the opportunity.*
>
> *(v) Consultation is never to be treated perfunctorily or as a mere formality.*
>
> *(vi) The parties are to approach consultation with an open mind.*
>
> *(vii) Consultation is an intermediate situation involving meaningful discussions and does not necessarily involve resolution by agreement.*
>
> *(viii) Neither party is entitled to make demands.*
>
> *(ix) There is no universal requirement as to form or duration.*
>
> *(x) The whole process is to be underlain by fairness."*

Although there are no specific statutory requirements for consultation under the RMA,[82] OceanaGold values its relationships with key stakeholders and is committed to consulting with these parties, particularly for a project of this nature and scale. It also makes sense to conduct a careful and strategic consultation process that informs the AEE. In particular, Clause 6(1)(f) of the Fourth Schedule of the RMA requires that an AEE must include identification of the persons affected by the activity, any consultation undertaken and any response of the views of any person consulted. As such, this information is included in Sections 8.3 – 8.9 below.

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[81] West Coast United Council v Prebble (1988) 12 NZTPA 399.

[82] Reference to consultation is set out in the Fourth Schedule (persons affected by the application must be identified, any consultation undertaken, and any response to the views of any person consulted must be set out), and with reference to section 8 – Treaty of Waitangi.

8.2 NOTIFICATION

OceanaGold requests that this consent application is publicly notified pursuant to s.95A(3)(a) of the RMA. As such, the public will be provided with an opportunity to make a submission and engage with OceanaGold further.

8.3 CONSULTATION PROCESS

In relation to MP4, OceanaGold commenced consultation with key stakeholders and potentially affected parties in 2022. A record and summary of this ongoing consultation is set out in the sections that follow.

8.4 DEPARTMENT OF CONSERVATION

Several meetings and site visits were conducted with Department of Conservation ("**DoC**") to discuss the proposal, including:

- 27 March 2023 – Site visit to Murphys EEA and meeting with Alexandra and National DoC staff in conjunction with ORC and WDC to discuss the MP4 proposal and visit the open pit extensions;
- 16 June 2023 – MP4 overview presentation to DoC staff in conjunction with ORC, WDC and DCC and site visit to open pit mine extensions;
- 11 September 2023 – Meeting and presentation to DoC staff[83] to discuss the MP4 scope change, baseline monitoring, Murphys EEA and Wildlife Act authority application;
- 8 March 2024 – Site visit and meeting with Dunedin and National staff to discuss Murphys EEA and open pit extension areas and Wildlife Act authority application; and
- There have also been numerous emails, pertaining both to the MP4 resource consent application and the Wildlife Act authority, and specific discussions on the Wildlife Act Authority and OceanaGold has provided draft copies of the Assessment of Effects on Vegetation and Avifauna report, Herpetofauna Survey and Assessment report, Lizard Management Plan and Ecological Impact Management Plan to DoC to enable them to better understand the project.

8.5 IWI

A series of meetings and site visits were conducted with Iwi and / or its representatives to discuss the proposal, including:

[83] DoC staff: Warren Chinn, Richard Clayton, Tracey Grose, Murray Brass, Jenna Sinclair, Pene Williams, Lynn Adams, Herb Familton.

- 23 June 2022 – Meeting with representatives of Kāti Huirapa Rūnaka ki Puketeraki and an expert consultant to discuss MP4 consenting including the potential reinstatement of the NBWR;
- 4 August 2022 – Provided progress update on MP4 to Aukaha representative;
- 4 May 2023 – Site visit and hui with Korako Edwards of Aukaha and runaka representatives Charlotte Boyt and Brendan Flack;
- 21 August 2023 - Discussion with Aukaha on the scope, timeframes and need for a CIA;
- 3 October 2023 – Aukaha updated on MP4 and consenting;
- 1 December 2023 – Correspondence with Aukaha regarding CIA;
- 9 January 2024 – Correspondence with Aukaha regarding MP4 and CIA;
- 13 March 2024 – Discussion with representative of Kāti Huirapa Rūnaka ki Puketeraki regarding information for MP4 consent application and seeking kanohi-te-kanohi hui; and
- 26 March 2024 – Correspondence with Aukaha regarding CIA.
- 12 July 2024 - Site visit and hui with representatives from Kāti Huirapa Rūnaka ki Puketeraki and Aukaha
- 3 October 2024 – Hui between OceanaGold and representatives from Kāti Huirapa Rūnaka ki Puketeraki and Aukaha at the Aukaha office In Dunedin. As part of a broader discussion on our relationship and how we can improve it, a specific update was given, and discussion was had regarding MP4.
- 10 February 2025 - Hui between OceanaGold and representatives from Kāti Huirapa Rūnaka ki Puketeraki at the OceanaGold office in Dunedin. An update on MP4 was given as part of this discussion.

In consultation with Rūnaka, OceanaGold has recently developed a process agreement which sets out the planned engagement (and principles of engagement) and sets the structural foundation for how and when OceanaGold engages with Runaka including engagement on consenting projects. It is expected that identification of any specific cultural values that are relevant to the consideration of the MP4 Project will occur in the near future through the completion of the MP4 CIA. OceanaGold will provide the completed CIA to WDC, ORC and DCC upon its receipt.

8.6 WAITAKI DISTRICT COUNCIL, OTAGO REGIONAL COUNCIL AND DUNEDIN CITY COUNCIL

OceanaGold has had early and ongoing consultation with regulatory authorities. The meetings and site visits that have occurred prior to lodgement are set out below.

- 27 March 2023 – Site visit with representatives from ORC, WDC and DoC;
- 1 June 2023 – Pre-application meeting with ORC to discuss the resource consents to be varied and the new consents required for the MP4 proposal;
- 16 June 2023 – Site visit and meeting in conjunction with ORC, WDC, DCC and DoC to discuss the MP4 proposal and visit the open pit extensions;
- 30 June 2023 – Pre-application follow-up meeting with ORC;
- 5 September 2023 – Presentation to ORC, WDC and DCC staff[84] on the MP4 scope and application timing changes;
- 20 October 2023 – Teams meeting with Shay McDonald of the ORC regarding Frasers Co-disposal-MP4 scope changes;
- In addition to these meetings, OceanaGold provided draft copies of reports, where possible, to enable Council staff and their technical experts to become familiar with the project and provide any feedback on the assessments if required; and
- OceanaGold has met with and otherwise liaised with the Councils on various matters since the application was first lodged. This has included several site visits with ORC and WDC and their technical auditors to inform s92 requests, including most recently a site visit to the MEEA on 25 November 2024.

8.7 FISH AND GAME

OceanaGold has an ongoing and active relationship with Fish and Game New Zealand ("**F&G**"). A summary of meetings related to the proposal are below.

- 26 June 2023 – Teams meeting with Nigel Paragreen of F&G to discuss the MP4 proposal.
- 29 September 2023 –Telephone call with Nigel Paragreen of F&G regarding the scope change of the MP4 proposal and discussing information sharing arrangements.

[84] Rebecca Jackson; Shay McDonald; Marian Weaver; Campbell Thomson.

8.8 LOCAL COMMUNITY

OceanaGold has an ongoing and active relationship with its adjoining landowners, lessees and the local community and OceanaGold has regularly consulted with and informed them, as well as Macraes Community Incorporated, of its Project intentions and impact.

OceanaGold has consulted with the owner and occupier of 1668 Macraes Road regarding amenity effects resulting from MP4 and has obtained the written approval of this person.

8.9 PUBLIC DROP-IN SESSION

In addition to the consultation outlined above, OceanaGold held a public drop-in session at the Macraes Village Cricket Pavilion on 20 March 2024 from 3pm to 7pm. The drop-in session was hosted by OceanaGold and its key expert consultants (GHD, Whirika, and Greg Ryder Consultants) to provide the public with an opportunity to learn more about the project and discuss any issues or concerns.

Information made available to the public at the drop-in session and online included Project maps and fact sheets outlining the key effects at a high level.

9. STATUTORY ASSESSMENT

9.1 INFORMATION REQUIREMENTS

Section 88(2) of the RMA stipulates that a resource consent application must be made in the prescribed form and manner. It must also include an assessment of environmental effects in such detail as corresponds with the scale and significance of the effects that the activity may have in accordance with Schedule 4 of the RMA.

The resource consent applications for the MP4 Project are in the prescribed form as set out in Form 9 and Form 10 of Schedule 1 to the Resource Management (Forms, Fees, and Procedure) Regulations 2003. OceanaGold has also complied with the application form requirements of the District Councils and the Regional Council.

With respect to the information requirements in Schedule 4 of the RMA, it is noted that Clauses (2), (3), (6) and (7) specify information requirements that are directly relevant to the resource consent applications required for the MP4 Project. These matters have been addressed throughout this AEE and in the relevant technical assessments.

9.2 SECTION 104D OF THE RESOURCE MANAGEMENT ACT 1991

As outlined in Section 4 of this AEE, the Project is classified as a non-complying activity because of the non-compliance with the Waitaki District Plan critical zone standard for noise.

Section 104D of the RMA establishes restrictions on the ability of a consent authority to grant resource consents for non-complying activities. It states:

> *(1) Despite any decision made for the purpose of notification in relation to adverse effects, a consent authority may grant a resource consent for a non-complying activity only if it is satisfied that either—*
>
> *(a) the adverse effects of the activity on the environment (other than any effect to which section 104(3)(a)(ii) applies) will be minor; or*
>
> *(b) the application is for an activity that will not be contrary to the objectives and policies of—*
>
> *i. the relevant plan, if there is a plan but no proposed plan in respect of the activity; or*
>
> *ii. the relevant proposed plan, if there is a proposed plan but no relevant plan in respect of the activity; or*
>
> *iii. both the relevant plan and the relevant proposed plan, if there is both a plan and a proposed plan in respect of the activity.*
>
> *(2) To avoid doubt, section 104(2) applies to the determination of an application for a non-complying activity.*

The objectives and policies of the Waitaki District Plan are identified and assessed in Section 9.17 of this AEE. As is noted in that section, the proposed activities will not be contrary to the objectives and policies of the Waitaki District Plan. Therefore, the second gateway test at Section 104D(1)(b) can be passed. Section 104D requires that only one limb of the gateway test be passed and as such, Section 104D is not an impediment to the granting of the resource consents sought.

In light of the above, it is not necessary to form an overall conclusion as to whether the adverse effects of the Project on the environment will be 'no more than minor' in order to satisfy the first gateway test of Section 104D(1)(a). However, as discussed in Section 5 and summarised in Section 5.19, apart from some residual adverse effects on wetlands, streams, and terrestrial ecology, all other adverse effects arising from the proposed activities will be no more than minor.

9.3 SECTION 104 OF THE RESOURCE MANAGEMENT ACT 1991

Section 104 of the RMA identifies the matters that a consent authority must have regard to, subject to Part 2 of the Act, when considering an application for resource consent. It states, relevantly:

> *(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2 and section 77M, have regard to–*
>
> *(a) any actual and potential effects on the environment of allowing the activity; and*
>
> *(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and*
>
> *(b) any relevant provisions of—*
>
> *(i) a national environmental standard:*
>
> *(ii) other regulations:*
>
> *(iii) a national policy statement:*
>
> *(iv) a New Zealand coastal policy statement:*
>
> *(v) a regional policy statement or proposed regional policy statement:*
>
> *(vi) a plan or proposed plan; and*
>
> *(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*
>
> *(2) When forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.*

(2A) When considering an application affected by section 124 or 165ZH(1)(c), the consent authority must have regard to the value of the investment of the existing consent holder.

...

(2F) When considering an application and any submissions received, a consent authority must not have regard to clause 1.3(5) or 2.1 of the NPSFM 2020 (which relates to the hierarchy of obligations in the NPSFM 2020).

(2G) Subsection (2F) applies despite subsection (1)(b)(iii) and any other provision of this Act.

...

Section 104 of the RMA does not give primacy to any of the matters to which a consent authority is required to have regard. All of the relevant matters are to be given such weight as the consent authority deems appropriate in the circumstances, and all matters listed in section 104(1) are subject to Part 2 of the RMA (which is further discussed in Section 9.20 of this AEE). Note that because of the Resource Management (Freshwater and Other Matters) Amendment Act 2024, the consent authority is precluded from having regard to matters within the NPSFM that relate to hierarchy of obligations embedded in the concept of Te Mana o te Wai. Accordingly, this requirement is reflected in the assessment of the NPSFM and other related direction below.

9.3.1 Actual and Potential Effects on the Environment

In accordance with Section 104(1)(a) of the RMA, an assessment of the actual and potential effects on the environment associated with the Project is provided in Section 5 of this AEE and in the technical assessments commissioned by OceanaGold that are appended to this AEE.

It is noted that OceanaGold has obtained the written approval of the owner and occupier of 1668 Macraes Road and is consulting with Macraes Community Incorporated and the owners and occupiers 406 Horse Flat Road in respect of the anticipated noise effects that will be generated and expects to obtain the written approval of these parties in due course. In accordance with Section 104(3)(a)(ii), when considering this application, the consent authorities must not have regard to any adverse effects on those parties who have provided written approval.

9.3.2 Measures Proposed to Offset or Compensate for Any Adverse Effects on the Environment

Section 104(1)(ab) of the RMA requires decision makers to have regard to "*any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity*". As discussed in Section 5 of this AEE, the Project is expected to result in some residual adverse effects on terrestrial ecological values that

are considered to be more than minor. OceanaGold is proposing an ecological offset and compensation package to address residual adverse effects of the Project on wetland habitat, river extent and biodiversity values that remain after avoidance, remediation and mitigation measures are employed. These proposed measures are described in Section 6.3 of this AEE and must be had regard to by the consent authority.

9.3.3 Relevant Statutory Documents

With respect to section 104(1)(b) of the RMA, the national, regional and district planning documents of relevance to the MP4 Project are:

- The National Policy Statement for Freshwater Management 2020 ("**NPS-FM**");
- The National Policy Statement for Indigenous Biodiversity 2023 ("**NPS-IB**");
- The National Policy Statement for Highly Productive Land ("**NPS-HPL**");
- Resource Management (National Environmental Standards for Freshwater) Regulations 2020 ("**NES-FW**");
- Resource Management (National Environmental Standard for Air Quality) Regulations 2004 ("**NES-AQ**");
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ("**NES-CS**");
- Resource Management (National Environmental Standard for Sources of Human Drinking Water) Regulations 2007 ("**NES-HDW**");
- Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 ("**the Regulations**");
- The Otago Regional Policy Statements;
- The Regional Plan: Water for Otago ("**Water Plan**");
- The Regional Plan: Air for Otago ("**Air Plan**");
- The Regional Plan: Waste for Otago ("**Waste Plan**");
- The Waitaki District Plan ("**District Plan**"); and
- The Dunedin City Second Generation District Plan ("**2GP**").

The sections below provide an assessment of the Project against the relevant provisions of these statutory planning documents and regulations.

The relevant provisions of the Kāi Tahu Ki Otago Natural Resource Management Plan 2005 are also examined below within Section 9.19.

9.4 SECTION 104B OF THE RESOURCE MANAGEMENT ACT 1991

For determining applications for a Discretionary Activity or Non-Complying Activity, section 104B of the RMA also applies:

> *After considering an application for a resource consent for a discretionary activity or non-complying activity, a consent authority—*
>
> *(a) may grant or refuse the application; and*
>
> *(b) if it grants the application, may impose conditions under section 108.*

OceanaGold intends to provide the consent authorities with a full suite of proposed conditions prior to the applications being heard.

9.5 SECTION 105 OF THE RESOURCE MANAGEMENT ACT 1991

Section 105(1) of the RMA sets out additional matters which must be considered by a consent authority when considering an application for a discharge permit. It states:

> *"If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—*
>
> *(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
>
> *(b) the applicant's reasons for the proposed choice; and*
>
> *(c) any possible alternative methods of discharge, including discharge into any other receiving environment."*

OceanaGold holds a suite of discharge permits associated with previously consented projects that are still in operation. These include the discharge of waste rock to land, the discharge of tailings to existing TSFs, the discharge of water and contaminants from silt ponds, and the discharge of water and contaminants into the open pits for the purpose of disposal of water and the creation of the pit lakes. The proposed activities will occur within the existing, highly modified Macraes mining environment, considered to be of low sensitivity. Alternatives were considered as part of the Project design and are discussed further in Section 7 of this AEE. It is concluded that the proposed discharges of contaminants to air, land and water associated with the MP4 Project are the best practicable option for managing the activities and any potential effects on the environment.

Section 105(2) of the RMA sets out additional matters which must be considered by a consent authority when considering an application for a reclamation. It states:

> *"If an application is for a resource consent for a reclamation, the consent authority must, in addition to the matters in section 104(1), consider whether an esplanade reserve or esplanade strip is appropriate and, if so, impose a condition under section 108(2)(g) on the resource consent."*

The proposed reclamations all occur on private land that does not facilitate public access. As such, an esplanade reserve or esplanade strip in respect of the proposed reclamations would not be appropriate and need not be imposed as a condition.

9.6 SECTION 107 OF THE RESOURCE MANAGEMENT ACT 1991

Section 107 of the RMA states that a discharge permit providing for discharge of contaminants to water or land shall not be granted if, after reasonable mixing, the contaminant or water discharged is likely to give rise to all or any of the following effects in receiving waters:

(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended material; or

(b) any conspicuous change in the colour or visual clarity; or

(c) any emission of objectionable odour; or

(d) the rendering of freshwater unsuitable for consumption by farm animals; or

(e) any significant adverse effects on aquatic life.

As noted in Section 5 of this AEE, the surface water and groundwater and aquatic ecology assessments completed by GHD and Greg Ryder Consulting, respectively, do not predict any of these effects will occur as a result of the proposed activity. In particular, the assessments noted there will be no significant adverse effects on the water quality or quantity of nearby surface water bodies, provided the recommended mitigation measures are implemented as soon as is practicable. OceanaGold will continue to implement its comprehensive water quality monitoring of groundwater and surface water that is required under existing consents, and it is anticipated that any potential subsequent effects of this proposal will be captured by this monitoring and managed by the methods outlined in Section 6 and elsewhere in this AEE. As such, section 107 of the RMA is not an impediment to the granting of the discharge permits sought.

9.7 SECTION 127 OF THE RESOURCE MANAGEMENT ACT 1991

Section 127 of the RMA sets out matters pertaining to a change or cancellation of consent conditions, when applied for by a consent holder. It states that:

- No holder of a resource consent may apply for a change to the duration of the consent (s127(1)(b));
- Sections 88 to 121 of the RMA apply as if the application to change conditions were an application for a discretionary activity (s127(3)(a)); and
- When determining who is adversely affected by the change, the consent authority must consider every person who made a submission on the original application and may be affected by the change (s127(4)).

This application does not seek to change the consent duration of any existing consent, in accordance with s127(1)(b). The following sections assess the proposed changes as discretionary activities in accordance with s127(3)(a). An assessment of affected persons in accordance with s127(4) is not necessary as OceanaGold is requesting that the applications be publicly notified.

9.8 NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT 2020 ("NPS-FM")

The NPS-FM is a relevant statutory planning document under section 104(1)(b) of the RMA as the Project involves activities that relate to, occur in, and affect the freshwater environment.[85] This includes the discharge of contaminants to land where they may enter ground and surface water, the discharge of water, and the pumping of surface water and groundwater to dewater the pits and silt ponds/sumps and provide water for use in the MWMS. In addition, the proposal will result in effects on ephemeral wetlands, wetland vegetation, and some river extent.

The proposal occurs within a freshwater environment, being the upper catchments of the Waikouaiti River, the Waihemo / Shag River, and the Taieri River.

The NPS-FM provides direction to local authorities and resource users regarding activities that affect the health of freshwater and sets out objectives and policies for freshwater management under the RMA.

The NPS-FM came into force on 3 September 2020 and was most recently updated in October 2024.The NPS-FM, amongst other things:

- Sets out a framework of policies to manage activities affecting freshwater;
- Requires regional councils to develop long-term visions for freshwater in their region and include those long-term visions as objectives in their regional policy statement;
- Requires every local authority to actively involve tangata whenua in freshwater management;
- Sets out a more expansive National Objectives Framework, and Freshwater Management Unit, environmental flow and level setting, and take limit setting processes. This includes 13 new attribute states for ecosystem health, including national bottom lines and national targets; and
- Includes specific requirements to protect streams and wetlands and to provide for fish passage, including new policies which must be included in all regional plans.

[85] The analysis of the NPS-FM provided in this section excludes analysis of clauses 1.3(5) and 2.1 in accordance with Section 104(2F) of the RMA.

The relevant NPS-FM policies are set out and briefly discussed below:

Policy 1

Freshwater is managed in a way that gives effect to Te Mana o te Wai.

Policy 2

Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.

Policy 3

Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.

Policy 5

Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.

Policy 6

There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.

Policy 7

The loss of river extent and values is avoided to the extent practicable.

Policy 9

The habitats of indigenous freshwater species are protected.

Policy 11

Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.

Policy 12

The national target (as set out in Appendix 3) for water quality improvement is achieved.

Policy 13

The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.

Policy 14

Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.

Policy 15

Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

9.8.1 Policies 1 and 2

Te Mana o te Wai refers to the fundamental importance of water and that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai, restores and preserves the balance between water, the wider environment and the community. It is relevant to all aspects of freshwater management.

The Project is consistent with Policy 1 as the health and wellbeing of waterbodies and freshwater ecosystems will be maintained. This proposal has been assessed by GHD to be unlikely to significantly alter the water quality and quantity of nearby surface water receptors either during the construction phase, operational or following the closure of the mine, including long-term climate change scenarios (2050-2230). The impact on freshwater values is, therefore, minor or less when compared to the existing consented environment.

Policy 2 has been given effect to through consultation with tangata whenua. OceanaGold continues to seek input from tangata whenua through resource consenting processes and has sent this application to Aukaha on behalf of Kāti Huirapa Rūnaka ki Puketeraki and Te Rūnanga o Moeraki as part of OceanaGold's ongoing consultation with tangata whenua, in accordance with a recently signed process agreement.

9.8.2 Policies 3 and 5

While overall the results of the groundwater and surface water modelling suggest that the proposed development can be undertaken within the currently consented surface water compliance criteria limits, OceanaGold has considered the actual and potential effects of the Project on land and freshwater in an integrated manner, which is consistent with Policy 3. This includes considering the potential effects of sedimentation, seepage and runoff from the mining activities and the WRSs, both in terms of water quality and aquatic ecology.

Limits and targets for the Waikouaiti River North Branch, Taieri and Shag River / Waihemo catchments have not yet been set under the National Objectives Framework (Policy 5). However, the proposal intends to retain water quality and quantity limits and monitoring aligned with limits established for previous consents at Macraes, including the Deepdell North Project suite of consents (2020), which incorporated NPS-FM limits for relevant water quality parameters.

9.8.3 Policy 6

Policy 6 of the NPS-FM seeks to ensure that there is no loss to the extent of natural inland wetlands and that their values are protected, to the extent practicable. Specific requirements relating to wetlands for particular activities, including those relating to specified infrastructure, quarrying activities and the extraction of minerals, are further outlined in clause 3.22 of the NPS-FM. This requires Regional Councils to include a new provision in their regional plans which guides how this policy will be implemented at a regional level. Collectively and of relevance to the MP4 Project, these provisions direct that the loss of the extent of natural wetlands is avoided, their values are protected, and their restoration is promoted, except where:

- The regional council is satisfied that:
    - the activity is necessary for the purpose of the extraction of minerals and ancillary activities; The extraction of the mineral will provide significant national or regional benefits;
    - There is a functional need for the activity to be done in that location;The effects of the activity will be managed through applying the effects management hierarchy; and
- The regional council must ensure that consent is not granted unless:
    - The Council is satisfied that the applicant has demonstrated how each step of the effects management hierarchy will be applied to any loss of extent or values of the wetland (including cumulative effects and loss of potential value), particularly (without limitation) in relation to the values of ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values, and amenity values;
    - if aquatic offsetting or aquatic compensation is applied, the applicant has complied with principles 1 to 6 in Appendix 6 and 7, and has had regard to the remaining principles in Appendix 6 and 7, as appropriate;
    - There are methods or measures that will ensure that the offsetting or compensation will be maintained and managed over time to achieve the conservation outcomes; and
- Any consent granted must be subject to:
    - Conditions that apply the effects management hierarchy;
    - A condition requiring monitoring of the wetland at a scale commensurate with the risk of the loss of extent or values of the wetland; and
    - Conditions that specify how the offsetting or compensation requirements will be achieved.

The proposed mineral extraction activities will result both directly and, potentially, indirectly in the loss of extent of ephemeral wetlands present within the footprint and buffer zone of the proposed Coronation 6 extension activities, wetlands within the Innes Mills Pit extension buffer zone, and wetland vegetation within the footprints of the Golden Bar Pit extension and associated WRS extension. The vegetation clearance, earthworks and land disturbance required to expand the respective pits and to construct the associated WRSs is clearly necessary to enable the extraction of minerals from the orebody that dips to the northeast. The economic and social benefits that derive from this activity are explained in Section 5.2 of this AEE which confirms that the extraction of minerals enabled by the MP4 Project will provide significant regional and national benefits.

Regarding functional need for the activity, the NPS-FM defines the term "functional need" as "the need for a proposal or activity to traverse, locate or operate in a particular environment because the activity can only occur in that environment."

Mining activities by their nature are constrained by the location of the economic gold bearing ore. At Macraes, OceanaGold mines a well-defined, low grade ore body (the Hyde-Macraes Shear Zone). Extending established pits, whether underground or open pit, to take advantage of the investment in mine development, infrastructure assets and resource consents is the most feasible approach to mining. As described in Section 7 of this AEE, the average ore grade is not sufficient to make underground mining of the ore targeted by the MP4 proposed open pit extensions economically feasible, therefore, the development of open pit extensions is required. At Golden Bar Pit, the ore body dips to the east, and the proposed pit extension is a down-dip extension to access deeper ore. For this reason, there is a clear functional need for the activity to be located at the proposed site, and consequently, for the loss, or potential loss, of wetlands.

In terms of effects management, OceanaGold has adopted the effects management hierarchy in its proposal to manage the effects of the Project on wetlands, including considering cumulative effects. In the first instance, where practicable, the Project Description was amended to avoid adverse effects on the wetlands present within the site. Due to the location of the ore and the need to extend to the limits of Innes Mills Stage 10 and Coronation 6 and Golden Bar Pit, there is no option to avoid these wetlands. OceanaGold has therefore minimised the footprint of any intrusion into the wetlands as far as practicable, however, there is no way to remedy or further mitigate these effects. As residual adverse effects remain, OceanaGold proposes to offset for these through the creation of wetlands or compensate for losses by creating and protecting equivalent environments. Further details on this are addressed in the Ecological Impact Management Plan prepared by Whirika, attached as **Appendix 16**, and discussed in Section 6.3.5 of this AEE.

In summary, the residual adverse effects on ephemeral wetlands at Coronation 6 and Innes Mills are expected to be more than minor and thus offsetting for these effects is

proposed as outlined in Section 6.3.5 of this AEE. In this case of the wetland vegetation that forms part of the riparian / wetland vegetation mosaics at Golden Bar Pit and the recently created wetland at Golden Bar WRS, the residual adverse effects on the small area of wetland vegetation is not assessed to be more than minor. Therefore, offsetting or compensation is not required in accordance with the effects management hierarchy. However, taking a conservative approach, removal of the riparian / wetland vegetation mosaic which this wetland vegetation forms part of, will result in residual adverse effects on overall ecological values that are potentially more than minor. Accordingly, OceanaGold proposes to compensate for these residual adverse effects by protecting an equivalent area within the MEEA which contains similar mosaics of riparian and wetland vegetation. Details regarding this protection can be found in **Appendix 16**.

OceanaGold will propose appropriate conditions to secure the offset outcomes.

These proposed measures will ensure that there is no overall loss of wetland extent or values consistent with Policy 6 and Clause 3.22 of the NPS-FM.

9.8.4 Policy 7

Policy 7 of the NPS-FM seeks to ensure the loss of river extent and values is avoided to the extent practicable. Specific requirements relating to rivers are further outlined in clause 3.24 of the NPS-FM. This requires Regional Councils to include a new provision in their regional plans which guides how this policy will be implemented at a regional level. Collectively, and of relevance to the MP4 Project, these provisions direct that the loss of river extent and values is avoided, unless:

- The regional council is satisfied that:
    - There is a functional need for the activity in that location; and[86]
    - The effects of the activity will be managed by applying the effects management hierarchy; and
- The regional council must ensure that consent is not granted unless:
    - The applicant has demonstrated how each step in the effects management hierarchy will be applied to any loss of extent or values of the river (including cumulative effects and loss of potential value), particularly (without limitation) in relation to the values of: ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values, and amenity;

[86] Functional need is defined in the NPS-FM as meaning "the need for a proposal or activity to traverse, locate or operate in a particular environment because the activity can only occur in that environment."

- If aquatic offsetting or aquatic compensation is applied, the applicant has complied with principles 1 to 6 in Appendix 6 and 7 of the NPSFM, and has had regard to the remaining principles in Appendix 6 and 7, as appropriate; and
- There are methods or measures that will ensure that the offsetting or compensation will be maintained and managed over time to achieve the conservation outcomes; and

- Any consent granted must be subject to:
  - Conditions that apply the effects management hierarchy; and
  - Conditions that specify how the offsetting or compensation requirements will be achieved.

Deposition of rock into the Golden Bar WRS extension will result in the loss of 95 m of river with a natural bed and the loss of 335 m of modified river bed which resulted from creation of the original Golden Bar WRS. In total there will be a loss of approximately 430 m of river extent.

Regarding functional need for the activity, given the location of the mineral resource, there is a functional need for the extraction of minerals and ancillary activities, such as the construction and extension of WRSs at Macraes. Specifically, there is a functional need for the existing Golden Bar WRS to be extended as proposed to allow for further waste rock deposition because the WRS is already existing, it is adjacent to the Golden Bar pit, and alternative sites are not feasible and/or would cause much greater adverse environmental effects.

As described in Section 7 of this AEE, OceanaGold considered disposing the waste rock in the headwaters of the stream to the north of the site, as an alternative to extending the Golden Bar WRS. This had some advantages in that the waste rock would not need to be hauled as high, therefore, resulting in lower cost and less visual impacts. However, this option was discounted due to the greater ground disturbance and stream bed / water course disturbance that would result from this activity. Priority was given to avoiding these areas as discussed in Section 6.3.1 of this AEE.

Furthermore, in selecting the location for the Golden Bar WRS extension, OceanaGold has considered a range of additional factors including, but not limited to:

- Land ownership / control – features can only be located on land which the company owns or controls and which is available for development (e.g., does not contain existing infrastructure). In this case, the affected land is fully owned by OceanaGold.
- Scale – features must be at sufficient scale to accommodate the required volumes of material, meaning that down-scaling to avoid sensitive areas may be impractical while still retaining adequate storage space. All waste rock planned for disposal fits within

the proposed footprint and geometric limits required for slope stability of the Golden Bar WRS extension. Limiting the footprint of the WRS results in reduced capacity which cannot be transferred to any other facility. A reduced footprint of the WRS would cause reduced operational efficiency and necessitate disturbing a new area located nearby to store the shortfall of waste rock.

- Material movement cost – WRSs must be located close to the places from which the material is sourced. The Golden Bar mining area is located a significant distance from the central operations at the MGP. Moving large volumes of overburden significant distances to areas further afield is economically inefficient and would give rise to additional and otherwise avoidable adverse effects (including amenity effects, air discharge effects, and carbon emissions). Furthermore, the existing haul road is designed for smaller trucks hauling ore. To widen this to accommodate larger waste rock trucks would potentially cause significant adverse environmental effects.
- Geotechnical and hydrogeological – features must be located on suitable foundations to manage stability and groundwater. The Golden Bar WRS extension has been designed by recognised geotechnical specialists and will be constructed in accordance with those design requirements.
- Construction efficiency – the use of existing landforms and contours (such as gullies) can significantly reduce the scale and volume of materials needed to construct storage impoundments, impacting the feasibility using available volumes of rock and soil, time and cost to construct, with due consideration of emissions produced in the process. The disposal of waste rock at Golden Bar WRS is via established, short haulage routes using established disposal methods and working toward a landform that achieves appropriate landscape outcomes.
- Water management – potentially affected surface and groundwater resources must be capable of management. This includes the ability and space to construct water management infrastructure (silt ponds, drains, etc) and to maintain appropriate separation distances from sensitive waterbodies. The proposed Golden Bar WRS extension meets these criteria. The WRS extension will benefit from use of the existing Clydesdale Silt Pond. Perimeter drains may be constructed around the extended WRS, to direct surface runoff into the silt control structures, with subsequent treatment, if necessary, before discharge to local waterways. This would only be required until rehabilitation of WRS slopes takes effect and generates clean water runoff.

Considering the above, there is a clear functional need for the activity to be located within the site, and consequently, for the loss of approximately 430 m of mixed modified watercourse within the Clydesdale Creek catchment.

In terms of effects management, OceanaGold has adopted the effects management hierarchy in its proposal to manage the effects of the WRS extension on river extent and values, including considering cumulative effects. In the first instance, where practicable, adverse effects on river and wetland extent and values will be avoided. As discussed above and in Section 6.3.1 of this AEE, the footprint of the Golden Bar WRS was modified to avoid significant lizard habitat, rare plants, and an ephemeral wetland. The next stage of the effects management hierarchy is where avoidance is not practicable, OceanaGold will firstly minimise the footprint of any intrusion, and secondly, remedy any harm caused. Where residual adverse effects remain that are more than minor, OceanaGold will offset and compensate for these.

Removal of the watercourse (albeit heavily modified) will result in residual adverse effects on overall ecological values that are potentially more than minor. Accordingly, OceanaGold proposes to compensate for these and other more than minor residual adverse effects of the MP4 Project by protecting a substantially greater extent of river (at least 860 m) within the MEEA which contains similar or better value watercourse which include areas of adjoining riparian and wetland vegetation. Details regarding this protection can be found in **Appendix 16** and Section 6 of this AEE.

Ultimately, with the above measures in place, it is considered that there will be no net loss of river extent and values as a direct result of this proposal consistent with Policy 7 and Clause 3.24 of the NPS-FM.

9.8.5 Policies 9 and 10

Protection of habitats of indigenous freshwater species, trout and salmon is the focus of Policies 9 and 10 respectively.

Greg Ryder Consulting has undertaken an assessment of the existing aquatic ecological values within the surrounding catchment and downstream of the proposed mining activities. The modelling indicates that water quality is expected to remain largely within existing compliance limits. Within these limits, existing fish populations have remained relatively stable, with the galaxiid population densities at MB01 and MB02 between 2017 and 2022 trending upwards. This species has been shown to be resilient to elevated nitrate and sulphate concentrations, which may occur over the life of the consent and beyond, and is not expected to be adversely affected by the anticipated increases in concentration over time.

9.8.6 Policies 13 and 14

As mentioned above, OceanaGold seeks to manage and monitor water quality to ensure the health and wellbeing of water bodies and freshwater ecosystems is maintained. This monitoring will provide ongoing data to ensure that the Project is being managed in a manner that aligns with policies 13 and 14 of the NPS-FM. These policies seek to ensure

the monitoring of freshwater bodies and ecosystems and intervention to reverse deteriorating trends, and the provision of information about the state of waterbodies and challenges to their health and wellbeing that will be reported and published on. This aspect of the Project is therefore considered to be consistent with this policy directive.

9.8.7 Policy 15

OceanaGold seeks to undertake the MP4 Project to continue mining operations at Macraes and manage any potential or actual adverse effects in a manner which maintains the health and wellbeing of waterbodies. The continuation of mining activities at Macraes will also continue to provide for the economic and social wellbeing of the Otago region and New Zealand more generally.

9.8.8 Summary

Given the above, it is considered that the proposal is consistent with the policies of the NPS-FM.

9.9 THE NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY 2023 ("NPS-IB")

The NPS-IB came into effect on 4 August 2023 and was updated in October 2024. It contains a single objective, which is to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss of biodiversity after the commencement of the NPS-IB.

The MP4 Project will result in the loss of indigenous vegetation, comprising ephemeral wetlands, riparian vegetation, shrubland and tussockland habitats. The site is not identified as a SNA in either the Waitaki District Plan or the Otago Regional Policy Statements, and therefore, does not technically meet the NPS-IB definition of a SNA. Notwithstanding that, as outlined in the Whirika reports, there are sites affected by the Project which trigger some of the significance criteria for indigenous vegetation and habitats for indigenous fauna.

Clause 3.10 of the NPS-IB outlines the requirements for the management of adverse effects on SNAs. This includes clause 3.10(2) which requires that adverse effects of activities on SNAs are avoided, unless otherwise provided for. Clause 3.11 outlines the exceptions to clause 3.10(2) and includes clause 3.11(1)(a)(ii) which states that clause 3.10(2) does not apply to mineral extraction that provides significant national public benefit that could not otherwise be achieved using resources within New Zealand. In accordance with this policy direction, it is considered the MP4 Project meets this criterion given the regional and national benefits that will be derived from the Project, as outlined in this application. Therefore, the policy direction of clause 3.10(3) of the NPS-IB applies to the Project and OceanaGold will adopt a precautionary approach to the management of the effects of the Project on these areas and will apply the effects management hierarchy. This is discussed

in detail in Section 5 and 6 of this AEE and in the technical assessments prepared by Whirika.

9.10 NATIONAL POLICY STATEMENT FOR HIGHLY PRODUCTIVE LAND 2022 ("NPS-HPL")

The NPS-HPL came into effect on 17 October 2022. It provides direction for the management of highly productive land. Ultimately highly productive land will be mapped in regional policy statements, however, until that occurs it includes land which is zoned general rural or rural production and identified as Land Use Capability Class 1, 2 or 3 and not identified for future urban development or subject to a notified plan change to rezone it to urban or rural lifestyle (clause 3.5(7)).

The land which will be disturbed as part of the MP4 project is not identified as Land Use Capability Class 1, 2 or 3 and therefore, the NPS-HPL is not relevant to the proposal.

9.11 NATIONAL ENVIRONMENTAL STANDARDS

National environmental standards prescribe standards for environmental matters in accordance with section 43 of the RMA. Each local authority must administer the national environmental standards. Where specified, a local authority can impose stricter or more lenient standards than those set out in a national environmental standard.

The national environmental standards potentially relevant to the MP4 Project are discussed in the sub-sections below.

9.11.1 National Environmental Standards for Freshwater 2020 (NES-FW)

The majority of the NES-FW came into force on 3 September 2020, with some other provisions coming into force later in 2021.

The NES-FW sets out requirements for certain activities that pose risks to freshwater ecosystems. The standards are designed to:

- Protect existing inland and coastal wetlands;
- Protect urban and rural streams from in-filling;
- Ensure connectivity of fish habitat (fish passage);
- Set minimum requirements for feedlots and other stockholding areas;
- Improve poor practice intensive winter grazing of forage crops;
- Restrict further agricultural intensification until the end of 2024; and
- Limit the discharge of synthetic nitrogen fertiliser to land and require reporting of fertiliser use.

The NES-FW also outlines provisions for activities that relate to natural inland wetlands and the reclamation of riverbeds. As noted above, the proposed activities in the Coronation 6, and potentially the Innes Mills areas, will result in impacts on ephemeral wetlands, and there will be some loss of river extent in the Golden Bar area.

The proposed activity is for the extraction of minerals and ancillary activities. Regulation 45D of the NES-FW therefore applies to the effects of the Project on natural inland wetlands. In accordance with the requirements for activities to be applied for under regulation 45D, the proposed activity meets the following criteria[87]:

- The extraction of the minerals will provide significant national or regional benefits (Refer Section 5.2 of this AEE and **Appendix 25**);
- Given the location of the mineral resource, there is a functional need for the extraction of minerals and ancillary activities at the locations identified; and
- OceanaGold has applied the effects management hierarchy as set out in the IMP.

There is a functional need for the extension of the open pits for Coronation 6, Innes Mills Stages 9-10 and Golden Bar Stage 2 as this is where the economic part of the ore body ('mineral resource') is located.

Therefore, resource consent for activities, including vegetation clearance, earthworks and land disturbance within, and within a 100 m setback from, a natural inland wetland is required for the proposed activity for a discretionary activity.

With regard to the loss of river extent, Regulation 57 applies to the Project. In accordance with the requirements for activities to be applied for under regulation 57, the proposed activity meets the following criteria:[88]

- Given the location of the mineral resource, there is a functional need for the extraction of minerals and ancillary activities at this site. There is a functional need for the Golden Bar WRS to be extended as the WRS is already existing, adjacent to the pit and, given alternative sites are not feasible or involve much greater environmental effects, it is necessary to expand it to allow for further waste rock deposition; and
- OceanaGold have applied the effects management hierarchy as set out in the IMP and is as explained above. OceanaGold has modified the mine design as much as possible to avoid significant lizard habitat, rare plants, and an ephemeral wetland.

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87 Section 45D(6), National Environmental Standards for Freshwater.

88 Section 57(2), National Environmental Standards for Freshwater.

Therefore, resource consent for the reclamation of parts of Golden Bar Creek and Clydesdale Creek is required for the proposed activity for a discretionary activity.

The NESF also applies to the installation of culverts in the bed of a river. The proposed culverts at the MEEA will comply with the permitted activity conditions prescribed by Regulation 70 and therefore do not require resource consent under the NESF.[89]

In summary, the relevant activities that are regulated by the NES-FW are provided for as discretionary activities and the necessary resource consents have been sought as part of this application with all relevant requirements prescribed by the Regulations met. As such, the proposed activity is not impeded by the NES-FW.

9.11.2 National Environmental Standard for Air Quality 2004 (NES-AQ)

The NES-AQ outlines the standards to ensure a guaranteed minimal level of health protection for people living in New Zealand. The NES-AQ is comprised of 14 separate, but interlinked standards.

As noted in Section 5.11 of this AEE, the predominant discharges from the proposed activity will be dust, or particulate matter, from the excavation, load out and transport of waste rock or ore. OceanaGold have a Dust Management Plan in place that appropriately manages dust on the site. Beca concluded that the discharge of PM_{10} from the site will not exceed the limits outlined in the NES-AQ and the effects associated with the discharge of contaminants to air will be negligible.

As such, the proposed activity is not impeded by the NES-AQ.

9.11.3 National Environmental Standard for Assessing and Managing Contaminants in Soil 2011 (NES-CS)

The NES-CS seeks to ensure that land affected by contaminants in soil is appropriately identified and assessed before it is developed. If necessary, affected land will need to be remediated or the contaminants contained to make it safe for human use.

Mining industries are included on the Hazardous Activities and Industries List ("**HAIL**"), although it is understood that the continuation of existing uses is not affected by the NES-CS.

Extensive studies associated with mining on-site to date have demonstrated that the human health effects of extracting ore from the ground on the site, and subsequent disposal, are able to be controlled adequately using established on-site methodologies and rehabilitation so that human health is protected appropriately. The waste rock to be

[89] Resource consent for the diversion of water is required for one of the proposed culverts in accordance with the Regional Plan: Water for Otago.

discharged to land for this proposal is of a similar nature, to other waste rock stacks consented previously, and as such, would have similar, negligible effects on human health.

As such, the NES-CS is not an impediment to granting a land use consent for disturbance of a site that been subject to HAIL activities.

9.11.4 National Environmental Standard for Sources of Human Drinking Water (NES-HDW)

The NES-HDW sets requirements for the protection of sources of human drinking water from contamination. Regulations 7 and 8 of the NES-HDW need to be considered when assessing discharge permits that have the potential to affect registered drinking water supplies that provide 501 or more people with drinking water for 60 or more calendar days each year.

The Macraes-Moonlight School water take is located approximately 2 km west of Frasers Pit. The register states this supply provides for 30 people. Therefore, it does not meet the criteria for the NES-HDW.

The Waihemo community supply is located approximately 26 km southeast of the site and supplies water to around 1350 people. Given the separation distance between the MGP and this drinking water supply, the risk of potential contamination is considered to be very low. Existing compliance limits in the Shag River ensure appropriate protection of the drinking water resource. The Project will manage its impact on water quality to comply with limits in the Shag River that have previously been deemed acceptable to not put human drinking water supplies at risk. On that basis, the Project will not introduce or increase the concentration of any determinands in the drinking water such that it no longer meets the health quality criteria after existing treatment. As such, it is assessed that the granting of discharge permits associated with this proposal is not impeded by the NES-HDW.

9.12 RESOURCE MANAGEMENT (MEASUREMENT AND REPORTING OF WATER TAKES) REGULATIONS 2010

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 ("**the Regulations**") apply to water permits that allow fresh water to be taken at a rate of 5 litres/second or more but not if the take is non-consumptive. Fresh water is defined in the RMA as all water except coastal or geothermal water. The water proposed to be taken is not coastal or geothermal water and is therefore fresh water. The Regulations provide for consistent monitoring and reporting to Councils, which appears to have the purpose of enabling accurate tracking of resource use and allocation. The monitoring and reporting of the proposed water takes in accordance with the Regulations would appear to provide little benefit to the Council as the takes are generally from within the MWMS and do not give rise to any water allocation issues.

In any case, the following performance monitoring condition is understood to be compliant with the Regulations.

The proposed surface water takes will comply with this condition and will therefore be compliant with the regulations.

a. *The Consent Holder must install and maintain a water meter at the points of take when water is being taken that will measure the rate and volume of water taken to within an accuracy of +/- 5% over the meter's nominal flow range. The water meter must be capable of output to a telemetry-capable datalogger.*

b. *A datalogger(s) that time stamps a pulse from the flow meter at least once every 15 minutes and has the capacity to hold at least 24 months data of water taken.*

c. *The Consent Holder must provide records from the datalogger electronically to the Consent Authority at annual intervals by 31 July each year and at any time upon request. Data must be provided electronically giving the date, time and flow rates in no more than 15-minute increments of water.*

d. *Within 20 working days of the installation and any subsequent replacement of the water meter or datalogger and at five yearly intervals thereafter for an electromagnetic metre or annual intervals for a mechanical water meter, and at any time when requested by the Council, the Consent Holder must provide written certification to the Consent Authority signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:*

    i. *Each device is installed in accordance with the manufacturer's specifications;*

    ii. *Data from the recording device can be readily accessed and/or retrieved in accordance with the conditions above; and*

    iii. *That the water meter has been verified as accurate.*

e. *The water meter / datalogger must be installed and maintained throughout the duration of the consent in accordance with the manufacturer's specifications.*

f. *All practicable measures must be taken to ensure that the water meter and recording device(s) are fully functional at all times.*

g. *The Consent Holder must report any malfunction of the water meter and datalogger to the Consent Authority within 5 working days of observation of the malfunction. The malfunction must be repaired within 10 working days of observation of the malfunction and the Consent Holder must provide proof of the repair, including photographic evidence, to the Consent Authority within 5 working days of the completion of repairs.*

OceanaGold proposes to include this condition on all consents that provide for the take and use of surface water (except for pit lake filling, discussed below) to ensure these consents are consistent with the Regulations. It is noted that passive takes of groundwater for pit dewatering purposes cannot comply with the above condition as there is no practical means of measuring the quantity of groundwater passively taken with any accuracy. However, these takes can be considered non-consumptive because this water flows into the pit and accumulates in pit sumps and is abstracted from there as surface water, that abstraction from the pit sumps will be monitored in accordance with the above

condition. As with its existing dewatering permits, OceanaGold proposes a maximum rate of take of 200 L/s for the combined surface and groundwater abstractions from each pit for dewatering purposes. Monitoring of that combined rate will be achieved by the above condition. However, OceanaGold will not have the ability to differentiate groundwater from surface water in its monitoring and reporting of these takes.

Water permits for the take and use of surface water and groundwater to facilitate pit lake filling after closure are not subject to the above condition and are not proposed to be because these takes are passive, non-consumptive, and there is no practical means by which to measure these relative takes in accordance with the above condition or the Regulations.

Considering the above, the Regulations are not an impediment to the granting of all requisite water permits.

9.13 OTAGO REGIONAL POLICY STATEMENT

The Otago Regional Policy Statement 2019 ("**RPS**") was declared operative on 4 March 2024.

The Proposed Otago Regional Policy Statement 2021 ("**pRPS**") was notified on 26 June 2021. The 2021 version included objectives and policies which sought to give effect to a range of new or amended national guidance including the NPS-FM and NES-FW. This version of the RPS also sought better alignment with the National Planning Standards. As a result of a High Court challenge on whether the pRPS was a freshwater planning document in its entirety,[90] the proposed hearings were cancelled and the Freshwater Planning Instrument Parts of the pRPS ("**FPIP**") were notified on 30 September 2022. Hearings on both the Non-Freshwater Planning Instrument Parts and the FPIP have been held and concluded and a decision on the pRPS as a whole was released on 28 March 2024.

Multiple appeals were lodged with the High Court in respect of the FPIP and with the Environment Court in respect of the Non-FPIP. Mediations on the FPIP were held in August 2024, however there is one remaining appeal point on LF-WAI-O1 which has not been resolved and will be heard by the High Court (although a hearing date has not yet been set). Mediations on the Environment Court appeals have been broken down by topic into 12 groups. The Environment Court mediations commenced in November 2024 and at the time of writing, are estimated to go until at least the end of May. Because the pRPS provisions remain subject to appeal[91] and as such, some weight should be given to the Operative RPS until such time as appeals are resolved and wording of the relevant

[90] *Otago Regional Council v Royal Forest and Bird Protection Society of New Zealand Inc* [2022] NZHC 1777.

[91] In respect of the FPIP appeals are confined to points of law.

provisions are finalised. To the extent that the pRPS gives effect to provisions in the NPS-FM and NPS-IB, these provisions have already been considered against this proposal as discussed in Sections 9.8 and 9.9, respectively.

9.13.1 Operative Otago Regional Policy Statement 2019 ("RPS")

9.13.1.1 Chapter 1 – Resource management in Otago is integrated

Chapter 1 of the RPS seeks to recognise that different parts of the natural and physical environment are interconnected. Relevant objectives and policies relate to the following:

- Otago's resources are used sustainably to promote economic, social, and cultural wellbeing for its people and communities;[92]
- Provide for the economic wellbeing of Otago's people and communities by enabling the resilient and sustainable use and development of natural and physical resources;[93]
- Provide for social and cultural wellbeing and health and safety;[94]
- Recognise and provide for the integrated management of natural and physical resources to support the wellbeing of people and communities in Otago;[95] and
- Achieve integrated resource management of Otago's natural and physical resources.[96]

The technical assessments that have been commissioned by OceanaGold have considered the actual and potential effects of the Project on physical and natural resources in an integrated manner. This includes considering the potential effects of seepage and runoff from the activity on the surrounding water resources. Modelling has been completed which has enabled OceanaGold to test the impact of ongoing and future mine development on downstream water quality. This modelling has confirmed that water quality is expected to remain within existing compliance limits, provided the recommended mitigation measures are implemented, which in turn will not give rise to unconsented or unacceptable adverse effects on aquatic ecosystem health and wellbeing.

The proposal has also been considered in terms of its contribution to the social and economic wellbeing of the community and the Otago region. It will continue to provide employment and income and contribute to expenditure in the region and involvement of the workforce in community groups and clubs. The project will also promote sustainable

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92 Objective 1.1, Operative Otago Regional Policy Statement 2019.

93 Policy 1.1.1, Operative Otago Regional Policy Statement 2019.

94 Policy 1.1.2, Operative Otago Regional Policy Statement 2019.

95 Objective 1.2, Operative Otago Regional Policy Statement 2019.

96 Policy 1.2.1, Operative Otago Regional Policy Statement 2019.

and integrated management by being able to utilise the existing mine infrastructure to access and mine the ore body.

9.13.1.2 Chapter 2 - Kāi Tahu Values and interests are recognised and Kaitiakitaka is expressed

Relevant provisions within Chapter 2 relate to the following matters:

- The principles of Te Tiriti o Waitangi are taken into account in resource management processes and decisions;[97]
- Treaty principles;[98]
- Kāi Tahu values, interests and customary resources are recognised and provided for;[99]
- Manage the natural environment to support Kāi Tahu wellbeing;[100] and
- Recognising sites of cultural significance.[101]

These above provisions generally direct that the principles of Te Tiriti o Waitangi are acknowledged and taken into account for resource management decisions. They also direct that the values of takata whenua are also taken into account. In keeping with the principles of Te Tiriti o Waitangi, the relevant Kāi Tahu iwi mana whenua authority (through Aukaha) have been consulted and this will continue throughout the resource consent process and beyond. This consultation process will seek to recognise and provide for Kāi Tahu values, interests, customary values and wellbeing as outlined in the consultation correspondence received from the relevant iwi representative. Aukaha is in the process of preparing a CIA that will identify the key cultural values associated with the site and the potential effects of the Project on these values. OceanaGold will continue to seek feedback and comments from Aukaha in relation to the Project and the proposed management measures to ensure the potential effects identified in the CIA are appropriately addressed and provided for. It is noted that OceanaGold has recently signed a process agreement with Runaka to guide ongoing consultation on mining projects.

Further, the relevant provisions of the Kāi Tahu Ki Otago Natural Resource Management Plan 2005 ("**KTONRMP**") have been given regard to in applying for this proposal and while these are not considered to be an appropriate replacement for consultation, they provide a suitable initial guide to the relevant Kāi Tahu environmental management issues and achieving the general policy direction of the provisions regarding Kāi Tahu values, interests and wellbeing.

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97 Objective 2.1, Operative Otago Regional Policy Statement 2019.

98 Policy 2.1.2, Operative Otago Regional Policy Statement 2019.

99 Objective 2.2, Operative Otago Regional Policy Statement 2019.

100 Policy 2.2.1, Operative Otago Regional Policy Statement 2019.

101 Policy 2.2.2, Operative Otago Regional Policy Statement 2019.

9.13.1.3 Chapter 3: Otago has high quality natural resources and ecosystems

The first part of this chapter, which relates to the recognition and maintenance of all natural resources, is relevant to this proposal. Matters of relevance relate to the following:

- The values (including intrinsic values) of ecosystems and natural resources are recognised and maintained, or enhanced where degraded;[102]
- Safeguard the life supporting capacity of freshwater;[103]
- Manage air quality to maintain good ambient air quality that supports human health and maintain or enhance amenity values;[104]
- Manage ecosystems and indigenous biological diversity;[105]
- Otago's significant and highly-valued natural resources are identified, and protected or enhanced where degraded;[106] and
- Protect the function and values of wetlands.[107]

In accordance with the above provisions, the proposed activity will ensure appropriate management measures are in place to ensure compliance with existing water quality criteria and maintenance of the existing ecosystem and freshwater values.

Further, as discussed in Section 5 of this AEE, Whirika has completed an assessment on the ecological effects associated with the proposed activities. Following avoidance, remediation and mitigation, the Project will have potential impacts on tussockland, lizards and lizard habitat, birds and bird habitats, invertebrate habitat and ephemeral wetlands. These effects will be offset through the creation of the Murphys Ecological Enhancement Area and wetlands within a nearby area, that will ensure there is no net loss, and where possible, an overall net gain of such habitats associated with the Project.

In addition, Beca have confirmed the proposed activity will appropriately manage the discharge of dust and contaminants to air and any effects on air quality will be negligible.

9.13.1.4 Chapter 4 – Communities in Otago are resilient, safe and healthy

Chapter 4 matters which are relevant to this proposal relate to the following:

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[102] Objective 3.1, Operative Otago Regional Policy Statement 2019.

[103] Policy 3.1.1, Operative Otago Regional Policy Statement 2019.

[104] Policy 3.1.6, Operative Otago Regional Policy Statement 2019.

[105] Policy 3.1.9, Operative Otago Regional Policy Statement 2019.

[106] Objective 3.2, Operative Otago Regional Policy Statement 2019.

[107] Policy 3.2.16, Operative Otago Regional Policy Statement 2019.

- Risk that natural hazards pose to Otago's communities are minimised;[108]
- Minimising increases in natural hazard risk;[109]
- Reduce existing natural hazard risk to people and communities;[110]
- Hazardous substances, contaminated land and waste materials do not harm human health of the quality of the environment in Otago;[111] and
- Waste storage, recycling, recovery, treatment and disposal.[112]

'Natural hazard' is defined in the RMA as any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding), the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment. The proposal does not constitute a natural hazard, but it is noted that mining activities can potentially exacerbate natural hazard risks. Slope stability is actively managed by OceanaGold, and geotechnical reporting has assessed that the pit walls and proposed works will be stable and safe, both during operation and following rehabilitation in both a static and tectonic effects scenario.

Further, as identified in Section 5.3.4 of this AEE and in detail in the design and dam safety assessment completed by WSP (**Appendix 2**), the FTSF will be designed, constructed and operated in accordance with modern standards which are set out in the New Zealand Dam Safety Guidelines ("**NZDSG**"). Dams that are designed and operated to these standards have a low and acceptable risk of potential failure and a breach would be highly unlikely to occur.

With regard to hazardous substances and contaminated land the following is noted:

- Naturally occurring contaminant levels in waste rock resulting from weathering are known from extensive studies relating to previous and ongoing mining at the site and can be managed using established and appropriate methodologies to contain and minimise effects on the environment or human health; and
- The use and storage of hazardous substances as part of the proposal is being carried out using safe and appropriate methodologies, consistent with the relevant industry standards, and will not contaminate the site.

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[108] Objective 4.1 and Policy 4.1.6, Operative Otago Regional Policy Statement 2019.

[109] Policy 4.16, Operative Otago Regional Policy Statement 2019.

[110] Policy 4.17, Operative Otago Regional Policy Statement 2019.

[111] Objective 4.6, Operative Otago Regional Policy Statement 2019.

[112] Policy 4.6.8, Operative Otago Regional Policy Statement 2019.

9.13.1.5 Chapter 5: People are able to use and enjoy Otago's natural and built environment

Chapter 5 seeks to enable the use of the natural and physical environment for enjoyment as well as economic use, while ensuring that resources are sustainably managed for conflicting or incompatible uses. The relevant objectives and policies of Chapter 5 are as follows:

- Historic heritage resources are recognised and contribute to the region's character and sense of identity;[113]
- Recognising and managing historic heritage;[114]
- Sufficient land is managed and protected for economic production;[115]
- Manage activities in rural areas to support the region's economy and communities, including by providing for mineral exploration, extraction and processing;[116]
- Recognise the functional needs of mineral exploration, extraction and processing activities to be located where the resource exists;[117]
- Adverse effects of using and enjoying Otago's natural and physical resources are minimised;[118] and

The only historic heritage feature that has been identified as being affected by the proposal, as confirmed by the heritage assessment discussed in Section 5.12 of this AEE, is the partial removal of a historic fence line required for the proposed Coronation Stage 6 Pit extension. OceanaGold will obtain the relevant archaeological authorities necessary for this activity and Origin consider the activity will have a minor effect on the heritage values of the fence line.

Due to the location of the mineral resource, there is a functional need for this activity to locate in rural areas. The majority of the site is zoned for mining purposes, and the part that extends into the rurally zoned land will not affect the surrounding land to be utilised for primary production purposes. Upon closure and rehabilitation of the mine activity, the land will be able to be re-utilised for farming activities and other compatible land uses. During the operational phase of the Project adverse effects will be actively managed through the adoption of the effects management hierarchy, utilising the cascading approach of avoid, remedy, mitigate, then offset and compensate. A rehabilitation and

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[113] Objective 5.2, Operative Otago Regional Policy Statement 2019.

[114] Policy 5.2.1 and Policy 5.2.3, Operative Otago Regional Policy Statement 2019.

[115] Objective 5.3, Operative Otago Regional Policy Statement 2019.

[116] Policy 5.3.1, Operative Otago Regional Policy Statement 2019.

[117] Policy 5.3.4, Operative Otago Regional Policy Statement 2019.

[118] Objective 5.4, Operative Otago Regional Policy Statement 2019.

closure strategy will ensure appropriate measures are implemented such that any ongoing adverse effects of the proposal are appropriately avoided, remedied or mitigated.

The following policy relates specifically to the management of effects of mineral extraction and processing:

> ***Policy 5.4.8 Adverse effects from mineral and petroleum exploration, extraction and processing***
>
> *Manage adverse effects from the exploration, extraction and processing of mineral and petroleum by:*
>
> *a) Giving preference to avoiding their location in all of the following:*
>
> *i. Areas of significant indigenous vegetation and significant habitats of indigenous fauna in the coastal environment;*
>
> *ii. Outstanding natural character in the coastal environment;*
>
> *iii. Outstanding natural features and natural landscapes, including seascapes, in the coastal environment;*
>
> *iv. Areas of significant indigenous vegetation and significant habitats of indigenous fauna beyond the coastal environment;*
>
> *v. Outstanding natural character in areas beyond the coastal environment;*
>
> *vi. Outstanding natural features and landscapes beyond the coastal environment;*
>
> *vii. Outstanding water bodies or wetlands;*
>
> *viii. Places or areas containing historic heritage of regional or national significance;*
>
> *ix. Areas subject to significant natural hazard risk;*
>
> *b) Where it is not practicable to avoid locating in the areas listed in a) above because of the functional needs of that activity:*
>
> *i. Avoid adverse effects on the values that contribute to the significant or outstanding nature of a) i-iii;*
>
> *ii. Avoid, remedy or mitigate, as necessary, adverse effects on values in order to maintain the outstanding or significant nature of a)iv-viii;*
>
> *iii. Consider first biological diversity offsetting, and then biological diversity compensation, if adverse effects described in b)ii. on indigenous biological diversity cannot be practicably remedied or mitigated;*
>
> *iv. Minimise any increase in natural hazard risk through mitigation measures;*
>
> *v. Consider environmental compensation if adverse effects described in b) ii, other than on indigenous biological diversity, cannot practically be avoided, remedied or mitigated;*
>
> *ba) Avoid significant adverse effects on natural character in all other areas of the coastal environment;*

c) *Avoiding adverse effects on the health and safety of the community;*

d) *Avoiding, remedying, or mitigating adverse effects on other values including highly valued natural features, landscapes and seascapes in order to maintain their high values;*

e) *Considering biological diversity offsetting or compensating for residual adverse effects on other values;*

f) *Reducing unavoidable adverse effects by:*

   i. *Staging development for longer term activities; and*

   ii. *Progressively rehabilitating the site, where possible;*

g) *Applying a precautionary approach (including adaptive management where appropriate) to assessing the effects of the activity, where there is scientific uncertainty, and potentially significant or irreversible adverse effects.*

Policy 5.4.8 adopts a cascading (or 'stepped') approach to the management of adverse effects:

- Preference is to be given to avoiding the location of mining activities in areas of significant indigenous vegetation and significant habitats of indigenous fauna;
- Where it is not practicable to avoid such areas, because of the functional need(s)[119] of the proposed mining activity, then adverse effects should be remedied or mitigated as necessary to maintain the outstanding or significant nature of such areas;
- If adverse effects cannot be practically remedied or mitigated, and there are residual adverse effects, consideration must be given first to biological diversity offsetting, and then biological diversity compensation; and
- The parameters for offsets are prescribed by Policy 5.4.6 and for compensation by Policy 5.4.6A of the RPS.

Consistent with the above policy, the Project will not affect any sites that are deemed to have outstanding natural character or features.

The location of the existing mining activities within the Macraes site has influenced the location of the proposed activities, for example where existing open pits are being extended. Therefore, there will be some indigenous vegetation and habitat features within the footprint of the Project that will be impacted. Some of which is considered to trigger the 'significant' criteria, for example the ephemeral wetlands. Where it has been impractical to avoid adverse effects on such features, OceanaGold has then sought to remedy or mitigate any adverse effects, consistent with the effects management hierarchy.

[119] 'Functional needs' is defined in the RPS as "*The locational, operational, practical or technical needs of an activity, including development and upgrades*".

This is explained in the Ecological Impact Management Plan, attached as **Appendix 16** and discussed in Section 6.3 of this AEE. Where residual adverse effects remain, OceanaGold is proposing to offset some of these effects. In accordance with Policy 5.4.6 of the RPS, the offsetting design will adhere to the following principles:

> *Consider indigenous biological diversity offsetting, when:*
>
> *a) Residual adverse effects of activities cannot be avoided, remedied or mitigated.*
>
> *b) The offset achieves no net loss and preferably a net gain in indigenous biological diversity;*
>
> *c) The offset ensures there is no loss of individuals of Threatened taxa other than kanuka (Kunzea robusta and Kunzea serotina), and no reasonably measurable loss within the ecological district to an At Risk-Declining taxon, other than manuka (Leptospermum scoparium), under the New Zealand Threat Classification System ("**NZTCS**");*
>
> *d) The offset is undertaken where it will result in the best ecological outcome, preferably:*
>
> *i. Close to the location of development; or*
>
> *ii. Within the same ecological district;*
>
> *e) The offset is applied so that the ecological values being achieved are the same or similar to those being lost;*
>
> *f) The positive ecological outcomes of the offset last at least as long as the impact of the activity, preferably in perpetuity;*
>
> *g) The offset will achieve biological diversity outcomes beyond results that would have occurred if the offset was not proposed;*
>
> *h) The delay between the loss of biological diversity through the proposal and the gain or maturation of the offset's biological diversity outcomes is minimised.*

9.13.2 Proposed Otago Regional Policy Statement 2021

The relevant provisions of the pRPS are assessed below, noting the above comments that some of these provisions have been appealed.

9.13.2.1 MW – Mana whenua

Objective MW-O1 of the pRPS seeks to give effect to the principles of Te Tiriti o Waitangi in resource management processes and decisions to ensure that what is valued by mana whenua is actively protected in the region. Policy MW-P2 seeks to give effect to this objective by recognising and facilitating Kāi Tahu involvement in decision-making, recognising and providing for Kāi Tahu values and addressing resource management issues of significance to Kāi Tahu and having particular regard to the responsibility of Kāi Tahu to exercise their role as kaitiakitaka.

As noted above, OceanaGold has consulted with Aukaha and this will continue throughout the resource consent process and beyond. This consultation process will seek to recognise and provide for Kāi Tahu values, interests, customary values and wellbeing, as outlined in the consultation correspondence received from the relevant iwi representative. A CIA has also been commissioned from Aukaha and is being prepared to inform the resource consent application and AEE. OceanaGold will continue to seek to establish an understanding of how any cultural or historical associations with the Project Site may be affected by the Project, and what measures may be implemented to mitigate or otherwise manage any potential effects on such associations.

9.13.2.2 IM – Integrated Management

The Integrated Management chapter of the pRPS includes a range of relevant objectives that seek:

- To ensure the management of natural and physical resources achieves a healthy and resilient natural environment including the ecosystem services it provides and supports the well-being of present and future generations;[120]
- That the management of natural and physical resources embraces ki uta ki tai, recognising that the environment is an interconnected system;[121] and
- To enable Otago's communities to provide for their social, economic and cultural well-being in ways that support or restore environmental integrity, form, functioning and resilience, so that the life-supporting capacities of air, water, soil, and ecosystems are sustainably managed for future generations.[122]

In accordance with the policies that give effect to the above objectives, in designing the Project and preparing resource consent applications, OceanaGold has:

- Recognised the interconnectedness of the environment to ensure that the environment is managed to preserve environmental integrity, form, function and resilience;[123]
- Consulted with Aukaha on the proposed activity and the CIA prepared for the Project will provide guidance on the cultural values of significance associated with the site to ensure they are appropriately provided for;[124] and

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[120] IM-O1, Integrated Management, Proposed Otago Regional Policy Statement 2021.

[121] IM-O2, Integrated Management, Proposed Otago Regional Policy Statement 2021.

[122] IM-O3, Integrated Management, Proposed Otago Regional Policy Statement 2021.

[123] IM-P1, Proposed Otago Regional Policy Statement 2021.

[124] IM-P3, Proposed Otago Regional Policy Statement 2021.

- Committed to the goal of being carbon neutral by 2050, in line with the New Zealand Government (Climate Change Response Act 2019). As a step towards achieving this goal, Macraes Operation has developed a detailed plan, based on expert advice, which will see a 14-24% reduction in cumulative emissions by 2030.[125]

9.13.2.3 AIR - Air

Objectives AIR-O1 and Air-O2 of the pRPS aim to ensure that the ambient air quality and discharges to air provide for and do not compromise human health, amenity and mana whenua values and the life-supporting capacity of ecosystems.

The associated policies that give effect to these objectives seek to:

- Maintain ambient air quality in Otago by ensuring discharges to air comply with limits where they have been set, and where there are no limits, only allowing discharges to air if the adverse effects on ambient air quality are avoided, remedied or mitigated [and] are no more than minor;[126]
- Provide for discharges to air that do not adversely affect human health, amenity values and mana whenua values and the life-supporting capacity of ecosystems;[127] and
- Manage certain discharges to avoid noxious or dangerous effects, ensuring discharges do not cause offensive or objectionable effects, and avoiding, remedying or mitigating adverse effects from discharges arising from activities that produce dust, including by ensuring that discharges to air do not adversely affect mana whenua values.[128]

As noted in Section 5.11 of this AEE, Beca has completed an assessment of the proposed activities on air quality and confirmed any effects generated from the MP4 Project will be negligible. OceanaGold have a Dust Management Plan in place which will be updated and continue to appropriately manage any effects associated with the discharge of dust and other contaminants during the construction and operation of works at the site such that there are no unacceptable adverse effects. As such, the proposal is consistent with the provisions of the Air chapter of the pRPS.

9.13.2.4 LF – Land and Freshwater

The proposal is within the proposed North Otago Freshwater Management Unit ("**FMU**"). The relevant FMU vision is LF-VM-O3, which states:

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[125] IM-P9, Proposed Otago Regional Policy Statement 2021.

[126] AIR-P1, Air, Proposed Otago Regional Policy Statement 2021.

[127] AIR-P3, Air, Proposed Otago Regional Policy Statement 2021.

[128] AIR-P4; AIR-P6, Air, Proposed Otago Regional Policy Statement 2021.

By 2050 in the North Otago FMU, and in addition to the matters in LF-FW-O1A:

1. *the Waitaki River is managed holistically, ki uta ki tai, despite its catchments spanning the Canterbury and Otago regions,*
2. *the national significance of the Waitaki hydroelectricity generation scheme is recognised,*
3. *healthy riparian margins, wetlands, estuaries and lagoons support the health of downstream coastal ecosystems,*

LF-FW-O8 relates to freshwater and seeks that:

In Otago's water bodies and their catchments:

(1) the significant and outstanding values of Otago's outstanding water bodies are identified and protected.

LF-FW-O9 relates to wetland and seeks that:

Otago's wetlands are protected from inappropriate subdivision, use and development and, where degraded, restoration is promoted so that:

(1) mahika kai and other mana whenua values are sustained and enhanced now and for future generations,

(2) there is no net decrease, and preferably an increase, in the extent and diversity of wetland indigenous ecosystem types and habitats, and

(3) there is no reduction and, where degraded, there is an improvement in wetland ecosystem health, hydrological functioning, amenity values, extent or water quality, and

(4) their flood attenuation and water storage capacity is maintained or improved.

LF–FW–O10 relates to natural character and seeks that:

The natural character of wetlands, lakes and rivers and their margins is preserved and protected from inappropriate subdivision, use and development.

In addition to the aforementioned objectives, the following provisions are of relevance to the proposal:

- Otago's water bodies and their health and well-being are protected, and restored where they are degraded, so that the mauri of those water bodies is protected;[129]
- Prioritise, first, the health and well-being of water bodies and freshwater ecosystems, second, the health needs of people, and third, the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future;[130]

[129] LF-WAI-O1, Proposed Otago Regional Policy Statement 2021.

[130] LF-WAI-P1. Proposed Otago Regional Policy Statement 2021.

- Recognise and give practical effect to Kāi Tahu rakatirataka in respect of fresh water;[131]
- Manage the use of freshwater and land, using an integrated approach that is consistent with tikaka and kawa;[132]
- Give effect to Te Mana o te Wai;[133]
- Managing wetlands by applying clause 3.22(1) to (3) of the NPSFM to all wetlands,[134] and
- Preserving the natural character and instream values of lakes and rivers and the natural character of their beds and margins.[135]

The Project will ensure the existing freshwater and ecosystem values are maintained through the implementation of appropriate management measures recommended in the technical assessments prepared by GHD and Greg Ryder Consulting. The Project has been assessed by GHD to be unlikely to significantly alter the water quality and quantity of nearby surface water receptors either during the operational phase or following the closure of the mine. In addition, Greg Ryder Consulting considers that with the implementation of the appropriate management measures described in Section 6.2 of this AEE and the reports attached as **Appendices 20-21**, and retention of the existing compliance limits, there will be no more than minor adverse effects on aquatic ecology. OceanaGold will continue to carry out regular water quality monitoring in accordance with their existing resource consents to ensure the health and well-being of water bodies and freshwater ecosystems are maintained. Mitigation measures implemented during operation of the Project are likely to improve closure phase water quality outcomes from the status quo.

As discussed in Section 9.8.3 above, the proposed mineral extraction activities will result in potential adverse effects on ephemeral wetlands present within the proposed footprint of the Coronation 6 and buffer zone of the Innes Mills extensions, however there is a functional need for the activity to be undertaken in that location. In accordance with Clause 3.22 of the NPS-FM, which provides for the loss of extent or values that arise from the extraction of minerals and ancillary activities, OceanaGold will adopt the effects management hierarchy to manage the effects of this Project on wetlands. In the first instance, OceanaGold has avoided adverse effects where practicable, on the wetlands present within the site including redesigning the footprint of the Golden Bar WRS to avoid an ephemeral wetland. Where this is not practicable, OceanaGold has then sought to firstly

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131 LF-WAI-P2, Proposed Otago Regional Policy Statement 2021.

132 LF-WAI-P3, Proposed Otago Regional Policy Statement 2021.

133 LF-WAI-P4, Proposed Otago Regional Policy Statement 2021.

134 LF-FW-P10A, Proposed Otago Regional Policy Statement 2021.

135 LF-FW-P13, Proposed Otago Regional Policy Statement 2021.

minimise the footprint of any intrusion and, secondly, remedy any harm caused. This has not been possible with Coronation 6 and Innes Mills 10 and therefore because residual adverse effects remain, OceanaGold will offset for these. Further details on this are addressed in the Ecological Impact Management Plan prepared by Whirika, attached as **Appendix 16**, and discussed in Section 6.3 of this AEE. This includes creating up to 5 ephemeral wetlands, covering an area of 0.3 hectare on the exotic grassland-dominated spur on the Taieri Ridge, and a new wetland of up to 0.1 ha at the perimeter of the MEEA predator fence, to ensure there is no loss in wetland extent and values.

With respect to managing the loss of river extent and values, Policy LF-FW-P13 of the pRPS generally reflects the requirements of Clause 3.24 of the NPSFM. As discussed at Section 9.8.4 above, the Project will accord with those requirements. As such, the Project will appropriately preserve the natural character and instream values of rivers in accordance with Policy LF-FW-P13 of the pRPS.

9.13.2.5 Ecosystems and Indigenous Biodiversity

The relevant ECO chapter objectives seek to ensure Otago's indigenous biodiversity is healthy and thriving and any overall decline in conditions, quantity and diversity is halted.[136] Further, ECO-O2 aims for restoration and enhancement activities to result in an overall increase in the extent and occupancy of Otago's indigenous biodiversity. The policies that give effect to these objectives include those that relate to the management of activities in significant natural areas (ECO-P2, ECO-P3, ECO-P4 and ECO-P5A) and the pRPS has incorporated the relevant provisions of the NPS-IB.

The site is not identified as a significant natural area (SNA) in either the Waitaki District Plan, Dunedin City District Plan, or the Otago Regional Policy Statements, and therefore, does not technically meet the pRPS definition of a SNA. Notwithstanding that, as outlined in the Whirika report, there are sites affected by the Project which trigger some of the criteria for identifying areas that qualify as SNAs as outlined in APP2 of the pRPS. Applying a precautionary approach, OceanaGold has elected to manage the adverse effects of the Project on these areas as if they qualify as SNA's in accordance with applicable policies in the pRPS.

On that basis, the Project provides for mineral extraction that provides a significant regional and national public benefit that could not otherwise be achieved within New Zealand and there is a functional and operational need to locate within the relevant 'SNAs', and Policy ECO-P4 provides for the adverse effects on SNAs to be managed in accordance with the effects management hierarchy. This direction is derived from Clause 3.11 of the NPS-IB which is discussed in Section 9.9. With respect to indigenous biodiversity not qualifying as a SNA, Policy ECO-P6 requires only significant adverse

[136] ECO-O1, Proposed Otago Regional Policy Statement 2021.

effects to be managed in accordance with the effects management hierarchy. In relation to other adverse effects, Policy ECO-P6 directs the maintenance of indigenous biodiversity.

In determining the measures required to manage adverse effects of the Project on indigenous biodiversity, OceanaGold has generally applied the effects management hierarchy to all adverse effects as discussed in detail in Section 6.3. Application of the effects management hierarchy, including implementing the proposed ecological offsetting and compensation is designed to achieve a net gain outcome for indigenous biodiversity. This approach is suitably precautionary and exceeds the expectations of the pRPS.

9.13.2.6 HAZ – Hazards and Risks

Objective HAZ-NH-O1 seeks to ensure that risks to people, communities and property from natural hazards within Otago are maintained where they are acceptable, and managed to ensure they do not exceed a tolerable level.

The relevant policies seek:

- To use the best available information to identify areas where natural hazards may adversely affect people, communities and property.[137]

As noted above, the proposal does not constitute a natural hazard, but it is noted that mining activities can potentially exacerbate natural hazard risks. There are no identified natural hazard areas located within the Project site. Stability of landforms created by mining are actively managed by OceanaGold, and geotechnical stability modelling, informed by extensive site experience and expertise, has assessed that the pit walls, WRSs and other proposed earthworks will be stable and safe, both during operation and following rehabilitation in both static and seismic event scenarios. The pit margins will be isolated by a suitable barrier that is set back an appropriate distance that will be determined at the end of mining and informed by the most recent geological exposures in the pit.

Furthermore, the dam safety assessments, described in Section 5.3.4 of this AEE, confirmed that the proposed FTST Stage 2, will be designed, constructed and operated in accordance with the standards outlined in the NZDSG in view of the Potential Impact Classification rating of the Frasers Backfill embankment dam. This will ensure the dam is designed and operated to a standard with a low and acceptable risk of potential failure, and therefore, appropriately manage the hazards and risks associated with these activities.

[137] HAZ-NH-P1, Proposed Otago Regional Policy Statement 2021.

9.13.2.7 HCV – Historical and Cultural Values

Objective HCV-HH-O3 seeks to ensure Otago's unique historic heritage contributes to the region's character, sense of identity and social, cultural and economic well-being, and people's understanding and appreciation of it is enhanced, and that it is protected for future generations against inappropriate subdivision, use and development. The Heritage assessment completed for the Project and discussed in Section 5.12 of this AEE determined there would be no more than minor adverse effects on historic heritage from the proposed activities. OceanaGold will obtain an archaeological authority for the removal of part of a historic fence line required for the expansion of the Coronation 6 pit and will have an accidental discovery protocol in place to ensure that any unexpected historic heritage features are managed appropriately if encountered.[138]

9.14 REGIONAL PLAN: WATER FOR OTAGO ("WATER PLAN")

The Water Plan was made operative in its current form on 3 September 2022. It contains objectives and policies which seek to manage the following matters of relevance to the MP4 Project:

- The natural and human use values of lakes and rivers;
- Water quantity;
- Water quality;
- The beds and margins of lakes and rivers;
- Groundwater; and
- Wetlands.

The Water Plan contains provisions which specifically address the management of water and associated effects within the Region. As discussed above, the Water Plan has been amended and made operative as of 3 September 2022, to include specified policies as directed by the NPS-FM, however, has not been updated to reflect the most recent changes to the NPS-FM in February 2023. The provisions of the Water Plan that are assessed as being most relevant to this proposal are outlined in the sections below.

9.14.1 Natural and human use values of lakes and rivers

Key management objectives for the natural and human use values of Otago's rivers seek:

[138] HCV-HH-P5, Proposed Otago Regional Policy Statement 2021.

- To maintain or enhance the natural and human use values, identified in Schedules 1A, 1B and 1C;[139]
- To maintain or enhance the spiritual and cultural beliefs, values and uses of significance to Kāi Tahu, identified in Schedule 1D;[140]
- To protect the natural character of Otago's lakes and rivers and their margins from inappropriate subdivision, use or development;[141]
- To maintain or enhance the amenity values associated with Otago's lakes and rivers and their margins;[142]
- To provide for the sustainable use and development of Otago's water bodies, and the beds and margins of Otago's lakes and rivers;[143]
- To maintain the heritage values associated with Otago's lakes and rivers, and their margins;[144] and
- To avoid the exacerbation of any natural hazard or the creation of a hazard associated with Otago's lakes and rivers.[145]

The most relevant policies in terms of providing direction on how the MP4 Project should manage its adverse effects in light of these objectives are: Policies 5.4.2, 5.4.3, 5.4.8 and 5.4.9. They state:

> ***5.4.2*** *In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding, in preference to remedying or mitigating:*
>
> *(1) Adverse effects on:*
>
> *(a) Natural values identified in Schedule 1A;*
>
> *(b) Water supply values identified in Schedule 1B;*
>
> *(c) Registered historic places identified in Schedule 1C, or archaeological sites in, on, under or over the bed or margin of a lake or river;*
>
> *(d) Spiritual and cultural beliefs, values and uses of significance to Kāi Tahu identified in Schedule 1D;*
>
> *(e) The natural character of any lake or river, or its margins;*

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139 Objective 5.3.1, Regional Plan: Water for Otago.

140 Objective 5.3.2, Regional Plan: Water for Otago.

141 Objective 5.3.3, Regional Plan: Water for Otago.

142 Objective 5.3.4, Regional Plan: Water for Otago.

143 Objective 5.3.6, Regional Plan: Water for Otago.

144 Objective 5.3.7, Regional Plan: Water for Otago.

145 Objective 5.3.8, Regional Plan: Water for Otago.

(f) *Amenity values supported by any water body; and*

(2) *Causing or exacerbating flooding, erosion, land instability, sedimentation or property damage.*

5.4.3 *In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding adverse effects on:*

(a) *Existing lawful uses; and*

(b) *Existing lawful priorities for the use, of lakes and rivers and their margins.*

5.4.8 *To have particular regard to the following features of lakes and rivers, and their margins, when considering adverse effects on their natural character:*

(a) *The topography, including the setting and bed form of the lake or river;*

(b) *The natural flow characteristics of the river;*

(c) *The natural water level of the lake and its fluctuation;*

(d) *The natural water colour and clarity in the lake or river;*

(e) *The ecology of the lake or river and its margins; and*

(f) *The extent of use or development within the catchment, including the extent to which that use and development has influenced matters (a) to (e) above*

5.4.9 *To have particular regard to the following qualities or characteristics of lakes and rivers, and their margins, when considering adverse effects on amenity values:*

(a) *Aesthetic values associated with the lake or river; and*

(b) *Recreational opportunities provided by the lake or river, or its margins.*

The MP4 Project sits comfortably within these provisions, noting that:

- The relevant natural values in Schedule 1A attributed to Deepdell Creek are an absence of aquatic pest plants, and the presence of rare species including flathead and hybrid galaxiid species;
- The closest water supply values identified in Schedule 1B are the Dunback Water Supply, Palmerston Water Supply from the Shag River and the Mt Pleasant-Stoneburn Water Supply. The Project will be undertaken within parameters previously deemed acceptable and which do not put these water supplies at risk. Therefore, it will not introduce or increase the concentration of any determinands in the drinking water such that it no longer meets the health quality criteria after existing treatment;
- There are no registered historic places in Schedule 1C that will be affected by the MP4 Project. The Heritage Assessment completed for the Project identified a historic fence

line within the footprint of the Coronation 6 pit extension and OceanaGold will apply for an archaeological authority to permit the removal of part of this fence;

- Multiple Kāi Tahu values are attributed to the Shag River/Waihemo and Waikouaiti River catchments. This will be further considered as a result of ongoing consultation with Aukaha and the contents of the CIA and this will inform the proposed management measures;
- With respect to natural character and effects on amenity values, none of the relevant water bodies (the Mare Burn, Deepdell Creek, Clydesdale Creek, Golden Bar Creek Waikouaiti River North Branch) are attributed any significance. The affected lengths of these water bodies are already highly modified and are not known to support any notable recreation values that would be affected by the Project;
- The proposed activities in the Golden Bar area will require the reclamation of a small length of Clydesdale Creek (430 m). The ecological values of these watercourses have been assessed as low. OceanaGold will offset, compensate or mitigate the effects of this loss by protecting and enhancing twice the length stream habitat within the MEEA, as described in Section 6.3;
- Modelling indicates that downstream water quality on a cumulative basis will remain compliant with existing consent limits and recommended instream environmental limits for habitat and species protection;
- The Project will not exacerbate flooding, and a variety of measures are proposed to avoid erosion, land instability and sedimentation; and
- No adverse effects on other existing lawful uses of water have been identified.

Given the above, it is considered the proposed activity is consistent with the Water Plan provisions relating to the Natural and Human Use Values of Lakes and Rivers.

9.14.2 Water Quantity – Chapter 6

The following provisions of Chapter 6 of the Water Plan are of relevance to the proposed activity:

- To retain flows in rivers sufficient to maintain their life-supporting capacity for aquatic ecosystems, and their natural character;[146]
- To provide for the water needs of Otago's primary and secondary industries, and community domestic water needs;[147]

[146] Objective 6.3.1, Regional Plan: Water for Otago.

[147] Objective 6.3.2, Regional Plan: Water for Otago.

- To minimise adverse effects on the quality of receiving water, including its ecology and mauri, where such water is subject to any new inter-catchment transfer of water;[148] and
- In considering whether to grant or refuse consents to take, divert or use water outside of the Waitaki catchment, the consent authority will have regard to the extent to which granting consent will reduce the availability of water to current and reasonably foreseeable in-catchment needs.[149]

In accordance with the above provisions, the proposed takes will not result in adverse changes to the flow of the rivers within the catchment to ensure their life-supporting capacity is maintained. The assessments completed by GHD and Greg Ryder Consulting indicate that the proposed water takes will maintain the values of the affected water bodies.

9.14.3 Water Quality and Groundwater – Chapter 7 and Chapter 9

The key relevant objectives and policies for water quality in Otago are as follows:

- To maintain water quality in Otago lakes, rivers, wetlands, and groundwater, but enhance water quality where it is degraded;[150]
- To enable the discharge of water or contaminants to water or land, in a way that maintains water quality and supports natural and human use values, including Kāi Tahu values;[151]
- To have individuals and communities manage their discharges to reduce adverse effects, including cumulative effects, on water quality;[152]
- To maintain the quality of Otago's groundwater;[153]
- To sustain the recognised uses of Otago's groundwater;[154]
- To identify land of high risk in terms of the vulnerability of underlying groundwater to leachate contamination and to manage, with respect to this land, existing land use activities, point source discharges and excavation activities;[155] and

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148 Policy 6.3.5, Regional Plan: Water for Otago.

149 Policy 6.6A.5, Regional Plan: Water for Otago.

150 Objective 7.A.1, Regional Plan: Water for Otago.

151 Objective 7.A.2, Regional Plan: Water for Otago.

152 Objective 7.A.3, Regional Plan: Water for Otago.

153 Objective 9.3.3, Regional Plan: Water for Otago.

154 Objective 9.3.1, Regional Plan: Water for Otago.

155 Policy 9.4.18, Regional Plan: Water for Otago.

- Avoid objectionable discharges of water or contaminants.[156]

The most relevant policies in terms of providing direction on how the MP4 Project should manage its adverse effects in light of these objectives are 'general' policies: 7.B.1, 7.B.4, 7.B.6, 7.B.7 and 7.B.8.

Key policies state:

7.B.1 *Manage the quality of water in Otago lakes, rivers, wetlands and groundwater by:*

a) Describing, in Table 15.1 of Schedule 15, characteristics indicative of good quality water; and

b) Setting, in Table 15.2 of Schedule 15, receiving water numerical limits and targets for achieving good quality water; and

c) Maintaining, from the dates specified in Schedule 15, good quality water; and

d) Enhancing water quality where it does not meet Schedule 15 limits, to meet those limits by the date specified in the Schedule; and

e) Recognising the differences in the effects and management of point and non-point source discharges; and

f) Recognising discharge effects on groundwater; and

g) Promoting the discharge of contaminants to land in preference to water.

7.B.4 *When considering any discharge of water or contaminants to land, have regard to:*

a) The ability of the land to assimilate the water or contaminants; and

b) Any potential soil contamination; and

c) Any potential land instability; and

d) Any potential adverse effects on water quality; and

e) Any potential adverse effects on use of any proximate coastal marine area for contact recreation and seafood gathering.

7.B.6 *When assessing any consent to discharge contaminants to water, consider the need for and the extent of any zone for physical mixing, within which water will not meet the characteristics and limits described in Schedule 15, by taking account of:*

a) The sensitivity of the receiving environment; and

b) The natural and human use values, including Kāi Tahu values; and

c) The natural character of the water body; and

d) The amenity values supported by the water body; and

[156] Policy 7.B.2, Regional Plan: Water for Otago.

e) *The physical processes acting on the area of discharge; and*

f) *The particular discharge, including contaminant type, concentration and volume; and*

g) *The provision of cost-effective community infrastructure; and*

h) *Good quality water as described in Schedule 15.*

7.B.7 *Encourage land management practices that reduce the adverse effects of water or contaminants discharged into water.*

7.B.8 *Encourage adaptive management and innovation that reduces the level of contaminants in discharges.*

OceanaGold has undertaken water modelling to understand the potential extent of adverse effects of the MP4 Project in terms of discharges of contaminants to receiving water bodies. Compliance limits for contaminants in water that have been applied to other projects within the site will also be applied to the MP4 Project. According to modelling undertaken by GHD, the water quality downstream of the catchment is expected to remain well within the currently consented parameters. The only exception to this is iron, however, as noted by GHD this is because the baseline water quality and modelled exceedances of iron are likely conservative and significantly overstated. These parameters have been specifically developed and tested to protect the aquatic species in the receiving environment, particularly the galaxiids. This is expected to generally achieve outcomes consistent with good water quality as described in Schedule 15 and Policy 7.B.6.

It is proposed that any runoff of silt and sediment from the proposed activities will be managed through an updated erosion and sediment control plan for the site consistent with details provided in the EGL Erosion and Sediment Control report discussed in Section 6.1 of this AEE.

OceanaGold also intend to monitor water quality in the catchments consistent with its existing consent requirements, and to adaptively manage and mitigate any potential water quality issues that might arise. This is consistent with Policy 7.B.8 of the Water Plan.

9.14.4 Wetlands – Chapter 10

The relevant Water Plan provisions relating to wetlands seek to:

- Maintain or enhance Otago's wetlands and their individual and collective values and uses;[157]
- Promote the conservation, creation and reinstatement of wetland areas and enhancement of individual and collective wetland values; and

[157] Objective 10.3.1, Regional Plan: Water for Otago.

- Avoid the loss of natural inland wetlands, protect their values and promote restoration.[158]

While the proposed activity will result in impacts on ephemeral wetlands within the Coronation 6, and potentially within the Innes Mills area, given the functional need for the activity to occur within this footprint, OceanaGold will adopt the effects management hierarchy, in accordance with the provisions of the NPS-FM.[159] The Water Plan has not been updated to reflect the changes to the NPS-FM that provide for mineral extraction activities that may result in adverse effects on natural inland wetlands. As the higher-order statutory document, full consideration should be given to the provisions of the NPS-FM over the provisions of the Water Plan.

As set out above, OceanaGold has first sought to avoid adverse effects on wetlands identified within the site, where this has not been practicable these effects have been remedied and mitigated, and where residual effects remain, these effects will be offset. This will be through the establishment of up to 5 ephemeral wetlands, covering an area of 0.3 ha on the exotic grassland-dominated spur on the Taieri Ridge, and up to 0.1 ha at the perimeter of the MEEA predator fence as discussed in Section 6.3.5 of this AEE. This will ensure there is no net loss of wetland extent or values.

9.14.5 Replacement of Water Take and Use Permits – Chapter 10A

Objective 10A.1.1 aims to facilitate an efficient and effective transition from the operative freshwater planning framework toward a new integrated regional planning framework by managing the take and use of freshwater, the replacement of deemed permits and the replacement of water permits for takes and uses of freshwater.

The only provision within Chapter 10A that is relevant to the proposed activity is Policy 10A.2.2 which states:

> *Irrespective of any other policies in this Plan concerning consent duration, only grant resource consents for takes and uses of freshwater, where this activity was not previously authorised by a Deemed Permit or by a water permit expiring prior to 31 December 2025, for a duration of no more than six years.*

As set out in Section 4 of this AEE, OceanaGold is seeking new water permits for the take and use of tailings decant water from FTSF, the take and use of surface and groundwater from Coronation Pit, Coronation North Pit and Golden Bar Pit for the purpose of pit dewatering, as well as the take and use of surface water from silt ponds for the purpose of managing WRS seepage.

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158 Policy 10.4.8, Regional Plan: Water for Otago.

159 Clause 3.22 of the NPS-FM.

The RMA defines freshwater as all water except coastal water and geothermal water. Therefore, in the context of the above policy, the proposed takes and uses of water are considered to be takes and uses of 'freshwater'. It is acknowledged that Policy 10A.2.2 is very directive towards only allowing the duration of new water permit for a period of no more than six years. However, it is considered that the objective and policies of Chapter 10A, when read together, do not preclude the granting of some of the proposed water permits for a period longer than six years for the following reasons:

- For the take and use of tailings water from FTSF:
    - The tailings water proposed to be taken has been delivered to FTSF as tailings slurry and the subsequent taking allows this water to be recycled;
    - The processing plant water system is effectively closed, and so water take will not result in new adverse effects on water quantity in nearby surface water bodies; and
    - Any water taken from Frasers Pit that is sourced from rainfall or surface water runoff is authorised to be taken from the pit and used in the same manner as is proposed here, in accordance with RM10.351.48.V2 until 1 October 2046. This includes all water that may end up in Frasers Pit.
- For the take and use of surface water from Coronation Pit, Coronation North Pit and Golden Bar Pit:
    - The provisions of Chapter 10A are intended to manage activities where potential allocation issues may arise;
    - The proposed takes and uses of water do not result in any surface water allocation issues within the respective catchments as they occur high in the catchments and do not result in adverse water quantity effects in surface waterways;
    - In accordance with the relevant policies, the proposed water takes will replace valid water permits, are not for the purpose of irrigation, will contain the same conditions as are on the existing consents and do not seek to increase the rate of abstraction or volume of water taken beyond what is currently authorised under the existing consents.
- For the take and use of surface water from silt ponds:
    - The seepage water proposed to be taken has been delivered to the silt ponds from other consented mining discharges and the subsequent taking allows this water to be recycled within the MWMS to mitigate effects on surface water quality;

OceanaGold seeks a term of 22 years for the take and use of tailings return water from FTSF and the take and use of WRS seepage water from silt ponds to align with other related consents. A term of 28 years is sought for the take and use of surface water from

Coronation North Pit, and a term of 35 years for the take and use of surface water from Golden Bar Pit. Issuing these water permits for a term longer than six years will in no way adversely affect ORC's ability to transition to a new integrated regional planning framework efficiently and effectively. The taking and use of water in the manner proposed facilitates the conservation of water through recycling on site, where the supply of that water to be taken is largely provided for by existing resource consents. The proposed take and use of water from the TSF, open pits, and silt ponds represents a unique scenario and not one that is contemplated by the drafting of the provisions in Chapter 10A. Therefore, it could be considered as a true exception that will not give rise to any issues for the integrity of the plan. On that basis it is OceanaGold's position that issuing the water permits outlined above for the respective periods outlined above would not be contrary to the provisions of Chapter 10A when they are read 'in the round'.

9.14.6 Summary

Overall, the proposed activity is considered to be consistent with the relevant provisions of Chapters 6, 7, 9 and 10A of the Water Plan.

9.15 REGIONAL PLAN: AIR FOR OTAGO ("AIR PLAN")

The Air Plan contains the provisions which specifically address the management of air quality, including the discharge of contaminants to air. The provisions in Part 3 of the Air Plan that are assessed as being most relevant to the Project include:

- To maintain ambient air quality in parts of Otago that have high air quality and enhance ambient air quality in places where it has been degraded;[160]
- To avoid adverse localised effects of contaminant discharges into air on:
    - Human health;
    - Cultural, heritage and amenity values;
    - Ecosystems and the plants and animals within them; and
    - The life-supporting capacity of air;[161]
- To allow for the sustainable use of Otago's air resource;[162]
- To recognise and provide for the relationship Kai Tahu have with the air resource through procedures that enable Kai Tahu to participate in management of the air resource;[163]

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[160] Objective 6.1.1. Regional Plan: Air for Otago.

[161] Objective 6.1.2, Regional Plan: Air for Otago.

[162] Objective 6.1.3, Regional Plan: Air for Otago.

[163] Policy 7.1.1, Regional Plan: Air for Otago.

- To have regard to the Otago Goal Levels identified in Schedule 1 and comply with the Resource Management (National Environmental Standards Relating to Certain Air Pollutants, Dioxins and Other Toxics) Regulations 2004 in managing the region's ambient air resource;[164]

The activity is proposed to be carried out in a manner that is consistent with the currently consented air discharges. Therefore, established and effective management practices will continue to be used to avoid, remedy and mitigate the effects of dust so that it will have similar and acceptable effects within the scope of the relevant existing consents.

Beca completed an assessment on the effects of the proposed activity on air quality (refer to **Appendix 29**) and confirmed that any effects associated with the discharge of contaminants to air will be less than minor. The primary contaminant discharged from the proposed activity will be dust and the current dust monitoring and management programme will continue to operate during the proposed activity. No changes to the current approach to monitoring and management are considered necessary to effectively monitor the dust generated from the proposed activity.

Overall, the proposed activity is considered to be consistent with the most relevant provisions of the Air Plan and the general policy direction set out within this document.

9.16 REGIONAL PLAN: WASTE FOR OTAGO ("WASTE PLAN")

The Waste Plan seeks to manage waste and its effects on the environment. Some provisions are relevant to the MP4 Project as the site, being subject to HAIL activities, is potentially contaminated, and tailings are considered to be a hazardous waste. As such, the following provisions of Chapter 5 are most relevant to the Project.

9.16.1 Contaminated sites – Chapter 5

The site, being subject to HAIL activities, is potentially contaminated. As such, the following provisions of Chapter 5 are most relevant to this proposal:

- To avoid, remedy or mitigate any adverse effects of contaminated sites;[165]
- To contain contaminated sites and rehabilitate them to the extent that is practicable having regard to the use to which the land is to be put;[166] and
- To apply the Australia and New Zealand Conservation Council ("**ANZECC**") "Guidelines for the Assessment and Management of Contaminated Sites" (January

[164] Policy 8.1.1, Regional Plan: Air for Otago.

[165] Objective 5.3.1, Regional Plan: Waste for Otago.

[166] Policy 5.4.3, Regional Plan: Waste for Otago.

1992) as a guide to determine the most appropriate course of action for a particular contaminated site.[167]

In accordance with the above provisions, the FTSF has been designed such that the tailings are appropriately contained, and any off-site effects of tailings storage are appropriately minimised. The FTSF and the open pit mines will be appropriately rehabilitated as pit lakes in accordance with the closure arrangement anticipated by existing resource consents. Rehabilitation in this way is considered to be an appropriate course of action based on the activities that have been carried out at the site, as well as the fact that the Project is in itself, a HAIL activity. The proposed activities will not present any impediment to successful rehabilitation of the pits as pit lakes. All existing receiving environment water quality parameters will continue to be met. As such, the Project will be consistent with these provisions.

9.16.2 Hazardous substances and waste – Chapter 6

The key management objectives for hazardous substances and hazardous waste are:

- To avoid, remedy and mitigate the risk to the environment and human health from hazardous substances and hazardous wastes;[168]
- To avoid, remedy and mitigate the harmful effects of hazardous substances;[169] and
- To promote the safe transportation, and the use, treatment, storage and disposal of hazardous substances and hazardous wastes in such a manner that avoids adverse environmental effects.[170]

Extensive studies associated with mining on site to date have demonstrated that the human health effects of extracting ore from the ground on the site and subsequent disposal are able to be controlled adequately using established on-site methodologies and rehabilitation so that human health is appropriately protected.

The use and storage of hazardous substances on the site, such as diesel and explosives, will be carried out in a manner that meets the relevant health and safety regulations and industry best practice.

As such, the proposal is consistent with the above provisions.

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[167] Policy 5.4.4, Regional Plan: Waste for Otago.
[168] Objective 6.3.1, Regional Plan: Waste for Otago.
[169] Objective 6.3.2, Regional Plan: Waste for Otago.
[170] Policy 6.4.1, Regional Plan: Waste for Otago.

9.16.3 Summary

Overall, the proposed activity is considered to be consistent with the most relevant provisions of the Waste Plan and the general policy direction of that document. As such, consents should be granted as sought.

9.17 WAITAKI DISTRICT PLAN

The Waitaki District Plan contains 17 chapters within Part 2 which are related to zone specific and district wide issues, objectives and policies. Although the Mine is zoned as Macraes Mining Zone, there is no specific Mining Zone or Nature Conservation Values chapter within Part 2 of the District Plan, and these matters are addressed within Chapter 6 of Part 3 of the District Plan. The most relevant chapters to this proposal are assessed in the sections below.

9.17.1 Chapter 16 – Rural

The Waitaki District Plan acknowledges that mining is important to the economic and social wellbeing of the Waitaki District with a number of provisions specifically relating to extractive industries (mining). These provisions are situated in Part II Chapter 16 (Rural) of the Waitaki District Plan. As such, many of the matters relevant to mining activities are located within this chapter. The most relevant WDC matters concerning this proposal are addressed below.

Mineral Extraction

- Extractive industries are given the ability to access minerals but in a way that avoids, remedies or mitigates adverse effects on the environment;[171]
- To provide for a mining zone at Macraes Flat, in recognition of the scale and intensity of the mining operation, while ensuring the adverse effects of mining operations are avoided, remedied or mitigated;[172]
- To recognise the potential adverse effects of extractive operations, including mineral exploration, on the rural environment, and to control such operations in order that an assessment may be made as to the sensitivity of an existing area and the degree to which an operation will avoid, remedy or mitigate any adverse effects on the amenity and environment of the rural area;[173]
- To ensure that after mining, sites are rehabilitated sufficiently to enable the establishment of activities appropriate to the area;[174] and

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[171] Objective 16.7.1.6, Waitaki District Plan.

[172] Policy 16.7.2.3, Waitaki District Plan.

[173] Policy 16.7.2.2, Waitaki District Plan.

[174] Policy 16.7.2.4, Waitaki District Plan.

- To avoid, remedy or mitigate adverse effects on the rural amenity and environment by, where appropriate, encouraging extractive industries to continue in existing locations.[175]

As can be seen in the provisions related to mining activities listed above, the two broad policy directions of the Waitaki District Plan are to:

- Allow mining to occur in the area that the resource is located; and
- Ensure that the effects of mining are adequately controlled using the established mitigation hierarchy.

The Project is assessed to be consistent with the general policy direction in that it will meet the plan objective of allowing mining within the mining zone in a way that manages effects in accordance with the effects management hierarchy. Mining at Macraes is well-established and the proposed activity will utilise the existing pits and mining infrastructure on the site. OceanaGold have measures in place for rehabilitation of the site once mining is completed and this will enable pastoral farming activities to occur in the area.

Rural amenity

The following provisions regarding rural amenity are relevant to the proposal:

- A level of rural amenity that is consistent with the range of activities anticipated in the rural areas, but which does not create unacceptably unpleasant living or working conditions for the District's residents and visitors, nor a significant deterioration of the quality of the rural environment;[176] and
- To set performance standards or to use enforcement provisions for activities that may cause unpleasant living or working conditions for other people in the rural community, or that could cause a significant adverse effect to the environment.[177]

The Project is considered to be consistent with these provisions in that the activity is occurring largely within the mining zone and will not affect the rural amenity to the point of creating unpleasant living or working conditions for any resident or visitor, including through the generation of noise, traffic or landscape effects.

The noise assessment commissioned for the Project concludes, on a worst-case assessment basis, the Project will not create unacceptably unpleasant living conditions for the neighbouring properties and would not cause a significant deterioration of the quality of the rural environment in the Macraes township. Additionally, the area has low levels of

[175] Policy 16.7.2.5, Waitaki District Plan.

[176] Objective 16.5.1.4, Waitaki District Plan.

[177] Policy 16.5.2.3, Waitaki District Plan.

traffic activity, and the Project will not generate more than minor adverse traffic effects. The proposed Golden Bar road realignment will be designed and implemented in accordance with acceptable practice and will not unduly restrict existing public access. Further, the Landscape and Visual Amenity Assessment completed by WSP concluded the effects of the proposed activity on amenity will be less than minor.

Given the above, the proposal is not contrary to any relevant provision regarding rural amenity.

Nature Conservation Values

The Waitaki District Plan includes a number of provisions relating to nature conservation values and significant natural habitat. The following provisions are relevant to this proposal in providing general and specific policy direction regarding the habitat and species values on site and the effects of the proposal on those habitats and species values:

- The maintenance of biological diversity, nature conservation values, and ecosystem functioning within the District through the protection of areas assessed as having significant indigenous flora and significant habitats of indigenous fauna;[178]
- To manage the adverse effects of the use or development of land on significant indigenous vegetation or significant habitats of indigenous fauna so that the values of these areas are protected;[179]
- To use criteria to identify areas with significant indigenous vegetation or significant habitats of indigenous fauna;[180]
- To recognise that indigenous vegetation communities and associated fauna, other than areas with significant indigenous vegetation or significant habitats of indigenous fauna, may have nature conservation values;[181]
- To promote long-term sustainable protection of areas that have significant indigenous vegetation and significant habitats of indigenous fauna by encouraging landowners to investigate management options which maintain or enhance these sites and by supporting farmers and local community groups in private or valley conservation initiatives;[182]
- When considering resource consents that come before the Council, to ensure that regard is given to any adverse effects of the activity on the natural character of the

[178] Objective 16.9.2.1, Waitaki District Plan.

[179] Policy 16.9.3.1, Waitaki District Plan.

[180] Policy 16.9.3.3, Waitaki District Plan.

[181] Policy 16.9.3.4, Waitaki District Plan.

[182] Policy 16.9.3.7, Waitaki District Plan.

District's environment and on remaining indigenous vegetation and habitat, and that opportunities are taken to promote the retention of indigenous vegetation and habitat;[183] and

- To manage the effects of the use, development and protection of land on the natural character of the beds and margins of rivers, streams and wetlands, and having regard to the indigenous vegetation and habitat for indigenous fauna at a locality and the quality of the water.[184]

Of particular relevance, Whirika determined the vegetation communities that meet the significance criteria, as specified in the Waitaki District Plan, and these are outlined in **Table 9.1** below.

Table 9.1: Criteria outlined in the Waitaki District Plan used to identify areas with significant indigenous vegetation or significant habitats of indigenous fauna (Policy 16.9.3.3).

Policy 16.9.3.3 Criteria	Description	Habitat within the Project Footprint
Representativeness	*The area supports an example of a particular vegetation type, habitat or ecological process that is typical of the ecological district relative to the pre-European baseline and contributes to maintaining the appropriate proportional representation of that feature.*	Ephemeral Wetland Riparian Vegetation Shrubland
Rarity or Distinctiveness	*The area supports an indigenous species, habitat or community, which is rare and vulnerable within the ecological district or threatened nationally; or the area contains unusual features such as:* • *Playing an important role in the life-cycle of protected or threatened indigenous fauna;* • *The presence of species at their distribution limit;*	Ephemeral Wetland Tussockland Shrubland

[183] Policy 16.9.3.8, Waitaki District Plan.

[184] Policy 16.9.3.9, Waitaki District Plan.

Policy 16.9.3.3 Criteria	Description	Habitat within the Project Footprint
	• *Containing an intact sequence, or a substantial part of an intact sequence, of unusual ecological features or gradients.*	

Given these findings, the site is considered to contain species which are likely to be significant indigenous vegetation or habitats in terms of section 6(c) of the RMA.

The effects of the Project on terrestrial and aquatic ecological values are outlined in Sections 5.5 and 5.6 of this AEE. The site is a highly modified environment due to the presence of existing farming and mining activities. OceanaGold will manage the effects of the Project through the application of the effects management hierarchy. The proposed management of actual and potential effects associated with the MP4 Project activities are outlined in Section 6 of this AEE. Following the implementation of avoidance, remediation and mitigation measures, some residual adverse ecological effects remain. OceanaGold are proposing to create new wetlands in a nearby area and establish the MEEA which will also serve as a relocation site for salvaged lizards. This offset program has been designed by Whirika and it is considered this will be effective in ensuring there will at least be no net loss of ecological values as a result of the Project activities.

Further, Greg Ryder Consulting considered the effects of the Project on aquatic ecology, and it was concluded there will be no more than minor adverse effects on these values as a result of the Project relative to the existing consented environment.

Given the above, it is considered OceanaGold will appropriately manage the effects associated with the MP4 Project in a way that is consistent with the provisions of the Waitaki District Plan.

9.17.2 Chapter 1 – Takata Whenua

The most relevant provisions in this chapter are:

- Recognition of a partnership between the Council and the recognised Mana Whenua in the management of the District's natural and physical resources;[185]
- To ensure an appropriate level of iwi input into resource management matters guided by the principles of the Treaty of Waitangi;[186] and

[185] Objective 1.3.1, Waitaki District Plan.

[186] Policy 1.3.2.3, Waitaki District Plan.

- To recognise important mahinga kai areas and to protect such areas.[187]

The proposal is not contrary to the above provisions as the Applicant acknowledges the relevant Rūnaka as treaty partners and continues to work together with these parties to ensure that their values are recognised and taken into account. OceanaGold has consulted with Aukaha as the representatives of the relevant Rūnaka who have mana whenua status for the area to ensure that an appropriate level of input from Takata Whenua is achieved for resource management matters and, to uphold the principles of Te Tiriti o Waitangi. This approach for the proposal is not contrary to the direction of Policy 1.3.2.3 and is complimentary to the relevant overarching Objective 1.3.1. The values or issues identified in the CIA will be worked through with Aukaha in the first instance.

9.17.3 Chapter 2: Heritage Values

The relevant heritage provisions seek to preserve and manage the conservation and enhancement of the heritage values of the District.[188] Origin identified a historic fence line in the vicinity of the Coronation Stage 6 Pit extension area. The expansion of the pit will cross a small section (approximately 200m) of the fence line, however, the remainder of the fence line will remain intact. The fence will be restrained and preserved beyond 50m either side of the proposed pit extension and OceanaGold will obtain an archaeological authority for the proposed works. As such, the proposed activity is considered to be consistent with the relevant provisions of the Hertiage Values chapter of the Waitaki District Plan.

9.17.4 Chapter 12 – Hazardous Substances

The most relevant provisions in this chapter are:

- Avoid or mitigate adverse environmental effects arising from the use, storage, transportation, manufacture, and disposal of hazardous substances;[189]
- To avoid, remedy or mitigate any adverse effect on the environment caused by accidental spillages of hazardous substances, during the use, storage, manufacture, transportation and disposal of hazardous substances;[190] and
- To avoid or mitigate the potential for adverse effects to the environment from the use of land for the manufacture, storage, disposal and use of hazardous substances, while recognising that the quantities of hazardous substances, which are acceptable in

[187] Policy 1.3.5(3), Waitaki District Plan.

[188] 2.3.1 Objective A, Waitaki District Plan.

[189] Objective 12.2.2, Waitaki District Plan.

[190] Policy 12.2.3.1, Waitaki District Plan.

different areas of the District, will vary depending on the proximity of residential use, on community expectation and the sensitivity of the surrounding environment.[191]

OceanaGold carries out the storage and use of hazardous substances in accordance with the Health and Safety at Work (Hazardous Substances) Regulation 2017. Therefore, it is assessed that the actual or likely effects of this land use activity will be no more than minor and will be consistent with and not contrary to the above relevant provisions.

9.17.5 Summary

Overall, it is considered the proposed activity sits comfortably within the provisions of the Waitaki District Plan.

9.18 DUNEDIN CITY SECOND GENERATION DISTRICT PLAN

Part of the proposed Coronation Pit extension and the associated backfilling of Coronation North Pit occurs within the jurisdiction of the Dunedin City Council. Therefore, these activities must be assessed against the relevant provisions of the 2GP. Decisions on the 2GP were notified in 2018 and all rules that are not subject to an appeal are deemed operative. All provisions that are relevant to the proposed activity are not subject to an appeal, and therefore, there is no need to consider the Operative Dunedin City District Plan. The provisions of the 2GP that are relevant to this proposal are assessed below.

9.18.1 Chapter 16 – Rural Zones

The objectives of the Rural Zone seek to reserve the Rural Zone for productive rural activities[192] and to maintain or enhance the rural character and amenity values of the rural zone.[193]

In accordance with the relevant policies that give effect to these objectives:

- Mining is defined as a rural activity in the 2GP and the mining activity at this site is existing, legally authorised and has been operational for a number of years. As such, the Coronation and Coronation North pits and the consented activities at these sites form part of the existing environment. Within this context, the proposed expansion of the mine will have less than minor effects on the visual amenity of the site, as confirmed by the Landscape and Visual Amenity Assessment completed by WSP;[194]
- OceanaGold has closure plans in place to ensure the land will be restored or rehabilitated to an acceptable standard following the completion of mining at this site.

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[191] Policy 12.2.3.2, Waitaki District Plan.

[192] Objective 16.2.1, 2GP.

[193] Objective 16.2.3, 2GP.

[194] Policy 16.2.3.9, 2GP.

While the timing of those closure plans will be delayed by the proposed mining, the standard of rehabilitation will not be hindered by the proposed activites;[195] and

- OceanaGold have appropriate dust, erosion and sediment management controls in place to appropriately avoid, remedy or mitigate any effects associated with sediment run-off or on the amenity of surrounding sites.[196]

As such, it is considered the proposed activity is consistent with the relevant provisions of the Rural Zone.

9.18.2 Chapter 9 – Public Health and Safety

Objective 9.2.2 of the 2GP seeks to ensure land use activities maintain or enhance people's health and safety.

In accordance with the relevant policies that give effect to this objective, the proposed expansion of the Coronation Pit will:

- Not result in any adverse effects from air blast and vibration on people's health and safety or on surrounding properties, as confirmed by the blasting and vibration report prepared by TechNick Consulting;[197] and
- Comply with the relevant noise standards outlined in the 2GP, as confirmed by the noise assessment and discussed in Section 5 of this AEE, to ensure adverse effects from noise on the health of people will be avoided.[198]

Given the above, the proposal sits comfortably within the Public Health and Safety provisions of the 2GP.

9.18.3 Chapter 10 – Natural Environment

The relevant provisions of the Natural Environment chapter of the 2GP are considered below.

Objective 10.2.1 and Policy 10.2.1 of the 2GP seeks to maintain or enhance biodiversity values. In addition Policy 10.2.1.Y seeks to only allow mining activities where there is a functional and operational need for the activity to locate in the area and the adverse effects on biodivserity values can be avoided, remedied, mitigated or offset or compenasted for.

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195 Policy 16.2.3.4. 2GP.

196 Policy 16.2.3.X, 2GP.

197 Policy 9.2.2.6, 2GP.

198 Policy 9.2.2.1, 2GP.

The Coronation North Backfill area has been affected by past mining activities. The proposed activities will affect narrow-leaved tussock grassland present within this area, however, Whirika considers the magnitiude of this effect will be low. Notwithstanding this, in accordance with the policy direction of the 2GP, OceanaGold has adopted the effects management hierarchy to manage the effects identified and the MEEA will offset the loss of narrow-leaved tussock grassland. The proposed offsetting and compensation measures have also been designed in accordance with the relevant policy direction provided in the 2GP, and this is detailed in the Impact Management Plan.[199]

9.18.4 Summary

Overall, it is considered the proposal is consistent with the relevant provisions of the 2GP.

9.19 KĀI TAHU KI OTAGO NATURAL RESOURCE MANAGEMENT PLAN 2005

This is the principle planning document for Kāi Tahu and provides resource management guidance in accordance with the wishes of the rūnaka who hold mana whenua in Otago. While this assessment is in no way intended to be a replacement for consultation with the relevant mana whenua, it does contain provisions regarding certain issues of importance to mana whenua.

The provisions of the Kāi Tahu ki Otago Natural Resource Management Plan 2005 that are assessed as being most relevant to the Project include:

- The waters of the Otago Catchment are healthy and support Kai Tahu ki Otago customs;[200]
- Contaminants being discharged directly or indirectly to water are reduced;[201]
- To require groundwater monitoring for all discharges to land;[202]
- To promote the use of Accidental Discovery Protocols for any earth disturbance work;[203] and
- To require all earthworks, excavation, filling or the disposal of excavated material to:
    - avoid adverse impacts on significant natural landforms and areas of indigenous vegetation;
    - avoid, remedy, or mitigate soil instability and accelerated erosion;

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[199] Policy 2.2.3.6, 2GP.

[200] Objective 5.3.3.ii, Kāi Tahu ki Otago Natural Resource Management Plan 2005.

[201] Objective 5.3.3.iv, Kāi Tahu ki Otago Natural Resource Management Plan 2005.

[202] Policy 5.3.4.18, Kāi Tahu ki Otago Natural Resource Management Plan 2005.

[203] Policy 5.4.4.5, Kāi Tahu ki Otago Natural Resource Management Plan 2005.

- mitigate all adverse effects.[204]

The Project is considered to be largely consistent with the above objectives and policies given that:

- An assessment on the effects of the proposed activity on groundwater and surface water has been completed by GHD and confirmed it is unlikely the proposed activity will adversely effect ground and surface water quality and quantity, provided the appropriate mitigation measures are implemented. This will ensure the waters of the Otago catchment are healthy; and
- OceanaGold will continue to carry out regular monitoring as per the conditions of their existing resource consents, as well as the monitoring recommedned by GHD and Greg Ryder Consulting, which have been considered as being sufficient to monitor any potential effects generated from the proposed activity.

Overall, the proposed activity is assessed as being consistent with the most relevant provisions of the Kāi Tahu ki Otago Natural Resource Management Plan 2005 and its overarching general policy direction.

9.20 PART 2 OF THE RESOURCE MANAGEMENT ACT 1991

It is understood that a consent authority is generally no longer required to consider Part 2 of the RMA beyond its expression in the relevant statutory planning documents, unless it is appropriate to do so. In this case, it is considered that it may be appropriate to undertake an assessment against Part 2 on the basis that the regional and district plans have not yet been updated to reflect national policy requirements, such as the NPSIB and NPS-FM. Therefore, for completeness and in accordance with Schedule 4(2)(1)(f) of the RMA, Part 2 of the RMA is considered in the following paragraphs.

The purpose of the RMA is to promote the sustainable management of natural and physical resources. The RMA defines "sustainable management" as:

> *"...managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*
>
> *(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*

[204] Policy 5.6.4.19, Kāi Tahu ki Otago Natural Resource Management Plan 2005.

(c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

The MP4 Project will enable the social and economic wellbeing of the local community and wider Otago region through the provision of continued and additional employment of skilled and experienced mine workers, as well as technical, operational management and corporate staff that would otherwise not be possible, and the generation of significant benefits to the local, regional and national economy arising from the ongoing operation of the Macraes mine.

The Project will also safeguard the life supporting capacity of air, water, soil and ecosystems.

With respect to the key matters in sections 6, 7 and 8 of the RMA, the following points are pertinent:

- The natural character of the area, including the ephemeral wetlands and the streams, has already been modified by previous mining activities, and present-day farming activities;[205]
- The Project is not considered to be inappropriate in the location proposed on the basis that the majority is zoned for mining purposes, and the surrounding area has already been modified and influenced by existing and historical mining activities. The mining activity location is also constrained by the location of the mineral resource and there is a functional need for the extraction and ancillary mining activities to be located there;[206]
- Some of the indigenous vegetation and habitats affected by the Project have been assessed as significant under the criteria in the Appendices to the RPS, however none of the sites are recorded in the district plans or regional policy statements as SNAs. These values are recognised and provided for in the proposal through the adoption of the effects management hierarchy and the proposed offsetting and compensation measures where residual adverse effects cannot be avoided. At a district and regional level, these values will be sufficiently protected by the proposal;[207]
- A CIA has been commissioned and consultation with iwi is ongoing. This will assist in identifying any issues on cultural values, if any, which will then be addressed;[208]

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[205] Section 6(a) of the RMA.

[206] Section 6(a) of the RMA.

[207] Section 6(b) of the RMA.

[208] Section 7(a) & 7(aa) of the RMA.

- An archaeological authority for the removal of part of a historic fence line will be sought by OceanaGold. The Project will avoid all other areas of heritage significance;[209]
- The proposal will be managed to ensure any natural hazard risk will not be exacerbated. This is primarily through the incorporation of appropriate factors of safety in the design and management of geotechnical aspects of the mining activity, including cut slopes, rehabilitated waste rock slopes, large dams, water sumps and other supporting infrastructure;[210]
- The proposal is considered an efficient use and development of the natural and physical resources associated with the mining activities of the wider Macraes Gold Project. The MP4 Project will utilise existing infrastructure and pits located within the site to continue to deliver substantial and significant regional and national benefits associated with the existing mining operations until at least 2030;[211]
- The amenity values of surrounding occupied properties have been considered and will be maintained by the imposition of appropriate limits and controls on noise, vibration and dust from mining activities on the site;[212]
- The intrinsic values of the affected ecosystems have been considered and the quality of the existing environment will be maintained. Terrestrial ecological effects have been accounted for in the proposal such that the proposed offsetting and compensation means there will be at least a no net loss achieved. Water quality and aquatic ecology has been appropriately considered and it is concluded that consenting MP4 with similar discharge and receiving water quality standards will not result in detrimental effects on the significant aquatic values within the surrounding catchments;[213] and,
- OceanaGold is not a "person exercising functions and powers under the RMA" for the purposes of this project. That said, OceanaGold has commissioned a CIA in relation to the proposal and the outcomes of that CIA will be addressed in consultation with Aukaha.[214]

Overall, and based on the extensive technical assessments that have been commissioned by OceanaGold, it is considered that the MP4 Project will promote the sustainable management of natural and physical resources in accordance with Part 2 of the RMA.

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[209] Section 6(f) of the RMA.

[210] Section 6(h) of the RMA.

[211] Section 7(b) of the RMA.

[212] Section 7(c) of the RMA.

[213] Section 7(e) and (f) of the RMA.

[214] Section 8 of the RMA.

10. CONCLUSION

The Macraes Phase 4 Project will enable the continuation of business-as-usual mining operations at the Macraes Gold Project until approximately 2030. This resource consent application relates to the following activities which are part of the Macraes Phase 4 Project:

- Down dip extension of three open pits (Innes Mills, Coronation and Golden Bar), formation of their associated backfills, WRSs, and ancillary works;
- Backfilling of the Coronation North Pit on completion of already authorised mining;
- Further tailings disposal in the FTSF to support ore processing from the open pit extensions and other consented operations;
- Waste rock rehandling from a rehabilitated waste storage area to Golden Point Pit;
- A minor realignment of part of Golden Bar Road; and
- Activities associated with the mitigation, remediation, offsetting and compensation of the adverse effects of the above activities including establishment of the Murphys Ecological Enhancement Area.

OceanaGold is seeking all necessary resource consents and resource consent variations to authorise the MP4 Project from WDC, DCC and ORC, and requests that this application be publicly notified. The granting of these resource consents will provide for the continuation of the economic and social benefits that the mine generates for the Otago region and New Zealand.

The actual and potential effects of the Project have been assessed in Section 5 of this AEE and within the appended technical assessments. The existing environment at the Macraes Gold Project is highly modified due to past and existing mining operations and ongoing farming activities. It is considered that the Project can be undertaken in a manner that, for the most part, will avoid, remedy and mitigate the adverse effects on the existing environment such that adverse effects are generally no more than minor. There will be some more than minor residual adverse effects on wetland and terrestrial ecology that will be addressed through appropriate offsetting and compensation measures, as discussed in Section 6 of this AEE. This will include the establishment of the Murphys Ecological Enhancement Area, approximately 91 ha with a predator proof fence and predator control, to achieve at least a state of no net loss, and preferably, a net gain in biodiversity. As well as providing an area for rescued rare plants and a shrubland offset, salvaged lizards will also be relocated to the Murphys Ecological Enhancement Area. The compensation target of a minimum of no net loss of lizards is doubling of the lizard population within the MEEA within 10 years.

The Project will result in positive direct and indirect economic effects for the Waitaki District and the Otago region, and New Zealand. At the district level this is:

- 96 retained jobs;
- $11.6 million per annum retained wages and salaries; and
- Retained other expenditures of $11.1 million per annum.

Total regional economic impacts have been assessed as:

- 354 retained jobs;
- $42.6 million per annum retained wages and salaries; and
- Additional or retained other expenditure of $32.6 million per annum.

Overall, continuation of the Macraes Gold Project provides significant regional and national benefits.

The effects of the Project, including positive effects resulting from the proposed ecological offsetting and compensation have been considered in accordance with the relevant sections of the RMA including sections 104, 104D, 105 and 107.

With respect to the statutory planning framework, an assessment of the Project against the relevant provisions of the applicable planning documents, including the National Policy Statements and regional and district planning instruments, has been set out in Section 9 of this AEE. This assessment concludes that the Project is not contrary to the objectives and policies of the relevant documents and can be undertaken in a manner that is broadly consistent with the outcomes sought.

Overall, it is considered that the MP4 Project will promote the sustainable management of natural and physical resources in accordance with Part 2 of the RMA and there are no impediments to granting the resource consents sought for the Project.