Waste Rock Stack Management Plan

Macraes Operation

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Department	Mining
Location/Site	Macraes Operation

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1 INTRODUCTION

OceanaGold (New Zealand) Limited ("**OGNZL**") currently undertakes open pit and underground gold mining operations at the Macraes Operation located at Golden Point Road, Macraes Flat, East Otago. As part of their ongoing operations, OGNZL continually review the remaining life of the Macraes Operation in light of updated knowledge of the gold resource and the economics of mining.

Reflecting recent exploration success and optimisation work, together with higher gold prices, the Macraes Phase Four Project ("**MP4**" or "**the Project**") seeks to extend the life of mining at the Macraes Operation until at least 2039. The Project, which will enable ongoing gold production at a rate of approximately 130,000 ounces per annum, is identified as a Listed Project in Schedule 2 of the Fast-track Approvals Act 2024 ("**FTAA**") as a project providing significant national or regional benefits.

The objective of this plan is to:

- establish the key operational, construction, rehabilitation, management and monitoring controls for the construction of the waste rock stacks (WRS) for the MP4 Project;
- to describe the methods by which the waste rock stacks to which these consents relate will be designed and constructed to minimise the loss of waterborne contaminant loads; and
- Achieve compliance with relevant resource consents and building consents..

This plan specifically gives effect to conditions x.y.z [*when consents granted, insert the relevant conditions the plan give effect to and state which section of the plan gives effect to each condition].*

Following detailed design, engineering assessment, and building consent approvals, any additional project-specific requirements or design refinements will be incorporated through an amendment to this Plan, subject to Council certification where required by the relevant consent condition.

This management plan relates to the following WRS:

a) Coronation North Waste Rock Stack (CNWRS) and Trimbells Waste Rock Stack (TWRS)

b) Coronation Waste Rock Stack (CWRS)

c) Golden Point Underground Waste Rock Stacks (GPUGWRS)

d) Frasers West Waste Rock Stack (FWRS)

e) Golden Bar Waste Rock Stack (GBWRS)

This plan also summarises the monitoring and reporting required by conditions of the various resource consents held for the waste rock stacks.

2 SITE LOCATION AND DESCRIPTION

OGNZL owns and operates the Macraes Operation at Macraes, approximately 30 km northwest of Palmerston in the Otago Region. The Macraes Operation is the largest gold mine in New Zealand and, since commissioning in 1990, has produced more than 6 million ounces of gold.

Macraes Flat is situated on an elevated plateau at approximately 500 m above sea level. The plateau 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 Road provides access to Macraes Flat and the Macraes Operation, connecting to State Highway 85 to the east and State Highway 87 (SH87, the Middlemarch–Hyde Road) to the west.

The environment within and surrounding the Macraes Operation has been shaped by historic and current mining activities. Figure 1 shows the arrangement of the major mine features at the Macraes Operation. In summary, the current components of the Macraes Operation include:

- Numerous open pits (both operational and non-operational);
- Two underground mines (Frasers, now closed, and Golden Point, which is actively mined);
- Waste rock stacks at various stages of operation and rehabilitation;
- A network of haul roads and general mine service tracks;
- A Processing Plant;
- Five tailings storage facilities (three inactive, one active but nearing capacity, and one under construction and currently receiving tailings);
- An extensive network of water management infrastructure, including diversion drains, silt ponds, sumps, pit lakes, and freshwater storage reservoirs;
- Two consented but not yet constructed water storage reservoirs (Camp Creek Dam and Coal Creek Dam); and
- Associated infrastructure supporting ongoing operations, including district roads, powerlines, workshops, offices, and associated water and amenity facilities.

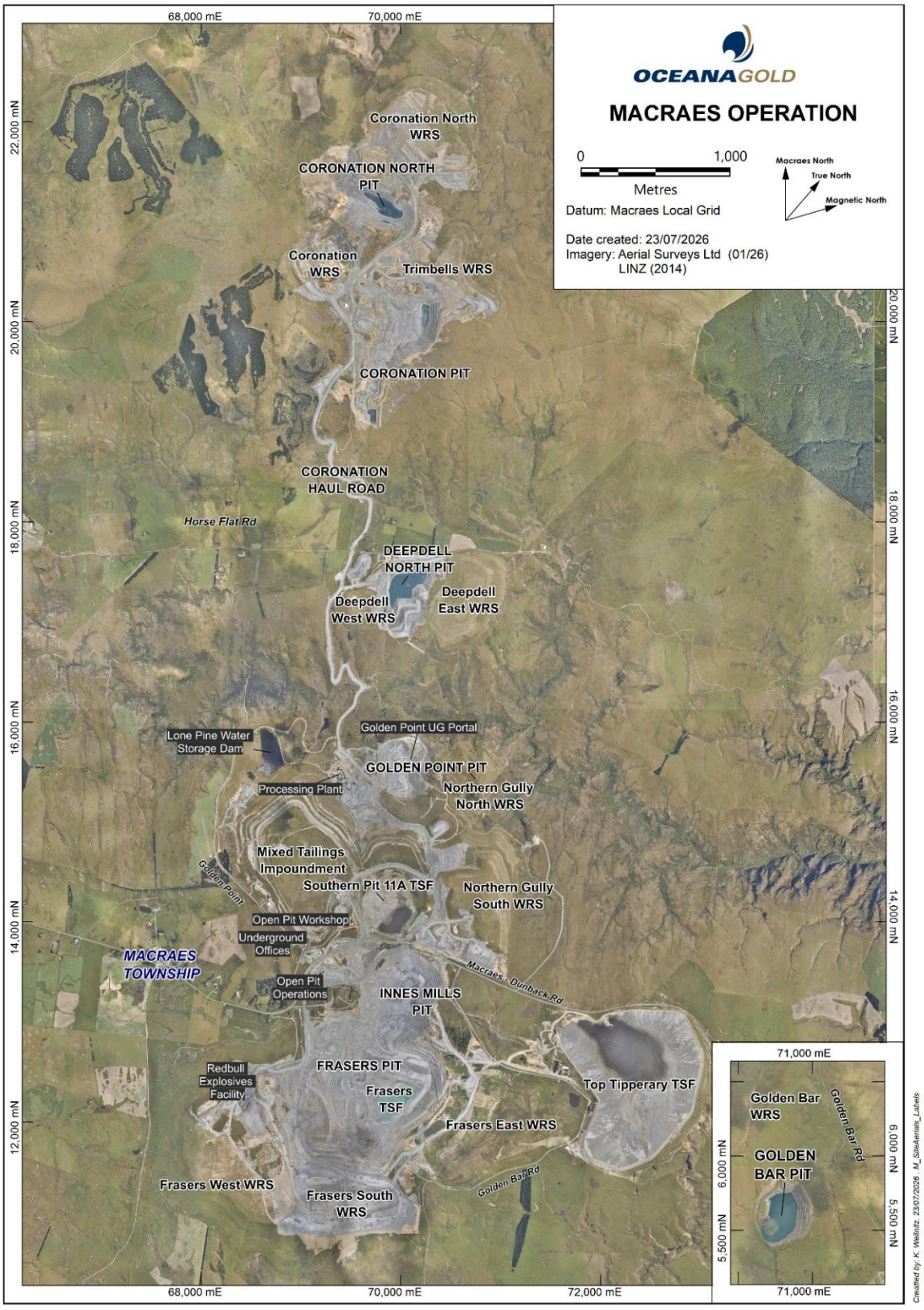

Figure 1: Existing site layout at the Macraes Operation (as of July 2026)

3 OPERATIONAL OVERVIEW

The Project is made up of the following proposed key activities:

- **Open pit extensions** at Coronation, Coronation North, Innes Mills, and Golden Bar.
- **Underground mine expansion** through further development of the Golden Point Underground mine ("**GPUG**").
- **Tailings management**, including:
  - Construction of the Frasers Tailings Storage Facility ("**FTSF**") Stage 3 to accommodate a total tailings storage of up to 153 Mt; and
  - Hydraulic mining and relocation of tailings from the Mixed Tailings Impoundment ("**MTI**"), Southern Pit Option 10 TSF ("**SP10**"), and Southern Pit Option 11A TSF ("**SP11**") to FTSF.
- **Waste rock disposal**, including increased storage capacity within open pits and at existing waste rock stacks at Coronation, Coronation North, Innes Mills, Golden Bar, Golden Point, and Frasers.
- **Water management infrastructure and operations**, including:
  - Construction of Camp Creek and Coal Creek water storage dams for flow and water quality management;
  - Construction, operation and maintenance of a Water Treatment Plant; and
  - Ongoing operation and maintenance of the Mine Water Management System ("**MWMS**").
- **Infrastructure and roading works**, including:
  - Realignment of Macraes Road in two stages; and
  - Relocation of the Open Pit Mining Workshop.
- **Ecological enhancements**, including establishment of:
  - Murphys Ecological Enhancement Area ("**MEEA**") near Murphys Creek, including predator fencing, access tracks, and site facilities;
  - Mt Highlay restoration area;
  - Cranky Jims Link shrubland enhancement area;
  - Murphys Link tussock protection area; and
  - Additional compensation measures for residual ecological impacts.
- **Mine closure and rehabilitation activities**, including rehabilitation of mining landforms, creation of pit lakes, dry capping of tailings storage facilities, and revegetation in accordance with closure objectives.

An overview of the proposed activities which make up the Project is shown in Figure 2 below.

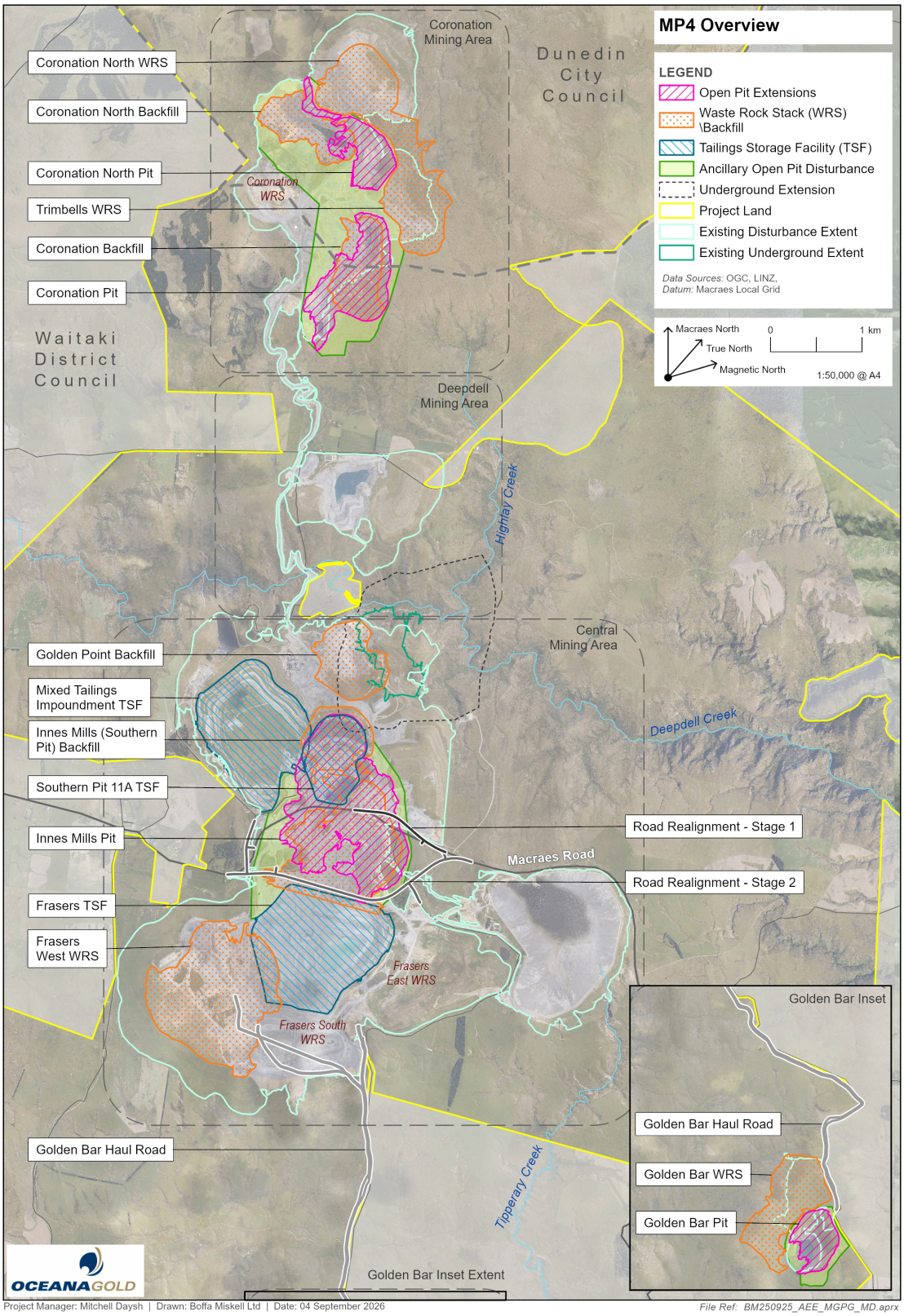

Figure 2: MP4 Overview Plan

4 CONSENT CONDITIONS

To be inserted when issued.

5 DESCRIPTION OF THE SITE

5.1 Waste Rock Stack Locations

The waste rock stack locations are shown in the overview plan above (Figure 2) and there are location plans for the individual waste rock stacks in section 6 (Figures 3 to 6).

The proposed capacity and height of all waste rock stacks associated with MP4 is included in Section 8.

5.2 Topography

The topography in the Macraes Flat area is dominated by a gently undulating remnant schist peneplain. Regional drainage patterns are dominated by east and north striking fault orientations and strike ridges of the east dipping foliation, with streams often extended along faults, joint sets, or more erodible lithological units.

5.3 Natural Surface Water

The topography of the wider Macraes site is driven by the geological evolution of the region. Long term weathering and erosion of the underlying rock resulted in a distinctive low relief peneplain which is bounded by Waikouaiti River North Branch (NBWR) to the west, Deepdell Creek to the north, and Murphys Creek to the south. Deepdell Creek has been deeply incised into this erosional surface, resulting in steep valley slopes and minimal alluvial deposition. In contrast, the NBWR is characterised by shallow relief, broad valleys and alluvial deposition.

The original topography has been altered from more than thirty years of mining and waste storage. Mining has been generally aligned with the orientation of the major Hyde-Macraes Shear Zone (HMSZ) which is the primary structural feature that controlled the ore body development. Mining has altered portions of original catchments at the mining site, but the primary streams and rivers surrounding the mining site remain in their pre-mining locations.

The site intersects the Shag River/Waihemo, Taieri and NBWR catchments. The Shag River flows in a south-easterly direction and enters the ocean close to Matakaea. The NBWR flows in a southerly direction from the mine site and enters the ocean near Karitane. The Taieri River flows in a southerly direction to the ocean south of Dunedin. Land use within these catchments consists primarily of agriculture and forestry.

6 WASTE ROCK STACK DESCRIPTIONS

6.1 Coronation North Waste Rock Stack (CNWRS) and Trimbells Waste Rock Stack (TWRS)

All waste rock from the Coronation and Coronation North open pit extensions will be disposed of as backfill to the respective pits or to the existing Coronation North and Trimbells Waste Rock Stacks. To accommodate the additional capacity required, the consented capacity of the waste rocks stacks will be increased.

The height of Coronation North and Coronation North Backfill and Trimbells Waste Rock Stacks will be increased. The Trimbells Waste Rock Stack footprint will be increased by extending it to the east. The Trimbells WRS footprint has been refined to avoid direct disturbance of the streambed adjacent this WRS.

Construction commenced during the second quarter of 2017 at CNWRS and during the fourth quarter of 2018 at TWRS. The MP4 planned open pit extensions and waste rock disposal are shown below in Figure 3.

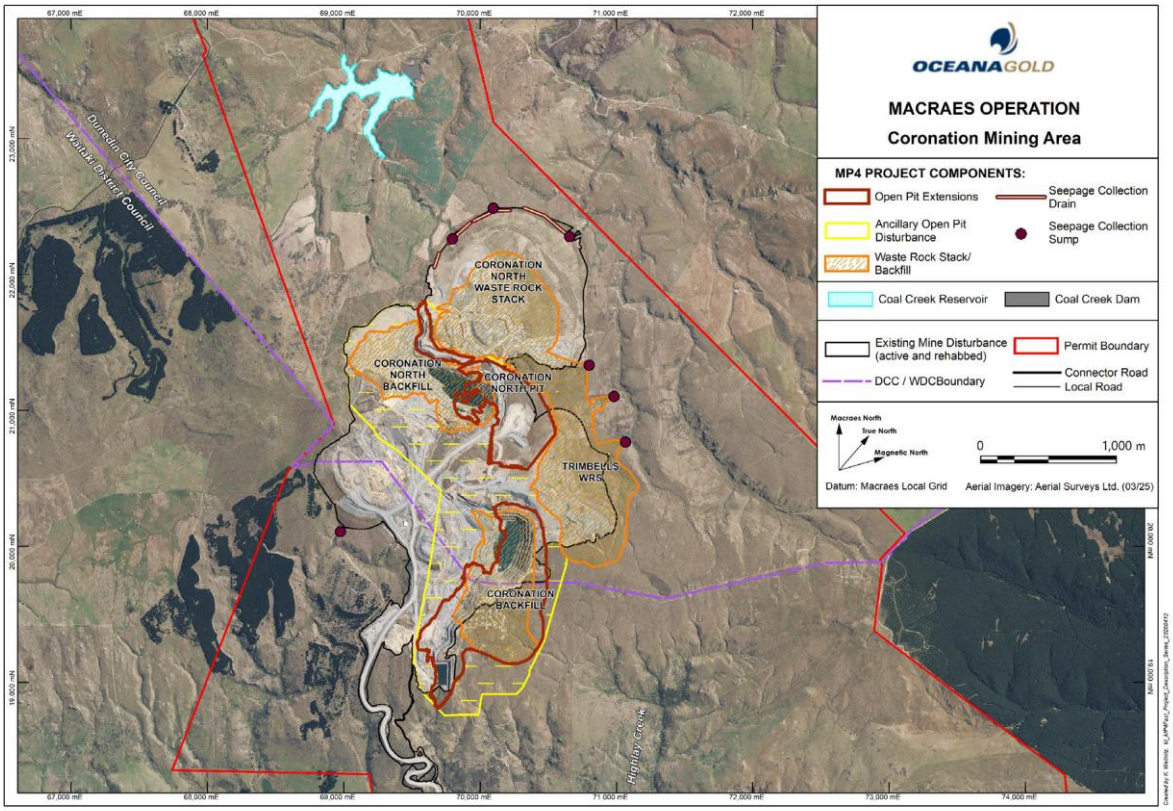

Figure 3: MP4 Coronation Mining Area

6.2 Coronation Waste Rock Stack (CWRS)

Waste rock capacity at Coronation WRS will be retained and the design capacity will be utilised. Rehabilitation of Coronation WRS will occur in accordance with existing resource consents.

6.3 Golden Point Underground Waste Rock Stacks (GPUGWRS)

The proposed expansion of GPUG is anticipated to generate about 260,000 m³ of waste rock. OGNZL holds existing resource consents authorising four small waste rock stacks associated with GPUG (with measurements shown as approximate values):

- Two waste rock stacks (backfilling) located at the north and south ends of the now defunct Golden Point Pit. Waste rock stack 1 is consented for a footprint of 2.5 ha, height of 30 m and volume of 300,000 m³. Waste rock stack 2 was consented with a footprint of 2.5 ha, height of 30 m and volume of 300,000 m³.
- Waste rock stack 3 to the immediate west of the pit on a previously worked site is consented for a footprint of 1.5 ha, height of 15 m and a volume of 200,000 m³; and
- Waste rock stack 4 to the immediate west of the Coronation Haul Road and adjacent to the Processing Plant was consented with a footprint of approximately 2.3 ha, height of 30 m and 400,000 m³.

These waste rock stacks contain sufficient residual capacity to support the proposed GPUG extension.

The locations of the GPUG waste rocks stacks are shown in Figure 4.

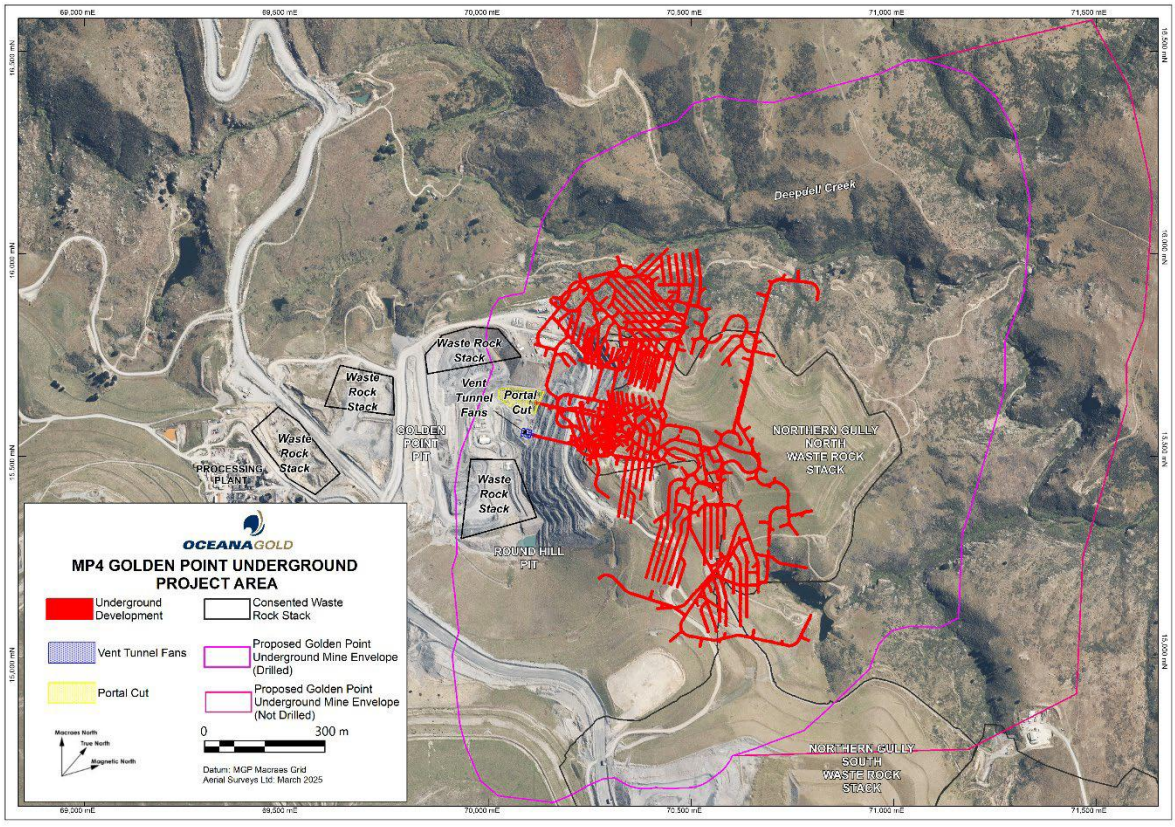

Figure 4: GPUG Consented WRS Locations

6.4 Frasers Waste Rock Stacks (FWRS)

Waste rock from the mining of the extension of Innes Mills Pit will primarily be placed within Frasers Backfill Embankment (FRBF). Excess waste rock beyond that required to complete construction of

FRBF will be placed on the existing consented Frasers South WRS (FSWRS), in the Innes Mills Backfill (IMBF), Southern Pit Backfill (SPBF), and on a new raise to Frasers West Waste Rock Stack (FWWRS).

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

The consent for Frasers North Waste Rock Stack (FNWRS) has been relinquished and therefore will no longer be constructed.

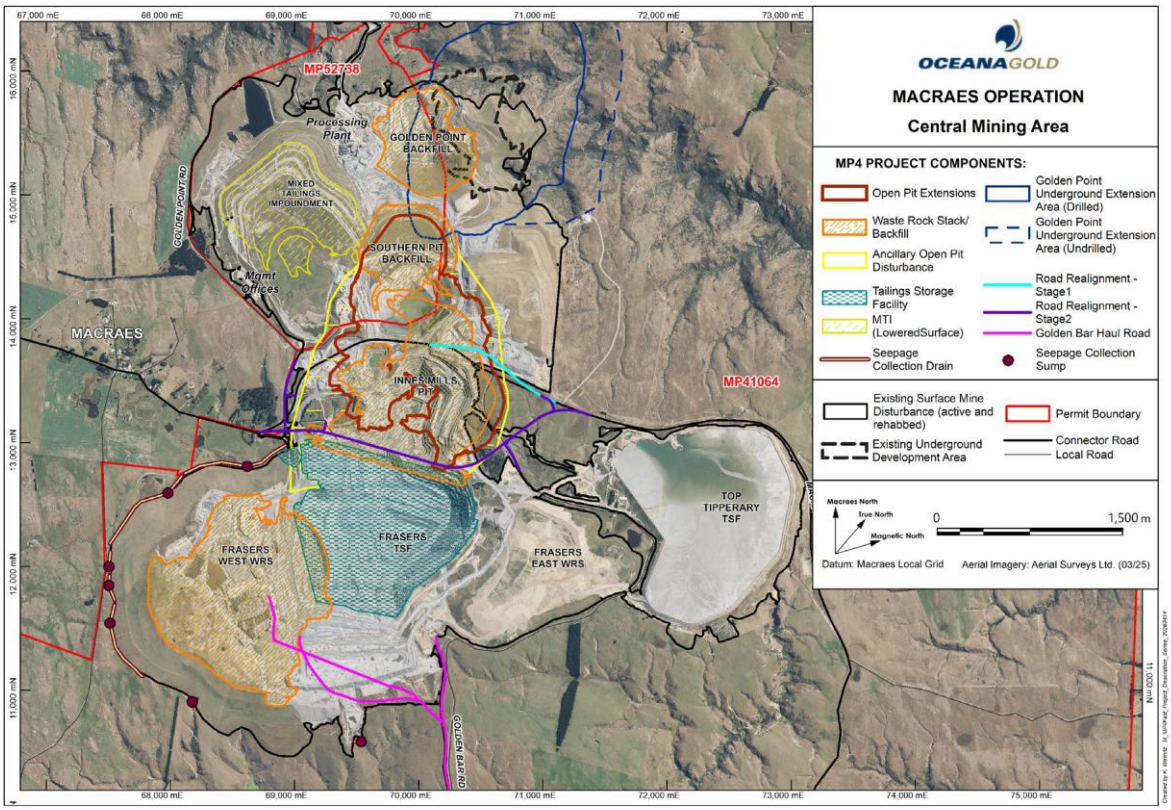

Figure 5: Waste Rock Disposal areas for Innes Mills/Frasers Areas

6.5 Golden Bar Waste Rock Stack (GBWRS)

All waste rock from the Golden Bar open pit extension will be disposed of within the Golden Bar WRS that will be extended to the northwest by about 55 ha as set out in Figure 6 to accommodate the additional capacity required.

The existing silt pond at the toe of the Golden Bar WRS will be retained and partially covered by the toe of the proposed WRS expansion. Access via a manhole will be retained for maintenance purposes.

Heritage field survey work has resulted in the Ancillary Pit Disturbance Area being pulled back away from heritage features to the south of the Golden Bar Pit to avoid disturbing them.

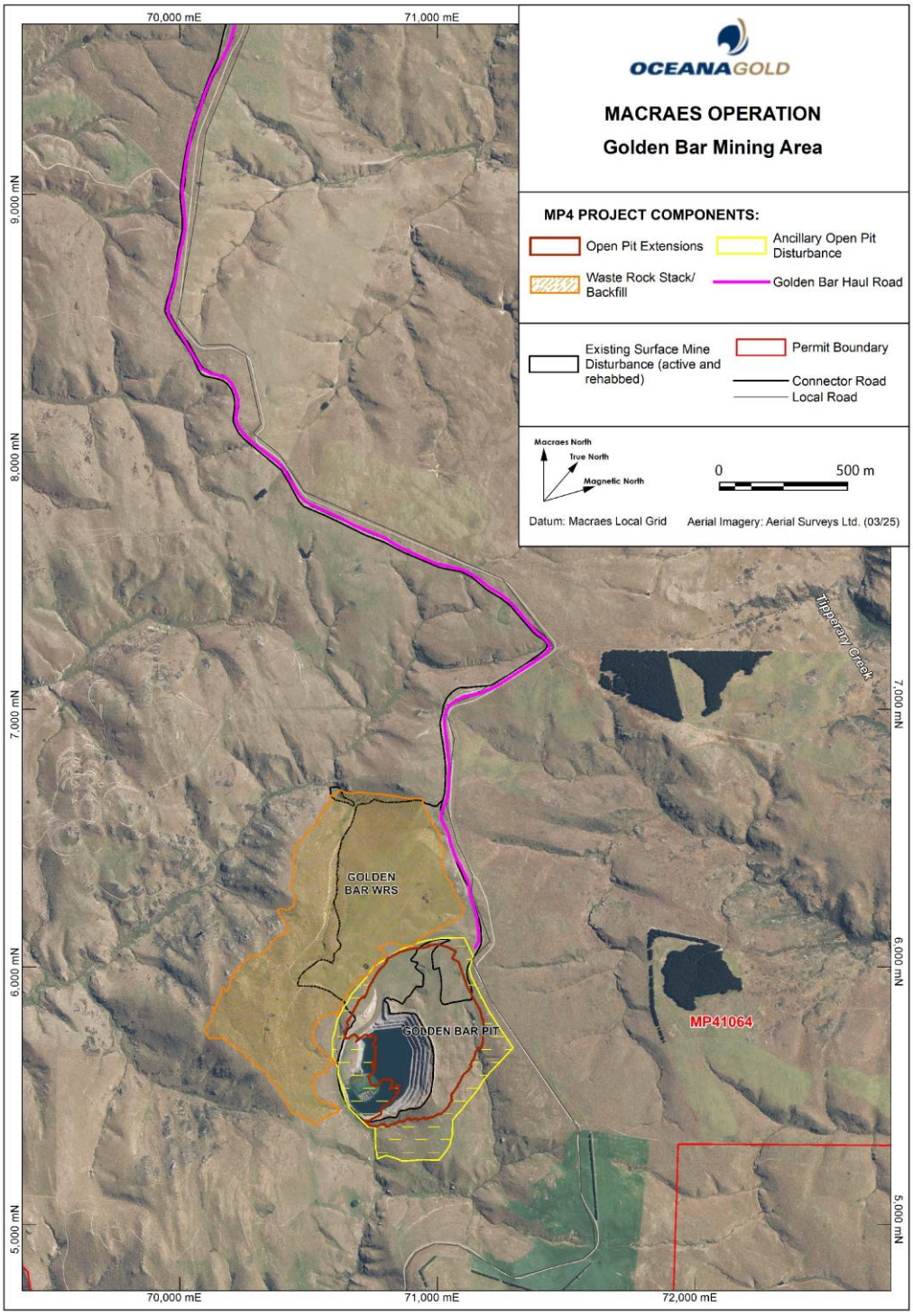

Figure 6: Golden Bar Waste Rock Disposal Area

7 GEOTECHNICAL CONSIDERATIONS

PSM, an Australian engineering consultancy with a long history of undertaking geotechnical assessments at the Macraes operation, performed limit equilibrium (LE) slope stability analyses for

the waste rock stacks. They considered static and seismic cases using the Rocscience software Slide2D adopting the GLE-Morgenstern-Price method for analyses of circular and non-circular failure mechanisms.

Ten stability sections were analysed across the proposed WRS locations. Critical sections were selected to assess representative stability condition for each WRS, i.e. highest WRS elevation and ground surface sloping away.

- The stability analyses were completed to confirm each proposed MP4 WRS will achieve a satisfactory end-of-mine life and long term (post closure) stability outcome. Stability analyses indicate proposed MP4 WRS geometries have an acceptable stability outcome in regard to end-of-mine-life and long-term (post closure) stability, specifically:
    - Static: All WRS achieved a FoS > 1.3 for overall stability for all scenarios (except for Trimbells WRS where several slopes should be flattened).
    - Seismic: OBE (1 in 150 year return period) – all scenarios achieved a FoS > 1.1; and MDE (1 in 2,500 year return period) – all WRS's achieved a FoS > 1.0 except for one section of Trimbells WRS where a section did not achieve a FoS > 1.0, all seismically induced displacements predictions are small (<1 cm) and are expected to achieve satisfactory performance in terms of slope deformation.

PSM also had the following key recommendations and conclusions based on their assessment:

The recommended slope stability design acceptance criteria for MP4 waste rock stacks should be:

- Static – minimum factor of safety (FoS) of 1.3, under a reasonable expected combination of adverse events.
- Pseudo static (seismic): Operating Base Earthquake (OBE) – minimum FoS of 1.1; and Maximum Design Earthquake (MDE) – minimum FoS of 1.0, or with satisfactory performance in terms of settlement and slope deformation.
- Waste rock stacks shall be designed in accordance with industry best-practice, and to withstand a 1-in-2500 annual-exceedance-probability earthquake without catastrophic failure, noting that some deformation is allowable provided the structure retains a state of long-term stability post event.
- A design report shall be prepared for each new waste rock stack by a suitably qualified geotechnical engineer or engineering geologist and this report provided to the Council prior to the commencement of construction of the structure. The report shall include details of the geotechnical model, loading assumptions, credible failure modes, and key design and construction requirements, and shall include an evaluation of the long-term stability for closure.
- The implications of climate change to long-term slope stability were considered. This particularly relates to high intensity rain events and associated sudden increase in groundwater levels within the WRS impacting both WRS stability and erosion potential. Stability implications have been addressed via the assessment of an additional elevated groundwater scenario. The stability outcomes from this assessment are acceptable. Mitigation of erosion risk is addressed by landform and landscape design.
- The potential for crest regression impacting the toe of proposed and existing WRS's was also identified in their study. The proposed WRS designs are typically 60 m or more offset from the crest of the proposed pits. In some locations where WRS extend closer to the crest of the proposed pits PSM considered there is sufficient flexibility in the geometry to enable localised design modification to prevent undercutting of the WRS or overloading of the pit crest, while still maintaining a long-term stable landform. Where applicable WRS slope angles can be locally steepened to 2H:1V while still achieving a FoS > 1.3.

- Detailed design should reduce or remove thin sections of WRS geometry that chase the existing topography, typically at gullies such as at TWRS2. This also provides a positive environmental outcome by minimising disturbance and disruption of surface water catchments. Where applicable additional compaction or armouring should be used to mitigate local stability effects.
- Foundation treatments, including grubbing/ripping of the foundation and terracing into sloping foundations, should be undertaken to improve stability outcomes of the WRS.
- Sub-surface drainage (involving the placement of free-draining rock) should be employed in the base of natural gullies to improve foundation drainage of the WRS.

All recommendations above will be adopted in the design and construction of each WRS.

8 WASTE ROCK STACK CONSTRUCTION, REHABILITATION AND MANAGEMENT

8.1 Overview

As outlined, MP4 involves the disposal of waste rock at several existing waste rock stacks and open pit backfill locations across the Macraes Operation. Two of the disposal locations extend over previously undisturbed land at Trimbells Waste Rock Stack and Golden Bar Waste Rock Stack.

Table 1 is a summary of the MP4 waste rock disposal locations, their existing design capacities and heights, and the proposed capacities and heights.

Waste rock stack / Backfill	Existing Design Capacity (Mm^3 (Mt))	Proposed Design Capacity (Mm^3 (Mt))	Additional MP4 Storage (Mm^3 (Mt))	Existing Maximum Design Height (mRL)	Proposed Maximum Design Height (mRL)	Additional MP4 height (mRL)
Coronation North WRS	51.22 (111.67)	67.11 (146.30)	15.89 (34.64)	640	670	30
Trimbells WRS	17.68 (38.54)	34.35 (74.88)	16.67 (36.33)	670	740	70
Coronation WRS	14.93 (32.55)	14.93 (32.55)	-	730	730	-
Coronation North Backfill	9.2 (19.3)	24.2 (52.97)	15.10 (32.92)	640	670	30
Coronation Pit Backfill	1.87 (4.08)	22.32 (48.66)	20.45 (44.58)	-	710	-
Frasers West WRS	154.93 (337.75)	198.25 (432.19)	43.32 (94.43)	570	610	40
Frasers South WRS	46.57 (101.52)	46.57 (101.52)	-	595	595	-
Golden Point Backfill	-	23.21 (35.24)	23.21 (35.24)	-	460	-
Frasers Backfill / Innes Mills Backfill 1	37.48 (81.71)	64.16 (139.87)	26.68 (58.16)	480	520	40
Innes Mills Backfill 2	-	15.46 (27.61)	15.46 (27.61)	-	520	-
Golden Bar Waste Rock Stack	6.77 (14.76)	22.12 (48.11)	15.35 (33.35)	550	600	50

Table 1: MP4 Waste Rock Disposal Design Capacities and Heights

The waste rock stacks (**WRS**) and waste rock pit backfills will be designed, constructed, decommissioned and closed in accordance with sound engineering practice.

All stages of construction of the waste rock stacks will be undertaken by Oceana Gold (New Zealand) Ltd (OceanaGold) or in part by contractors under supervision of OceanaGold employees.

Contractors will be used for smaller scale, short term projects around the stack, including tree removal, drainage construction etc. Major earthworks involved in topsoil stripping, construction of the stack and reclamation will be undertaken with OceanaGold open pit production and ancillary equipment.

8.2 Waste Rock Stack Establishment

Prior to stripping, the consented limits of any new waste rock stacks (or extensions) will be set out by surveyors and demarcated on the ground. Clean water diversion drains will be constructed outside the consented footprint as required to contain and re-route runoff from undisturbed areas that may report into the stripped area. Where runoff from disturbed areas will not be contained within the stripped catchment, toe drains shall be constructed to contain run off and divert it to either silt control structures (e.g. local containment structures, established silt ponds) or to subsurface drainage entrance points which drain back through the waste rock stack.

Where disturbed area runoff diversion drains are required these will be constructed to report runoff to the sediment control structures. Where this is not possible, disturbed runoff will be diverted into the remnant heads of gullies that drain back into the waste rock stack footprint.

Further details regarding runoff and sediment control can be found in the Erosion and Sediment Control Plan.

Any significant vegetation that may have a detrimental effect on waste rock stack stability will be removed from the footprint and disposed of. Any ecological salvage or relocation activities will be undertaken in accordance with relevant permits or consent conditions. Topsoil stripping will be scheduled to be undertaken in dry weather conditions. Topsoil stripping shall be conducted in a progressive fashion to minimise the exposure time of stripped areas and reduce potential silt and dust generation. Most topsoil will be shifted to just outside the final rock stack limits. Topsoil will be stockpiled in large bunds to be reclaimed during final rehabilitation. Topsoil which is stripped from the inner-most section of the stack footprint may need to be loaded and hauled rather than pushed to the periphery. Where possible, hauled topsoil will be trucked directly to finished batters for final rehabilitation, otherwise hauled to local topsoil stockpiles for future waste rock stack rehabilitation.

Areas of steep terrain within the waste rock stack extents will not be stripped as topsoil coverings are thin and not easily accessible and present a safety risk to machine operators. Vegetation in these areas act as buffers initially and intercept any silt laden runoff reporting from adjacent stripped areas.

8.3 Waste Rock Stack Construction

Construction of the waste rock stacks will be with run-of-mine waste rock delivered by the mining dump trucks and either pushed over a tiphead with tracked or wheeled dozers, or paddock dumped.

For extensions of existing waste rock stacks, subsurface coarse rock drains will be constructed within the main gullies within the footprint to represent the existing stream flow geometry.

Construction methods for both new and extensions of existing waste rock stacks will include measures to reduce the ingress of oxygen into the waste rock stacks, such as the use of controlled lift heights, toe bunds where applicable, closure capping and profiling to shed water.

There will generally be three zones of construction:

- an outer zone with a maximum lift height of 5 metres, compacted with either tracked dozers, wheeled dozers, mining dump trucks or self-propelled compactors.
- an inner zone with lift heights of 10 to 15 metres.
- an upper (and outer) rehabilitation zone for topsoiling, grassing and for facilitating water runoff.

The outer and upper zones will aid to reduce percolation of stormwater through the waste rock stack and provide a key control to reducing the generation of sulphate ions and other potential contaminants.

Short and long haulage profiles on the stack will be balanced for operational effectiveness as well as providing areas for concurrent reclamation.

Waste rock stack lifts will preferentially be developed to achieve the final design face (outer zone) prior to filling the internal area of the lift (inner zone). This will be achieved through initially progressing the lift tip-head around the as-dump toe (periphery of the waste rock stack). This will facilitate progressive rehabilitation of the rock stack lift as topsoil stripping material can be hauled straight to the batter and avoid having to be stockpiled and re-handled later.

The as-dump (repose angle) extent of vertical lifts will be set out and demarcated on the surface to be dumped upon. Once lifts have progressed out to these limits the final design crest will be set out on the completed lift. The excess material located outside the design crest will be re-contoured to the final design slopes of (typically) 1 vertical to 3 horizontal using the mining dozers.

Each WRS will be constructed to ensure surfaces will be water shedding and to avoid surface ponding.

Collection and management of any seepage from WRSs will involve the construction, operation and maintenance of any toe drains, toe bunds, seepage capture drains, seepage capture bunds, sumps, pumps and associated conveyance infrastructure for the purpose of capturing seepage from and conveying that seepage to the mine water management system or water treatment plant.

8.4 Waste Rock Stack Approvals

A building consent will be required for each waste rock stack. Design and construction reports for each waste rock stack will be required to support the building consent application and to also satisfy resource consent conditions.

The relevant draft consent condition is below (in *italics, still in draft*):

Prior to the commencement of construction of any new Waste Rock Stack, or any significant expansion of an existing Waste Rock Stack, the Consent Holder must engage an SQEP – Geotechnical Engineering, to prepare a design report for each new or expanded waste rock stack and waste rock pit backfill.

The design report must be provided for information only, to the Council no less than 30 working days prior to the commencement of construction of the structure. The report must include:

- *a) the geotechnical model adopted for the design;*
- *b) loading assumptions;*
- *c) credible failure modes;*
- *d) key design and construction requirements;*
- *e) Foundation preparation and drainage measures;*
- *f) an evaluation of the long-term predicted stability of the landform following closure;*
- *g) Any measures required to manage interfaces with adjacent pits and landforms;*
- *h) An assessment of long-term stability and closure performance; and*
- *i) The design measures proposed to promote long-term water shedding, minimise infiltration and seepage generation, support the rehabilitation of the WRS, maintain long-term surface integrity through erosion protection measures and minimise surface ponding and areas that promote infiltration, including any localised adjustments to existing WRSs where relevant.*

Advice note: Any design in these WRS and associated landforms must be in accordance the objectives of the LRSMP (Condition XX of Schedule 2).

Advice note: For the purposes of this condition, the Consent Holder may supply a PS1 required by the Building Code which addresses all of the requirements above items except g) and i), plus additional information would be provided for those requirements not met by the PS1

Following the completion of construction of any Waste Rock Stack (WRS), the Consent Holder must provide to the Consent Authority an 'as-built' certification prepared by a SQEP Geotechnical Engineer.

The 'as-built' certification must:

a) *Confirm that the WRS has been constructed in general accordance with the relevant WRS Design Report (Condition XX) and the requirements of this consent;*
b) *Identify any material departures from the WRS Design Report;*
c) *Confirm that any material departures will not adversely affect the stability, performance, seepage management, environmental outcomes, or design objectives of the WRS; and*
d) *Include, as appropriate, relevant as-built drawings, construction records, and supporting documentation.*
e) *Where the SQEP Geotechnical Engineer identifies any material departure from the WRS Design Report that may adversely affect the performance of the WRS, the 'as built' certification must provide details of the corrective measures undertaken to address the departure.*

8.5 Waste Rock Stack Rehabilitation

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

- Slopes shall be suitably concave 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;
- New landforms shall be aligned and located so they seem to continue, not cut across, existing landscape patterns; and
- Where silt ponds are not required for post-closure water management, they shall be removed and the site rehabilitated or be converted to stock water drinking ponds following completion of mining operations and rehabilitation.

Final batter slopes will be progressively covered in brown rock (oxidised rock) and topsoil as the waste rock stacks develop. Brown rock will generally be dumped at the crest of re-sloped batters and then pushed down with a dozer. Topsoil can also be spread in this manner or pushed up the slope from the initial topsoil stockpiles formed at the rock stack limits during initial stripping.

In keeping with the general desire to minimise percolation of water and advection of air through the dump, the brown rock layer will be 600mm thick with a 200mm covering of topsoil. In addition, the brown rock may be blended with tuff or loess if such material is available at that stage.

The WRS's will be capped and contoured to promote water shedding, minimise infiltration, and reduce the potential for seepage generated by surface ponding on or against the WRS.
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8.6 Interim Management

Where a Waste Rock Stack has not received waste rock and is not required for operational purposes for a continuous period of 12 months, it will be placed into interim management to manage any environmental effects in accordance with the consent requirements.

Each area placed in interim management and the measures implemented to minimise water infiltration and the discharge of dust to air will be detailed in the Project Overview and Annual Work and Rehabilitation Plan.

Interim measures may include undertaking reshaping and contouring, and temporary capping of surfaces to minimise dust generation, promote water shedding and minimise water infiltration.

8.7 Adaptive Management

OGNZL will use a SQEP - Water Quality, to undertake an annual review of the relationship between sulphate concentrations, contaminant loads and Waste Rock Stack characteristics throughout operations and closure. The review will be based on water quality monitoring data and contaminant loading data and must, where available, incorporate flow and loading data to improve understanding of contaminant generation and discharge from Waste Rock Stacks.

Where monitoring or a review demonstrates that seepage volume, seepage quality, contaminant load, seepage capture performance, or other relevant outcomes are, in the opinion of a SQEP – Water Quality, such that compliance with any receiving water quality criterion is at risk, must implement adaptive management measures will be implemented to avoid, remedy, or mitigate the risk of exceedance.

Adaptive management measures may include, but are not limited to:

a) Additional waste rock characterisation;
b) Changes to waste rock placement, waste rock stack construction methodology, water-shedding landform design, capping, rehabilitation or cover design;
c) Repair, extension or modification of seepage capture drains, toe bunds, sumps, pumps or conveyance systems;
d) Additional seepage capture infrastructure;
e) Increased pumping or conveyance capacity;
f) Additional or modified water treatment;
g) Increased monitoring frequency or additional monitoring locations; and
h) Review and amendment of this WRS MP.

Any use of adaptive management measures will be outlined in the POAWRP.

9 MONITORING

9.1 Volume and Topography Monitoring

a) Operational Surveys

As built surveys of the waste rock stacks will be conducted monthly during construction and combined with the most up to date site data. These surveys will serve as a check to ensure each waste rock stack is being constructed to design. Surveys of the rock stacks will consist primarily of GPS controlled point data and drone surveys and include volume calculations. Survey pick-ups may be done at more regular intervals on an as needed basis to satisfy production and design requirements.

b) Aerial Surveys

An annual vertical aerial photography of the waste rock stacks will be completed and be to industry standards. The photographic coverage shall extend a minimum of 500m beyond the boundary of the consented stack area.

The photography will be supplied to the ORC by 30 June each year as a digital image. Images supplied must be of a suitable quality to allow clear reproduction at a scale of 1:10,000.

InSAR (Interferometric Synthetic Aperture Radar) monitoring will also be used to determine ground deformation. The amount of any deformation is determined by comparing two different radar images from orbiting satellites of the same area that are collected at different times.

9.2 Environmental Monitoring

a) Groundwater Monitoring

Ground water bore locations and quality information can be found in the site Water Quality Management Plan and Water Monitoring Plan.

b) Waste Rock Stack Seepage

Representative samples of groundwater seepage will be collected at quarterly intervals from the toe of each WRS. These results are reported to the ORC in the Quarterly Environmental Monitoring Report.

The monitoring of groundwater seepage is dependent on waste rock being deposited in the catchment of each collection point and there being sufficient seepage discharged to allow collection.

Samples will be analysed for major anions, major cations, pH, conductivity, copper, iron, lead, total inorganic nitrogen and arsenic with all parameters analysed listed in the Water Monitoring Plan.

c) Waste Rock Stack Seepage Flow Monitoring

The surface water flow locations and parameters analysed are detailed in the Water Quality Management Plan.

d) Surface Water

Representative samples of surface water will be collected at monthly intervals from the sites listed in the Water Monitoring Plan. These results will be reported to the ORC in the Quarterly Environmental Monitoring Report.

Details of the location of these monitoring points and further surface water quality information can be found in the site Water Quality Management Plan and Water Monitoring Plan.

e) Aquatic Biology

A suitably qualified and experienced freshwater biologist will undertake the aquatic biological monitoring programme set out below. Monitoring shall be undertaken at the sites identified in Table 2 above and carried out at each site in accordance with Table 4 below, unless the site is dry or surface flows are otherwise insufficient to undertake the required sampling.

Sample type	Frequency	Sites	Methods
Aquatic flora*	Summer (Dec-Feb) Autumn (Mar-May) Spring (Sep-Nov)	MB01, MB02, DC08, MC01, MC02, GB02, NBWRRF, NB03	Visual assessment of percentage cover of filamentous algae, mat-forming algae, macrophytes and moss.
Benthic macroinvertebrates	Summer (Dec-Feb) Autumn (Mar-May) Winter (Jun-Aug) Spring (Sep-Nov)	MB01, MB02, DC08, MC01, MC02, GB02, NBWRRF, NB03	Taxonomic composition and abundance. Sampling shall include calculation of the macroinvertebrate community index (MCI) and the quantitative MCI (QMCI)
Fish	Summer (Feb-Mar)	MB01, MB02, DC08, MC01, MC02, NBWRRF, NB03	Taxonomic composition and abundance, by electric fishing survey.

Table 4: Aquatic Biological Monitoring Components and Frequency

f) Air Quality

Dust management and compliance limits are outlined in the Air Quality Management Plan, Macraes Operation.

Dust deposition rates are monitored monthly at sites situated around and beyond the mine boundaries.

Under MP4, the existing dust deposition monitoring and meteorological monitoring will continue, the continuous total suspended particulate (TSP) monitoring at Macraes Village (DG15) will be replaced with continuous reference-standard PM_{10} monitoring, and a PM_{10} nephelometer will be established on OGNZL land near the residence at 1668 Macraes Road to provide an early-warning regime.

Under the existing air discharge consents 96785_V5, RM10.351.52_V4, RM12.378.15, RM16.138.19_V1, RM20.024.12, and the MP4 consent, the following monitoring will be undertaken:

- Dust deposition rate monitoring at monthly intervals at 16 sites;
- Continuous real-time PM_{10} monitoring at DG15 (Macraes Village) using a reference grade instrument;
- Continuous real-time PM_{10} monitoring on OGNZL land near the residence at 1668 Macraes Road using a nephelometer instrument:
- Continuous meteorological monitoring of conditions at two representative locations (Sites DG03 and DG15);
- Real time total suspended particulate (TSP) monitoring at DG07 (Howards) for a period of at least 12 months following commencement of works at Frasers West and Deepdell North Stage III. ORC gave permission after completion of 12 plus months monitoring and review of the data by a suitably qualified expert that monitoring at DG11 (Macraes Road) could cease. Monitoring may be amended or suspended at DG07 after at least 12 months with the approval of the ORC; and
- A daily record kept of water used for dust suppression will be kept.

g) Geochemistry

Monthly samples of waste rock deposited in the stacks are collected and analysed for acid neutralising capacity (ANC) and percentage sulphur (used to calculate maximum potential acidity (MPA)). The exact location of the sample point varies within the stack depending on where deposition is occurring.

Representative geochemical testing of waste rock, including drill core data, is used to assess compliance with the acid neutralising capacity to maximum potential acidity (ANC:MPA) requirements.

Results are used to support and verify geochemical assessment and management of waste rock in accordance with the Waste Rock Stack Compliance and Monitoring Schedule included as Appendix 1 of this WRSMP. Results are included in the Quarterly Monitoring Reports that are forwarded to the ORC.

Geochemical information is used to identify potentially acid forming and non-acid forming materials and determine any material management, segregation or placement requirements necessary to achieve compliance with the acid neutralising capacity to maximum potential acidity (ANC:MPA) requirements. The compliance for ANC:MPA ratio of the waste rock being sampled is as follows:

"The average acid neutralising capacity to maximum potential acidity (ANC:MPA) ratio, as referred to in California Administrative Code Article 7, 1992, of waste rock rock discharged into the Waste Rock Stack or open pit backfill must not be less than 3:1."

9.3 Geotechnical Monitoring

As the factor of safety for slopes of the waste rock stacks are high, it is not envisioned that an extensive geotechnical monitoring programme will be required.

Primary geotechnical monitoring of the waste rock stacks will consist of a monthly visual inspection by onsite geotechnical or engineering personnel. Inspection will consist of checking stack surfaces for signs of unexpected subsidence cracking, inspecting rock stack toes for deformation and rill slope angles for proper construction. During active dump construction, production supervisory staff will undertake similar inspections as part of their daily workplace inspections.

If increased levels of settling, or other geotechnical instabilities occur, they may require monitoring through regular GPS survey or pin-set measurements.

Inspections of each Waste Rock Stack, by a SEQP – Geotechnical Engineer, will be undertaken at least annually to assess landform stability, erosion, settlement, evidence of deformation, and any remedial actions required will be recorded and reported to Council.

9.4 Quarterly Visual Inspections and Assessment

Quarterly monitoring of the waste rock stacks by visual inspection and assessment will be completed. Inspections will cover:

- Waste rock stack cover integrity;
- Geotechnical stability and erosion; and
- Vegetation health.

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Inspections will be completed by the Environment Team with assistance from mining personnel where appropriate. Inspection dates and observations will be recorded, along with any maintenance or remedial work undertaken and details of any measures implemented to avoid a recurrence.

Records of quarterly inspections will be reported in the Project Overview and Annual Work and Rehabilitation Plan.

10 MANAGEMENT OF NON-COMPLIANCES

10.1 Instability of the Rock Stack

The risk of instability in the rock stacks may be addressed in several ways and will vary dependent upon specific geotechnical considerations. Localised instabilities can be overcome through increased levels of monitoring, specific dumping regimes, re-sloping of repose angle dump faces or closure of the area for a settling period (to be re-opened when regular monitoring indicates it is safe to do so).

Larger regional instabilities are extremely unlikely to develop due to the high factor of safety the waste rock stack is designed to. However, in the unlikely situation of this occurring it could potentially require redesign of the rock stack, limits on rates of waste material entering the facility or as a last resort, permanent closure of an area of the waste rock stack.

The following will be reported to Council within 24 hours of identifying:

- Any geotechnical instability that could compromise the integrity of a Waste Rock Stack;
- Any material failure of erosion and sediment controls associated with a Waste Rock Stack which results in an unexpected direct discharge of sediment to water.

10.2 Non-Compliance Reporting

Any exceedance of a limit, trigger value or standard specified by the relevant consents; or any non-compliance with a monitoring, sampling, analysis, recording or reporting requirement of the relevant consent will be reported to Council within 24 hours.

Within 5 working days of the notification required above, a written report will be provided to the Council detailing:

i. the nature and cause of the incident or non-compliance;
ii. any actual or potential adverse environmental effects arising from the incident or non-compliance;
iii. the actions taken to remedy the incident or non-compliance; and
iv. the measures implemented, or proposed to be implemented, to prevent recurrence

In addition, air quality is reviewed on an annual basis by an independent consultant and summarised in the annual “Summary of Ambient Air Monitoring Results” monitoring report. The ORC is provided with a copy of this report.

In accordance with Air Discharge Permit RM16.138.19, any instances of non-compliance will be reported to the Otago Regional Council and a review to establish the cause of the exceedance will be undertaken. A report detailing the findings of this review shall be provided to the Otago Regional Council within two months of the non-compliant result being received.

Any non-compliance with the standards specified will be reported to the Otago Regional Council within 24 hours of being detected.

11 ROLES AND RESPONSIBILITIES

Role	Responsibilities
Mining Manager	• Overall responsibility for the preparation and approval of this management plan, and all reviews and updates. Ensure changes are communicated to relevant staff. • Ensure all volume and topography monitoring, and geotechnical monitoring outlined in this management plan is undertaken at the required frequencies. • Ensure supervisors, technical staff and operators are aware of the relevant processes and procedures to fulfil the construction and rehabilitation requirements of this management plan. • Liaise with the Environmental Manager to ensure non compliances are addressed with corrective actions and provide details of any non-compliances to the Environmental Manager to allow prompt reporting to Council.
Shift Supervisor	• Ensure all operators are trained and competent to undertake the construction and rehabilitation activities for the WRSs and that they receive sufficient instruction in the relevant standard operating procedures. • Undertake shift inspections of all WRSs in use during their operating shift and document these inspections. • During their shift, ensure each WRS is constructed and/or rehabilitated to design and there is sufficient survey control in place to achieve this. • Immediately report to the Mine Manager any observed instability of waste rock stacks and any failure of any environmental controls (eg erosion and sediment controls, or seepage collection systems). • Ensure water does not pond on WRS surfaces and that water shedding occurs during rainfall events.
SQEP Geotechnical Engineer	• Undertake the geotechnical monitoring and inspections required in this management plan. • Prepare and submit to Council the required design, design review and construction reports including as-built drawings.
SQEP – Water Quality	• Undertake an annual review of the relationship between sulphate concentrations, contaminant loads and Waste Rock Stack characteristics throughout operations and closure. • Recommend adaptive management measures to avoid, remedy, or mitigate any risk of a water quality exceedance.
Environmental Manager	• Report any non-compliance to Council as required by this management plan or resource consent. • Prepare and submit to Council the Project Overview and Annual Work and Rehabilitation Plan. • Engage a SQEP – Water Quality to undertake an annual review of sulphate and other contaminant loads to enable adaptive management measures to be taken where necessary.

12 REVIEW

This Waste Rock Stack Management Plan will be reviewed annually. If updates are required, the ORC will be provided with an updated OMP within one month of the update occurring.

13 REFERENCES

1. Air Quality Management Plan, Macraes Mine, Oceana Gold (New Zealand) Limited, August 2026;
2. Macraes Phase 4 Waste Rock Stack – Geotechnical Stability, PSM, August 2026
3. Erosion and Sediment Control Plan, Oceana Gold (New Zealand) Limited, 2026;
4. Water Quality Management Plan, Oceana Gold (New Zealand) Limited, August 2026;
5. Water Monitoring Plan, GHD, August 2026.
6. Macraes Phase 4 Landscape Rehabilitation Strategy and Management Plan, Boffa Miskell, August 2026