

EGL Ref: 9702

Matakanui Gold Limited
Via email

30 January 2026

Attention: Cheryl Low

**MATAKANUI GOLD LIMITED
BENDIGO-OPHIR GOLD PROJECT - FAST TRACK APPROVALS ACT
RESPONSE TO OTAGO REGIONAL COUNCIL
GEOTECHNICAL ENGINEERING, SURFACE WATER, EROSION AND SEDIMENT
CONTROL REQUESTS FOR INFORMATION**

1.0 INTRODUCTION

GeoSolve Limited has undertaken a peer-review of the Bendigo-Ophir Gold Project (BOGP) Fast Track Approvals Act (FTAA) application on behalf of Otago Regional Council (ORC). Subsequently, ORC have sought responses from Matakanui Gold Limited (MGL) on questions to assist them in their understanding of the proposal, its actual and potential effects and the proposed management of those effects relating to:

- Geotechnical Engineering, Surface Water, and Erosion and Sediment Control

Engineering Geology Limited (EGL) is engaged by MGL to provide geotechnical, earthquake and dam engineering services for the BOGP. This letter sets out EGL's response to select ORC's queries dated 12 December 2025¹.

2.0 RESPONSE TO ORC COMMENTS

Question 3

Report B.21 at page 24 states: Landslide potential into the impoundment exists. The landslide movement can be managed through tailings and landslide underdrainage in combination with tailings beaching against landslides, which together provide a buttressing effect (FM 7). The mitigation of landslides into the reservoir will form part of the Detailed Design stage.

Please explain how the risk of landslide within the TSF impoundment area is proposed to be managed, and how any actions would be secured by consent conditions and/or management plans?

¹ Otago Regional Council. 12 December 2025. Request for further information – Matakanui Gold Limited fast-track application for the Bendigo-Ophir Gold Project. ORC Ref: RMFT25.007

EGL Response:

EGL and MGL are conducting geotechnical investigations at key landslide locations within the TSF impoundment. The findings will support the risk assessment of potential landslides and guide the development of mitigation strategies, which will also support a Building Consent submission for the detailed design of Shepherds TSF.

Landslide risk mitigation measures within the TSF impoundment area will be documented in the Dam Safety Management System (DSMS), specifically within the Operation, Surveillance and Maintenance (OMS) Manual. These documents will be used to inform decision making and the management of landslide risk during operation and into closure.

EGL recommends these actions be secured through resource consent conditions which require a landslide risk assessment, and a landslide monitoring and management plan to be included in the OMS manual and DSMS:

“The Consent Holder must investigate and identify active or potentially active landslides within the TSF impoundment area and assess landslide risk to the TSF. The findings must be included in the TSF Detailed Design Report.”

“The Consent Holder must develop and implement a Landslide Monitoring and Management Plan (LMMP) as part of the TSF Dam Safety Management System. The objective of the LMMP is to ensure the landslides are monitored in a way that protects people and the environment, throughout the mine operation, active closure and passive closure phases of the BOGP. This LMMP shall be subject to a peer review by a SQEP as part of the detailed design of the TSF.”

Question 4

Please provide the following information in relation to the proposed diversion of both Shepherds Creek and ‘SREX tributaries’:

- a) Channel diversion / realignment path design details*
- b) Engineering drawings*
- c) Channel lengths, gradients and alignments*
- d) Proposed construction methodology*
- e) Erosion control or armouring details specific to the channel*
- f) Hydraulics / flood design calculations to support channel sizing*

It is noted that the above information has already been provided for the proposed Rise and Shine Creek diversions.

EGL Response:

A separate report will be prepared and issued to ORC with details of the proposed diversion, addressing Question 4 and Question 6 below.

Question 5

In Report B.04, Kōmanawa state that, post-closure: Overall, surface water flows in both arms of the Shepherds and Bendigo catchments would increase.

Please provide an assessment from a suitably qualified and experienced person of the predicted difference in flood magnitude between the current state and the post-closure state during an extreme event. This assessment should include an assessment of the impact of increased flows on flood hazards for receptors downstream of the development.

EGL Response:

Kōmanawa's (B.04) statement refers to the results of the Water and Load Balance modelling by HydroGeochem presented in the MWM report, B.06, Appendix N². The HydroGeochem estimates represent average flows, not flood peak flows. The modelled post-closure increases in average flow rates for Shepherds Creek and Rise and Shine Creek are:

- Shepherds Creek (SC01), an average flow increase of 11 L/s
- Rise and Shine Creek (RS03), an average flow increase of 6 L/s

The catchment extents used for these estimates are shown in Figure 1 below.

The main contribution to the increase in average flow rate is seepage from engineered landforms (ELFs) and the Shepherds Tailings Storage Facility (TSF) i.e. a greater proportion of rainfall is expected to infiltrate into the ELFs and the TSF rather than be lost through evapotranspiration, compared to undisturbed land, and it is this increase in infiltration that is subsequently released via seepage that increases the average flows in the creeks. Increases in average flows do not have a material effect on flood flows, as estimates of flood flows are one to two magnitudes greater than the average flows.

MWM report states the Water and Load Balance model for closure is not suitable for assessment of peak flood flows which occurs at a finer temporal scale (hours) than adopted for the Water and Load Balance model (days). Therefore, EGL has undertaken a separate comparison of peak flood flows pre mine development and post closure.

Rise and Shine Creek Catchment

In the Rise and Shine Creek catchment, SRX Pit and SRX ELF, and RAS Pit (small area crossing into RAS catchment) will reduce the flood flows in the creek a minor volume during operation. Runoff from the SRX ELF into the SRX Pit will be managed within ELF and Pit footprint and therefore attenuate peak flood flows. However, the size of the SRX Pit, RAS Pit and ELF catchments (~37 ha) are small compared to the total catchment (~417 ha) and therefore any reduction in flood flows will be relatively minor (less than 10%).

In closure, SRX Pit lake is proposed to spill clean water directly to the creek². The area of RAS Pit in the catchment (~9 ha) will remain isolated from the catchment. However, this is right at the bottom of RAS creek. Therefore, in closure for most of the length of RAS Creek the flood flows will be approximately the same as existing and the flood flows into Clearwater Creek will decrease slightly (~2%).

Shepherds Creek Catchment

Operation

In Shepherds Creek there are more notable changes to the land use, and therefore the potential for changes in flood flows is greater. In operation the notable changes are the

² MWM, 2025. Water and Load Balance Model Report: Bendigo-Ophir Gold Project, Doc. No.: J-NZ0233-016-R-Rev1. Dated 10 October 2025. Appendix N, document B06C of BOGP Fast Track Substantive Application

development of RAS Pit, CIT Pit, Shepherds ELF, and Shepherds TSF. In operation the RAS Pit, CIT pit and TSF will remove a notable volume of runoff from the catchment. Shepherds ELF will have more infiltration compared to previously undisturbed ground. Overall flood flows will be reduced.

Closure

In closure, the CIT Pit will be backfilled, and runoff from the backfilled area will discharge to the creek. However, because there is greater infiltration into the backfill material, and it will generate less surface runoff compared to pre mine development, overall runoff volumes will be reduced.

The final water level in the RAS PIT will remain well below the pit rim i.e. it will not spill in flood. Therefore no runoff from within RAS Pit will contribute to peak flood flows in Shepherds Creek.

Similarly, the Shepherds ELF surface will allow more rainfall infiltration compared to pre mine development conditions, which will reduce runoff and flood flow volume.

Shepherds TSF will attenuate peak flood flows. Although it will pass base flows at rates similar to the pre-development condition, its culvert and outlet channel system will attenuate more extreme flood events by detaining a portion of the flood volume and releasing flows gradually post event.

Peak Flood Flow Rates

For Shepherds Creek, the 1 in 100-year peak flood flow at the Valley outlet onto the gravel terraces are estimated to be 38 m³/s (for a 2-hour duration storm) at the valley outlet onto the terrace gravels. The historical rainfall depth estimated for a 1 in 100-year 2-hour storm is 41 mm. In operation these flows will reduce to 18 m³/s (also during a 2-hour duration storm). This is a reduction of approximately 50% in operation.

In closure, the 1 in 100-year peak flows are estimated to be 19 m³/s (for a 2-hour duration storm), a reduction of approximately 50% in closure compared to existing conditions.

These flood flows assessed by EGL use historical rainfall depths extracted from NIWA's High Intensity Database (HIRDS) without applying any climate change adjustments, to isolate and evaluate the effects of landscape changes on flood flows. EGL note that climate change is being allowed for in the design flow structures.

Clearwater Creek Catchment

Further, EGL note that the WELF will reduce flood flows as it will have more infiltration. However, it will have no material effect on the flood flows for Clearwater Creek catchment as it is a very small area compared to the total catchment.

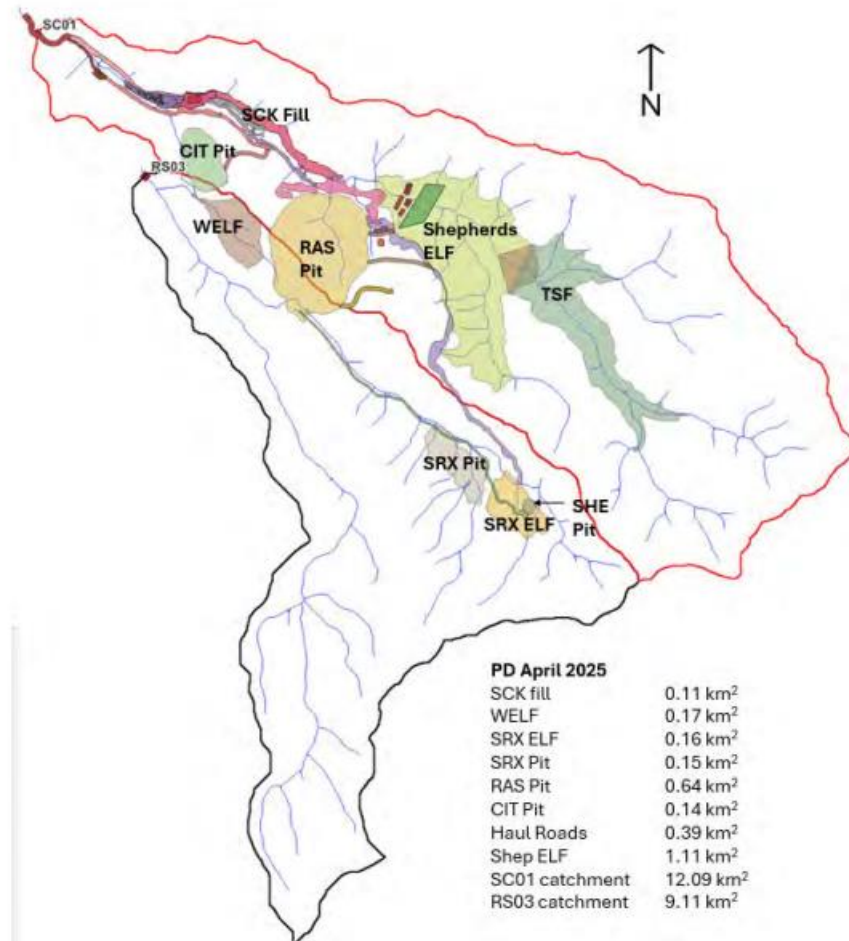


FIGURE 1: SC01 CATCHMENT (NORTH) AND RC03 CATCHMENT (SOUTH) EXCERPT FROM MWM REPORT²

Question 6

Please provide an assessment from a suitably qualified and experienced person of the flood carrying capacity of the proposed Shepherds Creek diversion channel. Specifically, this assessment should include:

- Whether this channel will be capable of conveying 100-year ARI (1% AEP) flood flows.*
- If the channel cannot accommodate the flows described in part (a) without overtopping,*
- an assessment of the potential consequences of overtopping.*
- Clarification of whether the proposed channels will be left as-constructed following closure of the mine, and if this is case then an explanation as to how their ongoing performance will be assured.*

EGL Response:

A separate report will be prepared and issued to ORC with details of the proposed diversion, addressing Question 4 above and Question 6.

Question 8

The Shepherds Silt Pond has been assessed in Report B.23 as a low PIC dam. GeoSolve consider that this is incorrect, and that the correct classification of the Shepherds Silt Pond would be a medium PIC dam. Please provide an updated assessment that reflects the correct classification of

this dam, including any changes to any design, construction, operation, maintenance, surveillance, or closure requirements.

EGL Response:

EGL's assessment of the Shepherds Silt Pond PIC follows the New Zealand Dam Safety Guideline method, and is based the assessed damage level, and incremental increase in Population at Risk (PAR) and Potential Loss of Life (PLL). The incremental increase is the based on the difference between the Rainy Day Base Flood and Rainy Day Breach with Base Flood to assess the consequence attributable to the dam. Details of this assessment are summarised in Figure 2 below.

An assessed damage level of 'Minimal' and incremental PAR and PLL of 30 and 0 respectively corresponds to a PIC Classification of 'Low' in accordance with New Zealand Dam Safety Guidelines³ (NZDSG). An excerpt of the relevant table from the NZDSG is included in Figure 3 below.

Table A7. Summary of PAR and Potential Loss of Life for Rainy Day Breach Scenario

Breach Scenario	Item	PAR	Potential Loss of Life	Damage				Potential Impact Classification (PIC)
				Community	Cultural	Critical Major Infrastructure	Natural Environment	
Rainy Day Base Flood (PMP – 1 hr)	Buildings	8.10	0.0008	-	-	-	-	-
	Roads & Bridges	1.75	0.5072					
	Farmlands	0.08	0.0000					
	Summary	9.94	1 (0.5080)					
Rainy Day Breach with Base Flood (PMP – 1 hr)	Buildings	38.10	0.0056	Minimal	Minimal	Minimal	Minimal	Low PIC
	Roads & Bridges	1.85	0.5086					
	Farmlands	0.11	0.0001					
	Summary	40.06	1 (0.5142)					
	Incremental Summary	30	0 (0.01)					

FIGURE 2: EXCERPT FROM TABLE A7, SHEPHERDS SILT POND TECHNICAL REPORT (PDF PAGE 61)⁴

³ New Zealand Society of Large Dam (NZSOLD). 2024. 'New Zealand Dam Safety Guidelines', ISBN: 978-0-473-72599-0.

⁴ Engineering Geology Limited. August 2025. Matakanaui Gold Limited, Bendigo-Ophir Gold Project, Shepherds Silt Pond, Technical Report. EGL Ref: 9702. document B23 of BOGP Fast Track Substantive Application

Table 2.6: Determination of Potential Impact Classification (PIC)

Assessed damage level	Population at Risk (PAR)				Potential Loss of Life
	0	1 to 10	11 to 100	100+	
Catastrophic	High	High	High	High	No persons
	N/A ¹	High	High	High	One person
	N/A ¹	High	High	High	Two or more persons
Major	Medium	Medium	High	High	No persons
	N/A ¹	Medium	High	High	One person
	N/A ¹	High	High	High	Two or more persons
Moderate	Low	Low	Medium	Medium	No persons
	N/A ¹	Medium	Medium	Medium	One person
	N/A ¹	High	High	High	Two or more persons
Minimal	Low	Low	Low	Low	No persons
	N/A ¹	Medium	Medium	Medium	One person
	N/A ¹	High	High	High	Two or more persons

Notes:
1. Not applicable. Population at risk is zero therefore no Potential Loss of Life.

FIGURE 3: EXCERPT FROM MODULE 2, NEW ZEALAND DAM SAFETY GUIDELINES 2024³

Question 9

GeoSolve recommend that sediment management features (such as sediment retention ponds) and other infrastructure that are to exist for the proposed operational life of the mine be designed to accommodate a 50-year ARI (2% AEP) storm event. Please explain whether there are any physical constraints on site that would prevent sediment devices and infrastructure being sized to this capacity. If such physical constraints exist, please assess the potential effects of sediment being discharged from sediment devices and entering streams, either directly or indirectly, including the expected frequency of this occurrence.

EGL Response:

Sediment retention features during construction and operation

During construction there will be a series of temporary sediment retention features including diversion channels, contour drains and bunds, sediment bunds, and sediment retention ponds that will operate for a few months to several years during site setup. Following this phase, areas will either be stabilised and sediment retention features removed, or more permanent sediment management features will be established for site operation. These will remain for the operation stage of the site and will generally be rehabilitated or repurposed for closure i.e. there is a series of operational management features that will operate for 14 years. These primarily include the North Diversion Channel along the north side of Shepherds TSF and Shepherds ELF, Shepherd Creek Diversion on the Valley Infill and past the Process Plant, Shepherds Creek Silt Pond, and a Dirty Water Diversion Channel along the south side of the Shepherds Valley Infill (more details to be provided in response to Questions 4 and 6). We note the WELF is only proposed to be operational for 2 years, after which it can be rehabilitated and the WELF silt pond is no longer required i.e. it is temporary.

Typical Practice in Other Gold-Mining Operations in New Zealand

EGL is involved in all three major existing gold-mining operations in New Zealand (Waihi, Reefton, and Macraes). At each of these sites, a 1 in 10-year design criteria is successfully applied to the sediment retention ponds that manage erosion and sediment from engineered landforms (rock stacks) and tailings storage facility embankments. These ponds are designed to capture and temporarily store the runoff volume associated with a 1 in 10-year event, with controlled release over several days.

EGL's experience at the Macraes Gold Mine Operation in Otago, within comparable schist terrain, is that very little sediment is conveyed to the silt ponds below rockfills and therefore large silt ponds exist for an effect that is not observed in practice. This is because the main risk of sediment discharge exists during site stripping and rehabilitation when surficial soils are being stripped or placed, which is a short timeframe compared to the overall mine operating life.

Where rockfill is placed and not trafficked, such as on a slope or in a windrow, it effectively prevents fines from washing away in rainfall and limits sheet flow and thereby reducing load on sediment retention structures. Conversely, the main sediment generating risk during operations on the ELFs are trafficked surfaces which lead to a tight surface of crushed rock that generates silt sized particles which require sediment retention. This also includes the operational surfaces and haul roads.

For the BOGP, however, the sediment retention ponds are proposed to be flow-through ponds, rather than store and release. This more closely aligns with the function and configuration of traditional sediment retention ponds, which operate by allowing flow to pass through the structure while providing sediment settlement time before decanting released water, rather than detaining the full event volume. Using a flow-through structure allows more shallow ponds that do not have to be large dams which present dam safety risks.

At other sites, a 1 in 10-year event is typically adopted as the design criteria for cleanwater diversions. This level provides a practical balance between diversion capacity and the physical footprint of the structure. Cleanwater diversions are often cut into slopes and can be very long structures, as is the case at BOGP. Widening diversion structures to increase capacity introduces other issues such as slope instability.

Shepherds Silt Pond Capacity

Shepherds Silt Pond will be the main sediment management feature, for Shepherds ELF and haul roads from the RAS Pit to the ELF, throughout the proposed operation life of the mine. It will protect clean water within the realigned Shepherds Creek on the Shepherds Valley Infill.

The previously proposed design criteria for Shepherds Silt Pond are to provide sediment retention control for at least a 1 in 10-year storm event, with a primary decant tower (spillway) sized to pass 1 in 10-year AEP rainfall events and an auxiliary spillway sized to pass a 1 in 1000-year AEP.

The design method being used requires a minimum surface area to achieve the required sediment retention time for sediment to drop out. The minimum pond surface area at the decant level for Shepherds Silt Pond of 11,500 m² at decant level was sized for a peak silt pond inflow⁵ rate of 5.6 m³/s (Note: the current design footprint is 11,200 m²). This flow rate was assessed using preliminary run-off coefficients which were not adjusted for duration

⁵ Using IECA method, refer to the Shepherds Silt Pond Technical Report for further details. document B23 of BOGP Fast Track Substantive Application

of rainfall or rainfall depth. EGL has since updated the flood flow rate assessments, incorporating the Curve Number (CN) method for estimating rainfall run-off coefficients. The CN method allows run-off coefficients to vary with soil type and hydrological conditions and provides a more realistic estimate of flows for short duration storm events.

Using the CN method the updated 10-year ARI peak flood flow rate is 2.2 m³/s. At this flow rate the minimum require pond surface area is of 4,500 m². EGL have also assessed the peak flow rate at 1 in 50 years. This is 5.8 m³/s. This includes allowance for the exceedance of the flow capacity of the North Diversion Channel. With the current pond surface area using more detailed runoff coefficients the surface area of 11,200 m² almost accommodates a 1 in 50 year ARI flow i.e. there is space for Shepherds Silt Pond to have a higher design criteria.

Design Storm Return Period for Permanent Sediment Management

The rationale for adopting a 10-year ARI design event for sediment management infrastructure is to balance its size and associated footprint effects with the risk for sediment discharge. When flows exceed the design flow, detention times are reduced for a period during the storm, however not the full storm duration i.e. the pond still functions effectively for most of the storm event.

EGL has provided a discussion above about New Zealand based design levels on operational mine sites and some of the difference to BOGP. EGL's proposed specific design criteria for elements that are permanent during the operation phase below:

TABLE 1: SUMMARY OF DESIGN CRITERIA FOR PERMANENT EROSION AND SEDIMENT CONTROL MANAGEMENT FEATURES DURING OPERATION

Feature	Channel capacity or sediment retention capacity design AEP and duration	Comment
North Diversion Channel past TSF	1 in 10-year 24 hour storm	This is a practical balance between diversion and the size of the required cut.
North Diversion Channel past ELF	1 in 10-year 24 hour storm	This is a practical balance between diversion and the size of the required cut. Note that flood detention capacity on the TSF in closure will allow this channel to repurpose to pass 1 in 100 year flows in closure.
Shepherds Silt Pond	1 in 20-year storm all durations	EGL acknowledges that a higher performance level than 1 in 10-year event would be appropriate below Shepherds ELF and area between RAS Pit as this is the main disturbed area during mine operations. We consider 1 in 50-year event to be unnecessarily high based on experience at other sites. We propose 1 in 20-year to be a practical compromise. We propose ORC and Geosolve consider what we have discussed.

Shepherd Creek Valley Infill Diversion	1 in 100-year storm all durations)	This is a typical design level for permanent channel design
Shepherd Creek Valley Infill Diversion – Dirty water diversion	1 in 20-year storm all durations	The slopes above the valley infill and on the valley infill will contain haul roads. We propose the same design level as the Shepherds Silt Pond as they are both protecting clean water in Shepherds Creek.

We have not included the WELF silt pond under permanent features as it has an expected operating duration of less than 2 years and can be managed under the proposed design criteria in the Erosion and Sediment Control Management Plan⁸.

EGL proposed that the Erosion and Sediment Control Management Plan allow for runoff coefficients based on CN method.

Question 15

Please explain how erosion and sediment control measures will be implemented around wetlands. It appears that wetlands are not considered within the Erosion and Sediment Control Management Plan (Report G.14).

EGL Response:

The proposed construction disturbance footprint bisects existing wetlands at several locations, and works will be undertaken in the catchment above wetlands at other locations. Figure 4 below extracted from the Wetlands Values⁶ report shows the approximate locations and extents of mapped wetlands. EGL understands wetlands within the Direct Disturbance Footprint (DDF) in red are assumed to be lost and do not require specific erosion and sediment measures. Wetlands within the Surrounding Landscape Surveyed for Wetlands (SLSW) in green require protection from sediment discharge.

Generally, it is the downstream portion of bisected wetlands that is affected by the DDF. At these locations sediment is not expected to impact upstream portions of wetlands and general erosion and sediment control measures set out in the Erosion and Sediment Control Report⁷ and the Erosion and Sediment Control Management Plan⁸ apply.

Wetlands located outside and downstream of the DDF require specific erosion and sediment measures such that there is no material discharge of sediment to the wetland as the primary objective. This may require higher standards of erosion and sediment controls, and monitoring; however, will be specific to each location.

We propose the Site-Specific Erosion and Sediment Control Plans consider whether wetlands are present and require additional management measures, and that this requirement is added to the Erosion and Sediment Control Management Plan⁸.

⁶ RMA Ecology Ltd. October 2025. Bendigo-Ophir Gold Project, Wetland Values Assessment. Ref: 2352. document B12 of BOGP Fast Track Substantive Application

⁷ EGL ESC Report

⁸ EGL ESC Management Plan

Wetland areas that are outside of and downstream of the DDF include the following, and are presented in Figure 5 and Figure 6 below:

1. Section of Thomsons Gorge Road between the RAS Pit and SRX Pit.
2. Area below SRX Pit and SRX ELF, and haul road leading to SRX.

For area 1, this road could require stabilisation with aggregate to reduce sediment generation potential, or a series of perimeter controls and sediment retention devices.

For area 2, we propose that this area is best managed with runoff from the haul road and ELF reporting to the SRX Pit. This will achieve the target of no material release of sediment into adjacent wetlands with the SRX Pit acting as a sump.

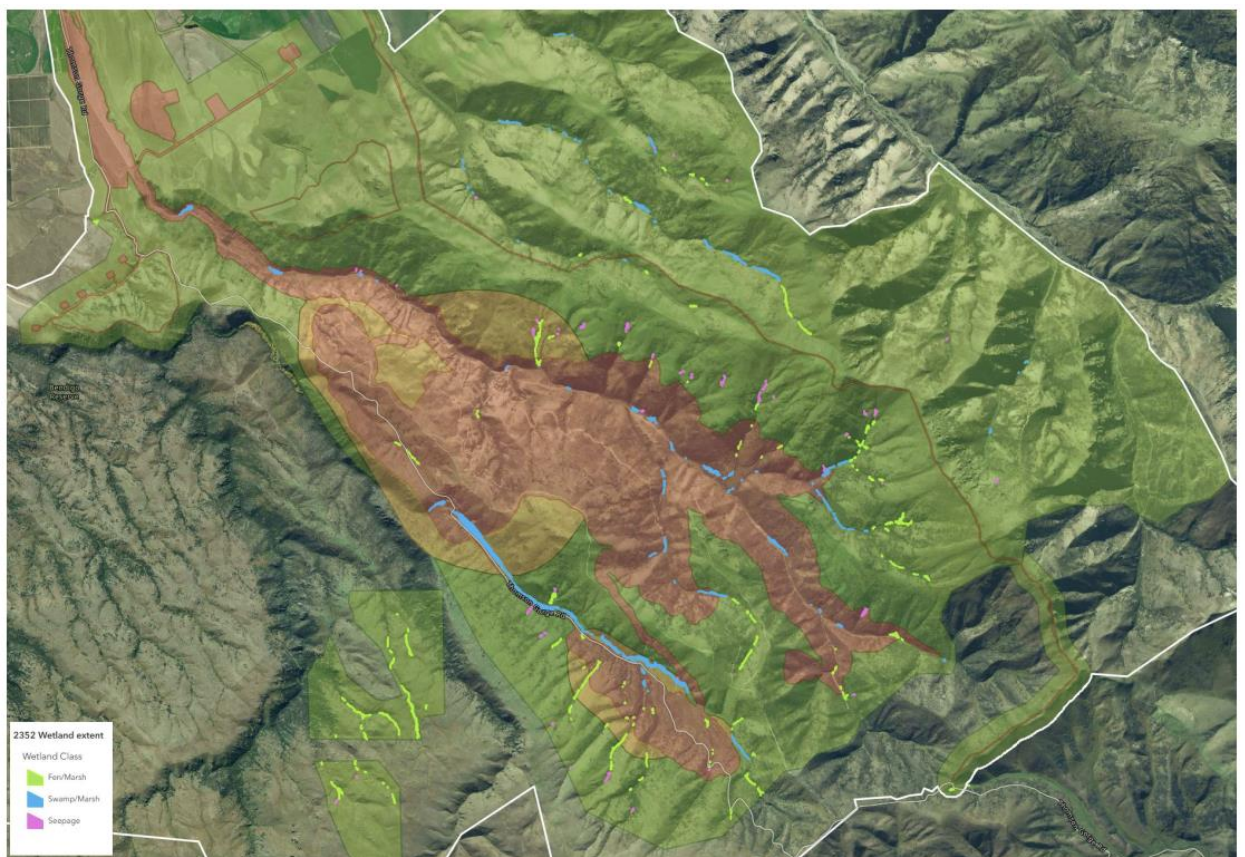


Figure 16. Distribution of wetlands within the SLSW (green polygon) within the ESA (white polygon). Wetlands are displayed by wetland class.

FIGURE 4: EXCERPT FROM WETLANDS VALUES REPORT SHOWING THE EXTENT OF THE DDF AND SLSW

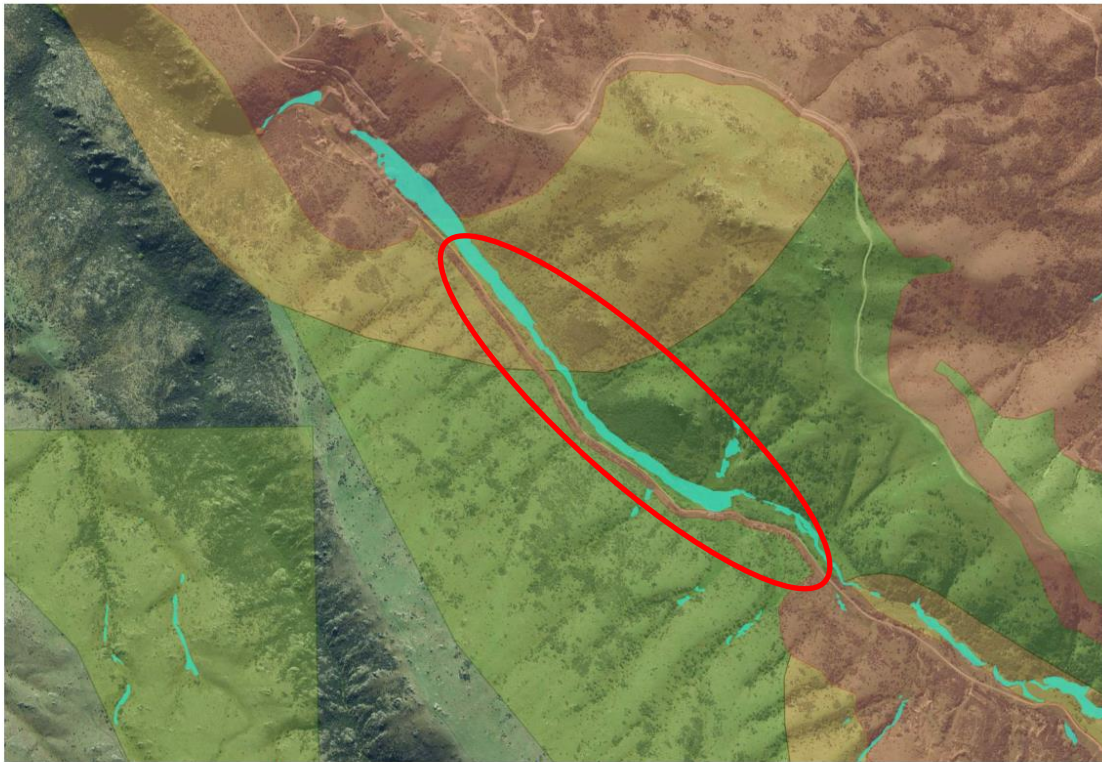


Figure F4. Rise and Shine Creek with wetlands highlighted in blue. DDF (red), DDZ (orange), SLSW (green).

Figure 5: Excerpt from Wetlands Values Report – Approximate location of wetlands that require specific erosion and sediment control design at Rise and Shine Creek

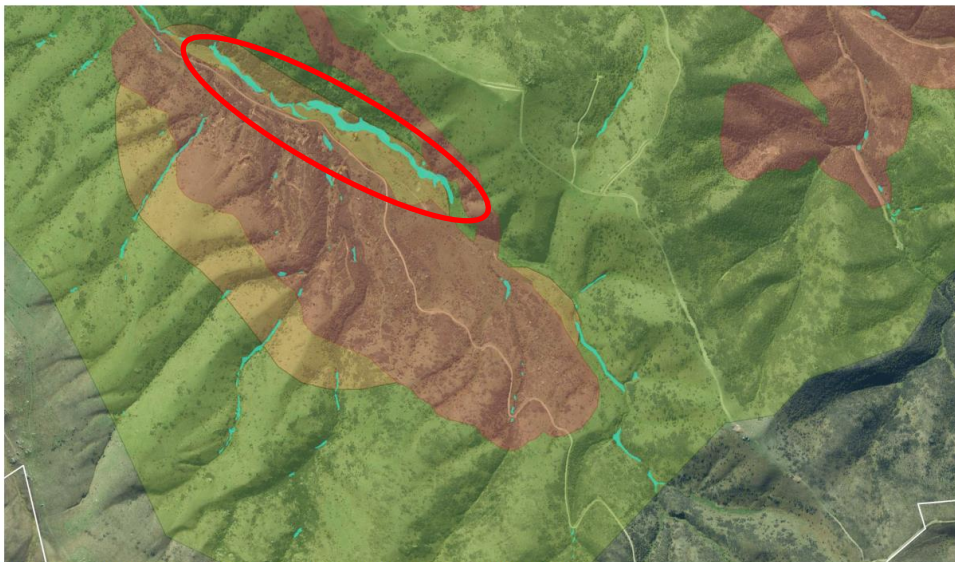


Figure F5. Rise and Shine Creek with wetlands highlighted in blue. DDF (red), DDZ (orange), SLSW (green).

Figure 6: Excerpt from Wetlands Values Report - Approximate location of wetlands that require specific erosion and sediment control design at SRX Pit.

Your Sincerely
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