

12 June 2026

REF: 310700414

To Whom It May Concern,

Re: Matakanui Gold Limited Fast Track Approvals Application – Lighting RFI

I write this covering letter in response to the Expert Panel's request for information regarding lighting. This covering letter is to accompany the supporting statement by Paul Wilson of Xyst.

I disclose that the specific details of vehicle lighting are not within my professional expertise, however I have reviewed the evidence provided and assessments made by others based on my technical expertise and knowledge of lighting in general.

The RFI Request sought the following additional lighting information be provided by 12 June 2026:

1. *If possible, quantify and provide an expert assessment of the magnitude of additional impacts from illumination levels, beyond those already identified, that are likely to result from moving and static vehicle lighting (including headlights and any required hazard awareness flashing lights, for example) during all phases of the proposal. It is expected that such an assessment would need to determine (as accurately as possible) the variety of different vehicle types and specifications which are likely to be utilised on the site during the hours of darkness.*

Paul Wilson has provided a response to this item in his supporting statement. I can confirm that I have reviewed this statement and agree with the technical assessments made in regard to anticipated light sources and illuminance levels at approximate distance from a vehicle lighting source, based on the reference information available.

The overall quantity of additional illumination can be approximated by considering these assessments and the expected number of operational vehicles, however as Paul has noted many different light sources are likely to exist.

2. *Outline specific proposed mitigation measures (such as physical barriers, as suggested at paragraph [41] of the JWS) to address any identified additional impacts from vehicle lighting.*

Paul Wilson has provided a response to this item in his supporting statement. I can confirm that I have reviewed this statement and understand that MGL have provided input regarding the proposed operational measures to assist with mitigation of light spill. I note the recommendation of a condition regarding the construction and staging of ELF's (Engineered Landforms) and support this. In particular I note the suggestion and intent to raise the outer edges of the ELF during daylight hours and work

within the inner sections during hours of darkness, as far as reasonably practicable. I agree that if the mitigation measures which are described in Paul's statement are implemented, this will help to reduce illuminance levels from spilled light and reduce visibility of vehicle lighting from neighbouring properties.

3. Confirm whether a separate management plan (additional to the proposed Lighting Management Plan) for vehicle lighting is required.

Paul Wilson has provided a response to this item in his supporting statement. I can confirm that I have reviewed this statement and agree that, as Paul has noted, AS/NZS 4282:2023 explicitly excludes vehicle lighting.

I support the suggested inclusion of vehicle lighting operation, proposed mitigation measures (such as ELF construction as mentioned above) and screening of work areas etc. to be included within the Lighting Management Plan, rather than a separate management plan.

Yours sincerely,



Tim White

Senior Principal Electrical Engineer

CPEng NZ, Tech IES

Xyst Limited
Level 1, 114 Peterborough Street, Christchurch, 8013
PO Box 1005, Christchurch, 8140
New Zealand



12 June 2026

Mary Askey
Principal Environment Advisor
Matakanui Gold Limited

Via Email

Kia ora Mary

Request for Further Information: Lighting

Following receipt of the Lighting / Dark Sky Joint Witness Statement (JWS) dated 26 May 2026, at the direction of the Panel, the EPA has requested the following information. My responses are included below.

1. *If possible, quantify and provide an expert assessment of the magnitude of additional impacts from illumination levels, beyond those already identified, that are likely to result from moving and static vehicle lighting (including headlights and any required hazard awareness flashing lights, for example) during all phases of the proposal. It is expected that such an assessment would need to determine (as accurately at possible) the variety of different vehicle types and specifications which are likely to be utilised on the site during the hours of darkness.*

- a) Many different combinations of light source, operating voltage and lamp optics (beam patterns) are likely to exist, and these are likely to be mounted at varying heights and angles meaning that it is not possible to calculate illuminance without knowing all variables including the point at which illuminance is to be calculated.
- b) Notwithstanding, I have reviewed a range of typical ECE¹ compliant and road legal headlamps from Hella, a German manufacturer which supplies vehicle and work lights in the New Zealand market. According to the data available from Hella for a 7-inch round replacement LED headlight that might be typically found in a road legal heavy vehicle, the headlight produces 1440 lumens per headlamp and provides an illuminance of 1 lux at approximately 350m on high beam. (Figure 1)

¹ ECE (Economic Commission for Europe) which is a United Nations body that establishes uniform, international regulations for vehicle design, including safety and performance standards for lighting and light-signalling devices

- c) Work lights on machinery will vary by machine type, make and model. I have assessed the work lights on a PC3400 excavator which consists of the lighting configuration shown in Figure 2. According to the data supplied by Komatsu, the total luminaire lumens is 75,600 lumens per excavator. A single luminaire generating 4,200 lumens will result in an illuminance of 1 lux at 25m from the luminaire when mounted at a height of 3m and a downward tilt of 17.
- d) As the distance from the light source increases, illuminance on a surface will decrease.²
- e) My assessment is that moving and static vehicle lighting (including headlights and any required hazard awareness flashing lights, for example) during all phases of the proposal will have localised and temporal effects on illumination levels. Levels of illumination from driving lights are likely to be less than 1 lux when measured horizontally and vertically at a distance of 300 - 400m. Illuminance will be increased in the immediate vicinity of vehicles and machinery operating at night, but such increases in localised illuminance will be temporary and minor in magnitude.

2. Outline specific proposed mitigation measures (such as physical barriers, as suggested at paragraph [41] of the JWS) to address any identified additional impacts from vehicle lighting.

- a) Vehicle lighting effects will vary as the mine develops. Most vehicle lighting effects will occur during surface mining in the Shepherd's Valley (associated within the Rise and Shine Open Pit and subject to the consent condition requirements being met, the Come-in-Time Open Pit), scheduled over the first eight years of mine life, after which underground mining will predominate resulting in substantially fewer vehicle movements.
- b) We understand that MGL will endeavour to minimise the effects of vehicle lighting at night through design and staging of ELF construction and we recommend a condition requiring that. As far as reasonably practical the outer edges will be raised during the hours of daylight to a higher elevation than the inner area. The inner area will be used during the night hours, with vehicle lights shielded to the extent practical by the elevated edges. Figures 3 and 4 show how vehicle driving and working lights may be screened behind a working bund.
- c) As the mine pits develop light will be shielded by pit walls. Haul routes will be altered periodically to service pit cutbacks and ELF development. Haul routes are constructed to a maximum grade and where reasonably practical haul routes will be in cut, within the constraints of the proposed project footprint and grade requirements.

3. Confirm whether a separate management plan (additional to the proposed Lighting Management Plan) for vehicle lighting is required.

² Illuminance is the measure of the total luminous flux (light) actually incident on a surface, per unit area

- a) AS/NZS 4282:2023 Control of the obtrusive effects of lighting and explicitly excludes "emergency warning, wayfinding lights/ marker lights, navigation lighting, all traffic signals, traffic signage and vehicle headlights, including working lights mounted on moving vehicles and plant"³
- b) I do not consider a separate Lighting Management Plan for vehicle headlights, work lights, or warning beacons necessary, as there are no practical measures to manage their effects other than switching them off, reducing their output, or screening them from view, all of which may create safety or compliance issues.
- c) A statement on the operation of vehicle lights, work lights and warning lights and the screening of work areas through the use of a visual bund will be included in the proposed Lighting Management Plan.

Yours sincerely,



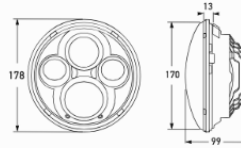
Paul Wilson
Director

(see figures on following pages)

³ AS/NZS 4282:2023 Control of the obtrusive effects of Lighting 1.1 Scope Page 1.

HEADLAMPS AND INSERTS

7" ROUND LED HEADLAMPS



1L6 958 307-021	1358LED
Mounting	Retrofit 178 Ø (7") headlamps
Voltage	Multivolt™ for optimum brightness in 12 and 24 volt systems.
Power Consumption	60W
Light Output	1440 lumen
Operating Temperature	-40°C to 65°C
Protection	Reverse polarity protection. IP 67 (Protection against dust and high pressure water jets)
Cable Length	2 x 100mm cables with male blade terminals.
Housing Material	Die-cast Aluminium
Lens Material	Coated polycarbonate
Compliance	E11 7501 ECE R112/01 Ref. 30

7" Round LED Headlamp - High Beam

This 7" Round LED Headlamp features a high beam function with a massive 1440 lumen light output for only 60W. Combining the latest state of the art LED technology, multivoltage 12/24V DC circuit design and precision optics, the retrofit lamps provide outstanding visibility, safety, and durability – making them one of the most advanced 7" LED headlamps available. The tough die-cast aluminium housing is IP67 sealed against water and dust ingress with a UV resistant, hard coated polycarbonate lens making the HELLA's 7" Round LED Headlamp range perfect for use on and off-road.



1L6 958 307-021 High Beam distance. (m)

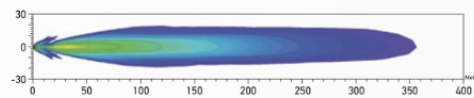


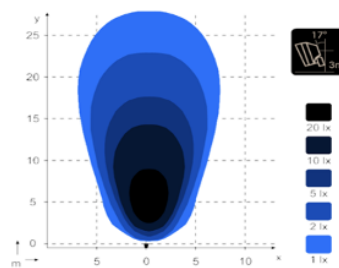
Figure 1 Specifications for Hella 1358 LED Headlamp (Dark Blue in graph = 1 lux)

PC3400	QTY	Description	Part number	Lumens	
				Theoretical Lumens Output	Operational Lumens Output
Counterweight	2	Lamp	DM950-737-40	6700lm	4200lm
Cab LH Deck	5	Lamp	DM950-737-40	6700lm	4200lm
Cab Top Front	2	Lamp	DM950-737-40	6700lm	4200lm
Oil Cooler	4	Lamp	DM950-737-40	6700lm	4200lm
Power container	9	Lamp	DM951-320-40	2400lm	1500lm
Cab Top Rear	1	Lamp	DM951-320-40	2400lm	1500lm
Cab Base	2	Lamp	DM951-320-40	2400lm	1500lm
Oil Cooler	1	Lamp	DM951-320-40	2400lm	1500lm
Service Arm	1	Lamp	DM951-320-40	2400lm	1500lm

DM950-737-40

DM951-320-40

N4401 QD N4402 4200lm Flood



KL1002 1200lm Diffused

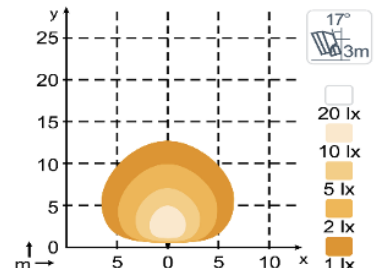


Figure 2 Working Lights on a PC3400 Excavator

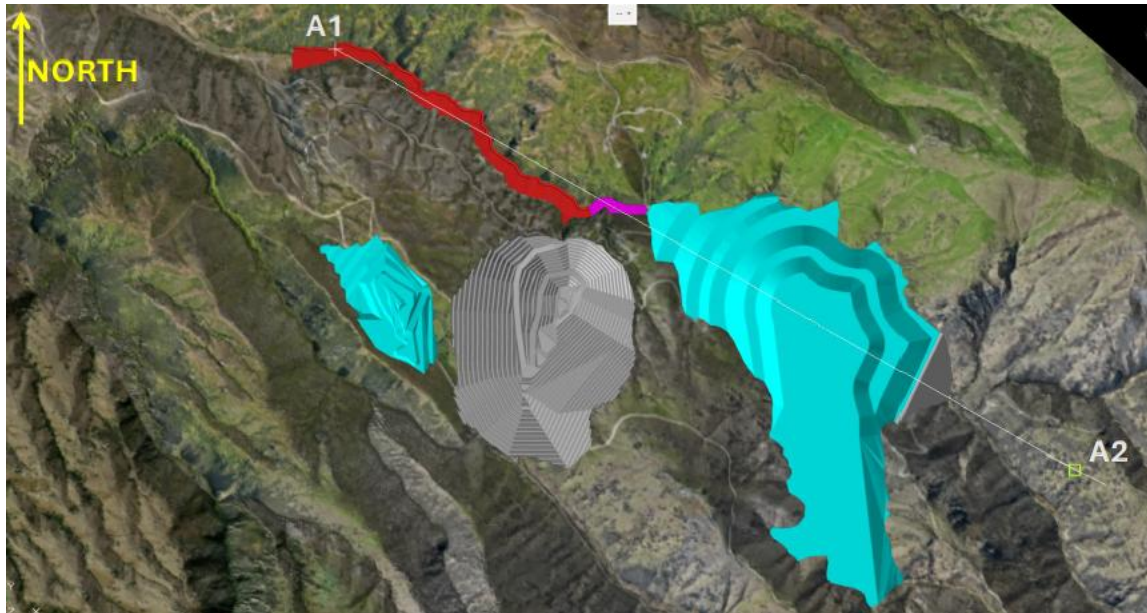


Figure 3 Position of cross -section A-B through ELF

NOT TO SCALE

Indicative section through ELF during construction

Potential opportunity to shield N/S activities behind visual bund

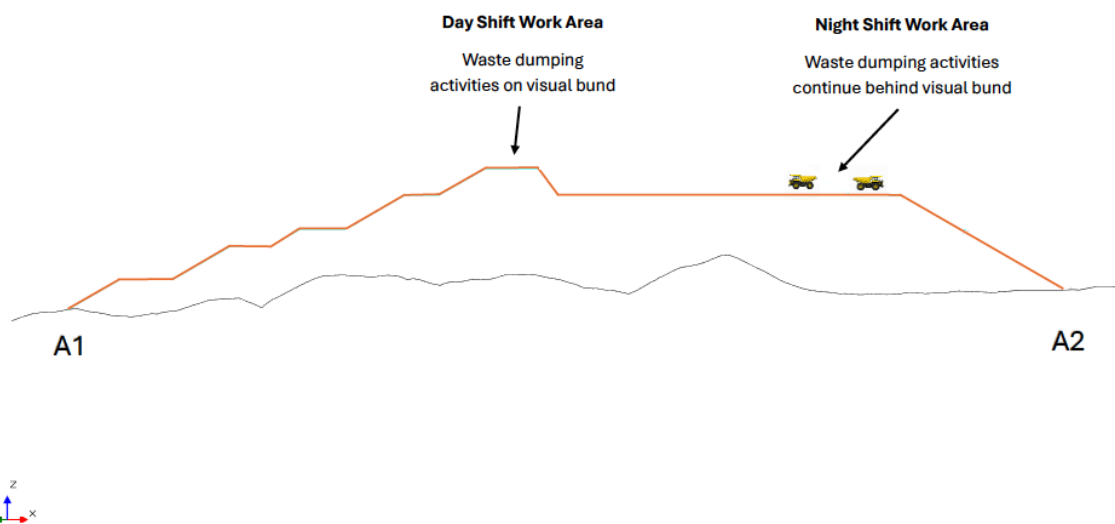


Figure 4 Indicative cross-section through ELF showing visual bund