PATTLE DELAMORE PARTNERS LTD
South British House, Level 2
35 Grey Street, Tauranga 3110
PO Box 13274, Tauranga 3141, New Zealand

Tel +64 7 **985 6440**
Web **www.pdp.co.nz**

memorandum

TO	Cheryl Low	FROM	Paul Crimmins, Service Leader – Air Quality
	Santana Minerals Ltd	DATE	29 January 2026
RE	Bendigo-Ophir Gold Project Air Quality Assessment: Response to Otago Regional Council information request		

Matakanui Gold Limited (MGL) has lodged a Fast Track consent application for the Bendigo-Ophir Gold Project (BOGP). Included within the application was an Air Quality Assessment (AQA) prepared by Pattle Delamore Partners Limited (PDP) (dated 13/10/2025, Fast Track Document Number B.33) and an Air Quality Management Plan (AQMP, dated 05/09/2025, Fast Track Document Number G.23).

The BOGP Fast Track consent application has been reviewed by Otago Regional Council (ORC). In a letter dated 17/12/2025, ORC provided an external peer review of the PDP AQA (SLR, 12/12/2025). Based on the SLR Review, the ORC letter posed nine questions as requests for further information. These requests, and PDP's responses, are detailed below at Table 1.

The responses are prepared by Paul Crimmins, Service Leader – Air Quality, and reviewed by Andrew Curtis, Technical Director - Air Quality. Paul and Andrew were the reviewers of the AQA and are considered to be Suitably Qualified and Experienced air quality Practitioners; both being 'Certified Air Quality Practitioners' by the professional organisation CASANZ and having more than 15 years of experience.

Table 1: ORC Information Requests and PDP Planned Responses

#	ORC Request	PDP Response
1	Please provide an air quality assessment, prepared by a suitably qualified and experienced air quality specialist, for: a. The concrete batching plant b. The cement paste plant	PDP considers that the AQA's comprehensive assessment of dust discharges and effects to off-site receptors sufficiently encompasses all aspects of the BOGP, including minor ancillary activities such as the preparation of concrete for use within the project. The preparation and use of concrete is an anticipated activity related to the construction of the mine. Concrete batching is proposed within small-scale purpose-built plants located more than 1.5 km from the nearest sensitive receptors and featuring standard dust control measures, such as air filters for the cement storage silos. Given the scale of the activity, mitigation measures and separation distances involved, no off-site dust effects are likely to arise from the use of concrete or cement as part of the BOGP. For clarity and to respond to this request in detail, PDP is preparing a stand-alone addendum AQA for the cement and concrete batching plant. This short report shall detail the activity, dust management measures (including dust capture devices), and assessment of air quality effects based on the separation distance to off-site receptors.
2	Please provide a quantitative assessment, prepared by a suitably qualified and experienced air quality specialist, of the expected emissions from all dust sources on site, including haul roads. An objective of Report B.33 is to quantify the amount of dust from each source, but this has not been achieved by the qualitative assessment. Page 4 of Mr Starke's memorandum provides context for this question.	PDP disagrees with the scope and necessity of this request. PDP considers this request is a misinterpretation of the SLR Review and would not add useful information for the assessment of dust effects. The SLR Review agrees with the qualitative IAQM dust assessment methodology employed by the AQA and agrees that quantification of the discharges and dispersion modelling would not be appropriate to assess dust effects (page 4 to 5). As noted by the SLR Review, the GPG:Dust specifically recommends against such theoretical quantifications, favouring that time and expense instead be taken to manage and mitigate dust. While a theoretical estimation of dust discharge quantities may be feasible based on published emission factors, open areas, rainfall and vehicle movements, PDP considers such an estimate would have orders of magnitude inaccuracy and not reflect the likely actual discharges given proposed mitigation measures.

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		PDP considers the above theoretical exercise to quantify dust discharges would not usefully add to the assessment of dust effects, which are considered to be adequately assessed by the AQA.
3	No assessment of the potential effects of construction-phase dust appears to have been undertaken. Please provide an assessment of the effects of construction-phase dust, with particular focus of the potential adverse effects that may be experienced at Dwelling 3 (as identified in Report B.33). The assessment should include recommendations as to appropriate monitoring and a Trigger Action Response Plan at or near Dwelling 3.	PDP considers that the AQA already adequately considers the dust discharges, mitigation measures and resulting adverse effects associated with the construction phase. Within the AQA, the construction phase is defined as: "site preparation, earthworks, haul road construction, stockpile establishment, and early-stage mining activities." The AQA's assessment of dust effects specifically considered Dwelling 3 during all phases of the project, including initial construction, and details mitigation measures. Particularly refer to section 10.2 of the AQA which concludes there is a 'Negligible Effect' of dust (during all phases of the project) at Dwelling 3. The AQMP details that a range of dust monitoring and trigger action responses are to be undertaken throughout all stages of the project, including construction. This monitoring includes an E-BAM+ PM_{10} instrumental monitor located at Lake Clearview (to be shifted nearer to the dust sources at Ardgour Road once power is available there).
4	The proposal to cease certain works when adverse dust conditions exist and cannot be managed is proposed to be triggered, in part, by staff observation of dust blowing over the site boundary. Please explain how effective this is expected to be achievable in practice, given the site boundaries are unlikely to be easily visible by onsite workers. In your answer, please consider alternative monitoring methods, including the recommendation of Mr Starke for	PDP considers the range of dust monitoring and contingency measures detailed within the AQMP are sufficient for the effective control of dust effects. The AQMP includes a range of dust monitoring and trigger action responses. That these measures include instrumental dust monitoring at Ardgour Road, with specific trigger alert levels and contingency measures. Overall, the key dust requirement is contained in the proffered conditions of consent (refer to Fast Track Document D.04): *70. There must be no particulate matter or gaseous emissions in any discharge to air that gives rise to objectionable, noxious or dangerous adverse effects (as defined in Section 16.2.9 of the Regional Plan:*

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	the installation of a dust monitoring camera in the service and administration area at Ardgour.	*Air for Otago as at the date of the commencement of this consent) at any location beyond the boundary of the BOGP Consent Area.* This proposed dust limit condition adheres to the recommended wording of the GPG:Dust and is the standard that all dust monitoring is assessed against. PDP does not consider that a dust monitoring camera is necessary, although such a device may be explored in a future iteration of the AQMP if dust discharges and effects eventuate. The proposed reviews of the AQMP allow for this adaptive management where additional monitoring techniques and locations could be added in response to any dust issues identified.
5	Please provide justification for the use of 7.5 m/s windspeeds in the qualitative assessment of dust impacts, when 5.5 m/s is recommended by IAQM (2016) Method or < 5 m/s is discussed in the MfE Good Practice Guide for Assessing and Managing Dust. Your answer should include discussion on mechanically generated dust from vehicle activity (rather than from only wind-blown dust) and should also explain why PDP only consider high-risk winds of greater than 7.5 m/s are capable of affecting Dwelling 3.	PDP considers that the AQA adequately assesses the actual and potential adverse effects of dust, including that generated by vehicle movements. The AQA applies IAQM's Source-Pathway-Receptor framework to assess dust risks, including consideration of local meteorology and receptor distances. IAQM (2016) does not prescribe operational triggers; professional judgement is expected to determine site-specific wind-speed trigger levels. The 5.5 m/s wind-speed figure quoted by SLR Review is only described by the IAQM guidance as 'sometimes used as a general threshold' and states that instead of this general threshold 'it is preferable to use a wind blow initiation wind speed specific to the mineral type.' Section 7.3.4 of the AQA utilises Stoke's Law of particle dynamics to estimate that wind-speeds of 5 m/s may transport dust particles (specific to the density of BOGP mine materials) up to 75 m from source, and higher wind-speeds of 7.5 m/s are required to transport these dust particles up to 150 m. Given that the nearest sensitive receptor to dust sources (Dwelling 3) is located approximately 140 m from the BOGP project boundary (and significantly further from construction or operational phase dust sources), only winds greater than 7.5 m/s may present a plausible transport pathway for this receptor given the site-specific density of dust particles.

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		The GPG:Dust also supports site-specific triggers and limiting or ceasing dusty activities on "particularly windy days". The GPG:Dust recommends a wind-speed warning of 10 m/s (1 minute average, occurring twice in 20 minutes) as a suggested trigger level. Section 9.3.2 and Table 23 of the AQMP detail that a two-level trigger alert for 1-hour average wind-speeds will be implemented at BOGP as a dust mitigation measure: ∴ Tier 1 trigger (alert to staff for enhanced vigilance of dust): 5 m/s, 1-hour average ∴ Tier 2 trigger (alert to staff to observe dust generating activities and mitigation measures. Cease processes if dust witnessed as crossing the BOGP boundary): 7.5 m/s, 1-hour average. Accordingly, PDP consider that the 5 m/s and 7.5 m/s triggers detailed in the AQA and AQMP are appropriate thresholds for pathway control for the dust sources at BOGP, including vehicle movements.
6	The statement that receptors between 250 m and 100 m from a source employing good dust suppression are unlikely to experience a detrimental effect on amenity values is not adequately justified. Please provide further explanation on this point, including by reference to any relevant good practice guide or other supporting document.	As stated in the IAQM and GPG:Dust guidance, amenity dust effects are dominated by coarse-fraction particles which settle rapidly with distance. Section 3 of the IAQM guidance states that the potential for visible deposition and associated amenity impacts reduces sharply beyond the immediate near-field (<100 m). The above site-specific assessment of dust, considering the likely density, identifies that dust is not likely to be transported significant distances before settling out of the air. This is particularly true for the larger particles most responsible for amenity dust effects. While the AQA conservatively references the distances between sensitive receptors and the BOGP project boundaries, it is also notable that the key dust sources within the large site are much further distant from off-site sensitive receptors, typically by more than 1 km also featuring steep ranges.

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		PDP therefore considers that receptors located beyond 100 m of the BOGP site boundaries are unlikely to experience a detrimental amenity effect given the range of dust suppression measures, monitoring and contingency responses detailed by the AQMP.
7	The risk associated with arsenic emissions during the handling and storage of overburden soils with naturally elevated arsenic levels has not been explicitly assessed by PDP, although mitigation measures have been proposed to manage potential adverse effects. Please indicate whether MGL agrees to installation of dust deposition gauges at the Lake Clearview and Ardgour Flats monitoring sites for the purpose of monitoring arsenic deposition rates. In your answer please also discuss the 4 µg/m2/day criterion suggested by Mr Starke.	The potential risks associated with handling Arsenic-elevated soils (As) are assessed in the AQA Table 7, which identifies elevated As concentrations, characterises their dust-generation potential, and specifies As-targeted mitigation measures (segregation, damping, wind-condition controls, stockpile separation). Notably, the proposed As soil stockpile (AQA Figure 7) is located more than 5 km from the sensitive off-site receptors described at AQA section 8.4 of the AQA. PDP considers this assessment may have been overlooked by the SLR Review, and further assessment is not necessary. Further detailed soils testing data has been obtained to illustrate the scale of As soils across the BOGP site. The location of these samples is illustrated at Map C.17. The majority of soil samples did not find As to be elevated above the relevant NES:CS Soil Contaminant Standard (1,485 out of 1,607 samples). No soil samples in the Shepherds Creek area identified elevated As. The 122 soil samples with As concentrations elevated above the NES:CS Soil Contaminant Standard (Industry) were contained within the BOGP site and adjoining Bendigo Scenic Reserve. PDP considers this higher-resolution As soils testing data further supports the conclusions of AQA Table 7, that disturbance and handling of As soils are not likely to pose any off-site effects. The discharges of dust associated with handling of As soils are limited by the dust limit condition (refer Condition 70 at Fast Track Document D.04). The AQMP includes a range of dust mitigation and monitoring measures, including deposition gauges at Lake Clearview and Ardgour Flats. PDP considers that these general dust measures are also sufficient for As soils. PDP notes that the 4 µg/m²/day As deposition rate trigger suggested by the RFI is not a New Zealand standard or guideline. The SLR Review (page 9) also mis-states this as '4 µg/m³', which is an ambient

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		air quality concentration and not a deposition rate. PDP has interrogated the potential origin of a 4 µg/m²/day As deposition rate trigger and found little supporting information within the SLR Review. Regulations for 'industrial installations' published by the German environmental ministry (TALuft, 2002, non-binding English translation: https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Luft/taluft_engl.pdf) may be a source of this suggested trigger, but these have no relevance to the control of human health or environmental risks for an earthworks or mining activity in Otago, NZ. The German 'immission value for pollutant deposition' is stated at 4 ug/m²/day averaged over a one year period for As (i.e. a threshold of 1.46 mg/m²/year). It appears these German regulations do not apply to earthworks and provides for permitting exceedances of this As trigger for large-scale industrial air discharges, further limiting its relevance to BOGP. For an As deposition rate trigger value to be derived for BOGP, background dust deposition monitoring would be required with XRF analysis of the dust to determine As content. PDP considers that this level of analysis is unnecessary for BOGP given the range of measures to mitigate and monitor total dust concentrations and deposition and the large separation distances to sensitive receptors. PDP considers that As soils have been adequately assessed by the AQA and are appropriately controlled by the AQMP.
8	Please provide an assessment prepared by a suitably qualified and experienced air quality specialist of 'upset conditions' in the context of discharges of gaseous contaminants from the gold processing plant. Upset conditions are conditions that deviate from standard or steady-state operating conditions, such as those which occur under fault conditions at the plant or as a	Upset conditions within the gold processing plant are unlikely to occur given the range of continuous monitoring and contingency response systems built into the process: ⁘ Sodium cyanide (NaCN) is used to extract the gold from the ore in the processing plant CIL circuit. Lime is used to maintain the pH of the CIL circuit slurry to alkaline conditions (pH>10.5) to prevent the NaCN forming hydrogen cyanide (HCN) gas. The pH is continuously monitored and alarmed prior to the addition of NaCN, so that HCN gas generation cannot occur. A back-up system can add caustic to maintain the alkaline conditions.

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	result of ineffective application of mitigation measures. Your response should include the nature and magnitude of these potential effects, including any potential impacts on any sensitive receptor.	⁘ pH probes are installed in the CIL tanks to measure the pH in the tanks. The probes are installed as a dual (duty and backup) system with both probes monitoring to the control system. The dual probe system ensures that if a probe fails there is always a backup. Further pH is measured in multiple tanks through the circuit with dual probes used in each. Probe accuracy is checked manually by process operators as part of the standard shift protocol and probes are cleaned and calibrated as part of the regular plant maintenance routine. ⁘ NaCN addition can be stopped immediately in the unlikely event of all other systems failing ⁘ Continuous ambient HCN gas monitoring is present at the entry points and operating floor of the CIL circuit with both an initial alarm if HCN gas is detected and a second alarm level if HCN rises. The second alarm level to evacuate would typically be at 5-10 ppm. ⁘ PDP understands that a similar system exists at the Macraes Gold Processing Facility, with no issues arising. PDP considers that no specific assessment of any hypothetical upset conditions is necessary given the significant range of systems and controls to avoid the instance of such conditions.
9	Please explain why neither the proposed consent conditions nor the Air Quality Management Plan appear to contain any receiving environment monitoring for gaseous contaminants that may be discharged from the processing plant. It is understood that PDP (Report B.33) have assessed the external (to the site) effects of these discharges as being 'negligible'. However, the valley terrain is complex, the PDP assessment does not consider	The processing plant location is detailed at section 5.6 of the AQA. This area is located more than 1.6 km south-east of the nearest off-site sensitive receptor defined at section 8.4 of the AQA (cherry orchard) and more than 2.8 km from Dwelling 3. The discharges and off-site effects of gaseous air discharges are limited by the proposed conditions of consent, in accordance with the recommendations of the Good Practice Guide for Assessing Discharges into Air from Industry (Ministry for the Environment, 2016). Particularly, Condition 70 (Fast Track Document D.04) states that: *There must be no particulate matter or gaseous emissions in any discharge to air that gives rise to objectionable, noxious or dangerous adverse effects (as defined in Section 16.2.9 of the Regional Plan:*

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	upset conditions and is contingent on effective application of the proposed mitigation measures. It is therefore unclear why neither the management plan nor proposed consent conditions require monitoring to confirm the ongoing efficacy of the mitigation measures and to confirm that no offsite effects are occurring.	*Air for Otago as at the date of the commencement of this consent) at any location beyond the boundary of the BOGP Consent Area.* This requirement is also stated as the 'key objective' for the AQMP, which is required to detail mitigation and monitoring strategies for all air contaminants (including gaseous contaminants), including proactive adaptive management. Gaseous emissions from the processing plant are largely limited to diesel combustion exhaust from the regeneration furnace, elution heater and smelting kiln. An estimated 810,000 litres of diesel is predicted to be consumed per year for these stationary heat processes. The diesel exhaust contaminants are discharged from 15 m high stacks at significant distance from the BOGP site boundaries and off-site sensitive receptors. Given the distances involved, these combustion emissions will have negligible impact on off-site ambient air contaminant concentrations. The AQA assesses the discharges of gaseous air contaminant discharges, such as ammonia from the electro-winning cells, as part of the assessment of effects (particularly refer to sections 6.1 and 12.3 of the AQA). As detailed at AQA section 6.1, the emission control measures at the processing plant mean that only minor emissions of these gaseous contaminants are expected. Gaseous discharges of HCN are not expected to occur given the range of measures to prevent HCN gas generation within the CIL circuit. Discharges of ammonia and metals are expected to be low, as assessed by the AQA. Across the significant separation distances to the consent area boundaries and to off-site sensitive receptors, the low levels of contaminants discharged from the processing plant shall reduce to minimal / undetectable levels so that off-site ambient air quality monitoring is not considered to be justified at this point, although the exact monitoring programme shall be refined throughout the project as part of the AQMP's adaptive management review processes.

This memorandum has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Santana Minerals Ltd. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the memorandum. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

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Prepared by

Paul Crimmins

Service Leader – Air Quality

Reviewed and approved by

Andrew Curtis

Technical Director – Air Quality