

HANSON LYSTERFIELD QUARRY – AIR QUALITY IMPACT ASSESSMENT – EXECUTIVE SUMMARY

Introduction

Hanson Construction Materials Pty Ltd (Hanson) engaged Golder Associates Pty Ltd (Golder) in 2018 to undertake an Air Quality Impact Assessment (AQIA) for its quarry operations located at Wellington Road, Lysterfield, Victoria (the site). Hanson is proposing to extend the existing limit of extraction at its quarry operations. The location of the proposed extension is to the west and southwest of the existing limit of extraction and will progress into the hillside. The western and north-western extent of the extended footprint would extend no closer than 400 m to residences, which is consistent with the existing 400 m separation distance provided between the limit of extraction and residences.

The purpose of the AQIA is to assess the potential impacts to local air quality resulting from Hanson's proposed extension to quarrying activities on the site and has been submitted by Hanson in support of its Work Plan Variation application to Earth Resources Regulation (ERR). Hanson requested that Golder prepare this Executive Summary of the AQIA to assist it in communicating project risks with stakeholders through its ongoing engagement on the quarry extension and the associated statutory and planning approval processes.

Regulatory Context

At the time of undertaking the assessment and submitting the Work Plan Variation to Earth Resources Regulation (ERR), all mining and extractive industries had a requirement to comply with the *State Environment Protection Policy (Air Quality Management) December 2001 (SEPP (AQM))*. Pursuant to the SEPP (AQM), the *Protocol for Environmental Management: Mining and Extractive Industries 2007 (PEM)* was developed by the Environment Protection Authority Victoria (EPAV) to set out the requirements for emissions to air from mining and extractive operations.

EPAV Publication 1518, "*Recommended Separation Distances for Industrial Air Emissions*" (EPAV 2013) provided guidance on recommended separation distances between industrial land uses and sensitive land uses, such as residential areas and public open space.

From 1 July 2021 the *Environment Protection Act 2017* took effect. A key element of the new legislative framework is the General Environmental Duty (GED) and the need to apply preventative measures to mitigate the risk of harm to human health and the environment.

Accordingly, EPA is transitioning from a compliance framework that monitors compliance under the SEPP (AQM) to one where preventative measures are applied and ambient air environmental quality objectives are maintained in accordance with the air quality Environment Reference Standards (ERS), which also took effect on 1 July 2021. EPA advises that the air quality objectives in the ERS are generally consistent with the former *State Environment Protection Policy (Ambient Air Quality) February 1999 (SEPP (AAQ))* environmental values, indicators and objectives for ambient air.

Recognising that the compilation of the AQIA and assessment of the Work Plan Variation application by ERR was to be completed through the transition of the *Environment Protection Act 1970* to the *Environment Protection Act 2017*, and the SEPP (AQM) to the ERS, EPAV was engaged with to inform the scope and methodology applied in the AQIA. EPA agreed that the targeted three month monitoring and assessment undertaken as part of the AQIA would be complimented by a further nine months of targeted monitoring and assessment following Hanson receiving statutory approvals for the quarry extension. This would be further complimented by a raft of ongoing preventative monitoring and risk management practices being applied by Hanson at the site, with these including, but not necessarily limited to:

- Vehicle speed restrictions.
- A water tanker being used to spray internal roadways during dry and windy weather conditions.
- Dust suppressants being used on stockpiles to minimise the production of dust.
- Water being sprayed on work faces when risk of dust is elevated.
- Dust producing activities ceasing when high winds cause excessive uncontrolled raised dust.
- Static screening machinery, crushing machinery, and other static dust generating plant being enclosed within sheltered buildings, with the crusher and screening machinery also equipped with onboard sprayer systems to reduce dust generation.
- Long term storage of fill and overburden materials in stockpiles being stabilised (i.e., covered).
- Magnesium chloride-based sealant being applied to internal roads and haul roads in late spring in preparation for summer. This provides a harder-wearing and longer-lasting crust to roadways through the dryer months.
- Street sweeping being undertaken on all internal sealed roads (including main entrance road) twice per week, and street sweeping being undertaken on Wellington Road.
- Rumble-pad and wheel wash facility being used by vehicles exiting the site to remove dirt, mud and gravel from tyres.
- Installation and monitoring of an additional two closed-circuit television (CCTV) cameras along the western boundary of the site, which are integrated with the existing CCTV network and enable monitoring potential dust emissions along the western site boundary.
- Installation and monitoring of fixed real-time PM_{2.5} and/or PM₁₀ monitoring devices. These real-time monitoring stations will be located around the perimeter of the site to enable monitoring of dust concentrations upwind and downwind of on-site dust emissions sources and manage the application of additional dust mitigation controls.

Assessment Outcomes

The purpose of the AQIA is to assess the potential impacts to local air quality resulting from the proposed extension. Given that the proposed extension involves the extraction of rock from a new area in the southwest of the site, by the continuation of current extraction and processing practices, and that it will not extend any closer to sensitive residential receptors than already permitted under the existing Work Authority, Golder assumed that the assessment of current impacts is indicative of potential future air quality impacts as they may relate to the extended quarry footprint.

The environmental setting of the proposed extension is within a natural geological depression, sitting behind a ridgeline between the quarry's limit of extraction and the residential area to the northwest of the site. This ridgeline lowers the potential risk of air quality impacts on sensitive residential areas proximal to the site by providing a physical barrier between the quarry and residential areas. The prevailing wind conditions were also investigated and found that during the hot and dry summer months, when the predominant wind direction is blowing to the north (i.e., from the quarry towards residential areas), the quarrying operations are protected by the ridgeline, and during the remainder of the year when the predominant wind direction is blowing to the south (i.e., from residential areas towards the quarry), the residential area will generally be upwind of the quarry operations.

This AQIA assessed the emission of air quality contaminants, namely nuisance dust; particulate matter (PM₁₀, PM_{2.5}) and Respirable Crystalline Silica (RCS), against the relevant assessment criteria defined by EPA in the *Protocol for Environmental Management: Mining and Extractive Industries 2007* (the PEM). The assessment sought to understand whether the site's environmental setting, and the mitigation measures applied by Hanson at the site are adequate in reducing risks of adverse air quality impacts to the extent practicable. To do this, air quality data obtained through air monitoring programs was assessed, which included a review of Hanson's nuisance dust monitoring gauge results and the three-month deployment of a Partisol dichotomous sampler. The Partisol was programmed to collect periodic discrete air samples of airborne particulate concentrations (PM_{2.5}, PM₁₀ and RCS) over a 24-hour period. This enables correlation between site activities and meteorological conditions to understand emission sources and impacts. Samples were taken on a 1 in 3-day cycle during the monitoring period to take account of variation in site activities during the assessment period. The Partisol was located downwind of the quarry, between the quarry and the residential area to the northwest of the site, providing opportunity to assess emissions from the quarry that may be carried by the prevailing winds in this direction.

The AQIA findings included:

- The Hanson nuisance dust monitoring station adjacent to Montague Court was generally compliant with the PEM criteria, with 3 exceedances recorded across the 26 months of monitoring. The Montague Court station is considered the most relevant monitoring station regarding its proximity to residential sensitive receptors, as it is downwind of the site through the worst-case (hottest, driest, windiest) predominant summer wind conditions. Hanson's nuisance dust monitoring stations allow directional analysis, which can be corroborated with wind direction data to inform the direction from which the identified dust may have been generated. Directional data associated with the observed exceedances at the Montague Court station showed that at those times, the highest contributor of dust in the monitoring gauge was from the north of the monitoring station (i.e., not associated with Hanson as a potential source of dust), possibly corresponding to other activities further north of the quarry.
- The Park and Weather Station nuisance dust monitoring stations, within the Hanson site, have seen an increase in exceedances through time. Noting the location of these stations and the directional data that was assessed, the AQIA indicates these exceedances may correspond with rehabilitation works being completed by Hanson in that area of the site. It is, however, noted that these are temporary works and once the vegetation has been established in these rehabilitated areas, there will be additional mitigation of wind-blown dust emissions.
- Directional data also shows that off-site sources are also contributing to nuisance dust being collected in Hanson's nuisance dust monitoring stations.
- Particulate dust (PM₁₀) monitoring results met the PEM criteria for the three-month AQIA assessment period.

- Particulate dust (PM_{2.5}) monitoring results met the PEM criteria for the three-month AQIA assessment period.
- RCS monitoring results met the PEM criteria for the three-month AQIA assessment period, with no detection of RCS above the laboratory limit of reporting.

The air quality monitoring data indicate that all particulate dust and RCS monitoring parameters were below the criteria set by the PEM throughout the 'worst case' monitoring and assessment period (i.e. summer months with predominant wind blowing towards residences). This provides evidence that the current dust emission mitigation measures applied by Hanson at the site are sufficiently reducing the potential impact of airborne PM₁₀, PM_{2.5} and RCS on the nearest sensitive receptors. Therefore, ongoing application of the existing emission control measures and retention of the 400 m separation distance for the proposed extension should provide sufficient mitigation of the potential impacts of airborne particulate dust (PM₁₀, PM_{2.5}) and RCS on the closest residential areas.

Conclusions and Next Steps

Following the completion of monitoring and assessment of the available datasets, Golder assessed the potential sources of risk as they relate to air quality. The assessment found that the dust emission mitigation measures applied by Hanson at the site are adequate in reducing the potential impacts of adverse air quality impacts.

The application of current mitigation measures by Hanson across the proposed quarry extension footprint are considered adequate in reducing the risk of adverse air quality impacts.

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https://golderassociates.sharepoint.com/sites/28072g/deliverables/061-l_aqia_exec_summary/1544229-061-m-rev0.docx