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JBA
Level 7, 77 Berry Street
North Sydney
NSW 2059

Attention: Tim Ward

Dear Tim

Aurizon Train Support Facility Hexham
Air Quality Impacts of Project Redesign

1 Introduction

Aurizon currently hauls coal from the Hunter Valley to the Port of Newcastle. They have a secured and forecast growth that will increase train sets from 10 trains at the present time to 38 trains by 2019. This will drive demand for additional train service capacity. Substantial amounts of rollingstock have been purchased to cope with the forecasted growth. Correspondingly, the new rollingstock require new provisioning and maintenance facilities and it is of critical importance that new maintenance and provisioning facilities are brought on line in parallel with the delivery of new rollingstock. The proposed Train Support Facility at Hexham will provide Aurizon with the appropriate facilities.

The facility will provide a train support facility where:

- The operation of Aurizon trains can be managed;
- Aurizon trains can undergo statutory and routine maintenance inspections;
- Locomotives and wagons can be attached/detached to/from Aurizon trains;
- Locomotives can be provisioned;
- Locomotives and wagons can be serviced;
- Locomotives and wagons can be parked; and,
- Spare parts can be held for locomotives and wagons.

In September 2012, SLR Consulting Australia Pty Ltd (SLR) was commissioned to prepare an Air Quality Impact Assessment (AQIA) for the proposed Train Support Facility at Hexham. This AQIA formed part of the Environmental Assessment for the proposed Train Support Facility which has recently completed the statutory public exhibition period. Submissions on the Environmental Assessment have been received from a number of agencies as well as some members of the local community. In addition there have been some changes to the design as a result of addressing some of the issues raised in submissions.

A Preferred Project Report is now being prepared, which will set out the responses to the issues raised in submissions, and how those issues have been addressed. Where necessary it will also provide clarification, justification and verification of the Environmental Assessment, and where appropriate update or supplement the various technical assessments to take into account the revisions to the design.

As part of the Preferred Project Report, SLR was requested to provide additional technical advice in relation to air quality issues, specifically:

- Respond to issues raised in submissions by providing additional information, clarification or justification as required.
- Review the proposed project design changes and assess their impact on the findings of the AQIA. The main elements of the proposed design changes are as follows:
  - Instead of the construction of an embankment, the rail formation will be constructed on a lowered vertical alignment, below the level of the existing main line. This is to address the issues raised by agencies in relation to flood impacts. The repercussions of lowering the level of the tracks are that some 125,000 m^3 of soil, which includes up to 60,000 m^3 of potential acid sulphate soil, will need to be excavated and emplaced elsewhere at the site. At this stage the preferred location for emplacing excavated materials will be on top of the existing tailings dams.
  - Minor changes to road and track alignments, including realignment of the truck turning loop outside of the original development area.
  - The Locomotive Maintenance Facility has been relocated so it is combined with a modified Wagon Maintenance Facility.
  - The fuel farm has been relocated.

2 Response to Issues Raised in Submissions

In their submission on the Environmental Assessment, Newcastle Council noted:

> *"The bioremediation of total recoverable hydrocarbons will include the release of emissions and odour. The RAP prepared by GHD Australia does not address these potential emissions and potential emissions have not been included within the air quality assessment. It is requested that any emissions from remediation activities be appropriately assessed and management measures incorporated into construction documents"*

The quantity of materials expected to be encountered during the project that would require treatment is small. In addition, the nature of the contaminants (being generally longer chain hydrocarbons) are unlikely to volatise readily. In particular the RAP (on page 29) states "*Due to the general absence of volatile contaminants (C6-C9, BTEX) found in previous investigations, vapour risk is not considered to be a significant issue for this site*." As a result, the likelihood of significant emissions of odour or volatile organic compounds into the air is low due to the low volatility of the contaminants involved.

Should some material be identified as being suitable for bioremediation, the risk of any off-site air quality or odour impacts would be most appropriately managed as follows:

- Locating the activities as far as practicable from the nearest sensitive receptors;
- Minimising the quantities of materials being treated at any point in time (e.g. surface areas of material being landfarmed) to ensure that emissions do not give rise to off-site impacts; and,
- Regular on-site observations of odour strength immediately downwind of the landfarming area, and at the site boundary. Records of all observations should be logged and held on site including:
  - any mitigation measures implemented should odours be detected at the site boundary;
  - observed meteorological conditions at the time of the inspection;
  - details of the amount and location of material being treated; and,

- any other activities occurring on site with the potential to give rise to odour emissions (e.g. fuel deliveries).

3 Air Quality Implications of Project Changes

3.1 Fugitive Dust Emissions during Construction

Key aspects of the project redesign that have the potential to impact on dust emissions during the construction phase are as follows:

- Excavation of some 125,000 m^3 of soil.
- Crushing and screening during the bulk earthworks phase of the construction works in order to maximise the reuse of excavated material on-site.
- A concrete batching plant in order to minimise the number of agitator trucks required to deliver concrete to the site during the construction works.

It is understood that the crusher/screen would have a throughput of up to around 18 tonnes per hour, but that details such as operating hours and expected duration on site are not known at this stage as it will depend on the amount of material sourced on site that is suitable for use in the construction works. Similarly, details on the size of the concrete batching plant, its operating hours and the length of time the plant is anticipated to be on site are not currently available, although based on SLR's experience it is expected that it will be in the region of 30 – 60 m^3/hr.

As noted in the AQIA, due to the irregularity and short duration of the dust emission sources during the construction phase, the activities are not expected to have long-term health or ecological impacts beyond the proposed site boundaries and a quantitative assessment of these emissions was not performed. Rather, it was recommended that control measures such as watering, minimisation of disturbed areas, chemical stabilisation, wind sheltering and source activity management be put in place during this phase to prevent off-site impacts.

While the project redesign means that there is an increase in the amount of material to be excavated, and the crusher/screen and concrete batching plant have the potential to give rise to emissions of particulates to air, emissions from truck movements associated with delivering concrete to site will be significantly reduced. The potential impacts of fugitive dust emissions during the construction phase are still most appropriately managed through the implementation of best practice controls as detailed in Section 7.1.1 of the AQIA.

The following recommendations regarding the concrete batching plant have been compiled based on guidelines provided in:

- NSW EPA Environmental Best Management Practice Guideline for Concreting Contractors (DEC 2004/36)
- The South Australian EPA *Industry Guideline for Concrete Batching* (EPA 427/09, updated September 2009)
- EPA Victoria *Environmental Guidelines for the Concrete Batching Industry* (Publication 628, June 1998)

Location: Locate the mobile batch plant so that it is no closer than 50 m to an environmentally sensitive location and provide a buffer zone of 100 m from any residential dwelling.

Road and yard dust: Where possible, hard-surface roadways and any other areas where there is a regular movement of vehicles. Plan access and exit routes for heavy transport vehicles to minimise dust impacts on the environment and amenity of the locality. Where it is not practicable to hard-surface a site (e.g. at a short-term location), consider the use of armouring (a thin layer of high quality pavement material is placed on the pavement surface), chemical suppressant products, and/or regular light watering.

Delivery of raw materials: Sand and aggregates should be delivered in a damp condition, using covered trucks.

Housekeeping: Any raw material spills should be removed promptly by dry sweeping. Water should not be used in the process of cleaning up spills except where the area drains to a wastewater collection point where washing down would be preferable to generating dust by sweeping.

Materials storage: Aggregate stored on site in stockpiles should be contained within three-sided storage bunkers with windshields that project 0.5 metres above the bunker wall. Drive-over in-ground aggregate storage bins should be shielded on at least two sides to 0.5 metres high for the full length and width of the bin. Where overhead aggregate storage bins are not totally enclosed, aggregate should not be loaded within 0.5 metres of the top of the walls. The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a leeward position to minimise the effects of the wind. Water sprays or a dust suppression agent should be correctly applied to reduce dust emissions and reduce water usage.

Materials handling: Conveyors should be designed and constructed to prevent fugitive dust emissions. This may include covering the conveyor with a roof, installing side protection barriers and equipping the conveyor with spill trays, which direct material to a collection point. Belt cleaning devices at the conveyor head may also assist to reduce spillage. Mixer loading areas should be roofed and enclosed on either two (drive-through) or three sides. Water sprays and a robust curtain of suitable design, or an effective air extraction and filtration system, should be installed to suppress dust generated during mixer truck loading.

Fabric filters: An approved fabric filter incorporating a fabric-cleaning device should be installed on each cement storage silo. The quality of the filter media and the design characteristics of the filter system must be capable of ensuring that the maximum concentration of solid particles in residual gases does not exceed 100 mg/m^3. Fabric filters should be serviced and maintained in accordance with the manufacturer's recommendations. Adequate access to the filters should be provided to allow for regular inspection and maintenance. A pollution control equipment register (PCER) should be used to record, on a weekly basis, the pressure drop, visual conditions of exhaust material, incidents of filter media failure/replacement.

Overfill alarms: To prevent overfill and subsequent filter damage, storage silos should be fitted with high-level audible and visual alarms in addition to an automatic delivery shut-down. These alarms must have a test circuit and be tested regularly and documented in the PCER. Every alarm apparatus must be maintained in working order at all times.

The key mitigation measures for the crushing and screening plant will be:

- Location of the plant so that it is no closer than 50 m to an environmentally sensitive location and 100 m from any residential dwelling;
- Use of conveyor covers and skirts, enclosure/housing of crusher and screen;
- Good housekeeping, including immediate clean-up of any spills; and,
- Operation of the plant in accordance with the manufacturer's instructions and within the nominated capacity of the plant.

3.2 Diesel Storage and Throughput

The project redesign includes an increase in the volume of diesel stored on-site during operations from 400,000 L to 630,000 L (seven 90,000 L tanks instead of four 100,000 L tanks). The throughput is also projected to increase from 122,200 L/day to 320,000 L/day.

Section 7.2.5 of the AQIA presented the results of an air dispersion modelling study of emissions of volatile organic compounds (VOCs) due to working and breathing losses from fuel (diesel and fuel oil) storage as well as exhaust emissions from trains idling at the facility. This assessment was based on the following estimates of total VOC emissions from the main sources (note that the estimated emissions from fuel oil storage and handling on site during operations were negligible):

- Fuel storage - 0.003 kg/hr based on diesel storage capacity of 400,000 L;
- Fuel refilling - 0.001 kg/hr based on diesel usage of 122,200 L per day; and
- Diesel locomotives (idling) - 0.042 kg/hr per engine (3 assumed).

The assessment of emissions from fuel storage showed that, even if a worst-case assumption is used – that all VOCs emitted from the site are in the form of either benzene, cyclohexane, ethylbenzene or n-hexane – maximum predicted off-site concentrations of these individual hydrocarbon species would be far below relevant guideline levels. As would be expected due to its low guideline level, the most significant VOC was predicted to be benzene, however the maximum benzene concentration predicted at the worst-affected sensitive receptor was only 1% of the guideline.

Given that the major source of VOC emissions from the site was identified to be the idling locomotives (as shown by the estimated emission rates listed above), a 58% increase in the diesel storage volume, the projected increase in the diesel throughput and the change in the tank farm location will not give rise to any significant changes in the off-site hydrocarbon concentrations from those presented in the AQIA. No adverse impacts on off-site air quality would therefore be expected as a result of these design changes.

Yours sincerely

KIRSTEN LAWRENCE
Principal