

APPENDIX K

SLR Consulting Peer Review – Air Quality and Noise

Independent Peer Review – Air Quality Assessment

Independent Peer Review – Noise Assessment



7 August 2017

610.17202-L01-v1.0.docx

Queanbeyan Palerang Regional Council
256 Crawford Street
Queanbeyan
NSW 2620
Australia

Attention: Jacinta Tonner

Dear Jacinta

**Independent Peer Review - Air Quality Assessment
Proposed Resource Recovery Facility
Queanbeyan West**

Thank you for commissioning SLR to perform an Independent Peer Review of the Air Quality Impact Assessment (AQIA) report and associated documents submitted as part of the *Environmental Impact Statement for the Development Application (338-2015) of the proposed Waste or Resource Management Facility* (the EIS) by SUEZ in Queanbeyan, NSW.

The attached document outlines the agreed scope of work, the documentation reviewed and the findings of my assessment of whether the air quality aspects of the proposed development have been adequately addressed.

If you require any further information or clarification, please do not hesitate to contact the undersigned at your convenience.

Yours sincerely

ALI NAGHIZADEH
Associate - Air Quality

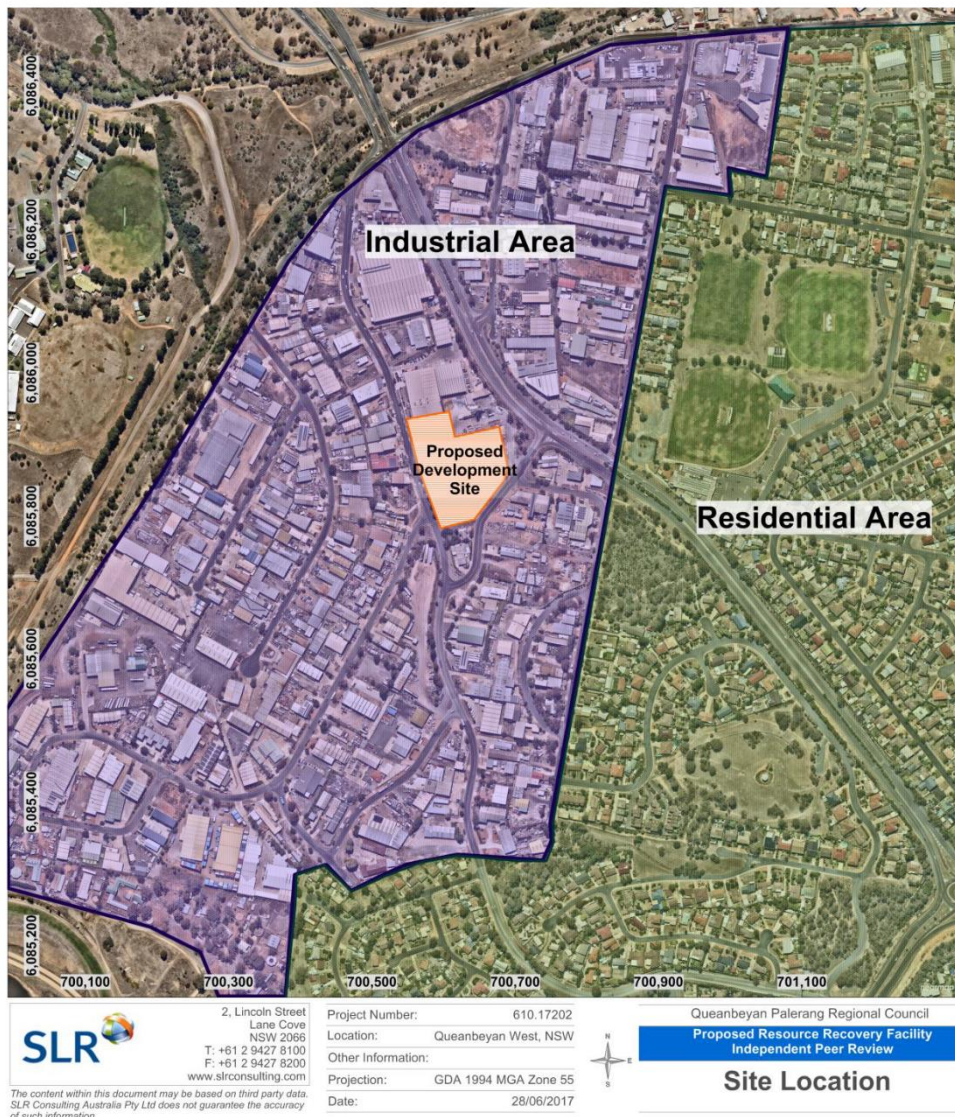
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1 Introduction

SLR Consulting Pty Ltd (SLR) was commissioned by Queanbeyan Palerang Regional Council (the Council) to perform an Independent Peer Review of the Air Quality section of the EIS prepared by Wild Environment dated 4 September 2015 and all other relevant documentation. The EIS was submitted to support Development Application 338-2015 for SUEZ Environment to expand their current operations at their Queanbeyan West site (the Proposed Development Site).

The Proposed Development Site is located within the Queanbeyan West Industrial area, which contains a range of industries, including concrete batching, landscape supplies, timber processing, recycling centre, transport depot, smash repairers and wholesale warehouses. In addition to these industrial activities, there are a number of caretaker dwellings, a café, a school, gym and fitness centres and a mosque located within the industrial area. The location of the Proposed Development Site is shown in Figure 1.

Figure 1 Location of the Proposed Development Site



2 Scope of Work

The objective of this review is to consider the methodology, assumptions and findings of the air quality assessment, including the level of compliance with the NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2016) (hereinafter called the Approved Methods).

The agreed scope of work for the review was as follows:

- Perform a detailed review of the provided documents listed in **Section 3** of this report, identifying to the client as soon as practicable where additional clarification may be required to be obtained from the proponent.
- Assess the methodology and findings of the Air Quality Impact Assessment prepared for the Proposed Development against the NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2016) and any other relevant requirements for the Project.
- Assess the suitability and robustness of the following specific aspects of the assessment:
 - Selection of appropriate air quality criteria
 - Identification of potentially affected receptors
 - Identification of all potential air emissions associated with the Proposed Development
 - Characterisation of the existing air quality in the surrounding area
 - Characterisation of the local climate and meteorology and the effects that these elements will have on background air quality and the impacts of the Proposed Development
 - Appropriateness of the model inputs and emissions inventory
 - Suitability and accuracy of the dispersion modelling methodology
 - Suitability and accuracy of the assessment of potential cumulative impacts with any existing odorous industry
 - Validity and/or anticipated effectiveness of any proposed mitigation measures
- Review submissions received on the EIS, including those received from consent and referral authorities, to identify issues raised relating to air quality issues. Assess the adequacy of the responses given by the Proponent and their consultants to the issues raised in the submissions.
- Based on the findings of the review outlined above, prepare an Air Quality Peer Review Report outlining the following:
 - Any identified limitations, errors or inconsistencies in the air quality assessment and supporting information;
 - The materiality/risk of each identified issue identified;
 - The practicality and anticipated effectiveness of mitigation measures proposed to reduce impacts identified; and
 - Recommendation(s) for the determination of the Proposal (e.g. conditional approval or refusal).

3 Documents Reviewed

The documentation regarding the Queanbeyan Development reviewed by SLR as part of this review is as follows:

- *Environmental Impact Statement for Proposed Changes to Queanbeyan Resource Recovery and Waste Transfer Facility: Construction of additional building and acceptance of additional waste types and volume*, prepared by Wild Environment for SUEZ Environnement, dated 4 September 2015.

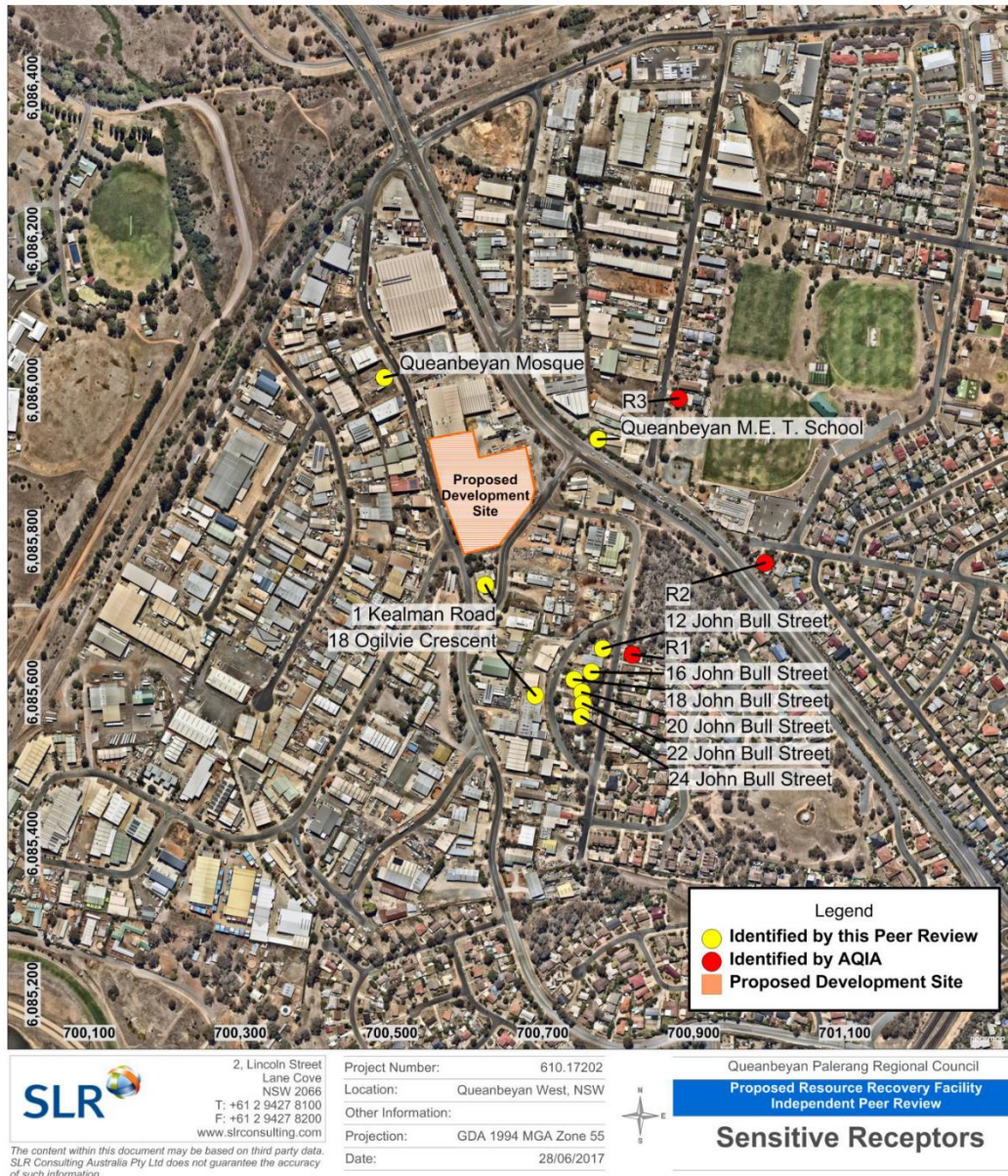
- *Air Quality and Greenhouse Gas Assessment - Proposed Resource Recovery Facility, Queanbeyan West*, prepared by Todoroski Air Sciences for Wild Environment, dated 13 February 2015 (hereafter called the AQIA).
- *DRAFT Addendum Report to the Air Quality and Greenhouse Gas Assessment for the Proposed Queanbeyan Resource Recovery Facility, Queanbeyan West*, prepared by Todoroski Air Sciences for Wild Environment, dated 15 March 2016 (hereafter the Draft Addendum Report).
- *Summary and Consideration of Submissions Received Pursuant to Section 97 of the Environmental Planning and Assessment Act 1979: DA 338-2015*, prepared by Queanbeyan Palerang Regional Council.
- *Additional Information Required before Determining Application*, Issued to Wild Environment by Queanbeyan Palerang Regional Council, dated 5 April 2016.
- *Queanbeyan Resource Recovery Facility Environmental Management Plan*, prepared by SUEZ Environnement, dated April 2016.
- *Queanbeyan Resource Recovery Facility: DA 2015/338 Additional Information Submission*, prepared by SUEZ Environnement, dated 28 October 2016.

4 Site Visit

In addition to a desktop review of the documents listed above, Ali Naghizadeh of SLR also visited the Proposed Development Site on 24 May 2017. This included an inspection of publicly accessible areas around the Proposed Development Site, as well as an inspection (in vehicle and on foot) of the surrounding residential and industrial areas. No significant odours were detected in the area surrounding the Proposed Development Site.

During the site visit, additional sensitive receptors located closer to the Proposed Development Site than those included in the AQIA were identified. This included a mosque, a school and several caretaker dwellings. **Figure 2** illustrates the location of these sensitive receptors in relation to the sensitive receptors identified by the AQIA and the Proposed Development Site.

Figure 2 Locations of Identified Sensitive Receptors



5 Review

The summary table in Attachment A of this report outlines the findings of the peer review. The observations have been categorised as:

Significance	Description
Comment only	Observation only
Low	Issues identified are not likely to change the conclusions of the report
Medium	Issues identified may have the potential to change the conclusions of the report
High	Issues identified have the potential to change the conclusions of the report

The review highlighted a number of limitations in the AQIA and supporting documentation for the Proposed Development. The key issues identified to be of high/medium significance are as follows:

- According to the Approved Methods a sensitive receptor is "A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area". Several sensitive receptors including a number of caretaker dwellings (closest is less than 40 metres (m) from the site), a mosque and a school are closer to the Proposed Development Site than the sensitive receptors identified by the AQIA. Air pollutant/odour concentrations have not been assessed for these sensitive receptors. It is noted that according to the EPA's General Terms of Approval, residents within an industrial zone are treated as industrial receptors for the purposes of noise assessments, but not for air quality assessments.
- Odour emission rates adopted by the AQIA are based on measurements carried out at a landfill. These emission rates are significantly less than publicly-available measurements carried out at waste transfer facilities in Australia. The use of the landfill odour emission rates is estimated to result in an under-prediction of ground level odour impacts at sensitive receptors by a factor of 3.7 to 18.2. This means that ground level odour concentrations at the sensitive receptors identified by the AQIA could potentially be in exceedance of the adopted criterion of 2 odour units (ou) (anywhere between 2.2 ou to 10.9 ou).
- The Approved Methods requires predicted emission concentrations to be combined with existing background levels before comparison with the relevant impact assessment criteria. While potential background levels for PM₁₀ and PM_{2.5} concentrations have been established in the AQIA, other potential sources of odour emissions have not been considered. The AQIA only presents predicted incremental concentrations and does not take into account any background PM₁₀ and PM_{2.5} or odour levels. Given the industrial zoning of the area surrounding the site and existing activities including the a concrete plant immediately to the north of the site, a landscape supplier approximately 100 m south east of the site and a recycling centre 500 m north east of the site, assuming zero background PM₁₀ and PM_{2.5} and odour concentrations is not justified.
- While enclosing of the waste transfer building could potentially be an efficient measure for reducing fugitive emissions from site, the building would need to be equipped with a suitably designed air extraction system to ensure excessive build-up of odour does not occur inside the building. SLR understands that the current plan is to commission the building with no mechanical ventilation system. The provided documents do not specify what type of natural ventilation (if any) will be used. It is noted that the Applicant will be incorporating the capability for future upgrading of ventilation and odour treatment into the design of the building, but until that time, enclosing the building with no mechanical ventilation may potentially increase odour impacts at nearby receptors when doors or vent/louvres are opened, and may also result in air quality issues for workers inside the building.
- From the information presented in the Addendum Report, it is unclear how emissions from the enclosed building with no ventilation have been modelled. The addendum report also fails to specify critical modelling parameters, including ventilation airflow rates, the emission point location(s) and dimension(s), and how building downwash effects have been accounted for.

- Dust emissions from shredding activities on site are identified in the site's Environmental Management Plan as a potential source of excessive dust, but has not been identified by the AQIA as a dust source. Moreover, there are discrepancies in the number of truck movements specified in the AQIA and the EIS document.
- The latest version of the Environmental Management Plan provided to the Council does not include any information on ventilation or odour extraction and treatment, nor does it define triggers or include details on odour and air quality monitoring methodology.

The remaining comments provided in the attached table have been identified as having a low potential to impact on the findings of the assessment, or have been provided for information purposes only.

It is not recommended that approval be granted for the proposed development until the above issues are satisfactorily resolved.

ID	Reference	Comment	Significance
Air Quality and Greenhouse Gas Assessment, Proposed Resource Recovery Facility, Queanbeyan West (February 2015)			
1	Section 2.1, Page 1	Identification of Sensitive Receptors Residences located to the east of the project site were identified by the AQIA as the nearest sensitive receptors. Sensitive receptors closer to the project site were identified during the SLR site visit. It is noted that these receptors are located in an area zoned for industrial activity (See Figure 1). However, the Council has confirmed that all identified sensitive receptors are approved premises and therefore fall within the Approved Methods definition of sensitive receptors. The Approved Methods defines a sensitive receptor as "A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area". The identified residences confirmed by the Council as having approval are illustrated in Figure 2 and include the following: • School: 67 Lorn Rd, Crestwood NSW 2620 • Mosque: 185 Gilmore Rd, Queanbeyan West NSW 2620 • Caretaker's dwelling : 12 John Bull Street, Queanbeyan West NSW 2620 • Caretaker's dwelling : 16 John Bull Street, Queanbeyan West NSW 2620 • Caretaker's dwelling : 18 John Bull Street, Queanbeyan West NSW 2620 • Caretaker's dwelling : 20 John Bull Street, Queanbeyan West NSW 2620 • Caretaker's dwelling : 22 John Bull Street, Queanbeyan West NSW 2620 • Caretaker's dwelling : 24 John Bull Street, Queanbeyan West NSW 2620 • Caretaker's dwelling : 18 Ogilvie Crescent, Queanbeyan West NSW 2620 • Caretaker's dwelling : 1 Kealman Road, Queanbeyan West NSW 2620 The approved residences, mosque and school located in the industrial zone should be considered as sensitive receptors.	High
2	Sections 3.2 and 3.3, page 5-7	Selection of Air Quality Criteria Air quality criteria are presented in the AQIA for TSP, PM₁₀, PM_{2.5}, deposited dust and odour. The air quality criteria for annual average PM₁₀ has been recently been updated and the advisory reporting standards for PM_{2.5} are now standards according to the latest version of the Approved Methods document (2016). The air quality criteria for the remaining pollutants (i.e. 24-hour average PM₁₀, TSP, dust deposition and odour) remain current and are appropriate for assessing impacts of these pollutants at sensitive receptors. It is noted that the EPA references the previous version of the Approved Methods document (dated August 2005) when assessing air quality impact assessments submitted as part of any planning application prior to 20 January 2017.	Comment only
3	Section 3.3, page 7	Peak-to-mean Factors The AQIA discusses the use of peak-to-mean factors in order to account for time averaging limitations of the CALPUFF model. It refers to peak-to-mean factors developed by Katestone Scientific for NSW EPA and lists these factors in Appendix A of the	Comment only

ID	Reference	Comment	Significance
4	Section 4.2, pages 9/10	AQIA, however, no information is provided on the peak-to-mean factors adopted for the odour source(s) modelled as part of this AQIA. Background Air Quality Ambient PM₁₀ and PM_{2.5} monitoring data recorded at ACT Government air quality monitoring sites Monash and Civic were used to characterise local air quality in the area surrounding the project site. These sites are considered suitable for characterising background air quality. However, the data presented in the report does not include recorded background concentrations for annual average PM₁₀. No details regarding the potential background odour conditions in the area, or sources/facilities which could potentially contribute to a cumulative impact has been presented in the Report. The NSW EPA "Technical Framework - Assessment and management of odour from stationary sources in NSW" notes that several activities with similar odour character will result in cumulative odour impact.	Low
5	Section 5, page 11	Construction Phase Air Quality Impacts It is noted in the AQIA that dust generated from the construction phase is unlikely to be significant and that due to the limited time period, no significant or prolonged effect at any receiver is predicted. Emissions identified are particulate emissions from material handling, vehicle movements, windblown dust from exposed areas and emissions generated from the exhaust of construction vehicles and plant. The AQIA also lists potential construction dust mitigation options. Given the industrial nature of the area surrounding the site, construction phase air quality impacts are expected to be able to managed to acceptable levels if appropriate dust mitigation measures are implemented.	Comment only
6	Sections 6.1 and 6.2, pages 12/13	Dispersion Modelling Approach The AQIA has utilised the TAPM/CALMET/CALPUFF modelling suite, which are regulatory approved models for use in air dispersion modelling studies and are widely used throughout Australia in air quality impact assessments. Given the relatively varied terrain in the area surrounding the Proposed Development Site (i.e. hilly to the south and east of the site and relatively flat to the west and north) that would affect wind patterns, TAPM/CALMET are appropriate models to take into account the effect of topography on the local meteorology. When configured correctly, these models are capable of dealing with the complex wind flows and air dispersion conditions. If not configured correctly, minor errors in model setup have the potential to significantly affect the results. It is noted that some of the main settings of the models have been provided in the AQIA. Whilst the settings provided appear to be appropriate, the model has numerous other settings that may affect the results, but cannot be verified without access to the model input file(s). Therefore, conclusively confirming that there are no potential issues in TAPM/CALMET/CALPUFF parameters is not possible.	Comment only

ID	Reference	Comment	Significance
7	Section 6.2, page 13	Meteorological Data Selected for Modelling The AQIA states that "It was determined that the 2012 calendar year is representative of the area based on a long-term meteorological analysis". However, sufficient justification to confirm that the selected modelling year is representative of typical conditions has not been provided.	Comment only
8	Section 6.3, page 16	Dust Emission Estimation The main dust sources identified in the AQIA are: • Hauling of waste/materials to site • Unloading of wastes/materials inside the building • Sorting and separating of wastes • Loading to trucks • Hauling material off-site Dust emissions from shredding activities on site, which have been outlined in the site's Environmental Management Plan as a potential source of excessive dust, are not identified by the AQIA as a dust source.	Medium
9	Section 6.3, page 16	TSP Emission Estimation There is a discrepancy between the number of daily truck movements used in the dust emission calculations and the number reported in the EIS document (50 and 60 respectively). The additional 10 truck movements per day will result in a 20% increase in emissions estimated from haulage of materials to site. Given the low overall dust emissions generated from the site and the conservative assumptions made for estimating dust emissions this is unlikely to have a significant impact on the predicted dust concentrations at nearby receptors.	Low
10	Section 6.3, page 16	PM₁₀ and PM_{2.5} Emission Estimation From the information provided in the report it appears that only TSP emissions have been quantified and source specific PM₁₀ and PM_{2.5} emissions have not been calculated. While not explicitly stated, it is assumed that PM₁₀ and PM_{2.5} emissions have been estimated by applying ratios to the calculated TSP emissions. The ratios used to calculate the estimated PM₁₀ and PM_{2.5} emissions from each activity have not been identified in the AQIA and therefore, confirming the suitability of these ratios cannot be verified. Considering the US EPA AP42 Emission Factors referenced within the AQIA also present emission factors for the estimation of PM₁₀ and PM_{2.5}, the use of ratios is considered inappropriate and has the potential to significantly underestimate PM₁₀ and PM_{2.5} emissions from the Proposed Development Site.	Medium

ID	Reference	Comment	Significance
11	Section 6.4, pages 16/17	Odour Emission Estimation The main odour sources identified in the AQIA are: • Putrescible material on the waste floor; and • Parked garbage trucks The AQIA uses a specific odour emission rate of 3.65 OU.m³/m²/s based on measurements conducted at a landfill operation. Given the continuous disturbing of putrescible waste material at waste transfer stations, the use of odour measurements from landfills, where putrescible waste is generally not disturbed and is often blended with non-putrescible waste like Virgin Excavated Natural Material (VENM), is not suitable. The odour emission rate used in the AQIA is significantly lower than that measured from other waste transfer stations in Australia. The report provides no additional justification for the applicability of the landfill emission rate for the proposed waste transfer facility. Two Australian studies that include measured odour emission rates from waste transfer stations were reviewed for the purpose of this peer review. Both studies presented emission rates which were significantly higher than those used in the AQIA. The reviewed studies were: • Clyde Transfer Terminal - The Odour Unit Pty Ltd (August 2008). Four samples were taken from within the extraction stack for the building, in which 250 tonnes of waste was present at the time of monitoring. The average odour concentration measured during this sampling was 320 OU₁ with a mean stack gas flow rate of 88.7 m³/s. Based on this data, a per tonne of waste emission factor of 113.5 OU.m³/t/s can be calculated. The use of this emission factor would result in odour emissions that are significantly (5.9 times) higher than those calculated in the AQIA using the landfill emission rate. • SITA Rockdale Waste and Recycling Centre – SLR Consulting (2014). Odours from this transfer station (similar in area to the Proposed Development Site, approximately 1,800 m² in area) are emitted through 18 “whirlybird” roof vents. Four samples were collected from two roof locations. The measured odour concentrations ranged from 956 OU to 4,710 OU. The SITA Rockdale study assumed a constant flow rate of 1.41 m³/s for each whirlybird. Based on this data and making a highly conservative assumption that the whole area of the transfer station is covered in waste, an emission factor of 13.5 OU.m³/m²/s to 66.5 OU.m³/m²/scan be calculated. The use of these emission factors would result in odour emissions that are significantly (3.7 to 18.2 times) higher than those calculated in the AQIA using the landfill emission rates. In addition to the above studies, an air quality impact assessment recently prepared by SLR for a waste transfer facility in western Sydney adopted an odour emission factor of 503.1 OU.m³/t/s in order to provide a conservative estimation of potential odour emissions from the site. The use of this emission factor would result in odour emissions that are significantly (26.3 times) higher than those calculated in the AQIA. It is strongly recommended that the modelling assessment considers alternative odour emission rates derived from actual measurements of odour concentrations at waste transfer stations.	High

ID	Reference	Comment	Significance
12	Section 6.4, page 17	Odour Modelling Assumptions The AQIA states that <i>"The odour emissions modelling results are considered conservative (overestimate likely effects) as it was assumed that odours would be emitted continuously for every hour of the year, and the modelling did not take into account any of the proposed odour control measures that would be applied"</i> and that <i>"a key conservative assumption in the modelling was to ignore the effect of the enclosed building that would prevent the release of a large fraction of the odour from the waste floor."</i> While enclosing of the waste transfer building could significantly reduce fugitive emissions from site. This will only work if the building is equipped with a suitably designed air extraction system. It is noted that the Applicant will be incorporating the capability for future upgrading of ventilation and odour treatment into the design of the building, but until that time, enclosing of a building with no mechanical ventilation will not necessarily reduce ground level odour concentrations at nearby sensitive receptors. In reality, due to the build-up of odour in the enclosed building and subsequent sudden release once the doors have opened for truck entry/exit, more significant odour impacts may be experienced at nearby receptors.	High
13	Section 7, page 17	Mitigation Measures The AQIA does not justify the use of the listed mitigation measures. Considering the building has been designed with no mechanical ventilation, fully enclosing the building and closing all doors immediately after trucks enter/exit the building is not practical as it could potentially lead to dangerously high contaminant build-up in the building. Moreover, the effectiveness of sprays in the removal of odour has not been commented on.	Medium
14	Section 8.1, page 18	Assessment of Particulate Matter Impacts The AQIA states that the potential for cumulative air quality impacts associated with the Project is considered to be negligible and that it is unlikely that the Project would result in any discernible change to existing background levels at the nearest residential receptors. Although the predicted incremental particulate matter concentrations are low, the AQIA has not adopted background particulate concentrations and potential cumulative emissions at the identified receptors have not been quantified. The Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW DEC, 2005) (Approved Methods) which has been referenced in the AQIA, specifies that predicted emission concentrations must be combined with existing background levels before comparison with the relevant impact assessment criteria. Moreover, although air quality impact assessment criteria have been adopted for TSP and Deposited dust (Section 3.2.1 of AQIA), no modelling has been carried out for these parameters.	High
Draft Addendum Report to the Air Quality and Greenhouse Gas Assessment for the Proposed Queanbeyan Resource Recovery Facility (March 2016)			
15	Page 1	Odour Emission Estimation The Draft Addendum Report References the AQIA and mentions that the dispersion modelling was based on conservative assumptions of the potential odour source and applicable odour emission rate and that these assumptions are likely to generate an over prediction of the actual impact in reality. As outlined above (Observation 10), the use of landfill odour emission rates to estimate odour emissions from the waste	High

ID	Reference	Comment	Significance
		transfer station, over publicly available data from actual measurements carried out at waste transfer stations has not been justified. Based on a review of publicly available data, the use of the selected landfill odour emission rate is expected to significantly under predict the worst case odour impacts from the Proposed Development Site. It is expected that the use of odour emission rates that are more representative of actual waste transfer station emissions will result in odour impacts outside the industrial area.	
16	Pages 1, 2	Modelling Assumptions In response to the Council's 'Request for Information' letters and submissions received by the Council, further odour modelling was carried out by Todoroski Air Sciences and submitted as a draft addendum to the AQIA. The Draft Addendum Report compares the potential odour impacts of the no-mitigation scenario presented in the AQIA (AQIA Scenario), a scenario which takes into account mitigation measures proposed in the EIS (Scenario 1) and a scenario that includes an air extraction and filtration system (Scenario 2). The Draft Addendum Report refers to the original AQIA for modelling assumptions and parameters. However, the original AQIA does not cover all modelling parameters required for the addendum report scenarios (Scenario 1 and Scenario 2).	Comment only
17	Page 3	Identification of Sensitive Receptors See Observation 1, above. Odour impact has not been predicted for sensitive receptors closer to the site.	Medium
18	Page 2,3	Dispersion modelling results The Draft Addendum Report concludes that predicted odour concentrations from Scenario 1 (no extraction/mechanical ventilation, enclosed building and odour sprays) are lower than the original Scenario presented in the AQIA. While this cannot be verified without access to model input files and clarification on assumptions made for Scenario 1 (See Observation 23), enclosing of the building without effective ventilation/control could lead to situations where no significant odour is emitted from the building for the period that building doors are shut, but upon opening the doors for delivery truck entry/exit, a large amount of odour is released which could potentially lead to higher impacts at nearby receptors. It would also not be practical for indoor air quality and temperature control to enclose the building with no mechanical ventilation.	Medium
The Councils Request for Information (April 2016)			
19	-	The request for further information (RFI) issued by the council dated 5 April 2016, requests for an Environmental Management Plan (EMP) to be prepared which: "...specifies how the effectiveness of environmental management measures will be controlled and monitored. It should include the control systems, methodology, frequency and duration of monitoring activities. It should also include trigger values or conditions under which corrective actions are taken. The plan should also specify if, and when, follow up action is required and how monitoring records will be maintained." The RFI also requests for the plan to include details on ventilation as well as odour extraction and treatment. The latest version of the EMP provided to the Council does not include any information on ventilation or odour extraction and treatment nor does it define triggers for corrective actions or include details on odour and air quality monitoring methodology.	Medium

ID	Reference	Comment	Significance
Environmental Management Plan (EMP) (April 2016)			
20	Section 4.2.1, Page 14	The EMP states that "given the waste transfer operations are contained within the enclosed building odour is not anticipated." Considering the lack of mechanical ventilation which could help dilute and disperse odour emissions and the limited effectiveness of odour/dust suppression sprays in controlling odour emissions, odours from putrescible waste will build-up inside the enclosed building and high concentrations will potentially be emitted once the doors are eventually opened. Therefore, enclosing the building without effective ventilation/control is not a suitable mitigation measure and could lead to potentially higher impacts at nearby receptors. It is noted that the Applicant will be incorporating the capability for future upgrading of ventilation and odour treatment into the design of the building, but that these features are not proposed to be installed upon commissioning.	High
21	Section 4.2.3, Page 14	From the data provided in the EMP it is not clear how continuous checking for excessive dust/odour levels will be carried out or how the Centre Manager would be checking that the dust/odour suppression system is providing adequate dust/odour control.	Comment only
22		It is recommended that the EMP considers incidents that might adversely affect the control of odour and dust at the plant and puts in place measures to reduce the likelihood of an incident occurring, minimise any impacts if an incident were to occur, and recover control of the process as quickly as possible. Potential incidents that could lead to significant odour and dust release from the site include: • Breakdown of waste handling equipment; • Breakdown of roller shutter doors; • Breakdown of ventilation fans (if installed); • Breakdown of suppression spray system; • Abnormal traffic conditions that may lead to waste remaining on site for more than 24 hours; • Power outages; and • Abnormal meteorological conditions.	Comment only
Submissions from Community Consultation for DA 338-2015 (October 2016)			
23	Pages 19, 34 and 64	The Applicant states that: "Odorous materials will only be kept on site for a maximum 24hr period. This will ensure any materials being transported do not have enough time to emit offensive odours. Waste will also be transported in dedicated waste trucks, further mitigating the release of offensive odours." While the measure outlined above will help reduce odour emissions from trucks carrying waste, it is recommended that contingency measures are adopted by the Applicant and incorporated into the EMP for abnormal operating conditions where waste may not be removed from site on time or if dedicated waste trucks are not available.	Medium
24	Pages 19 and 64	The Applicant states that: "Odour has been considered as part of the EIS. Since public exhibition, and following public concern, SUEZ are proposing to incorporate capacity for future ventilation/odour treatment if required. Predicted odour is well	Medium

ID	Reference	Comment	Significance
		<i>within odour criteria and odour impacts are not expected."</i>	
		Refer to Observations 15-18 which outline gaps in the Draft Addendum Report.	
25	Page 35	The Applicant states that: "Odour has been considered as part of the EIS. Predicted odour is well within odour criteria and odour impacts are not expected." It is recommended that the Applicant revises this statement until Observations 1, 11, 12, 15 and 16 of this report have been addressed.	High
26	Page 37	The Applicant states that: "The air quality and odour assessment has been completed in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (Approved Methods) (NSW DEC, 2005). This does not consider ambient air quality, and assumes that good air quality is seen at the site. Thus, only the expected PM ₁₀ , PM _{2.5} and odour is considered from the proposal. The output of PM ₁₀ , PM _{2.5} and odour from the proposal meets the EPA criteria and is not predicted to impact on air quality." As noted in Observation 14 , in order for the AQIA to be in accordance with the Approved Methods, predicted emission concentrations must be combined with existing background levels before comparison with the relevant impact assessment criteria. While potential background levels for PM ₁₀ and PM _{2.5} concentrations have been established in the report, they have not been combined with the predicted concentrations. If combined, additional exceedances of the impact assessment criteria may occur. Given the industrial zoning of the area surrounding the site and presence of existing activities including a concrete plant immediately to the north of the site as well as existing SUEZ activities, assuming zero background PM ₁₀ and PM _{2.5} concentrations at the site is not justified.	High
27	Page 37	The Applicant states that: "The modelled scenarios used the nearest residential receptors to assess air quality impacts. These receptors are located closer to the site than the two local schools. As the predicted PM ₁₀ , PM _{2.5} and odour outputs meet the relevant criteria at areas closer to the site than the schools, it is expected to meet the criteria at the schools." Refer to Observation 1 and Figure 2 . MET school, a number of caretaker dwellings and a mosque are closer to the Proposed Development Site than the sensitive receptors identified by the AQIA.	High
28	Page 68	The Applicant states that: "Strict odour controls will be used on site at all times to ensure offsite odours do not occur." The efficiency and suitability of the adopted odour controls has not been established by the Applicant.	Comment only
29	Page 79	The Applicant states that: "The Air Quality Assessment considered PM ₁₀ and PM _{2.5} which are the assessable components of dust. The Assessment concluded that the proposal meets the relevant criteria relating to dust and would not have an impact on surrounding environment." Refer to Observation 8, 9, 10 and 14 .	High



7 August 2017

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Queanbeyan Palerang Regional Council
256 Crawford Street
QUEANBEYAN NSW 2620

Attention: Jacinta Tonner

Dear Jacinta

**Independent Peer Review - Noise Assessment
Proposed Resource Recovery Facility
Queanbeyan West**

Thank you for commissioning SLR Consulting Australia Pty Ltd (SLR) to perform an Independent Peer Review of the Noise Impact Assessment (NIA) report and associated documents submitted as part of the *Environmental Impact Statement for the Development Application (338-2015) of the proposed Waste or Resource Management Facility* (the EIS) by SUEZ in Queanbeyan, NSW.

The attached document outlines the agreed scope of work, the documentation reviewed and the findings of our assessment of whether the noise aspects of the proposed development have been adequately addressed.

If you require any further information or clarification, please do not hesitate to contact the undersigned at your convenience.

Yours sincerely

JOHN SLEEMAN
Principal - Noise and Vibration

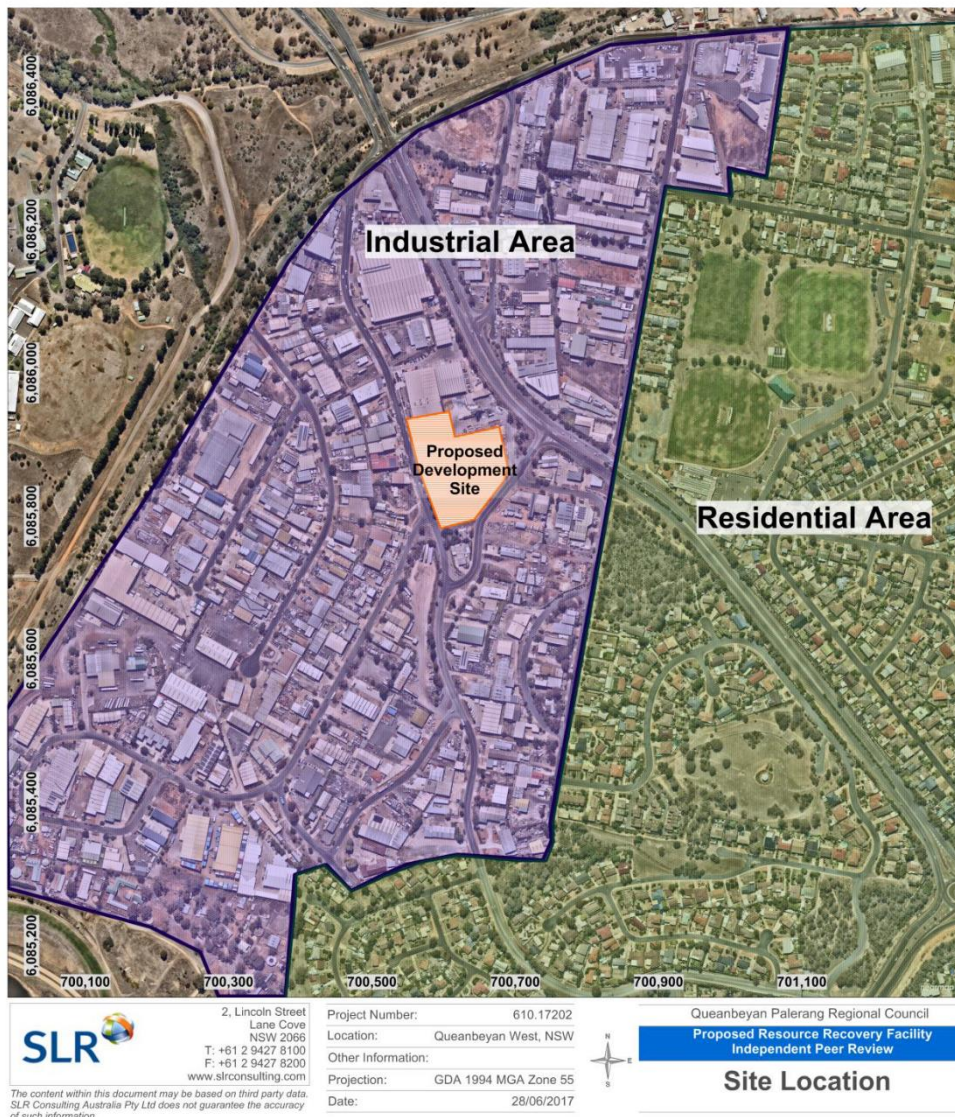
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1 Introduction

SLR was commissioned by Queanbeyan Palerang Regional Council (the Council) to perform an Independent Peer Review of the Noise section of the EIS prepared by Wilkinson Murray Pty Ltd (WM) dated November 2015 and all other relevant documentation. The EIS was submitted to support Development Application 338-2015 for SUEZ Environment to expand their current operations at their Queanbeyan West site (the Proposed Development Site).

The Proposed Development Site is located within the Queanbeyan West Industrial Area, which contains a range of industries, including concrete batching, landscape supplies, timber processing, a recycling centre, transport depot, smash repairers and wholesale warehouses. In addition to these industrial activities, there are a number of caretaker dwellings, a café, a school, gym and fitness centres and a mosque all located within the industrial area. The location of the Proposed Development Site and the adjoining residential area to the east is shown in Figure 1.

Figure 1 Location of the Proposed Development Site



2 Scope of Work

The objective of this review is to consider the methodology, assumptions and findings of the noise assessment, including the level of compliance with the NSW EPA's *Industrial Noise Policy* (INP), and their *Interim Construction Noise Guideline* (ICNG).

The agreed scope of work for the review was as follows:

- Perform a detailed review of the provided documents listed in **Section 3** of this report, identifying to the client as soon as practicable where additional clarification may be required to be obtained from the proponent.
- Assess the methodology and findings of the Noise Impact Assessment prepared for the Proposed Development against the NSW EPA's INP, ICNG the Road Noise Policy (RNP) and any other relevant requirements for the Project.
- Assess the suitability and robustness of the following specific aspects of the assessment:
 - Selection of appropriate noise and vibration criteria
 - Identification of potentially affected receptors
 - Identification of all potential noise and vibration emissions associated with the Proposed Development
 - Characterisation of the existing noise and vibration in the surrounding area
 - Characterisation of the local meteorology and the effects that these elements will have on background noise and the noise impacts of the Proposed Development
 - Appropriateness of the model inputs and sound power levels (SWLs)
 - Suitability and accuracy of the noise modelling methodology and the appropriateness of the data used in the noise and vibration modelling
 - Suitability and accuracy of the noise and vibration modelling methodology
 - Suitability and accuracy of the assessment of potential cumulative impacts with any existing nearby industry
 - Validity and/or anticipated effectiveness of any proposed noise mitigation measures
- Review submissions received on the EIS, including those received from consent and referral authorities, to identify issues raised relating to noise issues. Assess the adequacy of the responses given by the Proponent and their consultants to the issues raised in the submissions.
- Based on the findings of the review outlined above, prepare an Noise Peer Review Report outlining the following:
 - Any identified limitations, errors or inconsistencies in the noise assessment and supporting information;
 - The materiality/risk of each identified issue identified;
 - The practicality and anticipated effectiveness of mitigation measures proposed to reduce impacts identified; and
 - Recommendation(s) for the determination of the Proposal (e.g. conditional approval or refusal).

3 Documents Reviewed

The documentation regarding the Queanbeyan Development reviewed by SLR as part of this review is as follows:

- *Environmental Impact Statement for Proposed Changes to Queanbeyan Resource Recovery and Waste Transfer Facility: Construction of additional building and acceptance of additional waste types and volume*, prepared by Wild Environment for SUEZ Environment, dated 4 September 2017.

- *Noise Impact Assessment - Queanbeyan Transfer Station Report No 13246 Version A*, prepared by Wilkinson Murray Pty Limited, dated February 2015.
- *Noise Impact Assessment - Queanbeyan Transfer Station Report No 13246 Version B*, prepared by Wilkinson Murray Pty Limited, dated November 2015 (hereafter called the NIA).
- *Summary and Consideration of Submissions Received Pursuant to Section 97 of the Environmental Planning and Assessment Act 1979: DA 338-2015*, prepared by Queanbeyan Palerang Regional Council.
- *Additional Information Required before Determining Application*, Issued to Wild Environment by Queanbeyan Palerang Regional Council, dated 5 April 2016.
- *Queanbeyan Resource Recovery Facility Environmental Management Plan*, prepared by SUEZ Environment, dated April 2016.
- *Queanbeyan Resource Recovery Facility: DA 2015/338 Additional Information Submission*, prepared by SUEZ Environment, dated 28 October 2016.

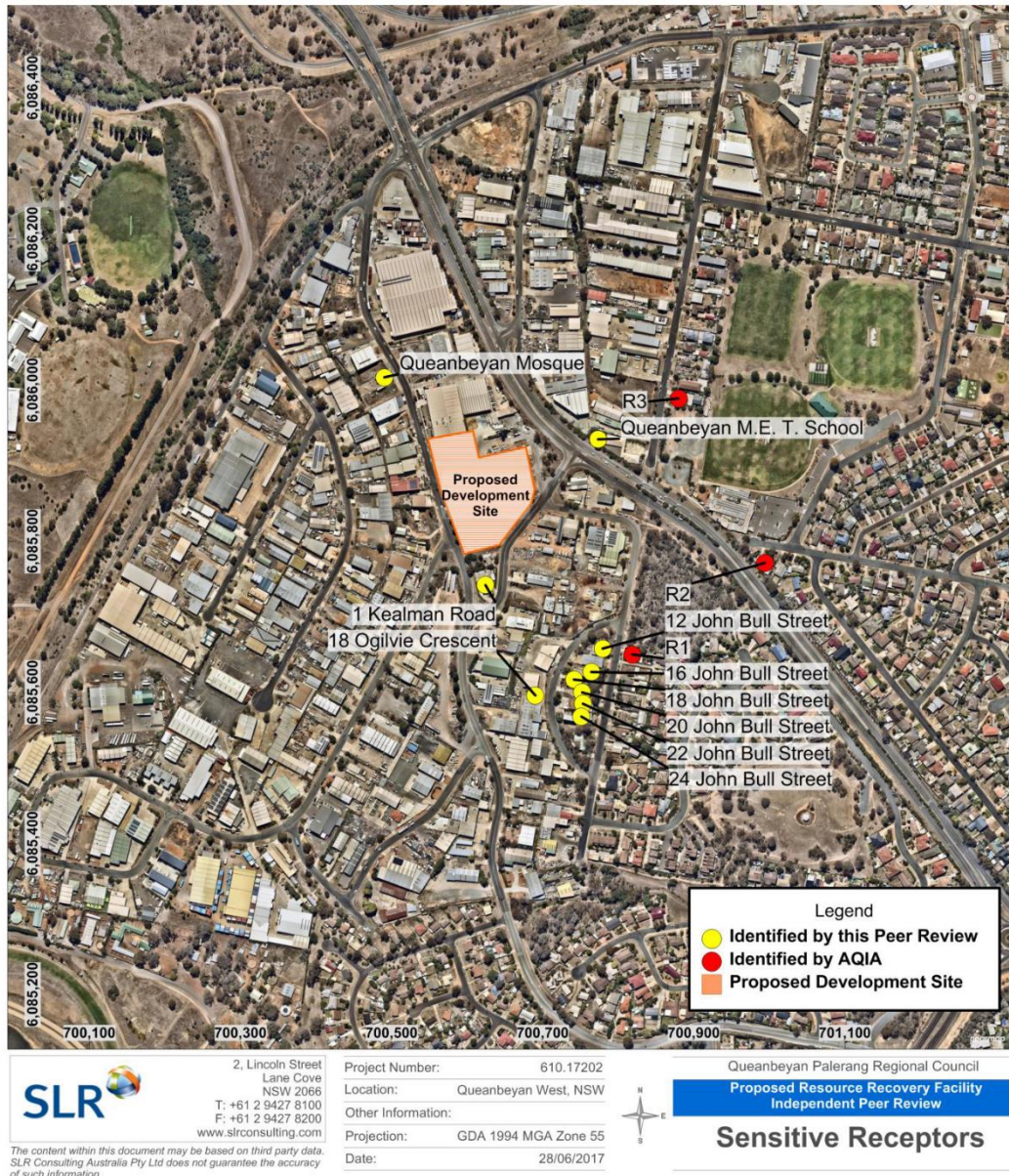
4 Site Visit

In addition to a desktop review of the documents listed above, Matthew Bryce of SLR also visited the Proposed Development Site on 24 May 2017. This site visit included an inspection of publicly accessible areas around the Proposed Development Site as well as an inspection (in vehicle and on foot) of the surrounding residential and industrial areas. No significant odours were detected in the area surrounding the Proposed Development Site.

During the site visit, additional sensitive receptors located closer to the Proposed Development Site than those included in the NIA were identified. This included a mosque, a school and several caretaker dwellings.

Figure 2 illustrates the location of these additional sensitive receptors in relation to the sensitive receptors identified by the NIA and the Proposed Development Site.

Figure 2 Locations of Identified Sensitive Receptors



5 Existing Meteorological Environment

The NSW INP requires the meteorological conditions be examined, and if there are prevailing conditions, then the noise assessment should include the change in impact as a result. Prevailing conditions are by definition when there is a prevailing wind or temperature inversion for more than 30 percent of the time.

Accordingly, an assessment of the prevailing wind conditions from meteorological data from the Bureau of Meteorology site at Canberra for the period of May 2014 to May 2017 was conducted.

The prevailing winds of velocity less than (or equal to) 3 metres per second (m/s) with a frequency of occurrence greater than (or equal to) 30% that are considered to be relevant to the site in accordance with the INP procedures are presented in **Table 1**.

Table 1 Prevailing Wind Velocities in Accordance with the INP

Season	Winds $\pm 45^\circ \leq 3$ m/s with Frequency of Occurrence $\geq 30\%$		
	Daytime	Evening	Night-time
Summer	Nil	Nil	SE, ESE
Autumn	Nil	Nil	Nil
Winter	Nil	Nil	Nil
Spring	Nil	Nil	Nil

An assessment of the atmospheric stability conditions has also been prepared from the meteorological data set described above. The winter evening and night-time frequency of occurrence of atmospheric stability classes are presented in **Table 2**, together with the estimated Environmental Lapse Rates (ELR).

Table 2 Atmospheric Stability Frequency of Occurrence – Winter Evening/Night-time

Stability Class	Occurrence Percentage	Estimated ELR ¹ °C/100 m	Qualitative Description
A	0%	<-1.9	Lapse
B	0%	-1.9 to -1.7	Lapse
C	0%	-1.7 to -1.5	Lapse
D	47.3%	-1.5 to -0.5	Neutral
E	15.2%	-0.5 to 1.5	Weak Inversion
F	24.5%	1.5 to 4.0	Moderate Inversion
G	12.9%	>4.0	Strong Inversion
F & G	37.5%	1.5 to >4.0	Moderate to Strong Inversion

Note 1: ELR (Environmental Lapse Rate).

In accordance with the INP, the frequency of occurrence of moderate to strong (ie 1.5 to >4.0°C/100 m) winter temperature inversions is more than 30% during the combined evening and night-time period and therefore requires assessment.

6 Operational Predicted Noise Levels

In order to assess the acoustical impact of the subject Project, SLR developed a 3 dimensional noise model using SoundPLAN v7.1 software, incorporating the significant noise sources and the intervening terrain and buildings to the receivers.

The SLR noise model was prepared using the CONCAWE noise prediction algorithm, as accepted by the NSW EPA for the assessment of industrial facilities. The CONCAWE algorithm enables a temperature inversion to be modelled in order to assess adverse meteorological conditions as required by the INP.

The noise modelling included a reverberant level of 85 dBA within the building, as per the NIA, and consistent with SLR's experience. The building was constructed of steel as per the NIA, and for trucks a SWL of 122 dBA for parking (air brakes) brakes was used to assess sleep disturbance. The building was modelled with doors open for 3 minutes every 15 minutes, which is considered a realistic scenario for 4 truck movements every 15 minutes. Note the assessment is for the proposed facility and does not include the existing operations to the west and north-west.

The results of the noise modelling are summarised in **Table 3** and **Table 4**.

Table 3 Predicted LAeq(15min) Operational Noise Levels – dBA re 20uPa

Receiver	Criteria		
		Calm	Temperature Inversion
R1	37	36	39
R2	37	32	36
R3	37	38	40
1 Kealman Road (nearest caretaker)	60	48	49
MET School	45	45	n/a
Mosque	50	26	n/a
Notes	1. The criteria for the School and Mosque are external noise levels, based on the INP internal noise levels of 35 dBA and 40 dBA respectively with a 10 dB external to internal reduction with operable windows.		

Table 4 Predicted LMax(15min) Operational Noise Levels - – dBA re 20uPa

Receiver	Sleep Disturbance Screen		
		Calm	Temperature Inversion
R1	47	59	64
R2	47	52	60
R3	47	55	64
1 Kealman Road (nearest caretaker)	n/a		
Notes	1. Truck parking brakes are assumed to potentially operated at the weighbridge and near the southern doorway prior to entry into the building		

7 Review

The summary table in **Attachment A** of this report outlines the findings of the peer review. The observations have been categorised as:

Significance	Description
Comment only	Observation only
Low	Issues identified are not likely to change the conclusions of the report
Medium	Issues identified may have the potential to change the conclusions of the report
High	Issues identified have the potential to change the conclusions of the report

The review highlighted a number of limitations in the NIA and supporting documentation for the Proposed Development. The key issues identified to be of high/medium significance are as follows:

- According to the NSW EPA's INP impacts from a proposed addition to an existing facility should include the cumulative impacts of the overall operation. The NIA only assesses the new transfer station.
- The INP requires the noise assessment to consider adverse meteorological conditions, if they are found to be a feature of the area. The NIA does not include an examination of the existing meteorological environment. SLR conducted an assessment of prevailing wind conditions as derived from meteorological data from the Bureau of Meteorology site at Canberra. The assessment concluded that there are prevailing summer winds, and moderate to strong temperature inversions during winter for more than 30 percent of the time. Adverse weather conditions were not included in the NIA.
- Noise modelling for enhancing adverse meteorological conditions indicate a resulting exceedance of the INP derived noise criteria of up to 3 dB.
- Noise modelling for the potential for sleep disturbance indicates exceedances of the sleep disturbance screening level of up to 17 dB. It is also noted Revision A of the NIA adopted a Sound Power Level of 122 dBA, which reduced to 115 dBA in Revision B. SLR uses a level of 122 dBA for parking brakes (air release), based on measurement.

It is not recommended that approval be granted for the proposed development until the above issues are satisfactorily resolved.

Attachment A – Independent Peer Review Noise Summary

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ID	Reference	Comment	Significance
Noise and Greenhouse Gas Assessment, Proposed Resource Recovery Facility, Queanbeyan West (February 2015)			
1	Section 2.1, Page 1	Identification of Sensitive Receptors Residences located to the east of the project site were identified by the NIA as being the nearest sensitive receptors. Sensitive receptors closer to the project site were identified during the SLR site visit. It is noted that these receptors are located in an area zoned for industrial activity (see Figure 1). However, the Council has confirmed that all identified sensitive receptors are approved premises and therefore fall within the Approved Methods definition of sensitive receptors. The Approved Methods defines a sensitive receptor as "A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area". The identified residences confirmed by the Council as having approval are illustrated in Figure 2 and include the following: - School: 67 Lorn Rd, Crestwood NSW 2620 - Mosque: 185 Gilmore Rd, Queanbeyan West NSW 2620 - Caretaker's dwelling : 12 John Bull Street, Queanbeyan West NSW 2620 - Caretaker's dwelling : 16 John Bull Street, Queanbeyan West NSW 2620 - Caretaker's dwelling : 18 John Bull Street, Queanbeyan West NSW 2620 - Caretaker's dwelling : 20 John Bull Street, Queanbeyan West NSW 2620 - Caretaker's dwelling : 22 John Bull Street, Queanbeyan West NSW 2620 - Caretaker's dwelling : 24 John Bull Street, Queanbeyan West NSW 2620 - Caretaker's dwelling : 18 Ogilvie Crescent, Queanbeyan West NSW 2620 - Caretaker's dwelling : 1 Kealman Road, Queanbeyan West NSW 2620	Medium
2		Project Description The site contains existing services and SITA has proposes to expand these operations with the establishment of the Resource Recovery Facility. The NIA assesses the proposed Resource Recovery Facility without addressing the cumulative impacts of the existing SITA operations and the proposed Resource Recovery Facility.	High
3		Existing Noise Environment SLR concurs with the results of the ambient noise survey in the NIA, with the results being typically of those expected at residences in this type of setting.	Comment only
4		Selection of Noise Criteria Noise criteria are presented in the NIA as being in accordance with the NSW EPA's INP for operational noise and with the NSW EPA's ICNG for construction noise. SLR concurs that these are the appropriate policies and guidelines. Also that the resulting	Comment only

ID	Reference	Comment	Significance
		noise criteria are correct.	
		Section 5.1 of the NIA sets project specific criteria for operational noise in accordance with the INP. SLR concurs with the project specific criteria of Table 5-4 of the NIA, as well as the sleep disturbance criteria of Table 5-5 of the NIA.	
		Section 5.3 of the NIA presents traffic noise criteria in accordance with the NSW Road Noise Policy (RNP). SLR concurs with the RNP criteria used for the project.	
		Section 5.4 of the NIA sets project specific criteria for construction noise in accordance with the ICNG. SLR concurs with the project specific criteria for the non-residential receivers of Table 5-8 for of the NIA and for the residential receivers of Table 5-9 of the NIA.	
5	Section 6.2,	Operational Noise Impacts The NIA assesses the operational noise impacts in Section 6.2, and for the more sensitive night-time period (as a result of the lower criteria) predicts noise levels of 37 dBA at the nearest receivers. SLR modelled the facility, and based on calm meteorological conditions predicted marginally lower noise levels at R1 and R2, and 1 dBA higher at R3. These variations are within the modelling tolerances expected. Under a temperature inversion or adverse meteorological conditions exceedances of the design criteria of up to 3 dBA were predicted. Noise mitigation measures will be required for the operation to comply under calm/neutral and adverse meteorological conditions. Furthermore, the operational noise assessment should include a cumulative impact of the existing and proposed operations. The NIA assesses sleep disturbance impacts in Section 6.3, for which a sleep disturbance screening level of 47 dBA is adopted. It is noted that Revision A of the NIA adopted a Sound Power Level of 122 dBA, which was reduced to 115 dBA in Revision B. SLR uses a level of 122 dBA for parking brakes (air release), based on measurement. Using a SWL of 122 dBA in the modelling predicts an exceedance of the sleep disturbance screening level of up to 17 dB. Noise mitigation measures, such as air release silencers will be required to reduce the potential for sleep disturbance.	High
6	Section 6.4	Operational Phase Traffic Noise Impacts The NIA assesses the operational traffic impacts in Section 6.5. SLR concurs with the conclusion of the NIA in that there is a negligible increase in traffic noise as a result of the development.	Comment only
7	Section 6.5	Construction Phase Noise Impacts The NIA assesses the construction noise impacts in Section 6.5. SLR concurs with the construction sound power levels used in the modelling, as well as the predicted noise levels and conclusion of the construction noise assessment.	Comment only
8		Mitigation Measures The NIA does not consider mitigation measures, or discuss whether the openable doors are closed when not required. SLR's modelling has assumed the openable doors would be closed for 12 of each 15 minute period during the evening and night-time. Furthermore the building has been designed with no mechanical ventilation, and fully enclosing the building and closing all doors immediately after trucks enter/exit the building may not be practical.	Medium