Our ref: DOC26/139195-10

10 April 2026

Patrick Copas
Principal Planning Officer
Department of Planning, Housing and Infrastructure

Via: NSW Major Projects Portal

EPA Advice on Environmental Impact Statement
Mamre Road Data Centre Campus – SSD-92743706

Dear Patrick

I am writing in response to your request for the NSW Environment Protection Authority (EPA) to review the Environmental Impact Statement (EIS) for the proposed Mamre Road Data centre Campus at 706-752 Mamre Road, Kemps Creek.

The EPA has reviewed the following documents:

- *Environmental Impact Statement* (Version 5) – Willowtree Planning – 2 February 2026
- *Air Quality Impact Assessment* (Version 3) – Northstar – 11 December 2025
- *Air Quality Impact Assessment – Appendices* (Version 1) – Northstar – 3 December 2025
- *Noise and Vibration Impact Assessment* (Revision 6) – Renzo Tonin – 12 December 2025
- *Greenhouse Gas Assessment Report* (Revision 6) – E-LAB Consulting – 4 December 2025
- *Preliminary Risk Screening* (Revision 3) – Core Engineering Group – 9 December 2025
- *Detailed Site Investigation* (Revision 0) – JBS&G – 1 December 2025
- *Remedial Action Plan* (Revision 0) – JBS&G – 1 December 2025

The EPA understands the proposal is for construction and operation of a 1000MW data centre consisting of:

- 6 buildings to be constructed in multiple stages over 10 years,
- On-site storage of 18,056kL (approx. 15,350t) diesel fuel,
- 846 x 2MW back-up generators,
- 728 air cooled chillers,
- On-site storage of 2,652t of lithium-ion batteries.

Based on the information provided, the proposal will require an environment protection licence under the *Protection of the Environment Operations Act 1997* (POEO Act) for Chemical Storage (petroleum products) in Clause 9 of Schedule 1 of the POEO Act.

The EPA has reviewed the EIS and notes that it does not provide the information required to allow us to complete our assessment. The EPA has the following comments and recommendations:

Matters to be addressed prior to determination

Following review of the EIS and associated documentation the EPA recommends the Department of Planning, Housing and Infrastructure (DPHI) request additional information be provided addressing the matters listed below prior to determination of the proposal. Further information regarding these matters is provided in **Attachment A**.

1. Air quality
2. Noise
3. Greenhouse Gas emissions (GHG)

   With regard to GHG emissions, the EPA notes the commitments in the EIS regarding the purchase of electricity 100% backed by renewable sources from 2030 for the full operational life of the project. The EPA advises its preference is for applicants to prioritise use of NSW-based offsets.

   Noting the EPA's recommendation below requesting additional details on estimated emissions, the EPA recommends the independent reviewer provides comment/confirmation that they have reviewed and agree with any additional GHG emissions and associated mitigation strategies.
4. Waste storage

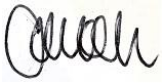
The above information is needed to ensure all the Secretary Environmental Assessment Requirements (SEARs) are responded to and sufficient information is provided to enable the EPA's assessment which includes the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2022), Noise Policy for Industry (2017) and NSW Guide for Large Emitters. This is important to ensure likely impacts from the proposal are clearly identified, especially given the potential for significant air quality and noise impacts and proximity to sensitive receivers including schools, aged care facilities and existing residences.

In particular, the Air Quality Impact Assessment (AQIA) and Noise and Vibration Impact Assessment (NVIA) reports should be revised to (i) consider all situations where generators are likely to be used, (ii) address exceedances of impact assessment criteria and (iii) revise assessments of cumulative and emergency scenarios to include assessment of overlapping operation and construction impacts. Consideration of appropriate feasible and reasonable mitigation and management measures should be revised accordingly.

The EPA requests it be consulted further regarding this proposal following receipt of additional information addressing the above matters, as the EPA would likely have further advice to provide for consideration by DPHI as part of its assessment.

Please contact Carlos Ferguson at environmentprotection.planning@epa.nsw.gov.au if you have any further questions about this matter.

Yours sincerely,



CHRIS MARSH
A/Manager – Environment Protection Planning
NSW Environment Protection Authority

APPENDIX A – Detailed comments on EIS for Mamre Road Data Centre Campus – SSD-92743706

The EPA provides detailed comments below regarding matters that are recommended to be addressed prior to determination, for consideration by DPHI as part of its assessment of the proposal.

Matters to be addressed prior to determination

1. Air Quality

   a. The AQIA does not fully account for all potential diesel generator use at the facility

      The AQIA has assessed 24 operational scenarios. Eighteen (18) scenarios represent emergency situations where diesel generators are used in the event of power supply failures. These scenarios consider various number of generators in operation (between 67 and 846) in the event of electricity feeder failures (1, 2, and 3 feeder failures have been considered). The remaining six (6) scenarios represent required generator testing. These maintenance testing scenarios assume up to 6 generators operating at any one time for various stages of the proposal.

      The EPA is aware that diesel generators are used in scenarios other than those included in the AQIA. The AQIA is to be updated to include all potential operating scenarios. Further information regarding these operating scenarios is to be provided as outlined below.

      i. Voltage disturbances

         Data centres disconnect from the grid and switch to their backup supply if there is a disturbance on the network that exceeds their voltage tolerance limits. Information published by the Australia Energy Market Commission (AEMC) outlines that most data centres use inverter-based technology which can disconnect during grid disturbances (i.e. changes in voltage). If there are data centres connecting/clustering in similar locations, then one network disturbance can result in many data centres disconnecting simultaneously, increasing the risk of cascading outages or grid instability. The AEMC also advises that such cascading failures and grid instability events have occurred in the US and Ireland. These scenarios have not been assessed in the EIS.

         Recommendation: Provide further detailed information on any proposed diesel generator use during voltage disturbances. This includes but is not limited to:

         - Voltage disturbance conditions at which will disconnect from the grid
         - Operating protocol during and after a voltage disturbance
         - Duration of any generator usage during a voltage disturbance
         - How quickly the data centre will connect back to the grid after a voltage disturbance
         - The generator load (number of generators and load) that would be operated under such circumstances
         - Mitigations proposed to minimise any generator usage during voltage disturbances, including whether or not the proposed Mamre Road Data Centre Campus will comply with the Draft Improving the NEM access standards – Package 2 rule change which will introduce a number of requirements for data centres to ride through typical voltage disturbances in the network.

         A discussion must also be provided regarding potential frequency of voltage disturbances which takes into account future energy system security risks as a result of increasing large loads (such as data centres) connecting to the grid.

ii. Generator testing

The AQIA describes the required generator testing (for maintenance purposes) to occur on an annual basis. That is, each generator will be required to be tested once per year for 60 minutes. Assessments for other data centres have provided information on other required testing outside of the annual 60-minute testing described in the AQIA. This includes other monthly maintenance testing of each generator. The EPA understands that maintenance regimes may be dictated by suppliers, generator warranties, and any relevant industry standards, such as NFPA 110 Standard for Emergency and Standby Power Systems.

Furthermore, section 4.13.1 of the EIS states that *"Quarterly testing occurs with generators connected to mobile load banks at each sub-parcel"*. Quarterly testing has not been discussed or assessed in the AQIA.

Recommendation: Provide further detailed description of required generator maintenance testing. This includes, but is not limited to:

- generator testing regimes that are required by the suppliers and/or the warranties attached to the four proposed generators (Cummins C2750D5BE (2,200 kW), MTU 16V4000G84F (2,185 kW), Stirling 20M33GD2500/5 (2,010 kW) Caterpillar 3516B (2,000 kW), and
- any testing regimes required by applicable industry standards.

The additional information must detail any monthly, quarterly and annual testing requirements that are dictated by any of these mechanisms (i.e. supplier recommended maintenance, warranties, applicable industry standards).

iii. Other maintenance outside of generator testing

The AQIA and EIS describe maintenance scenarios as situations where the generators are required to be tested on an annual basis. Detailed description of other possible maintenance scenarios, where generators may be required to be operated, has not been detailed.

This includes, describing the required maintenance on any other components of the power supply systems, how power supply would be provided during maintenance of other components, and information on any generator operation during these periods.

The EIS outlines that the power supply systems for the project have a number of components, including an uninterrupted power supply (UPS) system to each building, a STATCOM (Static Compensator) facility as part of the main substation that interfaces with the grid, and substations serving each sub-parcel.

Recommendation: Further detailed description of required power supply maintenance. Information provided must include all situations where generator operation will be required, to cover the required maintenance for each component of the power supply systems (including but not limited to substations, UPS systems and components, and the static compensators).

Where generator operation is required for particular maintenance scenarios, the operational load requirements from generators must be detailed (i.e. number of generators and load). The frequency and duration of such maintenance scenarios must also be provided.

iv. Load shedding

The AQIA and EIS have not described instances, where the proposed data centre could be required to shed the power load during periods of low energy reserve conditions. The EPA understands that should the proposed data centre be requested to load shed, then diesel generators would be utilised to maintain operation.

Recommendation: Provide further detailed information on any proposed diesel generator use under circumstances directed by the Australia Energy Market Operator (AEMO). The generator load (number of generators and load) that would be operated under such circumstances must be detailed. Information on likelihood and frequency of any load shedding instances must take into account future grid security and reliability issues (e.g. projected low reserve conditions) and not just past data.

v. Grid firming

The AQIA and EIS describe diesel generator usage during periods of power outage, or during generator maintenance testing. A discussion around possible usage of diesel generators to stabilise the grid has not been included.

Recommendation: Provide further detailed information on the use of diesel generators under any proposed arrangements with other power supply entities.

The generator load (number of generators and load) that would be operated under such circumstances must be detailed. Information on likelihood and frequency of any grid firming instances must take into account future grid security and reliability issues (e.g. projected low reserve conditions) and not just past data.

b. Proposed generator operating hours have been underestimated

The Protection of the Environment Operations (Clean Air) Regulation outlines that emergency standby plant is exempt from emission standards for oxides of nitrogen if the plant comprises a stationary reciprocating internal combustion engine, and it is used for a total of not more than 200 hours per year.

The EIS and AQIA outline a proposed diesel generator usage of 141 hours per year. The calculated number of hours is based solely on the annual testing regime. The calculation of diesel generator usage is to account for all proposed operational scenarios, not just the annual testing regime. The EPA request further information on the proposed number of operating hours.

Recommendation: Provide an updated inventory of proposed diesel generator operating hours, having regard to all proposed diesel generator operating scenarios, including but not limited to:

- Grid disturbances
- Generator testing in accordance with noise management measures in NVIA (p124), testing regimes required by suppliers, warranties or any applicable industry standards
- Other maintenance scenarios including maintenance on components of the power supply systems
- Grid firming
- Load shedding

c. Assessment of air quality impacts for operating scenarios

The AQIA includes assessment scenarios for emergency situations and for annual generator maintenance testing. The generator maintenance testing scenarios assume 6 generators operating at any one time. The emergency scenarios assume 281 generators operating in the event of 1 feeder failure, for the Stage 2 completed project, and 846 generators in the event of 3 feeder failures.

The EPA request that assessment of air quality impacts be undertaken for any further operating scenarios that are identified in Issue 1 where greater than 6 generators are anticipated to be operating concurrently.

Recommendation: Provide an assessment of air quality impacts for any additional operating scenarios that are identified and discussed in issue 1. This includes any operating scenarios for:

- Grid disturbances
- Generator testing in accordance with testing regimes required by suppliers, warranties or any applicable industry standards
- Other maintenance scenarios including maintenance on components of the power supply systems
- Grid firming
- Load shedding

d. Emergency scenario possibly underestimated in terms of both impact and probability

The emergency scenarios assessed in the AQIA have been based on the probabilities of potential power failures and the frequency of predicted air quality exceedances. The AQIA predicts:

- 1728 exceedances of the NO_2 (1 hour) impact assessment criteria at residential receptors for a 1-feeder failure event (281 generators operating).
- 2465 exceedances of the NO_2 (1 hour) impact assessment criteria at residential receptors for a 2-feeder failure event (554 generators operating).
- 2692 exceedances of the NO_2 (1 hour) impact assessment criteria at residential receptors for a 3-feeder failure event (846 generators operating).

The EPA provide comments on the power failure probabilities and predicted frequency of air quality exceedances below.

i. Power failure probabilities

The AQIA estimates power failure probability based on the average unplanned outage duration per year per customer over a 10-year period from 2013 to 2024. The AQIA uses the normalised outage data referenced from the Endeavour Energy 2024 Distribution Annual Planning Report. The normalised data does not account for major events typically associated with adverse weather conditions. On that basis the probabilities could be underestimated.

Further, the EPA also have concerns that the power failure probabilities have been underestimated as historical power supply data does not reflect future grid security and stability. The Ausralian Energy Market Operator (AEMO) in their 2025 Transition Plan for System Security (the AEMO 2025 Transition Plan) identifies that *"Large inverter-based loads (LIBL) particularly large data centres, are projected to rapidly become major loads on the system, with over 10 GW lodging connection enquiries (some single data centres exceeding 1 GW) in New South Wales by the End of 2024-205"*. The 2025 AEMO Transition Plan states that *"Without coordinated planning and careful connection, LIBL present system security risks including through power system oscillations, sudden load loss of ramping, transient stability, and increase inertia requirements"*. Historical power supply data may not reflect these potential future risks factors. The increase in data centre uptake and associated risks, coupled with changes to the grid (uptake of renewable energy, phase out of base load coal fired power stations) and potential climate change impacts on grid infrastructure increase the energy supply uncertainty.

Recommendation: The assessment of emergency scenarios give consideration to probability data that is representative of future grid security and reliability.

ii. Frequency of predicted air quality exceedances

The likelihood of potential adverse air quality impacts has been based on the number of predicted exceedances of the relevant air quality impact assessment criteria. The predicted number of exceedances for each of the emergency scenarios have been tabulated in Section 8.1. The number of exceedances are presented as a function of the different receptor types (Residential, Educational, Industrial, Recreational, Medical).

Based on the data presented the EPA assumes that the likelihood of potential adverse air quality impacts has been based on the number of exceedances for individual receptor groups and has not considered the number of exceedances predicted when considering all sensitive receptors in totality.

Recommendation: The assessment of emergency scenarios be reviewed to consider the number of predicted exceedances at all sensitive receptors in totality. Supporting data and calculations must be provided.

e. Model setup and inputs not in accordance with the Approved Methods for Modelling

i. Meteorology may not be representative of calm winds characteristic of the site

As noted in the AQIA there is no onsite weather station to be able to provide site specific weather data to characterise the local meteorological conditions and use as input to the air dispersion modelling. Therefore, the AQIA has relied on site representative data from the Bureau of Meteorology's (BoM) automatic weather station (AWS) at Horsley Park AWS for 2020-2024. The Horsely Park AWS is located 6.4 km to the east of the Proposal.

The AQIA also references the Departments of Climate Change, Energy, the Environment and Water (DCCEEW) operated air quality monitoring station (AQMS) St Mary's, located 4.6 km north-northwest of the site. The EPA note that the St Mary's AQMS also measures meteorological information suitable to characterise the local meteorology.

The AQIA has stated that neither site representative weather station data were assimilated into the meteorological models TAPM or CALMET. The meteorological analysis presented in the AQIA shows that at the Horsley Park AWS the annual percentage of calms ranged between 18.3% and 21.1% with an annual average wind speed ranging between 1.9 m/s and 2.0 m/s. No weather information was presented for the St Marys weather station.

The EPA have compared these values with those presented for the CALMET extract, where the percentage of calms was 5.4% and a corresponding annual wind speed of 2.5 m/s for the 2021 model period. The EPA are concerned that the percentage of calms has been underestimated in the meteorological modelling and is therefore not site representative. Underestimating calms can result in an underestimation of impacts as dispersion is limited.

In accordance with the Approved Methods for Modelling it must be clearly established that the site-representative data adequately describes the expected meteorological patterns at the site under investigation (e.g. wind speed, wind direction, ambient temperature, atmospheric stability class, inversion conditions and katabatic drift). The AQIA has not demonstrated that the CALMET generated data is site representative.

Recommendation: The Proponent must:

- demonstrate that the meteorological data is site representative or update the meteorological model to improve performance through assimilation of measured meteorological data

- provide all relevant files for the modelling, including (but not limited to) configuration files, input files, output files and results processing for the emissions, meteorological and dispersion modelling. A link to download the files must be included in the response to ensure timely access to the files.

ii. Selection of representative year

As described in Issue e, there are two nearby weather stations operated by BoM and DCCEEW. Weather data from Horsley Park AWS has been correlated with nitrogen dioxide (NO_2) concentrations measured at St Marys AQMS to establish an appropriate year for modelling.

The EPA is unclear the purpose of the correlation analysis as the St Marys AQMS includes reliable weather information and do not consider the analysis as a justifiable means for selecting an appropriate year to model. In accordance with the Approved Methods for Modelling the site-representative data should be correlated against a longer-duration site-representative meteorological database of at least five years (preferably five consecutive years) to be deemed acceptable.

If it is to be considered that air quality data is to be taken into account in the selection of an appropriate year to model, then the Proponent must consider the effects of the COVID lockdowns in reducing traffic emissions and the subsequent influence on air quality. In Sydney the improvement in air quality due to the reduction of transport emission during the COVID lockdown was found to be small but measurable (Duc et al., 2021).

The AQIA has only analysed monitoring data from 2021. It is not clear to the EPA that the year-on-year variability of the pollutant concentrations that align with the meteorological years was analysed.

Recommendation: The Proponent provide additional information to demonstrate that 2021 provides a worst-case scenario. Year on year variability in pollutant concentrations must be included.

iii. CALMET model setting require additional transparency

Table C3 provides a summary of the CALMET model parameters and Figure 8 provides a visual aid for the additional terrain. No figures have been included to identify land use in the model. The EPA would benefit from the CALMET settings TERRAD and land use being included on the terrain map for transparency.

In accordance with the Approved Methods for Modelling a Level 2 assessment must clearly establish that the meteorological data adequately describes the expected meteorological patterns at the site under investigation, including inversion conditions and katabatic drift. Seasonal characteristics of the wind speed and wind direction are also a useful tool in understanding the characteristics of the local meteorology.

The settings would further be supported by a graphical representation of the simulated wind fields produced by CALMET for a range of meteorological conditions, including whether the meteorological model captures inversion conditions and katabatic drift.

The AQIA provides that the 25 vertical levels for TAPM were used to generate the three-dimensional wind field used for CALMET input. The CALTAPM guidance (Barclay, 2009) recommends at least 30 or more levels are used.

Recommendation: The Proponent:

- Include the TERRAD and the R1 and RMAX settings to Figure 2.1

- Provide a seasonal breakdown of wind speed and wind direction and evaluation of how the predictions compare with observed.
- Revise the report to include graphical representations of the CALMET wind fields for a range of meteorological conditions, including inversion conditions and katabatic drift.
- Justify the TAPM setting as input to CALMET.

f. The AQIA does not adequately address cumulative emissions in the background or as modelled sources

The AQIA has included eight data centres identified within a 5km radius in the cumulative assessment (refer to Table G2 of the Appendices). The location of the surrounding data centres is shown in Figure G1. The EPA note that the information in Table G2 does not align with Figure G1. This creates uncertainty in the model predictions for the cumulative assessment as the incorrect source locations, stack parameters and number of generators operating may not provide the worst-case scenario.

Furthermore, the influence of the Western Sydney Airport (WSA) on local air quality has not been considered in the AQIA. WSA is located approximately 5km southwest of the Proposal and is scheduled to be operational in July 2026. WSA will be a significant source of localised air pollution, especially NO_2, and therefore must be considered in the assessment.

Recommendation: The Proponent:

- Review the location of the identified data centres included in the cumulative assessment and confirm that the location, source parameters and number of gensets operating is correct. The cumulative assessment must be updated if required.
- Include in the assessment all known significant sources of emission that would not have been captured in the background. This must include, as a minimum, the future operation of the Western Sydney Airport.

g. Maintenance and Emergency source locations have not been clearly identified

The AQIA states *"location of each generator within each shell has been assumed to remain constant and located at the northern-most part of each shell. This provides the lowest separation distance between the relevant generator flues and the sensitive receptors to the north of the Proposal site (i.e. schools and retirement homes)"*. This statement appears to contradict the source locations information presented in Figures 9 to 15 where the stack locations are generally shown to be located towards the west and spread along the length of the building.

In consideration of the proximity of the Proposal to the nearby residences, schools and aged care facilities the location of the sources must present the worst-case scenario. In accordance with the Approved Methods for Modelling all emission sources are required to be clearly identified.

Recommendation: The Proponent:

- Identify and confirm source locations for all emissions scenarios.
- Demonstrate that the location of the generators in the maintenance scenario provides a worst-case scenario for all sensitive receptors. This is to include, as a minimum, the results of a sensitivity analysis whereby the sensitivity of the modelling results to generator location is tested.
- If the realistic case is not a worst-case scenario, update the modelling accordingly.

h. SO_2 emissions appear to be significantly underestimated

Table 21 of the AQIA presents the standby generator emissions and stack parameters which have been used to assess modelled predictions in the assessment. The sulphur dioxide (SO_2)

emission rate included in Table 21 is reported as 0.00000564 g/s, which is significantly less than the emission rate of 0.0035 g/s derived from the figures provided in Appendix E (Cummins C2750D5BE). The EPA notes that even though the figure of 0.0035 g/s is based on a fuel sulphur content of 0.0015 wt% (equivalent to 15 ppm sulphur) and the AQIA assumes a fuel sulphur content of 10ppm, this does not explain the vast discrepancy between the two figures.

The EPA consulted Table 43 of the National Pollutant Inventory (NPI) Emission Estimation Technique (EET) Manual for Combustion Engines, which predicted an SO_2 figure of ~0.0025 g/s based on the appropriate sulphur content (10ppm) and fuel consumption (0.5268 m3/hr). Therefore, the EPA raise concerns that the SO_2 emission rate presented in the assessment may be ~450 times lower than the intended SO_2 emission rate.

Recommendation: The AQIA must be amended to adopt corrected sulphur dioxide (SO_2) emission rates. All related dispersion modelling figures must also be updated accordingly to allow for the adequate presentation of SO_2 impacts.

i. Emissions abatement has not been described or demonstrated to be best practice

As per the Approved Methods for Modelling, benzene and formaldehyde, which are emitted from the diesel generators, are classified as principal toxic air pollutants. Section 7.2.1 of the Approved Methods for Modelling describes that 'principal toxic air pollutants must be minimised to the maximum extent achievable through the application of best-practice process design and/or emission controls'. This has not been demonstrated in the AQIA.

The AQIA recommends the following operational phase air quality management strategy:

- Maintenance testing will be performed at times when other proximate data centres are not performing similar maintenance testing. This will involve communication and coordination between data centre operators to minimise simultaneous emissions.
- The performance of the maintenance testing will not be performed during periods of elevated background air quality conditions.

The EPA advises that there are practical issues associated with the use of ozone monitoring data to inform the times when engine testing can be undertaken. Air quality monitoring data from the NSW government network is not updated in real time. There is a delay (~up to 2 hours) to the publishing of measured ozone concentrations. This means that measured elevated levels could occur before it is reported, and before the proponent would be able to access that information.

Further, Appendix J outlines a review of feasible best available techniques (BAT) measures that could be employed at the Proposal site to minimise and reduce air pollution impacts from the standby generator operations. However, it is unclear if the options provided in Table J5 are only applicable as additional options once the Proposal is already operational. The EPA advise that the Proponent should consider additional mitigation measures, consistent with best practice, which could be implemented in the design phase (as opposed to the operational phase) to achieve improved emission performance of the Proposal.

Recommendation: The AQIA is revised to:

- Describe the proposed mitigation systems and emission controls for minimising emissions of principal air toxics from the diesel generators. This should include a process description, emission performance and associated control efficiencies.
- Demonstrate proposed mitigation measures are consistent with best practice. This should give consideration, but not necessarily limited to:
    - Proposed emission controls and emission performances
    - Comparison of performance of proposed emission controls against other emission control options/facility design options that are not proposed for implementation. This is to include, but not be limited to:

        - use of alternate fuels (e.g gas)
        - alternate energy generation options (e.g gas turbine) and
        - alternate facility design options to minimise diesel generator use, such as a larger UPS system.
    - Benchmarking emission performance with other plants.
    - Proposed emission monitoring methods and management practices.
- Describe how the Proponent will identify periods when background air quality is not elevated, to enable all diesel generators complete maintenance checks.

j. Presentation of results does not comply with the Approved Methods for Modelling

The presentation of results is limited to the impacted sensitive receptor according to the receptor type classifications (residential, educational, industrial, recreational or medical). Two contour plots for operations have been included for:

- Predicted maximum incremental 1-hour NO_2 impacts – Scenario M6 (maintenance scenario when all buildings are operational)
- Predicted maximum incremental 24-hour $PM_{2.5}$ impacts – Scenario M6

The results tables comprise the incremental contribution, the background, contribution from other modelled sources and the final cumulative result. The EPA have very limited insight into the full impact of the Proposal.

From the contours presented in Figure 20 for the maximum 1-hour average NO_2 concentration predictions, it is clear that the plume goes beyond the extent of the modelling domain. The creates uncertainty that there may be impacts beyond the extent of the model domain.

Recommendation: The Proponent provide additional transparency in the presentation of results, this includes the presentation of contour plots which show the maximum extent of the plume and the identification of the impacted receptors.

k. Method for chemical transformation of NOx requires justification

For the chemical transformation of oxides of nitrogen (NOx) to nitrogen dioxide (NO_2) the AQIA has adopted Method 3 as per the Approved Methods for Modelling. Justification for the selection of Method 3 has been interpreted as stepping through Method 1 to Method 3 until compliance is achieved. The Approved Methods for Modelling states *"If additional exceedances of the impact assessment criteria are caused by the addition of the subject source, a more refined assessment should be undertaken and/or additional management practices or emission controls applied"*. A more refined assessment would typically be considered a photochemical model. Method 3 was developed as an empirical equation for estimating the oxidation rate of NO in power plant plumes, not diesel generators.

Nevertheless, The EPA have reviewed the model results presented as tabulated 1-hour maximum and annual average for the most impacted receptors class and the single contour plot for maximum 1-hour average NO_2 (Figure 20). No information on the NOx concentration prediction or the assumed in-stack ratio has been included in the report.

Given the 'substantial' increments described in the AQIA it would benefit the EPA to understand the inputs and assumptions used in the Method 3 chemical transformation calculations. In accordance with the Approved Methods for Modelling an air quality impact assessment report must clearly document the methodology and result of the assessment.

Recommendation: The AQIA is revised to:

- Justify the use of Method 3 as being appropriate for the assessment, particularly on near field receptors.

- Provide worked examples for the Method 3 calculations. This must include all parameters included in the Method 3 equation and a justified in-stack ratio of NO_2/NOx.

I. The AQIA predicts extensive exceedances of the impact assessment criteria and does not comply with the Approved Methods for Modelling

For operations the AQIA provides six maintenance scenarios and 18 emergency scenarios to assess the potential impacts of the Proposal on the local air shed. The following summarises exceedances:

- Maintenance – No predicted exceedances
- Emergency – All six scenarios predict significant exceedances (NO_2, CO, PM_{10} and $PM_{2.}5$)

As the probability of the significant emergency scenario exceedances is presented as low, Section 9.6 of the AQIA states that *"based upon the assumptions presented in this AQIA, the operation of the Proposal does not necessitate any additional management strategies"*.

The Approved Methods for Modelling requires no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity. If the EPA's impact assessment criteria are exceeded, the dispersion modelling must be revised to include various pollution control strategies until compliance is achieved. Section 7.7 of the Approved Methods for Modelling outlines a suggested approach of undertaking a sensitivity analysis to varying parameters to determine the most cost-effective and environmentally effective control strategy to achieve compliance with the impact assessment criteria.

The level of management practice is one of those parameters that can be tested in a sensitivity analysis. The EPA consider that as a minimum, it is appropriate that the AQIA details how the Proponent would respond in circumstances where a significant portion of emergency backup diesel generators are operating concurrently. The AQIA has not provided specific information regarding an appropriate response plan that could be initiated in the event of an emergency or scheduled testing, such as a Trigger Action Response Plan (TARP). The EPA provide the following measures which may be included in a TARP:

- **Sensitive Receptors:** Identify and outline the sensitive receptors that may be adversely impacted by the Proponent's operation during an emergency or scheduled testing scenario.
- **Trigger Criteria:** Define the trigger criteria (e.g. operational events, air quality thresholds, or meteorological conditions) which activate the TARP. Include appropriate response levels (e.g. advisory, alert, emergency) which correspond to the trigger criteria.
- **Response:** Based on the defined trigger criteria and levels, outline the corresponding response actions that the Proponent proposes to implement to minimise potential health impacts to sensitive receptors (e.g. evacuation).
- **Communication strategy:** Outline how the Proponent will inform local sensitive receivers during an emergency or scheduled testing scenario. Provide detail regarding how the Proponent will ensure that all sensitive receivers are adequately informed in such scenarios.
- **Auditing and review:** Outline the ongoing performance audits of the TARP to ensure that it is appropriate for use on an ongoing basis. Ensure that community feedback is included in the plan where relevant.

Recommendation: The AQIA must comply with the Approved Methods for Modelling. The Proponent must consider various control strategies to demonstrate no additional exceedances for any air pollutants assessed or scenarios assessed. If a TARP is relied upon to demonstrate compliance, it must include (but is not limited to) the examples outlined above.

m. Potential for ozone to be assessed

The AQIA reports annual NOx load to be 24.7 tonnes per year when operating under only maintenance operations. As highlighted in Issues 1 and 2, there may be additional hours that the diesel generators operate. Based on the annual load of 24.7 tonnes of NOx when operating at only 1 hour per year, it would only require each generator to be operating for four (4) hours per year for the 90 tonnes NOx/VOC threshold prescribed in the Tiered Procedure for Estimating Ground-Level Ozone Impacts from Stationary Sources (Environ, 2011) to be exceeded.

Recommendation: Based on the outcomes of Issue a and Issue b, the Proponent re-evaluate whether the NOx/VOC threshold is exceeded triggering the requirement for an ozone assessment.

n. The Health Impact Assessment does not adequately address the predicated health impacts under a worst-case scenario

Table 9 of the Health Impact Assessment (the HIA) states that under an emergency generator operation (during feeder failures), sensitive receptors may potentially be exposed to acute elevated concentrations of fine particles, NOx, and CO. The HIA states that due to network redundancy and short expected outage durations, that the residual risk is considered low.

However, the HIA does not consider or address potential consequences and associated health impacts under a potential worst-case scenario i.e. when all 846 generators are operational for a significant period, as described in table 131 of the AQIA. The EPA advise that the impacts associated with worst-case emergency scenarios exceed the relevant impact assessment criteria by significant margins. Therefore, the EPA would benefit from understanding the predicted health impacts which are associated with a worst-case emergency scenario.

Recommendation: The Health Impact Assessment be updated to assess a worst-case emergency generator scenario (consistent with the AQIA worst-case assumptions) to ensure that the predicted health impacts of the Proposal are transparently presented.

o. Construction assessment requires additional transparency and assessment

i. The AQIA has not complied with the Approved Methods for Modelling

For construction the AQIA provides two construction scenarios. The following summarises exceedances:

- Stage 1 – No predicted exceedances
- Stage 2 (PM_{10})

The Approved Methods for Modelling requires no additional exceedances of the IAC will occur as a result of the proposed activity. If the EPA's impact assessment criteria are exceeded, the dispersion modelling must be revised to include various pollution control strategies until compliance is achieved.

Recommendation: The AQIA must comply with the Approved Methods for Modelling. The Proponent must include a scenario that demonstrates no additional exceedances for any air pollutants assessed or scenarios assessed.

ii. Cumulative impacts during Stage 2 construction and operations have not been adequately assessed

Table 16 summarises the modelled scenarios assessed in the AQIA. The AQIA explains "26 scenarios have been assessed to ensure that all stages of the development have been considered (two construction, six operation – maintenance, and 18 operation – emergency)". The construction scenarios are identified as Stage 1 and Stage 2.

There is no scenario that assesses the concurrent Stage 2 construction and maintenance or emergency operations. The AQIA states *"The potential for cumulative impacts between the construction stages and operational phases has been considered and is discussed in Section 9".* There is no discussion of concurrent air quality impacts in Section 9, only *"No additional exceedances of the 24-hour PM_{10} criterion are predicted at any receptor during Stage 2 construction works."*

Recommendation: The Proponent must assess a worst-case scenario that includes concurrent construction and operation emissions.

iii. Control factors outlined within the AQIA may be difficult to achieve in practice

The emissions inventory in Appendix F shows that hauling on unpaved roads makes up the approximately 12% of PM_{10} emissions. The control efficiency applied for each activity (Table F2) indicates that the application of water on unpaved haulage routes will provide a control efficiency of 75%. A further reduction of 85% was applied to represent limiting of onsite vehicle speeds. The combination of these control efficiencies equates to a control efficiency of 96.25%. The EPA raise concerns that this significant control efficiency would need to be maintained at all times throughout the project lifetime to reduce the risk of project related dust impacts.

Given the range of control efficiencies for watering in Katestone (2011), the EPA considers that the adoption of a 96.25% control efficiency for watering may not reflect a reasonable worst-case scenario, and such a control efficiency may not be achievable at all times. The EPA request that the AQIA be revised to include a sensitivity analysis that assesses the offsite impacts for a range of control efficiencies.

Recommendation: The EPA request additional information and justification (including any supporting calculations) to demonstrate a 96.25% control efficiency would be readily achieved. The EPA request that the AQIA be revised to include a sensitivity analysis that assesses the offsite impacts for a range of control efficiencies.

iv. Grader speed outside of valid range for equation

The AQIA references the grader equations being sourced from AP-42 Table 11.9-2 (US EPA, 2006). As per Table 11.9.3 of AP-42, the valid range for the grading equation is 8-19 km/hr. The EPA have reviewed the air emissions inventory in Appendix F and found in order to replicate the emissions estimates a grader speed of 5 km/hr is required.

The EPA is concerned that adopting variables outside the range of the equation will introduce additional uncertainty in the model predictions. For example, for Stage 1 the PM_{10} emission from grading are 413 kg/year. When grader speed is increased to 8 km/hr the PM_{10} emissions increase to 1,057 kg/year, this is a 2.5 times increase.

Recommendation: The EPA request that the fugitive dust emissions inventory is revised to be constructed in accordance with the valid range of the equation parameters.

v. Construction hours not clear in assessment

To contextualise the 24-hour average PM_{10} exceedances the AQIA states *"for a 24-hour averaging period, and as such the predicted impacts need to be interpreted at commercial and industrial receptor locations with care. It is considered to be atypical for a person to be at those locations for a complete 24-hour period and as such, the exposure risks associated with those pollutants at those locations would be over-estimated by adoption of those locations in the modelling assessment"*.

The proposed construction time are not clearly stated in the AQIA. The NVIA (Renzo Tonin & Associates, 2025) identifies standard construction hours to be between 7am and 6pm. These hours are not identified in the AQIA. The EPA notes that this timeframe broadly aligns with the time of days that the school will be open.

Recommendation: The Proponent clarify the construction hours in the assessment and confirm consistency with the modelling and other assessments.

vi. Material properties may underestimate emissions

Table F1 provides the material properties that have been used in the fugitive dust emissions calculations for construction. The adopted value for moisture content is 2% and the silt content is also 2%. The EPA have reviewed the ISPT Summit Kemps Creek Cumulative Air Quality Impact Assessment (SSD-3068110) (EMM, 2025) and note that the default silt content was 6.9% for topsoil and overburden / excavation and fill.

The EPA have reviewed the dust emissions inventory for the site and the cumulative emissions and note that silt content would not be required as an input for the fugitive dust equations. However, this highlights the absence of the use of dozers in the construction equipment which is concerning given the proposed schedule and quantity of material to be cut and filled. The AQIA has rather opted to rely only on excavators and front end loading in the construction dust emissions calculations.

The Mamre Road Data Centre Campus, Kemps Creek Noise and Vibration Impact Assessment (NVIA)(Renzo Tonin & Associates, 2025) states *"Bulk earthworks is proposed to be undertaken using conventional earth-moving plant such as dozers and front-end-loaders, considering the existing ground types and the aim of avoiding extensive cut into bedrock sub-surface units, this will minimise the requirement to use high-noise plant such as excavators with hammer attachments."*

The inconsistency in the equipment to be used and inputs to the equations generates uncertainty in the model predictions of the potential fugitive dust impacts during construction. This is of significant concern for the two schools adjacent to the site.

Recommendation: The Proponent must:

- Confirm if dozers are to be used during construction
- If required, update the emissions inventory and results accordingly.

2. Noise

a. Cumulative impact from overlapping operational and construction stages

The SEARs provided by the EPA recommended that the proposal should consider impacts resulting from overlapping construction and operational stages to ensure cumulative impacts from the proposal are clearly identified.

While the proposal provides detailed breakdown of staging and cumulative impacts with other sites within the Mamre Road Precinct (MRP), the NVIA does not appear to address combined noise impacts from overlapping construction and operational noise resulting from staging of the development.

Recommendation: The EPA recommends the NVIA be revised to include a detailed quantitative assessment on potential for cumulative impacts, including the potential overlapping of operational and construction impacts arising from the proposed staging of the development.

b. Detailed assessment of sensitive receivers

The NVIA has considered internal noise levels within existing schools and places of worship by using a generic outside to inside conversion (loss) of 10 dB to convert internal project noise trigger levels to external noise levels.

The SEARs provided by the EPA (item 5.4 and 5.5) recommended the NVIA provide detailed identification of various land uses within receiver locations (especially for schools and aged-care facilities) and robust justification for external to internal noise corrections.

While the NPfI includes assessment trigger levels for certain receiver types, the EPA notes that there may be additional sensitive uses that may occur within an impacted property. For sensitive receiver types not specified in the NPfI, DPHI may consider it appropriate that these sensitive receivers are considered in the assessment. This may require reasonable criteria to be established that considers the context of the development to inform an assessment of feasible and reasonable mitigation measures. Where the NPfI does not include a sensitive receiver type, but the receiver is considered appropriate to be assessed, a suitable and justified alternative reference could be used to inform the assessment.

Recommendation: The EPA recommends the NVIA be revised to provide a more detailed assessment of the variety of land-uses and receiver types within receiver locations, facades of existing schools and places of worship and achievable internal noise levels of the Emmaus Aged Care Facility, taking into account construction, window types and how these areas operate (windows open, or closed with air conditioning) and estimated internal levels.

c. Project Noise Trigger Levels (PNTLs)

The NVIA provides a complex methodology for developing PNTLs specifically for the project, including short-term and longer-term noise assessment criteria to sensitive land uses within the MRP in recognition that the uptake of the new industrially zoned land will have an impact of the acoustic climate in the area.

The EPA notes the Mamre Road Precinct (MRP) uses a comprehensive area approach which has been consistently applied by DPHI to determine acceptable amenity goals for individual industrial developments to manage cumulative noise outside the MRP.

The EPA notes the NVIA applies a “long-term” internal amenity noise level of 40dB ($L_{Aeq\ 1hr}$) for schools in NCA02, based on increased industrial noise from the fully developed MRP. The EPA acknowledges rezoning of the MRP is likely to result in a change in the acoustic amenity of the area as the precinct develops. In considering appropriate criteria for schools in the long-term scenario, the EPA advises that the internal level of 35dB ($L_{Aeq\ 1hr}$) should be sought to be achieved through detailed assessment and feasible and reasonable mitigation – noting the higher level of 40dB ($L_{Aeq\ 1hr}$) is acceptable in the circumstances noted in the NPfI.

The EPA notes it may have further comment on the proposed PNTLs and associated mitigation measures following consideration of the information requested in item 2.b. and above.

The EPA also notes that operational noise assessment should also be revised with regard to any changes or clarification to the generator operating details, such as increases to the number of generators that may need to operate at any one time.

d. Operational noise impacts

Noise predictions provided in the NVIA were conducted using the CADNA A noise modelling platform implementing two (2) modelling algorithms, ISO 9316-2:2024 and CONCAWE. The NVIA adopts the higher noise level for assessment purposes.

Recommendation: While both substantially satisfy the “noise-enhancing meteorological conditions” definition in the NPfI, the EPA recommends the NVIA be updated to include predicted levels for both models for transparency.

3. Greenhouse Gas Emissions

   a. Consistent with the requirements in the Large Emitters Guide, input data and assumptions used to estimate GHG emissions should be provided and justified

      For the EPA to replicate the estimated emissions in the GHG assessment, details are needed to demonstrate how the reported activity data were quantified and how they are reflective of the project.

      To be consistent with section 4.4.1 of the NSW Guide for Large Emitters (Large Emitters Guide), the GHG assessment should clearly document the assumptions, data and methods used in estimating Scope 1 and Scope 2 emissions. The GHG assessment should include sufficient supporting information to enable replication of the emissions calculations, with information disaggregated for each operation. The underlying assumptions and input data used to develop the emissions estimates should be clearly documented for all relevant GHG sources. In particular:

      i. The GHG assessment to include if there are any Scope 1 and Scope 2 emissions from decommissioning, closure, post closure, and maintenance/repair activities that are applicable for this proposal. The GHG assessment should include construction emissions (including demolition, land clearing and excavation – if applicable), since construction will occur for 2–4 years per phase and for 10 years in total.

         To ensure the GHG assessment provides representation of the project’s entire emissions profile, the applicant should supply appropriate justification if excluding these activities. Alternatively, the assessment should include indicative estimates or calculations to demonstrate the potential magnitude and relevance of emissions from these sources, confirming whether their exclusion is appropriate based on materiality.

      ii. Details are required to explain how the activity data summarised in Appendix A was sourced and compiled. At the same time, no supporting documentation has been provided for the activity data reported.

         The report ELAB_706 752 Mamre Rd_ESD Report_005 (4 December 2025) is cited as providing additional information on energy, water and material resources consumption, however, it was not appended to the GHG assessment.

      iii. Regarding Scope 1 emissions, the applicant should provide further information demonstrating how diesel use for proposed generator operation has been calculated (e.g., generator specifications, operating assumptions). This clarification is necessary to confirm that the estimated Scope 1 emissions reflect expected diesel consumption.

      iv. Similarly, it should also be clarified whether emissions from actual emergency operations, in addition to routine testing have been included in the assessment of Scope 1 emissions.

      v. The methodology section states that Scope 1 emissions include fugitive refrigerant emissions, however refrigerant details and the associated calculation breakdown are not presented within the assessment. While the independent expert review report includes a spot check calculation for fugitive refrigerant emissions, additional information is required to understand the underlying assumptions, inputs, and the magnitude of these emissions.

vi. Further, regarding the assessment methodology, the adequacy of the emission factors used to calculate Scope 1 and Scope 2 emissions should be clarified. Consistent with the Large Emitters Guide, the assessment should apply the latest National Greenhouse Accounts (NGA) factors and NGER methods (where applicable).

In addition, clarification is required on the following matters:

- The assessment refers to "client historical tenant utilisation factors" and notes that the "annual operational load factor is varied as per historical tenant utilisation"; however, no information is provided on how this data was obtained, including the time period, data sources, or assumptions used.
- The terms "Airtrunk renewable factor" and "Airtrunk renewable purchase" are referenced in Appendix A, however these concepts were not explained.

vii. Similarly, regarding the Scope 3 emissions calculation methodology, the assessment applies fixed percentage assumptions derived from Scope 2 emissions for the reported sources. Where possible, activity data and related emission factors should be included. Please consider activity based methods endorsed by GHG Protocol. According to the Large Emitters Guide, NGA scope 3 emission factors should be applied where available. Technical Guidance for Calculating Scope 3 Emissions (Scope 3 guide) gives data requirements and methods for calculating GHG emissions for each category. The GHG Protocol provides a list of available third-party databases to help users collect data for scope 3 GHG inventories.

viii. While grid water consumption volumes are presented in Appendix A, the assessment does not explicitly quantify the associated greenhouse gas emissions from water supply as part of Scope 3, nor does it provide detail on the water supply system or assumptions applied.

ix. The EPA notes that the calculations of Scope 1 and Scope 3 emissions do not reference the most up-to-date emissions factors published in the National Greenhouse Accounts Factors: 2025 by DCCEEW (National Greenhouse Accounts Factors: 2025 - DCCEEW).

x. For the emissions inventory reported in Appendix A, the assessment applies the expected Scope 2 renewable electricity target and simultaneously accounts for offsets against Scope 1 emissions. However, offsets are intended to address residual emissions only and should not be included within the project only GHG emissions calculations.

As outlined in Section 4.1 of the Large Emitters Guide, the project only scenario should represent the GHG emissions of the proposal within the defined assessment boundary, after the application of any planned mitigation measures, but before the application of offsets. This enables the net GHG emissions impact of the proposal to be assessed and understood.

The project only scenario should therefore include only the sources and emissions within the GHG assessment boundary, incorporate planned mitigation measures, and clearly distinguish between emissions and any subsequent offsetting.

xi. References are made throughout the assessment to data centre industry benchmarks; however, no detail is provided on the specific benchmarks, metrics, or specific projects used. In accordance with the Large Emitters Guide, the assessment should include a clear comparison of the project's Scope 1 and Scope 2 emissions and emissions intensity (per unit of output) against comparable projects, recognised best practice performance, and relevant industry standards or milestones, where available.

Recommendation: The GHG assessment be revised to include and justify all input data and assumptions used to estimate Scope 1, Scope 2, and Scope 3 emissions, and to demonstrate

how these inputs represent the project's full emissions profile across all relevant lifecycle stages and emissions sources.

b. Applicant to be informed that the EPA considers indirect emissions due to electricity use within the premises as Scope 2 emissions

If approved, the proposal will trigger environment protection licence requirements under 'chemical storage' in accordance with Schedule 1 of the Protection of the Environment Operations (POEO) Act.

The applicant describes as an excluded Scope 3 emission source: "Use-phase emissions from tenants' IT workloads and customer digital services fall outside the operator's reporting boundary"., and "(…) emissions are accounted for by customers under their own Scope 2 or 3 inventories". At the same time, small-scale tenant fit-outs are considered separately as part of tenant-managed emissions.

It is important to clarify that the EPA's current position is that, for licensing and assessment purposes, indirect GHG emissions from electricity use within a licensed premises (whether by the operator or by lessees) are considered Scope 2 emissions attributable to the licensee. This is consistent with the NSW EPA's regulatory approach whereby the EPA regulates all activities and operations within the premises. The licensee is responsible for managing emissions and potential environmental impacts due to activities undertaken within a licensed premises.

Currently, it is the EPA's position that the applicant:

- can influence the final project design to avoid, reduce and substitute emissions as far as is feasible and practicable.
- will have the power to purchase electricity that is backed by renewable sources for all operations within the premises.

Recommendation: The applicant be made aware that for licensing and assessment purposes, the EPA considers that indirect GHG emissions due to electricity use (by the operator and lessees) within a licensed premises are Scope 2 emissions. This does not preclude the applicant from following relevant guidelines or fulfilling their obligations under other regulatory frameworks.

4. Waste Management

The proposal provides detail on the total quantity of lithium-ion batteries (LIBs) to be stored on the premises but does not appear to provide any details on the likely quantity of waste batteries to be stored on-site at any one time. This information is needed to consider the adequacy of proposed storage and emergency mitigation and management measures.

Recommendation: The proposal provide details of likely quantity of waste LIBs to be stored on the premises at any one time.