

## Appendix A to CBAG Operational Noise Assessment

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|  | Needs to be addressed and made a <b>CONDITION of CONSENT</b> |
|  | Needs more work ...can do better                             |
|  | Good   |

| EIS<br>REFERENCE  | TOPIC                 | REF #  | ISSUE   | CBAG RESPONSE  | REVIEWED |
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| <b>VOL 1B<br/>chapter 9<br/>noise &amp;<br/>vibration</b> | Existing noise levels | 9.2.3<br>page 9.6 and<br>the whole of<br>Table 9.3 | <p>Table 9.3 is described as “A summary of the background noise levels and road traffic noise levels”.</p> <p>This is totally misleading. Depending on how this data has been used, it could totally misrepresent the existing <b>road traffic noise</b> in these areas. More analysis needs to be done to obtain a much more accurate measure of existing road traffic noise, particularly in the quieter areas.</p> | <p>This will be dealt with in detail in our response to the Operational Noise Results table in Appendix 4B of this document.</p> <p>The column titled Measured Traffic Noise Level LAeq is inappropriate. What is presented is the <b>total noise level</b>, with no attempt to split out traffic noise. The difference is often vast.</p> |          |

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| <b>VOL 1B<br/>chapter 9<br/>noise &amp;<br/>vibration</b> | Operational<br>Noise and<br>Vibration<br>Criteria | Sleep<br>disturbance p<br>9-28 | <p>Repeatedly throughout this document the EIS cherry picks the same key phrase out of Sections 5.4 (Sleep Disturbance) and 5.5 (Health Effects) of the NSW Road Policy document (2011).</p> <p>The two key points are 1 “Maximum internal noise levels below 50–55 dB(A) are unlikely to cause awakening reactions” and 2 “One or two noise events per night with maximum internal noise levels of 65–70 dB(A) are not likely to significantly affect health and wellbeing”.</p> <p>This is not at an accurate reflection of the responsibilities of the proponents under Sections 5.4 and 5.5 of the NSW Road Traffic Policy.</p> | <p>This will be dealt with in detail in our response under Volume 10 Section 5 Assessment of Noise Impact on Health.</p> <p>For now, the key point to be made is that continually repeating this phrase when it is not a fair representation of the responsibilities of the RMS under the policy, is highly deceptive.</p> <p>There is no Quantitative Assessment of the predicted maximum noise events in terms of quantity and noise level at different distances along the route.</p> <p><b>Failure to include a Quantitative Assessment, when the profile of the traffic along the new corridor is well understood, fails to discharge the responsibilities of the RMS under sections 5.4 and 5.5 of the NSW Road Traffic Policy.</b></p> |  |

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|                     |                                | Health Impacts from Operational Noise p 9-66 | <p>A conclusion is reached, “As such, where noise mitigation is not implemented there is the potential for unacceptable health impacts at some properties in these NCAs.” ‘At residence’ remediation is proposed and then in the next sentence the conclusion is reached that ‘at residence’ remediation may not be effective and carries its own issues.</p> <p>If the potential for unacceptable health risks is created, then surely it is inviting future litigation to leave it unremedied.</p> | In the Operational Noise Results table residences are left unmitigated at L(A)eq,night levels of 61 and 64. Surely this is a clear example of creating the potential risk of unacceptable health impacts.   |  |
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| <b>VOL 4A App G</b> | Noise and Vibration Assessment | Executive Summary p2                         | <p>The EIS states: “A qualitative analysis was undertaken of potential change in maximum noise impacts due to the project” and “The overall magnitude of maximum road traffic noise events is not expected to change significantly along existing road corridors where alterations to geometry are minimal”.</p>   | <p><b>There needs to be a Quantitative Assessment of the predicted maximum noise events in terms of quantity and noise level at different distances along the route. The area of focus should be night, and it should be by hour of the night so as to allow a better understanding of the impact on sleep.</b></p> |  |

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|                     |                                |  | <p>The first issue is that feedback from experiences at Valla Beach, Boambee, Sapphire and Emerald Beaches, and Woolgoolga would indicate that a change in speed from 80 km/h to 110 km/h <b>does cause a substantial change in sleep disturbance</b> probably due to maximum noise impacts. The 2<sup>nd</sup> issue is that the above conclusion only applies “along existing road corridors where alterations to geometry are minimal”. What about all of the <b>other areas along the Bypass</b> where the alterations are significant?</p> | <p>This should clearly distinguish between areas where “alterations to the road geometry are minimal” (the northern and southern ends) and those areas where the road corridor is ‘new’.</p> <p>Failure to include a Quantitative Assessment, when the profile of the traffic along the new corridor is well understood, <b>fails to discharge the responsibilities of the RMS under sections 5.4 and 5.5 of the NSW Road Traffic Policy.</b></p> |  |
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| <b>VOL 4A App G</b> | Noise and Vibration Assessment | Sub-section 3.1.2 p18 Noise Mitigation Guideline | <p>There are a few guidelines that need to be quoted because they have not been consistently followed:</p> <p>“Communities should receive reasonable and equitable outcomes”.</p> <p>“Incidental benefits from the noise mitigation designed for qualifying receivers should be recognised at all receivers within a community where noise levels</p>   | <p><i>See Appendix B in our attached CBAG Data Appendices document for data that supports our conclusions.</i></p> <p>In NCA13 which has been classified as a ‘Transitional Zone’ the community <b>is not receiving “reasonable and equitable” outcomes.</b></p> <p>1 The existing <b>traffic noise levels</b> do not appear accurate, when tested at the façade of modelled residences</p>   |  |

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|                     |                                |                                       | <p>exceed WHO guidelines (Façade noise levels of 50 dB(A) during day and 45 dB(A) during night-time)".</p>   | <p>(see submission Volume 4B G1 analysis).</p> <p>2 The existing noise source at night is highly skewed to a small portion of the period (5 – 7 am) but this is being used to justify a higher permitted threshold which will impact over the whole night (new highway traffic noise goes right through the night).</p> <p>15 Safrano Place measures <b>44.2</b> dBA from 12-5am but <b>55.6</b> dBA 5-7am</p> <p>21 Safrano Place measures <b>35.7</b> dBA from 12-5am but <b>49.1</b> dBA 5-7am</p> <p>We have included in Appendix A a visual of the soundwave and 10 minute recording typical of the 5-7 am period for 15 Safrano. It is 67% birds. And this is the more typical scenario for most of NCA16.</p> |  |
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| <b>VOL 4A App G</b> | Noise and Vibration Assessment | Sub-Appendix C Noise Survey Summaries | <p>The essential issue is that the readings <b>do not distinguish traffic noise from other noise</b> and there is <b>no indication in the EIS of how this data is fed into the models</b> that arrive at 'No Build' baseline noise levels. We will present the evidence in areas we have measured to</p> | <p><i>See Appendix B in our attached CBAG Data Appendices document for data that supports our conclusions.</i></p> <p>Example: Noise Logger 16 in NCA16. It is measured <b>at night</b> as 53 dB(A). The notes contained in Sub-appendix C of Volume 4A clarify that</p>   |  |

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|  |  |  | <p>show that the recorded measurements are not indicative of existing traffic noise. Just looking at the aerial photos of many of the loggers and the photos of the precise positioning it is clear that they are positioned near trees or chained to trees where birdlife is likely to distort the 5-7 am results in a significant manner.</p> <p><b>There needs to be an independent audit made of these measurements to ensure that they are fit for the purpose for which they have been used.</b></p> | <p>“hardly any road traffic noise was heard”, that “presumably the main source are trains”, and that “background noise is characterised by local fauna”. From our own measurements when 8 x 5-minute measurement periods that were impacted by train were dropped from the measurement from 10 pm until 5 am the noise level drops from 57.7 dBA to 31.5. The 5 am until 7 am time period is absolutely dominated by local bird noise. There is hardly any traffic to be heard. Yet this period in our measurements measured 53.9 dBA. In all likelihood the real traffic noise is close to 33 dBA.</p> <p>Many of the other receivers are placed close to bushland or under trees where birdlife is likely to greatly distort the 5 – 7 am period.</p> <p>In all of our noise measurements and noise recordings, particularly in the more quiet areas, the <b>5-7 am</b> period has a significantly louder reading. In the more quiet areas, even in NCA13 once you get more</p> |  |
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|                     |                                |  |  | than 50 or so metres from Coramba Road, the noise at this time of day is dominated by bird noise.  |  |
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| <b>VOL 4A App G</b> | Noise and Vibration Assessment | Sub-appendix D Noise Monitoring Graphs | <p>The main logger on which we would like to focus is Noise Logger 4 (NCA13) 12 Tamora Close.</p> <p>The graphs support much of the more granular analysis that we have performed and demonstrate an issue that we have been raising; which is that the traffic profile for Coramba Road is very skewed.</p> <p>As discussed in Volume 4A Sub-section 3.1.2 above we feel the whole of NCA13 is not receiving a fair and reasonable outcome because the total averaged measurements from this logger are being used to give a whole area higher targets which they will be subject to right throughout the night period.</p> | <p><i>See Appendix B in our attached CBAG Data Appendices document for data that supports our conclusions.</i></p> <p>Again we are focusing on the night measurements, in this instance for logger 4, which was positioned in the open right behind a thin fence almost on Coramba Road. This is a validation logger and is measured as 52 dB(A) for the night period. If we focus on time period 22-24, 0-5, and 5-7 there is a clear picture that develops which is consistent with the measurements we will present in our submission in Volume 4B where we challenge some of the modelled 'no build' baseline measurements.</p> <p>Period 22-24: the first hour Leq measurements are consistently in the low 50's, whereas the 2<sup>nd</sup> hour consistently drops into the mid 40's.</p> |  |

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|  |  |  |  | <p>Period 0-5: the measurements jump around in a range from 40 dBA to 50 dBA averaging something like 45.</p> <p>Period 5-7: the measurements start at the low 50's and move into the low 60's.</p> <p>We measured this residence and a very similarly positioned residence at the façade and obtained readings just on and below 50 dB(A) for the Leq(A),night period. We believe the modelled figure is slightly high and does not take account of non-traffic noise. We would contend that it should be independently measured again, due to the number of residences impacted by this measurement.</p> <p>Equally as importantly we measured the same more granular time periods mentioned above and found the same pattern.</p> <p>There is no doubt that the Coramba Road traffic at night is very skewed to the 5 – 7 am morning period; and, for those residences backing onto Coramba Road, it is this period that is dragging the Leq night level up from significantly lower levels.</p> |  |
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|                     |                                |  |   | <p>This is critical because it is this that is causing the whole NCA to endure higher levels of the 'new corridor' noise profile which is characterised by truck noise which travels further and continues right through the critical 11 until 5 am period where residents can currently get good sleep.</p>  |  |
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| <b>VOL 4A App G</b> | Noise and Vibration Assessment | Sub-appendix F2.2 Validation Traffic Volumes | <p>The issue with this data is that it was only made available at an aggregated level where it masks the real difference between the profile of Coramba Road versus the Pacific Highway.</p> <p>We requested this information in writing from the RMS early in the submission period but it was not made available.</p> <p>It will show the point we are making that the community in noise area NCA13 is not receiving a fair and equitable outcome.</p> | <p>The aggregated traffic volume for the night-time period shows the difference between the aggregate profile of Coramba Road and the Pacific Highway: Per hour light vehicles of 44 versus 300 and heavy vehicles of 5 versus 70.</p> <p>What it masks is the picture in the 11 pm until 5 am period of something in the range of 10 per hour for Coramba Road (total vehicles) versus 70 per hour (trucks only) for the Pacific Highway.</p> <p><b>The residences in noise area NCA13 (around Coramba Road) will not receive a fair and equitable outcome if the Transition Zone approach is blindly applied as it has been in the EIS.</b></p> |  |
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| <b>VOL 4B App G</b> | Noise and Vibration | G1: Operational Noise Results Table | <p>There are 3 key issues shown up by our analysis of residences in this table. They all relate to the Unmitigated Night No Build that has been modelled:</p> <p>1) Around the Coramba Road area (NCA13) it is inaccurate. It is significantly above measurements that we have made at the façade for a number of residences at different distances from Coramba Road. According to the EIS model 10% of the façades in NCA13 have a No Build modelled level of 50 dBA or higher. Of these the average increase to the Mitigated Build Night level is 1.3 dBA. Given the noise events in this area due to the Bypass, this cannot be correct. <b>This needs independent investigation, We contend that the starting level is incorrect.</b></p> <p>2) In quiet areas (such as NCA16) the noise level in the 5 am until 7 am time period from native birdlife has not been taken out. If it has been taken out then it needs further review. An analysis</p> | <p><i>See Appendix B in our attached CBAG Data Appendices document for data that supports our conclusions.</i></p> <p><b>1A) Coramba Road (NCA13)</b> – a façade on the southern side of 15 Safrano Place, a residence <b>backing onto Coramba Road</b>. Measured 18 and 20 metres from Coramba Road:<br/> * Leq,night readings of <b>49</b> and <b>50.2</b> dB(A). EIS No Build estimates <b>60</b> and <b>64</b> dBA.<br/> * Leq readings for 10 pm until 5 am of <b>45</b> dBA and 5-7 am of <b>55.6</b>. Shows the skewed nature of the traffic on Coramba Road.<br/> * EIS final Mitigated Build Night predicted levels of 61 dBA and 65 dBA, a total increase from the EIS modelled No Build level <b>over 10 years of 1 dBA for each façade!!</b> This given an increase in traffic on this section of Coramba Road due to the Bypass, an interchange at a distance of 380 metres, the Bypass at 345 metres to closest point, and the bypass arc around this property!</p> <p><b>1B) Coramba Road (NCA13)</b> – a façade on the western side of a</p> |  |
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|  |  |  | <p>of the façades on the street-side of residences has left an allowance for local traffic that is significantly above what we believe to be the current picture (measured and audio evidence included in Appendix A).</p> <p>3) In elevated areas at some distance (400 metres) from existing noisy areas the figures in the table are significantly above those that current measurements show. The example detailed here is 10 dBA less than the No Build baseline figure modelled in the Noise Table. <b>Again this needs independent investigation.</b></p> | <p>residence 1 block back from Coramba Road. Measured <b>80 metres from Coramba Road</b> with an open view to it and right on Roselands Drive:</p> <p>* Our Leq,night readings of <b>43.4</b> dB(A). EIS No Build estimates <b>53</b> and <b>54</b> dB(A).</p> <p>* Our Leq readings for 10 pm until 5 am of <b>36.8</b> dBA and 5-7 am of <b>49.1</b>. Most of the 5-7 am noise is bird noise.</p> <p>* EIS final Mitigated Build Night predicted levels of 56 dBA and 57 dBA, a total increase from the EIS modelled No Build level over 10 years of 3 dBA for each façade. This given an increase in traffic on this section of Coramba Road due to Bypass, an interchange at a distance of 323 metres to the centre, the Bypass at 350 metres to closest point, and the bypass bending around this property!</p> <p><i>See Appendix A in our attached CBAG Data Appendices document for data and a map that supports our conclusions.</i></p> |  |
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|  |  |  |  | <p><b>1C) Coramba Road (NCA13)</b> – a façade on the southern side of 12 Tamara Close, a residence <b>backing onto Coramba Road</b>. Measured in the EIS in the field right next to the road at 52 dBA and assigned an Unmitigated Night No Build figure of 52 dBA at the southern façade of the residence. Given the growth in traffic to 2024 and the extra distance of the façade from the main source of the noise this appears reasonable. What cannot be correct is that this façade is modelled at baseline <b>52</b> dBA whereas the same position 160 metres further down the road is modelled at <b>60</b> and <b>64</b> dBA. What also cannot be true is that the same façade at 12 Tamara Close, which is 160 metres closer to the new Bypass and interchange, will have a final mitigated noise level of <b>52</b> dBA when 15 Safrano is modelled to finish up at <b>61</b> and <b>65</b> dBA.</p> <p><i>For cases 2A, 2B, and 3 below see Appendix B in our attached CBAG Data Appendices document for data that supports our conclusions.</i></p> |  |
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|  |  |  |  | <p><b>2A) Rigoni Crescent (NCA16)</b> – a façade on the northern side of a residence <b>backing onto the railway</b>.</p> <p>* We basically replicated the Leq,night readings of Logger 16. In fact we measured slightly noisier, but this can reasonably be explained by an increase in the dominant source of the noise which is the trains, with freight trains being quite variable.</p> <p>* Measured Leq readings for 10 pm until 5 am dropped from <b>57.7 dBA</b> to <b>31.5 dBA</b> by excluding the periods (ours measured in 5 minute intervals) impacted by the train. Note that even this reading of 31.5 is impacted by many noises other than traffic.</p> <p>* The EIS Unmitigated No Build Night modelled level for this residence is 30 dBA for 3 façades and 32 dBA for the façade facing the street. We feel this fits well with our measurements and audio.</p> <p><b>2B) Brennan Court (NCA16)</b> – a façade on the southern side of the residence <b>backing onto the street (the end of a cul de sac)</b>.</p> |  |
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|  |  |  |  | <p>* We measured this twice on weekdays and obtained readings within 1 dBA of each other. Again the train is the dominant factor over the night-time period, though this house is more protected and the house partially shielded the train noise from our measurement site.</p> <p>* Measured Leq readings for 10 pm until 5 am dropped from <b>35.7</b> dBA to <b>30.4</b> dBA by excluding the periods (again measured in 5 minute intervals) impacted by the train. Note that even this reading of 30.4 is impacted by many noises other than traffic, though local traffic can be clearly heard at points through-out this period.</p> <p>* The 5 – 7 am period is the point of contention. Our measured Leq readings are in the range of <b>43 to 45</b> dBA but the noisy periods are predominantly dominated by bird noise.</p> <p>* It is incredibly difficult to separate out the non-traffic noise in this time-period and there needs to be more investigation as to how a figure of 6 dBA is being assigned to the local traffic by the EIS model.</p> |  |
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|                     |                   |                            |   | <p><b>3) Breakers Way Korora (NCA24)</b> – a façade on the western side of a residence <b>410 metres from the existing highway (speed limit 80 km/h)</b>. Note also that this property is elevated from the highway and the highway at this point travels in a wide arc around the residence.</p> <p>* Measured Leq readings for 10 pm until 5 am of <b>41.1 dBA</b> and <b>50.1 dBA</b> in the 5-7 am time period, giving <b>45.1 dBA over the 9 hours</b>.</p> <p>* However the 5-7 am time period is dominated by bird noise to the extent that the highway noise is just a hum in the background. It is difficult to believe that the existing traffic noise over this time period would be much more than 1 to 2 dBA over the average for the preceding 7 hours.</p> <p>* The EIS Unmitigated No Build Night modelled level for this residence is <b>50-52 dBA</b> for the western façades. We believe this should be about <b>42 dBA</b>.</p> |  |
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| <b>VOL 10 App Q</b> | Human Health Risk | 5.2.2: Health Impacts from | This section and sections 5.4 and 5.5 of the NSW Road Traffic | Given the raw number and percentage of façades that exceed  |  |

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|  | <p>Assessment – Section 5</p> <p>Assessment of noise impacts on health</p> | <p>Road Traffic Noise</p> | <p>Policy document (2011) refer to a number of guidelines and statements from various bodies in Australia and around the world that should be examined carefully and applied where appropriate.</p> <p>In the Road Traffic Policy document of 2011 is a reference to WHO Report of <b>2009</b> that concludes with a recommendation of the adoption of “a long term a long-term L<sub>A</sub>night,outside noise guideline level of 40 dB(A), with an interim L<sub>A</sub>night,outside target level of 55 dB(A). The <b>interim target</b> is only intended as an intermediate step”.</p> <p>During the 10 years elapsed since that report the WHO in 2018 has come out with new guidelines which it strongly recommends and that is the immediate <b>adoption of a long-term L<sub>A</sub>night,outside noise guideline level of 45 dB(A).</b></p> | <p>the WHO 2018 <b>L<sub>A</sub>night,outside noise guideline level of 45 dB(A)</b> and for which there is no recommendation of responsibility for ‘at residence’ remediation we request the commissioning of an independently run Quantitative Assessment <b>that deals with anticipated overnight maximum noise levels, frequency of occurrence, by hour of night, at various distances and elevations from the noise source.</b></p> <p>Given that the major reason for the recommendation within the noise model for ‘at residence’ remediation is the due to the high No Build baseline modelled noise levels and the analysis and data that we have presented that casts doubt on those figures, we are requesting an independent analysis of the data and processes that lead to the predicted results and that further ‘at façade’ noise testing be conducted to increase the confidence level in this part of the model. Again, given the one-sided nature with which the noise</p> |  |
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|  |  |  | <p>These documents taken together reach many conclusions which are repeated in the EIS:</p> <ul style="list-style-type: none"> <li>* Leq on its own is not an adequate measurement for potential health impacts in general and sleep disturbance in particular.</li> <li>* "While no specific criterion is set to address this specific issue, a number of guidance points may be used to qualify if the maximum noise level is likely to be an issue. These include calculation of maximum noise levels, the extent to which the maximum noise levels for individual vehicle pass-bys exceed the LAeq noise level for each hour of the night, and the number of times the maximum noise levels for individual vehicle pass-bys exceed the LAeq noise level for each hour of the night."</li> <li>* "The volume of long-haul road freight vehicles becomes proportionally more significant during the night-time period and hence the determinant of road traffic noise disturbance."</li> </ul> | <p>assessment has been presented to date, we are requesting that this task be managed by a body independent from the RMS.</p> <p>Again in this section of the EIS and through-out multiple more visible sections of the EIS the proponents have cherry picked one section that taken on its own presents a biased view of Sections 5.4 and 5.5 of the NSW Road Noise Policy. The two key points are:</p> <ol style="list-style-type: none"> <li>1 "Maximum internal noise levels below 50–55 dB(A) are unlikely to cause awakening reactions"</li> <li>and 2 "One or two noise events per night with maximum internal noise levels of 65–70 dB(A) are not likely to significantly affect health and wellbeing".</li> </ol> <p>Even if these two key phrases summed up the responsibilities of the RMS in these key areas, there are key issues that have not been addressed:</p> <ul style="list-style-type: none"> <li>* the fact that internal noise levels need to go above the stated level to cause an awakening event does not</li> </ul> |  |
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|  |  |  | <p>An analysis of the Operational Noise Results table shows the following (keeping in mind the WHO 2018 <b>long-term LA<sub>night</sub>,outside noise guideline level of 45 dB(A)</b>).</p> <ul style="list-style-type: none"> <li>* 15% of the façades in the Boambee NCA's</li> <li>* 25% of the façades in the West Coffs NCA's, including 70% in NCA13</li> <li>* 68% of the façades in the Korora NCA's</li> </ul> <p><b>have a final night-time mitigated predicted noise level of 45 dB(A) and above with no recommendation of further at residence remediation.</b></p> <p>The overwhelming reason for the absence of any 'at residence' remediation recommendation is due to the high No Build baseline modelled figures.</p> <p><b>We see two significant issues with this:</b></p> <p>1) <b>There needs to be a high level of confidence that the No Build modelled figures are accurate.</b></p> <p>As already demonstrated, we do</p> | <p>of itself mean there isn't a problem. People wake multiple times during the night, if the noise level causes people to not be able to get back to sleep then there is a problem.</p> <p>* The EIS presents no evidence that residences are not experiencing internal noise levels above 50-55 dB(A). There is no Quantitative Assessment of maximum noise events in the whole document.</p> <p>In support of the recommendation made by the WHO (2018), as if such a body should require us to validate its findings, we would challenge anybody assessing this EIS to go to 30 Birugan Close, Valla Beach and sleep for a week in one of the rooms on the highway side of the building. The analysis of the noise readings for this residence are presented in Appendix A, and match almost exactly measurements taken and presented in the Post Operational Noise Assessment (2016) for the Nambucca to Urunga section of the Pacific Highway. In summary the Leq(A),night reading is consistently measured around 48</p> |  |
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|  |  |  | <p>not believe this is the case and recommend that a thorough independent noise test and analysis be conducted.</p> <p>2) Given the number of residences that are modelled to exceed the latest WHO guidelines it is staggering that <b>there is no data presented in the EIS that deals with anticipated overnight maximum noise levels, frequency of occurrence, by hour of night, at various distances and elevations from the noise source.</b></p> | <p>dB(A), a level which is quite consistent every hour of the night due to the overnight highway truck profile. Most people would clearly find this a problem and a 3 dB(A) reduction from this level is likely to make a significant difference.</p> <p>The high pre-existing noise levels at Boambee and Korora are used as rationale to impose higher mitigated noise level targets on residents. Long term residents along the existing route (Aubrey Crescent) have often commented on how much the noise level had changed in the last 5 – 10 years, since the recent emphasis on Pacific Highway upgrades has commenced. This should be investigated because, if substantiated in reliable traffic data, it would indicate that we should be now returning the noise targets back to the 'no fault' maximums, not ratcheting them up based on previous upgrades for which we never properly remedied residents outside the immediate study area who were never properly compensated.</p> |  |
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