Wollondilly Shire Council

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Kiersten Fishburn
Secretary
Office of the Secretary
Department of Planning, Industry and Environment
C/o - OSEC.Corro@dpie.nsw.gov.au

2 December 2021

Dear Secretary

WARRAGAMBA DAM WALL RAISING - ENVIRONMENTAL IMPACT STATEMENT (EIS) SUBMISSION

Please find attached Wollondilly Shire Council's submission on the proposed Warragamba Dam Wall Raising Environmental Impact Statement (EIS)

Council is alarmed at the significant inadequacies of the EIS in particular to the information supplied relating to (but not limited too);

- Project Development Alternatives
- Consultation
- Air Quality
- Biodiversity Upstream
- Downstream Ecological Assessment
- Biodiversity Construction Area
- Matters of NES - Biodiversity
- Biodiversity Offset Strategy
- Flooding and Hydrology
- Heritage impacts – particularly aboriginal heritage
- Noise and Vibration
- Traffic and Transport

The application has not adequately demonstrated that the potential impacts of the proposal are satisfactorily addressed or mitigated, nor demonstrated the benefit of the project justifies the cost. It is therefore submitted that the current application should not be supported based on the exhibited EIS.

Should you wish to discuss any of these issues further please contact our Manager Assets, Transport and Engineering, Mike Nelson on 4677 9580

Yours faithfully

Cr Robert Khan
Mayor

Warragamba Dam Raising

EIS Submissions

Submitted 3 December 2021 by

Wollondilly Shire Council

Contents

Executive Summary

Wollondilly Shire Council unanimously Resolved its strong opposition to the raising of the Warragamba Dam Wall, at an extraordinary meeting on Friday, 8 October 2021, condemning the inadequacies of the recently released Environmental Impact Statement (EIS).

Councils view is that; not only does the EIS fail to address many of the conditions imposed by the SEARs, but completely fails to demonstrate the viability of the Project. In summary;

Council is concerned with the demonstrated value of the project

- The EIS articulates the project has a 'cost benefit ratio' of 1.05, barely breaking even.
- Yet this includes $700m of unspecified 'works already required', discounting the cost of the project to achieve a result better than 1, at the same time failing to include adequate allowances for heritage impacts including cultural value impacts, ecology impacts and offsets, traffic impacts (road safety, condition and capacity), noise, air quality and socioeconomic impacts on the village of Warragamba.
- As an alternative proposal; the citing of 'social impact' of voluntary purchasing (VP) flood affected properties has been used to discount VP as an option. Yet VP is an adopted state wide practice under the floodplain management program and other state lead initiatives such as the asbestos buy back scheme. Additionally, the EIS does not acknowledge the social impact of properties that will continued to be being flooded, or flooded for longer if the project is to proceed.
- Clarity needs to be given, on the long term benefits of the project given potential for development and densification of the Hawkesbury Nepean Valley.

Council is concerned with the level of consultation carried out to inform the EIS

- There has been inadequate, meaningful consultation regarding upstream and adjacent community impacts, local and state government lead initiatives (such as Silverdale Rd upgrades), therefore there must be more extensive consultation with commitment to act on findings.
- Anecdotally, residents of the Hawkesbury Nepean feel that this is a 'silver bullet' to solving the flood issue in the valley, leading to false expectations and complacency.

Council is concerned with air quality for the village of Warragamba during the 5year construction period

- A construction air quality management plan, to include a dust mitigation plan for all stages of the works, is required, in order to mitigate exceedences in dust and particulate matter criteria at sensitive receptors. 24 hour average particulate matter are likely to be in exceedence at receptor R49.

Council is concerned with how ecological impacts have been assessed

- The determination of the level used for the Project Upstream Impact Area (PUIA) is confusing and not appropriate. It would appear the level chosen to determine the PUIA is **~1.5m lower** than the height of the proposed spillway**, ~3m** below the nominal 14m high wall extension and **~8m** below the actual 19m extension being proposed. Nil impact above the nominated PUIA level is inappropriate and shows the 'typical flood' used to determine the PUIA is significantly lower than the design flood event used for the project.
- Clarity is required on the applicability of the *NSW Biodiversity Conservation Act's* Biodiversity Offset Scheme, and the appropriateness for the State Government to suggest anything else could be used.
- The potential significant impact proposed to a large number of threatened species and ecological communities, including those already listed as Critically Endangered under State or Commonwealth legislation, must be critically considered. This does not align with a key principle of the project to achieve a 'no-net-loss' of biodiversity.

- Clarity is required on the version of the Koala SEPP that is applicable to the EIS and update the EIS accordingly.
- Council have found inconsistencies with aspects of the biodiversity related Standard Secretary Environment Assessment Requirements. It is asked that a specific response is provided which talks to the Desired Outcomes for the Major Impact Priority Theme within the Greater Blue Mountains World Heritage Strategic Plan.
- The stated number of credits to be retired through offsetting as a result of the development will likely result in significant expense for the applicant and offsetting may not be able to be achieved based on requirements of the FBA and rules and principles of the NSW Offset Policy.
- The need for more extensive surveys for threatened flora species is viewed as being of particular importance to enable an accurate assessment of biodiversity values and actual threatened species directly impacted by the development as well as informing offsetting.
- The project does not seem to have adequately considered the avoidance of impacts to biodiversity and instead is focused on offsetting.
- Review of the applicable biodiversity legislation, given the exhibition of the EIS in October 2021. Consideration of Serious and Irreversible Impacts may be required.

Council is extremely concerned with how heritage impacts, including cultural impact, have been addressed.

Further to the non-aboriginal heritage assessment;

- The heritage assessment does not consider all heritage places and items in study area.
- The EIS only gives a generalised assessment of impacts for the majority of heritage places.
- The heritage assessment does not identify and assess impacts on social heritage values.
- Options analysis for the project does not demonstrate a clear consideration of heritage impacts of alternatives to justify the selected approach.
- The heritage assessment does not include mitigation measures for impacts on downstream heritage sites.

Further to the aboriginal heritage and cultural value assessment;

- the options analysis does not appear to account for Aboriginal cultural heritage values;
- the survey method is inadequate;
- predictive modelling is flawed due to its limited focus on soil and slope landscape characteristics, and its reliance on an inadequate survey methodology;
- National Heritage values have not been assessed;
- cumulative impact assessment is inadequate—the cumulative impact assessment uses historical impacts as a mitigating measure for current additional impacts, does not account for historical loss, and does not account for the views of RAPs / Traditional Owners; and recommendations do not adequately address the impacts, and do not account for Aboriginal cultural values, but are focused only on technical archaeological values.
- As detailed in ecological impacts, the PUIA is determined from a low 'typical flood event', much lower than the design event for the wall.

Council is very concerned with the noise impacts to the residents of Warragamba for the 5year construction period, and how this will be mitigated

- In Order to meet the requirements of the SEARs, assessment should be carried out to demonstrate how blast impacts can be mitigated at receivers to ensure that they meet with current guidelines
- Details should be provided on how the recommendations provided in the Noise and Vibration Assessment will achieve compliance at the nearest sensitive receivers, particularly during evening and night time periods.

- Given the length of time that sensitive receivers are likely to be impacted by noise and vibration from the construction works, (up to 5 years), the assessment should also consider mitigation measures, from noise and vibration generating activities.

Council is very concerned for the socioeconomic impacts to Warragamba and how this will be addressed

Warragamba is heavily reliant on tourism trade and history has showed that extended dam works has a disastrous impact on the local shops. This has not been addressed in the EIS and 'local shop engagement' does not reflect the concerns raised direct to Council.

Noise impacts, air quality impacts and local traffic impacts will also have a significant detrimental impact to the village and have not been satisfactorily covered in the EIS.

The offer to 'Provide support to Wollondilly Council to assist with project related administration and enquiries' is unknown to Council and expectation is not clear, what level of service or if this has been costed.

Council is very concerned with the impacts to the Wollondilly road network and the lack of consideration in the EIS

Wollondilly has an aging road network with significant road safety, road condition and road capacity issues. Any development would be required to develop traffic impact assessments and transport management plan that must include;

- Approval from the relevant Roads Authorities on the chosen haul routes.
- Clear articulation of all transport routes proposed including the 'north' and 'south' route.
- Pre and post dilapidation surveys of all roads, bridges and structures on the routes.
- Road safety audits by qualified persons, informing road upgrades to be completed prior to works commencing on the dam
- Capacity (traffic volume, heavy vehicles, structural) assessment for all intersections, roads, bridges and structures and proposed mitigation measures.
- Management measures for sensitive land uses, such as schools, adjacent to proposed routes.
- Updated traffic counts and modelling to accurately reflect the construction period.
- Management plan for monitoring and remediating as required throughout the construction period.
- Management plan for inspection and remediation of Sheeys Creek Firetrail following any flood event (post-construction) given its criticality in accessing the Burragorang Valley, particularly in times of bushfire.

The application has not adequately answered the SEARS & failed to demonstrated that the potential impacts of the proposal are satisfactorily addressed or mitigated, nor demonstrated the benefit of the project is sufficient to justify the cost and impacts.

Chapter 02 – Statutory and Planning Framework

Chapter: 2 Statutory and Planning Framework	Reference:
Primary Issue: Hierarchy of legislation is misleading.	
Task: The assessment framework is addressed in the chapter provides a brief overview of various Legislation, Policies, Plans and Guidelines related to water, dams, fisheries, and environmental values including habitat protection for the project. Many do not require specific approvals. However they are required to undertaken an assessment of impact.	
Details: In terms of the hierarchy of plans, the National Environmental Biodiversity and Conservation Act 1999 protections afford protection with the world heritage listing with UNESCO, the National Heritage Listing and these should be clearly addressed and articulated and the strength in terms of hierarchy noted. The 'last' section of the document should be the listed first in order of hierarchy. The Local Strategic Planning Statement, District Plan and Metropolitan Plan all form part of the planning framework, however, none of the key strategic planning document are considered nor listed. The assessment on some impacts are not as robust i.e. Aboriginal Heritage Assessment and the scale of assessment (spatial) undertaken. The studies need to be robust so that appropriate management of impacts can be addressed in the EMP for the project. Part 5A of the Water NSW Act may not require the project to obtain a lease, licence etc. to temporarily inundate land protected un the NPW Act however before they do cause inundation they need to prepare an EMP to the satisfaction of the Minister. The EMP is only as good as the information it is based on and we should argue that the information is flawed/not extensive enough to understand the full extent of impacts. If the project proceeds, it must be abundantly clear what the full range of impacts will be, the mitigations measures, the environment, social and economic impacts must be completely understood. The work should it go ahead needs to be supported by comprehensive studies that identify full extent of impacts. This does not appear to be the case after having listened to the representation on Aboriginal Cultural Heritage. We could suggest the EMP based on current work/field survey would not meet legislation because it does not do a full and proper assessment.	

Chapter 03 – Strategic Justification

Chapter 3: Strategic Intent	Reference: N/A
Primary Issue: Alternative Options with less impact must be explored transparently	
Task: Chapter 03 mainly focussed on analysing the Hawkesbury-Nepean Valley Flood Risk Management Strategy (the Strategy). The protection of life and property are absolute, and this highest principle is supported. The intent of any project seeking this outcome is supported, however this project has been nominated without full transparency of all options, cost benefit, social and environmental considerations being provided clearly to the community. The Strategy identified nine outcomes to reduce flood risk and impacts in the valley, and actions for each of those outcomes. One of the outcomes was to reduce flood risk in the Hawkesbury-Nepean Valley by raising Warragamba Dam, and it reveals: • By raising Warragamba Dam and creating a flood mitigation zone (FMZ) of around 14 metres provided the highest net benefit for reducing flood damages and risk to life compared to other alternatives considered. • They considered raising it higher but was not taken further given additional cost and impacts The outcome/ intent to manage risk is not disputed as being important however it is argued that there are likely other options that need to be explored and costed (infrastructure costs as well as community /cultural/ environmental cost of impacts) Such new infrastructure could include redirecting funds from this project to the early delivery of the OSO with greater access to the impacted communities to create safe access and egress and new or upgrade roads to create flood resistant access for such emergency events. This has the added benefit of serving more than just flood evacuation and can look to support bushfire and other emergency evacuation purposes. Such an option would have les environmental and heritage impacts than a project that would see the complete destruction of environment and heritage values of the NP.	

Chapter 04 – Project Development Alternatives

Chapter 4: Project Development & Alternatives	Reference: N/A
Primary Issue: Need more clarity of assumptions used to determine costs used for Benefit Cost Ratio (of 1.05). Any small increase in costs will drop the BCR ratio to less than 1	
Task: Provide greater clarity of cost of project including appropriate levels of ecological offsets, appropriate heritage impact (including cultural value impacts) compensation, road management, consultancy costs (including EIS preparation) and confirmation of Workplace Health and Safety Explicitly show assumptions for developing costs What are the project controls that would ensure BCR remains above 1.	
Details: **Sect 4.8.1 – cost estimate in order of $1.8-1.9b** Yet for purpose of BCR reduced to $1.07b for 'provision of works already required for dam wall. Need full clarity what these works are, what assumptions are made in those costing, given they amount to $700m +.	

Chapter 4: Project Development & Alternatives	Reference: N/A
Primary Issue: Need more clarity of assumptions used to determine benefits used for Benefit Cost Ratio (of 1.05). Any small decrease in benefits will drop the BCR ratio to less than 1.	
Task: Provide greater clarity of benefits of project including growth in housing assumed over the 30year benefit period that would see a decrease in benefit on an annualised basis (and will reach zero over a long enough timeline).	
Details: Any development within the floodplain will see a sliding decrease in mitigation from the completed project which needs to be demonstrated.	

Chapter 4: Project Development & Alternatives	Reference: N/A
Primary Issue: Fails to demonstrate the benefits of developing and implementing a contemporary floodplain risk management plan approach (consistent with State Government Policy for Flood Prone Land) with a combination of strategies and projects.	

Task: Demonstrate benefits of a combination of measures including capping of development and maintaining or reducing population and density through voluntary purchase of worst affected properties.
Details: A staged VP program over time will reduce risk to life, life and property over time & reduce the need for road upgrades for evacuation – the premise that 'all' properties would be bought (under a VP program) is misleading and voluntary purchases would only occur over a long time period, and can be targeted at 'worst first' priority basis to remove the worst affected properties from flood risk.

Chapter 4: **Project Development & Alternatives**	**Reference:** **N/A**
Primary Issue: Need more clarity about the 'social disruption' of voluntary purchase of properties.	
Task: Require reference to confirm the social disruption of voluntary purchasing properties given its a standard option considered with any floodplain risk management process and the competing social disruption of those properties being flooded.	
Details: Reference work done to confirm the social disruption of voluntary purchasing properties given it's a standard options to be considered with floodplain risk management process development manual and comparison with social disruption of those properties being flooded. Voluntary Purchase is adopted practice such as the 'Loose-fill Asbestos Voluntary Purchase and Demolition Program'.	

Chapter 06 – Consultation

Chapter 6: Consultation	Reference: Whole Chapter 6 plus Appendix D – Community Consultation Report

Primary Issue:

- Inadequate meaningful consultation regarding upstream and adjacent community impacts

Task:

- More extensive consultation with commitment to act on findings
- Clearer documentation of consultation, and consistency in how consultation is reported

Secondary Issues:

Documentation of consultation. The extent, depth, and effectiveness of consultation is unclear in Chapter 6; there is inconsistency in reporting between Chapter 6 and Appendix D; some of the community consultation detail is actually in Chapter 21.

Framing: Concerns seem to have been minimised e.g. through use of language.

Details:

Chapter 6

- Focus is on awareness (of the project and downstream flood risk) rather than obtaining meaningful input about impacts. I.e. awareness regarding the dam-raising project, downstream flood risks, and downstream impacts of flooding.
- Limited engagement. There only seems to have been one workshop day with Warragamba residents, and the key emerging themes are not mentioned (6.4.6). These themes seem to be noted in Chapter 21, and readers are directed there from Appendix D.
- Information is difficult to navigate. E.g. Tables 6.6 – 6.10 are neat and provide a directory of high level concerns raised by specified stakeholders, but the process of navigating to review multiple lengthy chapters and appendices is cumbersome.
- Key information is hard to find. E.g. Survey results are not provided (6.4.5) nor is their location noted in this Chapter. In fact the results are discussed in Chapter 21 albeit in a text-heavy way.
    - These results are reported in a confusing/conflicting way: (bold added for emphasis) "*Of the 20 business respondents in Warragamba/Silverdale,* ***most recorded a neutral response*** *as to potential effects of the Project construction with the only concern raised being the potential effect being in relation to 'business amenity'* ***(50 percent of respondents reported that the Project may have a negative effect).*** *– 21.6.2.5*

Appendix D

- Reporting of feedback from Community Consultation Cluster One (upstream) is presented in a confusing way that is different to the other clusters (2.2)
- There are inconsistencies in how engagement events are reported: e.g. Chapter 6 reports one community workshop in Warragamba whereas Appendix D reports two. Chapter 6 reports eight Community *Information Displays* whereas Appendix D reports eight Community *Consultation Sessions* – these give very different impressions of the intent of the events.
- The 'Sentiment' section (fig. 1.1) provides little context about how it was tabulated, and gives the impression that most interactions regarding the dam raising were neutral/apathetic. It minimises the degree of opposition to the project.
- Appendix A of Appendix D outlines Flood Strategy engagement activities which are focused on promoting the project rather than assessing impact.

Language

- The language used around water events upstream vs downstream seems to minimise the impact upstream while emphasising the impact downstream: downstream they are referred to as "floods" and "flooding" which may be accurate but are also emotive, dramatic terms;

whereas upstream they are referred to as “temporary inundations” which sounds more clinical and benign.

- Language used in the section for Community Consultation Cluster Four is minimising and dismissive e.g. “According to local stakeholders…”, “They say that…”, “…perceived negative impacts”, “Local stakeholders believe…” (2.5.1)

Chapter 07 – Air Quality

Chapter 7: Air Quality Assessment	Reference: EIS Chapter 7 and Appendix E Air quality assessment
Primary Issue: No assessment/modelling on air quality has been carried out to a new residential subdivision West of Marsh Road Silverdale.	
Task: Further air quality modelling needs to be carried out to the new residential subdivision West of Marsh Road Silverdale. Modelling needs to record the background levels and the emission levels, for each process, in the same format, for ease of understanding the report. A construction air quality management plan, to include a dust mitigation plan for all stages of the works, is recommended to be developed, and should be strictly adhered to, in order to mitigate exceedences in dust and particulate matter criteria at sensitive receptors.	
Secondary Issue: Total Suspended Particles - cumulative concentrations and PM10 – 24 hour average particulate matter are likely to be in exceedence at receptor R49 (Receptor 49 has only been identified by latitude and longitude in the report).	
Details: Assessment on background particulate levels was made on 5 years' worth of wind data from Bringelly, Camden, St Marys and Oakdale monitoring stations. All except Oakdale are impacted by nearby development and therefore are not conservative in estimates of background data for the subject sites. However, all of the background data is below the mean annual average for air quality. Air quality will fluctuate daily, and each of the monitoring stations in between the years 2014 to 2017 have exceeded the 24 hour average at least once – which may have been attributed to dust storms or bushfires. It should be noted that the reference background exposure levels for the annual mean for PM 2.5, PM10 and Total Suspended Particles (TSP) are recorded in µg/$m^{3,}$ with deposited dust levels annual mean recorded as 2g/m^2/month. Established emissions for site establishment works Table 5-1 and Table 5-2 are recorded as kg/year. For consistency in the report and ease of understanding, these figures should be recorded in the same format. Whilst most receptors are located downwind of the development, contour plots show TSP cumulative concentrations & PM10 - 24 hour average particulate matter may be exceeded at Receptor R49 due to emissions from close proximity to site establishment works. There does not appear to be any predicted exceedence for annual averages of air quality for the construction scenario. However the cumulative 24 hour average PM2.5 may be exceeded at R49. A dust mitigation plan is recommended in the air quality assessment with recommendations to control dust emissions from the development. The EIS recommends that a construction air quality management plan is to be developed to minimise impacts of particulate matter to receivers during the construction phase, and controls adhered to, as per the recommendations in the EIS and the Air Quality Assessment.	

Chapter 08 – Biodiversity – Upstream

Chapter 8: Biodiversity Upstream	Reference: N/A
Primary Issue: The magnitude of the extent of impact to threatened species and ecological communities is enormous	
Task: Consideration of alternatives to the Project to avoid and minimise impacts to biodiversity. Consideration of the likelihood that credits will be able to be offset appropriately.	
Secondary Issue: Legislative references and requirements	
Details: The assessment takes into consideration and uses best available knowledge to input to the Framework for Biodiversity Assessment. Overall, the assessment of impacts to biodiversity is comprehensive. The number of species and ecological communities included in the assessment are greater than that recommended by the SEARs. The difficulty in detailing expected impacts to biodiversity based on flood modelling is understood. It takes a precautionary approach to impacts by assuming loss of all vegetation within the upstream impact area. In reality, this is unlikely as sensitive areas/sites would have differing risks of impact depending on their respective locations in terms of elevation. It is noted that, because there will be no impact until the dam is raised and an actual flood occurs that fills the lake above full supply level (FSL), there is opportunity to refine the assessment by undertaking: • further vegetation mapping and assessment to refine the extents of key threatened Plant Community Types • additional biodiversity surveys to confirm the presence/absence of threatened flora and fauna The high quality and comprehensiveness of the survey does not deter from the magnitude of the number and extent of threatened species and ecological communities proposed to be impacted by the project. Number of threatened species and ecological communities impacted requiring offsets: - 91 species credit species - 18 Plant Community Types (PCTs) Of the 18 PCTs, the Project will impact 430.56 hectares of Critically Endangered Ecological Community White Box Yellow Box Blakely's Red Gum Woodland within the upstream impact area, which also supports important breeding and foraging habitat for the Critically Endangered Regent Honeyeater as well as foraging habitat for the Critically Endangered Swift Parrot. The magnitude of impacts on these Critically Endangered entities, let alone to other threatened species and communities, is not considered acceptable. It is noted that impacts to Swift Parrot will not be directly offset. This is a correct conclusion in the EIS. Impacts to Swift Parrot will be offset through 'ecosystem offsets', calculated based on impacts to vegetation considered to support habitat for the species. Impacts to breeding habitat won't occur	

as the species exclusively breeds in Tasmania. Whereas impacts to Regent Honeyeater have correctly been proposed to be offset through species credit offsets.

Another species of particular importance to Wollondilly is koalas. Despite the surveys not detecting koalas, their presence has been assumed across suitable habitat. The area of koala habitat impacted upstream by the project is 1,380.35 hectares, constituting a significant impact to the species. This area of impact equates to 35,890 credits to be offset. This is a huge number of offsets, which are unlikely to be available to be sourced in the credit market without defaulting to payment into the Biodiversity Conservation Fund. Payment into the Fund is the least preferred offset mechanism as it does not secure local offsets and most often leads to an unsatisfactory lag time between credit retirement and commencement of onground conservation works.

Determination of the Project Upstream Impact Area (PUIA)

Limited information is provided in this chapter on the determination of the PUIA. Additionally, the PUIA extent shown in chapter 8 is different to that shown in chapter 18 – Aboriginal Cultural Heritage.

A clear methodology for the determination of the PUIA is to be detailed to ensure the extent of impacts have been appropriately accounted for.

Legislative matters

Koalas

The version of the State Environmental Planning Policy (Koala Habitat Protection) referenced is to be clarified and additional assessment considered if required. Koala SEPP 2020 is referred to in the assessment. Based on the date of publication of the EIS (September 2021), the applicable SEPP to reference is SEPP 2021. It is noted that neither SEPP 2020 or SEPP 2021 apply to developments assessed under Part 5 of the NSW Environmental Planning and Assessment Act 1979, therefore further consideration of impacts to koala is not required. However, based on the date of publication of the updated SEARs (March 2018), the Koala SEPP 44 would be applicable and may require additional consideration of koala habitat.

Council recommend that the applicant seek legal advice on the version of the Koala SEPP that is applicable to the EIS and update the EIS accordingly.

Water NSW Act 2014

WaterNSW is required to prepare an Environmental Management Plan (EMP) under Part 5A of the Water NSW Act 2014 before the temporary inundation of any land protected by the National Parks and Wildlife Act 1974 can occur. Council request consultation during the preparation of the EMP, relevant to land within Wollondilly Local Government Area.

It is strongly recommended that the applicant review the application of the former FBA as opposed to the *NSW Biodiversity Conservation Act's* Biodiversity Offset Scheme. Specifically, whether the lodgement date of the application is determined by the publication of the SEARs or the publication of the EIS? If the Biodiversity Offset Scheme applies, consideration of Serious and Irreversible Impacts in accordance with Section 9.1 of the Biodiversity Assessment Method is required.

Minor typo

Table 4-10 in Appendix F1 Upstream BAR – states "Key diagnostic characteristics for Shale Sandstone Transition Forest of the Sydney Basin Bioregion" when considering diagnostic attributes of Sydney Turpentine Ironbark Forest. Amend wording accordingly.

Council has engaged a subject matter expert Dr Steve Douglas, Ecological Surveys & Planning; Visiting Fellow, Western Sydney University, to review the Ecology issues and their comments are provided as a separate attachment to Councils submission.

Chapter 09 – Downstream Ecological Assessment

Chapter 9: **Downstream ecological assessment**	**Reference:** **N/A**
Primary Issue: The potential significant impact proposed to a large number of threatened species and ecological communities, including those already listed as Critically Endangered under State or Commonwealth legislation. This does not align with a key principle of the project to achieve a 'no-net-loss' of biodiversity.	
Task: Further consideration of alternatives to the Project to avoid and minimise impacts to biodiversity.	
Secondary Issue: Legislative matters in relation to koala assessment and biodiversity assessment require review.	
Details: It is noted that a relatively small portion of the downstream project area is located within Wollondilly Local Government Area, including suburbs of Silverdale, Warragamba and Wallacia. <u>Summary and comment on the biodiversity impact assessment pathway</u> Impacts to biodiversity have been assessed differently for downstream areas compared to upstream and construction areas. No biodiversity offsets were calculated for the downstream area, as these were considered not feasible to calculate based on the size of the area. Instead, following guidance provided in the SEARs, assessments of significance were undertaken for impacts to species and ecological communities. This is because the Framework for Biodiversity Assessment does not assess downstream impacts on hydrology and environmental flows on surface vegetation (see section 2.3.1.2 of the FBA). Council agree that this approach provides a comprehensive assessment. Council also understands the difficulties associated with quantifying downstream impacts to biodiversity as a result of the Project, as other sources of downstream impacts occurring concurrently such as runoff from rural and urban land uses, discharges from sewage treatment plants are also likely to affect biodiversity. Because of this lack of quantifiable impacts resulting from the Project, no offsets are proposed for potential downstream impacts, compared to the assessment method undertaken for the construction area and upstream areas where offsets were calculated. Of the three surveys undertaken for koala (SAT assessments), which resulted in their presence recorded, the EIS does not indicate the locations of where these surveys were undertaken or where koalas were recorded and if any presence of koala was recorded within Wollondilly LGA. Council recommend that the locations of the SAT surveys are provided separately on a map (currently all fauna surveys are grouped as a whole). The conclusions of the Assessments of Significance are of most concern to Council, with regard to the number of threatened species and ecological communities with the potential to be significantly impacted by the project.	

Proposed impacts the threatened biodiversity

Number of threatened species assessed as potentially significantly impacted:

- 12 flora species
- 6 fauna species including the Critically Endangered Regent Honeyeater.
    - Koalas were recorded but impact risk was considered to be low for the highly mobile species. This conclusion is agreed with. The overall assessment of impacts to koalas as a whole as a result of the project is considered to be comprehensive and conservative, with koalas assumed to be present across a large area assessed as containing potential koala habitat.
- 4 ecological communities including the Critically Endangered Cumberland Plain Woodland

The number of entities potentially significantly impacted by the Project is of concern and does not align with a key principle of the project to achieve a 'no-net-loss' of biodiversity.

The overall risk assessment for downstream impacts (pages 64 and 95 of Chapter 9) concludes that after risk mitigation measures are undertaken, the residual impacts to the environment is identified as being *Minor-with localised or widespread medium-term impact to habitat, species or environmental media*.

Further detail is required in relation to the mitigation strategies proposed to minimise the residual impacts to the threatened entities identified with the potential to be significantly impacted.

The EIS states the following in relation to impact on wildlife corridors:
The Project is unlikely to result in loss of vegetation cover but may change the structure and composition of vegetation communities over the long term. Potential fragmentation and patch size impacts are unlikely but structural changes in adjacent vegetation due to the project may exacerbate the current disturbance regimes and stressors, namely weed invasion, and lead to a subsequent loss of value within these biodiversity links and corridors.

Council recommend that impacts such as structural vegetation changes are considered in an Environmental Management Plan (or equivalent) for the Project and that an ongoing monitoring program is established, particularly in areas closer to the dam wall where impacts from the Project are less likely to be influenced by other co-occurring downstream impacts.

The Environmental Management Plan should also include further consideration of and management measures for the potential spread of diseases and pathogens such as chytrid fungus and *Phytophthora cinnamomi* (dieback).

Legislative matter

It is strongly recommended that the applicant review the application of the former FBA as opposed to the *NSW Biodiversity Conservation Act's* Biodiversity Offset Scheme. Specifically, whether the lodgement date of the application is determined by the publication of the SEARs or the publication of the EIS? If the Biodiversity Offset Scheme applies, consideration of Serious and Irreversible Impacts in accordance with Section 9.1 of the Biodiversity Assessment Method is required.

Koalas
The version of the State Environmental Planning Policy (Koala Habitat Protection) referenced is to be clarified and additional assessment considered if required. Koala SEPP 2020 is referred to in the

assessment. Based on the date of publication of the EIS (September 2021), the applicable SEPP to reference is SEPP 2021. It is noted that neither SEPP 2020 or SEPP 2021 apply to developments assessed under Part 5 of the NSW Environmental Planning and Assessment Act 1979, therefore further consideration of impacts to koala is not required. However, based on the date of publication of the updated SEARs (March 2018), the Koala SEPP 44 would be applicable and may require additional consideration of koala habitat.

It is noted that Koala SEPP 44 is referred to on page 11 of EIS chapter 9, however Koala SEPP 2020 is referenced in the associated Appendix report *Appendix F2 – Downstream Ecological Assessment*.

Council recommend that the applicant seek legal advice on the version of the Koala SEPP that is applicable to the EIS and update the EIS accordingly.

Chapter 10 – Biodiversity – Construction Area

Chapter 10: Construction site Biodiversity Assessment Report	Reference: N/A
Primary Issue: Inconsistencies with aspects of the biodiversity related Standard Secretary Environment Assessment Requirements)	
Task: The EIS requires adjusting to be fully consistent with all applicable SEAR'S.	
Secondary Issue: The EIS requires amendment to be fully consistent with all issued Commonwealth biodiversity related requirements.	
Details: **Requirements issued by the Commonwealth** <u>Background</u> The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* requires the referral of an application to the Commonwealth Department of Environment for consideration if there is likely to be a significant impact on listed threatened ecological communities and species (Matters of National Environmental Significance (MNES). The EIS states that a review for the development site with a 10-kilometre buffer identified the following biodiversity-related MNES may occur in, or may relate to, the area covered by the Biodiversity Assessment: • 12 threatened ecological communities • 78 threatened species • 16 migratory bird species. <u>Consistency with Requirements issued by the Commonwealth</u> The Commonwealth Department of Agriculture, Water and the Environment issued a range of requirements specifically relating to the assessment and management of potential impacts of each component of the development (upstream, downstream and construction footprint) on the above Commonwealth listed species and ecological communities in main body The BAR has been identified as being consistent with a number of the requirements. However, it has been identified as having inconsistencies with the following requirement for specific surveys on listed threatened species (viewed as being a consequence of the approach in assuming presence of all such species within the development footprint and not undertaking targeted surveys *For each of the EPBC Act listed threatened species and communities likely to be significantly impacted by the development the EIS must provide a separate:* *(a) description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with*	

consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans;

(b) Details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements;

Issued NSW Secretary Assessment Requirements

Background

Section 4 of the State Significant Development Guidelines states" *the SEARs identify the information that must be provided in the EIS, including the matters that require further assessment in the EIS and the community engagement that must be carried out during the preparation of the EIS*". The compliance of the application with the issued SSAR's is recognised as being a matter for DPIE. However, the full consistency of the EIS with all issued requirements is expected and important given their statutory function.

Issue

The Biodiversity Assessment has been identified as largely complying with the Biodiversity Requirements listed in the SEAR's as well as the Framework for Biodiversity Assessment (FBA) issued by DPIE for State Significant Development Projects. However, the following details outline considered inaccuracies in aspects of applicable SEAR's for consideration and response by DPIE:

SEAR 6.1: The Proponent must assess biodiversity impacts in accordance with the current guidelines including the Framework for Biodiversity Assessment (FBA), unless otherwise agreed by OEH, by a person accredited in accordance with s142B(1)(c) of the Threatened Species Conservation Act 1995

The Biodiversity Assessment has been identified as largely complying with the Framework for Biodiversity Development issued by DPIE for State Significant Development Projects. However, inconsistencies with the following parts of this Framework have been identified:

- The Assessment has not detailed the connectivity value when describing landscape values (Section 4.2.3 of FBA) in response to the FBA Requirement
- There is viewed as being an insufficient response to the FBA requirement to "*identify reasonable measures and strategies to minimise the impact on biodiversity values"*.
- The Assessment has not accurately identified biodiversity values in regard to the FBA requirement *"the proponent must seek to avoid the direct impacts on all biodiversity values of the site including (amongst others) areas that contain habitat for threatened species and ecological communities".*
- *The BAR is viewed as not adequately responding to the Section 6.1.5.10 of the FBA in terms of only including Expert Reports based on a desktop analysis rather than for all threatened species assumed present on the development site (as listed within the Biodiversity Assessment).*
- While recognised as being consistent with the FBA, the approach of assuming presence of species rather than undertaking targeted surveys based on habitat analysis is questioned. In this regard, the Assessment is not considered to have provided sufficient responses to requested additional information regarding the extent of likely impact as a result of this assumption.

Where a species is assumed to be present on the development site, the assessor must use an expert report to determine the location and area of the species polygon to include the fauna habitat or number of individual flora species assumed to be present on the development site.

- Separate comments are provided on the Chapter of the EIS in regard to the Biodiversity Offset Strategy. However, the details of supplementary measures (in addition to retirement of offsetting credits) is viewed as not being sufficient to comply with Section 10.5.7 of the FBA.

SEAR 6.2: The proponent must assess the downstream impacts on threatened biodiversity, native vegetation and habitats resulting from any changes to hydrology and environmental flows. This assessment should address the matters in Attachment B.

Comments in relation to this matter are provided in regard to Downstream Biodiversity Assessment Component of the EIS. However, as a general comment, this Chapter is viewed as having a focus on impacts associated with flooding and has not sufficiently assessed potential impacts resulting from any changes to hydrology and environmental flows.

SEAR 6.3: The Proponent must assess impacts on the following: endangered ecological communities (EECs), threatened species and/or populations, and provide the information specified in s9.2 of the FBA. Specific environmental requirements are provided in Attachment C.

The Biodiversity Assessment is considered in broad terms to have assessed impacts on threatened ecological communities and species consistent with the FBA. However, the stated broad purpose of Stage 1 of this Framework to provide the preliminary information necessary to inform project planning and is viewed as being compromised by the adopted approach in assuming presence of threatened species on the site rather than undertaking surveys (particularly given the comparatively small direct footprint of 22 ha). It is requested to be noted that Council would require surveys rather than assume presence for a development where it is the consent authority for similar development footprints.

Chapter 10: **Biodiversity- Construction Area**	**Reference:** **N/A**
Primary Issue: Reference to Greater Blue Mountains World Heritage documents	
Task: Provide a specific response to the Desired Outcomes for the Major Impact Priority Theme within the Greater Blue Mountains World Heritage Strategic Plan.	
Secondary Issue: Incorporate outcomes of consultation (understood to be occurring) with the Greater Blue Mountains World Heritage Authority into the Biodiversity Assessment document.	
Details: The EIS is recognised as containing a Chapter outlining considered consistency with strategic documents applying to the Greater Blue Mountains World Heritage Area as well as potential impacts of the development to the values of this Area. Specific comments regarding these matters is also recognised as being the responsibility of the Greater Blue Mountains World Heritage Authority (GBMWHA).	

However, the specific consideration of the world heritage values and GBMWHA documents by the Biodiversity Assessment is viewed as being important in terms of providing a statutory management framework as well as an information source of biodiversity values potentially impacted by the development. The GBMWH Strategic Plan is noted in this regard to include as an Objective of direct relevance to the development "*To reduce the potential for major impacts to adversely affect the integrity of the GBMWHA".* The Plan is further noted to list the following 'desired outcomes' in relation to this Objective:

- *Local, regional and statewide planning instruments and catchment blueprints for areas adjacent to the GBMWHA adequately address the need for protection of the GBMWHA's World Heritage values.*
- *Effective inter-governmental and interagency administrative arrangements are in place to ensure the cooperative, coordinated and consistent processing of development proposals which may adversely impact the GBMWHA.*
- *Developments and activities with an unknown but potentially significant impact on the World Heritage and other values of the GBMWHA are either modified to minimise the risk of impact on those values or do not proceed.*
- *The impacts of surrounding land use on World Heritage values are better understood and monitored.*

The apparent absence of reference to the GBMWHA Strategic Plan within the BAR is noted with concern given the considered relevance outlined above. It is consequently requested that the Biodiversity Assessment be amended to contain a summary of the world heritage biodiversity values (broadly based on Appendix J) as well as a response to each of the Outcomes of the Plan listed above that is developed in close collaboration with the GBMWHA Committee.

Chapter 10: **Biodiversity- Construction Area**	**Reference:** **N/A**
The stated number of credits to be retired through offsetting as a result of the development will likely result in significant expense for the applicant and offsetting may not be able to be achieved based on requirements of the FBA and rules and principles of the NSW Offset Policy.	
Task: Require consultation between the applicant and applicable government agencies to identify an approach that would involve sufficient targeted surveys for threatened fauna species that would accurately identify biodiversity values and credit retirement requirements within resourcing and time constraints.	
Details: **Background** <u>Approach of the Biodiversity Assessment</u> The approach of the Biodiversity Assessment in assuming the presence of threatened species on the development site instead of undertaking a threatened species surveys or obtaining an expert report is recognised as being technically consistent with the FBA. However, this approach is viewed as having adverse implications in firstly obtaining an accurate understanding of biodiversity values as well as related suitably ecological rigorous basis for biodiversity offsetting. In addition, while a matter for the Greater Blue Mountains World Heritage Area Authority, this approach is also viewed as having a level of inconsistency with the Desired Outcome in the Strategic Plan prepared by this Authority "*Developments and activities with an unknown but potentially significant impact on the*	

World Heritage and other values of the GBMWHA are either modified to minimise the risk of impact on those values or do not proceed".

Considered appropriateness of surveys by the Biodiversity Assessment

Threatened flora surveys

Section 5.5.2 of the Biodiversity Assessment is noted to state "*targeted threatened flora surveys were not completed within the development site, although incidental observations of threatened flora species were recorded using a GPS"*. Such survey methodology, (with associated habitat analysis), is sufficient to achieve a very approximate indicator over threatened species that would have the potential to occur on the site. However, the need for more extensive surveys for threatened flora species is viewed as being of particular importance to enable an accurate assessment of biodiversity values and actual threatened species directly impacted by the development as well as informing offsetting.

The Biodiversity Assessment is also noted to state that the undertaking of sufficient surveys to comply with the FBA would require significant allocation of resources. This statement is viewed as not having validity for the Construction Area given its comparatively small development footprint of approximately 22 ha. A conservative estimate of required funding to undertake targeted surveys for all identified threatened flora species occurring on the site is considered extremely low in comparison to the costs involved in the retiring the calculated offsetting credits as specified in the Offsetting Strategy. The recommendation of the Biodiversity assessment in relation to this matter that "*targeted surveys be carried out in line with relevant guidelines for threatened flora species currently assumed as present within the development site and that such surveys would likely refine the quantification of impacts and associated credit liability generated by the Project"* is consistent with the above comments and consequently agreed with.

Threatened fauna surveys

Section 5.5.3 of the Biodiversity Assessment is noted to states *"General fauna surveys were conducted within the development site over five days and four nights during December 2017"* and *"additional nights were surveyed using cameras (Table 5-7)*". A similar level of concern is not expressed in regard to the extent of fauna impacts in comparison to flora surveys given their mobility. However, the undertaking of additional surveys is requested for the purposes of obtaining a more accurate assessment of biodiversity values and threatened species impacted by the development as well as informing offsetting

ISSUE

Comments regarding the consistency of surveys with applicable requirements of the Framework for Biodiversity Assessment

Section 6.5.1.7 of the FBA

"W*here the development site contains any of the specified geographic attributes and the habitat features or habitat components associated with a species that is on the list of candidate species for assessment at Step 3, an assessor may opt to assume the species or breeding habitat component is present on the development site, instead of undertaking a threatened species survey or obtaining an expert report".*

Comment re approach of the Biodiversity Assessment

The approach of the Biodiversity Assessment is recognised as being consistent with the above FBA requirement.

6.5.1.9 and 6.1.5.10 of the Framework for Biodiversity Assessment
"Where the survey or expert report confirms that a remaining candidate species is present on a development site, or is likely to use the potential habitat on the development site, the remaining candidate species is a species credit species present on the development site and must be assessed further under Steps 4 and 5 (within the Framework)". Step 5 in this regard includes the requirement "*Where a species is assumed to be present on the development site, the assessor must use an expert report to determine the location and area of the species polygon to include the fauna habitat or number of individual flora species assumed to be present on the development site".*

Comment re approach of the Biodiversity Assessment

The Biodiversity Assessment is noted to have adopted an approach of only including an Expert Report for threatened species that are viewed as not occurring within the development footprint based on a desktop habitat analysis (apart from *Grevillea parviflora* identified by incidental sightings). This approach is viewed as having inconsistencies with the above FBA requirement as it is not based on the list of species contained in the Biodiversity Assessment that have been identified as 'assuming to be present on the development site'.

Section 9.2.5 of the FBA
Where the impacts of the proposed development meet criteria (for inclusion of additional assessment), the assessor is required to provide the following further information in the BAR (amongst others):
(a) the size of the local population directly and indirectly impacted by the development
(b) the likely impact (including direct and indirect impacts) that the development will have on the habitat of the local population

The absence of targeted surveys provides constraints in responding the additional information requirements contained in this section of the BAR

<u>Shortcomings of the adopted approach of the Biodiversity Assessment</u>

The following shortcomings have been identified with the adopted approach of the Biodiversity Assessment in terms of identification of the biodiversity values of the site and informing the offsetting approach, (whilst recognising consistency of this approach with Section 9.5.2 of the FBA):

- The adequate carrying out of statutory responsibilities by the consent authority in assessing and approving the development broadly based on Section 5.2 of the *Environmental Planning and Assessment Act 1979*.
- The provision of sufficient information to demonstrate consistency with applicable parts of the Greater Blue Mountains World Heritage Area Strategic Plan
- The creation of constraints in responding to information requirements for certain threatened flora species within the FBA.
- Inconsistencies with the intended stated outcome of Stage 1 of the Framework for Biodiversity Assessment to "provide the preliminary information necessary to inform project planning"
- Does not enable accurate identification of impacts on species listed as Matters of National Environment Significance in accordance with the Commonwealth Requirements.
- Insufficient basis to the development and implementation of an offsetting approach that is in accordance with the NSW Biodiversity Offset Policy. The Policy is noted to state the

following which is viewed as highlighting the need for an accurate identification of direct impacts associated with the development.

There may be identified impacts that are considered severe enough to prevent a project going ahead. The prima facie position for these impacts is that a project should not proceed if they are likely to occur. The purpose of further consideration by the consent authority is to determine if there may be other factors that could allow the project to proceed.

- There is viewed as being significant difficulty in achieving offsetting of the stated credit retirements within the Biodiversity Assessment based on the rules and principles of the NSW Offset Policy.

Chapter 10: **Biodiversity- Construction Area**	**Reference:** **N/A**

Primary Issue:
Potential incorrect application of State Environmental Planning Policy (Koala Habitat Protection).

Task:
The application of Koala SEPP 44 to the development may require legal advice as a result of its introduction in 1995 prior to the introduction of the State Significant Development Framework within NSW.

Details:
The version of the State Environmental Planning Policy (Koala Habitat Protection) referenced is to be clarified and additional assessment considered if required. Koala SEPP 2020 is referred to in the assessment. Based on the date of publication of the EIS (September 2021), the applicable SEPP to reference is SEPP 2021.

It is noted that neither SEPP 2020 nor SEPP 2021 apply to developments assessed under Part 5 of the NSW Environmental Planning and Assessment Act 1979, therefore further consideration of impacts to koala is not required. However, based on the date of publication of the SEARs (June 2017), the Koala SEPP 44 would be applicable and may require additional consideration of koala habitat based on the following Clause within this SEPP:

(1) Before a council may grant consent to an application for consent to carry out development on land to which this Part applies that it is satisfied is a potential koala habitat, it must satisfy itself whether or not the land is a core koala habitat.
(2) **A council may satisfy itself as to whether or not land is a core koala habitat only on information obtained by it, or by the applicant, from a person with appropriate qualifications and experience in biological science and fauna survey and management.**

Chapter 10: Biodiversity- Construction Area	Reference: N/A
Primary Issue: Review of the applicable biodiversity assessment legislation is strongly recommended. Specifically, whether the lodgement date is determined by the exhibition of the SEARs or EIS.	
Task: Confirmation of the applicability of the *NSW Biodiversity Conservation Act.*	
Details: It is strongly recommended that the applicant review the application of the former FBA as opposed to the *NSW Biodiversity Conservation Act's* Biodiversity Offset Scheme. Specifically, whether the lodgement date of the application is determined by the publication of the SEARs or the publication of the EIS? If the Biodiversity Offset Scheme applies, consideration of Serious and Irreversible Impacts in accordance with Section 9.1 of the Biodiversity Assessment Method is required.	

Chapter 11 – Aquatic Ecology

Chapter 11: Aquatic Ecology	Reference: N/A

Primary Issue:
Insufficiently rigorous baseline data to identify impacts to downstream aquatic ecology attributed to the development by the proposed ongoing monitoring.

Task:
A detailed Soil and Water Management Plan (or equivalent) applying to the construction site with demonstrated consistency with the Neutral or Beneficial Effect and approved independently of Water NSW be required prior to the commencement of any works by DPIE.

A Monitoring Program, (expanding on such existing programs) detailing parameters, location, frequency and methodology of aquatic ecology downstream of the site be required prior to the commencement of any construction activity by DPIE.

Details:

(i) *Overall approach of the Aquatic Ecology Assessment*

The Aquatic Ecology Assessment is considered to have adequately considered the applicable statutory and policy framework in describing aquatic ecology downstream of the site (taken as being aquatic plants and animals and their interaction). It is also considered to have broadly addressed the relevant SEAR requirement to "*assess the downstream impacts on threatened biodiversity, native vegetation and habitats resulting from any changes to hydrology and environmental flows*". However, the expressed view in the Assessment that environmental flows does not require assessment as this is regulated separately by Water NSW is not necessarily agreed with given that such flows will likely continue to occur with the raised dam wall. The consideration of this matter and need for any further assessment to fully comply with the above SEAR item by DPIE is requested.

(ii) *Adequacy of assessment and baseline data regarding aquatic ecology*

The approach of the Assessment in basing the description of aquatic ecology on the wide variety of previous surveys and assessments applying to the downstream sections of the Nepean River is recognised as being appropriate. However, the document is noted to state that a dedicated aquatic habitat assessment was not conducted downstream with the description based on studies carried out ranging from 10 to 20 years ago. It is noted in this regard that descriptions of macroinvertebrates (recognised by the Assessment as being indicators of water quality impacts) are based on surveys and monitoring carried out in 1999 and 2012 to 2014. The timeframe of these assessments is viewed as not providing sufficiently rigorous and current baseline to adequately identify potential impacts of the construction and discharge components of the development to downstream aquatic ecology.

(iii) *Adequacy of assessment of potential impacts to aquatic ecology*

The wide variety of impacts to aquatic ecology from these components of the development and likely level of these impacts described by the Aquatic Ecology Assessment are agreed with in principle. The description is noted however to contain a range of generic statements over the likelihood and extent of these impacts such as

"Any impacts related directly to construction activities would likely be restricted to within the Warragamba River, and are unlikely to extend into the Nepean River.

The views expressed within the Assessment that the potential for impacts on downstream aquatic ecology from the construction is negligible if suitable management measures are implemented is agreed with in principle. In relation to this matter, Council would expect that a detailed strategy for the management of these impacts with demonstrated consistency with the Neutral or Beneficial Effect and approved independently of Water NSW be required prior to the commencement of any works.

In relation to this matter, the Assessment is noted to list as a mitigation measure for impacts to Aquatic habitat "Existing monitoring programs would be maintained and augmented as required to monitoring potential impacts resulting from the Project". Council would expect in this regard that a Monitoring Program, (expanding on such existing programs) detailing parameters, location, frequency and methodology of aquatic ecology downstream of the site be required prior to the commencement of any construction activity by DPIE.

(iv) The need for further surveys and analysis of aquatic ecology

Support is provided to the approach of the Assessment and identification of impacts to aquatic ecology from the construction and discharge components of the development based on existing studies in the downstream sections of the Nepean River system. However, appropriate further surveys and monitoring is recommended to obtain current baseline data to enable the proposed ongoing monitoring to identify and rectify any impacts determined to be attributable to the development.

Chapter 12 – Matters of NES – Biodiversity

Chapter 12: Matters of National Environmental Significance - Biodiversity	Reference: N/A

Primary Issue:
The extent and number of threatened species and ecological communities likely to be significantly impacted by the project is not acceptable and does not align with a key principle of the project to achieve a 'no-net-loss' of biodiversity.

Task:
Re-evaluate possible avoidance measures. Are the benefits of the project enough to outweigh the significant impacts to biodiversity?

Secondary Issue:
Review of the applicable biodiversity assessment legislation is strongly recommended. Specifically, whether the lodgement date is determined by the exhibition of the SEARs or EIS.

Details:
The assessment of impacts to threatened species and communities is considered to be a conservative approach, with complete loss of entities assumed within the study area. This actual impact is likely to be less. This approach is commended, as it adds a high level of rigour to the assessment. However, given the geographic scale of the study area and anticipated impacts, the number of species and ecological communities and extent of impact is highly concerning. Particularly for entities already listed as Critically Endangered under the EPBC Act such as:

- Cumberland Plain Woodland
- Shale Sandstone Transition Forest
- Callistemon megalongensis
- Regent Honeyeater

The project will without a doubt place an increased risk of extinction to these entities.

The number of entities listed under the EPBC Act assessed in the EIS as likely to be significantly impacted:

- 47 threatened flora species
- 11 fauna species including Regent Honeyeater and Koala
- 4 Threatened Ecological Communities

The magnitude of the number and extent of threatened species and ecological communities proposed to be impacted by the project is concerning. Impacts to threatened biota will be offset in accordance with the proposed offset strategy (chapter 13 of the EIS). Comments on the offset strategy are provided separately, but there are concerns around whether the total amount of offsets will be able to be feasibly retired in accordance with the rules stipulated in the NSW Offset Policy.

Table 12-33 of chapter 12 of the EIS states that 858 hectares of koala habitat downstream of the Flood Mitigation Zone is likely to be significantly impacted; similarly 805 hectares of koala habitat is assessed as likely to be significantly impacted in the 'DS 10% AEP difference'. Clarification of where these figures are derived is sought – the downstream biodiversity chapter did not quantify area of koala habitat to be impacted.

It is strongly recommended that the applicant review the application of the former FBA as opposed to the *NSW Biodiversity Conservation Act's* Biodiversity Offset Scheme. Specifically, whether the lodgement date of the application is determined by the publication of the SEARs or the publication of the EIS? If the Biodiversity Offset Scheme applies, consideration of Serious and Irreversible Impacts in accordance with Section 9.1 of the Biodiversity Assessment Method is required.

Chapter 13 – Biodiversity Offset Strategy

Chapter 13: Biodiversity Offset Strategy	Reference: N/A

Primary Issue:
The project does not seem to have adequately considered the avoidance of impacts to biodiversity and instead is focused on offsetting.
Biodiversity offsets are a last resort in instances where an action will give rise to residual impacts, even after the application of management measures.

Task:
Council would like to see further evidence of avoidance measures at the first instance.

The calculation of equivalent credits from the former to present biodiversity legislation (BBAM to BAM) will need to be detailed clearly.

Offsetting is to be implemented expeditiously to avoid lags in time of impact to biodiversity versus offsetting impacts

Clarification in detail is required around the mechanism proposed to facilitate 'supplementary measures' if offsets are unable to be retired

Review of the applicable biodiversity legislation, given the exhibition of the EIS in October 2021. Consideration of Serious and Irreversible Impacts may be required.

Secondary Issue:
Calculation of equivalent credit requirements generated from BBAM to BAM conversion needs to be transparent.

Details:
The Biodiversity Offset Strategy has adequately met the requirements of the NSW Framework for Biodiversity Assessment (FBA) for major projects (OEH 2014). The Commonwealth Department of Agriculture, Water and Environment (DAWE) has officially endorsed the NSW legislative pathway for biodiversity assessment and offsets, therefore this approach is accurate and correct.

The NSW framework is underpinned by 6 principles:

1. Before offsets are considered, the impacts must first be avoided, and unavoidable impacts minimised through mitigation measures. Only then should offsets be considered for the remaining impacts.
2. Offset requirements should be based on reliable and transparent assessment of losses and gains.
3. Offsets must be target by the biodiversity values being lost or to higher conservation priorities.
4. Offsets must be additional to other legal requirements.
5. Offsets must be enduring, enforceable and auditable.
6. Supplementary measures can be used in lieu of offsets.

The project does not seem to have adequately considered the avoidance of impacts to biodiversity and instead is focused on offsetting. It is recognised that there are a number of shortcomings to biodiversity protection enabled by NSW legislation, however projects too often revert straight to

biodiversity offsets to address impacts. This project is no exception. The EIS states that the specific objectives for the Biodiversity Offset Strategy are to:

1. maintain ecological values: strategy aims to achieve the standard of 'no-net-loss' of biodiversity
2. source local offsets: where feasible, offsets will be sourced as close to the impact as possible
3. support heritage values: offsets will support or enhance World Heritage values, particularly those related to biodiversity.

It is considered that the project is very unlikely to achieve a 'no-net-loss' of biodiversity as a consequence of the extent and level of impact anticipated. Impacts to some critically endangered biota are likely to be irreversible.

It is considered that the project will not fulfil its objective of sourcing local biodiversity offsets. Smaller-scale developers with a relatively smaller biodiversity offset burden are finding it increasingly difficult to source local credits in the current market and are reverting to the option of paying directly into the Biodiversity Conservation Fund. This is becoming an important issue in Wollondilly, with impacts to local critically endangered ecological communities such as Cumberland Plain Woodland, being offset outside of the LGA or not at all leading to a net-loss locally. It is anticipated that the huge number of and diversity of biodiversity offsets for the project will not be available to be able to be offset locally.

Impacts to heritage values are addressed in a different chapter, but relative to the objectives of the Biodiversity Offset Strategy, the impacts to many heritage values from the project are considered to be irreplaceable.

Council would like to see further evidence of avoidance measures at the first instance.

The inclusion of a condition of consent requiring the retirement of all offsets prior to commencement of construction works is recommended. Offsetting is to be implemented expeditiously to avoid lags in time of impact to biodiversity versus offsetting impacts.

An additional item that requires clarification in detail around the mechanism proposed to facilitate 'supplementary measures' if offsets are unable to be retired. The statement in the Offsetting Strategy that such measures may be necessary given the difficulty in sourcing required biodiversity credits is agreed with. However, there is considered an insufficient description of the intended process in identifying when such measures will be pursued. In addition, the Offset Strategy is noted to include a proposed approach for implementing the Offset Program and a list of stakeholders to be consulted as part of this implementation. However, the Offset Strategy has not provided any specifics over intended approach to comply with Appendix B of the NSW Offset Policy for Major Projects in providing actions to benefit respective threatened species and ecological communities being offset. Council would expect that all supplementary measures be consistent with the like-for like and variation rules as Part of Principle 2 within the NSW Offset Policy. In this regard, Council would expect that the supplementary measures be developed in collaboration with the Greater Blue Mountains World Heritage Authority.

It is strongly recommended that the applicant review the application of the former FBA as opposed to the *NSW Biodiversity Conservation Act's* Biodiversity Offset Scheme. Specifically, whether the lodgement date of the application is determined by the publication of the SEARs or the publication of the EIS? If the Biodiversity Offset Scheme applies, consideration of Serious and Irreversible Impacts in accordance with Section 9.1 of the Biodiversity Assessment Method is required.

Secondary issue: Calculation of equivalent credit requirements generated from BBAM to BAM conversion needs to be transparent.

The credit offset requirements were calculated in accordance with the legislation that was current at the time – the NSW *Threatened Species Conservation Act 1995* and the associated FBA. Since that time the NSW *Biodiversity Conservation Act 2016* (BC Act) and the associated Biodiversity Offset Scheme was introduced. The calculation of credits is different for the two pieces of legislation. What will be important for the project, is that the method for converting the credits that were calculated and reported on in accordance with the FBA and Biobanking Method (BBAM 2014) to equivalent credits under the BC Act and Biodiversity Assessment Method (BAM 2016) will need to clearly explained and made public. There is a perceived risk that the number and/or value of credits will be significantly reduced upon conversion to equivalent BAM credits, therefore underestimating the value of impacts to biodiversity by the project.

Chapter 14 – Climate Change Risk

Wollondilly Shire Council has liaised with Blue Mountain City Council and endorse their position in regard to the response to Climate Change Risk;

- The assessment methodology being used for this assessment is out of date and does not meet current standards.
    - The standards that would give the best risk assessment would be:
        - ISO 14091:2021 Adaptation to climate change Guidelines on Vulnerability, impacts and risk assessment
        - ISO 31000: 2018 Risk Management guidelines
        - Climate risk Ready NSW guide – Practical guidance for the NSW Government Sector to assess and manage climate change impacts.
    - The use of these would provide a much improved climate risk assessment that meets with current practice and expectations.
- These assessments should be redone using the latest standards.
- Page14-1 – references other key stakeholders, Who were they? Councils affected should have been included.
- Climate risk will often have unknown risk consequence and should be given higher ratings. As old methodologies are used this has not been applied and reduces the validity of the assessment.

14-2 - The risk assessment only considered activities or outcomes where the proponent had ownership, direct control, or influence. Impacts of climate change to activities or outcomes out of the Project's influence were not assessed. This significantly reduces the scope of the assessment and fails to acknowledge that climate risks have a range of interdependencies and they need to be assessed holistically. This raises significant concerns as to the robustness and reliably of this assessment.

14.3.1 why are different locations used for upper catchment temperature means, is this to demonstrate the point the project wants?

Table14.5 – Do the temporary mechanisms in place during construction to capture floods result in an increased risk of downstream flooding for the duration of the temporary measures?

Chapter 15 – Flooding and Hydrology

Chapter 15: Flooding and Hydrology	Reference: Chapter 8 section 8.2 page 8-7 Chapter 18 section 18.1 page 18-2

Primary Issue:

- Chapter 15 Flooding and Hydrology does not document the determination of the Project Upstream Impact Area (PUIA) used in Chapter 8 Biodiversity Upstream and Chapter 18 Aboriginal Cultural Heritage
- Limited information is provided in Chapter 8 and Chapter 18 on the determination of the PUIA.
- The figures showing PUIA are at an inappropriate scale
- The PUIA extent shown in Chapter 8 is different to the PUIA extent shown in Chapter 18.
- PUIA extent as described in Chapter 8 and Chapter 18 is within 200mm of a 1 in 20 chance in a year flood extent (5% AEP) which is inside the extent of a flood at the proposed dam crest level (approx. 1 in 40 chance in a year flood extent).
- PUIA does not represent an appropriate extent.

Task:

A clear methodology for the determination of the PUIA needs to be detailed within Chapter 15 Flooding and Hydrology and appropriately referenced in Chapter 8 and Chapter 18.

Secondary Issue:

Chapter 8 and Chapter 18 rely on appropriate assessment of PUIA.

Details:

Chapter 8 and Chapter 18 PUIA Definitions are the same but mapping is different.

Snip from page 8-11

Element	FBA definition	Adopted Project definition
Field survey area	Not defined within the FBA	The area within a 1 in 100 chance in a year event (1% AEP[1]) plus 9% climate change (that is, a 9% increase in rainfall under a climate change scenario). This equates to an area of about 3,740 ha.
Upstream impact area	Not defined within the FBA (see Section 8.2.5.2)	The area between the likely inundation level with the Project (10.25 m above FSL, RL 126.97 mAHD) and the likely inundation level for the existing dam (2.78 m above FSL, RL 119.5 mAHD). The size of this area is about 1,400 ha.

1 Annual Exceedance Probability

Snip from page 18-6

- **Upstream impact area** (Figure 18-3, Figure 18-4, Figure 18-5, Figure 18-6). The upstream impact area is described in Chapter 8 (Section 8.2.5), which was based on a review of the historical record that identified at least one large flood above FSL would occur within a 20-year period. Modelling was then done of around 20,000 hypothetical scenarios to determine what the average or likely inundation level would be for the existing dam and with the Project.
  Definitions used in the archaeological study are:
  - **Project Upstream Impact Area (PUIA)**: The area between 119.5 mAHD and 126.97 mAHD, and covers 1,401 hectares. (note: The ACHA uses the terminology 'Subject Area' to represent the PUIA which is consistent with assessment guideline terminology)
  - **Existing Upstream Impact Area (EUIA)**: The area below 119.5 mAHD (including below FSL or 116.7 mAHD)

Figure 8-4. Upstream impact area

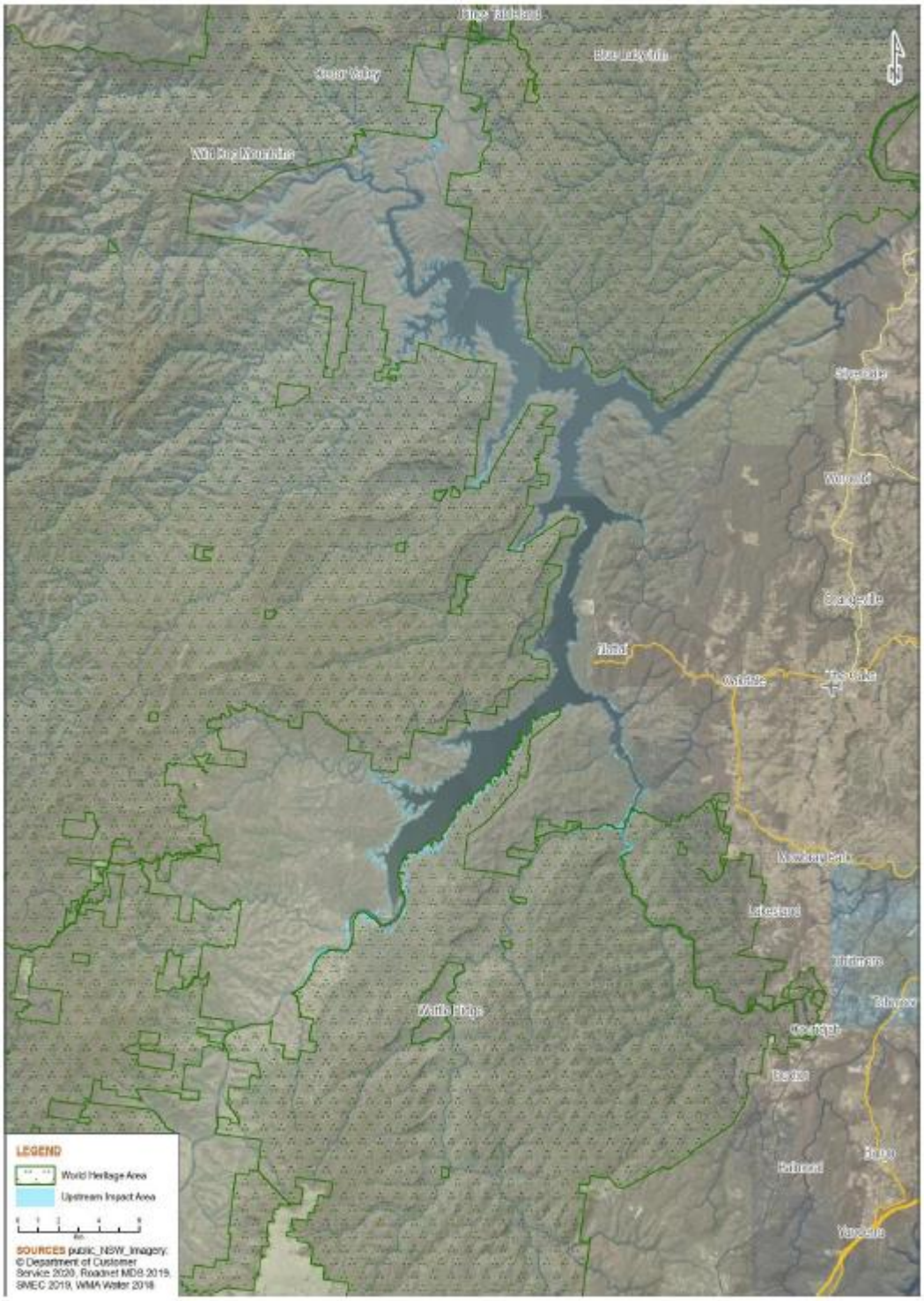
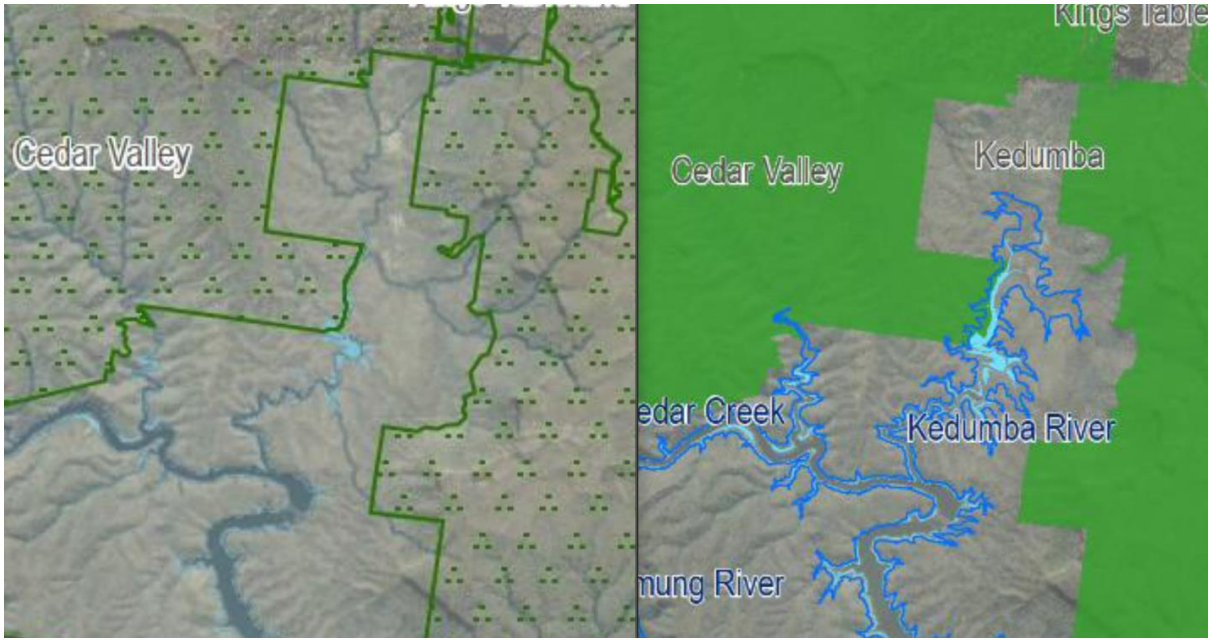
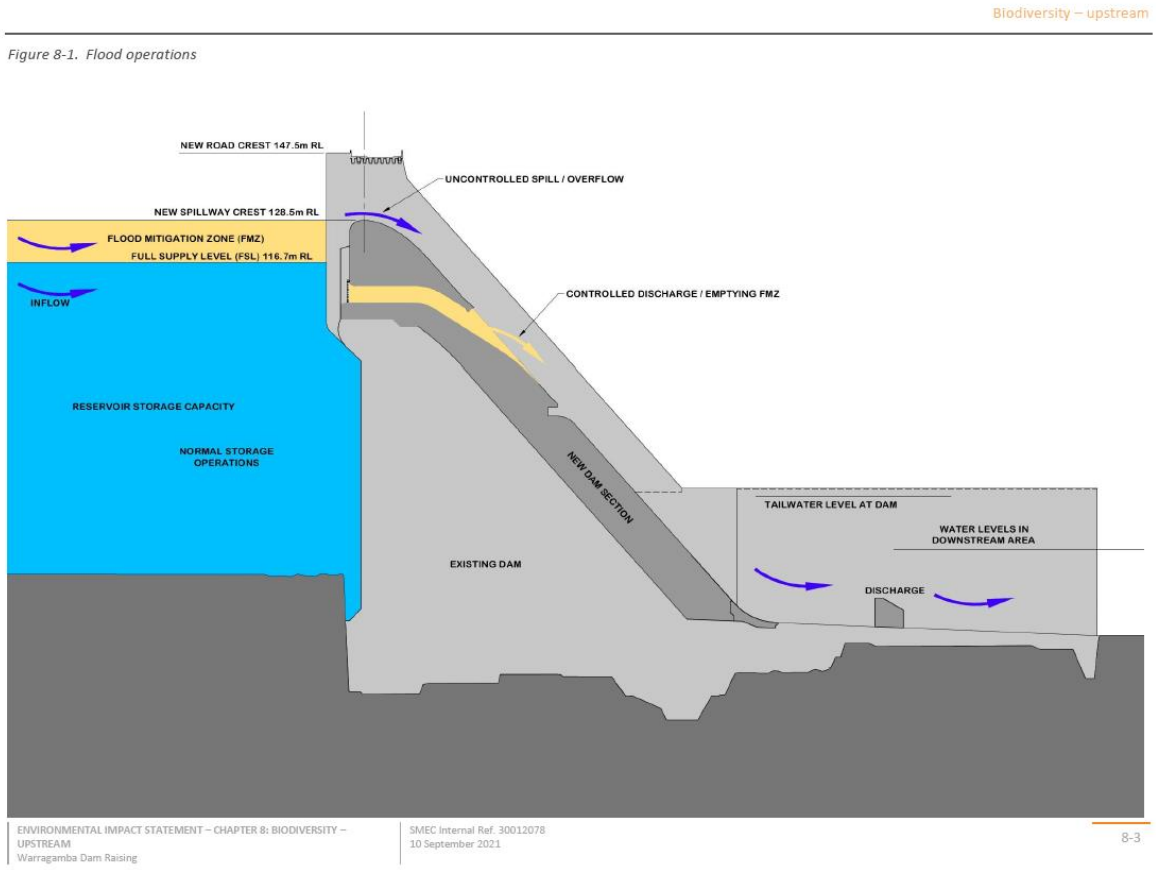


Figure 18-3. Upstream impact area

Side by side comparison:



Snip of Page 8-3
Dam wall crest is at 128.5m RL



Snip from page 15-66

Dam wall crest is at a level between 1 in 20 and 1 in 100 chance in a year

1 in 20 chance in a year event (126.8) equates to the upper limit of the PUIA (126.97) within 200mm

15.6.3.1 Dam wall

Predicted changes at the dam wall are shown on Figure 15-30 and summarised in Table 15-14.

Changes to the duration of upstream inundation at the dam wall would be up to about five days for the relatively more frequent 1 in 5 chance in a year flood, and up to about 11 days for a rarer 1 in 100 chance in a year flood event.

Table 15-14. Dam wall: Changes to temporary inundation levels and durations

Event (1 in x chance in a year)	Existing			Project			
	Level (mAHD)	Depth (m)	Inundation* (days)	Level (mAHD)	Depth (m)	Increase in inundation (days)	Total inundation (days)
5	117.4	0.7	2.8	120.3	2.9	4.6	7.4
10	118.0	1.3	3.4	123.1	5.1	6	9.4
20	118.6	1.9	4.0	126.8	8.2	8.6	12.6
100	121.5	4.8	4.0	132.0	10.5	10.8	14.8
PMF	131.2	14.5	4.2	143.9	12.7	7	11.2

* Duration of temporary inundation has been calculated as when the rising limb of the hydrograph exceeds FSL (116.7 metres) and the falling limb of the hydrograph reaches FSL.

Chapter 15: Flooding and Hydrology	**Reference: Appendix A Secretaries Environmental Assessment Requirements page 3 point (q)**
Primary Issue: • *Sears Performance Outcome 2. Environmental Impact Statement 1.(q) relevant project plans, drawings, diagrams in an electronic format that enables integration with mapping and other technical software* has not been met.	
Task: • Flooding and Hydrology output mapping including the PUIA needs to be provided in an electronic format for integration with mapping	
Secondary Issue: Proper assessment is not possible with the information provided and there are critical chapters that rely on correct assessment of impact areas.	
Details: Mapping for flooding and hydrology has been provided in figures and diagrams that are of generally poor quality and at scales unsuitable for detailed examination and comparison.	

Chapter 17 – Non-Aboriginal Heritage

Non-Aboriginal heritage is covered in chapter 17 of the EIS, which assesses the potential impacts of the Warragamba Dam Raising project on non-Aboriginal (historical) heritage during construction and as part of the future operations of the infrastructure.

Within the 74-page non-Aboriginal heritage chapter, there are several subheadings which provide an overview of the project, the assessment methodology, the existing environment, and the impact assessment related to construction and operations. Environmental management measures are included, as is a risk analysis. There are several tables which identify the various heritage impact types, the heritage items within the study area listed in the *Wollondilly LEP 2011* (LEP) and State Environmental Planning Policy (Sydney Region Grown Centres) (SRGC) schedules, archaeological potential within the construction footprint, an assessment of significance under the NSW heritage assessment criteria, and an assessment against the significance impact criteria, among other things. Figures illustrate the study area, heritage items, various views, heritage curtilages and World Heritage, National Heritage, State Heritage and LEP-listed items within inundation areas.

This non-Aboriginal heritage chapter of the EIS is supported by a detailed non-Aboriginal heritage impact assessment prepared by Artefact Heritage in 2019 (Appendix I). The impacts on World and National Heritage listed values for the Greater Blue Mountains Area (GBMA), including the nominated National Heritage List Greater Blue Mountains Area—Additional Values, is assessed in Appendix J in the EIS.

Secretary's Environmental Assessment Requirements for non-Aboriginal heritage

The Secretary's Environmental Assessment Requirements (SEARS) relevant to non-Aboriginal heritage are reproduced below.

> ***Desired performance outcome***
>
> *The design construction and operation of the project facilitates, to the greatest extent possible, the long term protection conservation and management of the heritage significance of items of environmental heritage objects and places.*
>
> *The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage, objects and places.*
>
> ***Requirements***
>
> *The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage of:*
>
> *a) environmental heritage, as defined under the Heritage Act 1977*
> *b) items listed on the National and World Heritage lists.*
>
> *Investigations including surveys and identification of cultural heritage values should be conducted in consultation with OEH regional officers.*

Where impacts to State or locally significant heritage items area are identified, the assessment must:

(a) include a statement of heritage impact for all heritage items (including significance assessment).
(b) consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, alternated historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant).
(c) outline measures to avoid and minimise those impacts in accordance with the current guidelines
(d) be undertaken by a suitably qualified heritage consultant/s (note: where archaeological excavations are proposed, the relevant consultant must meet the NSW Heritage Council's excavation director criteria).

Any objects recorded as part of the assessment must be documented and notified to OEH.

Where land is declared wilderness under the Wilderness Act 1987 or on the World Heritage List as part of the Greater Blue Mountains World Heritage Area (GBMWHA) and lands declared as Wild Rivers under the NPW Act the Proponent:

(a) must define the area and extent of impact on such lands.
(b) provide evidence that the proposal is consistent with the Wilderness Act 1987 and the management principles for wilderness areas.
(c) assess impacts on land to be included on the National Heritage List.

Response

The methodology used for the non-Aboriginal heritage assessment conducted by Artefact Heritage included desktop research and assessment, review of statutory listings, previous reports, preparation of detailed land use histories, field surveys, assessment of heritage impacts, and recommendations for environmental management and mitigation measures.

According to the Artefact report, a total of 988 listed heritage items are present in the area. This includes (11) places listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and (184) heritage items listed under the *Heritage Act 1977* (NSW), comprising State Heritage Register listed items (68), NSW Historic Shipwreck Database items (40) and (76) items included by State government owned or managed places on Section 170 Heritage and Conservation registers. There are 793 places listed on Local Environmental Plans (LEP). It is not clear if all of the LEP listings are also on the other registers.

No potential heritage items have been identified as part of the non-Aboriginal heritage assessment. No social values assessment or community engagement was conducted.

In general, the EIS Chapter 17: Non-Aboriginal Heritage and Appendix I: Non-Aboriginal Heritage Assessment Report, provide a sufficient assessment of impacts to non-Aboriginal archaeological heritage and three key sites closely associated with the existing dam (Haviland Park, Warragamba Supply Scheme and Warragamba Dam). The heritage impact assessment of the broader scope of heritage sites, in particular downstream sites, would benefit from further detail and specificity. Additional information on alternatives considered and their heritage impacts, and more mitigation measures, would improve compliance with the SEARS Desired Performance Outcomes.

Based on a high-level review, the following key issues with the non-Aboriginal cultural heritage have been identified. These represent an overview of the main substantive issues in relation to non-Aboriginal culture heritage, but do not include detailed discussion of a range of other more minor issues:

- The heritage assessment does not consider all heritage places and items in study area.
- The EIS only gives a generalised assessment of impacts for the majority of heritage places.
- The heritage assessment does not identify and assess impacts on social heritage values.
- Options analysis for the project does not demonstrate a clear consideration of heritage impacts of alternatives to justify the selected approach.
- The heritage assessment does not include mitigation measures for impacts on downstream heritage sites.

Chapter 17: **Non-Aboriginal Heritage**	**Reference:** **Appendix I: Non-Aboriginal Heritage Assessment**
Primary Issue: The heritage assessment does not consider all heritage places and items in study area.	
Task: Undertake a further investigation of all heritage places within the study area; in particular, downstream places that are listed on non-statutory heritage registers.	
Secondary Issue Lack of knowledge about heritage values prevents a comprehensive assessment of impacts.	
Details The EIS states that 'due to the large study area and generally minor impacts only items listed on statutory registers are included in the assessment, with the exception of Jooriland homestead' (page 17-3). It also states that, due to expected minor impacts, heritage items downstream of the project were not inspected (page 17-7). It is standard practice to include consideration of all heritage items within a study area, including non-statutory listed heritage items. Under *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013*, which defines the basic principles and procedures to be followed in the conservation of Australian heritage places, the impact of proposed changes on the cultural significance of a place should be assessed (Article 27). The cultural significance means all of a place's aesthetic, historic, scientific, social or spiritual value for past, present or future generations (Article 1). All heritage values within a place need to be understood to be able to determine the level of impact, whether it is acceptable, and the best way to avoid or minimise impacts. Otherwise impacts on potentially significant heritage places may be missed. The omission of non-statutory listings does not constitute 'best practice' in heritage impact assessment. Non-statutory registers provide an indication of the community's esteem for places, and	

they may also indicate places or items of heritage significance which have not been listed for other reasons (eg because nomination to a heritage list has not yet happened). Depending on the location of the proposed development, this may include heritage lists such as the former Register of the National Estate, the National Trust Register (NSW), and the Australian Institute of Architect's Register of the Twentieth Century Buildings.

The rationale for the omission in the EIS is explained as due to the scale of the study area, and the 'generally minor impacts'. Non-statutory registers are not typically omitted due to the scale of the area. Further, it is not possible to confirm whether 'generally minor impacts' will occur to a heritage place without understanding its cultural significance. For example, some places will be constructed of sensitive materials which will be greatly affected by flooding, while other places may be significant for their social values and will be less affected by physical change.

The EIS states that consultation with institutions that maintain non-statutory lists (eg National Trust, Australian Institute of Architects) 'would be undertaken once stakeholders have matched areas of impacts to items on their respective databases' (page 17-5). Best practice, as well as the SEARS for non-Aboriginal heritage, place the responsibility for identifying impacts on environmental heritage on the proponent, not third parties.

Chapter 17 **Non-Aboriginal Heritage**	**Reference:** **Appendix I: Non-Aboriginal Heritage Assessment Reports**
Primary Issue: The EIS only gives a generalised assessment of impacts for the majority of heritage places.	
Task: Update the heritage assessment to provide a more specific assessment of impacts on heritage places and items, including using examples where appropriate.	
Details The EIS and Heritage Assessment (HA) report gives a specific assessment of heritage impacts for several key places within the construction zone (Haviland Park, Warragamba Emergency Scheme, and Warragamba Supply Scheme). However, for impacts within the flood mitigation zone (FMZ) and downstream, the HA only provides generalised commentary on types of heritage impacts that could occur. The HA does not provide examples or types of impacts with reference to specific heritage places, nor detail the likelihood of different types of impacts. For example, the EIS states that for build heritage items downstream, 'the level of impact on individual items would be dependent on several factors including the construction, permeability and materiality of the item, its structural and fabric condition, the nature of any moveable heritage items, and the depth and velocity of the low-level floodwaters resulting from discharges from the FMZ' (page 17-57). This analysis does not provide project-specific information on the types of heritage impacts that may be likely for heritage places within the study area, such as whether all timber structures would be expected to	

be damaged by longer duration floodwaters, or whether the majority of heritage buildings within the study area are masonry and therefore less likely to suffer from flooding, etc. The heritage assessment is not targeted at the actual impacts associated with the operation of the project, and does not cross-reference with the list of identified heritage items (Table 17-4).

The generalised assessment only addresses the physical impacts associated with the project on the physical fabric of the heritage places and items, without analysing how the associated heritage significance of the places would be affected. Heritage impact assessment should consider the impact on the cultural significance of a place, which can be due to its physical fabric, historic importance, social and community value, etc.

Without detail on the type or degree of impacts on many heritage places and items, it is difficult to establish whether all impacts have been taken into account, and whether appropriate measures have been taken to avoid and minimise impacts.

Chapter 17: Non-Aboriginal Heritage	Reference: Appendix I, Non-Aboriginal Heritage Assessment Report
Primary Issue: The heritage assessment does not identify or assess impacts on social heritage values.	
Task: Update the heritage assessment to identify and take into account social heritage values.	
Details: The HA states that 'no community consultation was undertaken in the production of this assessment. Social and associative significance assessments for heritage listed items and potential archaeological resources were based predominantly on existing studies and data included on the State Heritage Inventory (SHI) for individual items' (page 8). Consideration of all the cultural significance of heritage places and items, including social heritage values, is best practice in heritage impact assessment, but has not been followed in the preparation of the EIS. Social heritage values are special associations between a community or cultural group with a place for social, cultural or spiritual reasons. Assessing social value involves understanding the significance of a place to communities and groups, and where in a place this significance resides. While the social heritage values of several specific places have been considered (eg Haviland Park), there are a large number of both listed and unlisted heritage places and items in the study area which have not been considered for potential impacts on social heritage values. The level of community interest in the proposed project indicates a high degree of social engagement and association with the study area. Community consultation and further assessment would be expected to identify additional social heritage values which could be impacted by the project and thus needing to be considered as part of any environmental approvals. The HA could draw on the findings of community consultation to support this assessment.	

Chapter 4: Project Development and Alternatives	Reference: N/A

Primary Issue:
The options analysis for the project does not demonstrate a clear consideration of heritage impacts of alternatives to justify the selected approach.

Task:
Conduct a detailed review of the iterative process of the options analyses and include it in the EIS, to show that non-Aboriginal cultural heritage was meaningfully considered as part of the options selection process.

Details:
SEAR Desired Performance Outcome 2 for non-Aboriginal cultural heritage requires that 'the design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage, objects and places.'

To establish whether impacts have been avoided to the greatest extent possible, the project should be described in sufficient detail to demonstrate that it has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts. Evidence that alternatives have been considered, along with their associated heritage impacts, is necessary for this comparison.

The EIS does not provide a detailed analysis of the options and alternatives considered for the project and their associated non-Aboriginal cultural heritage impacts. It states that the Taskforce Options Assessment Report (2019) considered the impact of alternatives on socio-economic, environmental and cultural heritage values, but the detail of this analysis is not included in the EIS (page 4-10). A high-level summary of alternatives is included at Table 4-6, but this analysis combines social, economic and environmental impacts, meaning it is not possible to distinguish the specific heritage impacts of the different options.

Some sections of the EIS provide a partial analysis of the impacts of some designs on heritage alternatives (eg 4.4.3.3, at page 4-23), but overall this topic is not comprehensively addressed to an extent that demonstrates non-Aboriginal cultural heritage was meaningfully considered as part of the design iteration processes.

Chapter 17: **Non-Aboriginal Heritage**	**Reference:** **Appendix I, Non-Aboriginal Heritage Assessment Report**

Primary Issue:
The heritage assessment does not include mitigation measures for impacts to downstream heritage sites.

Task:
Revise the HA to include suggested mitigation measures to reduce impacts on downstream sites.

Details:
The HA identifies that there would be low-level impacts from the project downstream from flooding events, and that 'additional impacts would occur to heritage items within the area impacted by the Flood Mitigation Zone discharge, where low level flooding would be extended in duration' (page iv; see also page 115).

Despite the recognition of downstream impacts associated with the project, the EIS does not provide any measures targeted at mitigating specific types of downstream impacts. All mitigation measures suggested in the HA are targeted at the construction area and the Warragamba Supply Scheme, Haviland Park and Warragamba Dam heritage places.

SEAR Desired Performance Outcome 2 for non-Aboriginal cultural heritage requires that 'the design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage, objects and places'.

The lack of suggested mitigation measures for downstream impacts mean the HA does not establish that all impacts have been minimised to the greatest extent possible. The HA does not discuss whether additional mitigation measures have been considered, and whether they could be effective or useful. This suggests there may be further opportunities that have not been identified to reduce the heritage impacts of the project on a large number of heritage places. If no suitable mitigation measures are available for downstream impacts, this should be explained and justified, so the extent of residual impacts can be understood.

Chapter 18 – Aboriginal Heritage

The SMEC assessment of Aboriginal Heritage is summarised in Chapter 18 of the EIS and draws on the Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared by Niche and included in the EIS Appendices.

The AAR also includes a number of annexes that cover the mapping of AHIMS site locations, the mapping of new site locations, and the Archaeological Survey Methodology provided to the Registered Aboriginal Parties (RAPs) as part of the consultation process. However, all site location mapping has been removed from the document, along with the Archaeological Survey Methodology document, at the request of the RAPs. This is not uncommon as it provides an opportunity for RAPs to minimise the exposure of sensitive site data to the wider public. However, the omission of this information impedes GML's ability to clearly review the integrity of the report's findings.

With that in mind, it is clear there are a number of deficiencies and oversights in the assessment process that affect the integrity of the conclusions.

After a preliminary review of the ACHAR, it became apparent that a review of Chapter 4 of the EIS (Project Development and Alternatives) was necessary—hence its inclusion in this review.

Secretary's Environmental Assessment Requirements for Aboriginal Heritage

The Secretary's Environmental Assessment Requirements (SEARs) include a range of Desired Performance Outcomes for an EIS. Desired Performance Outcome 10 is specific to Aboriginal heritage and is reproduced below.

> ***Desired performance outcome***
>
> *The design construction and operation of the project facilitates, to the greatest extent possible, the long term protection conservation and management of the heritage significance of items of environmental heritage objects and places.*
>
> *The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage, objects and places.*
>
> ***Requirements***
>
> *The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of:*
>
> a) *Aboriginal places and objects, as defined under the National Parks and Wildlife Act 1974 and in accordance with the principles and methods of assessment identified in the current guidelines;*
> b) *Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan; Investigations including surveys and identification of cultural heritage values should be conducted in consultation with OEH regional officers.*

Where archaeological investigations of Aboriginal objects are proposed, these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010). Consultation with Aboriginal people must be undertaken prior to investigations. Significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS.

Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines.

Any objects recorded as part of the assessment must be documented and notified to OEH

Where land is declared wilderness under the Wilderness Act 1987 or on the World Heritage List as part of the Greater Blue Mountains World Heritage Area (GBMWHA) and lands declared as Wild Rivers under the NPW Act, the Proponent:

(a) must define the area and extent of impact on such lands;
(b) provide evidence that the proposal is consistent with the Wilderness Act 1987 and the management principles for wilderness areas;
c) assess impacts on land to be included on the National Heritage List

Response

Based on a high-level review, six main points have been identified for discussion. It should be noted that they represent an overview of the more substantive issues and do not include detailed discussion of a range of other more minor issues that speak to the overall quality of the report. The following key issues were identified:

- the options analysis does not appear to account for Aboriginal cultural heritage values;
- the survey method is inadequate;
- predictive modelling is flawed due to its limited focus on soil and slope landscape characteristics, and its reliance on an inadequate survey methodology;
- National Heritage values have not been assessed;
- cumulative impact assessment is inadequate—the cumulative impact assessment uses historical impacts as a mitigating measure for current additional impacts, does not account for historical loss, and does not account for the views of RAPs / Traditional Owners; and recommendations do not adequately address the impacts, and do not account for Aboriginal cultural values, but are focused only on technical archaeological values.

Chapter 4: Project Development and Alternatives	Reference: N/A

Primary Issue:
Options analysis does not appear to account for Aboriginal cultural heritage values.

Task:
Conduct a detailed review of the iterative process of the options analyses and include it in the ACHAR to demonstrate that Aboriginal cultural heritage was meaningfully considered as part of the options selection process.

Details:
There is no clear evidence in Chapter 4 that Aboriginal cultural heritage values were assessed and considered as part of the options analysis.

SEAR Desired Performance Outcome 2 requires that the project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact, including its cumulative impact. This requirement references the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as the relevant guideline. The 'environment' as defined in the EPBC Act includes cultural heritage.

While an iterative decision-making process is discussed in Chapter 4, there is no evidence that any assessment of cultural heritage informed that process. Reference is made to prior reporting prepared for the 2014–2016 Task Force, but no summary of cultural heritage values assessment or Aboriginal community consultation is provided to assist in justifying the final design decision.

There is no evidence that any design options were discussed with the Aboriginal community for this EIS process, and there is no clear evidence to indicate that any prior consultation was undertaken. The summary in the ACHAR of the consultation processes undertaken for that report indicates that the current proposal for raising the dam wall was the only option provided to the Aboriginal community. This point was not lost on the RAPs for the project, who noted in their responses to the project that no alternative development options were presented to them and that no apparent consideration had been given to alternatives that caused no harm to Aboriginal cultural heritage.

While criteria for the assessment of alternatives outlined in Chapter 4.2 include 'socio-economic, environmental and cultural heritage impacts' (pp 4–5), these are noted as having been discussed elsewhere in the Taskforce Assessment Options Report (INSW 2019) and no further detail is provided on how they were assessed.

Chapter 18: Aboriginal Cultural Heritage Assessment	Reference: AAR Section 8 and Appendix K—ACHAR (and Appendix 1 AAR)

Primary Issue:
Survey method is inadequate.

Task:
Develop a revised archaeological survey strategy that:

- is based on a more rigorous sampling methodology that includes null hypothesis survey locations and greater calculation and reporting of effective survey coverage;
- considers and actively includes cultural landscapes and ethnographic information; and covers a greater portion of the study area.

Details

The archaeological survey strategy (AAR Sec 8.2) was targeted to known sites, and a range of other ad hoc sampling strategies were used that have not been clearly described. The AAR notes that 'sampling of rivers, creek lines and large sandstone rock platforms and boulders … were all subject to systematic survey'.

However, this statement fails to outline whether **all** such features were 'systematically surveyed' or were only subjected to 'sampling'. If only a sample of these features was surveyed, the basis of the sampling has not been outlined. The figures indicating survey coverage (AAR Annex 2 Fig 16–17) suggest that the there was a partial sample of these features, but the sample selection process is not discussed. No detailed figures are provided to understand the relationship between the sampling strategy and the survey coverage.

The survey sampling strategy was not prepared using a stratified random sampling methodology, and it targets areas predicted as being the most archaeologically sensitive. This approach becomes a self-fulfilling prophecy—sites will be found in areas predicted as having sites, and no information is collected about areas where there are no sites predicted. Testing areas where sites are not predicted is referred to as 'null hypothesis' testing and is a credible approach to testing the integrity of a predictive model.

Without a rigorously prepared stratified random sample and without any form of null hypothesis testing, the veracity of the predictive model cannot be tested.

Because approximately 30 per cent of the impact area was sampled during the archaeological survey, the Aboriginal heritage impact assessment relies heavily on the predictive model. However, the predictive model is flawed, and only makes predictions about areas already expected to contain sites.

The results discussion does not provide any information on the effective survey coverage. Discussions of Ground Surface Visibility (GSV)which underpins the idea of effective survey coverage is obscured by reference to methodologies of finding rockshelters by other consultants working on the Illawarra Escarpment and Woronora Plateau. An opaque connection is drawn

between these studies and the Warragamba Dam project in lieu of discussion about the actual GSV and its effectiveness of the survey coverage. Summary tables of survey coverage by slope class and soil landscape omit the important data on GSV to indicate the actual effectiveness of the survey coverage for these landforms.

Limited provision was made in the survey strategy for drawing from ethnographic information or other cultural information relating to intangible values. Part of the survey focused on a creation story, as noted by the RAPs, but—as noted in the CVAR—no cultural values mapping exercise was undertaken and consideration of these sites was not included in the ACHAR's archaeological survey strategy.

The statement on page 32 of the AAR (Appendix K—Appendix 1) that the sampling strategy '... is considered adequate for the purpose of this assessment' is simply incorrect and seems to be an attempt to circumvent critical review.

Chapter: **Appendix K—ACHAR—Appendix 1** **AAR**	**Reference:** **AAR Section 8**
Primary Issue: The predictive model is flawed due to its limited focus on soil and slope landscape characteristics and its reliance on an inadequate survey methodology.	
Task: Revise the predictive model to include a broader range of variables, including ethnographic information, the results of an updated sampling strategy, and a consistent set of parameters supported by the survey.	
Details The archaeological survey strategy was not set up to support a testable and verifiable predictive model, so the scientific merit of the predictive model is flawed. Furthermore, a revised predictive model is presented (at AAR Sec 10.1.1), resulting in the prediction that 174 sites could exist within the Project Upstream Impact Area (PUIA). The modelling to achieve this prediction is formulated around hectares of soil landscape per site found. However, the basis for this is not consistent with the apparent survey method, which largely references slope category rather than soil landscape as the key determinant of which areas were chosen for survey. While soil landscape and slope category are discussed together on a number of occasions, there is no clear demonstration of how the survey method accounted for the total composition of soil landscapes across this survey area, nor the percentages of each soil landscape covered. While the total area of each soil landscape and its proportional relationship to sites found is provided, the validity of this calculation as a predictive modelling method cannot	

be verified in this context because there is no consistent basis for comparison between the survey method and predictive model.

The predictive model relies solely on technical archaeological descriptions of landscape, excluding ethnographic and other information from the CVAR or from discussions with the RAPs. While Aboriginal archaeological reports, such as this, often focus on scientific significance, they are supporting documents to an ACHAR which is intended to encompass a wider discussion of Aboriginal cultural values. The ACHAR should draw in the cultural information from RAPs and the CVAR and incorporate this information into any modelling for both the significance assessment and the impact assessment.

Chapter: **Appendix K—ACHAR Chapter 8**	**Reference:** **Pp 58–65**
Primary Issue: National Heritage values have not been assessed.	
Task: Update the significance assessment to account for National Heritage values (criteria under the EPBC Act).	
Details: The significance assessment covers criteria related to the *National Parks and Wildlife Act 1974* (NSW) (NPW Act) but overlooks the SEARs requirement that National Heritage values be considered as well. Given the relationship of the site to the Greater Blue Mountains World Heritage Area, the National Heritage List (NHL) criteria under the EPBC Act should be outlined and the identified values assessed against them. The comments from the RAPs in this section clearly show that the study area in general is of high cultural value.	

Chapter: **Appendix K—ACHAR Chapter 10**	**Reference:** **N/A**
Primary Issue: Cumulative impact assessment is inadequate; it uses historical impacts as a mitigating measure for current additional impacts, does not account for historical loss, and does not account for the views of RAPs / Traditional Owners.	
Task: Revise the cumulative impact assessment in light of revised archaeological survey data, and in consultation with the Aboriginal community.	
Details	

Impacts to both archaeological sites and cultural sites are outlined in Chapter 9 of the ACHAR, and also in the AAR. Impacts are assumed to be 'total loss of value' for any site within the PUIA—predicted to be 174.

Section 9.3 (pages 75–77 in the ACHAR) acknowledges that the impacts will constitute harm to those sites, noting that impacts from the project 'will result in harm to Aboriginal objects and cultural values' and also separately noting that the proposal 'will be harmful to the identified cultural values'.

The AAR also notes, in regard to the 43 known sites in the PUIA, that 5 are of high significance, 3 are of moderate significance and 35 are of low significance. As there is no way of predicting the likely significance of the other possible 131 sites within the area, there is no way to quantify the actual impacts to sites of high significance. Furthermore, this observation is based on the AAR assessment of archaeological technical significance only and doesn't account for cultural values.

So, in essence, the ACHAR acknowledges that there will be harm to all sites within the PUIA, and the degree of harm to those sites is considered to be total. The scientific significance of at last 75 per cent of those sites is broadly unknown (based on the current predictive model) and the cultural significance of all of those sites is high.

Despite this position, Section 10 of the ACHAR (p 79) states that 'The A[A]R has concluded that considered against the precautionary principle the potential impacts of the Project on archaeological scientific values can be considered relatively minor due to prior or existing impacts'.

This conclusion is entirely at odds with the findings of the report. Giving consideration to the precautionary principle, full scientific certainly about the number, nature and extent of sites within the PUIA is not known. Therefore, the conclusion that the impacts from the project would be minor does not take into account the precautionary principle at all. Instead, it is entirely opposed to the fundamental purpose of the precautionary principle. There is also no rationale for the conclusion that the impacts would be minor. This is simply an assertion by the authors that is unsupported by the extent of impacts outlined in Chapter 9.

Furthermore, the justification for the assessment of the cumulative impacts being minor is based on the existence of prior impacts. The concept of cumulative impacts should not use historical impacts as a mitigating measure in assessing ongoing and future impact as being negligible.

The cumulative impact assessment also fails to address the key issue set out by the Aboriginal community—that the existing dam construction in the 1950s is already a source of significant impact to the cultural values of the area, and that this existing impact is entirely unmitigated. Comments from the Aboriginal community state that the current dam represents a historical and inter-generational impact on cultural values.

The ACHAR (pages 58–60) presents a number of specific quotes from RAPs that impacts will be substantial.

Chapter: Appendix K—ACHAR Chapter 11	Reference: N/A
Primary Issue: Recommendations do not adequately address the impacts, and do not account for Aboriginal cultural values, but are focused only on the archaeological values.	
Task: Revise the recommendations in light of revised predictive modelling, survey strategy and impact assessment. Revise the recommendations to incorporate the views of Aboriginal community.	
Details The CVAR and RAP responses in the ACHAR indicate that the Aboriginal community does not support the project. The recommendations for the report focus substantially on the collection of technical archaeological evidence to mitigate impacts, and include the completion of an archaeological survey of the study area. While the archaeological survey is recommended as a post-approval process, it should in fact have been undertaken as a pre-approval process to inform the assessment. The recommendations at present presuppose that the project will be approved. They do not provide for any options for mitigation through redesign or any greater consideration of alternatives. Comments from the RAPs note that they were not consulted about alternatives to the project and do not believe that their objection to the project has informed the recommendations.	

Additionally, Council has engaged a subject matter expert 'Peter Kabaila, Heritage Consultant, Black Mountain Projects' to review this chapter and their comments are provided as a separate attachment to Councils submission.

Chapter 19 – Noise and Vibration

Chapter: 19: Noise and Vibration	Reference: EIS Table 19-15 Predicted construction noise (standard hours), 19-16 Predicted Construction Noise (outside of standard hours), Table 19-20 Predicted blasting and overpressure levels, Table 19-21 Management measures, Noise and Vibration Assessment

Primary Issue:

The results of the construction noise assessment have found that construction noise impacts associated with the proposal are predicted to exceed construction noise management level criteria at the majority of receivers in Warragamba throughout the construction program. Predicted noise levels were identified as noticeable to clearly audible for the majority of the receivers.

Secondary Issue:

Background Noise Monitoring, and assessment, was carried out to the nearest receivers at Warragamba. Whilst the noise contours appear to extend beyond this zone, no noise/vibration assessment was carried out to the new residential subdivision at Silverdale – West of Marsh Road.

Task:

Further Noise/Vibration Assessment should be carried out to assess vehicles leaving and entering the site, unladen and laden. Further Noise/Vibration Assessment should be carried out to heavy vehicles using the local road network.

Cumulative assessment should be carried out on processes which may occur simultaneously during construction.

Further Noise/Vibration Assessment should be carried out to potentially effected homes in the new subdivision, West of Marsh Road Silverdale.

In Order to meet the requirements of the SEARs, assessment should be carried out to demonstrate how blast impacts can be mitigated at receivers to ensure that they meet with current guidelines.

Details should be provided on how the recommendations provided in the Noise and Vibration Assessment will achieve compliance at the nearest sensitive receivers, particularly during evening and night time periods.

Given the length of time that sensitive receivers are likely to be impacted by noise and vibration from the construction works, (up to 5 years), the assessment should also consider respite periods, where there is a lull from noise and vibration generating activities.

Details:

The EIS Table 19-21 provides management measures to deal with exceedences in construction noise and vibration. These include:

- A construction noise and vibration management plan (CNVMP) to include processes and responsibilities to assess, monitor, minimise and mitigate noise and vibration impacts during construction.

- Detailed noise assessments for ancillary facilities during construction of the project. Requirements for appropriate noise management measures are to be assessed and implemented prior to commencement of activities likely to cause noise or vibration impacts
- Consultation with potentially affected residents – prior to undertaking an activity
- Noisy work and vibration intensity activities , where possible to be undertaken during daytime hours, or as early as possible in the evening or night time periods, and to provide respite periods
- Deliveries only during the day and Mitigation measures for out of hours vehicle movements to be included in the CNVMP
- Vibration managed to minimise potential for impact on structures and sensitive receptors, or use of alternative methods. If no alternative, monitoring to take place.
- Blast management plan (BMP) to be developed for the project. To design and monitor trial blasts and to confirm maximum instantaneous charge (MIC) and blast design to meet vibration and overpressure limits.
- Restrict blasting to between 9am to 5pm Monday to Saturday,
- Ongoing monitoring of plant and equipment.

The development has the potential to increase traffic noise and vibration, around and beyond the curtilage of the development particularly along the local road network, extending along Silverdale Road, Park Road and Farnsworth Road and into neighbouring suburbs, dependant on the route taken. The assessment identifies a potential increase in up to 208 heavy vehicle movements/day and an increase in up to 250 light vehicle movements/day during the construction phase.

Exceedence in traffic noise criteria is expected to receivers in Park Road, Wallacia. With the greatest impact being felt at Warradale Road Silverdale, during night time periods. The report states that any increase in road noise should be limited to 2dB above the existing noise level. No recommendations have been made as to how noise from increased traffic should be mitigated and the assessment advises that exceedences are not considered to warrant noise mitigation at this stage. However, the Noise and Vibration Assessment states that traffic noise will be included in the CNVMP.

Assumptions have been made on routes intended to be travelled and no noise/vibration assessment has been carried out to impacts from heavy vehicle movements to ensure that the RTA Noise criteria of <2dB above background noise is met. No assessment has been made relating to trucks leaving and entering the site.

Exceedences have been demonstrated for construction noise, both at daytime and night time periods, as well as vibration, which has the potential to cause significant impact to receivers during the very long construction phase (up to 5 years) of the development.

No cumulative noise assessment for construction processes has been carried out.

Some recommendations have been addressed in the Noise and Vibration Assessment, including, the use of temporary screens, selection of plant and equipment, minimising number of plant operating at once, equipment maintenance and community engagement. There has been no demonstration in the report on how effective these controls will be in mitigating noise impacts to receivers.

There has been no demonstration that blast impacts are capable of complying with the current guidelines as required under the SEARS. The assessment has concluded that overpressure from

blasting will be experienced in exceedence of the relevant criteria at various locations, including at the Warragamba Dam Visitor's Centre, Haviland Park and the Indigenous Heritage Receivers.
The EIS, and the Noise/Vibration Assessment are relying heavily on monitoring and mitigation measures to be implemented once the project starts.

Chapter 20 – Protected and Sensitive Lands

Chapter: 20: Protected and Sensitive Lands	Reference: N/A
Primary Issue: Councils should be included as core representatives on the Warragamba Offset Program Advisory Committee	
Task: This chapter provides a very high level overview and assessment of the various legislation and international conventions, principles and listings for a range of protected and sensitive land considerations ranging from world heritage areas and property, conservations areas, listed threatened species and ecological communities, biobank sites, national parks, key fish habitat and aquatic reserves, water management, water quality, wild rivers, wilderness areas, areas of outstanding biodiversity value, bushfires, geology, and aboriginal cultural heritage. The brief assessment provided against each of the matters is covered in greater detail in other chapters within the EIS and it is therefore difficult (and possibly inappropriate) to provide any substantive comments without reviewing the related chapters. This includes nine other chapters and one appendix.	
Details: **PMF is an useful measure;** The chapter identifies the 'probable maximum flood' (PMF) as a notional upper limit of flood magnitude and does not identify the probability of exceedance of such an event. In particular the chapter notes that the PMF is unlikely to occur in nature given the size of the Warragamba Dam Catchment. The nominated PMF is unhelpful. The extreme risk scenario provided is diversionary as it distracts from less severe but more likely events that may still require mitigation measures. The chapter frequently notes in response to any identified impact from the PMF that such an event 'is unlikely to ever occur in reality'. The concern is that practicable mitigation measures that may have been identified with a lower PMF may be overlooked. **Content not understandable;** It is not clear on what the purpose of Chapter 20 is. Impacts are considered in parts on a site/species basis (noting that these are all dealt with in other chapters) and there is no holistic discussion. For example; - Chapter 20 focusses on the potential impacts on protected and sensitive lands but does not include any commentary on the significance of the impacts collectively and whether these are justified in terms of the overall benefits of the project or the relative impacts of alternative options for that matter. - Likewise the chapter makes reference to scenarios where the dam wall raising may reduce impacts downstream but does not conclude whether there will be more or less impacts on protected land downstream than the status quo. **Impacts on archaeological sites and aboriginal cultural heritage down played**; Acknowledges that there is the potential for other sites to occur but does not propose any mitigation measures, nor really appreciate the significance of such sites.	

Inconsistent approach to the potential impact on sites from water inundation.

Only about 40% of the Greater Blue Mountains World Heritage Area potentially impacted by the project has actually been surveyed in terms of Aboriginal cultural heritage

Page 20-33 (page 36 of PDF); summarises findings from survey assessment of aboriginal cultural heritage potentially impacted by the project. One bullet point notes that *generally rock (that is, artefacts, axe grinding grooves) and would not be directly affected by temporary inundation, however indirect impacts such as changes in erosion and deposition of sediments may affect the integrity and access to the sit*es

Section 20.5.4.2 lists a number of examples of impacts on cultural heritage items from submersion to demonstrate the benefit from the project where inundation of areas downstream would be reduced. One of the examples lists axe grinding grooves which contradicts the statement on page 20 mentioned above.

Advocate for stronger role in Warragamba Offset Program; An advisory committee will be established as part of the Warragamba Offset Program. A number of core representatives are identified and Councils are mentioned as 'other parties' who will be involved where required.

The Offset Program appears to cover offsets for a range of biodiversity and non-biodiversity matters including cultural heritage.

Refer to page 20-55 (page 58 of the pdf document).

Chapter 21 – Socioeconomic Assessment

Chapter: 21: Socio-Economic, land use and property	Reference: Whole chapter plus Appendix M: Socio-economic, Land Use, and Property Assessment Report

Primary Issue:

Chapter gives inadequate consideration to the distributional inequity of burdening the disadvantaged town of Warragamba with five years of construction in order to benefit the people of the Hawkesbury-Nepean Valley. The EIS and SEIA implicitly take the position that the potential benefits to the people of the Hawkesbury-Nepean valley outweigh the costs to the people of Warragamba, but no cost-benefit analysis appears to have been carried out to establish and justify this position, and alternative options do not appear to have been explored.

Warragamba has a small commercial offering that is highly dependant on tourist trade. This has not been addressed at all and history has shown the disastrous impacts extended works on the dam has had to local businesses.

Wollondilly Shire Council has not been informed what the expectation is for 'Provide support to Wollondilly Council to assist with project related administration and enquiries'.

Task:

Alternative options for mitigating flood risk to the people of the Valley need to be explored (eg. road network improvements for better evacuation capacity, which would likely be a more equitable approach), and a proper analysis should be carried out to compare the options. Should this project proceed, it must be justified against the other options by an appropriate cost-benefit analysis.

Secondary Issue:

A number of issues have been ignored or inadequately dealt with in the chapter and appendix.

Details:

The SEIA (Appendix M) does not appear to include any plan for ongoing monitoring of social or economic impacts during or after the construction phase.

- Best practice would suggest that such monitoring should be carried out regularly either internally (project staff) or externally (agencies or community groups), but there appears to be no suggestion that such a plan or financial resources will be available.

Discussion of mental health impacts is limited to the trade-off between the positive impacts of flood risk mitigation and the negative impacts of noise and vibration, without addressing the inequitably distributed impact of loss of connection to country and possible exacerbation of intergenerational trauma for Gundangara people and other Indigenous residents.

While the EIS is predicated on the principle that the purpose of the project is solely to improve safety for the Hawkesbury-Nepean valley, we have no guarantee that the project will not also be used to justify further intensification of residential development on the flood plain. There has been (justifiable) community suspicion on this front, and such an outcome would have detrimental social and health impacts throughout the Western Parkland City.

The EIS documentation is extremely long and is not organised in an intuitive and accessible way. This makes it extremely difficult for community members to identify and access key information about a project that is likely to affect them.

- Warragamba is a socio-economically disadvantaged community, creating additional challenges (and responsibilities) for engagement.

The impacts of reduced safety (and perceptions of reduced safety) for people walking and cycling have not been adequately addressed, particularly in the context of Warragamba's narrow streets and poor way-finding.

Finally the offense caused by the mislabelled and incorrect identification of suburbs for the people of Wollondilly is offensive, and creates immediate detachment and separate issues.

Chapter 23 – Sustainability

Chapter: 23 – Sustainability	Reference: N/A
Primary Issue: Insufficient detail and lack of proper referencing removes the ability to properly assess this chapter.	
Task: Further information is required.	
Secondary Issue: Traditional owners must be specifically mentioned in stakeholder collaboration.	
Details: Unable to properly assess the Sustainability Chapter as it is lacking sufficient detail including examples on how each items are achieved in Tables 23-2, 23-5, 23-6 and 23-7. Information is vague and unclear. Also lacking adequate referencing throughout tables mentioned above linking referenced documents and other relevant information such as detail from workshops which makes it unable to be properly assessed. Section 23.4.1 – Environmental and sustainability commitments must specify working collaboratively with the Gundungurra and other traditional owners. It is noted that one of the commitments state collaborating with key stakeholders however, working with the traditional owners must be specified. Traditional owners need to be specified clearly when stakeholder participation or engagement items – eg Table 23-6.	

Chapter 24 – Traffic and Transport

Chapter: 24.1.2 Project and Study Area	Reference: Page 3
Primary Issue – The traffic & transport study area focused around the roads and intersections near to Warragamba and not the region that would be used by light and heavy vehicles – as stated in the report.	
Task: The Traffic and Transport Study needs to be broadened out to include all haul routes as described including intersections and level of service referred to in Figure 24-2. A road safety audit and risk assessment is required for all haul roads, formalised through a Vehicle Movement Plan and Traffic Management Plan.	
Details: The additional light and heavy vehicles will have an impact on all roads proposed to be used to the north and south of the subject site. No thought has been put to the impact once the vehicles leave the Warragamba area and studies not carried out. Figure 24-2 is meant to show the regional road network impacted by the works and the study area – clearly this area has not been studied and the regional/local road network has not considered past Warragamba. Nor does it have a key to the road classifications within the described study area.	

Chapter: 24.2.1 Road Network	Reference: Page 5
Primary Issue: Regional Road network refers to M4 Motorway, The Northern Road and Hume Motorway - these are State managed roads, – most of the access around the site will be via Council managed Region Road network and Council Roads, most of which are outside the study area for traffic impacts.	
Task: The existing road network needs to be considered in the context of State/Regional/Council Roads and the maps updated to reflect the very different classifications and funding of, and extended to show the full extent of the surrounding network that heavy vehicle will use to access the site.	
Details: The maps provided to show the existing environment and the surrounding network for the heavy vehicle access are poorly defined to show State/Regional/Local road classification and stop short of showing how these vehicles exit Wollondilly onto the Hume Highway in the south. The southern route lists Silverdale, Warradale and Production Avenue – what happens at the end of Silverdale Road at the Oaks? Looks like the plan is to use Motpelier Drive/Barkers Lodge Road and Remembrance Driveway – however these roads to not factor in the intersection capacity review (or note that Montpelier Drive has a 15T load limit).	

Chapter: 24.2.2 Major intersections and traffic count survey	Reference: Page 8
Primary Issue Surveys limited to 7 key intersections - none of which are outside of the Warragamba/Silverdale area – what happens when they leave Silverdale Road?	
Task: Traffic count surveys need to be extended to include all intersections for the proposed haulage routes within Wollondilly where none of the roads proposed are State Roads and have a lower design and service level.	
Secondary Issue: Major impacts to local and regional roads within Wollondilly that have not been considered in the traffic surveys.	
Details: No studies carried out at: • Silverdale Road/Mary Street/ John Street intersection – The Oaks • Montpelier Drive/Barkers Lodge Road intersection – Mowbray Park. • Barkers Lodge Road/Argyle Street – Picton – likely to go to a LOS F and a result + compromised road safety. • Remembrance Driveway/Thirlmere Way – Tahmoor.	

Chapter: 24.2.3 Roads and intersection capacity	Reference: Page 12
Primary Issue Data survey base year 2018 with an analysis for future year with construction traffic at 2022 – given that this is a 5 year construction project – why wasn't the analysis done for 2027?	
Task: Analysis should be redone for 2027 or beyond given the duration of the works and should factor in the developments happening in the Silverdale/Warragamba area.	
Secondary Issue: No capacity analysis carried out on other intersections within Wollondilly that will be heavily impacted by the Southern Haul Route	
Details: The 2022 analysis year for traffic figures with projected construction traffic are unrealistic given the potential start date past 2022 and the 5 year construction period. The two scenarios used to analysis the intersections were based in scenario 1 – 100% heavy vehicle using the northern route, and scenario 2 - 50% using the northern route. Given that there is no way of knowing where the raw materials will be sourced from for the construction – how can these presumptions be made? No analysis has been done on 100% heavy vehicles using the southern route. The report states that no specific developments were identified or advised by Wollondilly Shire Council to inform the impact on the road network – with several development in the works at the	

time of the community consultation taking place, it would be hard to comprehend that Council did not advise of these works in progress and planned developments.

Chapter 24.2.6 Property Access	Reference: Page 14
Primary Issue: It is anticipated that additional heavy vehicles loaded with construction materials will impact existing access to properties with direct access to the two lane, two way undivided carriageways, thereby impacting road safety - a direct contradictions to the SEARS requirements to minimise the impact on connectivity, safety and efficiency of the transport system. The safety of the transport system customers was to be maintained.	
Task: Further studies required to measure the impact on road safety for vehicles, property access and pedestrians and control measures provided.	
Secondary Issue: Travel speeds impacted for existing traffic with additional heavy vehicles traversing the mountainous section of Silverdale Road to the north of the site and the vertical and horizontal alignment issues of Silverdale Road to the south of the site.	
Details: The report acknowledges that the will be an impact on road safety – with no measures suggested to counteract the effects on property access, pedestrians, or the impact on the main commercial centres of The Oaks, Picton, Tahmoor and Bargo, The southern route also impacts on 3 primary schools and one high school that have not been considered.	

Chapter: 24.2.7 Pavement condition	Reference: Page 20
Primary Issue: The assessment of the existing road conditions in limited to the roads surrounding the site, and does not go far enough to consider the rest of the network that will be impacted for both the northern and southern haul routes.	
Task: Dilapidation report require for the full extent of all haul routes.	
Secondary Issue: All routes within Wollondilly are either regional or local roads – under the care and control of Council and are subject to council's limited budget to maintain.	
Details: Pavement condition index figures provided for the haul routes near to the site – no recommendation or assessment done as the effects on these roads with the additional heavy vehicle loads.	

Chapter: 24.2.10 Loading capacity of Blaxland Crossing Bridge	Reference: Page 26
Primary Issue: The bridge is a two lane two way bridge with no shoulders and a narrow raised footpath to the northern side of the bridge. The maximum load permitted is 57.5 Tonne. Specialist equipment over this weight would have to find an alternative access route. The study presumes that all heavy vehicles will be 42.5T – highly unlikely given the advancements in freight carrying capabilities for Class 2 heavy Vehicles.	
Task: Alternative haul route needs to be devised for oversized/over mass loads and included in the report and a traffic Management Plan needs to be submitted for managing heavy vehicle using the bridge for Council's consideration.	
Secondary Issue: Road safety is a major concern given the bridge is two lane with no shoulders and can't accommodate breakdowns and wide loads. The report suggests lowering the speed limit across the bridge for heavy vehicles during construction – adding further inconvenience to the existing road users.	
Details: Blaxland Bridge has in recent year undergone bearing replacement to maintain the 57.5T load limit – the bridge is subject to regular flooding and closure. Future damage to the bridge cannot be ruled out during flooding events and is the only northern access route for residents of Warragamba and Silverdale. The closure of the bridge has a major impact on residents and is the primary evacuation route in times of bush fire.	

Chapter: 24.3.1 Construction program, traffic generation and travel routes	Reference: Page 30
Primary Issue: As stated in the report, most of the heavy vehicle movements would be trucks delivering material for concrete production with half of the known quarries being to the south of the site – however the two scenarios used to determine road and intersection capacity presumed 100% deliveries form the north and 50% deliveries form the north. No scenario was considered for all deliveries being trucked in from the south, or the impact on the road network for the entirety of Wollondilly. The report doesn't know where the raw material will be shipped in from as this is the responsibility of the construction contractor.	
Task: Road and intersection capacity considerations and investigation needs to be carried out for all road between Remembrance Driveway at Bargo to Production Avenue in Warragamba, and everything in between.	

Details:
The heavy vehicle traffic movements is estimated at 21 movements every hour over a 10 hour working day. That's a truck movement every 3 mins. The effect of this on road safety, property access, pedestrian safety and intersection operation has not been measured for all of the haul roads for the southern route.

Chapter: 24.3.1.1 **Heavy vehicle routes**	**Reference:** **Page 31**

Primary Issue:
The southern route listed in the report details the roads to The Oaks – from there the map shows the use of Montpelier Drive. Montpelier Drive has a road load limit of 15T and cannot be used as a haul route.

Task:
A thorough assessment of a southern haul route needs to be done to consider how heavy vehicles will access the Hume Highway, given the local and regional road constraints, including bridge limits on alternate routes, intersection constraints/level of service, railway bridges and tunnels, road safety, pedestrian safety and impact on commercial centres of The Oaks, Picton, Tahmoor and Bargo.

Secondary Issue:
The haul route to the north does not address the impact of the steep incline on Silverdale Road from Bents Basin Road to Norton's Basin Road and the effects on traffic speed and road safety.

Details:
The southern haul route has Montpelier Drive as the connection between Silverdale Road and Barkers Lodge Road – this is load limited and cannot be used.
The intersection of Barkers Lodge Road and Argyle Street Picton is already operation at:

- LOS F during the AM peak
- LOS E during the PM peak.

This intersection cannot accommodate another 21 heavy vehicle movements each hour without having a major impact on an already struggling network around Picton town centre.
Picton town centre currently experiences traffic congestion in a few key locations, which is forecast to worsen in future years. The strategic context of the town, the surrounding topography and the existing transport networks result in a large proportion of through traffic travelling via the town centre. This through traffic is, in the main, travelling from Tahmoor, Thirlmere and smaller towns and villages to the south of Picton towards the Hume Motorway and Wollongong in the east. Due to a weight restriction on Prince Street, which provides the only other east-west connection, a high volume of heavy vehicles make up the traffic travelling through Picton, affecting pedestrian amenity, safety and the general attractiveness of the town centre.

The proposed haul road passed directly in front of 4 primary schools and one secondary school and the townships of The Oaks, Picton, Tahmoor and Bargo – this will have an adverse effect on road safety, amenity, noise, dust and pedestrian safety.

Chapter 24.3.1.2 Traffic distribution and assignment	Reference: Page 32
Primary Issue Assumptions made on where aggregates would be sourced although it was previously stated that this would be the responsibility of the construction contractor, and cannot be known at this time. Until the contract is awarded, we will not know where the majority of the heavy vehicles will travel from and therefore assessments should be carried out on a 3rd scenario for 100% of heavy vehicles using the southern route.	
Task: Carry out an assessment for a 3rd scenario looking at the possibility of 100% of heavy vehicles using the southern route.	
Secondary Issue: The southern route suggested include Montpelier Drive that is load limited to 15T and not available as a haul route.	
Details: Consideration has not been given to the use of the southern route when Blaxland Bridge is closed during flooding events, or for the use of the southern route when heavy vehicles exceed the allowable load limit of 57.5T.	

Chapter: 24.3.2 Road Modifications	Reference: Page 37
Primary Issue: Temporary long term closure of any public road would be subject to the Local Traffic Committee recommendation to Council and subsequent resolution of Council, with the issuing of a Section 138 permit (Roads Act 1993) before presumptions could be made to effect road closures.	
Task: Applications need to be made to Council for road closures to be considered.	

Chapter 24.3.3 Impacts on intersections	Reference: Page 37
Primary Issue: Impact assessments only carried out on 7 intersections in the vicinity of the project site. No assessment was carried out on other intersections along the southern haul route which impacts the towns of The Oaks, Picton, Tahmoor and Bargo.	
Task: Intersection capacity analysis needs to be carried out on all intersections impacted on the Regional and Council Road network using current traffic count data and future predictions past the 2022 assessment year.	

Secondary Issue: Traffic count data used is dated 2018 and does not take into account development on the Silverdale/Warragamba area and is no analysis has been done presuming 100% of heavy vehicles using the southern haul route.

Chapter 24.3.5 **Impacts on pavement condition**	**Reference:** **Page 39**
Primary Issue It is stated that the pavement condition of the Southern route would be more effected than the Northern Route – as this route is either a Regional or Local road network under the care and control of Council – no further investigation or improvements have been discussed to manage this road network under the additional heavy vehicle loads to ensure the roads are maintained in a serviceable condition for all road users.	
Task: A dilapidation report is required for all regional and Local Roads proposed to be used for the haul routes and a management plan provided to ensure no further deterioration to Council's assets.	
Details: All roads within the haulage routes, from remembrance driveway at Bargo to Silverdale Road at Wallacia, and everything in between need to be assessed for their suitability for the use suggested and management plans provide to Council to ensure the roads are maintained an in a serviceable condition throughout the construction period.	

Chapter: 24.3.9 **Impacts on Parking**	**Reference** **Page 40**
Primary Issue: The potential impact on local parking is considered to be moderate with no access to the Visitors Information Centre Parking area, instead they propose the use of the existing parking area on Farnsworth Avenue adjacent to the existing recreation area, subject to an agreement with Council. The pressure on parking for a council facility during peak sporting events will be compounded by the closure of the dam visitor's parking area.	
Task: A parking study be conducted to consider the impact of the loss of parking in the Warragamba Area around the site.	
Details: Loss of parking and access to recreation areas would have a high impact on the residents of Warragamba.	

Chapter: 24.3.10 Summary of construction impacts	Reference: Page 40
Primary Issue: Road and intersection capacity level is considered to be minor – this cannot be stated as the complete network impacted by the proposed works has not been assessed. The rest of the table needs to be reassessed based on additional works that need to be carried out to assess the full impact.	
Task: The study area for the Traffic and Transport Assessment needs to be extended to include the whole network effected by the proposed works, not just those in the Warragamba area.	

Chapter: 24.4.3.2 Impacts on key river crossing low points – Blaxland Bridge	Reference: Page 44
Primary Issue: The closure times for Blaxland Crossing bridge remains much the same after the project, providing no relief from flooding issues for the residents of the Warragamba/Silverdale area.	
Task: Reassess the benefits of the works proposed for the residents of the area most effected by project.	
Secondary Issue: Alternative routes have not been investigated for flood events that close Blaxland crossing bridge as it was beyond the scope of the assessment.	
Details: Apart from the 1 in 5 chance of a flood event, the bridge would be closed during all flood events both under existing conditions and with the project completed. Alternate routes other than the poorly thought out southern route have not been investigated in the event of all northern routes being closed due to the closure of Blaxland Crossing Bridge. Given the fundamental flaw with the southern route being on a load limited road (Montpelier drive), the lack of investigation of alternate southern routes is fundamental to the success of the project.	

Chapter: 24.5 Environmental management measures (Construction traffic management plan CTMP)	Reference: Page 63
Primary Issue: A contingency plan has not been developed as part of this assessment to detail alternative routes in the event of emergency road closures and the road safety audits are only proposed at the CTMP stage, after the project has been given the green light.	
Task: Given the remote location and limited access routes to the project site, a CTMP needs to be developed to assess the viability of the project given the areas susceptibility to fire/flood/bridge repairs/traffic accidents.	

Details: No feasibility studies conducted on alternate routes which has suggested Werombi Road as a possible alternate route – with no safety audit or risk assessment carried out. In the event of pavement failure or reduced loading capacity of Blaxland Crossing Bridge they suggest reducing load capacity of trucks to mitigate the event. Queuing of construction vehicle swill only be allowed within the site – how will this be managed? Regular maintenance to be carried out on Park/Silverdale/Farnsworth/Production and Warradale Roads – what about the rest of th4 network impacted? A detailed stage 1 Road Safety Audit to be undertaken at the detailed construction traffic management plan development stage – too late in the process when haul routes suggested are not appropriate It's funny that they list consideration will be given to use alternative modes of transport such as rail to reduce the number of heavy vehicles on the roads – good luck with that in Wollondilly!

Chapter:	**Reference:**
Primary Issue: The Burragorang Valley is thepredominate starting point for bushfires that threatened the Wollondilly Shire. The Sheehys Creek firetrail is the primary access to the valley and becomes critical in times of bushfires as we saw during the Black Summer Bushfire. The firetrail is shown to be inundated by flooding if the wall is to be extended which could lead to damage and undermining of the firetrail, leaving the valley inaccessible during a bushfire event	
Task: A monitoring and management plan needs to be established post flood event	

Chapter 26 – Waste

Chapter 26: – **Waste**	**Reference:** **Chapter 26 Section 1-17**
Primary Issue: Inconsistent with the aims of NSW Waste and Sustainable Materials Strategy 2041 Stage 1 2021-2027 (June 2021) and NSW Government Net Zero Plan Stage 1 2020-2030 Priority 4 (March 2020).	
Task: Waste stream recycling and reuse targets and strategies need to be specified to align with the NSW targets outlined in NSW Waste and Sustainable Materials Strategy 2041 Stage 1 2021-2027 (June 2021) and NSW Government Net Zero Plan Stage 1 2020-2030 Priority 4 (March 2020) policy documents.	
Details:	

Chapter 26 Waste fails to detail any targets for waste stream recycling and reuse strategies in accordance with the above NSW Government Policy documents. Both policy documents were adopted prior to the September 2021 publication date for this EIS chapter.

The chapter incorrectly cites the NSW Waste Avoidance and Resource Recovery Strategy 2014–21 (EPA 2014a) as the framework and targets for waste management and recycling in NSW. Despite acknowledging the need for targets in the chapter, the applicant does not commit to any targets for recycling or reuse of waste from the demolition, construction or operations phase.

The sustainability of this project cannot be assessed without the targets given the number of estimated tonnes which have been listed in Table 26-3 and the unknown status of how many of these tonnes would end up in landfill.

For example, the NSW Government Net Zero Plan Stage 1 2020-2030 Priority 4 is to Lead by Example to reduce and offset carbon emissions including from waste, to achieve net zero emissions by 2050. The chapter often cites disposal as an option for waste from this project.

It is strongly recommended that the applicant review the application and set recycling or reuse targets for each waste stream in accordance with NSW Waste and Sustainable Materials Strategy 2041 Stage 1 2021-2027 (June 2021) and NSW Government Net Zero Plan Stage 1 2020-2030 Priority 4 (March 2020).

Chapter 26: **Waste**	**Reference:** **Chapter 26 Section 1-17**
Primary Issue: Basic information provided on potential waste disposal locations.	
Task: Comprehensive information on the off-site recycling, reuse and disposal locations needs to be provided.	
Secondary Issue: Stockpile management assessment.	
Details: Chapter 26 Waste provides only basic and weak commentary on the possible off site recycling and reuse locations for waste streams. Section 26.3.8 makes comments that existing metropolitan waste management facilities would have capacity to receive the anticipated waste streams generated by the Project. This statement incorrectly cites the status of many metropolitan waste management facilities with most landfills sites nearing capacity. The chapter often refers to disposal and it is likely that some of the facilities will be unable to accept this waste due to closure. No alternative waste technologies are discussed. Table 26-4 provides a list of 14 operators as options for offsite recycling or reuse however there is no further information provided on the type of waste which would be taken to these operators, amount of waste, whether the operators have the appropriate EPA licences and confirmation from these operators that they are capable of processing the type or amount of waste from this project.	

Extensive further investigation and rigour needs to be undertaken to determine suitable recycling and reuse options for ENM, VEMN, concrete and vegetation give the amounts which have been estimated from the construction process. The following comments do not meet the objectives of previously mentioned NSW Government documents. "While off-site opportunities would be investigated for the reuse of material during detailed construction planning, given the distance of Warragamba to any potential reuse sites and the large amount of spoil being generated by Western Sydney Airport construction, the likelihood of finding suitable and economically viable reuse options is expected to be low. Excess spoil would be reused where possible, or otherwise disposed of to an appropriate location either on site or off site".

The lack of detail identifying the recycling and reuse off-site locations which will be used makes the assessment of sustainability in terms of emissions and impact to transport routes impossible.

The chapter also fails to assess the impact of wind erosion on residential properties located close to the materials storage handling area. Stockpiles of concrete, ENM, VEMN and mulch will create significant dust from wind erosion while awaiting transport to offsite locations.

Council would appreciate the opportunity to review the Construction Waste Management Plan and Spoil Management Plan.

It is strongly recommended that the applicant review the application and provide more comprehensive information on off-site locations for recycling and reuse and the amount and types of waste taken to these facilities.

Chapter 27 – Water Quality

Chapter 27: Water Quality	Reference: N/A
Primary Issue: Appears to be inconsistent with the aims of the draft Greater Sydney Water Strategy.	
Task: Opportunities need to be evaluated with Greater Sydney Water Strategy.	

Details:

Chapter 27 Water Quality fails to mention or evaluate the draft Greater Sydney Water Strategy.

The viability of this project needs to be reviewed in further depth by looking at the opportunities presented in the draft Greater Sydney Water Strategy. The issues presented by both bodies of work can have common solutions that have the ability to complement each other and provide a more resilient community and environment in a changing climate.

For example, the draft Greater Sydney Water Strategy specifies opportunities present in recycling wastewater for purified drinking water. The wastewater and stormwater balances undertaken in Wollondilly, which are able to be seen in Council's Integrated Water Management Strategy, specify that there is very much a surplus of water compared to demand. This is common in many urban environments. Therefore, if smarter water management is applied that fully integrates both wastewater and stormwater it is possible to drought proof whole cities. Due to the contribution of sustainable, reliable and significant quantities of water wastewater provides (as well as other water sources), there would be decreased pressure to maintain the full volume of water within the Warragamba Dam. This may be an opportunity to build a spillway into the existing levels which does not inundate virgin ground of high heritage and biodiversity significance. This would provide the following benefits:

- Protection of the heritage significance of the area
- Protection of the threatened species and ecological communities present
- Protection of water quality from minimising wastewater discharges to natural waterways
- Managing flood impacts
- Transitioning Sydney to a Water Sensitive City that undertakes smarter water management which enables greener neighbourhoods and more liveable communities
- Enables much stronger economies through safeguarding water supplies
- Supports climate resilience and mitigates against climate change

This would be a much better holistic solution that is more appropriate for all stakeholders and should be evaluated.

Wollondilly Council have an adopted Integrated Water Management Policy and Strategy that aims to support water conservation for all future developments by promoting stormwater harvesting, water reuse and recycling and maximising synergies between landscaped areas and stormwater/wastewater management.

Wollondilly Council have also undertaken community engagement regarding wastewater recycling and reuse which found that the community is accepting of recycling wastewater.

Chapter 28 – Cumulative Impacts

Chapter 28: Cumulative Impacts	Reference: N/A
Primary Issue: The chapter fails to address: (n) an assessment of cumulative impacts of the project taking into account other projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed.	
Task: Significant rework including addressing aboriginal heritage impacts and traffic impacts.	
Details: Chapter summarises a lot of activity occurring around the Project but doesn't provide any detail of the assessment taken out. Almost alludes to the fact that aboriginal heritage is more at risk from other non-project related hazards yet also talks about how the airport project has addressed similar issues, yet fails to expand how this project can mirror and value add to that initiative. Also talks to about programs such as the Wester Sydney Infrastructure Plan – yet, had they looked at the detail would have realised that some of the projects are on Silverdale Rd and how project outcomes could be achieved by partnering with TfNSW and Council on those projects. Significant rework is required on this section given the scale of activity occurring in Western Sydney, particularly around the Aerotropolis.	

Chapter 29 – Synthesis

Chapter 29: Synthesis	Reference: N/A
Details: Sect 29.3 – Design changes to minimise impact for non-aboriginal (and aquatic ecology) is to 'Provide for a smooth finish to the face of the dam' is comical, tokenistic to the issue and a classic summary of the overall quality of the EIS.	