

Submission
No 347

INQUIRY INTO PROPOSAL TO RAISE THE WARRAGAMBA DAM WALL

Organisation: Australian Museum

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8 September 2019

Mr Justin Field, MLC
Chair
Select Committee on the Proposal to raise the Warragamba Dam Wall
Legislative Council
NSW Parliament House
Macquarie Street
SYDNEY NSW 2000

Dear Mr Field,

Submission to “Enquiry into the Proposal to Raise the Warragamba Dam Wall”. Written by Dr Val Attenbrow, FAHA, Senior Fellow, Geoscience and Archaeology, Australian Museum.

The Australian Museum appreciates the opportunity to provide a submission to the “Enquiry into the Proposal to Raise the Warragamba Dam Wall”.

This submission written by Dr Val Attenbrow relates to the enquiry’s terms of reference (d) “the adequacy of the Environmental Impact Assessment process to date” part (ii) Aboriginal Cultural Heritage.

The Museum supports the concerns of the Gundungurra elders and their views on the significance of their cultural heritage sites that will be impacted by the proposed raising of Warragamba Dam wall. However, this submission addresses shortcomings in the report prepared by Niche – Environment and Heritage: “Aboriginal Cultural Heritage – Warragamba Dam Raising” Reference No 30012078 prepared for Water NSW, 24 June 2019.

Dr Valerie Attenbrow is well-qualified to assess the adequacy of the report by Niche; see biographical notes and references listed at end of submission.

This is a large, complex and unwieldy report which is difficult to find one’s way around, not helped by the references to sections, tables and figures which do not contain the Appendix No.

- From all historical accounts prior to building Warragamba Dam, the Burratorang Valley was visually spectacular, and still is today despite the inundation of much of its valley floor by the building of the Dam in the 1950s. To Aboriginal people it was a valley rich in subsistence and material resources as well as spiritual sustenance. It would have been home to a large population of people. The 1-2-page summary in Section 8.1 (Ethnography and History) of the main report does not do justice to the large amount of information that is known about the Gundungurra’s post-contact occupation of the valley to the 1950s, and their subsequent continuing relationship with their country. Reference is needed in Section 8.1 to Section 12 (Cultural Values Assessment) of the main report, which is more comprehensive. Even so,

Section 12 still concentrates on the post-contact period as there has been no substantial archaeological investigations of the Burratorang Valley.

- Archaeological work in adjacent areas (e.g. northern and central Blue Mountains (includes Kings Tableland, Shaw Creek K2 and Wollemi NP), Hawkesbury district (includes Mangrove Creek Dam catchment), the Cumberland Plain (includes Windsor/Pitt town sand-sheets), the proposed Kerrabee Dam in the Goulburn River Valley, and Welcome Reef Dam in the Shoalhaven River Valley provide rich sources of information about Aboriginal occupation of the Sydney Basin (e.g. Attenbrow 1981, 1982, 1984, 2003, 2004; Attenbrow & Hughes 1983; Kohen et al 1981, 1984; Hiscock & Attenbrow 2005; Haglund 1981; McCarthy 1948, 1978; Stockton 1970, 1993; Stockton & Holland 1974; Taçon et al. 2010; Vinnicombe 1980; Williams et al. 2013). Several authors document Aboriginal occupation extending back 30,000 to 40,000 years ago (e.g. Stockton & Holland 1974; Nanson et al 1987). Occupation of the Burratorang Valley would have extended back at least the same length of time. For the age of Kings Tableland, the Niche report cites Bowdler 1981 who dismiss the 22,000 BP date for Kings Tableland, and only accept the age of 14,000 BP; I however, believe Stockton & Holland's 22,000 BP date is valid. Seen against these rich sources of information, the Burratorang Valley is a large blank on the map. Existing studies show regional diversity in the raw materials used for stone tools and activities undertaken, and in engraved and pigment rock art motifs. The question thus arises: what subsistence and land use patterns, social networks, trade/exchange and belief systems existed in pre-contact Burratorang Valley? How did the life of the Gundungurra ancestors differ from those of other regions in the Sydney Basin?
- The Gurungatch-Mirrigan story, which takes place in the southern Blue Mountains, documents the journey and escapades of two ancestral beings and the creation of the Wollondilly and Coxs River valleys (Smith 1992, 2018 Map opp.p.121, 2019 opp.p.79). The route taken by the ancestral figures, as well as other routes would have been well-travelled by Gundungurra people, as well as by adjacent communities visiting Gundungurra country for trade/exchange and ceremonies.
- The Gurungatch-Mirrigan story is the longest most complete story line in southeastern Australia. Some of the route and associated waterholes and sites are already drowned and made inaccessible by the current 1950s inundation levels. To inundate more of the route and associated waterholes and campsites and potentially subject them to damage is sacrilege.
- Appendix 8 provides a list of plants and animals that were possible food sources in the greater Blue Mountains (reference not provided). The excavated site Deep Creek Shelter in the Mangrove Creek dam catchment (Attenbrow 1982, 2004) provides evidence of the range of animals that were hunted in a sandstone environment similar to that of the Burratorang Valley. The remains of hunted animals may similarly survive in Burratorang Valley rock-shelters with

deposit and provide evidence as to whether the diet and use of animal products varied in different parts of the Sydney Basin.

- Appendix 3 Section 5.6, and Section 9 Survey Methodology in the main report. The general approach for the field survey (at the request of the Gundungurra elders) followed the journey of Gurungatch & Mirrigan and revisited 26 sites listed in Appendix 3 Section 5.6.2 (Table 13. previously recorded sites of high archaeological significance). Further to that, systematic survey of samples of rivers, creek lines and large sandstone rock platforms and boulders was undertaken. A gradient analysis also assisted in selecting areas for site survey. Areas with 0-30% slope were the focus of the survey. However, the criteria that were used to make the final selection of survey areas is not clearly stated.

- **Significance of sites - data from page iv of Executive Summary**

Previously known sites	31
Newly recorded sites	303
Total Aboriginal sites identified in subject area, i.e. areas potentially impacted by Probably Maximum Flood (PMF) and its immediate surrounds.	334

Sites previously impacted by current dam Full Supply Level (FSL)	64
Sites within existing PMF which are already impacted by proposed PMF, but would experience greater duration of temporary inundation	173
Sites outside the flooding and construction zones	64
“Only” an additional 34 sites would experience temporary inundation if a PMF event occurred	34
Total number of sites identified in subject area	334

Majority of sites have Low significance	241+31
Moderate significance	20
High significance	38+3

No sites were assigned as having Very High Significance	0
Total number of sites identified in subject area	333

It is not clear what the significance of the 34 additional sites is – are they +31 low significance and the +3 high significance as I have indicated?

Also, if newly recorded sites in areas to be impacted by the proposed raising of the dam wall are so few (34 of 334), why did the site survey not include more areas within that area, rather than surveying areas within the existing PMF?

- Appendix 9 provides a level of scientific (archaeological) significance for all recorded sites, and the basis of the assigned level of significance for open campsites, grinding grooves, deposit and art in rockshelters, scarred trees, etc. In the case of open campsites and deposit in rockshelters, this assessment is based on the artefacts exposed on the ground surface. Yet the site descriptions indicate many of the sites had potential for excavation to reveal additional information about the contents of sites – information that may have increased their level of significance. These sites need to be test-excavated to reveal the contents of the deposits and provide a valid basis for a significance assessment.
- It is current consulting practice to test excavate areas of open ground or deposit in rock-shelters that have no visible signs of use (e.g. stone artefacts on the surface deposit) but that may have buried archaeological assemblages – referred to as PADs (Potential Archaeological Deposits. Attenbrow 2004:49-50; Vinnicombe 1980). This open ground may be a river flat/terrace beside a watercourse with or without exposed artefacts. But no test excavations were undertaken in the current Warragamba Dam Raising Cultural Heritage Assessment to verify the nature of the deposits and their contents (e.g. stone artefact assemblages) and thus their level of archeological significance. Nor are there are any recommendations for such test excavations to take place and for the significant assessment to be revised in the light of the results of the excavations.
- Despite the site descriptions in Appendix 9 Survey Methodology including comments about the potential for excavations to reveal additional information (which includes those marked as being of high significance), there are no explicit recommendations in Section 16 (Draft Recommendations in the main report) for future salvage work (i.e. recording and excavation) if the raising of Warragamba Dam proceeds.
- The 1950s drowning of the Burraborang Valley floor would have inundated many hundreds of Aboriginal archaeological sites. This inundation may not have destroyed the sites with deposit

(i.e removed them), but it would have destroyed the stratigraphic integrity of the deposits and probably any faunal remains that were present. Charcoal and white ochre images in rock-shelters would be removed. Even if not destroyed in a technical sense, hundreds of sites are and will remain permanently inaccessible. If raising of the Warragamba Dam wall proceeds, to not fully document the Aboriginal heritage sites that will be impacted by inundation – even if not permanently inundated - is sacrilege.

- Appendix 9 also includes sites/locations along the route that Gurungatch and Mirrigan travelled and the associated waterholes, but as there is often no archaeological material present at these sites, they are listed as having 'low significance'. This is misleading. It would have been useful to have extra columns in this table for 'cultural significance' to be entered so that the combined values of the sites are clear. The waterholes and locations associated with the Gurungatch and Mirrigan route do not seem to have been assigned a level of cultural significance
- There are also no recommendations following up on the statements in Appendix 3, Section 4.4 (p.19) that 'survey represents a rare opportunity to examine in detail the archaeology of a large, relatively intact Aboriginal Dreaming Story, so close to a major city in Australia'.
- Appendix 5 presents information about the 31 previously recorded sites and 303 newly recorded sites (total 334 known sites). I have not looked at all the site information in Appendix 5, but what I have seen indicates the level of recording is patchy and minimal. For a valid assessment of the sites likely to be inundated by the raising of Warragamba Dam, more detailed recording is required, including test excavation of deposits (including PADs) recorded as having potential to provide greater levels of information about Aboriginal occupation and use of the Burratorang Valley.
- At present sites with small numbers of artefacts have in the main been given a 'low' level of significance. However, these small/minor sites (if proven as such by test excavation not to have very large numbers of artefacts) are important in identifying the land use and subsistence patterns of the Valley. Minor sites can be interpreted as transit camps used by people when travelling through the country from their base camps (the larger more complex archaeological sites which evidence many activities) to go to ceremonies, to procure raw materials and in hunting and gathering food resources (Attenbrow 2003, 2004). So, the sites with small numbers of artefacts may appear insignificant, but they are important in identifying the broader land and site use patterns of a region.
- Numerous ground-edged stone hatchets were recorded during the site survey. It may be possible using pXRF technology (c.f. Attenbrow et al. 2017, 2018) to trace the movement of the hatchets from their source rock location to their find-spot in the Burratorang Valley. Such

information, together with data on sites interpreted as transit camps, can shed light on trade/exchange systems and social networks in the south-eastern Australia.

- If raising the dam wall were to proceed, there needs to be a much higher level of recording for all sites recorded to date. This should include scaled site plans, detailed recording of all visible flaked and ground artefacts, grinding grooves and pigment art in rock-shelters, the stone arrangement and 'medicinal' sites. Also, essential is excavation of sites with archaeological deposit (i.e. artefacts), followed by detailed analyses of the excavated cultural materials (e.g. stone and bone artefacts, faunal remains) with the full results presented in written reports. A prior report by Brayshaw & Macdonald 1989 recommended a 2-3-year salvage project.
- The report focusses more on the 241 sites assigned low significance, rather than endeavoring to reveal whether more than 38 have high or very high significance.
- The study area (the area likely to be inundated) has the potential to yield much information that would contribute to a further understanding of the Aboriginal occupation of the local area and broader region. In particular: the nature of the long-term past Aboriginal land use; the relationship between Aboriginal land use and available resources (plant, animal and geological); the technology of stone artefact manufacture compared to adjacent regions; the source of the stone/rock used to make stone artefacts and the trade/exchange systems and social networks with Aboriginal groups outside the Burraborang Valley whereby they obtained suitable stone and other materials.
- To state (page iv in the Executive Summary) that "the PMF is also an extreme and rare flood event – and may not occur in the physical life span of some types of heritage sites (e.g. scarred trees, ochre/charcoal artwork)" is misleading. A one-in- a-thousand-year event can occur anytime. In addition, other site types, especially archaeological deposit in rock shelters, survive thousands of years if left undisturbed. Also, some pigments, such as red ochre, impregnates itself into the sandstone and these figures can last thousands of years as seen in rock art studies in Arnhem Land (Gunn et al. 2011).
- In Section 15 (Management and Mitigation Measures) it is suggested that 'ecologically sustainable development and intergenerational equity' should be guiding principles for future mitigation. However, the actions described can hardly be considered adequate compensation for the loss of and/or damaging impact on the archaeological and cultural heritage sites that have been identified to date as being in the Probable Maximum Flood zone.
- **References.** The references consulted (Section 17 of main report; page 53 of Appendix 3) are minimal and many more references should have been consulted, for example those of other

constructed or proposed dams (see list of archaeological work in adjacent areas at beginning of submission).

- **Report structure**

The use of similar hierarchical section numbering in appendices to that in the Main Report is confusing when looking for something. The appendices sections should all start with the Appendix number.

Tables should include the Appendix and Section No, as well as a Table No and Title at the top of each page of multi-paged tables.

Appendix 5 has much 'waste paper' with only small amounts of information on single sheets. Combining these sheets would make for less bulk and easier searching and finding of information about specific sites.

In summary, the preferred position is that the height of the Warragamba Dam wall not be raised, so that no further Aboriginal archaeological sites or cultural heritage items are inundated and destroyed. There are many shortcomings with this report, but most critical, if raising the Dam wall is to progress, are first the lack of another option to the inundation of further waterholes and site associated with the Gurungatch-Mirrigan story; such as a reduced heightening of the wall. Second is the lack of recommendations for a program of test excavations to reveal a valid significance assessment for the open campsites and deposits in rockshelters. This should be implemented before a decision is made to proceed with raising the height of the Dam wall, so their value can be taken into account in the decision. Finally, if the Dam wall is to be heightened a full salvage program of recording and excavation of archaeological and heritage sites should be carried out before inundation.

The Museum will be pleased to provide any further information for the Committee if required.

Yours sincerely,

Mr Cameron Slatyer

Acting Director, Australian Museum Research Institute

For:

Val Attenbrow, PhD, FAHA, Senior Fellow, Geoscience & Archaeology, Australian Museum.

Biographical notes for Dr Val Attenbrow, BA(hons) 1976, PhD 1987.

I joined the Australian Museum in 1989, retiring in 2011 as a Principal Research Scientist. I am currently a Senior Fellow with the Australian Museum, an honorary position, in which I continue my research into Australian indigenous history and archaeology, focusing on southeastern Australia – in particular the Sydney Basin. My current research focuses on provenancing source materials from which ground-edged artefacts (e.g. stone axes/hatchets) were made (Attenbrow et al. 2017, 2019). Tracing the movement of artefacts from source rock to findspot (the location at which they were found) enables identification of travelling routes for exchange/trade purposes and for attending ceremonies at which exchanges of material goods and intangible items were made. In turn, exchange systems and social networks can be revealed.

I have written two books (award-winning *Sydney's Aboriginal Past* [2002, 2010]; *What's Changing* [2004]), jointly authored another (*Australia's Eastern Regional Sequence Revisited* [2005]), and written over 80 peer reviewed journal articles and book chapters, some of which address Blue Mountains Aboriginal archaeological sites (e.g. Attenbrow 2004, 2009). *What's Changing* explores the archaeological record of Aboriginal people in the Mangrove Creek Dam catchment in the NSW Central Coast.

I am a Life Member of the Australian Archaeological Association and a Fellow of the Australian Academy of the Humanities.

During the 1960s to 1980s, as a member of the Kameruka Bushwalking Club, I walked in many parts of the northern, central and southern Blue Mountains.

- References** (copies of some articles, chapters and unpublished reports can be provided if required)
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