# Executive Summary

## Project Background

The Department of Infrastructure, Energy and Resources (DIER) is proposing to construct the Brighton Bypass to take road traffic on the Midland Highway around the townships of Brighton and Pontville in southern Tasmania (Figure 1.1). The Brighton Bypass Project extends north from the Derwent River to Pontville, mostly alongside the valley of the Jordan River. The project has a 'Northern Section' and a 'Southern Section' to be built concurrently with the proposed nearby Brighton Transport Hub.

In order to investigate the potential impact on Aboriginal heritage values resulting from the proposed road development, Tim Stone and Aaron Everett (2008) were engaged by GHD Pty. Ltd. to conduct an Aboriginal site survey of the Northern Section. A result of this investigation was the identification and registration of TASI 10757. This site comprises a surface scatter of stone artefacts on a floodplain landscape on the west bank of the Jordan River, near Brighton 30km north of Hobart. The floodplain landscape consists of several geomorphic features, one of which is a levee bank deposit. The surface artefact scatter identified by Stone and Everett (2008) as TASI 10757, is primarily, but not entirely, associated with the levee deposit (Figure 1.2).

The levee bank deposit was assessed as having the potential to contain a deeply stratified cultural sequence. That is, it had the potential to contain ancient intact living floors. As a result of this assessment it was recommended that a controlled excavation of a targeted sample of the levee deposit, the Jordan River Levee (JRL) site, be undertaken to test the character of the site. This testing programme was to be undertaken in collaboration with the Tasmanian Aboriginal community represented by an Aboriginal Heritage Officer (AHO).

Initial excavation of the JRL site was carried out under the directorship of Rob Paton, and the supervision of Tim Stone and Cornelia de Rochefort, over a period of three weeks from the 3rd August to 24th August 2009. The proposed scope of work and methodology for the archaeological excavation was developed by Rob Paton with reference to Stone and Everett (2008). This method statement was endorsed by Aboriginal Heritage Tasmania (AHT) and a Permit issued (Permit 911). However, issues were raised regarding appropriate collaboration with the Tasmanian Aboriginal community after Permit 911 had been issued. The Tasmanian Aboriginal Centre (TAC) requested that works be postponed until the matter could be resolved. As a result, excavation at the site ceased on 24th August 2009.

After considerable discussion between various parties a new methodology was submitted by Rob Paton, again with reference to Stone and Everett (2008). Works resumed at the site, with the endorsement of the TAC, the Tasmanian Aboriginal Land and Sea Council (TALSC), and AHT. This second stage of excavation was undertaken under the directorship of Rob Paton and Cornelia de Rochefort from the 8th to 26th February 2010. Specialist geomorphological services were provided by Dr Tim Stone and Dr Matthew Cupper, while Dr Sophie Collins provided on site supervision and management of artefactual material.

Subsequent to this testing programme, the results of the geomorphological assessment indicated that the JRL site had the potential to be of great antiquity, with Optically Stimulated Luminescence (OSL) results showing the deposit was up to 41,000 years old. The OSL results also suggested that the dated sandy deposits had undergone minimal post depositional mixing, indicating good stratigraphic integrity for the associated archaeological material. In light of this potential DIER amended the development proposal so as not to impact the JRL site, defined as the levee bank deposit. Instead they proposed that a bridge would span the JRL site with development impacts confined to the floodplain to the west and east of the levee bank deposit.

## Aboriginal Consultation

Throughout archaeological investigations along the northern section of the proposed bypass route, there was considerable discussion of appropriate collaboration with the Tasmanian Aboriginal community. Detail of this consultation process and resolution has been reported on by Paton (2010) in the revised excavation methodology for the JRL site, attached as Appendix 1 to this report.

Aboriginal consultation was undertaken according to best practice principles in the absence of detailed Aboriginal heritage consultation protocols in Tasmania. Prior to excavation works recommencing on the levee site it was made clear that all archaeological work would be undertaken with the participation and approval of the TAC and the TALSC (refer to Appendix 1: Revised Methodology).

Aboriginal Heritage Officers Aaron Everett and Robert Hughes were present on site during the first stage of excavations from the 3rd to 24th August 2009 and during the second stage of excavations from 8th to 26th February 2010. Leigh Maynard was also present for the second stage of excavations. Further to this, Aaron Everett

facilitated a community meeting on site, where various members of the Aboriginal community toured the site and were given the opportunity to contribute to the consultation process.

## Excavation Strategy

The test excavation of the JRL site had two key objectives. The first was to determine if the site contained a stratified cultural sequence. The second was to demonstrate the degree of site integrity. The strategy involved the controlled excavation of four 2m x 2m excavation trenches and four 1m x 1m trenches. Trenches were aligned both perpendicular to the strike of the levee ridge, and parallel to the strike of the levee ridge (Figure 1.2). By aligning the excavation trenches across the levee ridge in this way, two cross sections of the landform may be exposed. The number size and distribution of these test pits was discussed in detail with the Aboriginal community, AHT and DIER. Apart from the archaeological research goals, we excavated under an understanding that we would damage as little of the site as possible. Considerable thought went into balancing damage to the site against retrieving enough information to allow people to understand something of the general character of the JRL site.

The deposits were excavated in 5cm spits or layers, by hand with trowel and brush in order to record and photograph artefacts *in situ*, and make detailed observations of the soil profile. Each 2m x 2m test trench was divided in to four squares (labelled 1-4), with each square further divided in to four quadrants (labelled A-D). This enabled a degree of spatial control for the artefacts that were retrieved from the sieves. All excavated sediment was placed in labelled buckets according to square and quadrant. Each bucket was recorded in a sieve log before being wet sieved by hand, through a 3mm sieve plate.

All artefactual material was bagged and labelled according to provenance and retained for further analysis. The fine sand that forms the levee deposit is ideal material for Optically Stimulated Luminescence (OSL) dating methods. Five samples were collected in total, with three being collected from Trench 2 and two from a quarry cutting located in close proximity to the JRL site. The quarry cutting provided the opportunity to date the basal sands of the floodplain deposit on which the levee was formed, allowing for a more complete geomorphological reconstruction of the site. Furthermore, a geophysical investigation using Ground Penetrating Radar (GPR) was employed at the site because of the potential for the loose sandy deposits to contain Aboriginal burials. The results of the GPR investigation showed no evidence of human burials.

## Results

The TASI 10757 site represents the broader landscape setting of the JRL site. The TASI 10757 landscape is known to comprise four landform units: a buried and ancient floodplain unit; the levee deposit situated on top of this ancient floodplain unit; a modern floodplain unit; and back swamp deposits to the east and west of the levee respectively.

The two OSL ages from the buried floodplain unit show a major and rapid episode of riverine deposition in the Jordan River valley commencing before 60,000 years ago. This deposition ceased ~50,000 years ago and the river began to cut back into the sediments deposited in the valley. This cut off sediment supply to the older floodplain surface. Consequently, a weakly calcareous red brown alluvial soil developed on the abandoned floodplain. This soil surface would have been an ideal site for early Aboriginal occupation, although no such evidence was identified.

Construction of the levee on the older floodplain surface commenced ~41,000 years ago. The levee unit is comprised of three stratigraphic units. The unweathered basal sand unit (dating from 41,000 to 26,000 years old), an oxidised unit identified as a zone of maximum biological activity and a surface plough zone unit. The upper two units have not been dated at present. The three OSL ages thus far obtained from the unweathered basal sand unit show gradual overbank deposition over a period of ~12,000 years. However an age depth trend line fitted to the three OSL ages suggests that the levee formed from ~41,000 to 12,000 years ago, a period of ~30,000 years.

With climatic amelioration during the Holocene (from 10,000 years ago), the hydrological regime of the Jordan River changed and conditions for levee formation ceased. The modern floodplain unit east of the levee formed during this period of time.

The nature and extent of the back swamp deposits on the distal floodplain are unknown as these were not the subject of this investigation. The only information regarding this unit comes from one excavation trench, which contained up to 50cm of ploughed silty and clayey sediment. The older floodplain unit is 50cm below the surface in this trench and is likely to extend further to the west.

The alluvial architecture of the Jordan River, including the JRL site, was formed during a period of extreme landscape instability. Fluctuating climatic conditions during the Last Ice Age undoubtedly influenced the behaviour of the Jordan River. However the alluvial sequence cannot confidently be tied to broader palaeoclimates without further investigation and dating. In any case, the complex response of fluvial systems to

climate change makes correlation of the alluvial sequence to climatic episodes inherently problematic. For this reason, the back swamp deposits to the west of the levee unit may prove a more useful environment to retrieve palaeoclimatic information. The back swamp deposits have the potential to contain deep clayey and silty sediments. If conditions over time have permitted, these deposits may contain a detailed vegetation record of the environmental conditions during the period of human occupation.

However, the real value of the JRL sequence is that it provides a rare insight into a period of human history during the Last Ice Age, of which little is known, either in Tasmania or on the Australian mainland. This is particularly the case at open sites with nearly all older Tasmanian sites being rockshelters.

The archaeological material retrieved as a result of the excavation process was primarily associated with the levee bank unit.

An important archaeological consideration in any excavation is the ability to prove that artefacts found within buried sediment actually correspond to the radiometric dates retrieved. Put simply, the OSL method dates the last time a single sand grain was exposed to sunlight, it does not date the artefacts. One of the most important tasks faced by an archaeologist is to prove the association of the buried artefactual material with the dated sediment. This association cannot be assumed.

For this reason, a detailed analysis of site formation process and post depositional disturbances to the JRL site has been undertaken. The primary question is whether the artefacts were buried when the levee was forming, or did another process bury the artefacts after the levee formed? One of our tasks was to prove that the artefacts were buried during the formation of the levee in order to associate those artefacts with the OSL results. This is how we are able to make statements about the great antiquity of Aboriginal occupation at the site.

The essential goal of stone artefact analysis is to provide a detailed understanding of the prehistoric technology at a site and its relationship to the hunter-gatherer populations responsible for its manufacture and use. The purpose is to increase our understanding of prehistoric behaviour by examining changes and adaptations over time.

The JRL site was utilised by highly mobile prehistoric hunter-gatherer groups. The lack of locally available raw material forced groups to bring their own raw materials to the site, to conserve these raw materials and to continue to transport those items that were not exhausted for future use elsewhere. The primary activities undertaken at the site were tool maintenance and rejuvenation, with very low levels of manufacture also present. Artefact densities at this stage indicate that groups occupied the site for short term visits only; the lack of locally available raw material and inability to manufacture new tools at the site is a likely cause.

The presence of Aboriginal flaked pieces of glass at the JRL site provides evidence of a connection between Aboriginal and European occupation at the site during the historic period. This site with its sound stratigraphic profile and dates extending from ~41,000 years through to the European contact period is remarkable. The JRL site records the long and vital history of Aboriginal occupation in the area.

## Management Recommendations

### *General Recommendations*

**1.** Copies of this Draft Final Report should be supplied to the TAC offices, the TALSC, DIER and AHT. Comments on the report should be sought from these organisations. These comments need to be considered when making any decisions about site management.

**2.** The archaeologist should be available to present the report verbally to key individuals and organisations.

**3.** This report should be read in conjunction with the separate Social, Cultural and Historical Report being prepared by an Aboriginal Heritage Officer and historian. If made available, cognisance needs to be taken of the contents and recommendations of that report when considering management options for the Jordan River crossing.

**4.** Discussions should commence with the Aboriginal community regarding the curation of the stone artefacts from the excavation. The range of options - from reburial to Museum storage etc. - should be canvassed with the community. The project archaeologist should be available to meet with the Aboriginal community to discuss the various options.

**5.** A Cultural Heritage Management Plan (CHMP) should be developed for the JRL site, in consultation with the Aboriginal community. The CHMP should consider the levee as a whole unit and take into account the findings of this report as well as the Social, Cultural and Historic report being when prepared by the Aboriginal community representative and historian. Obviously, the key component of the CHMP will be the ongoing

management of the site, ideally by the Aboriginal community. This may be a complex process as much of the levee is private land. Some large sections to the north of the proposed bridge are government owned.

### *Archaeological Recommendations*

**6.** The JRL site is a scientifically important site. We strongly recommend that the levee, as an archaeological site, be preserved and protected. In the long term this can be achieved by the development of a detailed CHMP as recommended above. In the short term measures need to be taken to preclude any development activities that would impact directly on the levee, as it is defined in this report.

**7.** The test pitting programme reported in this document could, with the permission of the Aboriginal community, be supplemented with further excavations to provide additional samples, or to answer in more detail the research questions about the JRL site. However, for a number of reasons I would strongly recommend that no additional archaeological excavations of the levee take place at this time. Firstly, there are still a number of tests (pollen, OSL dating, conjoining) that should be undertaken as part of this initial test pitting programme. The details of these tests are discussed below. Secondly, it would be, in our opinion, destructive to dig more of the levee simply to get a statistically larger sample of artefacts to satisfy mathematical confidence tests. Thirdly, this an important site, and before any additional archaeological excavations take place, refined, timely and detailed research questions need to be formulated taking into account the findings of this report as well as the Social, Cultural and Historic report. Finally, the value of any additional digging needs to be discussed with, and endorsed by, the Aboriginal community.

**8.** It is recommended that the following archaeological works be undertaken as part of the current test pitting programme:

> **8a.** Pollen cores should be taken from the backswamp deposits on the western side of the levee, if suitable sediments exist (see Figure 8.1). Analysis of these cores could potentially provide a useful environmental record to help interpret the cultural sequence from the levee. The pollen core report should form a later addendum to this report.
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> **8b.** If permission is obtained from the Aboriginal community, a conjoin analysis should be undertaken on the artefacts from Trenches 1-8. This analysis will provide highly useful information on artefact reduction sequences as well as the integrity of the site. Again this report should form a later addendum to this report.
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> **8c.** Further OSL dating of the site is essential to: (1) enable an alignment of the artefact levels between the trenches; (2) further assess the geomorphic modelling for the site in this report; (3) further refine the age of the site. Approximately 10 additional samples will be needed. This number may have to be refined in consultation with the dating laboratory. Samples should be taken before the trenches are backfilled. Sections of this report will need to be revised when the new OSL data are available.

**9.** The eight test trenches should lined with a permeable membrane and backfilled with clean sand. A stainless steel metal peg engraved with the trench number should be placed immediately below the ground surface at the northwest corner of each pit to allow their accurate relocation in the future.

### *Mitigation*

From the outset it was made clear that this current study was a research investigation designed to inform discussion about the Jordan River crossing and its potential impact on Aboriginal cultural material. When we began the investigation nothing was known about the character of the JRL site. The current bridge proposal had not been designed at this stage. Our analysis of the landscape and stratigraphy derived from our investigations and DIER bore holes (detailed in this report) indicates the boundaries of the levee are approximately from its face at the east to Trench 8 in the west. Archaeological material is likely to occur further west than Trench 8, although this will be in a disturbed context and not on the levee. To the east is a modern floodplain that has been test pitted and is unlikely to contain Aboriginal cultural material.

To mitigate impact on the JRL site, and the wider site TASI 10757, the following is recommended:

**10.** Consider the comments from organisations and individuals to this report and the Social, Cultural and Historic Report if it is made available.

**11.** Have an on-site meeting as soon as possible with the Aboriginal community including representatives from the TAC and the TALSC. A detailed on-ground description can then be given by DIER engineers about the exact impact of the proposed Jordan River Crossing. The archaeologist should also attend this meeting to provide advice. Without this on-ground meeting, there is likely to be considerable confusion about ongoing plans.

**12.** Based on the above meeting, devise a plan to mitigate impact. This could, but should not necessarily include things like fencing a buffer zone and further test investigations. This mitigation plan could form part of the CHMP.