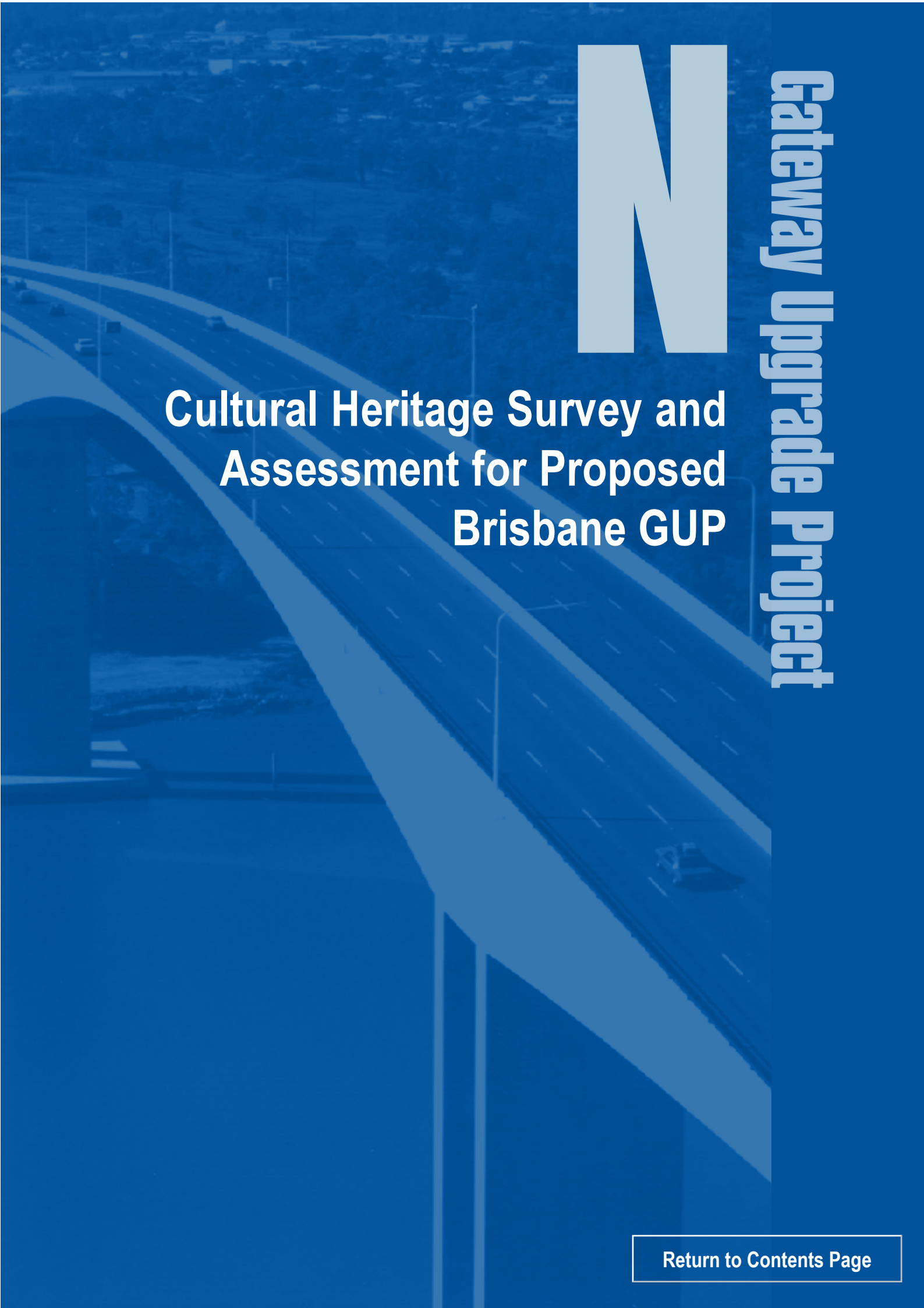

Gateway Upgrade Project

Cultural Heritage Survey and Assessment for Proposed Brisbane GUP

Return to Contents Page

ARCHAEO
CULTURAL HERITAGE SERVICES

Cultural Heritage Survey and Assessment

for the proposed **BRISBANE GATEWAY UPGRADE PROJECT**
Southeast Queensland

Report to:
The Department of Main Roads

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EPA Permit **CHCG00015003**

JUNE 2004

EXECUTIVE SUMMARY

The proposed Gateway Motorway Corridor Upgrade (hereafter referred to as the study area) incorporates an area extending from the existing Mt Gravatt Capalaba Road exit in the south through to Nudgee Golf Course in the north. The project proposes widening of existing sections of the Gateway Arterial in conjunction with extensive alterations including the construction of a second river crossing and new sections of motorway between the Port of Brisbane Motorway and Nudgee Road.

A preliminary Cultural Heritage Review (CHR) for the Brisbane Gateway Motorway Second River Crossing Planning Study was conducted in June 2002 (see ARCHAEO 2002). This report recommended a more detailed Cultural Heritage Assessment (CHA) would be required to assess any proposed impact areas for Aboriginal or non-Aboriginal sites of cultural heritage significance. This report examines the results of the subsequent CHA of the study area, with a concentration on an assessment of cultural heritage significance within proposed impact areas.

The CHA was conducted by ARCHAEO Cultural Heritage Services, in partnership with the Traditional Owner representatives for the study area, the Jagera Corporation, Yuggera people (Sandy family), Morgan and Isaac families; under Survey Permit No **CHCG00015003** from the Queensland Government Environmental Protection Agency. this survey was conducted on two separate dates. Those areas falling between the Port of Brisbane Motorway and Nudgee Road were surveyed on 17 March 2003 while the section of the study area falling between the Port of Brisbane Motorway and the Mt Gravatt Capalaba Road exit of the arterial were examined on 3 and 4 June 2004.

Where possible all representative environmental zones were sampled, with the location of transects determined by the presence of pre-existing tracks, accessibility, levels of ground surface visibility and by the areas that were to be directly impacted on by the development. A number of constraints were encountered during the survey, including generally poor ground surface visibility and inaccessibility in heavily vegetated areas.

No Aboriginal or non-Aboriginal sites of cultural heritage significance were located during the archaeological survey and assessment. It was noted during the field survey sessions that significant portions of the northern half of the area under assessment were heavily cleared/disturbed and reclaimed landscapes. Sites of cultural heritage significance are unlikely to be present in such heavily modified contexts. While landscape integrity was in general much higher in the southern sections of the project area, all areas under assessment were affected by exceedingly poor ground surface visibility in most surveyed areas. Thus, while no surface-based Aboriginal or non-Aboriginal sites of cultural heritage significance were located during the survey, this CHA can not rule out the possibility that such sites may be present within the study area. Surface and/or sub-surface cultural heritage sites may still be present along the banks of the Kedron Brook Floodway in the northern section of the Kedron Brook Wetlands Precinct study area, along the banks of Bulimba Creek and throughout the southern sections of the study area where landscape integrity is on average of a much higher level.

To manage effectively cultural heritage values associated with the area, a number of recommendations were outlined. These included on-going consultation with the Traditional Owners for the study area, the protection and management of known cultural heritage sites, the monitoring of construction activities in culturally sensitive areas, the avoidance of some areas and the general recognition of Aboriginal heritage values. These management recommendations will need to be detailed in a Cultural Heritage Management Plan before construction commences.

ACKNOWLEDGMENTS

Representatives of the Jagera Corporation, Yuggera people (Sandy family), Morgan, and Isaacs families are kindly thanked for their help in organising and conducting the field survey.

Maria Tegan and Warren Twist (Environmental Scientists, DMR), Jill Reid (EPA) and representatives of the Brisbane Airport are also thanked for their assistance.

1 INTRODUCTION

This report presents the results of a Cultural Heritage Assessment (CHA) conducted within those areas considered to be of particular cultural heritage significance within the impact area associated with the proposed development of the study area. According to the scope of works outlined by the Brisbane Gateway Upgrade Project, each of these areas (which are of unknown cultural heritage status) will be directly impacted upon by the proposed Brisbane Gateway Corridor Upgrade development.

A preliminary Cultural Heritage Review (CHR) for the Planning Study was conducted in June 2002 (see ARCHAEO 2002). This largely desktop-based study identified the presence of a number of known sites of cultural heritage significance in the proposed development zone. The 2002 CHR recommended that a more detailed CHA would be required to survey impact zones for which there was no known Aboriginal or non-Aboriginal sites of cultural heritage significance.

This recommendation included portions of land located on and adjacent to the Brisbane Airport (Lot 1RP844114 and Lot 3SP110569) and Bulimba Creek (Lot 1 SP100541: Par Bulimba) where it passes under the Gateway Arterial Road near Murrarie Road in the suburb of Murrarie. As the scope of the present study area extends beyond that of the 2002 CHR, it is further recommended that these study areas be increased to include those areas of remnant bushland located in impact zones located between the Port of Brisbane Motorway and the Mt Gravatt Capalaba Road sections of the Gateway Arterial Motorway.

For convenience these survey areas have been designated a Survey Area Number (SA 1-4) and include:

- **SA 1** - A small section of developed land on and in the vicinity of the Brisbane Airport in the Airport Northern Access Precinct; the Kedron Brook Wetlands Precinct;
- **SA 2** - Bulimba Creek area;
- **SA 3** – low lying floodplains and wetlands situated between Bulimba Creek and spanning to approximately half way between the Wynnum and Old Cleveland Road exits of the Gateway Motorway. This area contains a number of vegetational types including remnant melaleuca wetland forest and cleared pastoral land; and,
- **SA 4 –** predominantly elevated, undulating areas of in the south of the study area occurring between Wynnum and Mt Gravatt Capalaba Road composed primarily of remnant dry eucalypt forest and small pockets of low lying wetlands and wet eucalypt forest.

ARCHAEO Cultural Heritage Services was commissioned by the Department of Main Roads (DMR) to undertake the CHA. This work incorporated the ongoing consultation and involvement of the Traditional Owners, including representatives from the Jagera Corporation, Yuggera people (Sandy family), Morgan, and Isaacs families. Representatives of the Quandamooka Land Council and Turrbal Aboriginal Association were consulted by DMR and ARCHAEO but elected either not to include representatives on the archaeological field survey, or to conduct a separate/independent cultural heritage

assessment. The aim of the ARCHAEO assessment was to identify places and items of Indigenous and Non-Indigenous cultural heritage significance within the study area and to assess the levels of impact from the proposed development, and their acceptability from a cultural heritage management perspective.

A cultural heritage survey of SA 1 and 2 was conducted on 17 March 2003. Roughly 65% of the total area was surveyed by walking linear transects. Survey Areas 3 and 4 were surveyed on 3 and 4 June 2004. Due to size and accessibility constraints approximately 40% of these areas were surveyed. This survey was restricted to areas of higher landscape integrity and ground surface ability and accessibility. Where possible all representative environmental zones were sampled, with the location of transects determined by the presence of pre-existing tracks, accessibility and areas of higher ground surface visibility. A number of constraints were encountered during the survey, including generally poor ground surface visibility and inaccessibility in heavily vegetated areas.

The following report presents the results of the Cultural Heritage Assessment and includes:

- background research on the history and environment of the general study area
- a summary of existing archaeological research in the region
- the results of the cultural heritage field survey
- cultural heritage management recommendations.

1.1 Nature of project

Gateway Upgrade Project incorporates the construction of a second river crossing for the Gateway Motorway and an upgrade of both approaches from Mt Gravatt Capalaba Road through to the Nudgee Golfcourse, Brisbane, Southeast Queensland (Figure 4).

The proposed Brisbane Gateway Motorway Corridor Upgrade (referred to as the study area) incorporates an area extending from the existing Mt Gravatt Capalaba Road exit in the south through to Nudgee Golf Course in the north. Under the terms of this project the Department of Main Roads proposes widening of existing sections of the Gateway Arterial in conjunction with extensive alterations including the construction of a second river crossing and new sections of motorway between the Port of Brisbane Motorway and Nudgee Road (see Figure 4).

The proposed motorway is to pass close to a precinct of registered cultural heritage sites in the Eagle Farm area (see Section 5 below). A number of areas of unknown cultural heritage status also to be directly impacted on at this stage of the Brisbane Gateway Upgrade Project include:

1. a *c*. 75m wide by *c*. 2km long linear corridor spanning various portions of vacant land (Lot 1RP844114 and Lot 3SP110569) in the Airport Northern Access Precinct and the Kedron Brook Wetlands Precinct north of the roundabout at Lomandra Drive at the Brisbane Airport. According to the Planning Study a 2 x 900m long, 2 lane box girder bridge structure will be built over the Kedron Brook Floodway to allow high speed access to the proposed Airport through the Airport Northern Access Precinct from the Nudgee Road precinct (Survey Area 1).

2. both banks of Bulimba Creek (Lot 1 SP100541: Par Bulimba) where it passes under the Gateway Arterial near Murrarie Road in the suburb of Murrarie at the southernmost approach of the proposed new motorway (Survey Area 2).
3. areas of melaleuca swamp and low lying flood plains in the vicinity of Bulimba Creek (Survey Area 3) and the Meadowlands Picnic Ground (sections of Survey Area 4).
4. areas of remnant eucalypt woodland between the Wynnum Road and Mt Gravatt Capalaba Road exits of the Gateway Arterial Motorway (Survey Area 4).

As these areas were to be directly impacted upon due to the nature of the project, it was necessary to assess them carefully for sites of cultural heritage significance.

1.2 Personnel

Prior to the field assessment Ann Wallin and Deborra Kirwan (ARCHAEO) and Maria Tegan (Main Roads) undertook consultation with Indigenous groups claiming connection or traditional links to the study area (See Section 3, Community Consultation). Cultural heritage fieldwork was organised and conducted on Survey Areas 1 and 2 by Adam Brumm of ARCHAEO with representatives of the Jagera Corporation, Yuggera people (Sandy family), Morgan, and Isaacs families, and Environmental Scientists for DMR. Fieldwork associated with Survey Areas 3 and 4 was conducted by Simon Gall of ARCHAEO with Caroline Bonner representing the Jagera Corporation.

All field survey work was conducted under Survey Permit No **CHCG00015003** issued by the Queensland Government Environmental Protection Agency. The permit was issued to ARCHAEO Cultural Heritage Services on 4 March 2003 under Section 28 of the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*, and was extended, before it expired in March 2004, for a further year (March 2005).

1.3 Scope of study

ARCHAEO Cultural Heritage Services was commissioned by DMR to conduct a Cultural Heritage Assessment (CHA) assessing the impact of the proposed Gateway Motorway duplication development. This assessment incorporates the following:

- **Research -** conduct background research into historical and archaeological material in the vicinity of the study area.
- **Indigenous consultation -** liaise with members of the relevant Aboriginal communities regarding places of cultural and indigenous archaeological significance within and close by the study area on which development may impact.
- **Field survey**: - undertake a field survey to determine the impact of proposed development on any archaeological or historical site or place, as well as culturally significant sites, places and landscapes within the study area.
- **Assessment** - assess the significance of the findings and identify potential impacts and management strategies necessary to maintain and protect cultural heritage values.
- **Recommendations** - developed in consultation with the Traditional Owners and the Proponent these recommendations should outline the

management, protection or mitigation of any archaeological or culturally significant places within the study area.

The scope of this study acknowledges that the archaeological record is both fragile and non-renewable, and any major disturbance of the environment poses a threat to this valuable cultural resource.

The project sought to meet all requirements of the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987,* and other relevant legislation. Cultural heritage forms an integral component of Environmental Impact Statement (EIS) as required by the *Environmental Protection Act 1994.*

1.4 Organisation of report

The report discusses:

- Cultural Heritage Management and associated legislation
- Relevant historical and biogeographical information
- Details of the archaeological survey and findings
- Levels of significance and likely impacts on identified cultural heritage
- Community consultation regarding cultural significance
- Recommendations regarding cultural heritage that might be impacted upon by the development.

Copies of this report were circulated to the Traditional Owners, DMR and the EPA.

2 CULTURAL HERITAGE MANAGEMENT

Cultural Heritage Assessments identify culturally significant places, and make recommendations for their subsequent management. This process generally begins with research, involving relevant literature and heritage register searches. This research commonly results in field surveys conducted in conjunction with consultation with Aboriginal communities or local families that maintain traditional links with the study area. Other possible stakeholders can include landowners, local historical societies and government agencies. A report is then produced which assesses the significance of sites, features and places and identifies any potential impacts of development in the area.

Ideally, cultural heritage should be preserved. Where this does not occur, impacts from development can be mitigated by the implementation of cultural heritage management strategies. These strategies can range from the preservation of all or part of the site through to the recording of areas that are of cultural significance prior to their destruction.

2.1 Indigenous Cultural Heritage

For Aboriginal people, cultural heritage may be divided into archaeological sites that are visibly identifiable, such as stone scatters, scarred trees, axe-grinding sites, quarries, burials, rockshelters and stone arrangements. However, archaeological material may not account for sites, places and landscapes of spiritual, ceremonial or social significance. These may include landscapes, pathways, totem places, 'good' and 'bad' places, massacre sites and Dreaming sites among other things (Godwin and Creamer 1984). Because these sites and places cannot always be defined archaeologically, they can only be identified through the knowledge of the Traditional Owners (McNiven *et al* 1994).

Bowdler (1983) recognises two distinct groups of sites and places significant to Aboriginal people, pre-colonisation and post-colonisation. In the case of pre-colonial sites, current 'best practice' stresses that it is only the Aboriginal Traditional Owners that can identify sacred and significant sites and places. Post-colonial sites, although often previously overlooked by archaeologists, are becoming increasingly important to Aboriginal communities, particularly those attempting to prove connection to land from which their ancestors were dispossessed. Historical sites, i.e., sites and places of significance to the shared history of Australia since Non-Indigenous settlement, are also an important element of the archaeological record.

Prior to a given site survey, archaeologists conduct research in order to assist in the prediction of artefact sites and of other areas of cultural significance that may be encountered while in the field. The most common types of Indigenous archaeological and culturally significant sites that may be found in Southeast Queensland include:

Art sites
Art sites have been recorded in southeast Queensland and are considered highly significant as ritual and ceremonial areas. The art can include painted designs on rock faces, pecked art in rock and carved trees.

Significant places
These include visible sacred sites, 'non visible' sites such as 'good food places', 'men's places', 'women's places' and 'dangerous' places where there may be a manifestation of a spirit. Mythological sites are places associated with stories or myths about mountains, rock outcrops, swamps, lagoons, creeks, waterholes and other natural places. Dreaming sites are ancestral places associated with creation stories and ancestors and are often pivotal to Aboriginal beliefs.

Bora and ceremonial sites
Bora rings were sacred sites, used for ceremony, initiation and ritual (Satterthwait and Heather 1987). Initiation sites commonly had two rings, a large public ring and a smaller *kippa* or initiation ring, joined by a pathway.

Stone arrangements
These consist of groups of stone piles, or cairns, or lines and semi-circles. Some sites were used for ceremony, while others had a sacred and mythological role.

Burials
Traditional mortuary ritual appeared to include both ground interments and tree burial. For interment, softer soils and sand were often preferred, often at the base of trees or on sandy banks of rivers and creeks.

Food resource areas
Aboriginal people depended on plants for food, tools and shelter. Places that are culturally significant might include areas of high-density food species, such as fern root, yams, plum trees, birds' eggs or fruitbat camps.

Rockshelters
Rockshelters occur where the geology allows the formation of either wind blown overhangs or water derived caves and fissures. Sites in sandstone or limestone country are particularly common. Aboriginal people used rockshelters for a range of cultural activities, including camping, burial practices and the production of rock art.

Artefact scatters
Stone artefact scatters, ranging in size for one or two flakes, to tens of thousands of artefacts, are the most common type of archaeological site. Aboriginal people made cutting and scraping stone tools from fine-grained stone including silcrete, quartzite, chert, chalcedony and quartz. Volcanic rocks, such as basalt and andesite, or other rocks, including greywacke and argillite, were flaked into rough blanks, then ground on sandstone slabs to form axes, useful for chopping and fighting.

Quarry sites or artefact reduction sites
These sites are located near a suitable source of stone for flaking stone tools. Flaked rocks, heavy scattering of cores, flakes and flaked pieces and, sometimes, hammerstones, may distinguish this site type. The opportunistic assaying of gravel beds, often found in high velocity streams and rivers, is also common.

Ochre quarries
Deposits of red, yellow and white clay formed an important source of pigments for body decoration used during ceremonies and the decoration of trees and art objects. Ochre was a valued element of trade, often carried for long distances from its place of origin.

Axe grinding grooves
These are grooves in sandstone slabs made during the polishing and grinding of axe blanks into finished items. This site type is usually located near rivers and creeks.

Earth ovens
Earth ovens and hearth sites are often detected as stains in the earth where campfires have been lit to cook animals and plants for food. They may provide useful archaeological material for dating if organic material has been carbonized.

Natural wells
Wells are possibly more common than most researchers realize but are frequently overlooked. They consist of small cavities in rock slabs that collect water after rain. Frequently a slab of rock is placed over them to prevent animals from drinking and slow evaporation.

Scarred trees
Scars are formed by the removal of bark used to make items including water containers, roofing material and canoes. Wood is also used for manufacture of spears, boomerangs, nullas and other tools. However, scarring can also occur naturally from lightning strikes, termite damage, and fire and branch loss. These scars can often superficially resemble cultural scars. A detailed list of criteria has been established by ARCHAEO to identify essential elements and balance them against criteria, such as size of a tree, age, environment, soil type, size and nature of the scar and the tree species. The extraction of animals, such as possums and native bee honey, using stone or steel axes may also leave distinctive scarring. Importantly, trees were also scarred by removing bark and carving objects of ceremonial importance, and to act as markers.

Carved trees
Carved trees as ceremonial markers were formerly very common and considered significant places (Bell 1986; Morwood and Fillery 1976). The markers were involved with ceremony and created a sense of place. Today, as a result of land and tree clearing, and natural causes, this site type is increasingly rare and very important. The carvings are normally curvilinear or consist of geometric patterns incised into the heartwood using either stone or steel axes. Trees associated with ceremonial sites or boundary markers are called *teleteglyphs* and trees associated with burial sites are known as *taphoglyphs.*

Shell middens and shell scatters
A shell midden usually contains a high proportion of shellfish remains discarded by people in particular locations, and has vertical stratigraphy or depth (Meehan 1982). A scatter is composed of superficial scattered shell. Inland shell middens would predictively be Freshwater Mussel *Velesunio* species whereas coastal middens tend to contain oyster *Saccostrea commercialis* and mud ark *Anadara trapezia*.

Contact sites
This important aspect of Aboriginal archaeology and history is often overlooked. European settlement disrupted traditional lifestyles and created new site types. These include massacre sites, graves, and other places associated with historic events. Fringe camps were located usually on the outskirts of country towns or near homesteads, often across a river, affording the occupants some safety from Europeans. Shanty huts were constructed of corrugated iron, bark, sacking or any other material available. Gin bottles, poison bottles and other glass containers were not only used as containers, but also flaked into tools. Native Police sites and camps are controversial aspects of contact times, and along with Mission sites, reserves and workhouses, are significant to Aboriginal communities. Consultation with the Traditional Owners is an important aspect of identifying such sites.

As well as Aboriginal sites, archaeologists must be aware of **non-indigenous** and **shared sites** that have cultural heritage significance. Two centuries of change may be a short period of time when compared to the immense period of thousands of years that Aboriginal people have occupied Australia. Within the last 200 years, the highly organised hunter-gatherer societies have been decimated; their territories have become sheep runs or cattle stations or mines; pathways have become bullock tracks and roads and then super-highways; fences have enclosed open spaces and rivers have been dammed or flooded valleys. Australian landscapes are changing at an increasing rate and the loss of our historic heritage is considerable. Non-Indigenous sites that have cultural heritage significance include early buildings relating to pioneer settlement, farm houses, farm complexes, mines, timber sawmills, old roads and railways, bridges, monuments, etc.

2.2 Cultural Heritage Legislation

Knowledge of cultural heritage legislation is essential when assessing sites, places or items of cultural heritage significance. The following section discusses both National and State Legislation relevant to Cultural Heritage.

To facilitate the process of cultural resource management, various pieces of legislation exist at both a State and Federal level.

2.2.1 National Legislation

At the national level, the *Environment Protection and Biodiversity Conservation Act 1999* is now the key national heritage legislation, and is administered by the Commonwealth Department of the Environment and Heritage. In addition to the EPBC Act, the following legislation is relevant to heritage:

- The ***Aboriginal and Torres Strait Islander Heritage Protection Act 1984*** provides Aboriginal people with the right to request the federal Minister for Aboriginal Affairs to intervene through an injunction in cases where they consider that their cultural heritage is at risk. The Act does not determine significance, or limit the type and place for which protection is being sought.

- ***The Australian Heritage Council Act 2003*** provides for the establishment of the

Australian Heritage Council, which is the principal advisory group to the Australian Government on heritage issues. The AHC Act also provides for registration of places considered of national significance on the Register of the National Estate (RNE) or the Australian Heritage Places Inventory (AHPI).

Other Commonwealth heritage legislation that may also be relevant include:

- *World Heritage Properties Conservation Act 1983;*
- *Historic Shipwrecks Act 1976;*
- *Protection of Movable Cultural Heritage Act 1986.*

2.2.2 State Legislation

This study is being performed under legislation that has recently been retracted, namely the ***Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987.*** Under the Cultural Record Act cultural heritage can be identified as an "item of the Queensland Estate". The 'Queensland Estate' is defined as 'evidence of man's occupation of . . . Queensland which was made over thirty years ago but not produced as a facsimile, made for the sale since the commencement of the Cultural Landscapes Act or is not of historic or pre-historic significance' (s. 27). All evidence of Aboriginal or Torres Strait Islander culture is designated as Crown Property (Section 33), making it an offence to knowingly destroy or interfere with such places, sites or items without Ministerial approval (Division 3).

In regard to Indigenous cultural heritage issues, the new paramount legislation in Queensland is the recently introduced *Aboriginal Cultural Heritage Act 2003*, which states that a person who carries out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage (the **"cultural heritage duty of care"**) (Section 23(1), p. 19).

In the case where cultural heritage issues exist, a proponent can move ahead with a mitigation program on the following basis:

A person who carries out an activity is taken to have complied with the cultural heritage duty of care if -

(a) the person is acting -

(i) under the authority of another provision of this Act; or
(ii) under an approved cultural heritage management plan; or
(iii) under a native title agreement or another agreement with an Aboriginal party,
unless Aboriginal cultural heritage is expressly excluded from being subject to the agreement; or
(iv) in compliance with cultural heritage duty of care guidelines (Section 23(4)(a), p. 20).

The ***Land and Resources Tribunal Act 1999*** establishes a Land and Resources Tribunal that has exclusive jurisdiction over Aboriginal cultural heritage matters

referred to it for mediation or application for injunctive powers.

Non-Indigenous cultural heritage issues are covered in the ***Queensland Heritage Act 1992*** which provides for a listing of places within a Heritage Register (s.20). A site or place may be considered to be significant at the national, state or local level if it satisfies one or more of the following eight criteria:

1 the place is important in demonstrating the evolution or pattern of [Australia's/Queensland's/the local area's] history;

2 the place demonstrates rare, uncommon, or endangered aspects of [Australia's/Queensland's/the local area's] cultural heritage;

3 the place has potential to yield information that will contribute to an understanding of [Australia's/ Queensland's /the local area's] history;

4 the place is important in demonstrating the principal characteristics of a particular class of cultural places;

5 the place is important in exhibiting particular aesthetic characteristics valued by the community or a particular cultural group;

6 the place is important in demonstrating a high degree of creative or technical achievement at a particular period;

7 the place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

8 the place has a special association with the life or work of a particular person, group or organisation of importance in [Australia's/ Queensland's/the local area's] history.

2.3 Determining Cultural Heritage Significance

Cultural heritage significance relates to people's perspective of place and sense of value, within the context of history, environment, aesthetics and social organisation.

A range of standards and criteria are available to assist with determining cultural heritage significance. The following sections discuss the Burra Charter (ICOMOS Australia), concepts of Aboriginal site significance and scientific significance and incorporate aspects from the legislative framework.

2.3.1 The Burra Charter

The Burra Charter (Marquis-Kyle and Walker 1999) continues to guide cultural heritage management in Australia. First adopted in 1979 by Australia ICOMOS (International Council on Monuments and Sites), the charter was initially designed for the conservation of and management of historical heritage. However, after the addition of further guidelines that defined cultural significance and conservation policy, use of the charter was extended to Indigenous studies.

The charter defines conservation as 'the processes of looking after a place so as to retain its cultural significance' (Article 1.4). A place is considered significant if it possesses aesthetic, historic, scientific or social value for past, present or future generations (Article 1.2).
The definition given for each of these values is as follows (Articles 2.2 to 2.5):

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.

Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

The **Scientific research value** of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information.

Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group.

Article 2.6 of the Guidelines notes that other categories of cultural significance may become apparent during the course of assessment of particular sites, places or precincts. A range of cultural significance values may apply. Article 5 of the Burra Charter states that:

> Conservation of a place should identify and take into consideration all aspects of its cultural significance without unwarranted emphasis on any one aspect at the expense of others (Marquis-Kyle and Walker 1999).

2.3.2 Indigenous Site Significance

Indigenous people place a high cultural value on their archaeological sites and cultural heritage. This is partly due to the fact that the archaeological record (information about the pre-European history of Australia) has been heavily impacted on by 200 years of European settlement. Accordingly, a common fault in assessments of Indigenous cultural

heritage lies in a tendency to concentrate on an archaeological assessment of material cultural remains Such an approach often assesses only surviving elements of the archaeological record, often totally ignoring Indigenous viewpoints.

Aboriginal people consciously aimed to manage their impact on the environment. This connection to their environment paralleled their spiritual life. Aboriginal perceptions of the landscape were different from those of European settlers and pastoralists. Every aspect of the land – its weather, seasonal cycles, geology, plants and animals – was understood and its resources carefully managed and utilised. Unlike European perceptions, which regularly assess the Australian landscape in terms of resources, Aboriginal people saw the whole landscape as sacred, an extension of the Dreaming (Cowan 1989; Rolls 2001:2-20).

Archaeology represents an important tool for Indigenous people that can be used in conjunction with existing cultural or traditional knowledge. Crucial to an assessment of the archaeological significance of a site are the establishment of 'timely and specific research questions' (Bowdler 1984), in conjunction with establishing the research potential and representativeness of a site. Research questions or research potential may be gauged using factors such as site integrity, structure and content. Representativeness takes into account how common a site type is (Bowdler 1984:2), requiring reference to the known archaeological record. Both research potential and representativeness should be constantly assessed when assessing Aboriginal site significance.

Cultural heritage significance is often difficult to quantify as it relates to people's sense of place and value as existing within the framework of history, science, environment, aesthetics and social organization. Cultural heritage is also a crucial component of an Indigenous person's Native Title rights. Activities that impact on or diminish the cultural values of a place may also impact on a person's Traditional rights and values, and thus by implication, their Native Title. Accordingly, a range of standards and criteria are available to assist with determinations of cultural heritage significance. These include social, political, scientific, historical, educational, economic and aesthetic criteria.

2.3.3 Scientific significance

Scientific significance, as defined by various federal and state legislation and 'best practice' guidelines, relates to the research potential of a place or item to contribute information that other sites may not afford. It has the expectation that a place or object can contribute knowledge that is relevant to questions about human behaviour, history and other aspects of human interest.

Site integrity, site structure and site content are all fundamental to the scientific potential of a site. A range of natural or cultural issues can also affect sites. While archaeological sites are generally located as the result of disturbance, it is accepted that sites which are least affected are more likely to contain substantial archaeological information regarding past human history.

Site structure includes factors such as stratification, dimensions and patterns of archaeological materials within the site. Stratification offers insights into detecting cultural changes through time. Site content considers the various archaeological components of a site. These can vary considerably, depending on whether the site is

historic or archaeological; even sites with small variations can provide important archaeological data.

Ideally, scientific significance is evaluated as part of a detailed research design focussed on a particular aspect of past Aboriginal lifeways. If a site has the potential to contain information that may help address issues in this research design, a defensible evaluation of scientific significance can be made.

Since it is impossible to anticipate all research questions, it is also difficult to identify and conserve suites of sites that may be capable of addressing all future research problems. In order to avoid the problem of using specific research designs to evaluate sites, the concept of "representativeness" was advocated in Australia as an additional consideration for evaluating scientific significance (Bowdler 1982:128, 1984:2; Pearson and Sullivan 1995:152). According to this concept, identifying and preserving a representative sample of the complete range of site types in an area can conserve an adequate data set for all present and future research designs.

Despite its intuitive appeal, the "representativeness" concept has been seriously questioned (Pearson and Sullivan 1995:152). Grouping these unique entities into samples for conservation will inevitably be conducted in relation to the research concerns of the archaeologist defining the samples. As a result, the evaluations based on "representativeness" suffer from the identical weakness as evaluations based solely on the questions in a detailed research design.

2.4 Managing Aboriginal Heritage Values

Management options for threatened sites of Indigenous cultural heritage significance vary according to the level of impact and the ability of the proponent to adjust proposed works to avoid heritage sites. Important management recommendations for such sites include:

- **Site avoidance**
  This is the best management option for avoiding impact to sites of significant cultural heritage value to Aboriginal people.
- **Monitoring**
  A consistent system of site monitoring by the Traditional Owners should be developed and implemented at the planning stages for works in all areas deemed sensitive for heritage values.
- **Excavation**
  Construction works that impact directly on dense artefact scatters, or scatters suspected to contain significant sub-surface deposits, can be mitigated through a program of test excavations followed, if necessary, by full-scale excavation. Artefacts removed from a site are analysed, and an artefact handling and curation agreement negotiated between the Aboriginal community and the Queensland Museum. Mitigation works should be planned and implemented by the Aboriginal groups with technical input from an archaeologist. It must be noted that, although certain physical representations of Indigenous cultural heritage may be mitigated through archaeological excavation and/or the collection of artefacts, in many cases intangible aspects , such as cultural values associated with site setting, may require the avoidance of an area.

2.5 Community Consultation

All Cultural Heritage Assessments, including the application process for permits, require consultation with Native Title claimants and 'relevant' Aboriginal Groups who claim Traditional connection with the land in question. This chapter discusses the role and need for adequate and thorough consultation, especially in view of the fact, as discussed in Section 2 above, that Indigenous groups may have cultural knowledge that is only available through consultation and discussion.

2.5.1 Native Title

The study area is within the boundaries of two registered Native Title Claims:

1. Jagera Claim (Claim No.: QC02/033)
2. Turrbal Claim (Claim No.: QC98/026)

2.5.2 The Process of Community Consultation

The spread of historical, archaeological and culturally significant sites and places through a specific area is an important feature of the modern community, providing a sense of place and identity. The attachment of cultural significance to a site or place can often become the basis for public concern about the impact of a project on cultural heritage with established perceptions often changing when under threat of development.

News of an impending project can lead to emotive and sudden changes in the public's perception of the significance of a site or place, leading ultimately to the revision of the status of a place or item by the community. Consequently, community consultation provides an important opportunity for the expression of community concerns in combination with the identification of sites and places of cultural heritage significance. In combination with field studies, community consultation can play a vital role in the timely management of cultural heritage issues and allows for the adoption of more informed planning processes. Recommendations for post survey/development management are also an important result of community consultation.

2.5.3 Indigenous Community Consultation

Important aspects of Indigenous community consultation include:

- the identification of Traditional Owners/ Custodians and appropriate spokespersons.
- the provision of information to brief the community sufficiently about the project and its potential impacts;
- discussion regarding cultural heritage management objectives;
- establishment of protocols for the conduct of fieldwork procedures, and confidentiality of information;
- a discussion on archaeological and cultural heritage and the views of the community.

All relevant Traditional Owner groups were sent information on the study, including a map and details of the planned development. The Jagera Corporation, Yuggera people (Sandy family), Morgan and Isaac families responded and were enthusiastic about being part of the assessment. Traditional Owner representatives of the Quandamooka Land Council and Turrbal Aboriginal Association were consulted by DMR and ARCHAEO but elected either not to include representatives on the archaeological field survey, or to conduct a separate/independent cultural heritage assessment (to be submitted separately to the present CHA report).

Representatives of the Traditional Owners of the study area were present at, and participated in, the site survey of the study area conducted by ARCHAEO Cultural Heritage Services. These representatives are listed below in Table 1.

Table 1: Traditional Owner Groups that participated in the field survey

Group	Spokesperson	Field Representative	Survey Areas
Jagera Corporation	Madonna Williams	Russel Reid Caroline Bonner	(SA1 & 2) (SA3-10)
Yuggera(Sandy Family)	Des Sandy	Des Sandy	(SA1 & 2)
Morgan Family	Diane Morgan	Angel Davidson	(SA1& 2)
Isaac Family	Neville Isaacs	Neville Isaacs	(SA1& 2)

2.5.4 Results

Traditional Owner groups involved in the cultural heritage survey expressed their positive attitude about being included in consultation and being part of the field inspection. Prior to publication of this report ARCHAEO sent draft copies out to each of the Traditional Owner groups and families along with the request that the draft be reviewed and any relevant comments and suggestions made for inclusion in the final report. No specific cultural heritage issues were raised by the Traditional Owner Groups involved in the study concerning the cultural heritage significance of the project area outside those addressed within the recommendations presented at the end of this report.

3 THE CULTURAL LANDSCAPE

In both Indigenous and Non-Indigenous communities, it is the land that shapes where people choose to live and preserves what they leave behind. For Indigenous people, this connection with the land goes much further and takes on a sacred relationship, where the land is seen as being part of the whole cultural experience. This landscape is a living existence, with a spiritual presence. Thus people living within this landscape relate to the whole - all of the landscape - not particular parts. Within this whole, parts may have provided preferred living places; other parts may have had more defined spiritual significance or may have provided specific resources, eg., food, water or materials for tool making.

3.1 Environmental Factors

From a cultural heritage perspective, the landscape is a crucial factor in identifying the interface between humans and the environment. This is particularly true of Aboriginal Australia, where a close relationship between the people and their environment has existed for many tens of thousands of years. Accordingly, environmental factors have an important bearing on the distribution of people — and thus archaeological sites — across the landscape. Hence a study of vegetation, geomorphology and geology is important to establish an interpretative framework for the archaeological record. As Hughes and Sullivan (1984:35) have noted:

> The results of numerous investigations throughout Australia have shown that the nature and distribution of archaeological sites across the landscape are generally very strongly influenced by environmental factors such as bedrock geology, landforms and associated soils and vegetation, and climate.
>
> These factors influenced the organic raw materials, water, raw materials for stone artefacts, suitable campsites, and landforms and rock surfaces upon which rock art could be executed. They also affected the ease with which people could travel across the land.

Natural features in the physical landscape contribute to predictive modelling for both Indigenous and historical landscapes. Topography, geology, the availability of fresh water, vegetation, and faunal resources should all be taken into consideration. Many studies (eg., Gillieson and Hall 1982; Lilley 1978, 1982; Hughes and Sullivan 1984) have discussed natural parameters that appear to be associated with sites containing Indigenous material culture. Lilley (1982) in particular undertook a seminal study that identified site parameters.

These parameters, although often varying from area to area, can be summarised as follows:

- **fresh water availability** - creeks, waterholes and swamps;
- **soil types** – sandy and well drained
- **site preference** - stream cut terraces or ridges in proximity to water

- **preferred vegetation habitat** - for example open eucalypt woodland
- **resource proximity** – location of resources and raw materials such as stone and floral and/or faunal resources

From a cultural heritage perspective it is crucial that a much broader definition of the physical landscape be adopted. This understanding should incorporate recognition of the cultural significance of specific areas, in particular ceremonial and increase sites, sacred places, and social parameters. An understanding of the cultural landscape, its landforms, underlying geology, the resulting soil and the type of floral and faunal habitats are also important when constructing a predictive model for archaeology. Flora and fauna communities can have an effect on the cultural decisions people make, including lifestyle and interaction within that particular environment. This in turn influences the archaeology; what items of material cultural are left behind and what remains are preserved for the present.

3.1.2 The Physical Landscape

An understanding of the landscape shape, geological base, the resulting soil and the type of floral and faunal habitats are important in constructing a predictive model for archaeology. Flora and fauna communities can have an effect on the cultural decisions people make, including how to live and interact within the particular environment. This in turn influences the archaeological record, particularly the items of material culture that are left behind and the items that are preserved for the present.

The present study area, including the present day suburbs of Belmont, Carina, Carindale, Eagle Farm, Mackenzie, Mansfield, Murarrie, Pinkenba, Nundah and Nudgee, is situated primarily on the edge of the Walloon Coal Measures, within the bounded area known as the Tingalpa formation. The lateris surface of these Measures is comparatively erosion resistant, resulting in the undulating nature of parts of the study area. The end of the Measures is to the east of the Gateway Arterial Road, where topography changes from being undulating to low and flat. The flat lower topography to the east is largely the result of the Brisbane River's delta development, which has occurred in the last 6000 years (Wilmott and Stevens 1992: 29).

The major exception to these geological features is represented by Mt Petrie and its environs at the southern end of the study area. This area represents an island of earlier meta-sediments of the Neranliegh Fernvale beds in conjunction with smaller areas of volcanic deposits in the form of Brisbane Tuff. Wilmott and Stevens (1992: 45-46) noted that cuttings resulting from the construction of the Gateway Motorway in this area exhibit the presence of argallite/shale with some remnant overlying deposits of Brisbane Tuff. Surfaces of these deposits are prone to the effects of erosion. These features are restricted to an area extending from just before the Old Cleveland Road exit through almost to the end of the study area at the Mt Gravatt Capalaba Road exit (see Figure 1)

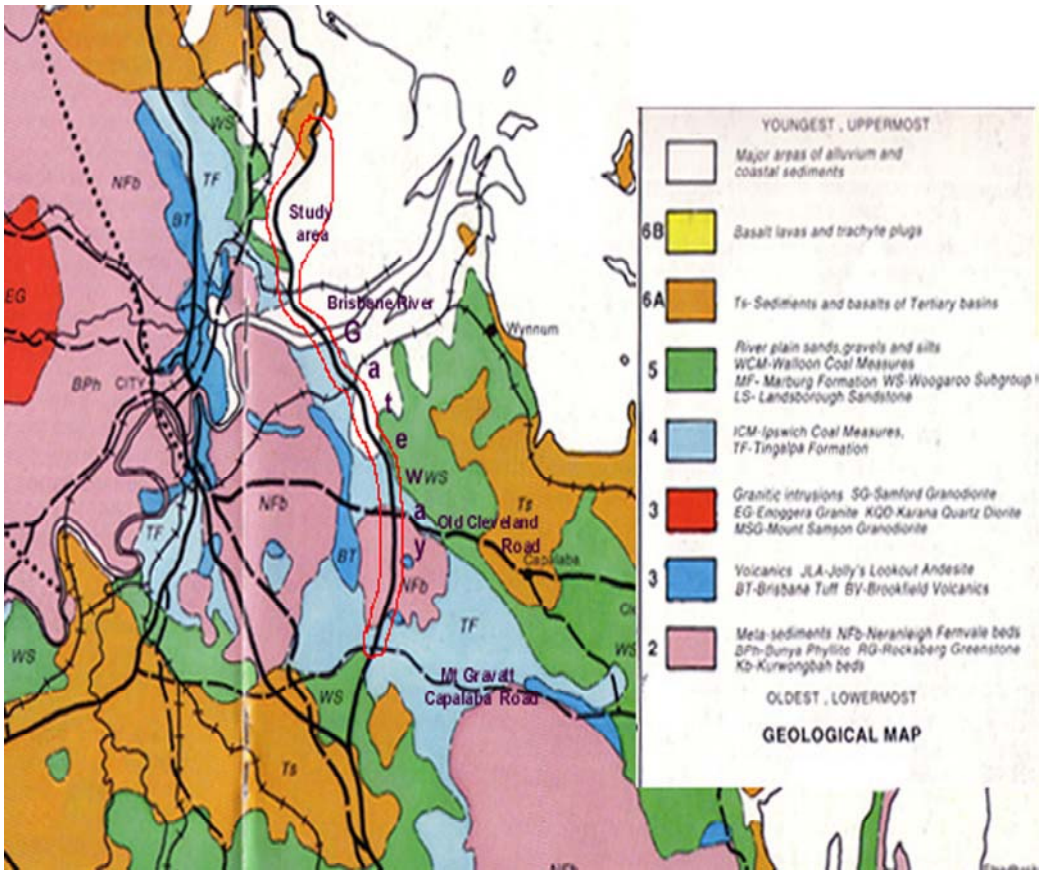

Figure 1: Map showing the geological makeup of the study area and surrounds (adapted from Willmott and Stevens 1992: 34-35)

As the only major protuberance in the immediate vicinity, Mt Petrie and its ridges dominate the southern section of the study area. Representing part of the Neranliegh-Fernvale Beds, this rocky layer was created as the result of the crumpling and folding of deep-water sediments sometime between 290 and 240 million years ago. This layer of bedrock became the base on which all further rocks in the district have been deposited. Isolated areas of Brisbane Tuff occurring in the southern half of the study area are the result of violent volcanic activity during the Triassic period (240-220 million years ago). Following this period, things began to stabilise and in swampy, low lying areas muds and clays mixed with organic matter to eventually become coal, leading to the creation of the Ipswich Coal Measures and the Tingalpa Formation (Willmott and Stevens 1992).

Much of the northern half of the study area consists of recent deposits laid down over the past 10 000 years, thus being described as Holocene in age. Around 120 000 years BP (Before Present), sea levels along the east coast of Australia were approximately 5 metres higher than present sea level. After this peak, sea levels gradually fell, reaching a minimum of approximately 150 metres below present sea levels around 18 000 years BP (Chappell 1983). This age corresponds to the last glacial period. At this stage, the Brisbane, Pine, Caboolture and Logan, Pimpama and Coomera Rivers incised valleys across the now exposed coastal plane and continued out over the current continental shelf

for a distance of approximately 25 kilometres before reaching the ocean (Jones 1992). The entire expanse of Moreton Bay to the north was completely exposed as land. Thus human exploitation of the land at this stage would have been dependent on hunting and gathering of sub-coastal vegetation and fauna.

Sea level began to rise rapidly as the glacial period ended and peaked at a level approximately 1 – 1.5 metres higher than present around 6500 BP (Chappell 1983). As sea levels increased, the incised valleys created by the rivers were the first to fill with alluvium, forming wide mouthed estuaries. As the transgression continued, water level was no longer confined to the widened valleys and sedimentation began to take place in a large shallow sandy bay similar to that seen during the previous stage of high sea levels.

Since that time sea levels have gradually fallen to their present levels. As levels fell, sediment was deposited in the bay by both marine and fluvial (river) sources. The majority of the sediment on coastal plains in the Moreton Bay Region are of a Holocene origin and are composed of dominantly marine derived sand, coming into the bay area through the tidal inlets at both Jumpinpin and North Stradbroke bars. Fluvial derived sand is restricted predominantly to the area around the mouth of the river, the major fluvial sediment being mud and silt. In regard to the study area, throughout the Quaternary fluctuations of sea level, the land has always been closely associated with the riverine environment of the Brisbane River.

Types of rocks from which flaked artefacts are made include quartzite, silcrete, chert, limestone, rhyolite, selected basalts, silicified wood, indurated siltstone, chalcedony and altered sandstone (Kamminga 1982). An important source of workable stone was identified by Hall and Lilley (1987) in close proximity to the study area, on what was once a spit into Moreton Bay. Friable sandstone outcrops observed in the study area may also have been utilised as useful tool resources. This suggests that lithic resources were readily available in the immediate area.

3.1.3 Flora and Fauna

The original vegetation in the study area would have represented a mosaic of foliage communities, with distribution influenced by factors such as soil salinity and type, micro-relief and drainage. These areas would have included:

- **Areas of saline intrusions**
  These areas would have supported mangrove, samphire and salt marsh communities, remnants of which still exists in Survey Areas 2 and 3.
- **Renewable freshwater swamps**
  These areas would have supported Swamp schlerophyll forests dominated by Broad-leaved paperbark and Swamp mahogany (SA3 and 4).
- **Areas of higher elevation**
  These areas would have supported dry Eucalypt and Casuarina forests along with small pockets of wet Eucalypt and rainforest including common species such as Blue gum, Moreton Bay Ash, Pink Bloodwood and Ironbarks (SA 4). While many larger trees were removed as the result of extensive logging in the 1850's and 60's, the southern end of the study area contains significant areas of remnant vegetation. This vegetation includes kangaroo grass, blue flax lily, sarsparilla, and other vines, under-forests of tree fern, casuarina, eucalypts, and brush box.

The land and associated permanent water supplies such as the Brisbane River and Bulimba Creek would have provided essential resource zones for Aboriginal hunter-gatherers. It is certain that numerous food species were present in the area prior to the impact of Non-Indigenous land use practices, some of which still remain today in isolated pockets. The nearby mangrove and riverine areas were important breeding grounds supporting numerous species of fish, such as flathead, bream, mullet and crustaceans such as crabs and shellfish. Mammalian fauna would have included echidna, ringtail and brushtail possums, koalas and numerous macropods, which would have been an important component of the lowland biota for hunter-gatherers. This mosaic of vegetation and associated fauna provided an incredibly rich and varied resource base, containing extensive food resources and useful materials for every day existence.

3.2 The Indigenous Cultural Landscape

Aboriginal people consciously aimed to manage their impact on the environment. This connection to their environment paralleled their spiritual life. Aboriginal perceptions of the landscape were different from those of European settlers and pastoralists. Every aspect of the land – its weather, seasonal cycles, geology, plants and animals – was understood and its resources carefully managed and utilised. Unlike European perceptions, which regularly assess the Australian landscape in terms of resources, Aboriginal people saw the whole landscape as sacred, an extension of the Dreaming (Cowan 1989; and critique by Rolls 2001:2-20).

The landscape was mapped intricately in terms of superhuman involvement. In this spiritual world, creeks, rock outcrops, waterholes, mountains and other natural features of the landscape had significance and could be places of power or the location of stories and myths (Bell 1986). Aboriginal people themselves were a part of the landscape. Plants, animals and physical features of the landscape were of equal importance (Strong 2000), tied to human activity through totemic and kinship networks.

Sites may have had both a visual and unseen significance. Symbols would direct people passing by that a place was off-limits, because of totemic, mythological or arcane reasons. It might have associations with increase rituals, for the replenishment of plant and animal life as food, or with various spirits, either good or evil, (or both), that dwelt in the area. Because ceremonies had such an importance and intensity for traditional Aboriginal people, whereby the very connection to the land was reforged, there are places that possess special significance. This significance can still be felt today, even though the sites contain no identifiable archaeology. This in no way lessens the importance of such places.

3.3 Conclusions

A review of the natural environment of the study area indicates that:

- Prior to the Holocene transgression the land was situated at a slightly higher point above the floodplain. By around 6 500 BP sea levels had risen to form Moreton Bay. At this stage the study area would have been quite close to the sea. Nearby shallow sandbanks would have provided marine resources such as shellfish, fish, dugong and

turtle. After 4000 BP the sea level began to drop resulting in the deposition of clay and silt from the Brisbane River.

- The environment was ideal for resource exploitation by Aboriginal people living in the region. A number of permanent water sources were present in the area, there was available stone for the manufacture of stone artefacts and a wide variety of plant and animal food species were present. The presence of such rich resources would support a permanent or semi-permanent population of people. Thus, there is a strong possibility that archaeological material exists within the study area, in particular shell middens.

4 HISTORICAL AND ARCHAEOLOGICAL OVERVIEW

This chapter provides an overview of the historical and archaeological context of the study area. This process will involve an examination of the results of previous cultural heritage studies in conjunction with an overview of the known local archaeological record and of the history of the area. This information will provide a sound framework on which to approach further assessment and recommendations concerning the cultural heritage values of the study area.

4.1 Cultural Heritage Studies

In 1995 Ann Wallin & Associates (now ARCHAEO Cultural Heritage Services) undertook a Cultural Heritage Assessment of an area on the western side of the Gateway Bridge, just outside the confines of the study area (Ann Wallin & Associates 1995). This CHA documented the location and type of a number of items of cultural heritage significance. These included:

- The remains of the Redlands Meatworks were found under the Gateway Bridge.
- Along Abattoir Road the remnants of the original stock holding yards were located. Abattoir Road was the original transport route into the Redlands area.
- Several large tanks from World War Two were present north east of the swamp.
- A scatter of highly fragmented oyster shell was also noted on one part of the frontal beach. The scatter extended about 15 metres east west and 10 metres to the north and south.

On the basis of an assessment of the archaeological data in conjunction with environmental and ethno-historical factors, it was hypothesised that the Murarrie area was a social and economic focus for Aboriginal groups living in the area. Of particular relevance was the nearby location of a bora ring recorded by Norma Richardson (1984). Unfortunately this important remnant of Aboriginal cultural heritage was apparently destroyed during the construction of the Gateway Bridge.

A Cultural Heritage Assessment of a proposed corridor for the realignment of Lytton Road at Murarrie was also undertaken by Ann Wallin & Associates in 1996 (Ann Wallin & Associates 1996). This assessment showed that the area had a varied and interesting history of land use involving long term Aboriginal occupation in combination with a more recent non-Indigenous land use incorporating coal mining and agricultural pursuits along with numerous factories, abattoirs and residential development.

No evidence of Aboriginal occupation, however, was found during the study, although it was highlighted that the ground surface integrity was very low. Holding yards for abattoirs had been built in the area and the continued presence of large numbers of cattle had greatly contributed to erosion in the area with very little topsoil was observed on the high ridge near the Gateway Arterial Road. The construction of this road and of the Gateway Bridge involved considerable earthworks and reshaping of the area.

In 1998 a review of Cultural Heritage Issues associated with the Brisbane Airport site was undertaken by Ann Wallin & Associates (Ann Wallin & Associates 1998). The historical

and environmental context of the area was evaluated in order to make predictions about the presence of archaeological material.

Although community consultation did not define any specific sites or places, the landscape was found to be significant to Traditional Owners. Subsequently, a full field analysis of the proposed site was recommended. Historical research indicated that archaeological sites connected with the convict era and World War Two may exist within the site. A significant archaeological site was also known to be present outside the western boundaries of the Airport land. When combined with the resource rich properties of the landscape, this evidence suggested that further Indigenous archaeological sites may exist within the boundaries of the Brisbane Airport. Based on these conclusions a number of recommendations were made, including; further historical research, on-going consultation, education of Brisbane Airport staff, a full cultural heritage assessment prior to development and the incorporation of cultural heritage issues within an Environmental Management Plan. To date these recommendations have not been addressed.

Two cultural heritage assessments carried out by ARCHAEO Cultural Heritage Services for the Brisbane City Council provide an in-depth background to those regions in the vicinity of the southern section of the study area (ARCHAEO 1999a and 1999b). Both studies provided evidence that this section of the study area would have represented a significant cultural landscape for Aboriginal people.

4.2 The Local Archaeological Record

The modern northeast Brisbane area was very significant to Aboriginal people living in the area as it lay upon the great coastal pathway that enabled trade and travel between tribal groups. One local historian has estimated that the pathway ran north-westerly from the river,

> ...probably skirting the eastern boundary of the Doomben racecourse….It crossed Nudgee Road somewhere between Gerler Road and Hedley Avenue and passed through the area now covered by the bulk stores built during the second world war. The 400 metre section of Hedley Avenue that led south-easterly from Walkers Way (now closed by the East-West Arterial Road) followed the old route exactly (Cleary 1990:85).

According to Petrie the pathway crossed the river at the sandbanks near the mouth. This place was an important centre for dugong fishing for both sustenance and medicinal purposes, and was associated with dugong dreaming stories. The location of the mission at Zion's Hill was chosen for its proximity to the pathway. As one missionary stated their station was situated "at the great thoroughfare of the Aborigines, when proceeding either from the north or south along the sea-coast, as well as coming from the interior" (Eipper 1841:4). The existence of this pathway has implications for the presence of cultural heritage items within the northern section of the study area.

To the north of the great coastal pathway an artefact scatter was located by Mr. Bill Wall (CSIRO Soils Division) and investigated by Dr Jay Hall (University of Queensland) in 1984 (Hall and Lilley 1987). The site is situated within the study area on the eastern bank of the Kedron Brook Floodway Canal near Landers Pocket Road. Test excavations of the

site unearthed an *in situ* artefact assemblage containing a number of backed blades. Further excavation of the site was undertaken in 1987.

More than two hundred stone artefacts made from silcrete, quartzite, chalcedony, silicified wood and quartz were found throughout the deposits. Artefacts from post-European occupation of the site were also found, including pieces of wood, ceramic, glass, concrete and metal objects. The site provides evidence of early human coastal exploitation during the early Mid-Holocene period (Hall and Lilley 1987). This study highlights the potential for archaeological material to exist in sub-surface deposits, even in areas that have been covered by fill.

Just outside the north-west boundary of the study area, opposite the Nudgee Golf Course, a significant Indigenous cultural site has been recorded. The Nudgee Waterhole Reserve forms part of an area of archaeological and cultural significance. The reserve protects a number of archaeological sites, including a bora ring. Bora rings are highly significant sacred sites to Indigenous people and the Nudgee Waterholes site is one of the only surviving bora rings in Brisbane. Another bora ring/ceremonial site is situated at Boggy Creek.

In 2001 ARCHAEO undertook A Cultural Heritage Assessment of the Nudgee Waterholes Reserve for the Brisbane City Council, as part of restoration and rehabilitation program (ARCHAEO 2001). The assessment included a detailed field survey of the Water Reserve to determine how many cultural sites have survived. Seven sites within the reserve were located including two artefact scatters, two isolated artefacts, one artefact scatter and midden, a midden and the bora ring itself. Two possible sites of historical significance were also identified.

The study confirmed the high archaeological and cultural significance of the reserve and recommended that the area be appropriately protected, conserved and preserved for future generations. An Interpretation Centre, walkways and the need for further archaeological work were also issues raised during the study (ARCHAEO 2001).

To Aboriginal People permanent water supplies such as the Brisbane River, Bulimba Creek and natural mineral springs near Mt Petrie represented extremely valuable resource areas. Historical references state that groups of Aboriginal people hunted and camped throughout much of the southern section of the study area well into historic times. There is also evidence that Aboriginal people travelled distances to take advantage of permanent water supplies in the vicinity of the study area; apparently in some cases travelling from as far away as Ipswich and Beaudesert (Howells 2000). Some of this travel may have taken place along the present route of Mt Gravatt Capalaba Road, once known as Old Ipswich Road, which is rumoured to have been built on the path of an existing Aboriginal 'highway'.

The importance of this area for Aboriginal people is further suggested by the existence of a number of archaeological features in the area, including the former presence of sites of ceremonial importance including two bora rings. At Murarrie, the possible location of a bora ring along with the location of a shell midden and artefact scatter were recorded by Norma Richardson in 1984 for the Archaeology Section of the Queensland Museum. Her report included the following details:

> In October 1984 the Queensland Museum received a collection of stone artefacts from Mr Joe Shaffery. He had collected the material over a number of years in the past. (He is now over 80 years old)…..Mr Joe Shaffery accompanied us to the site and was able to describe its condition when the artefacts were collected. The area has since been considerably disturbed due to its location within a now disused stock yard….In addition to locating the midden, Mr Shaffery pointed out the approximate location of a Bora ring (now totally destroyed) and several stone artefact find sites.
>
> The site is spread over the top of a low hill adjacent to the Brisbane River at Murarrie…..It is approximately 50 metres to the east of the Gateway Bridge. Most of the shell and artefact scatter is restricted to the hill top. The land is currently owned by the Brisbane City Council and was previously part of the Borthwicks Meatworks complex.

Unfortunately no details of the bora ring were recorded in Richardson's report, beyond the fact that it had been destroyed by the Gateway Bridge. The exact location of the artefact scatter is also unclear, other than its location to the east of the Gateway Arterial Road. Stone artefacts collected from the area included quartzite and silcrete retouched flakes and cores and edge ground stone axes. Further detailed study of the area was recommended.

Historical sources also point to the one time existence of an aboriginal ceremonial ground near Bulimba Creek in the vicinity of the former Baynes wool scour, located on the banks of Bulimba Creek in the vicinity of Carindale shopping centre (Brisbane City Council 1979). Mr John Godfrey also mentions that former residents of Belmont in the 1880s make mention of an Aboriginal 'corroboree site' located between Mt Petrie and the Bulimba Creek pocket (ARCHAEO 1999(a): 40). Unfortunately the exact location of these sites is unknown and the possibility exists that these sites represent in fact one single ceremonial site.

In summary, the archaeological evidence points to the fact that the study area represented a rich resource area for local Aboriginal groups; including permanent water supplies and a large variety of resource environments. Evidence also suggests that the study area contained a number of important places of ceremonial significance and that areas in or near the study area were frequently visited by Aboriginal families living outside the area and included a great deal of movement along important 'highway' routes. Indigenous occupation of the study area continued well into historical times.

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4.3 Historical Context

The primary aim of this section is the provision of an overview of the history of land use within the study area in order to allow for the prediction of local archaeological material and for the identification of sites of cultural heritage significance within the study area.

4.3.1 Early European Exploration

Local features such as Moreton Bay, Cape Moreton, and the Glass House Mountains were observed and named in May 1770 by Captain James Cook as he travelled along the eastern coast of Australia. It was not until 1799, however, that Matthew Flinders in the *Norfolk* entered Moreton Bay to explore its environs. Flinders named Point Skirmish (named after a skirmish with local Aborigines), Pumice Stone River and 'Red Cliffe' Point (now Woody Point, South Point and Pumicestone Channel). He identified the South Passage from the bay to the ocean and named the land to the north Moreton Island. Flinders landed at Woody Point in August 1799 and examined the foreshore where he found an Aboriginal camp. From a nearby fishing spot he took a fishing net and left an axe in exchange (Fairhall 1994).

Later European explorers included John Oxley, who was commissioned in 1823 to survey Port Curtis, Moreton Bay and Port Bowen with a view to forming a convict settlement. Oxley's report recommended that the Redcliffe peninsula was better adapted for a military post and stores depot than as the site of a principal settlement. Consequently, Governor Brisbane instructed that a settlement be established at Moreton Bay.

Mount Petrie was named after Andrew Petrie, who was reputedly the first white person to climb it. With a group including Major Cotton (then commandant of the penal settlement) Petrie visited Redbank. On their return it was decided to cut through to Oxley Creek. As a result the party was lost for two days and it was not until Petrie climbed Mount Petrie that the party was able to get their bearings.

4.3.2 The Moreton Bay Penal Colony

In September 1824, following John Oxley's recommendations, the colonial ship *Amity* was sent to Moreton Bay with the aim of starting a permanent European penal settlement. A number of prominent figures were involved in this process including Governor Sir Thomas Brisbane, commandant Lieutenant Henry Miller, a number of other military personnel, their families and 29 male convicts. Lieutenant Butler Oxley, surveyor Robert Hoddle and the King's Botanist Allan Cunningham and servants were also present.

In 1825 the settlement was relocated upstream in what is now known as the town of Brisbane. The settlement was administered for 17 years by eight different commandants. By 1831 the colony housed some 1288 people. Apart from military staff a number of free residents lived in the convict establishment including the family of Andrew Petrie and the German Missionaries at Zions Hill (Nundah) (Fisher and Johnston 1995).

In 1829 Commandant Logan selected the Eagle Farm area as an agricultural base for the penal colony (*Eagle Farm Agricultural Station*). The base was named "after the large numbers of eagles there" (Cleary 1990: 91). In the early 1830s a number of basic farm and prison buildings were erected at this site. The Superintendent of Agriculture's Quarters dominated the settlement. The land in question lay between the Brisbane River and Serpentine Creek, and had earlier been described by Colonial Botanist Charles Fraser as "extremely rich", lightly timbered with blue gum and well grassed.

The first road along the route, now known as *Kingsford Smith Drive*, was built by convict labour between 1829 and 1830 to link the main settlement with its agricultural outpost.

Initially, wheat and maize proved successful crops at the farm, and by 1831 surplus produce was being sent from Moreton Bay to Sydney (Johnston 1988: 43-45). By January 1832 approximately 650 acres were devoted to cultivating maize at Eagle Farm and a further 28 acres raised potatoes (Steele 1975: 312). Storms, summer heat, vermin and fires conspired to limit the farm's productivity, and by 1836, with shortages of convict manpower at the settlement, production had dramatically declined.

During the 1830s, many of the colony's female convicts had been stationed in isolated huts on the farm. By 1832 it is believed that female prisoners were employed in field labour on the site and by 1834 some forty female prisons were working at Eagle Farm. As the Quaker missionaries Backhouse and Walker reported in 1836: "Those at Eagle Farm, which is six miles from Brisbane Town, are about forty in number and go out to field-labour; they are locked up securely at night, and are also vigilantly watched during the day…" (cited in Steele 1975: 211). The site is now known as the *Eagle Farm Women's Prison and Factory*. The duties of the prisoners employed at the site included washing and mending clothes, cultivating vegetable and constructing roads. The site remained a prison until 1839 when it was closed and the area subdivided (Australian Heritage Commission, 2002). The allotments were then used to grow fruit crops and for grazing. From 1912 onwards the site was used for aviation activities.

As far as building remains of the Eagle Farm Women's Prison are concerned, S.G. Prior has identified the site of the main residence on the farm during the convict period as near the modern airport control tower. According to Prior, the site was marked in the early 1980s by "a lone palm tree near the tower. "The farm house was built of stone", he writes, "and [was] unfortunately demolished during WWII. The farm outbuildings were seen by the writer and were "made of solid cedar….cut from the area" (Prior 1983: 1). The foundations of the settlements are believed to have survived in sub-surface deposits. The remains of a saw pit, apparently dating from early in the era of European settlement, stood near the railway road crossing at Meeandah until about 1914.

A significant chapter in Queensland's early history commenced in 1838 with the foundation of a Lutheran mission at Nundah. The German mission was situated on a hilltop named *Zion's Hill*, close to Kedron Brook and to the north of the Brisbane River. The location of the mission was chosen for its proximity to a great coastal pathway. As one missionary stated their station was situated "at the great thoroughfare of the Aborigines, when proceeding either from the north or south along the sea-coast, as well as coming from the interior" (Eipper 1841: 4). This settlement was to become the genesis of Nundah and was important in the history of the Northeast Brisbane area. One of the key characters responsible for the promotion and establishment of the German Mission was Dr. J. D. Lang (Laverty 1954: 7). He was also responsible for the scheme that encouraged the arrival of Free Settlers on the sailing vessel *Fortitude* in 1849 (which gave its name to Fortitude Valley) along with two other ships the *Chaseley* and the *Lima*.

The settlement, as it developed over the first two years, was comprised of "eleven cottages with enclosed yards, kitchens, storehouses. These cottages [were] built in a line on the ridge of the hill from east to west" (Grope 1981 in Outridge 1989:9). The missionaries had very limited success in their endeavours, however they were responsible for many German migrants settling in the Nudgee and Nundah areas. The mission was abandoned in 1850 (Sparkes 1939: 47) but the surrounding area of settlement was still referred to as "German Station" for many years after.

Shortly after the establishment of the German mission at Zion's Hill historical documents indicate the existence of an *Aboriginal Fringe Camp* at Breakfast Creek on the road to the Eagle Farm establishment. James Fennelly was charged at his trial in December 1840 with abducting an Aboriginal woman from the camp (Evans 1992: 24). The same camp, it appears, was later known as the Eagle Farm camp and was situated further along the road, "across the creek and along the river road towards Eagle Farm" (Fisher 1992: 37).

In 1852 the camp was attacked and burnt by a party of constables and local inhabitants (Fisher 1992: 46). However, by 1859 the population of the camp was estimated as over 100 indicating the resilience of the local inhabitants. In October 1860, on the occasion of another notorious raid, the camp was composed of three separate but adjoining camps, one of 25 people, between 30 and 50 people, on the riverside about half a mile from the bridge and just yards from the road and another of around 60 people across the road on the crown of the hill (Loudons Hill). With reference to these camps, Fisher comments:

> "Though the origins of these encampments are obscure, one might have [in 1860] sheltered remnants of the Duke of York's clan, but more likely the Bribie Island, Ningy-Ningy (Toorbul Point to Redcliffe) and Wide Bay Aborigines who were losing their traditional territory further north. These clans appeared at Brisbane as early as 1845 and assembled regularly for tribal battles and blanket days thereafter. They were often hostile towards the Duke of York's clan, particularly during the 1850s when they were believed to be conducting a war of extermination against the Brisbane blacks. They were also blamed for much of the trouble around the town and further afield" (Fisher 1992: 37).

4.3.3 Early development

The formation of the penal colony at Brisbane Town brought with it restrictions on access, and it was not until these were lifted in February 1842 that shipping could enter Moreton Bay and people could travel through the penal colony. Effectively, the removal of these restrictions opened the area that is now southern Queensland to free settlers. The Hunter River Navigation Company began a regular service between Moreton Bay and Sydney with the *Shamrock*, *Rose*, *Thistle* and *Sovereign*. On 9 November 1845 the brig *Eliza Kincaid* anchored near the mouth of the river to receive the first cargo of wool from the Moreton May hinterland. In the same year Brisbane was declared a Port of Entry and in 1849 a Warehousing Port. Brisbane's port facilities and growing population encouraged both the development of trade and commerce, and the expansion of primary industry in the region.

During this early period Brisbane Town functioned purely as a service centre for the many squatting and pastoral runs in Moreton Bay. However, at this time squatters faced many problems including periodic drought, economic depression, transport difficulties, labour shortages and conflict with Aboriginal populations. One of the first Non-Indigenous settlers in the general vicinity of the study area was D.C. McConnel, of the Cressbrook run. He built "Bulimba House" in 1850 from grey freestone quarried from what was later called "Black Ball Quarry". This quarry was on the site of the Redbank Meatworks at Queensport (Bulimba Committee 1959: 6). Small farms, just beyond the Brisbane Town, were also established along the river at Eagle Farm, Breakfast Creek and New Farm.

Agricultural allotments at Eagle Farm were among the first parcels of land to be offered for sale when Brisbane was opened for free settlement in 1842. Early farmers in the Eagle Farm, Pikenba and Myrtletown district held small agricultural holdings of thirty to fifty acres. Despite the thin topsoil over clay and sand on the river flat country, the district farms were self-sufficient and sent their surplus to markets in Brisbane. Local produce at this time largely consisted of small crops of corn, potatoes, tomatoes, cauliflowers and cabbages (Prior 1983: 4). Grapes were found to be viable and many settlers, particularly those of German descent, practiced winemaking.

Following Andrew Petrie's observations on the fine timber in the vicinity of Mt Petrie, hoop pines attracted timber getters and sawyers to the southern areas off the study area in the 1850's. By the 1860s and 1870s much of the timber had been cleared in the Mt Petrie-Belmont Creek area.

Extensive settlement first commenced in earnest within the study area following the survey and sale of land in 1852. In the 1860s, foreign immigrants, particularly Germans, settled the area and started small crop farms and dairy farms and vineyards. Many of the assisted immigrants received land grants or purchased land for two shillings and sixpence per acre [0.4 hectares]. By the 1860s much of Murarrie and nearby Hemmant, Belmont and Carina had been bought by English, Scottish, Dutch and German migrants. Common occupations for these immigrants included farming, dairying, grape growing or butchery.

After the first sugar mill was established by the Hon Louis Hope at Ormiston in 1866, the suburbs in the southern section of the study area were seen as important potential sugar-growing areas. The controversial use of Pacific Island labourers was a feature of the sugar industry in these areas in the 1860s and 1870s. These people were 'imported', often forcefully, to do the heavy work in the sugar industry. Later subdivision and settlement around Kedron Brook also brought with it the establishment of piggeries, tanneries and slaughter yards along the creek banks.

With the decline of sugar growing in southern Queensland, the farmers around Belmont grew bananas, pineapples, and other small crops, including grapes, tomatoes, and potatoes. On the undulating topography along the south bank of the Queensport and Murarrie Reaches of the Brisbane River (probably including part of the study area) bananas became the principal crop. The Bulimba Committee (1959: 8) reported that in 1896 very heavy flooding occurred, and the settlers could not reach Brisbane for supplies. The residents apparently lived on bananas for some time. The Meadowlands area was dotted with dairies and small farms growing fodder.

An important agricultural development in the Nudgee/Nundah area during the depression years was the construction of the Schultz Canal.. In the late 1920s and early 1930s the canal was undertaken as a labour market program and significantly influenced future drainage and waterway modification in the district. The canal formed a boundary to one of the Schulz family properties.

4.3.4 Transport Links

At first the Brisbane and Bremer rivers acted as the main avenue of transport for people and goods travelling in the Brisbane area. Barge or punt services between Brisbane and

Ipswich started in 1845, with a Paddlewheel steamer service of the *Experiment* operational in the following year. Local transport between North and South Brisbane was serviced by local ferries, with the first lease advertised in 1842. Sailing ships and paddle wheelers operated in Moreton Bay itself, however, bad weather frequently forced the vessels ashore (Fisher and Johnston, 1995).

By 1846 a jetty was built at Eagle Farm, but proved almost useless as a port facility because a sandbank between it and deep water had not been detected when the jetty was built (Steele, 1975: 243). In 1898 the *Pinkenba Railway Wharves* were built by the Railway Department in order to service the Pinkenba deepwater facility. Sidings, depots and good sheds soon followed in 1901-2 and a major extension of the wharf in ferro-concrete was commenced in 1910. The wharves served passenger vessels as well as transport vessels. A tramway was built to transfer luggage from the railway passenger terminal to the wharf in 1913. With these and other developments, the new riverside township of Pikenba quickly became a hub of maritime, transport and commercial activity.

Whilst public transport on the river became quite common, road services were slow to become established, due to the slow growth of settlement and the state of the highways. A road network in Northeast Brisbane gradually grew to serve the needs of pastoralists. One of the first private carriages was used by McConnel in his trip from Brisbane to Cressbrook in the early 1850s (Fisher and Johnston 1995).

Several important early transport routes cross the southern part of the present study area. These include:

- **Mt Gravatt Capalaba Road** (referred to as Old Ipswich Road up into the 1960s) –Early references to this road state that it was constructed along the route of an existing route used by Aboriginal groups. While the exact route of such a highway is difficult to substantiate, oral history evidence supports the existence of such a 'highway', stating that Aboriginal people travelled from as far away as Ipswich and Beaudesert (Howells 2000: 19).

- **Old Cleveland Road (**also referred to as High Cleveland Road) - Old Cleveland Road is first shown as a line on a sketch made by Alan Cunningham in 1829. Plans for the establishment of a town situated at Cleveland Point led to the necessity for the development of a road linking Cleveland and Brisbane. Accordingly, in 1850 James Warner presented a 'Survey of a practicable road from Brisbane in the County of Stanley to the proposed Town of Cleveland' and Old Cleveland Road became a road constrained by surveyors' pegs. For a long time this road remained little more than a rough track (Endicott 1976).

- **Wynnum Road** (also known as Cleveland Road) – Following the construction of a bridge across Norman Creek in 1856, traffic to Cleveland, including the mail coach, began concentrating on Wynnum Road. This remained so until 1888 when the railway was constructed through to Cleveland. By the twentieth century, Wynnum Road represented a popular motorists' run to the bay.

The construction of a railway system had a mixed effect on areas within the present study area. For example, the opening of the Cleveland line saw areas such as Belmont in the southern section of the study area became relatively isolated. The only link to bus services between Coorparoo and Camp Hill were in the form of a wagonette (Kerr 1998). In an effort to solve these problems a seven kilometre tramway was built from Norman Park station to Belmont. The Belmont Flyer or Belmont Tramway was opened in 1912 with six stops. However, due to small population levels the line was not viable and closed for good in 1926. The lines were lifted in 1935. By the 1920s, the population of Belmont had declined to less than it had been twenty years earlier.

The opening of the Eagle Farm Racecourse in 1863 (BCC 1995:2) was the initial reason for the railway extension from Bowen Hills. The construction of the railway from the city centre was the biggest single factor in bringing settlers to the Nundah and Nudgee districts, and in influencing development in the area. The original Sandgate Railway Line was opened on 11 May 1882. The line had four stations between Brisbane (Roma St) and Sandgate - Bowen Park, The Albion, German Station (now Nundah) and Nudgee.

The single track line covered a distance of 12 miles 48 chains and took ten months to complete at a cost of 38,634 pounds (*Brisbane Courier* 12 May 1882). At the opening ceremony the line was described as promoting the "prosperity of the Colony of Queensland…great benefit to the southern portion of the Colony, not only for travelling but ultimately for the shipping interests of Moreton Bay" (*Brisbane Courier*).

4.3.5 Early industry

The most noted industrial facility in the study area prior to the arrival of the railway was arguably the Department of Port and Harbours' powder magazine that operated on the reserve (R.185) at Meeandah from 1878. The magazine stored cartridges, explosives, caps and fuses unloaded from arriving vessels prior to their distribution for mining, railway construction and other uses throughout Queensland (Davenport 1986: 120-1). The magazine was supervised by a Keeper in Charge, and his duties included tending the river navigational lights in the Lytton Reach (Wall 1972: 41).

Prior to World War Two, the majority of development occurring within the study area was closely linked to agriculture. Following the establishment of the first local sugar mill by the Hon Louis Hope at Ormiston in 1866, those suburbs in the south of the study area were soon seen as important potential sugar-growing areas. In the Belmont area, a floating sugar mill named the Walrus was initially used to crush cane, however the subsequent rush for small mills saw plants erected at Hemmant by Gibson and Sons, and at Murarrie by Christopher Porter.

Closely associated with agricultural development in the study area was the Redlands Abattoir and Freezing Works established in the early 1890s by the Graziers Butchering Company and Works. In 1896 some of the first surveys of the area show not only the extent of the land, but also a plan of all buildings – large wooden buildings, surrounded by extensive yards. A number of dwellings are also depicted. Of particular architectural merit was the substantial manager's residence that once graced the top of the terrace, with verandahs on its northern and eastern sides, a full-sized ballroom and servants' quarters. Another feature of Redlands was its wharf, which was known as the Queensport wharf.

In 1909 the international firm Thomas Borthwicks and Sons purchased the Redlands property, as well as further property to the east. Use of the old abattoir was discontinued, and the buildings left to crumble. The Moreton Freezing Works was established on an adjacent lot. Development at the site began in late 1910 and was completed at a cost of 115,000 pounds in the following year. The facility employed a range of staff from stockmen and slaughtermen to engineers and electricians. The works operated on a seasonal cycle, with the slaughtering occurring for between six to eight months.

From its beginning until the Second World War the Moreton Freezing Works exported prime frozen quarterbeef for the British market. Until the late 1970s the works was at the forefront of developments in the meat processing industry. However, significant levels of investment and debt accumulated as the company attempted to break into the American market. Unexpected developments in the US tariff policy sent the company bankrupt and its Australian holdings were forced to close. The site was offered for sale in late 1982 and an auction was held at the plant stripping the facility of most of its fittings and furniture (Ann Wallin & Associates 1999).

By 1999 structures and buildings at the site had deteriorated so much that conservation work and salvage operations were not feasible. Prior to the removal of the site Ann Wallin and Associates (1999) recorded the site in full, documenting the various buildings and structures with photography and architectural drawings.

On the opposite (northern) side of the river, the Eagle Farm Meatworks, established by the Queensland Meat Export Company was built following the construction of the railway in the late 1890s. The factory provided the bulk of local employment, apart from the wharves, in the early years of the nineteenth century. Situated on a siding in proximity to the Railway Wharves on the site of the later fertiliser works, the meatworks utilised a steam driven refrigeration system and cattle were pastured in paddocks at nearby Meeandah (Kerr 1988: 41).

Wool scour tanneries and a fell mongery were also built at an early stage along Bulimba Creek. The last of these wool scour tanneries to close was the Baynes Brothers wool scour (later known as the Redbank wool scour), located on the bank of Bulimba Creek near the modern Carindale shopping centre. Baynes Brothers bought holding paddocks for their cattle and sheep destined for the abattoir. Subdivision and settlement around Kedron Brook also brought with it the establishment of piggeries, tanneries and slaughter yards along the creek banks.

Early *coal mining operations* on the Brisbane River are also particularly significant to the study area. In 1854 Stutchbury identified an area for potential coal mining in the Bulimba region.

> "I again visited the [Moreton] bay, and on my way down, stopped at the "Stone Quarries", situated in the parish of Bulimba, about eight miles down the Brisbane River, on the south side, where I had before observed coal in the banks upon land belonging to Mr Charles Coxen [sic]. The coal presents a weathered surface of nearly ten feet in thickness…" (Stutchbury in Whitmore, 1981: 79).

Stutchbury also noted that the conditions for coal mining in the area were favourable. The close proximity of the Brisbane River provided a means of transporting the coal and the building of wharves in the area was not difficult. At the time of Stutchbury's assessment portions 18 and 19 in Bulimba were leased by Charles Coxon, a well-known pastoralist who owned land on the Darling Downs. Following Stutchbury's departure a small syndicate immediately excavated a trial pit on the land. Eventually some "excellent coal" was unearthed and a sample sent to Sydney for testing via the steamer *Boomerang*. Although more than two hundred tonnes of coal were mined the results were disappointing. The appearance of the coal had masked its high ash content and the coal was poor quality. In 1859 another shaft was sunk on Charles Coxon's land, however, higher quality coal was not found. Both workings were still visible forty years later when Mr Robert Jack, the government geologist at the time, inspected the seam.

Portion 15 Bulimba was purchased by John Williams in 1853. However the area was not prospected until 1862 when a shaft was sunk. It was found that there was insufficient coal to continue mining operations in the area. This conclusion was reached at various stages during the following years. Ultimately, although the position of the coal was ideal for transport, the product was too low in quality to compete with local and international markets.

4.3.6 World War Two

The Second World War had a large impact on the Brisbane community, as thousands of Australian and American troops had to be housed, entertained, drilled and given supplies during this period. The population also needed to be protected from imminent attack and this required improved communications between associated bases, installations and fortifications (Fisher and Johnston 1995). Temporary camps, training grounds and other facilities were established in many areas, including Victoria, Lang and Yeronga Parks. Significantly, Eagle Farm played an important role during this period.

In 1942 the American forces upgraded the existing airport at Eagle Farm. At this time Hanger No 7 was erected as part of the United States of America Army Air Corp's Eighty First Air Depot Group complex. The Hanger was used as a workshop for the allied Technical Air Intelligence Unit, a Corps who collected, evaluated, rebuilt and flew Japanese aircraft to test their ability. In 1990 the Hanger was assessed and was found to be intact, although a more recent extension has been built on one side, the exterior has been altered and the roof re-sheeted (Australian Heritage Commission, 1992).

The period 1939-1945 saw dramatic changes for the Belmont Rifle Range located in the southern section of the study area beside Mt Petrie Road. Originally reserved by the Commonwealth Government in the early 1900's as a military shooting range, the site was also used prior to this time by the Wynnum Manly Rifle Club. During the Second World War American bulldozer drivers exercised there and received training in Thompson light machine gun use. A grenade range and mortar testing block were also established on the site.

Another event that occurred during this period involves the 1942 crash of an Anson light aircraft flying for QANTAS. This crash apparently happened in a remote area within the boundaries of the Belmont Rifle Range in the vicinity of Mt Petrie. The crash was apparently due to mechanical failure and all passengers and crew on board the flight

(believed to be 14 persons) were killed. This event is one of only two recorded crashes of QANTAS aircraft in the history of the company.

4.3.7 The Post War Period

The post-war period in Brisbane involved a move away from the rural lifestyle and a slow process of industrialisation and urbanisation. Large sections of the study area, which until this time had remained either undeveloped or primarily agricultural, were now fast becoming residential zones as the city spread outwards.

During this period Brisbane increasingly became the central focus of the Southeast Queensland region. Railways in the city suffered increasing competition as large trucks demonstrated their ability to carry freight faster and cheaper. Subsequently, a number of unprofitable lines were closed in 1955. Population began to increase steadily and increased domestic and industrial demands for power were felt.

In 1947, in order to increase the power supply in the Northeast Brisbane area, the *Eagle Farm Pumping Station and Electrical Sub Station* was designed as a combined tramway and electricity substation. The building was designed by F. G. Costello, a city architect working for the Brisbane City Council and is typical of his work. In its design and detail the building is an outstanding example of the Inter War Functionalist style. An assessment of the building in 1988 revealed that it was in reasonably good condition with some extensions made in rear sections (Australian Heritage Commission, 2002).

Since the Second World War much of the study area has seen extensive development that has changed the face of these areas, in particular resumptions for developments such as the Brisbane Airport expansion and the Gateway Arterial Road. For example, in the northern area of the study the remnants of the Child's family vineyard were victim of the latter project. Several hundred acres had been sold and converted to the Nudgee Golf Course in the mid 1930s, while the remaining five acre block was resumed in the 1980s. A cottage known as "Tymyra" that originally stood on the vineyard was twice relocated to Burpengary and subsequently to the Caboolture Historical Village in 1981 (Beecher 1994: 11-12).

Development of much of the southern section of the study area also began following the war, with the construction of war service and housing commission homes. For example, the 1960s represent the height of development for areas such as Carina and Belmont. These areas formed the outer city limit till the end of the seventies. After that, the main growth in these southern areas was in the splinter suburb of Carindale. The twelve-stage development of the Carindale Estate began in 1976, initially on the northern side of Old Cleveland Road, and in twenty-five years Carindale has grown from nothing to a population of over ten thousand people.

One of the most dramatic (and most recent) events affecting the present study has been the construction of the Gateway Arterial Motorway. This road cut through many sections of what had been, until this time, relatively undeveloped areas of native bushland and agricultural and low density residential land. The Gateway Arterial Road further opened up these areas, greatly hastening the urbanisation process. Ultimately, the Gateway Arterial represents an important indicator of the scale and rapidity of the outward

expansion of Brisbane's urban sprawl and its associated development during the post World War Two period.

4.4 Heritage Register Searches

Searches of the Register of the National Estate and the Queensland Heritage Register were conducted to identify places and sites of historical cultural heritage significance that lie within the study area.

The Register of the National Estate is compiled by the Australian Heritage Commission and is an inventory of Australia's natural and cultural heritage places that are worth conserving for the future. On the Register of the National Estate three buildings within the study area were listed:

Eagle Farm Women's Prison and Factory, ***Eagle Farm Pumping Station and Electrical Sub Station*** and ***WWII Hangar No 7*** also at Eagle Farm.

The Queensland Heritage Register is maintained by the Cultural Heritage Branch, Environmental Protection Agency, with the aim of protecting cultural heritage for future generations. All places, trees, natural formations and buildings of cultural heritage significance listed on the register are protected under the *Queensland Heritage Act 1992*. The ***Eagle Farm Women's Prison and Factory Site*** and the ***Second World War Hanger No. 7*** were also listed on the Queensland Heritage Register.

The ***Former Allison Testing Stands, Old Brisbane Airport Site, Eagle Farm***, built in 1942, is an aircraft engine testing structure located off Terminal Drive, (Lot 30 on RP895254). Although the site is currently nominated for the Queensland Heritage Register, it has not yet been approved by the Heritage Council for full registration. The remains of this important feature of Queensland military aviation and WW2 history consists of a rectangular brick structure with largely intact internal elements, concrete testing stand engine mounts and associated infrastructure. A full height bridge structure for the Gateway Corridor Duplication will be located some distance to the south of this historical structure in the Kingsford Smith Drive and Old Airport Precinct.

Note: As discussed previously in this report, the expanse or precinct of sites of cultural heritage significance are often difficult to confine to the bounds of a specific area. This is certainly the case in relation to both the Eagle Farm Women's Prison site and the site of the Old Brisbane Airport Site. Sections of these sites listed on the State and National heritage Registers must be seen as representing only a portion of each overall site and of their former historical functions. From a cultural heritage point of view this report recommends that extreme caution be shown in relation to any development plans for areas in the vicinity of each of these sites. This process should preferably incorporate an archaeological assessment of the parameters of these sites in combination with close monitoring of the site during any planned development processes.

5 FIELD ASSESSMENT OF THE STUDY AREA

This chapter discusses the methodology, constraints and results of the field survey component of this Cultural Heritage Assessment.

5.1 Sampling

Sampling is usually based on standard systems (Dunnell and Dancey 1983; Gaffney & Tingle 1984; Plog and Wait 1978; Robins 1998; Schofield 1991; Sullivan and Bowdler 1984). Sampling strategies can be either purposive or probabilistic. Those generally employed for archaeological fieldwork involve either transects chosen at random to avoid prejudice, or transects of various intensities within chosen parameters, such as a field or road. Within this sampling strategy, site determination can involve a further range of options; such as recording all artefactual material (perhaps the best scenario, but frequently unrealistic), or recording artefact sites based on a predetermined density, e.g. 5 artefacts per square metre.

5.1.1 Defining archaeological sites

As noted by Dunnell and Dancey (1983:271): "distinguishing a site and setting its boundaries is an archaeological decision, not an observation". This *a priori* decision by the archaeologist is perhaps the most important factor in the characterisation of site patterning across the landscape, even outweighing obvious physical variables such as ground surface visibility and disturbance.

The most inclusive definition of a "site" refers to *all* physical traces of Aboriginal occupation. Using this definition, each isolated artefact and clusters of artefacts are considered sites and all cultural heritage material is recorded. Instead of visualising sites as discrete points or areas, a landscape approach conceives of the archaeological record as "*a more or less continuous distribution of artefacts over the land surface with highly variable density characteristics*" (Dunnell and Dancey 1983:272, emphasis in original).

This definition has one principal drawback relating to pragmatic factors in site survey and recording. Defining discrete site boundaries and characterising artefact scatters can be very time consuming in artefact-rich areas. As a result, most archaeologists prefer to define a 'site' based on density, and consider other isolates as background scatter. Defining background scatter is usually not explicitly defined. Valuable information on the archaeological landscape is therefore omitted from the cultural record. A number of archaeologists (Foley 1981) have pointed out that as much stonework would arguably be carried out away from living areas to avoid injury, as would be left *in situ*. The presence of single artefacts may therefore be just as important at indicating campsite locations as multiple finds.

In areas where artefact density is high, a useful protocol for recording artefact distribution would be to define an "isolate" as a find-spot of a single artefact, and "sites" as a cluster of two or more artefacts (M. Moore pers comm). Individual artefacts would be grouped together into a "site" if they occurred within 30 metres of each other.

In areas where artefact density is low, however, this approach would be unsuitable as it reduces the analytical potential of a site. In areas containing very little artefactual material, isolates or multiple artefacts could be recorded as separate 'sites', unless within 20 metres of each other. This approach ensures that as much spatial control is retained over artefact location as possible. Recording archaeological material in this way gives each artefact a known provenance of within +/-20 metres.

An important advantage of recording material in small site groups is the ability to eventually remove the site boundaries and allow a "non-site" approach to analysing artefact distributions. Robins (1997) has discussed an 'off-site' or 'non-site' sampling strategy emphasizing the limitations of defining a site too tightly. Foley (1981) demonstrated the value of recording all artefactual material, whether it be dense scatters or isolates, as an indicator of human activity within the landscape. Failure to record all artefactual material results in:

- Inadequately characterising the distribution of cultural heritage elements across the landscape;
- Failing to adequately characterise the nature of the artefacts within the landscape. This leads to an inability to properly evaluate the significance of the material for scientific and, in many cases, Aboriginal social values.

Defining the extent of Cultural sites or places is extremely difficult - where do cultural landscapes stop? The flanks of a mountain, or the mountain itself? Does the spring flowing from its base include the whole spring or just the part that relates to the mountain? For these reasons a 'non-site' definition, where boundaries are not drawn, is often a more compatible approach to Aboriginal concepts of country. This approach, however, can be problematic from a cultural heritage management perspective, as the boundaries of sites are usually required to form management recommendations about a site or place.

5.2 The Survey Methodology

The primary aim of the site survey was the examination, where possible, of examples of all major environmental zones present within the study area. These zones consist of the immediate surrounds of creeks and rivers, saline intrusions, renewable freshwater swamps and forested areas of higher elevation. This survey process concentrated on those areas possessing high landscape integrity and/or representing a high level of archaeological potential. These areas were chosen on the basis of an examination of aerial photographs combined with initial visual inspections of the study area. These choices were further strengthened on the basis of an examination of existing historical and archaeological knowledge of the area in conjunction with consultation with the Traditional Owners. This process resulted in four primary survey areas, each of which were designated a Survey Area Number (SA1-4).

Due to the overall low level of ground surface visibility indicated by the initial visual inspection within each of the Survey Areas, the survey was restricted primarily to an on foot inspection of areas of higher GSV, namely the periphery of the study areas, any areas of clearing and other development and any vehicular and walking tracks transecting the Survey Areas. It was decided that, where viable, efforts would also be made to penetrate more highly vegetated areas. The entire route was visually surveyed on foot.

ARCHAEO provided one archaeologist to assist with the management of cultural heritage issues and to give archaeological support in the field. For Survey Areas 1 and 2, four field representatives of the Traditional Owners took part in the survey, along with two Environmental Scientists for DMR. For Survey Areas 3 and 4, one archaeologist and one representative of the Traditional Owners participated in the field survey. All of the Traditional Owner representatives had already undertaken cultural heritage field surveys and were familiar with survey procedures. Representatives were encouraged to provide oral information about any culturally sensitive areas and voice any concerns they may have felt during the survey.

The client provided detailed aerial photographs of the study area. All details of the survey were recorded in field notebooks and photographs taken where possible. Based on information obtained from previous surveys it was decided that all archaeological material found within the study area would be recorded as separate sites, including isolated artefacts and small low-density shell scatters. Isolated artefacts more than 20 metres from each other were defined as individual sites. This definition ensured that as much spatial control over artefact location was retained as possible.

5.3 Constraints

The primary constraint governing the results of the site survey was due to overall poor levels of GSV and resulting from a high level of vegetation and/or undergrowth and leaf litter over the majority of all three Survey Areas. Areas of above average GSV levels within the Survey Areas were primarily associated with recent changes to the landscape integrity as the result of the development of features such as walking and vehicular tracks. A further constraint was caused by the inaccessibility of certain areas of the study area, primarily due to a combination of vegetation density and geographical factors.

These factors pose two obvious problems for the results of the site survey. Firstly, the majority of each Survey Area was unable to be surveyed adequately. Secondly, those areas successfully surveyed within a given Survey Area, due to factors such as rubbish deposition, erosion and higher disturbance levels, generally represent the lowest levels of landscape integrity within a given Survey Area.

5.3.1 Levels of Disturbance and Ground Surface Integrity

Crucial to landscape archaeology, especially assessing the potential for cultural heritage material to be present in an area, is an understanding of integrity. Whereas Aboriginal occupation of the land had minimal short-term impact, such as orchestrated burning of chosen areas and the keeping open of tracks through the bush, non-Indigenous impact was immediate and changed the face of Australia in the long term. Activities included vegetation clearance, ploughing, farming and grazing, timber cutting, mining, and the building of farms, houses, towns and roads contributing towards the destruction of a fragile archaeological record.

Thus to assess the archaeological potential of an area, one of the key elements is to evaluate the integrity of the landscape. In areas where land has been distorted or heavily modified by, for example, suburban residential estates or mining, the possibility of archaeological material remaining is significantly reduced. Surviving material may also

be highly disturbed. This said, all sites can contain important archaeological information regarding Aboriginal occupation of the area and the region generally.

It should be stressed that archaeological material that has lost scientific integrity may, however, still retain a high level of significance to Traditional Owners of the area. Such archaeological material represents events and places associated with their ancestors' way of life. Equally, it is important to note that for the Traditional Owners the cultural significance of a given area is not just restricted to archaeologically identifiable sites. Furthermore, in many cases a given study area may not contain any archaeologically identifiable sites, but hold important cultural significance for the Traditional Owners. These factors emphasise the importance of maintaining an ongoing consultation processes with representatives of the Traditional Owners and must be taken into consideration in any cultural heritage management recommendations.

The integrity of the ground surface within the study area was generally assessed as being quite low. However pockets of higher integrity were present within the study area, in particular in areas of SA 4 (particular a large proportion of those areas located between the Old Cleveland Road and Mt Gravatt Capalaba Road exits of the Gateway Motorway).

5.3.2 Ground Surface Visibility

Ground surface visibility is measured to demonstrate the level of constraint encountered when trying to locate archaeological material within a particular area. The ground surface is often obscured by vegetation, or may be covered over by concrete, gravel and bitumen. The level of visibility is determined using a percentage scale (Table 1). The better the visibility, the more potential there is for locating archaeological material.

Table 1: Percentage scale of ground surface visibility and associated descriptions.

PERCENT VISIBILITY (%)	DESCRIPTION
0	Very Low
10-25	Low
25-50	Medium
51-75	High
76-100	Very High

As mentioned above in Section 5.3, ground surface visibility was found to vary dramatically throughout the study area, although in most cases this GSV remained either very low or low. As such GSV represented a major obstacle to the successful outcome of the field survey.

5.4 SURVEY RESULTS

This chapter discusses the results of the cultural heritage field survey undertaken by ARCHAEO and representatives of Traditional Owner groups. References made to map numbers and chainage in the following sections refer to drawings detailing the proposed Gateway Upgrade Project as provided by Connell Wagner on behalf of the Department of Main Roads (Gateway Upgrade Project – Reference Project Plans – Revision 1 22.4.4).

Survey Area 1 (SA 1)

This area consisted of a *c*. 75m wide by *c*. 2km long linear corridor spanning various portions of cleared vacant land (Lot 1RP844114 and Lot 3SP110569) on and immediately adjacent to Brisbane Airport land. For ease of presentation **Survey Area 1** has been divided into two main sections, (see Figure 2) consisting of the southern and northern sections (Sections 1 and 2) respectively.

SA 1 –Section 1

The southern section of SA 1 commenced on the northern side of Airport Drive *c*. 100m west of the Lomandra Drive roundabout, extending in a north-easterly direction through the Airport Northern Access Precinct at lot 1RP844114 on Brisbane Airport Land, for approximately 1500m. Overlapping zigzag transects were surveyed in a linear direction along the proposed 75m wide corridor route. Impassable vegetation patches in most areas of the site made a full 75m wide survey impossible. Accordingly, transects in SA 1 varied from 25-40m in overall width.

A significant portion of this reclaimed area consisted of thick regrowth Casuarina forest, lantana patches and guinea-grass located on parallel 'wind-rows' of redistributed introduced sand-fill. Ground surface visibility was generally poor (0-25%). Abundant marine shell, non-local rock and gravel and assorted refuse of a recent date were notable in eroded sections of the artificial 'wind-rows.

It seems likely that most, if not all of this material was introduced with the dredged sand-fill from Moreton Bay. There was no noticeable size-sorting in the recorded shell material and numerous different marine faunal shell species were noted, providing further supporting evidence for the non-cultural status of the shell. As Aboriginal archaeological shell middens tend to feature individual shells of relatively uniform size and species type, finding a wide range of shell sizes of numerous species strongly suggests these shells originate from natural biotic environments (such as dredged shorefronts and/or ocean beds). A number of intersecting vehicle tracks, cleared areas and artificial drainage swales (including Schultz Canal) with associated swamp environments were noted in the first and southern section of **Survey Area 1**, further indicating past levels of development/disturbance.

The second and northern section of **Survey Area 1** extended from the northern boundary of Lot 1RP844114, extending outside of Brisbane Airport Land for *c*. 500m through Lot 3SP110569 to the southern (and opposite northern) banks of the Kedron Brook Floodway in the Kedron Brook Wetlands Precinct. This area consisted primarily of cleared, open wetlands/swamps with regrowth vegetation (primarily Casuarina, lantana) and low grassy understorey. A number of intersecting vehicle tracks, cleared areas and artificial drainage

swales with associated swamp environments were also noted in this section of **Survey Area 1**, suggesting the area has undergone considerable post-European environmental modifications. The northern boundary of **Survey Area 1** included both northern and southern banks of the Kedron Brook Floodway with associated swamp and mangrove environments (see Figure 2). This was a cleared, open swampy area with relatively good ground surface visibility (35-55%), but with abundant signs of development/disturbance. NB: **Survey Area 1** also included the north bank of the Kedron Brook Floodway, however, this area could not be safely accessed at the time of the field survey.

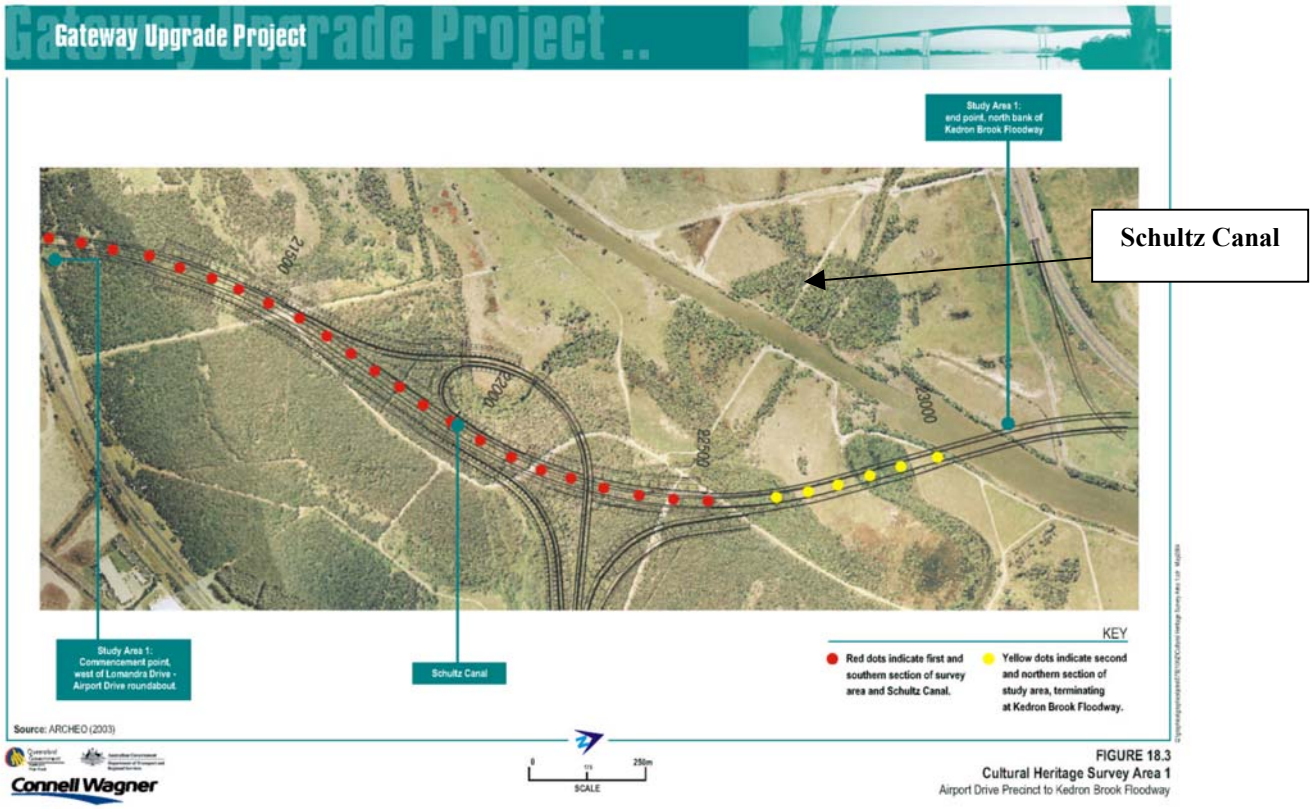

Figure 2: Survey Area 1: Red dots indicate first and southern section of survey areas and Schultz Canal; yellow dots indicate second and northern section of study area, terminating at Kedron Brook Floodway.

Figure 3: Kedron Brook Floodway, south bank.

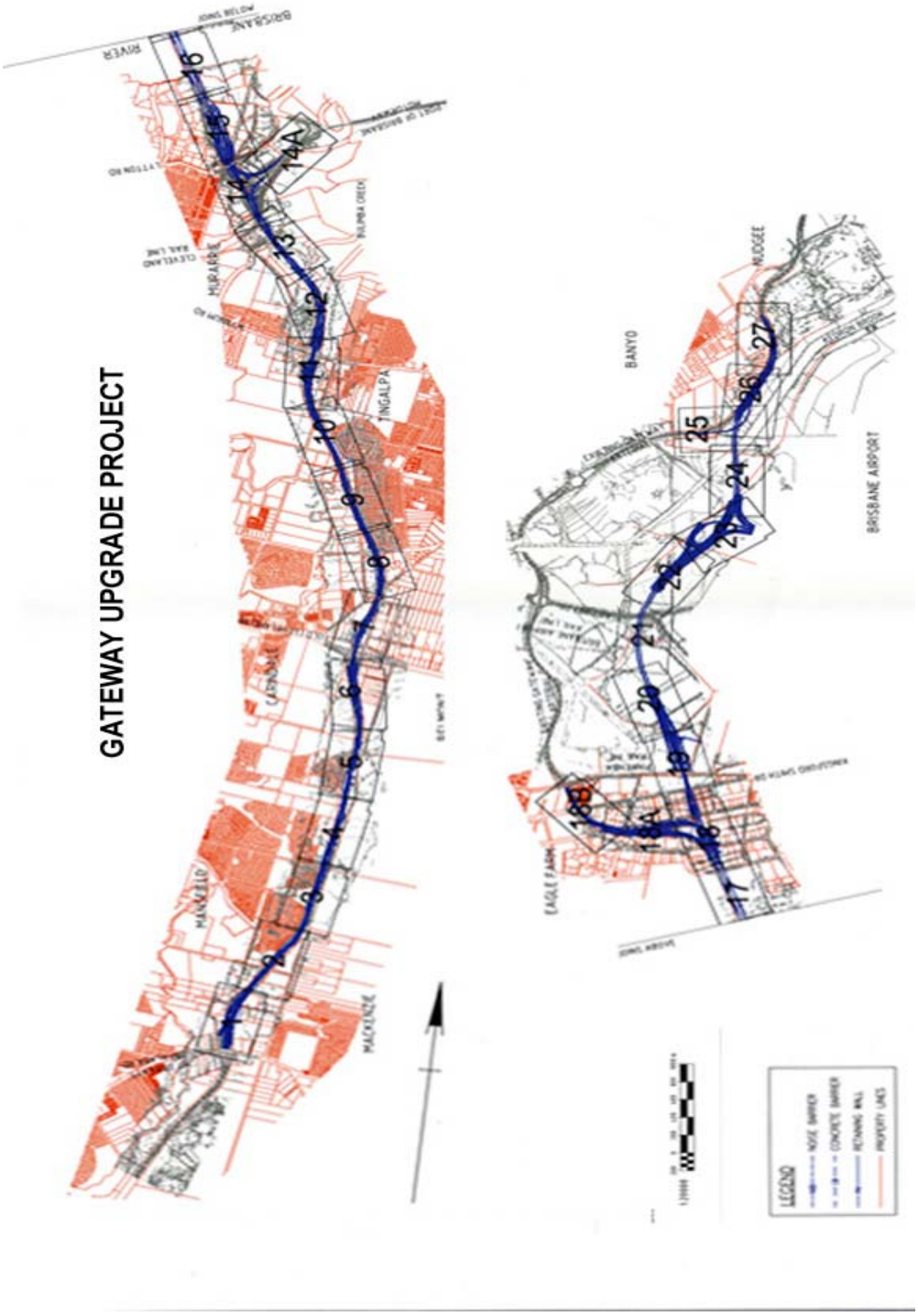

Figure 4: Adaptation from Department of Main Roads Reference Project Plans Revision 1 22.4.4 Map TS001. This map demonstrates the scope of the present project area. Drawing numbers referred to below in the body of the text are shown here in abbreviated form (1 for Drawing GA001, 2 for GA002 etc).

Survey Area 2

This area incorporates the environmental zone located along the northern and southern banks of Bulimba Creek where it passes under the Gateway Arterial Motorway northeast of Murrarie Road in the Brisbane suburb of Murrarie (Drawing Number GAO13, chainage from 14900 to 14700). This *c*. 25-35m wide snaking creek system drains into the Brisbane River at Lytton Reach to the north. Due to the uneven topography of the creek bank environment aformal transect survey was not practical, and an area c. 50m either side of the southern creek bank at the point where it passes under the Gateway Arterial Road was randomly surveyed.

The northern bank of the creek has been heavily impacted on as the result of a long history of industrial development. Similarly, much of the visible area in the vicinity of the southern bank exhibits evidence of substantial quantities of imported soil, gravel and refuse. Much of the area has been cleared with only small pockets of remnant vegetation along the creek bank. This vegetation includes remnants of original vegetation types including various mangrove types such as the river mangrove as well as several types of eucalypts and melaleuca.

Figure 5: Area situated under the Gateway Motorway immediately adjacent to the southern bank of Bulimba Creek. This area is highly modified and consists of large areas of imported soil and rubbish deposits

Figure 6: Pocket of remnant vegetation on the southern bank of Bulimba Creek – vegetation includes several types of eucalypt, melaleuca and acacia along with several types of native and introduced grasses. The foreground of the picture clearly demonstrates the level of artificial fill that has been introduced to the area.

Figure 7: Examples of imported refuse in front of a stand of remnant eucalypts beside the Gateway Motorway on the south bank of Bulimba Creek

Two closely associated vertical metal 'I-beam' girders were noted protruding above the present water level adjacent to the southern bank of Bulimba Creek at **Survey Area 2** (see Figure 8). This remnant metalwork may be related to former industrial structures located along Bulimba Creek, and other urban creek/drainage systems in this industrialised area of Brisbane; it is unlikely to be of cultural heritage significance.

Figure 8 : Remnant metal 'I-beam' girders in Bulimba Creek.

As ground surface visibility was poor to negligible (0-5%) due to very thick regrowth vegetation, effective survey was impeded in this area. It was also clear from a visual inspection that both banks of Bulimba Creek under the Gateway Arterial Road have been heavily disturbed due to road infrastructure construction

Overall, the banks of Bulimba Creek and the areas immediately surrounding them reflect a high level of disturbance resulting from a combination of industrial and agricultural work taking place in the area over the past 150 years. Despite these alterations it must be remembered that evidence exists that Bulimba Creek and its surrounding environs represented an extremely important resource, ceremonial and camping area for Aboriginal People. Accordingly, despite the fact that no evidence of artefact sites were discovered during the survey it remains highly likely that archaeological remains exist in surface or sub-surface deposits.

Survey Area 3

This area consists of low-lying wetlands incorporating areas of salt marshes, riverine floodplains and melaleuca wetlands extending south along both sides of the Gateway corridor from the southern border of SA 2 (Map Number GA013, chainage 14700), beyond the Wynnum Road exit through to the beginnings of elevated ground and associated vegetation changes of SA4 (Map Number GA010, chainage 12800). While much of this area has been cleared for a variety of purposes, including pastoral land on the eastern side of the arterial road along with an Industrial Park and land fill established on the western side of the arterial, enough pockets of higher integrity, remnant vegetation remain to give an indication of the original resources this land would have offered for Aboriginal groups.

The eastern perimeter of this Survey Area consists of low lying floodplains associated with the Bulimba Creek system and includes various species of Mangrove, pockets of re-growth casuarinas and a variety of groundcovers including berry saltbush (*Einadia hastate*), sea rush (*Juncus kraussii*), pigweed (*Portulaca oleraiera*) and beadweed (*Sarcocornia quinqueflora*). GSV in these areas is relatively high, however large quantities of gravel and land fill used in the construction of access roads inhibited the field survey.

Other remnant pockets of vegetation include several pockets of relatively high integrity melaleuca wetlands; a smaller one beside the eastern side of the arterial in the vicinity of the emergency breakdown bay (Map GA013, chainage 14500) and a larger remnant located on the western side between the arterial and Murarrie Road (Maps GA013 and 012, chainage 14600 to 14100) (see Figures 9 and 10). These wetland remnants included several types of eucalypt including scribbly gum (*Eucalyptus racemosa*), casuarinas including the common *Casuarina equsetifolia*, several types of melaleuca (such as *Melaleuca quinquenervia*), swampbox (*Lophostemon sauveolens*) and smaller vegetation varieties including soft twig rush (*Baumea rubiginosa*), grey sedge (*Lepironia articulata*) and slender knotweed (*Persicaria decipiens*).

The remainder of the survey area consisted of low-lying, damp areas of cleared land covered in a variety of native and introduced grasses, with occasional small pockets of re-growth casuarinas. This landscape type would appear to be the result of the clearing of existing wetland forests to make way for pastoral land. Unlike the eastern perimeter of the Survey Area, GSV levels in the remainder of these areas was extremely poor to non-existent due to the variety of native and introduced grasses and ground covers present in the area (see Figures 11 and 12).

Figure 9: perimeter of remnant melaleuca forest located in SA 3, east of the arterial

Figure 10: Caroline Bonner observing an example of a mature melaleuca situated within the wetlands remnant in SA 3 to the east of the arterial road. This tree is a good indicator of the relatively high integrity of the area.

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Figure11: view north towards across cleared pastoral land towards remnant melaleuca swamp (SA3)

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Figure 12: looking south across cleared pastoral land in SA3 (Drawing GA012, chainage 14000). Visible in the centre of the photograph is an example of casuarinas that appear in small pockets throughout the survey area, particularly in the vicinity of fence lines. The tree line visible to the right runs alongside the arterial motorway

The field survey of SA3 was restricted predominantly to those areas on the east side of the arterial road. This survey incorporated following vehicular access roads which extended throughout the area and incorporated randomly walking sections of cleared agricultural land, the low lying floodplain and sections of the remnant wetland forest. Overall landscape integrity was poor, with only small patches of higher integrity. The access roads were all constructed of imported gravel and fill that, considering these were the best areas of GSV, greatly hindered the likelihood of observing any artefactual material.

Although no evidence of archaeological material was found it must be noted that, in the past, these areas would have represented an environment rich in resources for local Aboriginal People. The probability that Aboriginal people occupied this area is supported by historical sources and substantial archaeological evidence including a number of nearby sites and information regarding the subsistence patterns of Aboriginal people in similar areas throughout the region. Furthermore, although development has impacted relatively heavily on this area there remains a good probability that archaeological material remains on the surface or in subsurface deposits.

Survey Area 4

Survey Area 4 represents by far the largest section surveyed within the present project area. This area consists of the eucalypt forests that cover the undulating, elevated areas of the southern end of the study area, inclusive of Mt Petrie and its associated ridges (extending from Map GA010, chainage 12800 through to Map GA001, chainage 5200).

The majority of SA4 is represented by relatively well-elevated, dry eucalypt and Casuarina woodland situated on dry, stony soil. This eucalypt forest represents a remnant of what was once a much larger forest that covered much of southeast Brisbane. These areas contain a large variety of native wildlife including echidna, koala, kangaroos and wallabies, possums and a large variety of reptilian and bird life. Equally, these eucalypt woodlands exhibit a surprising variety of flora; for example Forest red gums (*Eucalyptus tereticornis*), Grey gum (*Eucalyptus major*), Scribbly gum (*Eucalyptus racemosa*), Black she-oak and forest she-oak (*Allocasuarina littoralis*), a variety of Ironbarks and Stringybarks such as Yellow stringy bark (*Eucalyptus acmenoides*), Soap tree (*Alphitonia excelsa*) and many smaller shrubs and undergrowth such as Mat rush (*Lomandra longifolia*), Mountain bracken *(calochaenadubia*), Slender grapefruit (*Cayrathia clematidea*), Sword grass (*Gahnia aspera*) and Bitter pea (*Dariesia villifera*).

As access and GSV levels were a major issue throughout SA4, the field survey of the area was predominantly restricted to those areas along the peripheries and along vehicular access tracks. However, for control purpose this survey also included covering several large tracts of high integrity vegetation within SA4 on the eastern side of the Gateway Motorway including:

- an area beside the Mt Gravatt Capalaba Road (Map GA001, chainage 5160 to 5500, Figures 13, 14 and 15),
- a large area north of Wecker Road (Map GA002, chainage 6150 through to Map GA003, chainage 6800, Figures 16-19)

- a narrow area located between the arterial and Mt Petrie Road (Map GA004, chainage 7900 to 8300, Figures 22 and 23)

Figure 13: example of vegetation in SA4, the size of vegetation would indicate probable regrowth following the construction of the original Gateway Arterial.

Figure 14: Example of re-growth Casuarina vegetation along the ridges to the east of the arterial. In the foreground of the photograph is Caroline Bonner, one of the Traditional Owner representatives involved in the field survey

Figure 15: Example of mature vegetation to the east of the Gateway corridor, indicative of the older age of vegetation outside zones impacted on directly by past construction of the Gateway.

Figure 16: Looking east up Wecker Road from SA 4

Figure 17: Example of former semi-cleared pastoral land that has fallen into disuse. Many of the larger trees appeared to have been spared the clearing process.

Figure 18: Example of mature eucalypt located on one of the eastern ridges beside the Gateway Motorway in SA4, indicating that clearing was not of the same scale in higher areas of the southern section survey area.

Figure 19: More evidence of a rural past – old fence post on a ridge above the arterial on the outer limits of the eastern side of SA4 (Map GA01, chainage 5400)

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Figure 20: One of a number of gullies transecting the east side of SA4 – notable are the changes in vegetation hinting at a moister environment (Drawing GAA001, chainage 5300)

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Figure 21: Another example of one of the numerous gullies transecting SA4

Figure 22: Sparse regrowth and poor GSV on a high ridge beside the Gateway Motorway. The soil in this area was extremely poor with a high content of quartz and shale.

Figure 23: Example of high integrity remnant vegetation a few metres to the east of the impacted Gateway Corridor. (Map GA004, chainage 8000)

A further large section of eucalypt woodland was surveyed on the western side of the arterial road (Map GA009, chainage 11500. through to Map GA010, chainage 12600). This section represented an area of high integrity and was accessible via an access road running parallel to and a few metres to the west of the Gateway Motorway. While GSV in this area was at a slightly higher level, imported gravel and erosion represented major hindrances to observations.

While much of the area immediately beside the Gateway Motorway was primarily re-growth, vegetation located within 5 to 10 metres either side of the road exhibited a high level of integrity with a large variety of species and a high proportion of mature trees (see Figure 24 and 25 below). Evidence was ample for the existence of an abundance of wildlife including possums, koalas, snakes, lizards and bird life. Furthermore, Bulimba Creek, with all the resources it represents runs extremely close to this part of the Survey Area. These factors would tend to point to the fact that this area would have represented an extremely rich resource area for the local Aboriginal groups and most likely was suitable for hunting and camping alike in parts of the open eucalypt forest.

Figure 24: Mature vegetation located in close vicinity to the western side of the Gateway Motorway in SA4

Figure 25: Example of large eucalypts in an open woodland environment in close proximity to SA4 on the western side of the Gateway Motorway

Figure 26: Example of high integrity eucalypt forest in SA4 on the western side of the Gateway Motorway

Examples of wet eucalypt forest and dry rainforest also linger in the numerous gullies running between the ridges of the elevated areas (two examples of such gullies are located between Mt Gravatt Capalaba Road and Weedon Street East on the eastern side of the arterial (Map GA001, chainage 5350 and 5500 see Figures 20 and 21 above). Many of these gullies would probably have handled run-off to the Bulimba Creek system during wet periods and may have represented semi-permanent water supplies prior to being cut off by the construction of the Gateway Arterial.

Similarly, low lying areas such as that located beside the Gateway arterial, within the Meadowlands Park Picnic Ground in Carina (Map GA008, chainage 1100 to Map GA009, chainage 1400) most likely represented an important permanent water supply created by run-off from Bulimba Creek. Even today this area often floods after heavy rain. This area contains a small remnant wetlands forest in conjunction with a number of mature eucalypts of considerable size located in close proximity to the Gateway Motorway. Furthermore, although cleared of undergrowth and subsequently grassed, the area surrounding this wetland contains a large number of mature eucalypts that appear to have been spared the clearing process at the time of the parks creation (see Figure 27 and 28) Low GSV and general inaccessibility meant that much of this area was unable to be surveyed adequately.

Ultimately, although no archaeological material was uncovered in SA4 it must be noted that this area represents a diverse resource area of clear importance to the Aboriginal People who lived here in the past. The archaeological potential of SA 4 is particularly high in relation to areas of eucalypt woodland in close proximity to permanent water supplies such as were offered by Bulimba Creek and the low lying wetlands in the vicinity of Meadowlands recreational reserve. Some of these areas still reflect a high level of landscape integrity.

Figure 27: Looking east towards the Gateway Motorway. Visible in the photograph are low lying wetlands lying beside the Gateway Motorway within the confines Meadowlands Park Recreational Reserve in SA4. Also visible in the background of the photograph are a number of mature eucalypts lying close to the Gateway Motorway

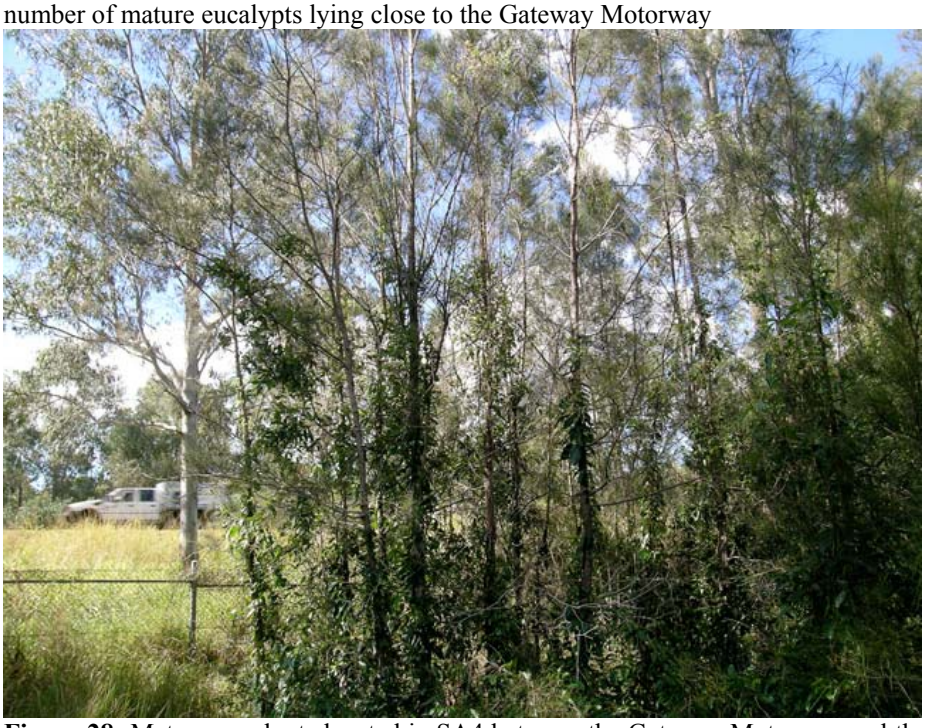

Figure 28: Mature eucalypts located in SA4 between the Gateway Motorway and the outer perimeter of the Meadowlands Recreational Reserve.

Figure 29: Caroline Bonner standing beside a scribbly gum (Eucalyptus racemosa) demonstrating evidence of scarring. Based on the type, size and probable age of the tree, in conjunction with the height from the ground, this scar is not considered cultural and is most likely due to natural causes. This eucalypt was one of a number of mature trees located in a open grassed sections of the Meadowlands recreational Reserve in close proximity to the Gateway Motorway (Drawing GA009, chainage 11450)

Figure 30: Example of high level of modification in the vicinity of the Greendale Way underpass in SA4

Figure 31: Example of low landscape integrity exhibiting evidence of vegetation clearing in the vicinity of the Emergency breakdown Service Bay near the Old Cleveland road exit on the west side of the Gateway Motorway (Drawing Number GA006)

5.4.1 Summary

No direct evidence of Indigenous cultural heritage was noted during the field survey. However, constraining factors such as an overall extremely low level of grounds surface visibility must be taken into consideration. Furthermore, the field survey has shown the existence of a number of areas of existing remnant vegetation and/or regrowth vegetation of a relatively high integrity indicative of the richness and variety of environmental types that would have existed in the survey area prior to the impact of Europeans. These areas included:

- **saline intrusions** supporting mangrove, samphire and salt marsh communities, (remnants of which still exists in SA 2 and 3).

- **Renewable freshwater swamps** supporting Swamp schlerophyll forests dominated by Broad-leaved paperbark and Swamp mahogany (SA3 and 4).

- **Areas of higher elevation** supporting dry eucalypt forest with small patches of wet eucalypt forest in low lying gullies and wetter area.

Each of these areas would have supplied Aboriginal people with a multitude of resources for both sustenance and artefact manufacture. This is clearly supported by archaeological and historical sources and through information provided by representatives of the Traditional Owners of the project area - of particular relevance is evidence of Aboriginal people travelling great distances to use the rich resources of the area in conjunction with evidence for the existence of important ceremonial areas. All of these factors point to the high probability of artefact sites existing within the study area.

While much direct evidence exists concerning early European history and use of the present study area, in particular traces of early timber cutting and use as pastoral and agricultural land, no sites of specific importance from an historical cultural heritage viewpoint were discovered during the field survey. This being said, concerns must be raised concerning the close proximity (and possible inclusion) of sections of the Eagle Farm Women's Prison and Farm site, the Old Airport and Schultz Canal to the present study area (see recommendation 3 and 4 below).

In summary, Table 2 below provides a statement of archaeological potential for each of the study areas surveyed in this study.

Table 2: Summary of the results of the field survey.

SURVEY AREA	LANDSCAPE INTEGRITY	GSV	ARCHAEOLOGICAL POTENTIAL
SA 1	Negligible to Low	Negligible to Low to Medium	Low to Medium
SA2	Low	Negligible to Low	Low to Medium to High
SA 3	Low to Medium	Negligible to Low to Medium	Low to Medium
SA4	Low to Medium High	Negligible to Low	Low to Medium to High

6 SUMMARY AND RECOMMENDATIONS

In summary, this Cultural Heritage Assessment has found that:

- The study area was a significant cultural heritage landscape for Indigenous people. An evaluation of the environmental and cultural historical conditions of the study area indicates that, prior to European colonisation, the study area would have contained numerous places whose natural parameters (flora, fauna etc) would have provided important resources for Aboriginal people and would have been habitable throughout the time that human populations have lived in the region. Accordingly, although no artefact sites have been discovered as yet, by implication the study area may still contain archaeological material. In particular, due to their suitability for camping / resource processing sites areas are open eucalypt woodland in the vicinity of permanent water supplies, such as Bulimba Creek, are of particular significance. Some of these environments remain in remnant areas of vegetation within the study area, in particular SA 4.

- The study area demonstrates a rich history of European settlement including, among other things, traditions of timber cutting, pastoralism, cattle running and sugar cane farming. Unfortunately, modern disturbance has removed most traces of this history from the study area.

- The Site Survey undertaken as a part of this review has further supported statements concerning the archaeological and cultural heritage potential of areas associated with proposed development plans. Despite the heavy disturbance that has occurred across much of the study area, the potential for archaeological material to have survived within the study area remains.

Despite the heavy disturbance that has occurred across most of the study area, the potential for archaeological material to have survived within the project area remains. The Site Survey undertaken as a part of this review has identified the archaeological potential of areas associated with the proposed development plans. This was achieved through a combination of archaeological, historical and environmental research coupled with visual inspections that assessed archaeological potential through factors such as ground surface visibility and landscape integrity.

On the basis of these findings, the following recommendations are made:

Recommendation 1: On-going Consultation

A full understanding of cultural heritage values is achieved through consideration of historical, archaeological and community significance. Following this initial Cultural Heritage Assessment, on-going consultation between the proponent and Relevant Indigenous Stakeholders is recommended to ensure that cultural heritage issues continue to be acknowledged and progress on the Brisbane Gateway Motorway Upgrade Project

effectively communicated between all parties. Community consultation is an essential part of a CHMP.

Recommendation 2: Monitoring of Sensitive Areas

It is recommended that monitoring by representatives of Jagera Corporation takes place during all bulk earthworks for the construction of the Gateway Duplication Corridor at:

1. Lot 3SP110569 in the Kedron Brook Wetlands precinct in vicinity of both the southern and northern approaches to the Kedron Brook Floodway (Survey Area 1). The wetlands located on Lot 3SP110569 appear to have undergone significantly less land reclamation/ground surface disturbance than adjacent Lot 1RP844114 on Brisbane Airport Land. A *c*. 5000 year old stratified archaeological site has also been recorded along the Kedron Brook Floodway in close vicinity to this area (Hall and Lilley 1987). There may be an increased possibility of locating sensitive cultural heritage materials in this region, thus a program of monitoring by Traditional Owner representatives is recommended. Monitoring should take place during any works on Lot 3SP110569. Monitoring in the Airport Drive Precinct (Lot 1RP844114) is not required due to the high levels of post-European landscape modification on Brisbane Airport Land (however, see Recommendation 3 below).

2. Bulimba Creek (Survey Area 2). Although both banks of Bulimba Creek beneath the Gateway Arterial Motorway appear to have undergone significant construction/industrial disturbances, there may still be in situ surface-based and/or subsurface cultural heritage materials (i.e. shell) located within the vicinity of this formerly significant water/food resource. Monitoring should take place 50m back from the creek banks and to a maximum depth of 50cm below the surface.

3. The section of SA4 located on the western side of the Gateway Motorway, stretching north from Meadowlands Road (Drawing GA008, chainage 11100) through to the northern perimeter of Lot128 RP207878 (Drawing GA010, chainage 12600). High levels of landscape integrity in conjunction with close proximity to permanent water and other important resources suggest that this area would have represented an important resource area for local Aboriginal People and indicate a high potential for the presence of archaeological material

The monitoring process should be detailed in a comprehensive Cultural Heritage Management Plan (CHMP) (Recommendation 6).

Recommendation 3: Avoiding Impacts on the site of both the Eagle Farm Women's Prison and the Old Brisbane Airport Site

As discussed previously in this report, the expanse of sites of cultural heritage significance is often difficult to confine to the bounds of a specific area. This is certainly the case in relation to both the Eagle Farm Women's Prison site and the site of the Old Brisbane Airport Site. Sections of these sites listed on the State and National heritage Registers must be seen as representing only a portion of each overall site and of their

former historical functions. The potential exists for sub-surface archaeological material from the Eagle Farm Women's Prison, and if this is found during construction, it is most likely that the material would be considered of high levels of cultural heritage significance.

This potential should be acknowledged in a comprehensive Cultural Heritage Management Plan (CHMP) and appropriate recommendations for management made that will safeguard the values of such material, if it is found.

Recommendation 4: Avoiding Impacts on Schultz Canal

The Planning Study mentions that the location of the Airport Northern Access Precinct will be designed to minimise impacts on surrounding floodplains and on Kedron Brook and Airport Wetlands. This scope of works should be broadened to include Schultz Canal, a *c*. 1920s drainage canal and historical property boundary located in the Airport Northern Access Precinct in Lot 1RP844114. Impacts upon this historical feature should be avoided during construction of the Airport Northern Access Precinct through this area.

Recommendation 5: Further Field Survey

Due to constraints resulting from poor accessibility and low GSV encountered during the field survey throughout the majority of the study area, it is recommended that a further field survey be undertaken in all areas of SA 3 and 4 falling outside those areas recommended for monitoring. This field survey should take place immediately following initial removal of vegetation and stick raking prior to the commencement of major earthworks within the project area. Based on the results of this field survey further action and/or recommendations may be necessary. This recommendation extends to any areas outside the present study area that may be impacted on as part of the construction process i.e. clearing associated with the construction of temporary access and service roads.

Recommendation 6: Cultural Heritage Management Plan

The avoidance, and subsequent protection, of cultural heritage sites is the most effective way to manage cultural heritage values. Accordingly, the development of a comprehensive CHMP is essential to the management of cultural heritage issues. This management strategy needs to be taken into consideration during future planning stages of the proposed development. If a known site can not be avoided a CHMP should provide a full understanding of the heritage values of the site(s) to be impacted upon and make appropriate management recommendations.

In order to effectively manage cultural heritage issues, and detail the monitoring process, it is recommended that a Cultural Heritage Management Plan (CHMP) be commissioned. The Traditional Owner groups in the area should be consulted during the design of this plan, particularly in relation to the storage of cultural heritage material recovered during the monitoring process.

In addition to the development of a CHMP to protect Aboriginal cultural heritage values, a site specific CHMP should be developed to protect potential archaeological material associated with the Women's Prison site.

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