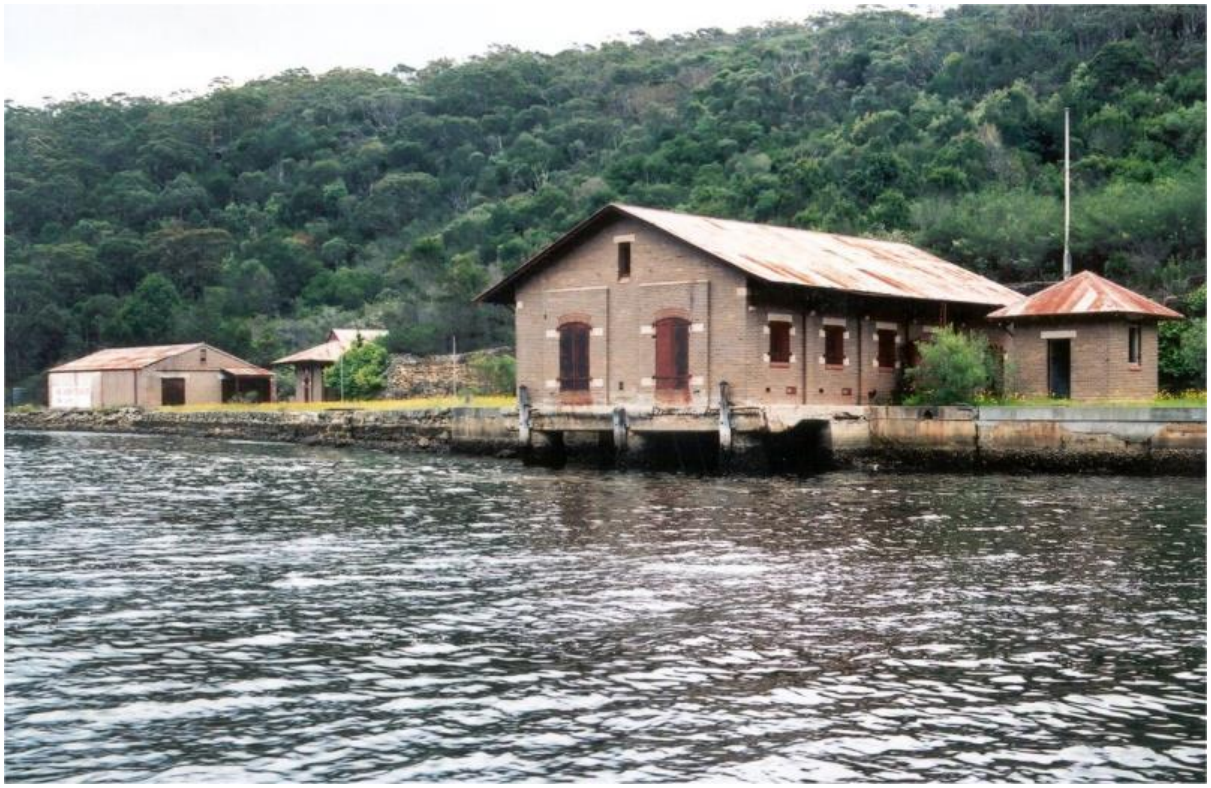
Bantry Bay Conservation Management Plan (draft)

Garigal National Park, NSW



Cover image: Receiving shed and telegraph office, including magazines No. 7 & 9, 2001

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NSW National Parks and Wildlife Service May 2002

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Introduction

1.0
INTRODUCTION

1.1 Background

This CMP forms the basis for the overall strategic management of the Bantry Bay Explosives Magazine complex to facilitate its long term conservation and future use in line with NPWS management objectives. The CMP expands on the existing Garigal National Park Plan of Management (NPWS 1998) and the Bantry Bay Explosives Magazine Conservation Plan (NPWS 1991).

The NSW National Parks and Wildlife Service (NPWS) is legislatively responsible for environmental land management and conservation of places of natural and cultural heritage value. The NPWS has managed the Bantry Bay Explosives Magazine complex since its closure in 1974.

The CMP articulates the philosophy and sets out short, medium and long term conservation management outcomes for the Bantry Bay Explosives Magazine complex. As such the Plan sets parameters that identify opportunities and constraints to guide the introduction of compatible adaptive reuse of the site, buildings and landscape. The CMP also addresses interpretation, archaeological management, cultural landscape, development control and design guidelines, species management and natural landscape management.

1.2 Report Objectives

The primary objective for this Conservation Management Plan, as set out in the project brief, is to provide a clear philosophy and direction for the policies and strategies to guide the NPWS in the conservation and management of the Bantry Bay Explosives Magazine complex, within the context of appropriate re-use.

To meet this objective a number of aspects were required to be addressed:

- The balanced and compatible management of cultural (Aboriginal and Non-indigenous) and natural heritage values of the site within its regional context;
- The cultural significance of the explosives magazine and its comparative significance as a representative example of similar places within Australia and beyond;
- NPWS management framework, legislative requirements and other stakeholder issues related to the conservation and management of the complex;
- Consideration of the NPWS 2000-2003 Corporate Plan, current NPWS site management and conservation and cultural tourism objectives, the 1998 Garigal National Park Plan of Management and the 1991 Bantry Bay Explosive Magazine Conservation Plan;

- Provide development control planning to provide appropriate guidance for the management of the conservation and/or development of the place, and its multiple uses, with consideration to cultural tourism, ongoing public role and conservation/adaptation for new uses, which ensure the retention and enhancement of the diverse heritage values.

In addition to these objectives, NPWS recognises and respects the fact that the Aboriginal community associated with the area of the complex have a fundamental right to be part of any decisions made about the future management of these places. This study includes an Aboriginal heritage component, which aims to identify current consultation and participation processes in NPWS management practices, and to suggest a framework for ongoing and future consultation.

The Aboriginal Heritage component also provides a preliminary assessment of the importance of the place to the Aboriginal communities in terms of prehistoric archaeological sites, post contact and contemporary Aboriginal history and associations with this area against which the NPWS can help structure future consultation. The Aboriginal consultation program and the findings of this component of the study are not intended to be final or conclusive, rather a step in an ongoing program of consultation to establish management processes with the Aboriginal community.

1.3 Report Methodology, Structure and Terminology

1.3.1 Methodology

The key methodology of this CMP has been to consider the Bantry Bay Explosives Magazine complex within its natural and cultural landscape setting.

The Bantry Bay Explosives Magazine complex is dominated by a natural landscape of steep sandstone topography and tranquil waters of Bantry Bay. Within this natural landscape are various storage and ancillary buildings, infrastructure, artificial landforms and managed landscape elements of the complex, which form its cultural landscape. Prior to the construction of the complex, the natural landscape had also been shaped by Aboriginal and early European occupation of the bay. The result is an integrated cultural and natural landscape setting, which has essentially been quarantined from urban development by the requirement of its specific explosives storage use and difficult topography.

This CMP draws on the fundamental methodology contained within the Australia ICOMOS *Burra Charter* and Dr JS Kerr's *The Conservation Plan*, by first gaining a thorough understanding of the complex and its contribution to the NPWS resource of Garigal National Park. Opportunities and constraints for the conservation and adaptive re-use of the complex are then identified, which inform the ultimate conservation and management policies and guidelines. Conservation recommendations have also been prepared with reference to the ICOMOS *International Cultural Tourism Charter*. This CMP has been prepared in accordance with the guidelines established by the NSW Heritage Office.

The study commenced with a review of the existing documentary material previously available within the NPWS. This information was supplemented by additional research at the Department of Mines, Mitchell Library and Department of Public Works.

Site visits were undertaken in December 2000 and January 2001 with consultants and relevant NPWS staff. The study took account of the extraordinary combination of natural and cultural values, which are inherent in the complex.

1.3.2 Structure

The study blends Aboriginal and non-indigenous heritage values and responses together, in order to provide a combined understanding of the cultural landscape. It also blends descriptive text and graphics of the landscape and built environment, with the historical narrative of how those aspects of the cultural landscape shaped final outcomes.

The report is divided into five major sections:

- Introduction
- Understanding the Resource
- Constraints and Opportunities
- Conservation Policies and Guidelines
- Implementation

1.3.3 Terminology

The general conservation terminology utilised within this report is consistent with that adopted in the Australia ICOMOS *Burra Charter*.

1.4 Site Identification

The Bantry Bay Explosives Magazine complex forms part of the National Parks and Wildlife Service Northern Beaches Area, and occupies an area of 14 hectares on the foreshores of Bantry Bay. Bantry Bay is located within Middle Harbour, and the foreshores of the bay form part of the Garigal National Park.

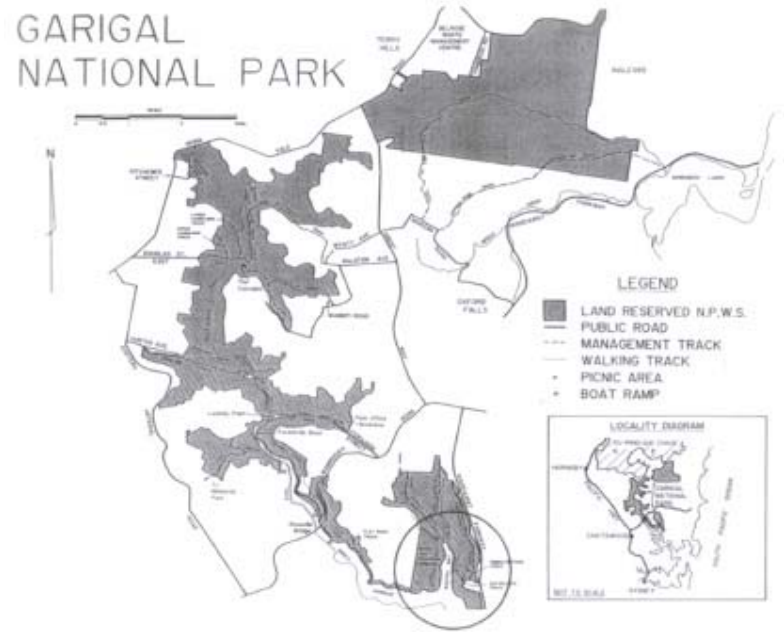

FIGURE 1.4.1 Location of Bantry Bay within Garigal National Park Source: Garigal National Park Plan of Management, NPWS, November 1998. (Not to Scale)

1.4.1 Precinct Identification

The Magazine complex occupies both the western and eastern shores of Bantry Bay. For the purpose of this report, the Bantry Bay Explosives Magazine complex has been divided into three distinct precincts as follows.

Precinct 1: Western Shore
Solely used for the storage of explosives since 1914, prior to which the area was bush, this precinct extends from the sea wall on the eastern side, to the existing fence line of the complex. This precinct contains the majority of the storage magazines, ancillary buildings and infrastructure which make up the Bantry Bay Explosives Magazine complex.

Precinct 2: Eastern Shore
The eastern shore has had a more layered history, being used prior to the establishment of the Explosives Magazine complex for a range of uses, including residential, recreational and industrial uses. The boundaries of this precinct are difficult to define, and essentially extend to the current "cultured" landscape, including those elements which relate to the magazine complex, or pre-date the operational period of the complex.

Precinct 3: Bay
Extending between the foreshores of the bay, this precinct includes any potential remnant archaeological material associated with the operation of the magazine complex.

1.5 The Study Team

The Study Team responsible for this project comprised:

Sera Jane Peters and Anita Krivickas of Graham Brooks and Associates, Heritage Consultants

Matthew Taylor of Taylor Brammer Landscape Architects

Judith Rawling of Urban Bushland Management Consultants

Mary Dallas of Mary Dallas Consulting Archaeologists.

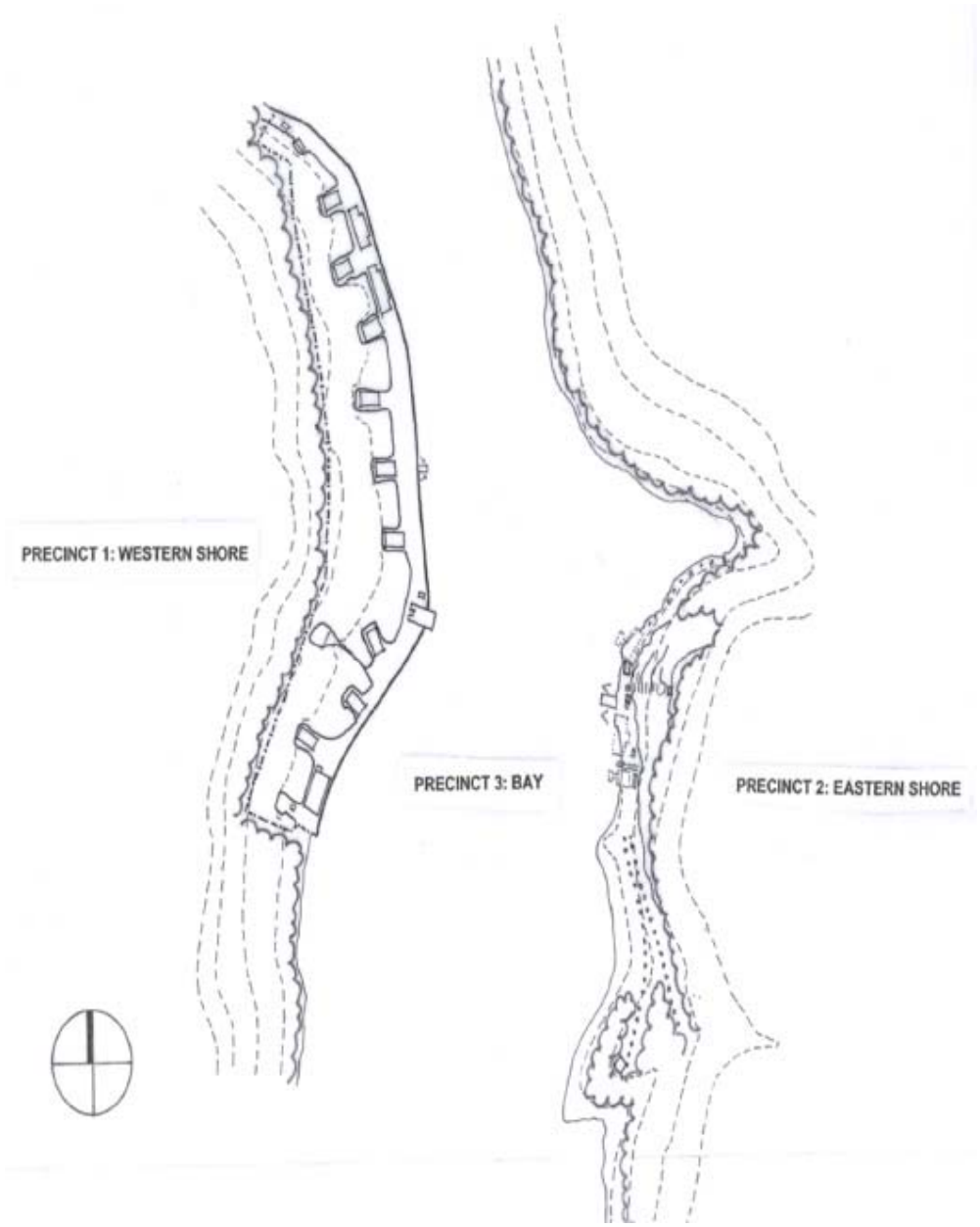

Figure 1.4.2 Plan of the study area, showing precincts

(Scale 1:2,000)

1.6 Documentary Sources

Existing documentary material available within the NPWS, which was reviewed for this CMP, includes the following:

- *Garigal National Park Plan of Management*, NPWS, November 1998;
- *Bantry Bay Explosives Magazine Conservation Plan*, NPWS, 1991;
- Bantry Bay Explosives Magazine complex and Davidson Park State Recreational Area, *A Report on the Architectural Significance of the Buildings and Associated Cultural Resources*, NPWS, 1989;
- *Bantry Bay Planning Study*, Latona Masterman and Associates, August 1982;
- *Brief for Maintenance Works*, Bantry Bay Explosives Magazine, NPWS, May 2000;
- *Conservation Plan Old Bullock Track*, Bantry Bay, NPWS, 1994; and
- Various aerial photographs of the bay and surrounds.

This material was supplemented by additional documentary material and images, including the following:

- *Reports of the Working of the NSW Explosives Department, Department of Mines,* and historic photographs located at the Department of Public Works;
- Historic photographs, maps and plans sourced at the NSW Department of Mineral Resources and Mitchell Library. The full collection of Explosive Department photographs held in the NSW Department of Mineral Resources collection was not sourced during the preparation of this report;
- Contemporary photographs taken by Graham Brooks, Anita Krivickas and Matthew Taylor during site inspections in December 2000; and Sera Jane Peters in January 2001.
- Internet references to comparative explosives storage complexes within Australia.

A full list of sources referred to during this CMP is included in the Bibliography, chapter 19.

1.7 Report Limitations

Although considerable primary research was undertaken for the preparation of this report, the original drawings for the construction of the magazines could not be located.

Access into the interior of the majority of the magazine buildings was not available for the preparation of this report, as these have been made secure to deter vandals, with the exception of the Receiving Shed, Examining Shed, Air Raid Shelter, Magazine No. 16 and former Testing Shed. Internal descriptions and assessments of condition have been sourced from previous documents (Bantry Bay Explosives Magazine Conservation Plan prepared by the NPWS in 1991).

There has been no structural assessment of the buildings to identify their condition, and any structural repairs, which may be required. It is a recommendation of this report that such an assessment be undertaken for the Receiving Shed, which appears structurally in poor condition.

There has been no assessment of the social value of the complex for the broader community as part of the preparation of this report. While there has been some assessment of the contemporary values of the place to Aboriginal people, through discussions with the MLALC, this has not been comprehensive.

1.8 Acknowledgments

The authors would like to thank all of those who assisted in the preparation of this CMP, including:

- Steve Brown, and Miriam Stacy, Cultural Heritage Division, NPWS;
- Chris McIntosh, and Alan Ginns, Sydney North Region, NPWS;
- Mark Watt, Ranger, Garigal National Park; NPWS;
- Allen Madden representing the Metropolitan Local Aboriginal Land Council (MLALC) and the Gadigal Native Title Claimant Organisation, who participated in the field inspections of the study area and provided comments on local site management.

Part B

Understanding the Resource

2.0

THEMATIC HISTORY

2.1 Introduction

Bantry Bay has a long and still-evolving history. It is a history, which continues to be largely influenced by its physical isolation and inaccessibility. This history has been written in a thematic way, in order that the development of the area is understood in a more balanced and not strictly descriptive fashion. Much of Bantry Bay's history no longer exists in physical fabric therefore a thematic approach can provide contextual patterns and associations which would not be immediately obvious from a strictly descriptive or chronological approach. A thematic history also provides opportunities for comparison with other sites, particularly those on State or National registers.

The Australian Heritage Commission has developed a thematic framework for use in heritage assessment and management. The Australian Historic Themes Framework identifies nine principal thematic groups and numerous sub-themes. They were designed to be used in conjunction with regional or State themes. The 35 State Historical themes adopted by the NSW Heritage Office were designed to be specifically relevant to the history of NSW.

The themes, which were found to be most relevant to Bantry Bay, were:

National Historic Themes, Australian Heritage Commission

Peopling Australia;
Living as Australia's earliest inhabitants

Developing Local, Regional and National Economies;
Utilising natural resources
Moving goods and people
Altering the environment

Governing;
Administering Australia
Developing Australia's Cultural Life

Organising Recreation

State Historic Themes, NSW Heritage Office

First Australians
Environment
Government and administration
Leisure

These themes have informed the research questions and narrative of the history, which follows. The chapters are not intended to be strictly chronological and some themes cross over chapters. Chapter 1, Gu-rin-gai and Settlers, covers the history of Aboriginal occupation and the impact of the early European incursions into the area to exploit the natural resources.

It describes the probable nature of the environment prior to the European dispossession of Aboriginal peoples and the affect of European exploitation on the natural resources.

Isolation and Romance is a chapter, which deals with a number of historical themes; Environment, Leisure, Organising Recreation and Government and Administration. All these themes inform a chapter which deals with the perception of Bantry Bay as an isolated and romantic landscape. This chapter covers a large period of the site's history, but is vitally important as perceptions of the landscape of Bantry Bay have had the greatest effects on its development to the present day.

The chapter, The Public Magazines, discusses the period of occupation of the site by the Explosives Department. This chapter relates to the themes of Government Administration, Moving Goods and People and Administering Australia. The history of the magazines combines bureaucracy with industry and transport. The management of the magazines is inextricably tied to the administration of the Explosives Act and the transport and storage of dangerous, explosive goods. This theme develops links to other sites within Sydney and Australia, such as the Sydney Harbour wharves and other magazines.

2.2 Gu-rin-gai And Settlers

In 1787, King George III issued instructions regarding the 'native inhabitants' of NSW to the future Governor of NSW, Governor Phillip:

"endeavour by every possible means to open an intercourse with the natives, and to conciliate their affections ... You will endeavour to procure an account of the numbers inhabiting the neighbourhood of the intended settlement." [1]

Phillip was also instructed to gather information on the 'natives':

"maintain friendly relations with the natives if possible and transmit to England such information of scientific interest as he might be able to gather." [2]

Phillip's curiosity about the Aboriginal owners is evident in his writings. In February 1790 he wrote to the Colonial Office in London with the following comment on tribal boundaries:

"about the north-west part of this harbour there is a tribe which is mentioned as being very powerful ... The district is called Cammerra; the head of the tribe is Cammerragal, by which name the men of that tribe are distinguished. A woman of this tribe is called a Camerragalleon ...

From the entrance of the harbour, along the south shore to the cove adjoining this settlement, the district is called Wann, and the tribe Wanngal. The opposite shore is called Wallumetta, and the tribe, Wallumedegal.

The other tribes which live near us are those of Gweagal, Noronggerragal, Borogegal, Gomerrigal, and the Boromedegal." [3]

There has been much argument and discussion among researchers regarding the tribal and linguistic boundaries in the Sydney region prior to contact. The impact of a virus (probably

[1] Ross, Anne 1988, "Tribal and Linguistic Boundaries: A re- assessment of the Evidence", in Aplin, G. (ed) *A Difficult Infant: Sydney before Macquarie*, University of NSW Press, p. 42.
[2] Ross, Anne 1976, "Inter-Tribal Contacts - What the First fleet Saw", B.A.Honours Thesis, University of Sydney, p.3.
[3] ibid.

smallpox) which swept through the Aboriginal population soon after the Europeans arrived, combined with the enormous cultural differences between the two groups, has made a definitive understanding impossible.

The most integral part of Aboriginal culture is the spiritual and physical relationship between people and land. Governor Phillip commented in 1790, that an Aboriginal group was identified by adding a suffix to the word describing the area where they reside. It is the subtleties of this relationship between Aborigines and land and also their tendency for mobility, which has made the definition by Europeans of groups of Aborigines into tribes a problematic one.

Although the early colonists referred to groups such as the Garigal or Cammeraygal as tribes, most current researchers would describe the groups named by Phillip and others, as bands or clans, "even though the number, names and distribution of these groups, and the relationships between them, is still open to debate." [4]

Attenbrow (the author of the quote immediately above) explains that in other parts of Australia, bands or clans are described as being land-owning groups with a specified territory and consisting of persons related through kinship ties. She goes on to say that it is assumed that the same would have applied in the Sydney region and suggests that each band or clan would have been part of a tribe, there being several clans in a tribe.

Linguistically, the Aboriginal people of the northern Sydney region including the Middle Harbour area, belonged to the Kurringai or Guringai group of speakers. Ross citing Capell (1976) argues this language was spoken from the north side of the Sydney Harbour to as far north as Lake Macquarie. She presents arguments based on early primary historical sources on Aboriginal movement, differences in material culture and reported apparent difficulties in communication between individuals for the tribal boundaries and inter-tribal contacts between the inland Dharuk speakers and the coastal Guringai speaking groups. There is an ongoing academic and Aboriginal community debate on the distribution of these groups. The issue of how far the Dharuk came towards the coast has direct bearing on Native Title claims in the region. The Metropolitan LALC, among others, dispute current Dharuk tribal claims to this part of Sydney. Historic or contemporary Aboriginal associations with Bantry Bay are described below.

Archaeological surveys of Bantry Bay have shown that occupation areas were in use as early as 4,600 years ago. Bantry Bay possesses a very fine collection of engraving sites, which were first recorded in 1899 by the geologist W.D. Campbell.[5] In 1975 an archaeological survey was conducted by the Anthropological Society of New South Wales which located additional art sites and three rock shelters.[6] The evidence of Aboriginal use of the resources in the bay, the shelter sites and art sites, and the descriptions of the area by the first Europeans indicates that the area was occupied by Aboriginal people at the time of European colonisation.

Very little information about the Aboriginal presence in and around the bay is available for the period between the invasion and the development of the magazine complex at Bantry Bay. The Aboriginal populations around Sydney were greatly affected by the epidemics of diseases brought by the colonists and many would have relocated or been forced off. It is, however,

[4] Attenbrow, Val 1988, Research into the Aboriginal occupation of the Hunter's Hill Municipality, p. 80.
[5] Campbell, W.D. n.d. Rock Engravings of Port Jackson, Memoirs of the Geological Survey of NSW, Ethnological Series No.1.
[6] Specht, J. 1976, An Archaeological Survey of Bantry Bay Reserve Middle Harbour, Port Jackson, NSW, Anthropological Society of NSW, quoted in Masterman & Associates, Bantry Bay Planning Study, 1982.

likely that the bay continued to be visited for the collection of shellfish and fishing throughout this period, particularly when the place was opened up for recreation with ferry access on the eastern shore.

There were at least two Aboriginal camps in the northern Sydney suburbs, one at Manly Lagoon and another at Deep Creek, Narrabeen, which survived into the 1950s.[7] It is not known when these camps were established. Dennis Foley, whose family had lived at these places, has recounted (Read 2000) the Garigal stories told to him by older members of his family. One of these relates to creation of the whaler shark around the area now known as The Spit. Allen Madden recalls visiting the Middle Harbour area by ferry for picnics organised by the Aboriginal Social Club of Redfern in the 1950s. He remembers Bantry Bay was a restricted area, and not available to them for a picnic location. The use of the Bay as a magazine depot from 1914 onwards, largely restricted access and contributed to the Garigal peoples lack of contact with the place. Particular places important to the present Aboriginal community in the area of Bantry Bay, include a large engraving site on the western side of the Wakehurst Parkway north of the Seaforth Oval, and a series of engravings within the Manly Reservoir lands.[8]

The first explorations of the area by Europeans occurred soon after the arrival of the First Fleet. An account of the first expedition into the areas round Manly and westward past Bantry Bay and on to Middle Harbour Creek, were made in John White's account of the First Fleet. The descriptions by John White of the forests around Bantry Bay confirm, although not in his mind, the presence of Aboriginal people in the area. White describes the forest of the area as having high and large trees with little under or brush wood and luxuriant grasses growing in the wide spaces between them. He recorded the Bantry Bay engraving site on the ridge top above the bay, and commented that there was no trace of recent Aboriginal occupation in the area.[9]

However, the description of the forest indicates that the area may have been managed using Aboriginal fire-stick farming and that it was therefore occupied and used, at least in the period immediately prior to his visits. Aboriginal burning practices reduced the density of undergrowth in order to optimise movement and attract animals for hunting. The areas around the bay are today dense and impassable with small and stunted trees, dead under wood and small bushes. His descriptions imply that the area had been subject to recent burning.

The first accounts of settlers in the area did not recount Aboriginal interactions and the histories of the district do not record the names of the Aboriginal groups living in the Middle Harbour and Bantry Bay area.

In 1788 an informal census was taken by Captain Hunter, of the Aboriginal population of North Harbour. In the area which Hunter described as North Harbour and all its coves and inlets, he observed a considerable number of canoes which were employed in catching fish. He counted 67 canoes, 94 men, 34 women, and 9 children, which he believed was by no means a just account of the numbers as he had seen more than that number in one single area of the harbour.[10]

[7] Dennis Foley's reminiscences quoted in Read, P. 2000 Belonging: Australian Place and Aboriginal Ownership. Cambridge University Press, pp. 22ff and 204ff.
[8] Pers. Comm. Allen Madden
[9] White, John 1790, Journal of a Voyage to New South Wales, London. Quoted in Champion, S & G 1988, Forest History, p.9
[10] Champion, S & G. 1990, Census of Aborigines, 17th August, 1788.

In 1789 a smallpox epidemic raged through Sydney and the Aboriginal populations on Middle Harbour would likely have been affected, given their close contact with Sydney Cove. Another epidemic in 1829-30 again reduced Aboriginal numbers significantly.

The small population of nomadic groups were unable to continue in their traditional way of life, in competition with European settlers. Those Europeans who settled in Bantry Bay assumed *terra nullius* and proceeded to exploit the natural resources. If Aboriginal people were present at this stage, the sources do not mention it.

In the beginning, the manner in which Europeans exploited the bay replicated the uses and ways in which Aboriginal people may have used the bay. An early map circa 1856, indicates that lime burners were exploiting the deposits of shells and possibly Aboriginal middens on the eastern shore of the bay..[11] An ex-Government Surveyor, William Romaine Govett, (1807-1848) returned to England after surveying the area between Pittwater and Manly, and wrote an article describing the landscape.

"Description of Country between Port Jackson and Broken Bay" was published in 1836.[12]

> *The bottom of the ravines, especially where the creeks widen and open to the river, were much frequented by the coast natives; for the wooded sides of the ridges in this neighbourhood, abound with animals, and the waters below afford a plentiful supply of oysters and other shell-fish. In many places about these creeks, heaps of dried shells piled up in a most singular manner, between twenty and thirty feet high, will be found by the escarp of the hills; but whether they have been placed there by the natives, or thrown up in this way by the force of the waters and the tide, is a matter of conjecture. It has been thought worth while, however, to employ men to remove them, and they are constantly brought from these creeks in large boats to Sydney, where they are burnt for lime.*

In 1888 an oyster gatherer, Edward Gall lived on the shores of Bantry Bay, where exactly is not known. Fishermen most probably used the bay, as its deep waters still contain flourishing shark populations.

The first permanent settlers, the Walters family had lived on the western side of the bay at a location above Flat Rock, where they kept goats. By 1888 Thomas Walters' residence is listed as Bantry Bay and he and the family had moved to the eastern shore above the present wharf. According to a description in the Explosives Departments reports, the Walters' house was a small timber cottage. A photo from the Government Printing Office (Figure 2.3.1) shows a cottage, with a verandah, situated on the highest part of the present terracing of the eastern shore.

According to a local history, which interviewed a Walters descendant, Mr Walters fished the bay, often rowing to Woolloomooloo with the catch and then coming back with provisions. They kept bee hives and tended their herd of goats near Killarney, by crossing a natural bridge along the main creek. The Walters children collected wildflowers, which grew along the hills of Bantry Bay to sell to visitors who came for the ferry trips. Later on, the Walters family acted as caretakers of the Dance Hall built to service the New Balmain Ferry Company pleasure grounds.[13]

[11] Map showing the eastern shore, land owners and Bantry Bay Road (present Wakehurst Parkway), circa 1856. NSW Department of Lands. Reproduced in Champion, op.cit. p. 12.
[12] Govett, W.R. 1836, "Description of Country Between Port Jackson and Broken Bay", Saturday Magazine, December 3. Quoted in Champion, S and G, Manly, Warringah, Pittwater, Volumes 1 and 2.
[13] Champion, op.cit. p.25-6.

The hills around Bantry Bay were covered in large trees. The tall trees attracted wood cutters and the pioneer of the area, James Harris French who later gave the suburb of French's Forest its name. French was a Constable and Crown Lands Ranger who arrived in the area in 1856. He acquired 46 acres of land above Bantry Bay and established the first local timber industry.

Access to and from Bantry Bay was mostly by water, but in approximately 1855 a road was cut from Bantry Bay Road to the eastern shore of the bay. It is probable that French used his influence as Crown Lands Ranger to have the road constructed at Government expense. French's sawmill cut and split timber on the hills above the bay and then dragged it down to Bantry Bay by bullock team. From the wharf on the eastern shore it was shipped to the Harbour for sale.[14]

Today, the Wakehurst Parkway follows the route of the old road along the top of the ridge. Correspondence from the Secretary for Lands and Public Works in 1856, indicates that a wharf had been erected, probably to serve the saw millers, at the end of the track.[15] The Old Bullock Track still exists in parts with cobbles, culverts and the remains of a stone bridge, and the reclaimed area at the end of the track is probably the base of the wharf.

The pattern of settlement in the bay, apart from the Walters family, was seasonal occupation and exploitation. The circa 1856 plan from the Department of Lands, which illustrates the eastern shore and indicates the line of Bantry Bay Road (present Wakehurst Parkway), shows a camp situated on the eastern shore of the bay above the present wharf and the resumption of land for the Old Bullock Track.

This camp is in a similar position to the Walters house, but they did not move to the bay until the late 1880s. The camp is most likely the seasonal camp of oystermen, fishermen or timber cutters. Fresh water was found in the narrow gully to the north of the campsite, and when inspected during January recently, was found to have a fast flowing stream of fresh water.

The area was almost certainly occupied by Aboriginal people on a seasonal basis as well. The lime burners would have been attracted by the shell deposits/mounds which generations of Aboriginal people left behind. After 1788, there is little or no mention of Aboriginal populations in Middle Harbour. The Walters family does not mention Aboriginal people visiting the bay in their reminiscence, and there is no evidence of Aboriginal/European conflict in the area.

After the smallpox epidemics, many Aboriginal people in Port Jackson moved on to areas where they could continue to hunt and gather, away from Europeans. Large groups went to the Hawkesbury area, and later La Perouse, Leichhardt and Redfern. Middle Harbour and its suburbs do not appear to have been a popular site for Aboriginal families and groups to reside, even though there was no permanent agricultural settlement here. Between 1906 and 1974, Aboriginal people could not visit Bantry Bay as they were restricted like everyone else due to the explosives reservation.

2.3 Isolation And Romance

> "The extreme danger attendant on man's going beyond the bounds of his own knowledge in the forests of an unsettled country could nowhere be more demonstrable than this. To the westward was an immense open track open before him, in which, if unbefriended by either sun or moon, he might wander until life were at an end…when sitting with my companions at my ease in a boat, I have been struck

[14] op.cit. p.14
[15] Cawthorn, Janice 1994, Old Bullock track, Bantry Bay, Conservation Plan, NPWS. p.19

> with horror at the bare idea of being lost in them; as, from the great similarity of one cove to another, the recollection would be bewildered in attempting to determine any relative situation. It is certain, that if destroyed by no other means, insanity would accelerate the miserable end that must ensue."[16]

David Collins the Judge Advocate of the colony, expresses what was a general fear and lack of understanding of the Australian landscape by the early colonists. His expedition with Governor Phillip in January 1788, through the areas round Bantry Bay, left him with a feeling of horror of getting lost, and a sense that "going beyond the bounds of his own knowledge" in the tall woods of Middle Harbour, would send one insane. These same tall woods would later prove to be a valuable asset to the colony's wood cutters and the isolation of the bay would prove to be attractive to a new generation of settlers looking for escape from the burgeoning suburbs of Sydney. This changing attitude to the environment is a recurring theme in the history of Bantry Bay.

Isolation was and still is the primary sense which one gets of Bantry Bay. In over 210 years, the bay now inspires wonder and a certain relief that it still exists, rather than dread and fear of madness. The early colony of Sydney has become an enormous metropolis and the isolation of Bantry Bay has become a rare and cherished commodity. The special character of the area was recognised by 1879, when the land surrounding Bantry Bay was first set aside for public recreation purposes.

The bay still has a certain romance in its wildness, and the feeling of entering an isolated space has not changed with the development of the powder magazines. The wild landscape, restricted access, attractive and deserted buildings with a dangerous history, create a sense of a place heavily imbued with romance. The steep and heavily wooded slopes, the tapered shape of the waterway, the incredible quiet and lack of development, generates a similar feeling to those who visited the site at the turn of last century.

The perception of Bantry Bay had changed enough by the end of the nineteenth century, for it to become a popular destination with Sydney excursionists. Pleasure grounds had become a popular form of entertainment by the end of the nineteenth century. Most were situated on water and provided picnic areas, landscaped gardens and entertainments such as performances or music. It was a cheap means of 'getting away' from the burgeoning cities in a period when the lack of private transport made distant locations difficult to access. The pleasure grounds movement in Sydney was strongly associated with the harbour and boat trips. Other pleasure grounds within the Middle Harbour were located at Hunters Hill, Lane Cove, Pearl Beach and Killarney Point, where the picnic ground and some associated buildings are still in existence.

The New Balmain Ferry Company built a dance hall, terraced picnic ground, a dining room, several summer houses, a caretakers cottage and a large number of tanks to provide fresh water, on 12 acres of land which they owned on the eastern shore.[17] The entrepreneur, John Dunbar Nelson had begun a number of Middle Harbour ferry trips sometime around 1895. An advertisement from 1904 listed excursions to Balmoral Beach, Pearl Bay, Bantry Bay and Flat Rock. For a sixpence ticket the excursionists could land at any of the designated stops while at Pearl Bay and Bantry Bay there was the addition of " Swings and Merry-go-rounds, Summer houses and Shady nooks, also Dancing and Dining Pavilions."[18] The ferries were provided with a band and the scenery was described as the 'Killarney of Australia', which added to the sentimental romance of the place.

[16] ibid.
[17] Department of Public Works Minute, 3 June 1908, quoted in Masterman, op.cit. p. 9
[18] Champion, op.cit. p.36

John Dunbar Nelson was himself Irish, although the naming of Bantry Bay had occurred long before 1856, he was happy to exploit any sentimental connections. Bantry Bay is named after a bay on the south coast of County Cork, Ireland, where the English battled with the French over their defence of Irish Catholicism in the 18th century. This, for the Irish at least, must have added to the romance of the place.

To attract patrons to the ferry services, Nelson's company advertised the pleasure resorts as providing rural seclusion, grandeur of scenery and "all the conveniences and attractions requisite to a 20th century pleasure resort". The advertising pamphlets included rhyming verse.

Bantry Bay
"Haste thee tired artisan in city pent
To Bowery woods whose green seclusion rear
The leafy arcades to the skies, all bent
In mazes intricate of plenteous shade."[19]

The pamphlet goes on to describe Bantry Bay as 'wild' and 'rugged' with 'virgin forest' which conveys a sense of being 'miles from any civilisation'.[20] These are similar descriptive terms as those used by the terrified early explorers, however they are now seen as a means of attracting people to the bay. The isolation of the bay is seen by Sydneysiders as romantic and evocative, and no longer the stuff of nightmares. Isolation also provided scope for illegal activities such as two-up which was conducted at the Flat Rock beach. Isolation and an uncivilised aspect is now the prime attraction of Bantry Bay. By 1907 the Dance Hall and picnic grounds were no longer used and the bay was surveyed for its next phase of occupation as an explosives depot.

Isolation was a primary factor in the choice of Bantry Bay as the new public powder magazine for Sydney. It was close to the existing magazine site in Powderhulk Bay, the land was available, occupation was limited and it was relatively inaccessible. After the magazines were built this sense of isolation was enhanced due to the restricted access to the site and surroundings. After the closure of the magazines, the sense of isolation has not been diminished and the romance of emptiness has taken precedence.

The incorporation of Bantry Bay into Garigal National Park has done little to alleviate the isolation or sense of romance of the bay. Bantry Bay was incorporated into Davidson State Recreation Area in 1976, which became Garigal National Park in 1992. The headland of Castle Cove, which was also part of the explosives reserve, is now called HC Press Reserve, and was handed over to the care of Willoughby Municipal Council.

The evolving history of Bantry Bay can be read in the context of the long and dynamic relationship which non-indigenous Australians have with their environment. The bay has changed in our perceptions from being a place of unknown terrors, to a resource for exploitation, to a picturesque retreat, then a convenient site for dangerous industry, and now to be valued again as a beautiful and rare landscape worth preserving. The changing perception that non-indigenous Australians have of their environment has altered the way we see not only the landscape, but also the history of our activities in the landscape. The environmental movement is not a new thing, but in the movement to preserve our environment today has an urgency which is new.

[19] The Harbour Guide, Sydney 1904, quoted in Champion, op.cit. p.36
[20] ibid

Davidson Park was dedicated for public recreational use in 1923. It was controlled by the local councils and consisted mainly of foreshore areas, along Middle Harbour, and the valleys of Middle Harbour creek. In 1963 it was suggested that Davidson should form part of Sydney Harbour National Park, and later that it should be added to Ku-ring-gai Chase, but both proposals were rejected. In 1969 a private trust was appointed to manage the Park as a single entity. In 1974 Bantry Bay was added to the Park, and by 1976 the Park measured 1,130 hectares. The area reserved by the Explosives Department at Castle Cove, was handed over to the Willoughby Municipal Council and is now called H.C. Press Park. The Davidson Park State recreation Area was absorbed by Garigal National Park in 1992.

The park trustees faced many problems in the 1970s, which are similar to the ones faced by the Garigal rangers of the NPWS today. Issues included the extensive and disparate nature of the park, the large number of neighbours and the pollution and environmental degradation arising from previous industrial usage. The trustee meetings were for a time held at the offices at Bantry Bay, where they must have spent much time wondering what to do with this new addition to the Park, which carried its own problems. Garigal was established as a sandstone reserve which provides linkages between Sydney Harbour National Park and Ku-ring-gai Chase National Park. This corridor enhances the viability of the natural systems in each park, provides corridors for endangered species and protects the catchment of Middle Harbour Creek.

The addition of the magazine area to the National Park has added a very beautiful asset to the Park, but also added new issues to the management of the Park resources. The magazine site is polluted with lead, arsenic, chromium and copper at levels which are considered dangerous for public parkland and open spaces, and the buildings with their associated cultural landscape are in a deteriorated state. The site has been very much under utilised, which has acted to preserve the nature of the landscape but also make it invisible. Bantry Bay has become an unknown part of Sydney, and in this it has come full circle in its history, and once again can be seen as an isolated and romantic place.

Figure 2.3.1 Middle Harbour Bantry Bay, December 1916, GPO1-18437, reproduced with permission, State Library of NSW.

2.4 The Public Magazines

This chapter is divided into sections which deal with the activities of the magazine, the buildings and landscape of the magazine complex and the workings of the NSW Explosives Department.

2.4.1 Origins of the magazine

In June 1903 as a result of agitation at Newcastle for the removal of powderhulks, a committee was formed to advise the government on the best means of assessing and improving the storage of gunpowder in Sydney and Newcastle. Bantry Bay was considered to be the best possible place to store powder with the possible exception of Newington, near Homebush Bay. Newington had been set aside for military uses while merchant stocks continued to be stored at an increasingly crowded Spectacle Island. Prior to 1882, military and civil gunpowder had been stored at Goat Island, which was becoming dangerously overcrowded, leading to the establishment of Spectacle Island magazine.

On the 19th of October 1906 the committee submitted a report which recommended that small isolated magazines be built at Bantry Bay to replace the floating hulks which had been moored in Powderhulk Bay since 1882.[21] Powderhulk Bay on Middle Harbour, was the site of a floating powder magazine, made up of two magazine ships, the *Pride of England* and *Bhering* and a guardship *Alacrity,* which were permanently moored in the bay (Photo 2.4.1). Photo 2 shows the interior of the *Pride of England* and the fit out of the decks for explosives storage. Two moorings were assigned permanently to the magazines but this does not seem to have restricted urban development along the shore, as early photos show boathouses, and federation style cottages along the shores of the bay. The foreshore of Powderhulk Bay had a boatshed, examining room and sail loft with a coal bin alongside made of a stone retaining wall, which still exists. The hulks were moored in the middle of the bay with rowing skiffs used as transport between the guardship, the hulks and the sheds. The sheds shown in Photo 3 were later removed and re-erected at Bantry Bay (Photo 2.4.2).

The choice of Bantry Bay as the site for the new powder magazine was a logical one for the commissioners to make. The land was largely public recreation reserve and therefore cheap. It was isolated from urban development and busy shipping lanes on the Harbour. The narrow mouth made it easy to restrict entry from the sea and access by land was along the Old Bullock Track, which was impassable to most vehicles. It was close to the powder anchorages at the mouth of the Harbour and had deep water anchorages close to shore.

Reservation of the land for an explosives magazine necessitated reservation of the area known as H.C Press Park in what is now Castle Cove, as a safety area. The reservation also included Flat Rock beach to the west along Middle Harbour Creek river, and all the land to the tops of the hills on either side of the bay. The magazine was therefore the dominant factor in the development of this area of Middle Harbour, and the preservation of 900 acres round the bay in a relatively undeveloped state.

2.4.2 History of the Magazine

A survey of the Explosives Department Annual Reports provides a picture of the work carried out at the bay from 1915 to 1974, with a gap during the war years when no reports were issued. From these reports one can attain some idea of the historical development of the Magazines and the changing nature of explosives work at Bantry Bay.

[21] Report of the Working of the Explosives Department of New South Wales, Department of Mines, 1915, p. 11

The magazines were first put to use at the end of 1914. By 1916, the magazines were so overstocked that three temporary, cheaper magazines were constructed, as well as the hulks which were moved from Powderhulk Bay. The Department appeared to have underestimated the quantities of explosives imported, and the capacities of the magazines to cope with the increasingly varied types of explosives which had to be stored. The Public Works Department had been continuously told to reduce costs while constructing the magazines and the budgets for the number of magazines may have been cut. The vacant tenth embrasure at the southern end of the site, although not documented, would appear to be an example of these cut backs.

Figure 2.4.1 Bantry Bay Explosives Depot, Pride of England *Hulk, showing explosives storage between decks, n.d. Reproduced with permission, Department of Mineral Resources*

The war in Europe had restricted imports from Britain, but a renewed supply of explosives from North America saw the quantities arriving at Bantry Bay become even greater. The temporary magazines were kept and put to good use throughout their lifetime. By 1916 the importation of industrial explosives had reduced and one of the hulks was decommissioned, while the other was dedicated to the rising number of fireworks being imported from Asia and Europe.

The public magazines were not a free service provided by the Government for the safety of its citizens. Bantry Bay was part of a closely regulated industry which charged merchants for the storage and administration of their cargoes. In 1918, revenue raised from storage and lighterage of merchants explosives amounted to £18,000. Financial reports for 1917 reveal that chemical examination and repacking of explosives which was charged back to the merchants, amounted to £70. Overhauling and destroying explosives was also charged back to the merchants and amounted to £137. The department was responsible for issuing licenses under the Explosives Act for which they also charged a fee. The magazines were therefore self-funding and in most years managed to recoup all costs, excepting capital works which was paid for from the Public Works Fund Account.

The Explosives Department staff kept a very close eye on any changes to the transportation and use of explosives as it could mean drastic changes in their ability to generate revenue. Between 1914 and the advent of the depression which started to affect operations at the magazine in 1931, the magazine's business was booming. The demand for merchants explosives was affected by the enormous public works undertaken round NSW at that time; the building of the Sydney Harbour Bridge, underground tunnels and railways in the city and the Newcastle highway construction, as well as the steady demands in the mining sector, ensured the magazines were kept busy. In 1931 the magazine felt the first pinch of the depression and had to lay off three staff. Deliveries to the town were stopped, overtime was cancelled and the hiring of casual labour stopped.

The work of the magazine slowed up until the start of the Second World War. In 1939 the Department stopped issuing reports as the magazines were taken over for use by the Allies in the Pacific War. In 1946 the reports resume with the comment that the; "Service ammunition and explosives held at the Middle Harbour Public Magazines, on behalf of the Ministry of Munitions, Royal Navy, US and Australian Armed Forces, were almost wholly cleared during the year."[22] The only information Mr Jack Lilly had on the war years was that the site had US personnel dealing with their own supplies.[23] Presumably these personnel were based at the facility.

Bantry Bay was an ideal site for storing munitions during the War, as the entrance to the bay could be protected by booms, one of which remains on the slipway of the eastern shore. The fortifications and batteries at the entrance to Middle Head provided additional protection. The narrowness of the bay and the steep walls round it provided additional protection from air raids. Although not documented, it is thought that at some time during the war the small concrete shed at the northern end of the western shore of the complex was constructed as an air raid shelter for staff, given its form and construction.

During 1946, munitions and explosives factories on the east coast of Australia experienced numerous disruptions due to industrial action. The explosives factory at Deer Park in Victoria which was the main supplier of explosives to the mining industry saw industrial disruptions throughout 1946 which strained the staff and the magazines to its utmost.[24] Transhipments from overseas to WA and QLD were handled at the Bantry Bay magazine and deliveries of explosives to the mining industry were carried out direct from ship to shore rather than via the magazines. The Explosives Department were also given the task of examination and assessment of surplus army stocks for disposal or sale as well as the introduction of new Australian Standards which required changes to procedures of handling and storage.[25]

As a result of developments during the War, and the increasing number of new explosives available from European and American manufacturers, new explosives regulations were written in 1949. Research and development by arms manufacturers had boomed during the war and after, especially with access to German technology. Explosives standards were regularly re-written as technology introduced more powerful, but also more stable explosives.[26]

[22] op.cit. 1946.
[23] Mr Jack Lilly, Oral history interview, 4/12/2000, Gymea Bay. ex-O.I.C Explosives Department, 1963-1969.
[24] Report of the Working of the Explosives Department of New South Wales, Department of Mines, 1946-1947.
[25] Australian Standard Specifications for Magazines for the Storage of Explosives, Technical Standard No. A.65-1946.
[26] Australian Standard Rules for the Storage and Use of Explosives, SAA Explosives Code, Feb, 1949

In 1949 the Snowy Mountains hydro-electric scheme was begun and until the late 1950s created a boom economy for explosives manufacturing in Australia. Freeways and other public works in Sydney required large amounts of explosives which kept the magazines busy throughout the 1950s and 1960s. By 1953 however, explosives were being railed directly to Broken Hill and to the Snowy Mountains scheme rather than going by sea, via Sydney. I.C.I who had consistently been the major client of the magazines, had a number of private magazines built at Tocumwal, which could hold explosives being railed direct from Victoria and tranship from there to the Snowy Mountains.

Nevertheless, the volume of imports of explosives into Sydney grew during the 1960s and capital works on the magazines showed no sign of the facility's decline. In 1961 the mains water supply was connected to the eastern shore and in 1965 electricity was also connected to the eastern shore. In 1965 a bush fire on the eastern shore threatened the offices and workshops, with the result that a fire trail was approved for the northern part of the reserve.

The 1968 annual report records that the volume of shipping was increasing as imports of explosives from Belgium, Japan, France and Britain, were handled at the facility. Bantry Bay was also responsible for the trans-shipment of explosives to the Pacific Islands and as the Newcastle magazine had closed in 1947, for trans-shipment to industry in the north of the state. A new building was erected in 1968 for testing detonators and explosives, and a new receiving shed was built at Rozelle Bay for items being railed.

However only 3 years later, the 1971 report records a decrease in the amount of explosives stored. As a revenue replacement exercise, license fees and lighterage charges were increased to maintain income. By 1973 the magazine started winding down and by September 1973 the last stocks were removed from the magazines. The report records that the magazine ceased operations of the 31st May 1974. "The closure of the magazines became necessary as a result of a growing decline in patronage among commercial explosives dealers."[27]

2.4.3 Buildings and structures: Powderhulk Bay

Powderhulk Bay, which is 2km downstream from Bantry Bay was the site of two permanently moored hulks, a boatshed, sailmakers loft and an examining room. The hulk *Alacrity* was used as guard ship and office and once the magazines opened at Bantry Bay, continued to be used as an officers mess, moored close to the eastern shore. The moorings at Powderhulk Bay were all lifted and relocated to Bantry Bay where *Pride of England* continued in use as a magazine when shipments got heavy (Figure 2.4.1). The boatshed and sailmakers loft were moved from Powderhulk Bay to the eastern shore and set on piers on reclaimed land to the south of the present wharf. The concrete piers of the boatshed and sailmakers loft still exist. The examining shed was clad in iron and mounted on piers, and continued to be used as an examining shed. (This building is the red corrugated iron shed at the northern end of the western shore, moved to this position in 1919.)

In a photo comparison of the structures at Powderhulk Bay and Bantry Bay, the boatshed is easily recognised, though painted a much darker colour. (Figures 2.4.3 and 2.4.4) The sailmakers loft has not been identified but is probably attached to the southern side of the boatshed. The hulks continued in use for a number of years as did the guard ship, until permanent quarters were built on the eastern shore.

[27] Report of the Working of the Explosives Department of New South Wales, Department of Mines,1974, p. 152

2.4.4 Buildings and Structures: Eastern shore

The eastern shore was resumed for the powder magazines with several structures intact. Three structures, which were definitely intact at the time of resumption, were a dance pavilion and a dining room and a cottage which may have been the home of the Walters family, caretakers of the pavilions. According to the Explosives Department's Annual Report for 1915, one of the dance halls was dilapidated, probably the dining room and the other, the dance pavilion, was re-erected at the water front for use as a workshop. The cottage was to be renovated for sleeping quarters for the watchmen when off duty.[28]

Figure 2.4.2 Bantry Bay, Middle Harbour and environs. (Scale 1:25,000)

The dance hall shown in Figure 2.4.4 was probably the one which was re-used as a workshop on the waterfront. From the physical evidence, this building appears to be in its original position from the pleasure ground period, as the stone piers and rear stone paving which are

[28] ibid.

extant on the foreshore, correspond to the size of the building. The Explosives Department Annual Reports however, indicate otherwise, and whether this building was re-erected in-situ, or moved from another location is unknown. An interior shot of the dance hall building from the collections of the SLNSW shows a geometric frieze below the picture rail and elaborate timber joinery round the doors.

The Walters family cottage which may have been on the site since the 1880s, was sited on the highest terrace of the shore, above the present site of the wharf. Figure 2.3.1 shows the dance hall on the shore and the verandahed cottage in the highest, cleared terrace area above the administration building.

In 1916 the financial reports for the Explosives Department lists additions to a mess and change room for casual hands, which from the amount spent, only £20, was probably a renovation of an existing structure. Also listed in 1916 was a Blacksmiths shop and a new brick inflammable liquid depot. Renovations to the old cottage to make it into watchmen's quarters was also listed but it wasn't listed as moved, and so presumably was left on its original site..[29]

The inflammable liquid depot was described in the 1917 report as made of 4 ½ inch brick, 6 x 6 x 8 feet, with a concrete floor, flat iron roof and a single door. This building no longer exists, but presumably had to be close to the water to enable loading and offloading of liquids from boats.

In 1918 the buildings on the eastern shore included: one guardhouse, a boatshed, boat slip, workshops, blacksmiths shop, watchmen's quarters, changing and mess rooms for casual hands, inflammable liquids depot and jetty. Of these only the slipway remains with its winch, rails and wooden cradle, constructed in 1918. The small toilet south of the stairs on the foreshore is quite possibly original.

Figure 2.3.1 indicates a small building on the foreshore below the cottage, and this may have been the guardhouse. No further information for this structure was found. Figure 2.4.5 shows that area, post WWII, and the structure has been replaced with an army style office.

The line of the foreshore on the eastern side of the bay has not changed since 1931 when a survey plan described the original line of high water and the extent of reclamation. The reclaimed area under the dance pavilion workshop has deteriorated, but several stone piers remain which indicate the line and size of the building. Figure 2.4.5 shows the original stone wall along the foreshore just north of the jetty, which is still intact. Several structures have not been accounted for, which are mentioned in the reports, the blacksmiths shop, the 1918 changing and mess rooms, the guardhouse, and inflammable liquids depot.

The Guardship *Alacrity* which had served as an Office for the O.I.C since 1915 was replaced, circa 1940 by an army shed with skillion roof, on the water front at the northern end. This was erected on piles partially over the water, with a floating pontoon allowing the men to moor their skiffs against the office porch. The reclaimed area of the foreshore under the office indicates that a smaller structure was once sited there, with stone steps carved out of the stone sea wall. This may have been the site of the changing and mess room, or the blacksmiths shop, mentioned in 1918.

To the south of the changing and mess room was a wooden building which is now the NPWS hut. This building dates from at least 1931, and was used for some time as a lunch room

[29] op.cit.,1916.

and/or a watchman's office. Above the office on a cleared slope, is a series of dry stone wall terraces which were left over from the days of the ferry excursions and pleasure grounds.

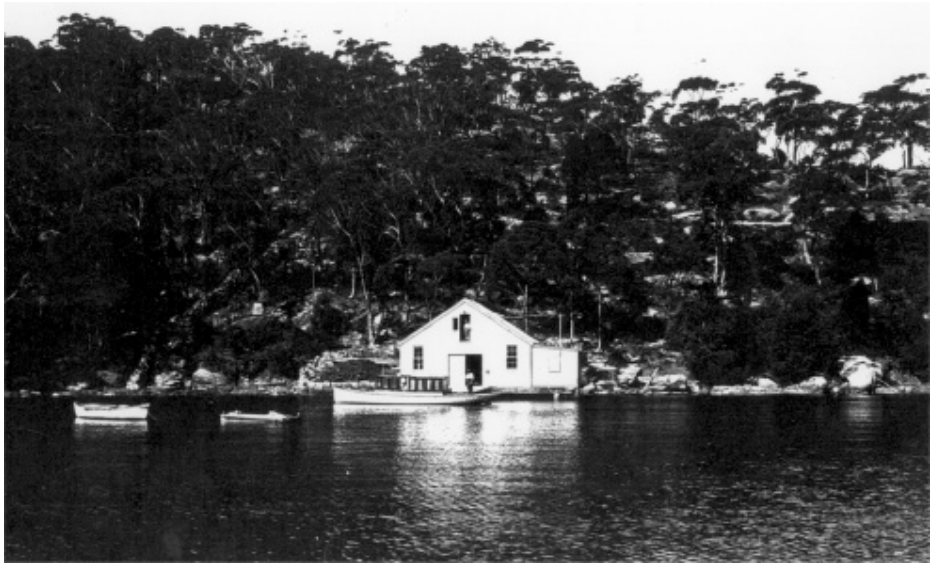

Figure 2.4.3 Boat shed at Powderhulk Bay, Middle Harbour, n.d. Reproduced with permission, Department of Mineral Resources.

Figure 2.4.4 Proposed site of coal bunker at Bantry Bay, May 1918, GPO1-21185, reproduced with permission, State Library of NSW.

On a middle level terrace was built another skillion roof army hut, probably dating to circa 1940 as well, which was used as a dining room/kitchen and mess room. What happened to the Walters family cottage shown in Figure 2.3.1, is not known.

On the southern end of the ridge which extends over the eastern foreshore is a red, flat iron and timber shed. This was described by Jack Lilly who worked as the Officer in Charge of explosives from 1963 until 1969 as the inspection or lab room. The building is described as the testing shed in departmental reports, its date of construction is unknown, and it is not shown in photos from 1918.

Figure 2.4.5 Departmental officers quarters with watchman's building in background, post-1940. Reproduced with permission, Department of Mineral Resources.

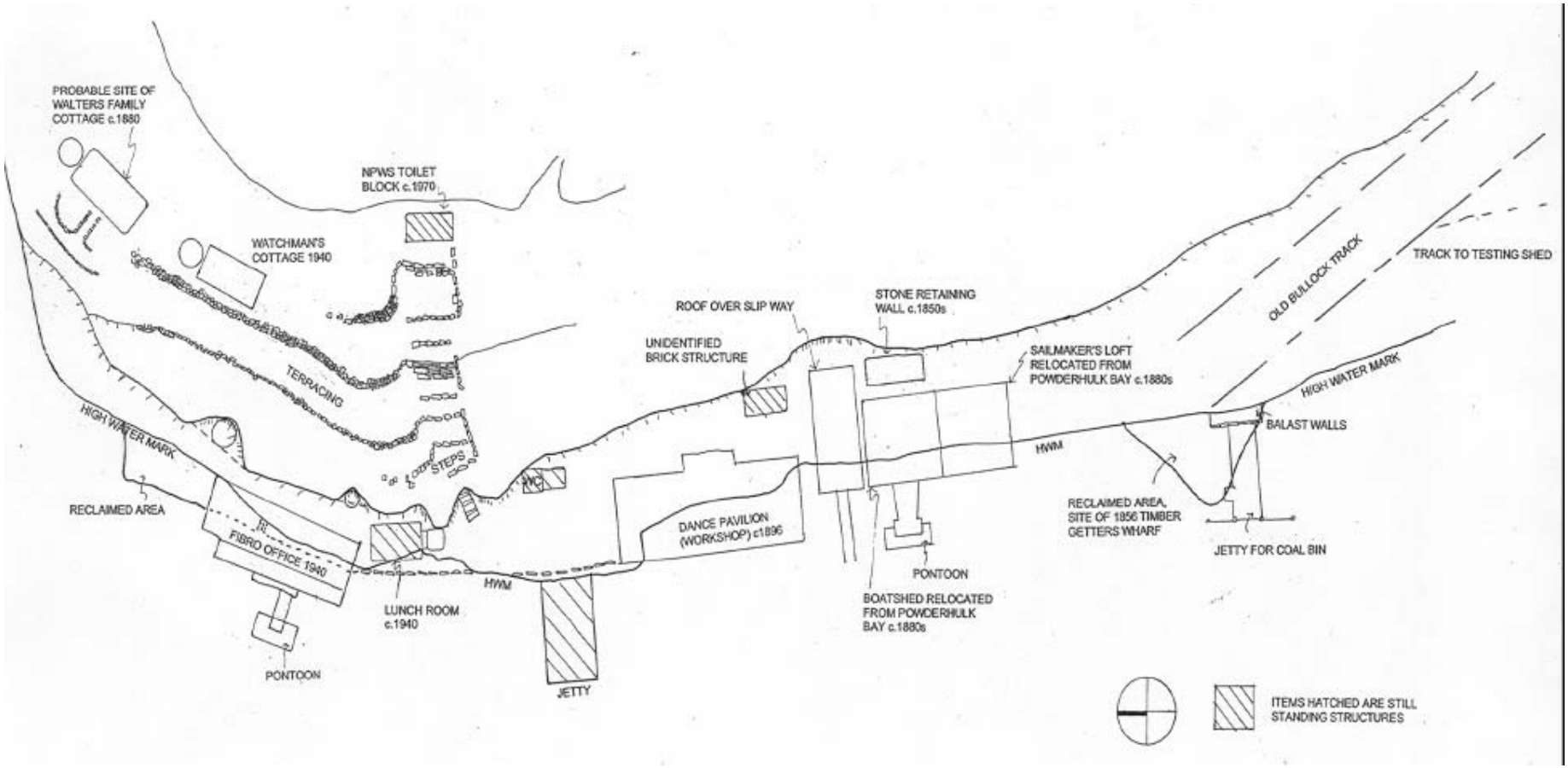

Figure 2.4.6 Plan of known features and buildings, Eastern Shore Bantry Bay. (Not to Scale)

2.4.5 Buildings and Structures: Western shore

230 acres of land which included the eastern and western shore of Bantry Bay, was resumed and gazetted as a public magazine reserve in January 1907, at a cost of £12,401. All the land surrounding Bantry Bay from the water's edge to the summit of the hills, comprising 701 acres in total was also gazetted in September 1908. This reserve area was necessary to restrict urban encroachment into the unsafe, danger area. [30]

In 1909 plans were drawn up by the Department of Public Works and £8000 appropriated for the construction of sea walls, excavation of the hillside and drainage of the cleared slopes.[31] The construction and excavation of the site was very slow, which according to the Explosives Department was due to a lack of funds.

Figures 2.4.7 and 2.4.8 show the extent of the reclamation and the excavation of the embrasures for the magazines. The excavation involved an enormous amount of rock removal which was then used to create a new sea wall and reclamation of flat concourse areas in front of the magazines. The excavation, reclamation and sea wall, the light rail and drainage, the reservoir and two timber wharves were completed in 1913.[32] A surveyor's plan drawn in 1931 indicates the original line of the hill and the extent of reclamation of flat concourse and excavation for the magazines was extensive.

Figure 2.4.7 Large cutting at site of new magazine, Bantry Bay, c.1913. GPO1-31380, reproduced with permission of State Library of NSW.

[30] Explosives Report, op.cit.p.11
[31] Reports of the NSW Department of Public Works For the Year Ended, 30 June 1911-1915
[32] ibid.

The tenders for the buildings were not let until 1914, even though the plans had been drawn up since 1909. The buildings proceeded slowly, as the war slowed down the supply of materials, and the buildings were not handed over until August 1915.[33]

The excavation of the hillside was necessary to provide blast containment for each magazine. Each magazine is situated inside an excavated stone embrasure, some with dry stone retaining walls which were cut to contain a magazine approximately 13 x 9 metres. In some instances the embrasure has been widened after building the magazine to accommodate guttering and the roof.

The close walls of the embrasure and the overhanging roof create a cool space which assists in ventilation of the magazines. A great deal of thought was put into the design of fire and explosion prevention systems, such as roof sprinklers, lightning conductors and fire fighting equipment.

The nine permanent magazines, numbers 2-8, 10-12 are of the same design. Each has brick cavity walls finished in plaster and an internal insulating wall which separates the porch from the storage area. The light rail tracks ran into this porch area to allow for unloading undercover. The ceiling is of reinforced concrete with a gabled-hip iron roof as shade protection. The floors are parquetry laid over concrete, and each magazine has ventilators, window shutters and double doors.

Figure 2.4.8 Site of new magazine station, Bantry Bay, c.1913. GPO1-31373, reproduced with permission, State Library of NSW.

The site was originally designed to accommodate nine magazines, a receiving shed and an examination room. By the time the magazines opened in 1915 they were already overstocked and three temporary magazines were added which are still intact. Buildings 9, 14 and 16 were built as temporary structures in 1916, but were retained as pressures on

[33] Explosives Report, op.cit. p.11

storage capacity was a continuing problem until the 1960s. The construction technique was of a completely different nature to the nine permanent magazines, using fibro-cement on a wooden framework for internal walls, and a flat iron roof.[34]

The Public Works department also constructed extensive drainage around each building and along the rear of the concourse. A reservoir above magazine number three pumped water onto the roofs of the buildings to assist in cooling them and to provide fire protection.

The Public Works Department also constructed a number of jetties to provide safe anchorage and unloading of the lighters. Four of these were sheltered by iron sheds, and three were uncovered. Pontoons and stairs gave access to rowing skiffs, which gave transport from one shore to the other and to the lighters and hulks.

A light rail system ran from each jetty to the porch of each magazine. Another line ran along the seawall, past each jetty, with a turntable system at the intersection. A branch line ran in a curve from each magazine to connect to the sea wall line. The light rail system was the only means of transporting the crates from the lighters to the magazines.

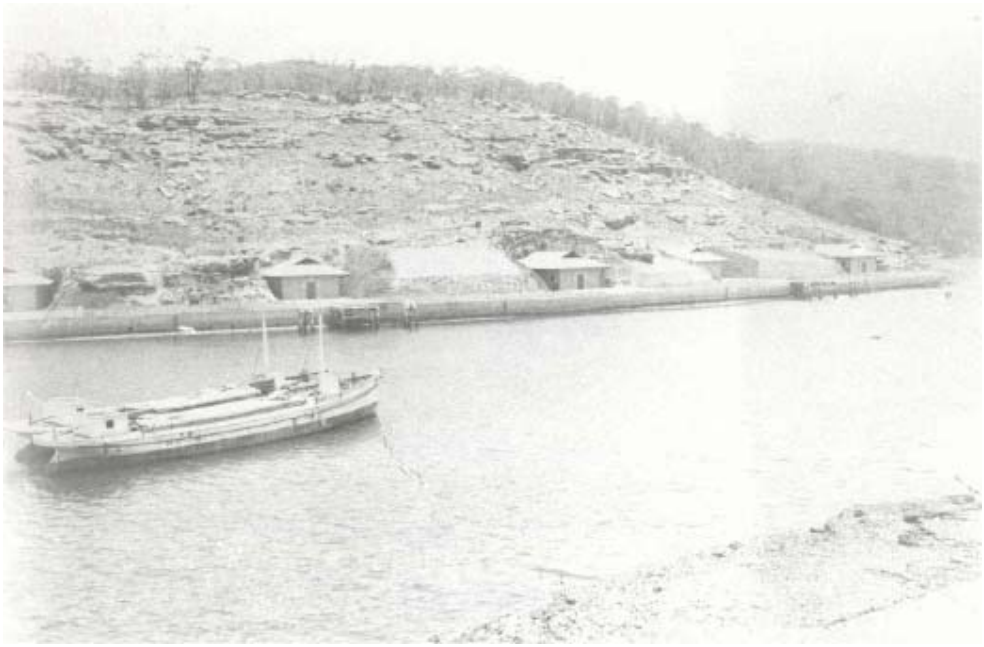

Figure 2.4.9 General view of magazine station, receiving house, jetties, January, 1916, GPO1-31859. Reproduced with permission, State Library of NSW.

[34] ibid. p.12

2.4.6 The Explosives Department

The floating powder magazine at Powderhulk Bay was established in 1882 to augment the overcrowded magazines at Goat and Spectacle Island. These magazines were placed under control of the new Ordinance and Barrack Department in 1876, which increasingly dealt with the growing military supplies of gunpowder.

The formation of the Explosives Department came about in 1894 when the Ordinance and Barrack Department was split into two entities. The Ordinance Department which was purely military and controlled magazines at Spectacle Island and Newington, and the Mercantile Explosives Department which oversaw Powderhulk Bay, under the Colonial Treasury. This split was probably due in part to the revenue raising possibilities of mercantile explosives, hence its administration under the Treasury.

Other than during the period of National Emergency during the Second World War, Bantry Bay was used solely for 'mercantile' explosives. Explosives were defined in the Explosives Act of 1905, as liquid or powder substances with combustible or explosive qualities. This could range from gelignite or dynamite, to fireworks, to the solutions which hairdressers used for dyeing and setting hair. Responsibility for storage of all types of explosives was invested in the Explosives Department, who were set up to administer the Act, in relation to civilian supplies.

In 1922, control of the Mercantile Explosives Department was passed to the Department of Mines, from whence the bulk of explosives work arose. The primary functions of the Explosives Department was the administration of the explosives act and regulations. This regulated and controlled the storage, chemical examination, repacking and destruction of explosives.

Figure 2.4.10 Construction of jetty for powder magazine in Bantry Bay, January, 1917, GPO1-24431, reproduced with permission, State Library of NSW.

The explosives regulations forbad the importation or use of fireworks, packaged explosives or explosive liquids, without the knowledge and clearance of the Explosives Department. The Explosives Department were responsible for ensuring that storage of explosives at mining sites, public works or merchant's premises, met departmental regulations. The Department inspectors had the power to enforce proper storage or destruction of dangerous explosives. They investigated accidents involving explosions and dangerous items thought to be explosive, such as suspect weapons, bombs, canisters and illegal fireworks. The analytical section which tested samples of all explosives imported into the State, were based at Circular Quay, in the old Mining Museum. The departmental chemists were responsible for inspection and testing of suspect explosives, as well as the destruction of all suspect or dangerous explosives.

The Department administered several properties round Sydney, apart from Bantry Bay. There were two designated explosives anchorages during the period of operation of the complex, the first at Rose Bay which operated until circa 1938, when it was moved to Double Bay, between Shark and Clark Islands. This second anchorage appears to remain.

Vessels carrying explosives were required to moor at the anchorage while their cargo was discharged into the departmental lighters for transport to Bantry Bay. While in storage at Bantry Bay the contents and state of the packaging was checked to ensure that it met regulations.

Figure 2.4.11 Receiving House, guardhouse and receiving jetty, January, 1916, GPO1-31864, reproduced with permission, State Library of NSW.

When the owners of the explosives required deliveries they notified the department by requisition and the quantity was dispatched to one of the three explosives wharves in the harbour (Woolloomooloo, The Spit and Darling Harbour/Rozelle). The main supplier of explosives on the eastern coast was the I.C.I factory at Deer Park, Victoria. In the 1950s small ships carrying I.C.I explosives would sometimes sail directly to Bantry Bay, while

transport using specialised railway carriages went to Broken Hill and the Snowy Mountain scheme via I.C.I magazines at Tocumwal.

Until the development of I.C.I in Victoria however, most shipments came from overseas, particularly Scotland, with large consignments of several thousand cases per ship. The use of the railways to transport explosives within NSW, although by-passing the Harbour, still generated work for the magazines, who had to store, check and repack explosives which came into Sydney by train or truck. In the 1960s, lighters made twice weekly visits to the receiving shed at Rozelle Bay to collect explosives from Victoria or Tocumwal or to transfer consignments to trucks. Trucks and railway carriages were specially adapted to carrying explosives and closely regulated when transport through suburban areas was required.[35]

The department had three explosives wharves designated for explosives use. The Woolloomooloo wharf shown in Figure 2.4.12, was an early establishment, though no certain dates were found for its period of use or its function. Presumably it was for the trans-shipment of explosives to trucks or drays for conveyance round the city.

Figure 2.4.12 Explosives receiving shed at Woolloomooloo Bay, n.d. reproduced with permission, Department of Mineral Resources

The explosives wharf at The Spit was used from the 1940s for the relay of staff and the loading of trucks for transfer to the northern areas. Darling Harbour, shown in Figure 2.4.13, was the first railway wharf, inaugurated in 1909, and which was a bone of contention between the department, Sydney Maritime Services and the State Railways until it was transferred to Rozelle in 1936.

The work at Bantry Bay revolved around the lighterage of explosives from ships or trains, storage in magazines, repacking or overhauling packaging, destruction of dangerous packages and trans-shipment or delivery of explosives to boat, train or road transport. The number and variety of tasks which the magazine staff performed meant that in the early years

[35] Author unknown, *Mineral*, Volume 18, September 1972. From a photocopy held by the Library of the Department of Mines, Sydney.

the number of staff was quite high and they were specialised to work boats, do carpentry or store and load explosives. After the war the workforce became increasingly multi-skilled, particularly after the introduction of diesel powered boats.

The men working the magazines were called warders, unless they had a specialised job, such as coxswain or watchman. The work generally involved some aspect of running the departmental lighters, tugs and launches, and before the 1940s, in making sails, nets and ropes and building equipment for the magazines.

The daily round of explosives work for wardens could involve either collecting or delivering explosives to ships at Double Bay, or to trains at Darling Harbour, or trucks at The Spit. Loading and unloading of the lighters might have taken a day or a few hours, and so schedules for delivery and receipt were organised well in advance. Merchant's requirements and ship timetables were relayed from the Head Office to the bay, where work programs were designated by the O.I.C.

Some of the warders would accompany the lighters and boat crew to assist in loading or unloading, while others would be occupied in stacking, sorting and packaging explosives at the Magazines.

Figure 2.4.13 Explosives wharf and receiving shed at Darling Harbour, n.d. reproduced with permission Department of Mineral Resources

Many of the men in the period before diesel powered launches and tugs, were seamen and the Officer in Charge until 1940 was an ex-naval man, who established the magazine along naval lines.[36] Administration of the contents of the magazines and tracking the quantities received and dispatched was carried out by the O.I.C and a junior Clerk. In 1927 the staff at the Magazine also included 3 crew of the tug boat, a sail maker, carpenter, painter, 2 coxswains, 3 lightermen, and up to 15 warders employed in loading, unloading and packaging. Casual labour recruitment was a policy which the Magazine practiced until it closed, with the ability to call on extra hands during very busy periods and for land clearance and maintenance as required.

[36] McKinnon, R.H. "Handling Explosives at Bantry Bay", *Mineral*, May, 1970.pp.21-25

The work of the warders involved a great deal of physical labour with repeated lifting, stacking and moving of boxes. Unlike the naval armament magazines at Newington, the men at Bantry Bay worked without the benefit of lifting equipment such as gantries and cranes. Much of the labour would today be considered to be unsafe and poor work practice. Many of the packages were found to be damaged and the close contact with the boxes would have resulted in many men being exposed to explosive substances. Exposure to Nitroglycerine in particular resulted in headaches and a lowering of blood pressure. In order to remain acclimatised to the effects, the men working at the magazine kept a pinch of nitroglycerine in their hat bands during holidays.[37]

In general, the workers at Bantry Bay were very happy with the work and according to an ex-O.I.C many stayed working at the bay until retirement.

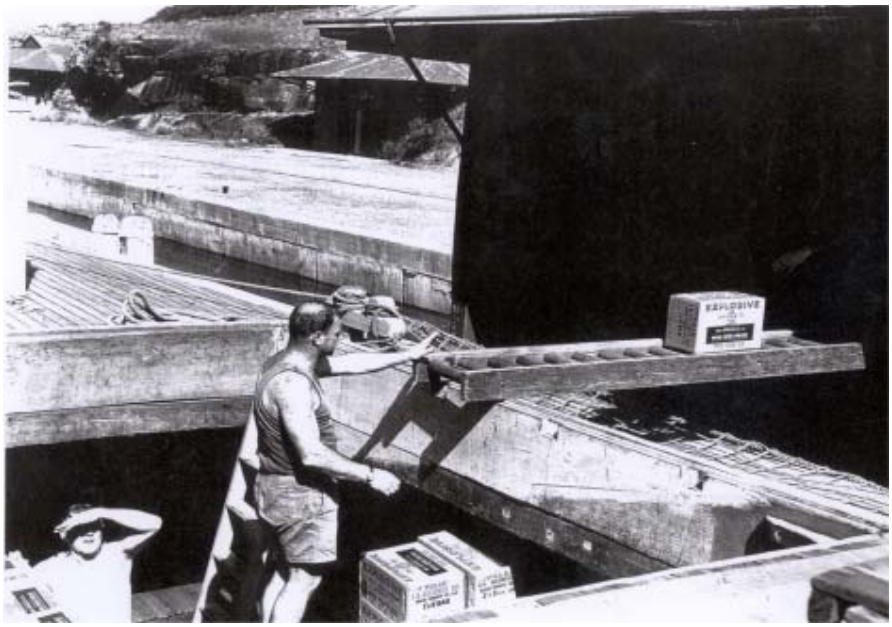

Figure 2.4.14 Warders unloading a lighter at Bantry Bay, 1965. Reproduced with permission, Department of Mineral Resources

The nature of the work, which sometimes required long over time to finish large loads and the isolated position of the bay meant that the site had to be self-contained. The men were supplied with a kitchen and the watchman on duty was assigned to cooking a hot midday meal for all staff. The men rowed from one side to the other in wooden skiffs and spent their lunch and tea breaks catching fish.[38]

On entry to a magazine the men would change into blue serge jackets and trousers and special felt overshoes or rubber soled boots to prevent sparking. Each day they were picked up in the launch at The Spit and taken back at the end of the shift. Two watchmen remained at the bay, and took it in turns to do the night or day shift. The watchmen provided security, checked the temperatures in the magazines and provided a fire watch.

The beautiful environment, the time spent on the water and the distance from head office which meant many rules could be relaxed, made the bay an extremely pleasant one in which

[37] Mr Jack Lilly, op.cit.
[38] ibid.

to work. Bantry Bay never suffered from industrial action and there were no major accidents reported.[39]

2.4.7 The Industrial Process

The process of collecting and dispatching explosives was described in an article published in 1970 by R.H. McKinnon, who had worked at the magazines since 1935. Information was also collected in an interview with Mr Jack Lilly, O.I.C of the Explosives Department between 1963-1969.[40]

Between 1915 and the mid-1950s the majority of explosives arrived in NSW by ship. The explosives department would be notified by the ships' agents that a load was going to enter port and the department kept abreast of its movements until it arrived in the harbour. The ships were required to moor at Rose Bay powder anchorage prior to 1938, after which the anchorage was moved to Double Bay, until they had been emptied of their explosive cargo. The magazines lighters were towed in conveys of up to 5 by the departmental tug. Once alongside they moored to the ship and magazine staff supervised the loading of the explosives from the hold into the lighters. They were then towed back to Bantry Bay.

The slings which were used to load the lighters at the anchorages were specially made by the magazine employees, and all stacking into the holds was done along regulation lines with explosives packed by type. Warders were trained to recognise which explosives could be packed together and which separated and the order in the hold of the lighter would replicate storage in the magazine.

McKinnon states that it would be almost a full day's work loading each lighter at the ship, adding to that the eight mile trip along Middle Harbour to the bay, meant that unloading often occurred the day after loading. Lighters which were full were moored in the middle of the bay on anchorages. Unloading could take a day or two depending on the state of the boxes and how many different types of explosives were in each lighter. Locations had to be carefully tracked by the staff and administrators, so that individual consignments were never mixed.

Each lighter could hold up to 90 tons which was equivalent to 3,500 cases or more. All unloading at the magazine was done by hand with a wooden-roller conveyer belt and transport to and from the magazine was by light rail trolley.

Transport round the site using light rail is a feature at many other powder magazines in Australia, particularly at Newington, where the track, trolleys and engines survive intact. At Bantry Bay, ten small wooden explosives trucks were built by the PWD for the light rail. These small explosives trucks do not appear to have been used very much, as in no photos of the bay are they to be seen. One example of the explosives trucks remains, inside the brick detonator shed on the western shore. Trolleys were always pushed by hand at Bantry Bay, unlike Newington where electro-mobiles were introduced.

As loads were placed into the magazines, samples were taken randomly from packages for testing on-site or taken to Circular Quay, by chemists. Poorly packed explosives and leaking or damaged containers were noted and either repacked or set aside in a magazine for destruction. Destroying unsafe, old or damaged packages of explosives, was another activity performed by the staff at Bantry Bay. Large quantities and cases would be dumped at sea, faulty or dangerous fireworks and gelignite were destroyed at Flat Rock.

[39] ibid.
[40] McKinnon, op.cit. Lilly, op.cit.

At Flat Rock beach to the west of the magazines, departmental chemists would conduct controlled burns of explosives. Gelignite was laid end-to-end in trenches of sawdust with kerosene and set alight. According to Mr Lilly there were only infrequent instances of explosions occurring.

Large quantities condemned by the chemists were towed out to sea by the departmental tug and dumped. Dumping at sea was strictly controlled by explosives regulations. They had to be taken not less than three miles out to sea and the cases opened and wet first. The burning was also closely prescribed especially the distance to be maintained from places of habitation.

The landscape development of Bantry Bay, H.C. Press Park and Flat Rock was largely influenced by considerations of fire prevention, security and blast prevention. This in turn influenced the shape and direction of urban development in Middle Harbour.

3.0

NATURE OF THE RESOURCE

3.1 An Integrated Natural and Cultural Landscape

The landscape of Bantry Bay is dominated by the steep and heavily wooded hillsides, which bound the waterway on either side and taper inward to the north. The natural landscapes are not untouched wilderness, but rather have been modified, adapted and shaped through both Aboriginal and European occupation of the site.

The natural landscape has been excavated, cleared, reshaped and revegetated to suit the site's occupants. The built elements have been sited and laid out in a manner which suits the topography. The areas of natural landscape which have not been disturbed by building, act as buffers for the explosive storage functions which occurred in them.

3.1.1 Natural Landscape

Bantry Bay is the southern limit of a deep north-south valley, which contains Middle Harbour Creek, and a number of tributary east-west creeks. The bay lies predominantly on Hawkesbury sandstone, a massive Triassic sandstone which covers large areas of the Sydney basin. Numerous sandstone ridges protrude into the main valley, and cliffs and rocky outcrops are a common feature. Middle Harbour Creek is a permanent fresh water stream, which merges with upper Middle Harbour, part of the drowned river valley of Sydney Harbour.

The geology of the sandstone determines to some extent the type of vegetation. The vegetation within and surrounding the explosives complex predominantly includes open forest, with some rainforest. The soils derived from the sandstone are primarily shallow and sandy, and are highly erodible on the steep slopes of Bantry Bay.

"Natural" is used here as a descriptor for those elements for the site that have not been managed, ie. the topography, geology and soils, native vegetation and fauna species.

3.1.2 Cultural Landscape

The Bantry Bay area was a cultural landscape well before Europeans inhabited Aboriginal lands. The various shell deposits and rock paintings provide evidence that Aboriginal people utilised the area for food gathering, hunting and for the making of implements. Aboriginal use of the land may have involved the practice of 'fire stick' farming, which would have given rise to a particular type of vegetation. That which exists today is probably quite different to that which the first Europeans saw.

The cultural landscape of the explosives magazine complex comprises the various built structures, as well as its distinct landscape areas.

Built structures include storage buildings, infrastructure and archaeological remains, which date from its period of operation between 1914-1974. These are generally located around both foreshores of the bay, with the majority of storage buildings located on the western side of the bay, recessed into the cliff face, and ancillary buildings located on the eastern side.

There are three distinct landscape areas within the complex, the area around the magazines; the area directly behind the magazines and to the fence line; and the informal terraces of the eastern shore, all of which have been transformed by earlier construction activities and management practices. The types of vegetation within these areas forms an integral part of its cultural landscape, and reflects its methodical removal and maintenance as a consequence of its specialised use.

The area around the magazines on the western shore and directly behind the magazines to the fence line present the newest landscape, and are a direct result of the construction and management of the magazine complex. The area behind the magazine buildings to the fence line contains a mixture of native re-growth and cultural plantings.

The areas directly surrounding the complex on both the western and eastern shores present the oldest landscapes, although have also been influenced to an extent by human intervention. The plant types located within this area are native, and the areas have the appearance of a pre-European landscape.

Figure 3.1.1 Forested slopes surrounding Bantry Bay, 2001.

Through its historic associations, the cultural landscape of the magazine complex also extends beyond its immediate boundaries, to include Powder Hulk Bay, HC Press Park, Castle Cove and Flat Rock.

Figure 3.1.2 Looking south towards H.C. Press Park and Seaforth, 2001

3.2 Greater Gu-Ring-Gai Setting

3.2.1 Natural Setting

The natural setting of the complex is dominated by the steeply forested slopes of native vegetation, which forms an enclosing and isolating landscape setting to the complex. Bantry Bay is one of the last significant areas of Sydney Harbour, which retains a bushland character and remains visibly free of urban development.

Topography, Geology and Soil Landscapes

Bantry Bay is part of the Hornsby Plateau sub-region of the Hawkesbury sandstone region, which was created during the Triassic Period, when it formed a freshwater basin.[41]

The landform around Bantry Bay rises to approximately 100 metres, and is typically divided by drowned river valleys and watercourses. Rocky outcrops and cliffs are frequent, offering views down Middle Harbour, south to Sydney and west to the Blue Mountains. The Magazine Complex was constructed on level ground along the shoreline, although part of this land has been reclaimed (or reformed) for construction purposes.

Two distinct geological formations occur within the study area and around Bantry Bay generally. The shorelines, hillslopes and ridges comprise Triassic Hawkesbury Sandstone, while the estuarine environment at the head of the bay comprises Quaternary alluvial and estuarine sediment deposits. The former consists of medium to coarse-grained quartz sandstones, with very minor shale and laminate lenses, while the latter consists of silty to peaty quartz, sand, silt and clays with shell layers.

Soil depth within the Bantry Bay area varies from nil on the plateau, to a metre of more in the gullies. Three soil landscapes occur around Bantry Bay. Soils of colluvial Hawkesbury soil landscape occur along the eastern and western shorelines of the bay, while soils of the estuarine Mangrove Creek soil landscape occur at the head of the bay. Soils of the erosional Lambert soil landscape occur upslope of the Hawkesbury soil landscape on the western side of Bantry Bay.

[41] The follow description of the natural setting has been sourced from the report *Overview of Flora and Fauna Populations: Recommendations for Bushland Management*, prepared by Urban Bushland Management Consultants, December 2000.

Native Vegetation, Weeds and Introduced Flora

The native vegetation within Bantry Bay comprises a mix of open woodland forest, heath, scrub and mangroves Until recently the native vegetation of the Bantry Bay has been protected by limitations on access and restricted development around the bay. However increasing urban development adjacent to the bay has altered the natural hydrological regimes and disrupted nutrient cycles, which has resulted in the establishment of weed plumes below development and degradation of drainage lines, in some areas extending to the foreshores of the bay.

Along the western shoreline weeds are gradually colonising all cleared and disturbed areas. Weeds are especially widespread on the landing platform and on the lower slopes behind the magazine complex, in particular the Creeping Fig (*Ficus pumila*).

Much of the bushland on the eastern side Bantry Bay was burnt during recent bushfires. The lower slopes however, comprising the picnic area and landing platform, were not burnt. Weeds and non-indigenous vegetation species have been introduced around the foreshores, site buildings and throughout the picnic grounds.

Approximately 35 species of conservation significance occur within Garigal National Park, of which five species are classified as 'threatened' under the *Threatened Species Conservation Act 1995*.

Of these, seven species of conservation significance may occur within the general vicinity of Bantry Bay (Refer 20.0), including *Acacia bynoeana, Caladenia tessellata, Eucalyptus camfieldii, Eucalyptus luehmanniana, Eucalyptus capitellata, Melaleuca deanei, Pimelea curviflora, Syzygium paniculatum* and *Tetratheca glandulosa.* .

Five additional species of local significance, and which are considered to occur in the Bantry Bay area include *Angophora crassifolia, Eucalyptus saligna, Gonocarous salsoloides, Lomandra brevis* and *Rulingia hermannfolia.*

None of the vegetation communities in the Bantry Bay area are listed under Schedules of the Threatened Species Conservation Act 1995. However Coastal Sandstone Heath has a very restricted distribution in the Sydney Metropolitan Region, and Sydney Sandstone Gully Forest is generally considered to have high local conservation significance.

Fauna

It is possible that many species which formerly occurred in the Bantry Bay area are no longer present due to impacts such as habitat destruction, limited fragment size, predation by introduced animals, and isolation by arterial roads. Declining water quality and altered fire regimes are also factors which could potentially threaten native fauna species. Nevertheless, the high structural and floristic diversity of Garigal National Park offers those fauna species that remain a wide variety of habitats.

Approximately 18 native mammals, 160 native birds and 23 native reptile species have been recorded with Garigal National Park. Of these tem mammals, 127 native birds and 38 native reptile species have been recorded, or are presumed to be present, with Bantry Bay (Refer 20.0).

Of those species recorded within Bantry Bay, only one species – The Southern Bandicoot *Isoodon obesulus*) – is listed as 'endangered' under Schedule 1 of the *Threatened Species Conservation Act 1995*.

3.2.2 The Aboriginal Landscape

The distribution of the known Aboriginal sites at Bantry Bay demonstrates that the Aboriginal occupants of the bay made their camps in sandstone overhangs and along the foreshore from where they could make use of the tidal mud flats, mangrove stands and rocky margins. These zones would have provided a rich supply of shellfish including mud whelk, *Pyrazus ebenins;* cockle*, Anadara trapezia;* mud oyster, *Ostrea angasi;* and rock oyster, *Saccostrea commercialis*. A wide variety of fish and avifauna would also have been available and hunted here.

The landforms located immediately behind the shoreline would have provided a relatively well watered environment attracting a wide range of animals, reptiles and birds. Fruits, nectar, roots and tubers from local plants would have richly augmented seafood and land animals. Trees and plants growing in the sandstone gullies, which provided fruits and berries, included Lillypilly, *Acmena smithii;* Native Grape, *Cissus;* Apple Berry, *Billardiera scandens;* Figs, *Ficus;* and native blackberry*, Rubus.* In winter staple plants foods were the starchy rhizomes of Bracken fern, *Pteridium esculentum;* and Bungwall fern, *Blechnum cartilagineum*. Wood, bark and vines of the shrubby woodlands and the low open forests in the sandstone landforms would have also provided materials for canoes, hunting and fishing spears, baskets, dishes, fishing lines, fishing nets and dilly bags. Movement through the thicker gullies and forested areas would have been facilitated by burning off, which would also have in turn attracted and/or increased existing fauna resources taking advantage of the regenerating vegetation.

3.3. Aboriginal Archaeological Resource

3.3.1 Greater Sydney Region

The greater Sydney region has been inhabited for at least 20,000 years as demonstrated by evidence from sheltered occupation sites in the Blue Mountains and its foothills. The earliest dated coastal sites are at Burrill Lake also dated to 20,000 years ago and at Bass Point dated to 17,000 years ago. These places would have been occupied at a time when the sea level was much lower and the present coastline would have been an inland environment drained by streams. There are no other Pleistocene, or sites dated to over 10,000 years ago on the Sydney coast. There are two sites dated to around 7,000 years ago, which are a sheltered midden at Curracurrang in Royal National Park and an open campsite containing a hearth at the Prince of Wales Hospital in Randwick. The majority of sites throughout the Sydney Basin are dated to within the last 2,500 years and, in the Sydney area demonstrate exploitation of marine resources after sea levels had stabilised.

Coastal sites in and around Sydney were largely ignored by archaeologists until relatively recently. The majority of sites investigated were located south of Sydney and the Georges River. Until recently the focus of investigations was on the stone artefacts made by the Aborigines in the past, the sequence of changes to their form and on comparisons with inland sites. More recent studies have focussed on the way the Aboriginal people adapted to the coastal environment and immediate hinterland.

Attenbrow (1987) argues that the early occupation was not intensive or by large groups of people and that around 5,000years ago when the sea levels stabilised at the present levels, more intensive use began. Many open sites were first occupied in the last 1,500 years. These arguments are also based on changes in stone tool assemblages and observable changes in the use of certain types of stone used in tool manufacture. The earlier phases of occupation are characterised by large cores and scraper tools. This is followed by the addition of a variety of backed implements, known as backed blades, geometric microliths or Bondi Points, to the larger tools around 5,000 years ago. By 1,500 years ago the backed

forms have gone out of use and the sites are characterised by quartz bi-polar artefacts and more opportunistic or undifferentiated small tools. It might be assumed that the many artefacts made on shell, bone or wood and observed at the time of the invasion were also in use in the past but these have not survived in the archaeological record. More recent excavation of foreshore sites in the Sydney area have all yielded dates of less than 4,000 years (Attenbrow 1990). Further inland, a rock shelter site in the Darling Mills Creek at West Pennant Hills, provided a radiocarbon date of 10,150 ± 130 BP (Wk-2511) and an Aboriginal hearth at the Prince of Wales Hospital was dated to 7,860 ± 50BP.

Specht (1976) excavated three rock shelters with midden to the north of the present study precinct at the mouth of Bantry Bay.

Sites in the Landscape
The distribution of Aboriginal sites is strongly related to bedrock geology and local topographic features, including elevation and water resources. Aboriginal sites have been located in all topographic contexts from valley floor to ridge tops. The most common Aboriginal site type in the coastal region is shell midden. These are most often low density scatters of shell, occasionally with some depth and often associated with other cultural remains such as stone tools, fish bone, hearths and burials. In areas of sandstone formations these middens are often found in rock overhangs. They may also be found in deposit adjacent to watercourses close to the aquatic resources. The survival of sites relates to the degree of past disturbance to landforms and in the context of the present study area least disturbed areas could be expected in any undeveloped land.

The sandstone formations also provide the medium for rock engraving and painted and drawn art. As early as 1890 Aboriginal art sites in the Sydney Basin were a focus of study with systematic attempts being made to locate and record engraving sites. Campbell (1899) identified and augmented earlier recordings of a number of rock engravings above Bantry Bay. Particular motifs within some of the engraving complexes had been previously identified as early as 1890 by Etheridge and in 1892 by Dalrymple-Hay, and in 1895 by Matthews. Campbell's recordings of these engravings showed them to be more extensive and complex than previously thought (Campbell 1899: 19-20; Plate 9 Fig 1; Plate 6 Figs1-5). More recent work (McDonald 1994) has shown that these early recorders also failed to identify all the motifs at these particular sites.

While it appears no-one observed the Aboriginal owners of Sydney making an engraving and apparently none were able or willing to tell the colonists who had made them or what they signified, it is certain that rock painting continued in Sydney after the invasion. For example, Aboriginal artists made pictures of sailing ships, soldiers and guns and cattle. Much of the interpretation of the engraving and painted art sites in the Sydney region is based on comparisons to areas for which information has survived or the art tradition continues.

3.3.2 Aboriginal Sites in Bantry Bay

There are eighteen (18) Aboriginal sites in the Bantry Bay area in the vicinity of the study precinct (see Table 3.3.1).

The site distribution pattern over Garigal National Park was subject to a preliminary investigation by Gunn in 1992. Gunn undertook a series of small site surveys within Garigal National Park but did not specifically investigate the eastern and western shores of Bantry Bay. He identified two clusters of sites to the north of the present study precinct as having archaeological significance. There have been only two archaeological surveys and site assessments since Gunn's study and these (Koettig 1993; Dallas 1997) focussed on one cluster at the Kimbriki Waste Recycling Depot to the north of the present study precinct.

While additional sites and areas of potential were located the regional pattern of site distribution and pre-contact land-use remains largely understudied.

The Bantry Bay sites include: open rock engraving sites, open and sheltered occupation sites and sheltered art sites. These sites represent a good selection of the range of site types that may be found in the Sydney region. These types of sites are briefly described below.

Occupation Sites
These sites exhibit evidence of the way the Aboriginal people occupied and utilised an area. They may comprise accumulations of discarded shellfish remains known as shell middens or layered deposits containing stone artefacts, hearths, and durable food remains. They may be in a sheltered or open contexts. Sheltered occupation sites are found in sandstone overhangs where weathering or erosion has formed sufficient space in a rock outcrop or sandstone formation to afford shelter from the elements. Shelters as small as 1x1x1m have been shown on excavation to contain occupation deposit. They may also contain art. Sheltered occupation sites are the most common type of occupation site identified in the Sydney region.

Open campsites comprising artefact scatters are rare in the Sydney region. Open shell middens are more common. They comprise a concentration of cultural remains that include a significant proportion of marine or freshwater shell. They are usually the result of interim or base camp activity and are normally located close to the aquatic environment and freshwater sources. They may also contain durable non-aquatic food remains or features such as bird, fish or animal bone and/or features such as hearths or stone tool workshops. Occasionally they contain burials.

Painted or Drawn Art Sites
The distribution of these sites relates to the occurrence of suitable rock outcrops and surfaces common in the Sydney sandstone formations. Painted or drawn art may be located on the ceilings or rear walls of an overhang. They may be in shelters, which contain occupation deposit or occur on their own. Aboriginal artists used a number of techniques to create paintings. Motifs may be drawn in charcoal or painted in ochres or white clay. Stencils of hands, body parts, implements, and plants may be made with ochre or clay. Art sites may contain single motifs or multiple depictions. Some shelters show repeated use for art and may contain overlapping motifs.

Rock Engravings
Engravings may be produced by the abrasion or percussion on flat even rock surfaces in either open or sheltered locations. They are often located on high vantage points along ridgelines at the headwaters of creeks but can be located on any suitable fine grained sandstone surface. Engraved designs include depictions of animals, fish, birds, humans, mythical beings and footprints and animal tracks. They may be in isolation or in large groups or compositions.

Burials
Burials are generally located in dry elevated soft sediments such as sand and alluvial silts. They are usually only visible where there has been some disturbance of the subsurface sediments or where erosion forces have exposed them. Burials are also found within rock shelter sites and midden deposits.

The earliest observations of Aboriginal mortuary practices in the Sydney region were made by officials and settlers of the First Fleet. The only forms observed were internment and

cremation. The ethnographic evidence has been summarised by McDonald (1994: 55-57), who argues that in Sydney the burial of the dead occurred in ad hoc, non-contiguous locations, usually in the open. Variations in methods have been related to age and initiation level and grave goods, consisting of personal possessions (fishing spears, throwing sticks etc) rather than ritual items were involved. Angas (1847 cited in McDonald) reported that older people were cremated and the young were buried beneath small mounds of soil.

There are no early accounts describing burial in middens or sand bodies, such as beach sand dunes. The only early references to burial in rock shelters relate to deaths from the 1789 epidemic. However the surviving archaeological evidence indicates these places were commonly used as burial places along the coastal strip, such as the example within a sheltered overhang within the Balls Head Reserve at Waverton.

The Australian Museum and Shellshear Museum collection of Aboriginal skeletal material for the Sydney region is limited to the coastal strip (ie, up to 5km inland) and all have been reportedly retrieved from shell midden deposits in coastal sand formations or in sheltered deposits in sandstone overhangs. These collections are made up of individuals incidentally uncovered and retrieved by archaeological excavation. The archaeological evidence indicates interment in living sites, often of several individuals. These burials are associated with habitation remains. There are no cemeteries (ie. places specifically set aside for the disposal of the dead and which have no occupation evidence) known for the Sydney Region.

Repatriation of these remains to the relevant Aboriginal communities for re-burial is a major priority of the Aboriginal community and the NSW State Land Council and the NPWS is assisting in this process.

Other site types which could be expected to have survived in the Bantry Bay area include:

Scarred or Carved Trees
These sites are extremely rare in urban areas. They result from bark or wood removal to make shields, shelters, canoes, containers, and/or carved designs into exposed wood. Few have survived in a natural state because of past timber clearance, bush fire regimes and rate of deterioration. Unless the tree is at least 100 years old the scarring is unlikely to be of Aboriginal origin. There are no known scarred trees in the Bantry Bay area although this may be because of a lack of systematic survey.

Axe Grinding Groove Sites
These are elliptical grooves in sandstone, which result from the manufacture of, or maintenance of, the working edge of a stone hatchet. They may be found where suitable sandstone is exposed in or adjacent to water sources. They are often found in sandstone creek beds or on rock platforms associated with rock pools to enable a wet-grinding technique.

Table 3.3.1 Nearest Known Aboriginal Sites

NPWS Site #	Grid Reference 1:25k	Site Type/Description	Comment
45-6-2205	335970 6260650	Open shell midden plus artefact scatter located on bush track from Killarney Drive around western foreshore of Bantry Bay.	Recorded by M.Guider 1.8.90. Site located outside Study Precinct approx. 200 to south.
45-6-12	335919 6261489	Rock shelter with art	Recorded by J. Specht 1.1.77. Located at mouth of Bantry Bay 400m north of study precinct.
45-6-13	335921 6261397	Rock shelter with shell midden	Recorded by J. Specht 1.1.77. Located at mouth of Bantry Bay 400m north of study precinct.
45-6-16	335921 6261397	Rock shelter with shell midden	Recorded by J. Specht 1.1.77. Located at mouth of Bantry Bay 400m north of study precinct. Excavated and dated.
45-6-2050-54	336190 621020-1390	5 sites: rock shelters with shell midden or art; open campsites; shell midden	Recorded By M. Guider 1.3.90 along eastern foreshore of Bantry Bay between 200 and 700m north of the study precinct.
45-6-17	336295 6260947	Rock shelter with shell midden	Recorded by J. Specht 1.1.77. Located above creek draining into Bantry Bay 80m to the north east of study precinct.
*45-6-2046	3362100 6260780	Open shell midden on shore within study precinct	Recorded By M. Guider 1.3.90. Located at northern end of the eastern precinct. Site destroyed by foreshore erosion and landscaping.
*45-6-2047	3362100 6260820	Open shell midden on shore within study precinct	Recorded By M. Guider 1.3.90. Located at northern end of the eastern precinct. Site destroyed by foreshore erosion and landscaping.
*45-6-2045	336210 6260690	Rock shelter with shell midden	Recorded By M. Guider 1.3.90. Present survey found no overhangs at this location.

*45-6-2044	336210 6260650	Open camp site	Recorded By M. Guider 1.3.90. Located in spoil from Old Bullock track cutting south in intermittent scatter to Testing Shed.
45-6-2043, 8 and 9		Rock shelters with shell midden	Located up slope and 3-400m to east of study precinct.

* Denotes sites located within the study area.

3.3.3 Aboriginal Sites located within the Study Area

There are no Sites located within the western shore precinct.

An attempt was made to relocate the sites identified as being located within the upslope of the eastern precinct as part of the present study. All the sites relocated are heavily disturbed by past land use practices, and some retain little or no site integrity or archaeological potential.

3.3.4 Summary

Known Aboriginal Sites within the eastern shore precinct include the following:

NPWS Site # 45-6-2045 is reported to be a shelter with midden, however no overhang or suitable shelter site is located at the grid reference recorded.

NPWS Site # 45-6-2046 and **2047** are recorded as being located in the vicinity of the main eastern shore complex. The survey found no *in situ* or readily identifiable open midden or camp sites in this area. The shell material present along the foreshore is a mixture of old and recent material, often heavily fragmented and mixed with European debris. No clearly discernible lens or surface scatter of shell material to which an Aboriginal origin could be ascribed was identified. No areas of potentially undisturbed significant artefact bearing deposit or shell midden deposit was identified.

NPWS Site # 45-6-2044 is recorded as being located in the vicinity of the Testing Shed (Photo 3.3.1 and 3.3.2). The present survey identified surface scatters of disturbed shell midden deposit across the knoll on which the Testing Shed is located, and over isolated exposures between the Shed and the Old Bullock Track. Disturbances include surface erosion, scouring and sub-surface gouging, grading, road cutting and excavation. The full sub-surface condition and lateral distribution of this site is not known.

Figure 3.3.1 Eastern half of the Midden at NPWS Site # 45-6-2044

Figure 3.3.2 Western half of midden at NPWS Site # 45-6-2044

3.4. Resource Exploitation

3.4.1 Old Bullock Track

The Old Bullock Track, established by 1856, provided access to a wharf at Bantry Bay to service the saw millers established in the area during the mid nineteenth century. Entry onto the Old Bullock Track can be obtained from two locations, either off the Engravings Track off Bantry Bay Road, Frenchs Forest, or from Seaforth Oval via the Wakehurst Parkway.

The Old Bullock Track appears as a cobblestone pathway, the outer walls of which have been formed from hand cut sandstone blocks (Photo 3.4.1). There are three water culverts cut from rock along the length of the track, and the remains of an old stone bridge. Where the track crosses natural sandstone outcrops, the surface has been "pecked" to provide traction. Concrete piers mark the location of a former jetty at the base of the track (Photo 3.4.2).

The track also has disturbed shell deposits, which are possibly the remains of an Aboriginal midden deposit where it cuts into the hillside immediately above the foreshore. The shell remains are so dispersed and fragmented however, that ascription to an Aboriginal midden is extremely difficult.

Figure 3.4.1 Old Bullock Track, 2001

3.4.2 Lime Burners' and Oyster Gathers

Lime burners, who exploited the deposits of shells and possibly the middens of Bantry Bay, and seasonal oyster gatherers would have most likely camped at the bay. A seasonal camp site was located on a rise above the waterfall on the eastern shore, approximately at the location of the Walter's cottage, however there is no longer any evidence of this camp remaining. A cave on the eastern foreshore would appear to be at the location of a known lime burning activity.[42] The impact of the lime-burners and oyster gatherers on Aboriginal sites on the eastern shore would have ranged from mining and destruction of middens, to the probable disturbance of shell deposits as a result of recent occupation.

[42] Refer c.1856 Plan of the Eastern Shore (Figure 2.2.1). NSW Department of Lands.

3.5 Recreational Use

3.5.1 Walters Family

The clearing of the hillside on the eastern shore of the bay was most likely begun by the Walters family, who resided here at a cottage from 1888. The remains of a garden layout in stone and brick would most likely have been begun by the Walters family. The cottage has since been demolished, date unknown, and there is evidence of the stone footings.

3.5.2 Balmain New Ferry Company

Further clearing and terracing of the eastern shore was most likely undertaken by the Balmain New Ferry Company, who would have had the resources to do such work. The terraces would have housed the dining room and various garden structures, which formed part of the pleasure garden.

Terracing and construction of retention walls would have had a similar impact on the open Aboriginal sites and middens along the lower slopes and foreshore as the lime burners and oyster gatherers.

A track cut through the bush to the waterfall appears to be from the pleasure garden period, and has left distinct markings on the stone for easier tread. The stone around the waterfall has been shaped to provide seating adjacent to the waterfall, to provide a “shady fern glen” for picnickers.

The stone footings of the dance hall remain at the foreshore between the jetty and slipway. This building was later used as a store and workshop for the magazine complex, after some refurbishment.

3.6 Bantry Bay Explosives Magazine Complex

The explosives magazine complex is located on the foreshores around either side of Bantry Bay. The majority of the magazine buildings of the complex are located on the reclaimed land around the western side of the bay, within individual cuttings excavated into the hillside, although three later magazine buildings are located near the foreshore. The majority of the ancillary facilities of the complex were located on the eastern side, and have been largely demolished. There remains some evidence of these however, in the various footings and other archaeological remains on this side of the bay.

There is no road access into either side of the complex, and access can only be gained by either water or walking track. Access into the western side of the complex has been prohibited since the closure of the magazine, mostly due to the high level of contamination of the soil and fabric of the buildings. Access to the eastern side is available to the public via a number of walking tracks, and this side makes a pleasant picnic spot overlooking the magazine complex and bay. The first walking track follows the line of the old Bullock Track, entering the site from the south, and is accessed from Seaforth oval. This track is arduous, however provides spectacular views of the bay and the complex on the western shore. Other tracks include the Bluff Track, which enters the site from the north and follows the line of the waterfront as the bay Track, the Engraving Track, which extends along the Wakehurst Parkway from the Bantry Bay Road in the north, and the Timber Getters Track.

3.6.1 Precinct Identification

For the purpose of this report, the study area has been divided into three distinct precincts, based on their geographical and historical associations, being (Precinct 1) the western shore, (Precinct 2) the eastern shore and (Precinct 3) the bay. The precincts are described in further detail below.

Precinct 1: Western Shore

The western shore has been solely used for the explosives magazine complex since construction began in 1911. Prior to this, the shore was bushland. Precinct 1 extends from the sea wall on the eastern side, to the fence line of the explosives magazine complex. The western shore contains the following buildings and archaeological elements related to the explosives magazine complex:

- brick and concrete air raid shelter;
- timber and iron examining room;
- nine brick storage magazines excavated into the cliff face;
- receiving shed partially built out over the bay;
- three “temporary” brick storage magazines at the water’s edge;
- small brick detonator shed; and
- infrastructure, including a series of stone cuttings and retaining walls, concrete concourse and surrounds, a series of rail tracks and turntables, concrete and sandstone sea wall, timber jetty, reservoir, drainage lines; and septic tanks.

Precinct 2: Eastern Shore

The eastern shore has had a more layered history having been used prior to the establishment of the Explosives Magazine complex, by saw millers, as a private residence, picnic and pleasure grounds and later the administrative functions of the magazines. The eastern shore comprises the following building and archaeological elements related to the magazine complex:

- concrete piers of the former officers’ quarters and watchman’s cottage;
- small pontoon;
- small timber structure used by NPWS;
- timber jetty;
- stone piers of the former Balmain New Ferry Company Dance Pavilion (later to become a store and workshop as part of the magazine complex);
- remains of a slipway including winch;
- concrete piers of the former boatshed;
- concrete piers at the location of a jetty at the end of the Old Bullock Track; and
- former testing shed.

The following archaeological elements on the eastern shore pre-date the operation of the magazine complex:

- Stone footings of the Walter’s family cottage
- Track and stone cuttings to the waterfall
- Old Bullock Track
- remains of a lime burners cave
- stone terrace walls and borders
- garden layout

- deposits of domestic building materials

Precinct 3: Bay

The bay possibly comprises the following elements and potential archaeological remains related to the magazine complex:

- pontoon at the northern end constructed during repair work to the sea wall;
- domestic/industrial deposits;
- remains of jetties;
- anchorages for the lighters;
- remains of submarine cable; and
- possible shipwrecks.

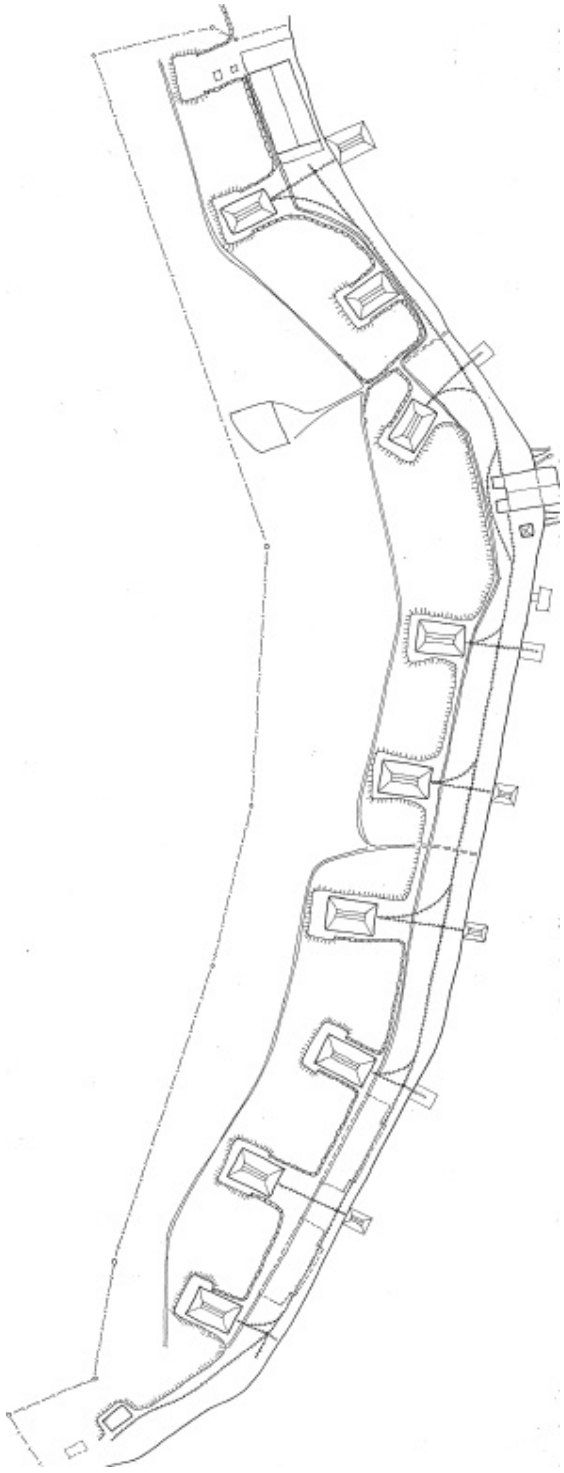

Figure 3.6.1 Precinct 1, the western shore of Bantry Bay. (1:1000)

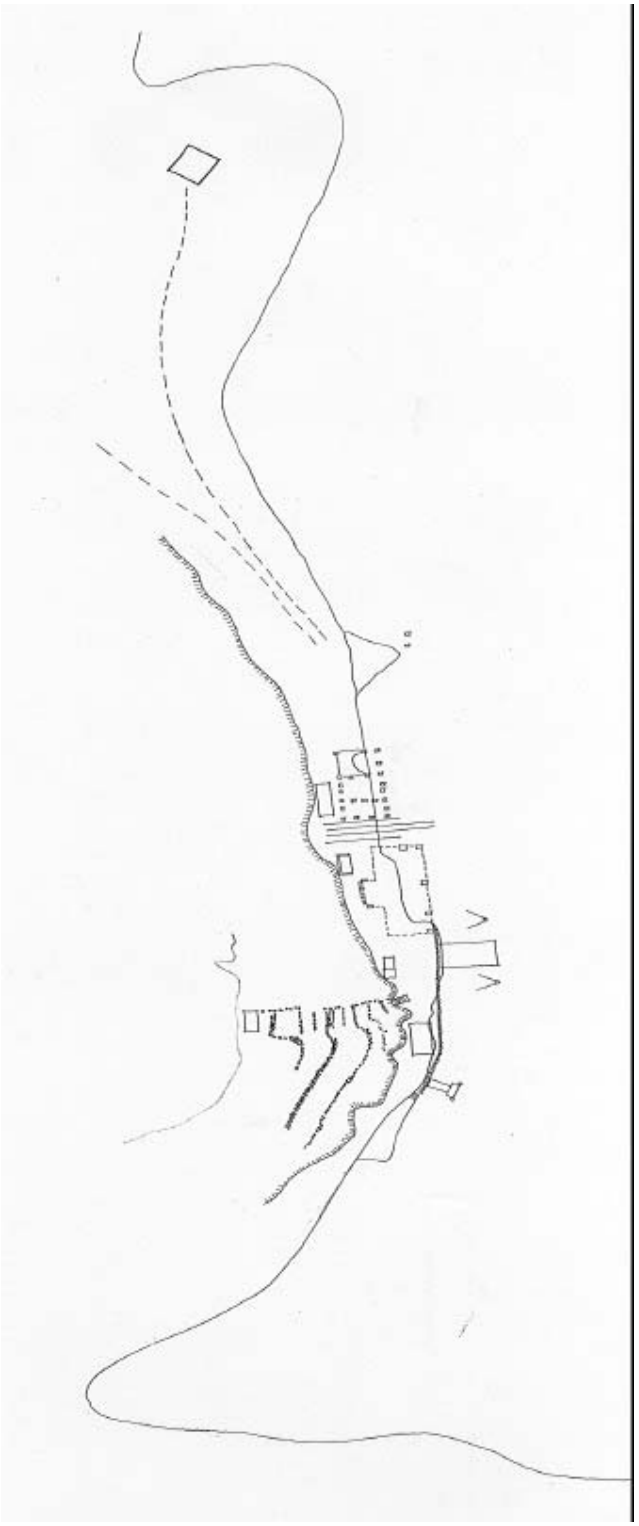

Figure 3.6.2 Precinct 2, eastern shore of Bantry Bay (1:1000)

3.6.2 Development of the Magazine Complex Setting

The site for the magazine complex was chosen for a number of specific safety and administrative reasons. Bantry Bay's isolation from the city and the principal centres of population was considered to be advantageous as a means to reduce the consequences of an explosion. To this extent an area of land around the complex was reserved, including the hillsides on either side of the bay, Flat Rock Beach and the present H.C. Press Park opposite the entrance to the bay. The reservation of this land has determined the nature of development of the surrounding suburbs, and has resulted in large areas of Middle Harbour retaining a green character, free of residential and foreshore development.

The steepness of the hillsides on the western side of the bay, meant that greater lateral protection could be secured by placing each of the magazines into a separate open cut at the base of the hill, such that solid earth and rock could be interposed between each of them. The nine original magazines are located within embrasures into the hillside, rock cuttings or retaining walls. A tenth embrasure at the southern end of the complex remains vacant, the intended tenth magazine not having been constructed.

The water on the western side of the bay was also deeper than on the eastern side, which allowed the lighters to approach close into the shore, thereby reducing the expense required in building long jetties, and improving the handling of the explosives generally.

The easterly and north-easterly aspect of the site was also considered an advantage, in that the site would receive morning light in winter time, which was important considering most of the work was undertaken in the early morning, between the hours of 6-8am. This protected the complex from the cold westerly winds, while benefiting from the cooling north easterly winds in summer, and shade from the westerly afternoon sun. This was an important consideration as explosives must be maintained at constant temperatures.

The development of the bay for military stores and other purposes had a direct effect on the survival of Aboriginal sites. On the western shore the extensive cut back into the foreshore rock formations for the magazine buildings, possibly destroyed sandstone overhangs in which occupation/painted art sites may have been located, and levelled sandstone outcrops on which engravings often occur. The reclamation of the foreshore, which included levelling, filling and construction of retention walls may have also destroyed open sites and middens on or near the shoreline.

3.6.3 Development of the Landscape Setting

The vegetation on the western shore reflects the distinctive and methodical removal and maintenance of the bush for fire protection. The eastern shore retains a picnic ground landscape of mown grass and terraced walls.

There are three distinctive landscape zones to the site:

A. The flat area around the magazines which consists of grasses, *Coreopsis sp* and other cultural plantings. This area consists of fill cut from the rock shelf (Precinct 1).

B. The area behind the magazines, defined as the firebreak area to the existing fence line. This consists of recently colonised vegetation communities, which have developed since the complex closed in 1974. The area does not have the maturity of the natural vegetation of the landscape higher up the slopes, reflecting the former landscape management practices of bush removal. Planting is a mixture of native regrowth and cultural planting of *Ficus pumila*, an evergreen vine planted as part of the initial landscape treatment of the site (Precinct 1).

C. The eastern shore landscape is a series of informal terraces with remnant planting of Cypresses from the former administration quarters (no longer in existence), and further cultural planting for recreational purposes in the form of *Ficus macrophylla* (Precinct 2).

Precinct 1: Western Shore

The largest impact on the development of the landscape setting around the magazine complex was the line of bush removal to the west of the complex for the control of bushfire. A substantial area was cleared to the rear of the magazines exposing the topography of sandstone rock ledges leading down toward the waters edge leaving a sub herbaceous layer adjacent to the ground. This can be clearly seen in Figure 2.3.1. Supplementing this cleared area was the line of drains and a dam at the rear of the complex, which supplied water for fire fighting and building cooling purposes. This maintained area clearly exposed the magazines along the western foreshore and the rock cutting that was located between the magazines.

Figure 3.6.3 Magazine No.2, showing hydrangeas and weed (Coreopsis SP) *covering concourse, 2001*

The remains of cultural plantings around the rock face (*Ficus pumila*) are still evident today. Supplementary planting of Hydrangeas (probably planted in the 1950's) brought a domestic quality to the place. The reclaimed areas between the magazines consisted of buffalo grass which currently have a flowering weed species (*Coreopsis sp*) interspersed through the grass. The complex, when in operation, exhibited a strict maintenance program reflecting the accepted practices of moving explosives which included the removal from site of any potential fire hazard.

Since NPWS became the land managers, the severe line of vegetation removal to the western section has been unnecessary. This has led to regeneration of the bushland to the immediate surrounds of the complex, resulting in an obscuring of the buildings and their original purpose.

Figure 3.6.4 Fig vine (Ficus Pumila*) covering the stone retaining wall, 2001*

Precinct 2: Eastern Shore

The eastern shore landscape is the result of a number of different uses. The clearing at the southern end was the termination point for the bullock track that led down from timber cutting locations in French's Forest. The Walters family established a small cottage from 1888 at the northern end. The remains of garden edging may exist from this time. The development of the pleasure grounds saw further clearing of the area and construction of a series of small stone terraces. A pathway exists to the waterfall and creek a short way to the north. With the establishment of the magazine complex, the clearings on the eastern shore were used for supporting buildings and infrastructure for the complex. The policy for clearing undertaken on the western shore appears to have been repeated in this location, and of the remaining planting, the Cypresses, and typical planting of the 1950's are the only plants which pre-date occupation by the National Parks and Wildlife Service. With the NPWS there has been some relatively recent planting of *Ficus macrophylla* as a shade tree to the area, and the cleared area, determined in general by the grass, remains as picnic grounds with a number of timber tables. An early toilet block and shed have been retained by the Service.

Figure 3.6.5 The complex on the eastern shore as seen from the western shore, 2001

3.6.4 Description of Key Building and Site Elements

Precinct 1: Western Shore

Magazines Nos. 2-8, 10 and 12

The original nine storage Magazines Nos. 2-8, 10 and 12 were originally designed as high security storage facilities for explosives. Their design reflects their main purpose of preventing and containing potential explosions.

The Magazines are identical in design, each magazine being 13.7 metres by 8.7 metres, and capable of holding 50 tonnes or 2,000 cases of explosives. The buildings essentially comprise a single large internal space, with a smaller trolley bay area at the front separated by a concrete insulating wall. The iron rail tracks extend into this trolley bay area. Access into the building is provided through central iron double doors, hinged onto sandstone anchor blocks. The door opening has a semi-arched head of polychromatic brickwork. Two windows on either side provide natural light and ventilation to the trolley bay area, and have internal timber shutters and external iron shutters. The main storage area is lit by a single window on the rear wall. Window openings have sandstone lintels and anchor blocks for the external shutters, and polychromatic bullnose brick sills.

The buildings are of cavity brick construction, comprising a 280mm brick cavity wall, a 60mm cavity and a 50mm concrete interior insulating wall which is cement rendered. The building is divided into four bays by brick piers along the side walls. Iron vents around the base of the walls have solid panels, which could be closed to contain fires. The ceilings are concrete, located at a height of 3.6 metres, and designed to contain and absorb the force of explosions.

The separate half gabled roof structures over the buildings are of light weight construction, comprising iron trusses covered with corrugated iron, with wide over-hanging eaves on all sides to shade the building. The eaves are supported by iron struts on sandstone brackets. The half gable ends have wide corrugated iron sheeting. The resultant air space between the ceiling and roof helps to reduce the reflected heat and cool the building, which is ventilated by two large ceiling ducts. The roofs were originally fitted with lightning conductors and sprinklers, which could be activated to cool the buildings, receiving water from the dam above the magazine complex. The floors are timber parquetry, comprising of short lengths of tongue and groove hardwood, set on a concrete slab.

Figure 3.6.6 Detail of magazine No.8, 2001

Figure 3.6.7 Detail of iron double doors, 2001

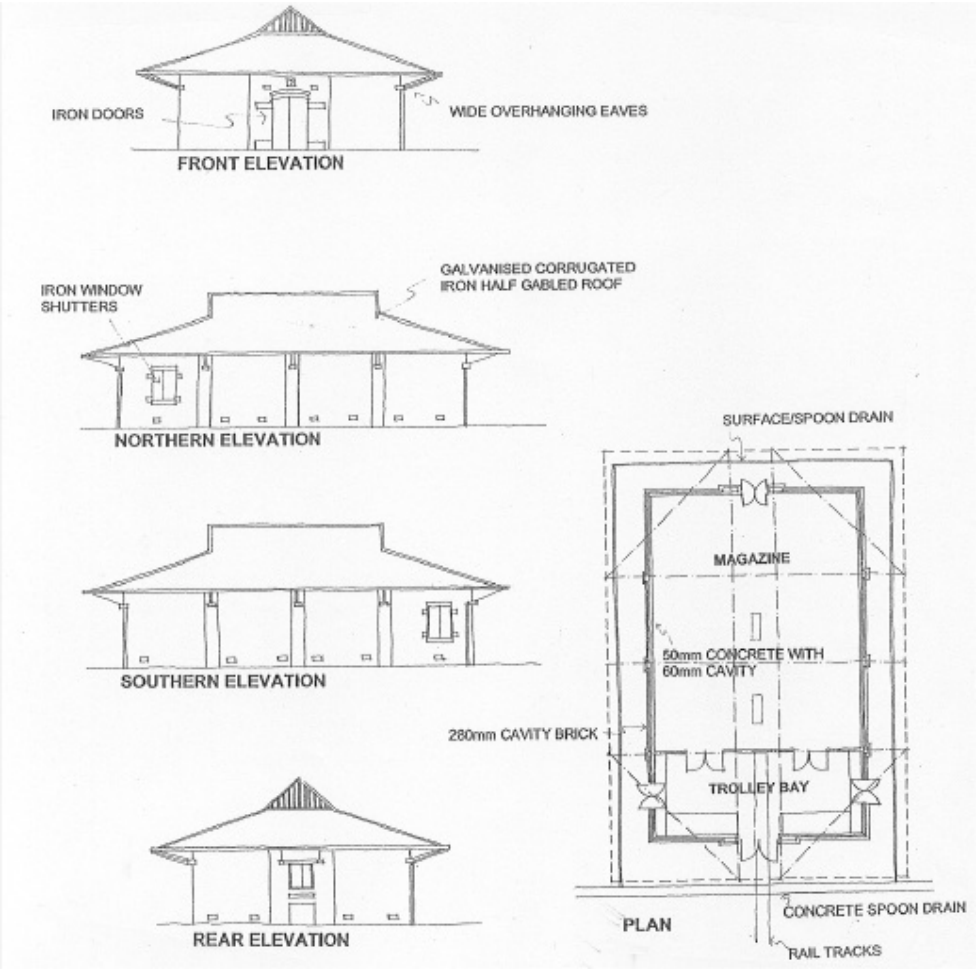

Figure 3.6.8 Magazines Nos.2-8, 10 and 12.(Scale 1:200)

Receiving Shed No. 1

The receiving shed No. 1 was designed with a similar construction technique to magazines 2-8, 10 and 12, and has brick cavity walls, internal concrete insulating wall which is cement rendered, a concrete ceiling, timber parquetry floor on a concrete slab, and gable roof of galvanised iron. The receiving shed is not recessed into the cliff face however, but built over the water to allow the unloading of the lighters at low tide. The building is supported on concrete piers set into the harbour floor.

The original building layout remains, comprising of a single large internal space projecting over the bay, and a narrow trolley bay at the rear of the building for the transfer of explosives, which could be accessed from either side, and which straddled the rail tracks.
The floor level of the main portion of the magazine is approximately 600mm above the level of the trolley bay, to facilitate the transfer of material directly onto the trolleys.

The main portion of the building has four windows along either side, with internal timber shutters and external iron shutters, and two sets of double doors facing onto the water, which allowed for the unloading of the lighters. The window openings have stone lintels and anchor blocks for the steel shutters, and the door openings have semi-arched heads of polychromatic brickwork, and similar stone anchor blocks for the external steel double doors. Similar door openings provide access into the trolley bay on either side of the building. Two small toilet blocks are located at the rear of the building on either side, and are not housed under the main portion of the building, but rather are located under flat roofs behind parapet walls.

Figure 3.6.9 Receiving shed and telegraph office, including magazines No. 7 & 9, 2001

Figure 3.6.10 Detail of southern elevation of receiving shed, 2001

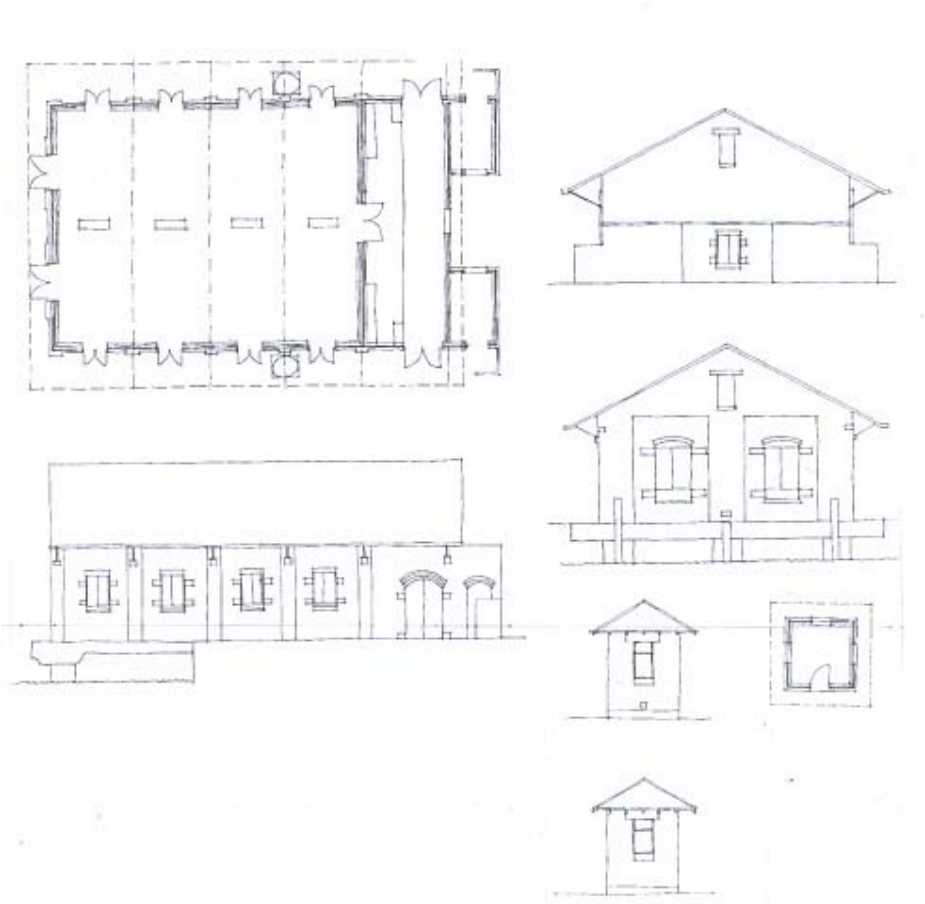

Figure 3.6.11 Receiving shed No 1 and telegraph exchange (Scale 1:200)

Adjacent to the receiving shed on the northern side is a small square building with double brick walls and a hipped roof of corrugated iron, which was originally a small office and telephone exchange. This building is square in shape, and has window openings on three sides, and a door opening facing the bay. This building has a timber parquetry floor, and its walls and ceilings are lined with timber. Although the construction date of this building is unknown, its materials and construction would indicate that it was also constructed in the initial phase of development in 1915.

Magazine No. 9

Magazine No. 9 is the southern most magazine at the site. Constructed in 1916, this magazine was intended to be of a temporary nature, which is reflected in its different construction style and location at the water's edge. The building has single brick walls, with internal galvanised iron wall lining, and a gabled roof of corrugated iron with no overhanging eaves or guttering. There are double sliding iron doors on the northern end, and a single central matching sliding door on the southern end, which have concrete lintels.

A skillion verandah along the northern end of the building has been substantially demolished due to fire, and has a timber floor, post and roof structure, and corrugated iron roof sheeting. Internally the building consists of a single large open space for the storage of explosives. The floor is timber tongue and groove, and the ceiling is asbestos cement.

Figure 3.6.12 Magazine No.9 at waterfront, 2001

Figure 3.6.13 Partially demolished verandah to magazine No.9, 2001

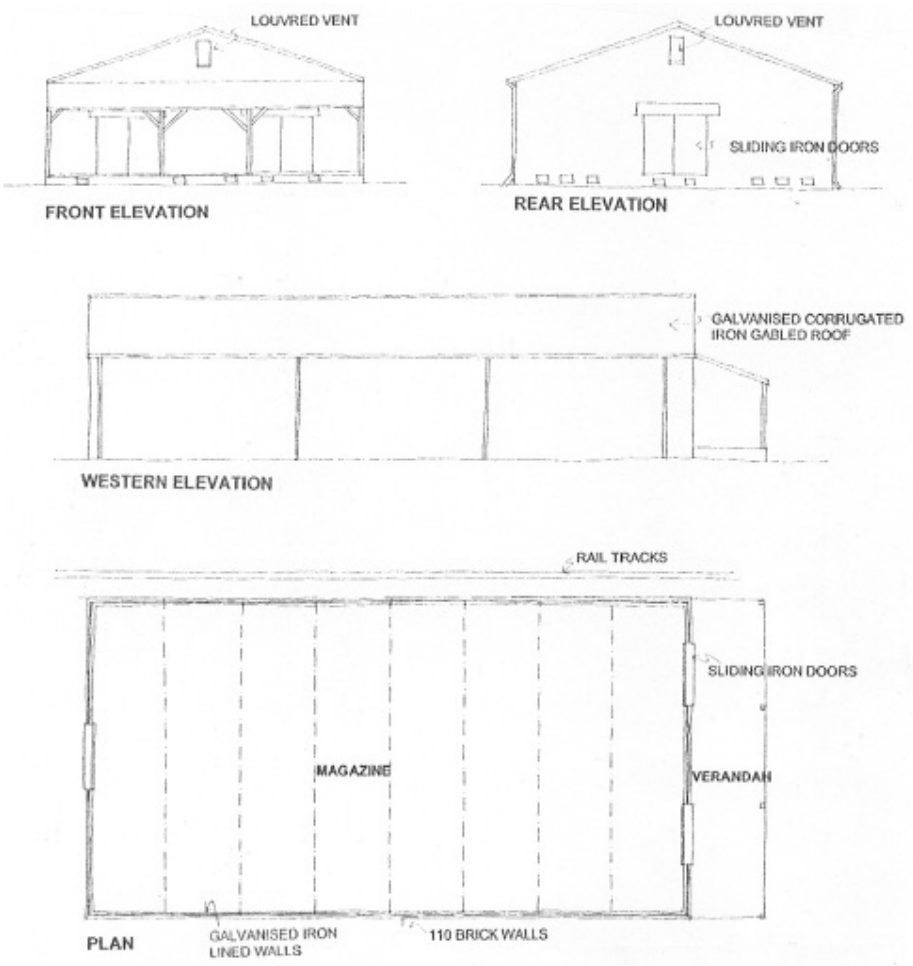

Figure 3.6.14 Magazine No.9 (Scale 1:200)

Magazines Nos. 14 and 16

Magazines Nos. 14 and 16 were also originally intended to be temporary, and are of a similar construction to Magazine No. 9. These buildings are also located at the water's edge at the northern end of the site, between Magazines Nos. 10 and 12, and Nos. 8 and 10 respectively, with openings facing the rail line.

The buildings comprise three smaller internal spaces, the central space being slightly larger than the outer two, each with its own separate entrance facing onto the bay. Each of the entrances are protruding slightly from the front facade, and are elevated off the ground by approximately 600mm, unlike the remainder of the buildings at the site. The external walls of the buildings are single brick, with an internal timber framed stud wall lined with asbestos sheeting. There is a small central window opening on each of the side and rear elevations, which has a single external steel shutter. The rear brick wall of the building, which is single brick, is set back from this internal wall, forming a cavity of approximately 700mm wide, at the base of which runs a shallow concrete drain, most likely used as part of the cooling system of the building. This rear wall is tied back to the building by a series of metal rods, which protrude past the rear facade in a grid like fashion. The party walls between each of the spaces are double brick, and extend out past the rear wall. These party walls do not extend the full depth of the rear cavity, and a number of holes in the brickwork facilitate air movement through the cavity.

Figure 3.6.15 Magazines No.14 & 16, 2001

The roofs of both buildings are a simple skillion form, supported by timber rafters and clad with corrugated iron. Of note is that these rafters are supported at the front of the building on the internal timber stud wall, and not the outer brick wall. The roof has a small overhang to the front only, and a simple timber barge fascia on the three remaining sides. There remains evidence of a former verandah over the entrances, which has since been largely removed. A single gutter is located along the front facade of the building, which drains along diagonal downpipes on either side of the building to the shallow drain at the rear. Internally the building has an asbestos battened ceiling, and timber boarded floor. The floor structure is timber supported on brick piers, which are resting on the original external concrete surrounds of the complex.

Examining Shed

The former examining shed at the northern end of the site would appear to be essentially in its original form and construction, although relocated on a number of occasions, from

Powderhulk Bay to the southern end of the site c.1914, and then to its present location in 1919. It is a timber framed building, supported on brick piers and clad with flat iron sheeting, and has a half-gabled roof of corrugated iron. The external walls have been painted, and are flaking. There are two door openings on either side of a central window opening on the side facing the bay. The doors are solid iron, and the window opening has an external solid iron shutter and internal timber shutter. There remains evidence of the rail track, which ran along the front of the building. The building consists of a single large internal space for examining, and a small entry porch at the northern end of the building. Internally the building has timber-boarded walls and ceiling, and a timber floor structure.

Figure 3.6.16 Examining shed, 2001

Air Raid Shelter

At the far northern end of the site is a small building of cement rendered brick wall construction, with a concrete floor and flat roof, which is thought to be a former air-raid shelter constructed during the second World War, given its distinctive form and construction. Although not documented, it was most likely constructed between 1939-1945.

Figure 3.6.17 Air raid shelter, 2001

Detonator Storage Shed

A small brick building located within the empty southern-most cutting on the western shore would appear to be that used for the storage of detonators. This building is square in shape, and appears to have been constructed around a timber rail carriage, utilised for the transportation of explosives at the complex. The building has a timber floor and a flat corrugated iron roof.

Figure 3.6.18 Detonator storage shed

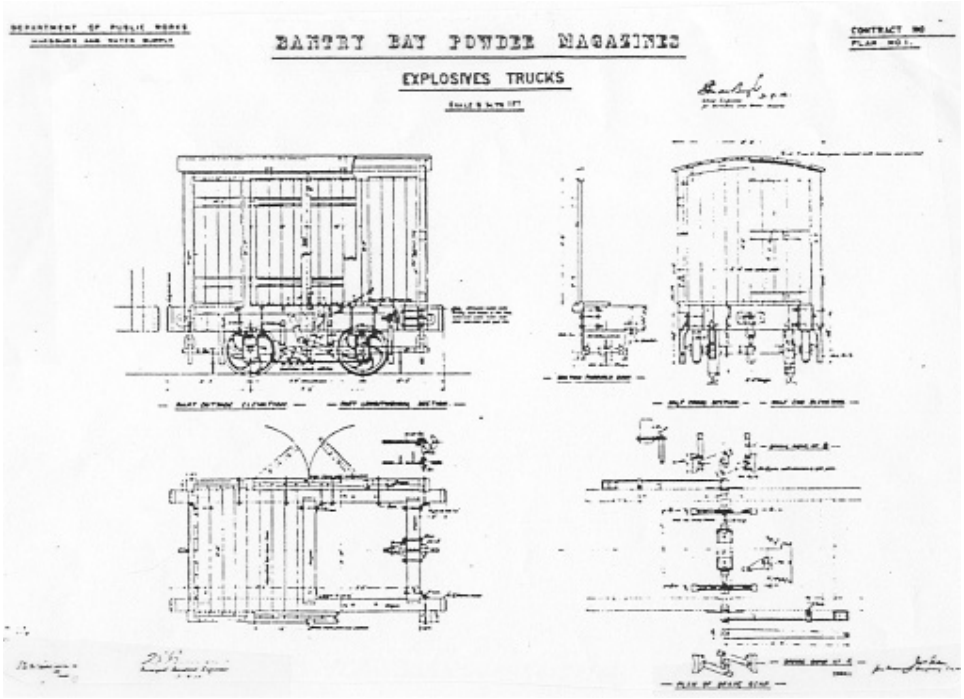

Figure 3.6.19 Timber light rail trolley, Department of Public Works, n.d.

Infrastructure

The majority of the open concourse area of the complex is covered with concrete, a requirement for the safe and expedient handling of explosives (as it provided an even surface), and which reduced the risk of spread of fire. Each of the original nine magazine buildings recessed into the cliff are also surrounded by a concrete apron. Drainage through the site was provided around each of the recessed magazine buildings in the form of surface/spoon drains, generally constructed of terracotta. These fed into a larger concrete spoon drain running along the front of the buildings, and also along the rear of Magazines Nos. 14 and 16, and which feed into the bay via culverts. An open stone drain extends along the rear of the magazine buildings, which feeds into culverts and then into the bay at a number of locations. Two septic tanks were provided adjacent to the Receiving Shed, the wells of which remain.

Figure 3.6.20 Stone retaining wall on concourse, with light rail track in front, 2001

Much of the original rail line which extended the full length of the magazine complex remains, as does several of its branch lines and turntables. The line originally linked each of the nine original magazine storage buildings and the examining room to the Receiving Shed. Smaller branch lines provided direct access to the water for easier and more efficient loading and unloading of the explosives, except infront of Magazine No. 5 which was located virtually at the water's edge, and a turntable was provided where these crossed with the main line. The rail line extends underneath Magazine No. 16, a result of the later construction of this magazine.

A stone and concrete sea wall extends along the full length of the magazine. The original stone seawall was constructed in 1911, as part of the reclamation process, however only a small length of this original wall remains, at the southern end of the complex, and is in poor condition. Major repairs to the seawall were undertaken in 1988, and the majority was replaced with a new concrete seawall, although much of the stone remains at the site, having fallen into the bay. Only one of the original six timber jetties remains, located in front of Magazine No. 6, at an original location.

Figure 3.6.21 Concrete concourse with light rail tracks and turntable, 2001

Where the embankment of the cliff face was insufficient to allow adequate separation between the magazine buildings, separation was achieved through the construction of stone retaining walls infilled with rubble. These stone retaining walls were constructed south of Magazine No. 5 and around No. 7, adjacent to No. 3, and to the north of No. 6, including Nos. 8-12.

On the rise above Magazines Nos. 3 and 5 is a concrete dam, constructed as part of the fire prevention mechanism at the site. Overflow from the dam runs along a stone gully and through an underground drain, to be piped into the bay.

Figure 3.6.22 Section of reconstructed seawall, 2001

Precinct 2: Eastern Shore

Testing Shed

A small timber framed and corrugated iron clad building, with a half-gabled roof of corrugated iron, is located at the southern most end on the eastern shore, and would appear to be a former testing shed associated with the Explosives Magazine complex. The building is sited at the top of a small rise above the water, and is in very poor condition, the internal timber wall lining and timber floor having been removed. At the centre of the building is a sturdy concrete base, which could have held machinery.

Figure 3.6.23 Testing shed

Concrete Piers of the former Officers' Quarters

These are located at the northern end of the site, set into the natural rock at the water's edge. A cutting in the stone behind would appear to be where two water tanks were located behind the building.

Pontoon

A small pontoon at the northern end of the site is accessed via a timber ramp, and would appear to be that which was located in front of the former Officers' Quarters. It is presently located just to the north of the ranger's accommodation building.

Stone Seawall and Timber Jetty

There is a small timber jetty approximately halfway around the bay, which is supported on concrete pylons over the bay. On either side are the heavy timber stays onto which the lighters were secured during the operation of the magazine complex.

A stone seawall extends around the eastern shore between the pontoon and jetty. To both the north and the south extends the stone rubble of the reclaimed land.

Ranger's Accommodation

A small timber structure to the north of the jetty, which appears to date from at least 1931, provides overnight ranger's accommodation for NPWS, and is a simple timber framed and clad structure, with a skillion roof of corrugated iron. This structure was formerly a lunch room and or/watchman's office for the magazine complex.

Figure 3.6.24 Stone sea wall, ranger accommodation and concourse, 2001

Toilet

A small gabled structure opposite the jetty is a single toilet block, and has painted brick walls and a corrugated iron roof. A brick skillion structure on the southern side is a later addition.

Stone Piers of the former Balmain New Ferry Company Dance Pavilion

Two of the stone piers of the former Balmain New Ferry Company Dance Pavilion remain at the edge of the foreshore between the jetty and slipway. The Dance Pavilion was relocated here as a store and workshop of the magazine complex.

Remains of the Slipway

The remains of the slipway include the tracks embedded into the stone base, two winches, and timber trolley. There is evidence in the stone at the side and rear of how it has been cut to accommodate the slipway. There remains evidence of the timber posts of the former gabled roof over, embedded into the stone.

Adjacent to the slipway is the remains of an unknown structure, with U-shaped solid brick walls, and a concrete floor (Photo 3.6.35).

Concrete Piers of the former Boatshed

The concrete piers of the former boatshed remain adjacent to the slipway. These are in a 7x4 grid formation, and the majority have a steel pin sticking out of the top. Towards the rear is what would appear to be a low sandstone retaining wall, although when or why it was constructed remains unknown.

Anchorages

Two of the iron anchorages, which anchored the lighters during the operation of the magazine complex, can be found at the southern end of the site.

Figure 3.6.25 Original toilet structure, 2001

Figure 3.6.26 Slipway and stone piers of dance hall, 2001

3.6.5 Specific Design Criteria Which Reflect the Explosive's Storage Use of the Site

The siting, design and construction of the site, magazines and related buildings reflects the use of the site for the storage of explosives. The design criteria related to its use for the storage of explosives, includes the siting of the magazines to avoid explosion, the maintenance of an even and moderate temperature inside the building, protection from fire, protection against unlawful and forcible entry, as well as elements which facilitated the safe and expedient handling of explosives.

Siting and design of magazines to avoid explosions.

- The separation of the nine original magazines into discrete units, combined with their partial excavation into the hillside (reinforced where necessary by sandstone mounds), was designed to localise the effect of an explosion to only one of the magazines.

- The walls of the magazine buildings are of solid double brick construction to withstand explosion.

- The concrete ceilings are designed to absorb the force of the potential explosions, and the light corrugated iron roofs were designed to lift off on impact.

Design elements to ensure the safe and expedient handling of explosives.

- Siting of the magazines almost to the water's edge meant that explosives could be unloaded from lighters and placed in the magazines and vice-versa with the minimum of labour, time and risk. This was afforded by the naturally deep water on this side of the bay, which could allow the lighters to moor close to the shore.

- A series of jetties were developed to service each of the magazines, linked by rail lines and a series of turntable connections, which allowed for the transportation of explosives to or from either the Receiving Shed or the magazine buildings.

- The concrete concourse allowed for the safe and expedient handling of explosives as it provided an even surface, and reduced the risk of spread of fire.

Design elements to ensure the maintenance of an even and moderate temperature.

- The easterly and north easterly aspect of the site meant that it benefited from the cooling north easterly winds in summer, and was shaded from the western afternoon sun.

- The airspace between the concrete ceiling and iron roof was designed to reduce heat and two large ventilation ducts were located in this ceiling space and orientated to take advantage of the cool breezes off the harbour.

- A sprinkler system located on the corrugated iron roofs provided cooling on very hot days, and was fed by the dam above.

- Limited openings for windows, doors and external vents enhanced other cooling systems.

Design elements to ensure the protection from fire.

- The dam at a site above the magazines provided water to a hydrant and hosing system outside each of the magazines.

- The parquetry floors within each magazine building were tongue and grooved to avoid nails, and treated as a fire protection measure.

- An elaborate system of lightning conductors was attached to each roof to deter potential sparks.

- Inside the magazine the rail tracks changed from steel to non-ferrous metal-brass, to prevent sparks caused by friction with the steel truck wheels.

- The hillside behind the magazine buildings was rigorously cleared of vegetation.

- Steel covers could be lowered over external vents in the event of a fire to prevent it spreading to other areas.

Design elements for the protection against unlawful and forcible entry.

- Both windows and doors were fixed with solid iron riveted doors.

- Solid walls and limited openings also contributed to the security of the buildings.

3.6.6 Demolished Elements

Much of the demolition at the site has largely occurred after the closure of the magazine complex, as the various elements become dilapidated or partially collapsed. Several elements, which were located on the eastern side of the bay prior to the establishment of the Explosives Magazine complex, were demolished during the operation of the complex. Those buildings and elements, which have been demolished at the site, are described below.

Precinct 1: Western Shore

- Six timber jetties located infront of Magazines Nos. 2, 3, 6, 8, 9 and 10, three of which were sheltered by timber and corrugated iron shed structures. These structures were constructed with similar half gabled roofs as the main magazine buildings, and were demolished as they had fallen into disrepair, sometime during the early 1990s, the exact date is unknown. The jetty existing infront of Magazine No. 4 was similarly sheltered, the roof of which has also been removed due to disrepair.

Precinct 2: Eastern Shore

- The Walter's family cottage was located around the hillside, and it is unknown when this building was constructed or demolished. There are the remans of the stone footings of the cottage and an early garden layout.

- The boatshed, located at the foreshore, was destroyed by vandals and fire in 1974, after the closure of the magazine complex. The concrete footings are all that remain.

- A timber gabled structure, which sheltered the slipway, has also been demolished, most likely in 1974 after the fire in the adjacent boatshed.
- A former dance pavilion of the Balmain New Ferry Company, later to become a workshop and store of the Magazine complex, was located at the foreshore, and was destroyed by fire in the 1970s after the closure of the complex.

- A blacksmith shop located somewhere on the eastern shore, although its exact location remains unknown, was demolished in the 1940s. This building was a brick structure, 6 x 6 x 8 feet, with a concrete floor, flat iron roof and a single door.

- A c.1940 skillion roofed army hut located on the middle terrace, which served as a dining room/kitchen and mess room, was demolished most likely during the 1970s. There is evidence of the concrete footings in the ground.

- A timber building at the foreshore, which served as a lunch room/watchman's office, was demolished most likely in the 1970s.

- An unknown structure adjacent to the testing shed, which appears in a 1977 aerial photograph of the site, has since been demolished.

Precinct 3: The Bay

- Two of the iron anchorages exist as moveable items on the eastern shore.

3.6.7 Integrity of the Site, Buildings and Infrastructure

The western shore retains a high degree of integrity in its original layout, with the majority of the magazine, ancillary buildings and infrastructure constructed still remaining, so that the operational functioning of the complex remains legible. The exceptions are the timber wharfs and sheds, which were demolished during the 1990s.

The magazine buildings retain a high degree of integrity in their original design and construction, retaining much of the original fabric, except where this has deteriorated or been removed.

Although Magazines Nos. 9, 14 and 16 were not constructed in the first phase of development at the site, they were constructed shortly thereafter, and are considered to be part of the early construction phase at the site.

3.6.8 Condition of the Site, Buildings and Infrastructure

One of the contributing factors, which lead to the closure of the Explosive Magazine complex, was the poor condition of the buildings and infrastructure, and the large capital expenditure required to upgrade them to standard. The Lands Department, which was responsible for the site after 1974, did not undertake any maintenance, while the MSB, responsible for the reclaimed lands and wharfs, also allowed these to fall into disrepair.

The following assessment of condition is the result of visual inspections of the exterior of the buildings in November and December 2000. There has not been any structural assessment of the majority of the buildings to identify their condition, and any structural repairs, which may be required. The Receiving Shed No. 1 however was the subject of a Structural Assessment by Richmond and Ross in 1997. All of the storage magazine buildings have been made secure to deter vandals, and access into the buildings was not available at the time of the site inspections, with the exception of the Receiving Shed and Magazine No. 16 (through the rear drain).

Magazines Nos. 2-8, 10 and 12

The nine original magazines are generally in fair condition, although exhibit a number of common problems which are typical given their exposure to the elements and low level of maintenance since closure of the magazine complex in 1974.

The exterior walls appear structurally sound, with no significant cracking evident. There is evidence of rising damp generally to the base of the exterior walls of all magazines, and there has been some erosion of the stone anchor blocks at the base of door openings as a result. Generally the rear and side walls appear damp where they are recessed into the cuttings, as they do not receive much light or ventilation. Overhanging vegetation has also contributed to this dampness.

The roofs of all magazines are generally in poor condition, with corrosion to all of the iron roof trusses and roof sheeting to varying degrees, and holes developing in the roof sheeting to some magazines. There has been further corrosion of the guttering and downpipes not removed in May 2000.

Corrosion of the external iron window shutters and doors, including hinges and handles, has resulted in much of the paintwork flaking off, and staining of the brick and stone work.

There has been cracking to the internal cement rendered walls and ceilings generally to all magazines due to movement of the walls, with evidence of water penetration through these cracks to some magazines. The ceiling vents are missing to most magazines, as are the internal timber doors.

Parquetry floors are generally in good to reasonable condition, with little evidence of termite damage or rot. Timber window frames have been damaged generally throughout due to poor maintenance and vandalism.

Figure 3.6.27 Erosion of sandstone anchor block of magazine,2001

Figure 3.6.28 Corrosion to external iron doors of magazine, 2001

Figure 3.6.29 Corrosion and flaking paint of magazine roof, 2001

Receiving Shed No. 1

The receiving shed was the subject of a Structural Assessment report in 1997 by Richmond and Ross. The report highlights the structural problems to the suspended concrete slab, mainly due to the corrosion of the reinforcement of the suspended concrete slab supporting the front of the building over the bay, and the subsidence of the concrete piers. There is a perceivable bowing of this suspended concrete floor slab, and large cracks are appearing in both the external and internal brickwork. The reinforcement to the concrete slab at the front of the building has been exposed at a number of locations, and has corroded, causing much of the surface concrete to flake away.

Previous repair works to the suspended concrete slab have largely been ineffective and all have failed. These included the removal of spalling concrete, cleaning of rusted steelwork, and new concrete to all soffit surfaces. Where the repair concrete has survived, it is drummy and falls at a touch, and all of the reinforcing bars are extensively rusted. The concrete slab on ground, onto which the majority of the building is constructed, could not be inspected. This floor slab is bowing at the centre, most likely because the ground supporting the slab has dropped due to either compaction under heavy loading or loss of material due to ingress of water through the sea walls.

The roof is in a similar condition to magazines Nos. 2-8, 10 and 12, with corrosion to all of the iron roof trusses and roof sheeting. Roof trusses and exposed eaves towards the waterfront have more severe corrosion. The bottom chord member of the eaves truss at the eastern end of the building has rusted severely, and has pushed the walls outwards. There has been further corrosion of the guttering and downpipes not removed in May 2000.

Figure 3.6.30 Suspended floor of receiving shed over water, note concrete corrosion, 2001

Figure 3.6.31 Cracking to internal walls of receiving shed, 2001

The substantial cracking and displacement to the northern and southern brick walls at the eastern end of the building appears to have been caused by an upward heave of the corroded reinforcing bars in the suspended concrete slab, rather than the settlement of the piers, although this may also be a contributing factor. The relative displacement of the brickwork would also suggest the former to be the case. Cracking and displacement outwards of the

eastern wall of the building appears to have been caused by the corroded bottom chords of the eaves trusses. Less severe cracking to each of the brick walls generally has been caused by corroded steel embedments, such as lintels over doors and windows. Corrosion of the iron window shutters and double doors, including hinges and handles, has resulted in much of the paintwork flaking off, and staining of brickwork.

Internally the timber framed windows and internal timber shutters have all been removed, although the frames remain, as have the internal timber doors. The concrete ceiling slab appears in good condition, and show only minor cracking in general terms and no spalling. All of the ceiling vents are missing, as are a number of the wall vents. The parquetry floor is generally in fair condition, although there are some missing sections of parquetry, and a number of damp areas.

The small office and telephone exchange adjacent to the receiving shed is in a similar condition to the magazine buildings. Much of the roof sheeting, gutting and downpipes has corroded, and sections of the guttering are falling away. The timber window frames remain, although the glass has been removed. Internally the parquetry floor is in reasonable condition, as is the timber boarded wall and ceiling lining.

Magazine No. 9
Externally the brick walls appear sound, although cracking to the front wall appears to be a result of subsidence of the sea wall.

Figure 3.6.32 Cracking to magazine No.9, indicating subsidence, 2001

The roof is in a similar condition to other corrugated iron roofs at the site, and there is corrosion to much of the roof sheeting. There has been further corrosion to gutters and downpipes not removed in May 2000. A section of the timber bargeboard at the northern end has fallen away. There is corrosion to the iron sliding doors. Where exposed the concrete lintels are flaking along the lower edge, exposing the steel reinforcing.

The verandah has been substantially demolished, and the remaining timberwork is in relatively poor condition, with much of the paint flaking and the timber boarded floor rotting and pulling away. There is evidence remaining however, of the verandah's original form.

Magazines Nos. 14 and 16

Magazine Nos. 14 and 16 are in a similar condition to magazine No. 9. The external brick walls appear in reasonable condition, although cracking to No. 16 would suggest that the rear wall is moving away from the remainder of the building. There is some evidence of rising damp to the front walls.

The roofs were not inspected, although would most likely be in a similar condition to the other storage magazines. There has been further corrosion of the guttering and downpipes. The removal of sections of the downpipes along the side walls has resulted in the water draining straight onto the brickwork and staining it.

The external iron window shutters and doors are corroding, causing some paint flaking and staining of the brickwork below.

Internally the buildings have suffered some damage from vandals, and much of the asbestos wall sheeting has been smashed. The ceilings and floors appear to be in good condition.

Figure 3.6.33 Damage caused by vandals to interior of magazine No.16, 2001

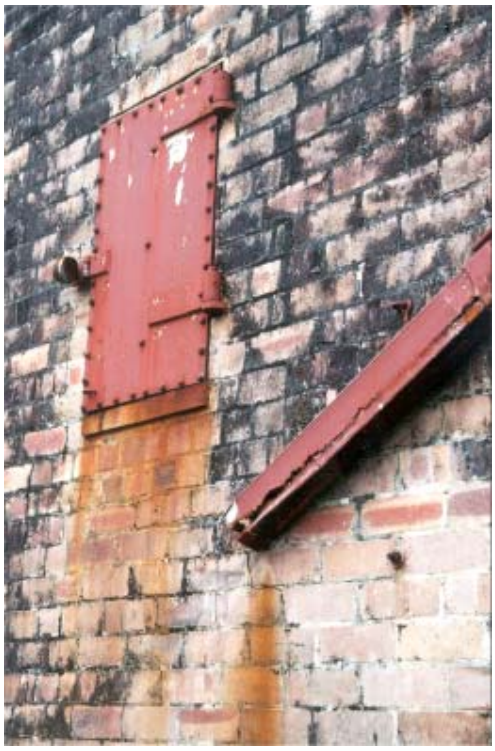

Figure 3.6.34 Water staining from shutters and downpipes to magazine No.16, 2001

Figure 3.6.35 Rising damp to front wall of magazine No.14, 2001

Examining Room

The examining room generally appears in good condition. There is some rusting of the iron wall and roof sheeting, which is typical given its exposure to the elements and low level of maintenance. There has been some damage to the iron wall sheeting and window shutters

from vandals. Internally the timber boarded floors, walls and ceiling all appear in reasonable condition

Air Raid Shelter

The air raid shelter is a solid structure, which appears in good condition.

Detonator Storage Shed

The detonator shed is in a similar condition to the magazine storage buildings. The walls appear structurally sound, although the roof is in poor condition, with much of the corrugated iron roof sheeting corroded. The floor has largely rotted away, and there is evidence of rising damp to the timber railway carriage.

Infrastructure

Generally the site infrastructure, composing concrete surrounds, septic tank and well, rail tracks, concrete and stone drain lines, retaining walls and sea walls are mostly in a dilapidated condition, which is to be expected given their low level of maintenance since 1974.

The majority of the open site area in front of the original magazines buildings is now largely covered with a low grass species, *Coreopsis sp*, resulting in the cracking and breaking up of the concrete. The concrete surrounds directly adjacent to the magazine buildings are generally clear of vegetation, although appear damp at the sides and rear where the buildings are recessed into the cuttings. This has been generally caused by the poor water drainage away from the buildings, caused by the build up of vegetation and sedimentary soil in surface/spoon drains around the building.

The majority of the rail tracks and turntables throughout the site have corroded, which has caused further breaking up of the concrete surrounds, and some sections of the track have been removed.

The majority of the sandstone retaining walls are covered with *Ficus Stipulata*, which in the long term could cause structural problems.

The concrete dam on the hill between magazines Nos. 3 and 5 appears in reasonable condition.

The sea wall to the north of the receiving shed was repaired in 1988, and as such is in good condition. The sea wall on the southern side however is in its original formation, and is in poor condition, particularly at the southern-most end in front of magazine No. 9, where subsidence could be causing structural damage to the magazine building.

The remaining timber wharf in front of magazine No. 4 appears in good condition, and has had recent structural and maintenance works.

Precinct 2: Eastern Shore

Testing Shed

The testing shed is in very poor condition, with much of the external corrugated roof and wall sheeting corroding, and falling off. The floor has been removed, and there is no evidence of any timber wall or ceiling lining.

Toilet and Timber Structure

The toilet and timber structures are both in fair condition, given their exposure to the elements. Both structures have been recently repainted, and are well maintained, continuing to be in use as part of the park.

Seawall and Jetty

The seawall, jetty and timber stays are in fair condition.

Archaeological Remains

The various piers of the former structures at the site, slipway and anchorages, are in poor condition, typical considering their exposure to the elements and low maintenance. The iron elements of the anchorages and slipway are corroded.

3.6.9 Contamination of the Site, Buildings and Infrastructure

The contamination of the Bantry Bay Explosives Magazine complex was assessed in a report prepared by Sinclair Knight Merz in April 1997. The study identifies the risks associated with explosives and chemical hazards, and recommends the actions required to control any unacceptable risks, with regard to making the site accessible to the public.

The general findings of the report concluded that the site is free of explosives, however remedial works are required to the magazines prior to the use by the public. There are high levels of lead and zinc contamination recorded in the drainage areas around the concrete aprons of each of the magazine buildings, limited to the surface, and caused by the decaying and rusting roof structures. There is also the potential for arsenic contamination inside the magazine buildings.

The areas surrounding the testing shed on the eastern shore also show signs of contamination. Contamination and the high costs of remediation will be a crucial factor in any decisions about re-use and public access which NPWS make.

3.6.10 Moveable Heritage Items

There are a number of moveable heritage items, which have been identified at the site, and include the following.

- The corroded remains of two anchorages located at the southern end of the eastern embankment.
- Two winches and a boat cradle, which formed part of the slipway.
- Exposed archaeological material, such as pavers, bricks, bottles, glass, iron chains and bolts.
- Railway carriage within the former Detonators Shed on the western shore.

3.7 Incorporation into NSW National Parks and Wildlife Service

After the closure of the Explosives Magazine complex in 1974, the complex was briefly managed by the Davidson State Trust, which became the Davidson Park State Recreational

area in 1976, under the management of the NPWS. The complex was incorporated into the Garigal National Park in 1992.

During the period that the complex has been managed by the NPWS, a number of works have been undertaken, generally comprising some demolition works, (as described in section 3.6.6), maintenance works and some construction works of park infrastructure, which are outlined below.

3.7.1 Maintenance Works

Maintenance works to approximately 130 metres of the seawall were undertaken by the MSB in 1988. These included repairs and replacement of sections of the wall with concrete. The works did not include the section of the sea wall to the south of the Receiving Shed, which is considerably deteriorated, particularly in front of Magazine No. 9.

Maintenance works to the magazine buildings were undertaken by the NPWS in May 2000, to prevent further deterioration. Prior to this, maintenance works had not been undertaken to the buildings for approximately eight years. The recent maintenance works essentially involved improvements to the building and site drainage, and the removal of overhanging vegetation, and are described as follows:

- Removal of vegetation overhanging the roof of the recessed storage magazines from the adjacent rock-shelf to a perimeter of one meter. This vegetation had blocked gutters and downpipes, thereby preventing efficient water drainage from the buildings, which contributed to their corrosion.

- Removal of vegetation which had fallen onto the rooftops, and caused corrosion of the iron sheeting.

- Cleaning/unblocking of guttering and downpipes, and removal of deteriorated guttering and downpipes assessed to be causing water damage to the buildings. Drainage from roofs where the guttering and downpipes were removed is now essentially directly into the surface/spoon drains. All removal material has been stored on site. Where the guttering and downpipes were not causing any damage, these were retained.

- Removal of vegetation and sediment from the surface/spoon drains surrounding each of the storage magazines, which was preventing the efficient drainage from around the buildings, contributing to rising damp within the walls of the buildings. Due to the contamination of the site, all removed soil from the surface/spoon drains has been stored on-site, covered and lined with plastic sheeting to prevent washing out and leaching of contaminants.

3.7.2 Park Infrastructure

Construction works on the eastern shore by the NPWS has generally focussed on the installation of, or upgrading of, existing park infrastructure, and includes the following.

- conversion of a small timber ancillary building at the foreshore for use by the NPWS staff;

- construction of a toilet building on the upper terrace;

- installation of BBQ facilities;

- construction of new pontoon at the northern end of the site;

- new plumbing and electricity servicing the park on the eastern shore. The electricity is presently not connected due to the fire on the eastern shore in October 2000.
- Planting of fig trees on the terraces.
- NPWS are also currently in the process of making clear the course of the Bullock Track.

4.0

ASSESSMENT OF CULTURAL SIGNIFICANCE

4.1 Assessment of Cultural Significance NSW State Heritage Register Criteria

The following assessment of cultural significance of the former Bantry Bay Explosives Magazine complex, which is under the management of NPWS, has been made in accordance with the assessment criteria established by the NSW Heritage Office.

Criterion (a)
An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).

The complex is significant for its illustration of the importance of Sydney Harbour as an explosives port for imports into and exports out of NSW and Australia. The Bantry Bay site was specifically chosen by the State government for its close proximity to receipt and delivery points within Port Jackson, whilst remaining isolated from the populated areas of the city.

The complex is significant as the sole public explosives magazine complex in Sydney, between the years 1915-1974. Prior to this, merchants' explosives had been stored at Powderhulk Bay, Spectacle and Goat Islands.

The complex is significant for its association with the urban and industrial growth of NSW during the period 1915-1974. It was the premier storage facility for merchants' explosives used to construct the numerous public works which were being undertaken around NSW during this period, such as the construction of the Sydney Harbour Bridge, underground tunnels and railways, highway construction and The Snowy River Scheme.

The complex has significance for its illustration of Sydney's role during the Pacific Naval Campaigns of World War II, as a storage facility for the Royal Navy, US and Australian Armed Forces.

The complex is highly significant for its role in the development of this section of Middle Harbour. The dangerous nature of the complex meant that large tracts of land were reserved around the bay to reduce the hazards of explosions. The preservation of Bantry Bay, H.C. Press Park and Flat Rock, have preserved this section of Harbour from suburban and foreshore development. This reservation was the dominant influence on the developed character of this area of Middle Harbour, including the surrounding suburbs of Frenchs Forest, Killarney Heights, Castle Cove, Seaforth and Allambie Heights.

Bantry Bay is significant for its preservation of gardens and landscaping which highlight its role in the Pleasure Garden movement in Sydney at the end of the nineteenth and start of the twentieth century.

The remains of the Old Bullock Track and associated archaeological features illustrate the role Bantry Bay played in the early timber getting industry of Sydney.

Bantry Bay has significance for containing remnants of the Aboriginal occupation of Middle Harbour, which although depleted and disturbed by subsequent land use of the site, are relatively rare in and along Middle Harbour foreshores in urban Sydney.

Criterion (b)
An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).

The magazine complex at Bantry Bay is significant for its association with the Department of Explosives, which was responsible for the storage of civilian supplies of explosives, and the administration of the *Explosives Act*, 1905. The Department was responsible for the administration and operation of several properties around Sydney, including the Bantry Bay complex, two designated anchorages at Rose Bay and Double Bay, and explosives wharves at The Spit, Woolloomooloo and Darling Harbour. The Bantry Bay magazines were the sole public magazines administered by the Department in Sydney between 1914-1974.

Criterion (c)
An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).

The complex has aesthetic significance as a distinctive industrial landscape within a striking natural setting. It is significant for the integrity of the buildings and structures on the western shore and its rare isolation from the urban development of Sydney. The natural setting of steep hillsides and enclosed bay provide a vivid comparison with the dense foreshore residential development elsewhere in the harbour. There is a high degree of uniformity in the design of the magazines and the layout of the western shore, which contributes to the picturesque character of the landscape. The nine original Magazines Nos. 2-8, 10 and 12, and the Receiving Shed No. 1 exhibit a number of Federation style elements which were typical of contemporary public utility architecture, such as the solid face brick walls, sandstone corbels, arched openings in polychromatic brickwork, and the use of ironwork for doors, shutters, hardware and ventilators.

The magazine complex on the western shore of the bay is significant as illustrating explosive storage and transport technology, and solutions to particular Australian climatic constraints. The complex and magazine buildings exhibit a high degree of integrity in their original design and construction, which reflects their storage function.

The complex exhibits a number of technical details which explain its explosives storage function, including; blast containment within excavated embrasures, orientation and construction to provide an even and moderate temperate inside the buildings, infrastructure and materials to prevent fire and sparking, security measures to guard against vandalism and transportation systems designed to facilitate the safe and expedient handling of explosives.

Criterion (d)
An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.

Bantry Bay has particular importance to the local aboriginal community as an example of the survival of archaeological evidence in the face of urban or suburban development and the early industrial development of the Middle Harbour foreshores. The Metropolitan LALC

representing the Aboriginal community of Sydney have identified the engraving sites above Bantry Bay as being of special importance.

The complex has sentimental significance for the Explosives Department employees who worked at the magazines, recreational significance to local people who utilise the bay and Garigal National Park and the various bushwalkers, fishermen, boaters and picnickers who regularly visit the site.

Criterion (e)
An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).

While many of the Aboriginal occupation sites along the Bantry Bay foreshores have been destroyed or disturbed, there remains the archaeological potential for the elaboration of the early contact and exploitation of the Aboriginal sites by the Limeburners and European ephemeral campers.

The area is significant for the preservation of large tracts of bushland in close proximity to an urban development and in a physically isolated setting, and is valuable for the comprehension of a managed landscape setting in the local area.

The complex has significance for its archaeological potential to yield information regarding the early occupation and use of the site, including early European settlers, timber getters, seasonal exploitation of the bay and surrounding area, and recreational use of the bay.

The complex is important for its potential to yield information regarding the manner in which explosives were stored within NSW between the period between 1914-1974, including the construction of the magazines, the day to day running of the site, including how explosives were transported to the site, handled and stored within the complex, tested, and disposed of.

The complex is important for its potential to yield information regarding its role in the development of this section of the Middle Harbour, which saw the reservation of 900 acres of land as a "buffer" to the explosives complex.

Criterion (f)
An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).

Although depleted and disturbed by the subsequent land use of the site, Bantry Bay has significance for containing remnants of the Aboriginal occupation of Middle Harbour, which are relatively rare in and along Middle Harbour foreshores in urban Sydney.

The surrounding bushland has a high degree of integrity through restricted access of the last 100 years. While none of the vegetation communities surrounding Bantry Bay are listed under the Threatened Species Act (1995), the mangroves and sea grass communities of Bantry Bay are significant in the context of Sydney Harbour due to their size and health.

The complex has significance as the only relatively intact early twentieth century public explosives magazine complex in NSW, which retains a high degree of integrity. Earlier public explosives storage facilities in NSW have been largely altered or developed over time, including Spectacle Island and Goat Island. The only other public magazine in NSW, which operated during a similar period to that at Bantry Bay, was at Newcastle, and has been largely altered.

Criterion (g)
An item is important in demonstrating the principal characteristics of a class of NSW's
cultural or natural places; or
cultural or natural environments.
(or a class of the local area's
cultural or natural places; or
cultural or natural environments).

The site is significant for its demonstration of the principal characteristics of Sydney pleasure grounds, with its waterside location, remnant garden landscaping, isolated aspect and bush views.

The magazine buildings are important for demonstrating representative early twentieth century design solutions and construction techniques for the storage of explosives, with regard to blast containment, temperature control, fire and spark prevention and efficient handling.

4.2 Natural Heritage Assessment of the Site

> Natural heritage incorporates a spectrum of values, ranging from existence value at one end through to socially based values at the other. The fundamental concept of natural heritage, which most clearly differentiates it from cultural heritage, is that of the dynamic ecological processes, on going natural evolution and the ability of the ecosystems to be self perpetuating.[43]

The following Natural Heritage Assessment is based on specialist input and general sources used in this report. In assessing the natural heritage the following values have been addressed.

Community diversity: all living parts of an ecosystem

The site has been subject to disturbance for a period of 140 years in the area of the former picnic ground on the eastern shore and approximately 90 years to the magazine site of the western shore. The original ecosystems have been modified through the importation of exotic plants such as the group of Hydrangea, *Hydrangea macrophylla* and the planting of the Creeping Ficus, *Ficus pumila* to the rock faces between the magazines. The prior management of a rigorous line of bushland removal to a line above the western extent of the magazines has led to an area of regrowth, characterised by a series of smaller plant species.

Ecosystem Diversity

Due to the site management practices since construction of the magazine complex, the diversity of the site is restricted through the culling of the landscape for fire restrictive purposes. This is reflected in the change of species to the area within the fence, reflecting a semi mature re-growth phase from the management regime terminated after the closure of the magazines in 1974.

Species Diversity

The site has a higher species diversity to the upper section above the cut and cliff line through the re establishment of the native species in this area. While the species diversity does not reflect the relatively undisturbed areas on the upper and adjacent slopes of the complex, the progressive re growth reflects a maturing diversity, following the lower maintenance regime

[43] Natural Heritage Charter, page 3.

after the complex closed. Through the requirement of the lower section, the species diversity remains low reflecting the cultural landscape features of the landscape being mown grass and selected ornamental planting.

Geo-diversity

The geological, geo-morphological, soil and hydrological processes present on site have been modified through the works that have established the drainage and rock cuttings surrounding the magazines. This has involved both the cutting of the rock, the filling of the seashore and the building up of mounds between the magazines where required. Minor works to the eastern shore have not had a great impact on the geo-diversity of the place through garden terracing for the establishment of a former vegetable patch and dance hall. Modification of the foreshore has also occurred for the purposes of wharfs and access.

Natural integrity

The site represents a modification to the natural integrity of the place. The construction of the facility and the ongoing management practices contrast to the natural landscape processes evident in the immediate surrounds. The evolving management practices of allowing for regrowth to the western slopes of the magazine have provided an opportunity for the natural integrity to be partially re instated through natural processes.

Indigenous species

The indigenous species on the site have been marginalised on much of the site because of past maintenance practices. The site represents a small portion of land adjacent to substantial and extensive bushland areas. The absence of a mature vegetative form restricts the holding capacity of the site to provide a range of habitats for a variety of fauna. However due to the relatively small size of the site in contrast to the extensive surrounding bushland it would be expected that the indigenous flora and fauna would be present in part on the site. Refer to Appendix A in the Supporting Material.

Introduced species

There are a number of introduced species on the site which are in the main restricted to the lower portions of the site. A number of these species have the potential to effect the natural integrity of the site.

Summary

The site has been modified over time in such a way that the natural heritage of the site has been modified through the intervention of the cultural planting and habitation patterns. The value of the natural heritage of the site reflects the site's location adjacent to extensive and generally undisturbed bushland, which has restricted the existing vegetation patterns which form a partial continuation of the natural vegetation patterns existing on the surrounding bushland areas and further to other natural bushland areas of Middle Harbour in the local area.

The Cultural Landscape Heritage of the site

The site represents a particular institutional landscape created for a specific purpose. The influence of the immediate cultural landscape extends to the surrounding ridgelines of the bay, through the requirements of the magazine in the provision of an area that had the capacity to absorb an accidental explosion. The selection of the bay highlighted the value of

a setting close to services and transport but isolated through the physical relationship of the place.

The majority of the backdrop in now contained within Garigal National Park. The Park, being preserved in the main for its natural values, contrasts to the preservation of the small, isolated cultural landscape of the Explosives Magazine complex.

4.3 Comparative Assessment

4.3.1 Explosive Magazine complexes

Sourced from the Australian Heritage Commission's *Australian Heritage Places Inventory*, the following have been identified as comparative explosive storage complexes with comparative features.

The range of building design and construction techniques included in this list varies, although all exhibit similar features such as blast containment, temperature control and spark prevention.

Of these complexes the Powder Magazine Group at North Esk in Tasmania, would appear to contain the greatest number of comparative design features and a similar landscape setting, including its geographic isolation, transportation systems, construction techniques and use during World War II.

Although this list is not exhaustive, there is no registered comparative complex in NSW. As such, Bantry Bay is of rare value, as a public magazine complex in NSW.

Dry Creek explosive magazines, Dry Creek, SA

Public magazines constructed in 1903 by the government on isolated former swamplands at North Arm. Site includes jetty, 10 magazines and 2 foot gauge light rail.

Goat Island, Sydney, NSW

C.19th century public magazine, which was the direct precursor of the Bantry Bay magazine complex. Harbour setting, and association with Sydney and government administration of gun powder.

North Esk Powder Magazine Group, Launceston, TAS

Late c.19th century public magazine, located in an isolated area accessible by boat. Includes light rail system, design features and similar uses for storage of ammunition and explosives during WWII to the Bantry Bay complex.

Enoggera Magazine Complex, Brisbane, QLD

Early c.20th century Military magazine, built by the Public Works Department in bushland setting. Magazine and laboratory buildings are surrounded by concrete bund walls.

Jacks Magazine, Maribyrnong, VIC

Public magazine constructed late c.19th, includes water setting and tramline.

Burrundie Explosives Magazine, Pine Creek, NT

Late c.19th century public magazine, of distinctive Scottish design for tropical climate.

Stratford Explosives Magazine and Detonator Store, Cairns, QLD

Public magazine constructed early 1900s, which has access by railway.

Spectacle Island Explosives Complex, Sydney, NSW

Military magazine constructed in 1865. Harbour setting and strong historical associations with explosive storage in Sydney.

Woodman Point, Cockburn, WA

Public magazine constructed in 1903. Isolated seaside setting, light rail and jetties.

This list does not recognise the many small, site specific explosives storage buildings that were erected on mining or construction sites to support the activities. These were typically used for the temporary storage of materials that were received from centralised stocks and used directly on the site.

4.3.2 Pleasure Grounds

There are three former pleasure ground sites around the Middle Harbour, which are all presently managed by NPWS, and which have comparable features to the former pleasure ground at Bantry Bay.

These sites include Killarney Heights in Garigal National Park, “Fairylands” in Lane Cove National Park, and Clifton Gardens in Sydney Harbour National Park. They are comparative in their location along the Middle Harbour, which facilitated access by ferry, and provided a picturesque view and picnic setting.

4.4 Statement of Cultural Significance

The Bantry Bay Explosives Magazine complex has rare significance at State level as the sole public magazine complex in Sydney between the years 1915-1974. It has significance for its historic association with the NSW Explosives Department, and the urban and industrial growth of Sydney and NSW during this period. The complex is regionally significant as an illustration of the importance of Sydney Harbour as an explosives port. The complex is regionally significant, as a component of the munition storage in Sydney during World War II.

The complex is locally significant for its role in the development of Middle Harbour, which saw the preservation of large areas from suburban and foreshore development due to blast restrictions, resulting in its green character.

The complex has local significance as a distinctive industrial landscape within a striking natural setting, which provides a vivid comparison with the dense residential foreshore development of Middle Harbour. It has significance for its high degree of uniformity and layout of the western shore, which contributes to the picturesque character of the landscape.

The original nine magazine buildings and receiving shed on the western shore are significant as representative examples of public utility architecture, which exhibit a number of Federation style details typical of this era.

The complex is of rare State significance for its high degree of integrity in its original design and construction, particularly on the western shore. It has significance for its deliberate siting and construction techniques, which illustrate early twentieth century explosive storage and transport technology for Australian climatic constraints. The complex and magazine buildings have significance for exhibiting typical construction techniques from this era, and which incorporate specific design features for the storage of explosives, such as blast confinement, fire and spark prevention, temperature control, security measures and the safe and efficient handling of explosives.

The complex has significance for the many Explosives Department employees who worked at the magazines. It is also significant for the various recreational users of the bay and National Park, including local residents, bushwalkers, fishermen, boaters and picnickers who regularly visit the site.

The complex is of local significance for its preservation of gardens and landscaping which illustrate its role in the late nineteenth and early twentieth century Pleasure Ground movement in Sydney.

The area has importance for its archaeological potential to reveal information regarding the early occupation and use of the site, including early European settlers, timber getters, seasonal exploitation of the bay and surrounding area, and recreational use of the bay.

The area has significance to the Aboriginal community as it contains rare surviving evidence of past Aboriginal use, which is rare within the urban context of Sydney.

4.5 Grading of Relative Significance.

Grading the relative contribution of the various elements or characteristics of an historic place or building to its overall significance, is a useful management and planning tool. It supports future programs of detailed fabric conservation, or the development of re-use options.

This assessment attempts to identify the contribution which individual elements make to the overall significance of the former Bantry Bay Explosives Magazine complex, and is a valuable planning tool to assist in the identification of the heritage issues for the site.

The former Bantry Bay Explosives Magazine complex has been carefully assessed to identify those elements and components, which contribute to the overall significance of the site. This process examines a number of factors, including relative age, historical association, architectural quality, technological interest, degree of intactness and general condition, and association with important people or events.

The assessment has identified three levels of significance, being *Primary, Contributory,* and *Little or No Significance*.

The different grades of significance are:

Primary Significance

Elements of Primary Significance make a considerable or vital contribution to the overall significance of the place.

Includes all of those elements related to the initial 1914 layout, construction and operation of the explosives complex, its supporting buildings and infrastructure, as they respond to the pre-existing topographical and landscape characteristics. Includes the landscape setting, sites of Aboriginal cultural significance, and pre-Explosives Department occupations of eastern shore.

Contributory Significance

Elements of Contributory Significance make some contribution to the overall significance of the place.

Includes those elements, built after 1914 which were temporary or non-specialised building designs, which relate to the evolving use of the place. It also includes subsequent cultural landscape features and post contact period sites and places of Aboriginal significance.

Little or No Significance

These elements make relatively little or no contribution to the overall significance of the place, when compared to other elements or aspects.

Generally only includes those elements which relate to the subsequent re-use and development of the place after it was transferred to the NPWS.

4.5.1 Primary Significance

- Archaeological remains of the Aboriginal use of the site prior to European settlement and occupation, which are rare within the urban context of Sydney.

- Topographical and landscape qualities of the site, including the natural landscape features, such as the setting of the bay surrounded by steep forested slopes, native vegetation and watercourses.

- The landscape setting of the magazine complex on the western shore, comprising embrasures set into the hillside, reinforced where necessary with stone retaining walls, including the partially cleared landscape directly behind the magazine buildings to the fence line.

- The cleared and terraced landscape of the eastern shore, which is a remnant of the pre-explosives department use of the bay as a pleasure ground and private home.

- Cypress trees on the eastern shore, which are remnants of early occupation of the bay.

- Original design, construction and fabric of the nine magazine storage buildings (Nos. 2-8, 10 and 12) and receiving shed No. 1 dating from the initial 1914 construction phase on the western shore.

- All ancillary buildings dating from the initial phase of construction in 1914, including the examining room, telegraph exchange and detonator shed with internal timber rail carriage on the western shore, and the testing shed on the eastern shore.

- 1914 remnant infrastructure of the complex, including the original sandstone seawall, concrete concourse, rock cuttings, stone retaining walls, system of rail tracks and turntables, dam, drainage lines and jetty.

- Elements of archaeological potential on the eastern shore which date from the establishment of the magazine complex, including timber jetty and pontoon, sandstone seawall, areas of reclaimed land to the north, slipway, excavated ramp, remnant winches and trolley, corroded iron moorings, reinforced brick structures, and industrial deposits.

- Elements of archaeological potential on the eastern shore and potential elements within the bay, which provide evidence of the early European settlement and use of the bay, including the foundations of the Walter's family cottage, rubbish pits and ornamental garden layout; lime burner's cave; cleared and terraced hillside, stone steps and reclaimed land and stone footings of the former dance pavilion dating from the pleasure ground period.

- The course, form and stonework of the Old Bullock Track and the remains of the timber cutters jetty at its end in Bantry Bay.

4.5.2 Contributory Significance

- The cultural planting of the western shore, including the *ficus pumila* on the stone retaining walls and decorative plantings of *hydrangea macrophylla* which were planted by staff of the explosives magazine

- Magazines Nos. 9, 14 and 16 on the western shore, constructed as temporary magazines in 1916, which do not display the design and construction details which make the other magazines of technological and historical interest.

- Air raid shelter on the western shore, constructed some time during World War II.

- Small timber 'love shack' and brick toilet on the waterfront of the eastern shore, constructed some time during the occupation of the bay by the magazine complex.

- Elements of archaeological potential related to later phases of construction and use of the magazine complex on the eastern shore, including the concrete footings of the various 1940s structures, such as the officers' quarters and kitchen/dining room.

4.5.3 Little or No Significance

- Ficus trees on the eastern shore, which were planted by the NPWS.

- Reconstruction of the original stone seawall on the western shore.

- Construction of a small toilet for the NPWS on the upper terrace on the eastern shore.

- NPWS landscaping on the eastern shore

4.5.4 Actions which have had a detrimental Impact on the significance & integrity of the complex:

The following actions have been identified as having had a detrimental impact on the overall significance of the complex, and generally include the demolition of elements and low level of maintenance.

- Demolition of the series of timber jetties and shelter structures on the western shore.

- Demolition of the verandah and jetty to Magazine No. 9.

- Low level of maintenance to the magazines, which has seen many falling into various levels of disrepair.

- Internal vandalism to the magazines.

- Removal of lightning conductors to the roofs of the magazine buildings.

- Demolition of the former dance pavilion, boat shed slipway and sailmaker's loft on the eastern shore due to fire.

Part C

Opportunities and Constraints

5.0

OBLIGATIONS AND CONSTRAINTS

The Bantry Bay Explosives Magazine complex is subject to a number of statutory and non-statutory requirements and agency management regimes. These impose different legislative and regulatory obligations and constraints upon the future conservation and management of the complex, which are detailed below.

The significance of the Bantry Bay Explosives Magazine complex gives rise to a number of obligations under the Australia ICOMOS *Burra Charter*, which provides guidance for the conservation and management of places of cultural significance.

5.1 Retention of the Integrated Cultural and Natural Significance Values

The essential significance of the Bantry Bay Explosives Magazine complex is one of integrated cultural and natural values.

The complex is of State significance as the sole public magazine complex in Sydney during much of the twentieth century, and for its high degree of integrity in its original design and construction, in particular on the western shore. The complex is representative of a period of explosives storage in Sydney Harbour.

The significance of the Bantry Bay Explosives Magazine complex means that it is subject to a number of different statutory requirements and agency management regimes. These impose different legislative and regulatory obligations and constraints upon the future conservation management of the complex by NPWS, and are detailed below.

This significance of the complex also gives rise to a number of obligations under the *Burra Charter*. This charter provides guidance for the conservation and management of places of cultural significance and was drawn up by the professional members of Australia ICOMOS.

5.2 Opportunities and Constraints Arising from the Statement of Significance

The following opportunities and constraints have arisen from a consideration of the heritage values expressed in the Statement of Significance, as they relate to the *Burra Charter* guidelines for the conservation of heritage places. They are guidelines to determining acceptable limits of change, whilst retaining the overall cultural significance of the complex.

- The heritage values and interpretation of the complex should not be weighted in favour of either the natural or cultural aspects of the site.

- The historic interpretation of the complex should endeavour to present an integrated set of heritage values of the complex, which recognises all aspects of the cultural significance and evolving history of occupation of the site.

- The conservation management of the complex should be undertaken in the context of adaptive re-use. Adaptive re-use should aim to protect the cultural significance of the complex, and be undertaken in a manner which does not detract from this significance.

- The moveable heritage items of the site, including operational fixtures and equipment, should be preserved in-situ, unless removal is necessitated by conservation or security concerns.

- The Local Aboriginal Land Council and Aboriginal community should be recognised and consulted in future decisions regarding the management and conservation of the site.

- The characteristics of the natural and cultural landscape should be managed and conserved.

5.3 National Agencies

5.3.1 Australian Heritage Commission

The Australian Heritage Commission has recognised the *Bantry Bay Public Magazine* and *Bantry Bay Reserve Area* (former) as important components of Australia's cultural resources, by listing on the *Register of the National Estate*. Both items were registered in October 1980.

The listing for the *Bantry Bay Public Magazine* includes the *"fourteen powder magazines, linking tramways with turntables, seven wharves and concrete dam"* on the western shore. The eastern shore is not included in this listing.

The official Description of the item is as follows:

> *Specialised industrial integrated complex designed for safe handling and cool storage of explosives. Main complex has magazines of different size and light variation in design detail but all with landing platform to tramway in excavated rock, double brick walls, parquet flooring (except fourteen and sixteen) and roofs to lift off under impact of explosion and with in built cooling systems watered from concrete dam. Some wharves covered to minimise heat exposure. Shed has a door to Harbour and a pontoon.*

The Statement of Significance reads:

> *Unique example of integrated handling and storage facilities for explosive materials required in industrial society. Fortunately main complex is handsome and harmonious with landscape. No buildings in testing and maintenance area compare but shed serves dual purpose as a record of the most common type of industrial building. There are few other galvanised iron buildings which could be retained in Sydney.*

The listing for the *Bantry Bay Reserve Area* includes 250 hectares comprising the former Explosives Reserve surrounding Bantry Bay (now part of Garigal National Park, generally bounded on the east by the Wakehurst Parkway, Killarney Heights; the parkland area to the south of Yeoland Point in Castle Cove bounded on the south by Cammeray Road and Road Reserve (now H.C. Press Park); and the southern and eastern natural sections of Forestville Park, Currie Road, Forestville.
The official Description for the Reserve is as follows:

> *Reserve forms natural watershed drained by two streams through sheltered gullies. Main stream, Bates Creek, has an 18m waterfall, a natural rock arch and three smaller falls. Area contains Bantry Bay explosives magazine complex, Aboriginal occupation deposits (to 4655 bp), engravings and paintings and an 1850s bullock track.*

The Statement of Significance reads:

> *An important and relatively large near natural area in the heart of the city. The reserve has outstanding scenic values. Aboriginal rock engravings, bullock tracks and explosives buildings are of cultural and historic value.*

The information contained in both listings was provided by the nominator at the time of listing, and is yet to be revised and reconsidered by the Commission.

The *Register of the National Estate* is maintained by the Australian Heritage Commission. The Commission is a statutory Commonwealth authority established under the Australian Heritage Commission Act 1975. It advises the Commonwealth Government and its agencies in the protection of Australia's National Estate and aims to help all Australians appreciate and care of the National Estate which is defined as:

"those places, being components of the natural or cultural environment of Australia that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community."

While listing on the *Register of the National Estate* has no statutory requirements or implications for non-Commonwealth agencies or organisations, listing is a clear indication of the national heritage status of the item. It provides a record of places considered to be of national significance, and is therefore an important aspect of the community's view of the place.

The registration data for the listing appears to have been taken from the National Trust listing, and is out of date and lacking information regarding subsequent works at the site. It is recommended that the Australian Heritage Commission be notified of changes to the site and its management, and that NPWS forward a copy of this CMP to the AHC, such that the listing on the *Register of the National Estate* can be revised and brought up to date.

The present Commonwealth Heritage Legislation is in the process of being revised however, such that the Commonwealth will only have heritage management interests in sites identified as of national significance, or Commonwealth owned sites of heritage significance.

Accordingly, as the Bantry Bay Explosives Magazine complex has only been identified as of State significance, NPWS does need to promote this site under the revised Commonwealth legislation.

5.3.2 Aboriginal and Torres Strait Islander Commission (ATSIC)

The Aboriginal and Torres Strait Islander Commission (ATSIC) advises the Minister for Aboriginal Affairs regarding the application of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

The purpose of the Act is to protect areas and objects which are of significance to Aborigines and which are under threat of injury or desecration. A significant area is an area of particular significance to Aborigines in accordance with Aboriginal tradition. A significant object is

defined as an object of particular significance to Aborigines in accordance with Aboriginal tradition, and includes skeletal remains.

The Act empowers the Minister to declare areas and objects as significant in accordance with Aboriginal tradition to prevent activities which may threaten these areas and objects. The Act applies to all States and Territories but operates concurrently with existing State and Territory legislation so far as this legislation is consistent with the Act.

5.3.3 The Native Title Act 1993

The *Native Title Act 1993* recognises native title rights, as the rights and interests in land and waters that Aboriginal and Torres Strait Islander peoples have under their traditional laws and customs and that are recognised by the common law.

The Act contains some basic principles about native title in Australia. The Act allows governments ways in which they can 'validate' or make legal past acts such as leases which native title might have made invalid; and do things in the future and still protect native title rights; allows people 'compensation' or something in return for loss of native title if this happens because past acts have been made legal, or because of future acts; and puts conditions on future acts which affect native title land and waters.

The Act contains a process for the following:

- Finding out about who has native title rights;
- Finding out which people might get compensation; and
- Making decision about whether governments can make future grants, such as grants of mining leases.
- Finally, the Act creates a Land Fund with money to help Aboriginal and Torres Strait Islander people acquire and manage land.

The *Native Title Act 1993* is currently before Parliament for amendment.

5.4 State Government Agencies

5.4.1 Regional Environmental Plan No. 23 Sydney And Middle Harbours

The Bantry Bay Public Powder Magazine and remains of HC Press Park picnic ground and public baths, have been identified as heritage items in the Sydney and Middle Harbours Regional Plan No. 23, issued by the Department of Urban Affairs and Planning in 1990 (amended in 1994). NPWS should respond to the aims, objectives and procedures for heritage items within REP No. 23.

Where a site has been listed as a heritage item within an REP, NPWS policy guidelines indicate that approval is required from the NSW Heritage Council in the form of a Conservation Management Plan for the listed site. NPWS should then seek to gain an agreement from the NSW Heritage Council that the site can be managed in accordance with the CMP, without further reference or application to the NSW Heritage Council.

Bantry Bay, the section of the Middle Harbour between Killarney Heights and Castle Cove, Castle Cove and the foreshore around HC Press Park, have been identified within Zone No.

W3 - Environmental Protection. Areas of waterway identified within this zone have significant natural or cultural conservation values, and proposed activities and facilities must ensure that development does not adversely impact on these values.

Prohibited activities within Zone No. W3 are aviation marina, boat lifts, boat sheds, boating industry facilities, charter and tourism boating facilities, commercial port facilities, houseboats, marinas and large marinas, large mooring structures, reclamation, swimming pools, water based restaurants and entertainment facilities. In general, REP restrictions of use are considered to be appropriate. Should a re-use option emerge in the future, which is in conflict with the provisions of the REP No. 23, its suitability should be the subject of a full impact assessment.

Nothing in the REP No. 23 however, prohibits or restricts the carrying out of development by the NPWS on land dedicated or reserved under the National Parks and Wildlife Act 1974 as a national park.

5.4.2 NSW Heritage Council

The Bantry Bay Explosives Magazine complex has been recognised as having State significance by the NSW Heritage Council, and has been included on the *State Heritage Register*. As such the NSW Heritage Council is the consent authority for any proposals for development or re-use of the magazine complex, and application must be made under section 60 of the *NSW Heritage Act 1977* and *Heritage Amendment Act 1998*.

NPWS should seek endorsement of this Conservation Management Plan by the NSW Heritage Office, such that the Bantry Bay Explosives Magazine complex can be managed in accordance with the CMP, without further referral to the NSW Heritage Council. In this circumstance, only those proposals which fall outside the scope of this report and their policies, will need to be separately referred to the NSW Heritage Council.

All archaeological material, with the exception of Aboriginal material, is managed through the archaeological management provision of the *NSW Heritage Act 1977* and *Amendment Act 1998*. Under the Act there is automatic protection for archaeological remains below the ground that are 50 years old or more. Disturbance may require approval in the form of an excavation permit under section 140 of the Act.

An Archaeological Zoning Plan for the Bantry Bay Magazine complex has been prepared and is included in this Conservation Management Plan, as a management tool to direct future development works. The Zoning Plan identifies areas of archaeological sensitivity, and prescribes levels of investigation required prior to future development.

5.4.3 NSW Waterways Authority

Management of the various jetties, seawalls and areas of land below the High Water Mark on both the western and eastern sides of the bay is the responsibility of NSW Waterways. NPWS should liaise actively with NSW Waterways regarding the on-going or future management of these areas and items.

5.4.4 NSW National Parks and Wildlife Services

The Bantry Bay Explosive Magazine has not been listed as a Historic Place under the *National Parks and Wildlife Act 1974*, however has been listed on the NPWS Historic Places Register.

The complex is located within Garigal National Park. The Plan of Management indicates that the primary importance of Garigal National Park is as one of a large group of sandstone

national parks and reserves in the Sydney Basin. Garigal also provides a link between Sydney Harbour National Park, Manly Dam Reserve and Ku-Ring-Gai Chase National Park, which greatly enhances the viability of the systems of each area.

Given that the Bantry Bay Explosives Magazine complex has not been listed as a Historic Place under the *NPW Act 1974*, there may be limitations on future re-use options for the complex. Re-use options should be complimentary to the original reasons for the gazettal of the Park, ie. its natural features. As such, the development and implementation of future re-use options for the complex will need to take into account any possible conflicts, and be subject to a full impact assessment.

NPWS are the responsible management entity for the complex. The *NPWS Field Management Guidelines* include the following Historic Resource Conservation and Management policies:

4.1.3
All sites, structures and relics of potential historical significance will be protected from all development or alteration until their historic or other values are evaluated.

4.1.6
Any works proposed for an historic place … shall be preceded by the preparation of a conservation plan, or other appropriate document.

4.1.7
Conservation Plans … will be prepared in accordance with the Burra Charter and by a person with qualifications approved by the Service.

The primary responsibility for Aboriginal heritage in NSW lies with the NSW National Parks and Wildlife Service, through the *National Parks and Wildlife Act 1974*. The Act protects Aboriginal relics and places. Relics are defined as deposits, objects or material evidence related to indigenous and non-European occupation both prior to and concurrent with European occupation. Aboriginal places are any place declared to be an Aboriginal place under Section 84 of the Act, which is or was of special significance with respect to Aboriginal Culture.

Under Sections 86 and 91 of the *National Parks and Wildlife Act 1974,* it is an offence to damage, deface or destroy Aboriginal relics or places without the consent of the Director of the NPWS. Consent is issued either under permit (s87), or in writing (s90). A person who is aware of the location of a relic is required to report its existence to the Director (s91).

A relic may be the property of the Crown or private property, depending upon their disposition and date of collection, however most relics which are "sites", ie are engraving sites or rock art sites, or archaeological deposits, are real property and therefore belong to whoever owns the land, however they may not be disturbed or destroyed. The Australian Museum curates moveable relics which are the property of the Crown.

The Act enables NPWS to acquire land which contains significant relics. These may be dedicated as Aboriginal areas or historic sites. The Service can also enter into agreements with landowners for the protection of relics (known as "conservation agreements") and/or, with the consent of the owners, areas can be declared protected archaeological areas while remaining in private ownership.

An area of land can also be declared an Aboriginal Place. This has the effect of bestowing on that land the same protection as a "relic". This provision is most often used to afford

protection to land which contains no physical relics but which is a site of proven importance to Aboriginal people, such as mythological sites.

A 1987 amendment to the Act allows the Minister responsible for administering the Act to make interim conservation orders over land of cultural significance. Such orders last twelve months and impose restrictions on the development of land.

As well as administering the provisions of the *National Parks and Wildlife Act 1974* the Service takes an active role in overseeing the implementation of the Environmental Impact Assessment process in relation to Aboriginal sites. NPWS Aboriginal Heritage Units (AHU) actively review environmental assessments and statements to ensure that these consider, and make appropriate provision for, Aboriginal sites. The various AHUs take an active role in Local Government planning in an effort to ensure that sites are protected in an active way, and in order to prevent the necessity for last minute interruptions to developments by the application of its own Act, should sites have been inadequately considered.

5.4.5 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* which is administered through the NSW Premiers Department is "property" law rather than "environmental" law, and there is widespread misunderstanding in the general community that it entitles Aboriginal people to claim places of Aboriginal heritage. The Act allows for claims of vacant Crown land, which is not required for an essential public purpose. It also provides funds for the purchase of these lands. This Act does not protect heritage places and makes no provision for them to be claimed by Aborigines.

The Act provided for the establishment of a system of elected Land Councils. The role of these Councils is to deal with land and monies flowing from actions under the Act. The system of Local Aboriginal Land Councils covers the whole state and provides a point of formal contact with Aboriginal communities which had hitherto not been available. The National Parks and Wildlife Service, which had long had a policy of consulting Aboriginal communities about the management of sites, chose to use this Land Council system as the formal reference point for matters concerning the management of Aboriginal sites.

As a matter of policy, the Director of the NPWS, when considering actions which he may take under the *National Parks and Wildlife Act* (with respect to Aboriginal sites), consults with the relevant Local Aboriginal Land Council. Local government has generally followed this lead and many Local Councils liaise regularly with Local Aboriginal Land Councils and other Aboriginal organisations about Aboriginal heritage and other issues.

Local Aboriginal Land Councils have themselves been active in advocating Aboriginal involvement in decision making about sites and many Councils employ trained, or trainee Aboriginal Site Officers whose specific role is to liaise with archaeologists, developers, the National Parks and Wildlife Service and Local Government about sites and their management. It is the practice of the National Parks and Wildlife Service and of most consultant archaeologists to involve the Local Aboriginal Land Council in planning for and assessment of matters affecting Aboriginal Sites.

The Local Aboriginal Land Council whose boundary coincides with the Bantry Bay area is the Metropolitan Local Aboriginal Land Council, which has been involved as a consultant throughout the course of this project.

5.4.6 Planning NSW

Planning NSW administers the *Environment Planning and Assessment Act 1979*. This Act provides for the preparation of environmental planning instruments intended to guide land use and management at State, regional and local levels. The Act provides a code for making and determining development applications. The main features of the Act with relevance to cultural heritage is the requirement for environmental assessment of development proposals and a mechanism for the inclusion of heritage conservation provisions in planning instruments.

Environmental assessment is required for all designated developments, and such reviews must include a review of impacts upon both the Aboriginal and built cultural environment. Environmental Impact Statements and Reviews of Environmental Factors require identification and assessment of Aboriginal heritage within the subject area.

5.4.7 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* aims to conserve threatened species, populations, ecological communities and their habitats; to promote their recovery; and manage the processes that threaten or endanger them.

This Act was established by the NSW Scientific Committee, which has listed a number of threatened species, including flora and fauna, under Schedules 1 and 2 of the Act, and those plant communities considered to be at risk of extinction as "endangered ecological communities" under Schedule 3.

An "eight-part test", as determined by section 5A of the Environmental Planning and Assessment Act 1979, will need to be done for the study area if a Development Application is submitted to Council within any area of high conservation value. The "eight-part test" allows decision makers to assess whether a proposed development or activity is likely to have a significant impact on threatened species, populations or ecological communities, or their habitats.

None of the vegetation communities in the Bantry Bay area have been listed under the Schedules of the *Threatened Species Conservation Act 1995*, however Coastal Sandstone Heath has a restricted distribution within the Sydney Metropolitan region, and the Sydney Sandstone Gully Forrest are generally considered to have high local conservation significance. One species of Conservation Significance *Eucalyptus luehmanniana*, has been identified in the bushland around Bantry Bay, although not recorded within the study area.

Of all of the fauna species recorded in the Bantry Bay area, only one species, the Southern Brown Bandicoot (*Isoodon obesulus*) is listed as endangered under Schedule 1 of the Act.

5.4.8 Noxious Weeds Act 1993

The Noxious Weeds Act 1993 replaces weed control legislation contained within the Local Government Act 1919. The Act allows for the declaration of noxious plants in four categories – W1 to W4. Noxious plants are categorised according to the specific action required to control them. Bushland or "environmental weeds" are generally grouped into category W4.

A total of five noxious weeds have been recorded within the study area. (Refer 20.0 Urban Bushland Management report contained within the Supporting Information). *Lantana camara* and *Rubus fruticosus* are listed as W2 weeds, and *Ageratine adenophora*, *Cortaderia selloana*, and *Parietaria juncea* are listed as W3. Under the terms of the Act, specific actions are required of the landowner with regard to its management and eradication.

5.4.9 Rural Fires Act 1997

The *Rural Fires Act 1997* replaced the Bush Fire Act 1949. Under the new Act, the Service is a fire authority and is responsible for controlling fires in national parks and ensuring that they do not cause damage to neighbouring land or property. This responsibility includes the implementation of fuel management programs. The Service may also assist with the control and suppression of fires adjacent to national parks.

Garigal National Park is included within the areas of Warringah/Pittwater and Hornsby/Ku-ring-gai District Fire Protection Committees (NPWS 1991). Management Strategies for Garigal National Park are briefly covered in the Service's District Fire Management Plan, and will be covered in more detail in the Garigal National Park Fire Management Plan currently in preparation.

5.5 Local Government Agencies

The Bantry Bay study area is situated within three local Council areas. The western foreshore of the bay, and the northern half of the eastern foreshore is located within Warringah Council area, while the southern half of the eastern foreshore is located within Manly Council area. HC Press park, located opposite the entrance to the bay is located within Willoughby Council area.

5.5.1 Warringah Council

The Bantry Bay Explosives Magazine complex has not been identified as a heritage item on the Warringah Local Environmental Plan 2000.

5.5.2 Manly Council

The southern end of the eastern foreshore of Bantry Bay, has been identified by Manly Council as an Item of Environmental Heritage in the Manly Council LEP 1998. The listing is for Bantry Bluff, located at Seaforth and the Bantry Bay entrance to Middle Harbour. The area listed is approximately south of the Timber Getters Track, and includes the small Testing shed and Old Bullock Track.

5.5.3 Willoughby City Council

HC Press Park has not been identified as a heritage item by Willoughby City Council.

5.6 Community Groups

5.6.1 National Trust of Australia (NSW)

The Bantry Bay Explosives Magazine complex was Classified by the National Trust of Australia (NSW) in August 1975, including the fourteen powder magazines, tramway and turntables, seven wharves and concrete dam on the western side of the bay, and the galvanised iron shed and pontoon on the eastern side of the bay.

The Trust's descriptive statement is as follows:

> *Specialised industrial integrated complex designed for the safe handling and cool storage of explosives. Main complex has magazines of different size and slight variation in design detail but all with landing platform to tramway and in excavated rock cuttings, double brick walls, parquet flooring, except 14 and 16, and roof to lift under impact of explosion and with inbuilt cooling systems watered from concrete*

dam. Some wharves covered to minimise heat exposure. All testing and maintenance likely to cause sparks done on other side of bay but main building there destroyed by fire. The shed has a door to harbour and a pontoon and could be retained as a reminder of the necessary division of functions and use of water transport. Site selected and surveyed in 1907 and construction commenced by 1915. Magazines 14 and 16 constructed during 1930s or 40s.

Magazine 1 overhangs water and is cracking, all wharves have rotted wooden piers. Otherwise condition is fair.

Site undeveloped except for logging before 1907 (remains of bullock track from this period on eastern side of bay). This was not the first public magazine but chosen to replace Goat Island because of isolation and water access."

The Trust's reasons for listing are as follows:

Unique example of integrated handling and storage facilities for explosive materials required in industrial society. Fortunately main complex is harmonious with landscape and handsome. No buildings in testing and maintenance area compare but shed serves dual purpose as a record of the separate function of the two sides of the bay and a reminder of the most common type of industrial building. There are few other galvanised iron buildings which could be retained in metropolitan Sydney.

While listing by the Trust carries with it no formal planning or development approval obligations, classification is a further recognition of the community's regard for its importance. NPWS should maintain a positive liaison with the National Trust as appropriate, in relation to the management of the complex.

The data for listing is now out of date and lacking information regarding subsequent works at the site, including demolition of six of the seven wharves. The Trust should be kept notified of changes to the site, and it is recommended that NPWS forward a copy of this CMP to the National Trust.

5.6.2 Australia ICOMOS

Australia ICOMOS is the National Committee of International Council of Monuments and Sites. Its publication, The Burra Charter, has become the agreed professional practice standard for methodologies and philosophical approaches to conservation work in Australia. Its status is advisory not statutory, however NPWS generally uses the Charter and its own Field Management Guidelines to guide its professional conservation activities.

5.6.3 Local Community Groups

This report has not identified many specific local community groups which have a strong interest in the site, with the exception of the Manly Warringah Pittwater Historical Society, which have expressed some interest in the site.

There has been some interest in the site from former employees, which should be taken into consideration in the management and future use of the site, and in identifying resources for the interpretation of the explosives magazine complex history.

5.7 Occupational Health and Safety Constraints

NPWS commissioned a report in 1997 to investigate pollution and contamination of the Bantry Bay complex. The general finding was that the site requires remediation prior to access by the public. The main contaminants were found to be lead and zinc.

The adaptive reuse of the complex will be greatly constrained by the occupational health and safety restrictions which the present levels of contamination imposes. Contamination of the eastern shore is restricted to an area around the testing shed, while the western shore has contamination around the magazines and within the soils of the concourse and drains.

As the eastern shore is publicly accessible, the NPWS needs to take immediate action to preserve public health and safety. Temporary fencing and warning signage or remediation of the contaminated material should be planned as soon as possible.
The western shore is not easily accessible to the public and there appear to be few visitors excepting those who come by boat. For visitors by boat, warning signage should be mounted at the jetty.

The cost of remediation of the site has not been estimated as part of this CMP. However, if adaptive reuse of the site goes ahead, the costs and feasibility of remediation will need to be factored into any adaption plans or plans to encourage public access to the site. It is recommended that the NPWS commission a remediation expert to assess options for removal of the contamination, and the costs of doing so. Should NPWS decide not to adapt or re-use the site, they should undertake an internal risk assessment process which identifies their liability should the public gain access to the site and become exposed and their liability should contaminated soils wash into the bay and the water ways. This issue will be addressed further in the policy section of this report.

6.0

CONSERVING THE CULTURAL RESOURCES

6.1 NPWS Management

6.1.1 NPWS Management Obligations for Natural and Cultural Resources

NSW National Parks and Wildlife Service is the primary State agency for the conservation and environmental management for places of natural and cultural heritage.

The corporate direction and priorities of the Service for the period 2000-2002 is identified in the *NSW National Parks and Wildlife Service Corporate Plan 2000-2003*. The Plan primarily adopts a holistic approach to conservation which integrates natural, cultural and community values. This approach to conservation is described in the Plan as "landscape conservation".

> *Landscape Conservation recognises that the whole landscape is greater than the sum of its parts. Most importantly, it involves people in the integrated management of natural and cultural landscapes for the long term ecological, social and economic sustainability. Landscape conservation applies across whole landscapes, regardless of land tenure, and encompasses management of lands for production purposes as well as lands managed more specifically for conservation.*

NPWS has a joint charter, under the *National Parks and Wildlife Act 1974,* which extends the conservation and management role into creating appropriate opportunities for making the cultural and natural values of places accessible to the public. Recreational and cultural tourism opportunities, including those through adaptive re-use, should therefore be identified and managed as part of the overall conservation management activities of the Service in relation to the Bantry Bay Explosives Magazine complex.

6.1.2 Garigal National Park, Plan of Management

The primary management mechanism for areas within the Service Estate is via Plans of Management. It is a requirement under the *National Parks and Wildlife Act 1974*, that Plans of Management are prepared for large management areas such as national parks or historic sites, which establish management policies and guidelines for conservation and use.

The Bantry Bay Explosives Magazine complex has been included within the Garigal National Park Plan of Management, prepared in November 1998.

It will be necessary for the Plan of Management to be progressively reconsidered in the light of the findings and recommendations of this Conservation Management Plan, and adjustments made as appropriate.

NPWS Management Objectives for Garigal National Park

The *Garigal National Park Plan of Management* identifies both general objectives for the management of national parks within New South Wales, and specific objectives for the management of Garigal National Park.

General management objectives for national parks relate to the protection and preservation of scenic and natural features, conservation of wildlife and historic features, maintenance of natural processes as far as possible, preservation of Aboriginal sites, provision of appropriate recreation opportunities, and encouragement of scientific and educational inquiries into environmental features and processes, prehistoric and historic features and park use patterns.

The specific objectives for the Garigal National Park have been summarised below:

- Preservation of threatened species, populations and ecological communities;
- Protection of the park from soil erosion, siltation, pollution and visual impacts;
- Rehabilitation of degraded areas affected by soil erosion, vegetation damage, illegal dumping and weed invasion;
- Conservation and appropriate use of Bantry Bay Explosives Magazine;
- Provision of recreation opportunities which allow a sense of escape from urban areas and complement those available elsewhere in the district; and
- Provision of opportunities for visitors to learn about the natural and cultural heritage of the park and promotion of appreciation of the values of the park in the community.

Overall Strategy

The overall strategy for Garigal National Park identified in the Plan of Management, is one in which the park is managed as a significant bushland area within urban Sydney. It is recognised that the conservation, landscape and recreation values of the park are greatly affected by the actions of other land use authorities, and NPWS aims to maintain close liaison with the relevant state and local government agencies, community organisations and neighbours.

NPWS will give priority to the conservation of the special values of the park through the following actions:

- Control of pollution and weeds by contributing to catchment management plans and preparing a weed management plan;
- Encouragement of protection of catchment values and natural views by liaising with appropriate authorities, organisations and neighbours regarding the protection of adjacent naturally vegetated ridge tops.
- Conservation of threatened species, populations and ecological communities by protection and appropriate fire management; and
- Conservation of Aboriginal and historic sites by protection and appropriate interpretation.

- Recreational use is to remain primarily focussed on the existing picnic and boat ramp area at Roseville Bridge, and the walking tracks which cover most parts of the park.

Policies

The Plan of Management contains policies and framework for the management of Garigal National Park, which are summarised under the natural heritage, cultural heritage and use of the area.

The policies provide a framework for management consistent with the resources available to NPWS and anticipated community trends for the next five to ten years. Management is also to be in accordance with NPWS Field Management Policies. A number of actions have also been identified in the Plan of Management, which are intended to be undertaken in the next five years, although do not preclude other actions from taking place, which are consistent with the policies.

Policies for the Bantry Bay Explosives Magazine complex have been summarised below:

- The historic places of Garigal National Park will be conserved in accordance with the principles established in the Burra Charter.

- Subject to safety and security requirements the Bantry Bay explosives magazine complex will be opened to controlled public visitation.

- The magazine buildings may be adapted for educational, commercial or other uses subject to the conservation plan and the following:

- The quiet secluded character of the Bantry Bay area will be retained;

- No vehicle access will be constructed; and

- Public visitation to the site is not prevented.

- Any change in the management and use of the Bantry Bay complex will be placed on public exhibition.

- All work involving ground disturbance within the park will be prepared by a check for historic places or will be monitored by an archaeologist if there is a likelihood of sub-surface material.

- Research into the history of the area will be encouraged.

The following actions for the complex have been identified.

- The Bantry Bay sea will stabilisation program will be continued.

- An engineering investigation will be undertaken of the receiving magazine to determine works necessary to stabilise the structure. If the magazine cannot be stabilised without demolition of the roof and walls, the building will be removed unless a lessee decides to reconstruct it to ensure viability of the site.

- One or more of the original explosives magazines will be restored and interpreted.

- Expressions of interest will be sought for adaptive use of the Bantry Bay explosives magazines in conjunction with conservation work. Leasing arrangements may include provision for management of the picnic area on the eastern side of Bantry Bay. If the Service proposes to proceed with any re-use of Bantry Bay, the proposal will be made available for public comment.

- Sponsorship support will be sought for conservation work on the explosives magazines if a lessee is not obtained.

- Erosion control and masonry conservation work will be undertaken on the old bullock track in accordance with the conservation plan for the track.

6.1.2 Staged Capital Works Programs

NPWS funding for historic places is largely determined by long term conservation and management outcomes determined by each Region/Directorate. Annual capital works and maintenance budgets are formulated to a set of prioritised needs and opportunities.

The Service recognises that not all of the recommendations contained within this CMP can be implemented in the short term. Equally, this plan recommends that a staged approach be adopted for the overall capital works and development opportunities that have been identified for the Bantry Bay Explosives Magazine complex.

A staged approach not only eases capital funding requirements, but ensures that adequate research and thorough planning are undertaken before development activities begin.

6.2 Evolutionary Change and Development

The Bantry Bay Explosives Magazine complex is remarkable for the relatively small degree of apparent change that has taken place within the complex, generally due to its continued storage function for the length of its operation.

The western shore in particular, has changed very little, retaining the majority of its original buildings and site infrastructure, such that the historic operation of the complex remains legible.

The eastern shore has been the site for a number of different cultural uses prior to the establishment of the magazine complex, such that there remains evidence of the many differing layers of use over the site.

The main evolutionary development of the site has been in the form of demolition of various built structures and elements of the site, such as the sheltered wharves on the western side, ancillary buildings on the eastern side, and a number of buildings and landscape treatments relating to the early European settlement of the area, including the pleasure garden phase, oyster gathers, timber getters and Walter's family occupation.

6.3 Environmental Conditions

The harbour marine environmental conditions of Bantry Bay create special problems for the conservation of the building fabric, site infrastructure and landscape features. Airborne salt is of particular concern, which attacks untreated or low maintained ferrous metals with a vengeance. Primers and paint can control the problem, but it requires constant maintenance, and can be expensive.

The original building materials of the magazines were generally resistant to the harbour marine conditions, given a reasonable level of maintenance. Masonry and stone construction was reasonably resistant to airborne salt attacks. The various iron roof structures, roof and wall sheeting required constant maintenance and repainting in order to prevent corrosion. In order to protect the significance of the individual building components, maintenance and new works should consider utilising traditional solutions, as well as the careful introduction of new technologies.

Newer materials, including pre-finished steel sheeting, may not require the same level of protection as ferrous metal sheeting. It is anticipated that there will be a demand for the increased use of such materials during future repair work. Should such materials be considered, their selection must be carefully considered on the grounds of the overall effect on the significance of the place, not only on cost or convenience criteria. In general, good conservation practice suggests that the replacement of "like with like" is the preferred approach when considering the introduction of new materials. Care should be taken however that materials, which have not performed well in the environmental circumstances or which may lead to accelerated deterioration of other elements, should only be replicated with extreme care.

6.4 Condition of the Site, Buildings and Infrastructure

The poor condition of the buildings and site infrastructure, and the large capital expenditure required to bring them to an adequate standard for continued use, were two of the contributing factors which lead to the closure of the magazine complex in 1974.

Since the closure of the magazine complex, very little maintenance works have been undertaken to the site and buildings. Maintenance works to the buildings and immediate surrounds were undertaken by NPWS in 2000, and generally involved works to improve the flow of stormwater, including removal of overgrown vegetation to the embrasures, clearing of gutters and surface drains, and removal of gutters and downpipes where these were in very poor condition. The majority of the original sandstone sea wall was replaced by concrete in 1988 by MSB.

Generally the various brick magazine buildings on the western shore are in poor condition that is a result of poor maintenance and exposure to the harbour marine environment. The main fault is the poor condition of the roof sheeting, gutters and downpipes, which have been severely corroded due to vegetation build up, which has prevented the disposal of stormwater. The majority of the gutters and downpipes have been removed. The iron roof structure is also suffering from severe surface corrosion, however would appear structurally stable, and repairs could be undertaken, and structure retained. Sheeting and gutters should be replaced. There has also been some erosion of stone anchor blocks, which needs to be stabilised.

Internally there has been some water damage to the various timber parquetry floors, due to the damaged roof structure, which will be remedied after replacement of the roof sheeting.

The small ancillary buildings on the western shore generally appear in fair condition. There is some rusting to the iron sheeting of the Examining Room. The small Detonator Shed is in a similar condition to the Magazine buildings, with much of the roof sheeting corroded. The original timber floor has largely rotted away, which is causing rising damp to the walls of the railway carriage located internally.

The Testing Shed on the eastern shore is in very poor condition, with much of the corrugated iron roof and wall sheeting corroded and falling off. The timber floor has been removed, and there is no evidence of any wall or ceiling lining.

6.4.1 Condition of the Receiving Shed No. 1

The Receiving Shed would appear to have some structural problems, largely caused by the corrosion of the steel reinforcement of the suspended concrete slab, corrosion of some elements of the roof structure, and settlement of the projecting portion of the building into the water.

The condition of the building was thoroughly assessed in a Structural Assessment report prepared by Richmond and Ross. The report acknowledged the heritage significance of the building, and the need to preserve as much of the original fabric as possible. It also noted that future loading for recreational purposes would likely be far less than the loads for which the building was originally designed to accommodate.

In conclusion, the report recommended the following items of repair:

1. Replace roof sheeting.
2. Replace south eaves truss.
3. Clean back and paint remaining trusses.
4. Remove and replace steel embedded in the concrete which is causing distress.
5. Remove and replace steel lintels.
6. Remove and replace rusting purlins embedded in the brickwork.
7. Replace fractured stone corbels on the southern elevation.
8. Jack up the settled ground floor by pressure injection if considered necessary.
9. Repair fractured brickwork.
10. Remove the corroded steel from soffits of suspended slabs and beams which are above the water and provide a secondary support structure beneath same to preserve the original construction and to act as a catch scaffold for falling pieces.

Furthermore, the report recommended the protection of the internal ceiling slab.

On the whole, the above recommendations for repair would appear to be appropriate, in order to bring the building to a suitable state for re-use.

In the short term all of the corroded elements of the building which are likely to cause further deterioration, should be repaired or replaced. Fractured brick or stone work, and re-levelling of the floor slab however, is not considered necessary in the short term, and could be undertaken as required once the future re-use of the building into the long term has been established.

Further consideration should also be given to the manner in which the suspended slab is repaired. The above recommendations have been developed with the aim of retaining as much of the original fabric as possible, including the suspended concrete slab. A second and preferred option however, is one in which the existing slab is removed and a new suspended slab constructed. This option would not only provide less of a visual impact on the building, than the “propping up” method recommended, it would discontinue the current cycle of corrosion and deterioration.

It is recognised that the preferred option is likely to be of a substantially greater cost than the first, which would need to be considered by NPWS. NPWS should commission a structural engineer and conservation architect to further develop the two options for repair/reconstruction, and a quantity surveyor to provide costings.

Also requiring consideration, is the urgency of repair. A Risk Analysis of Failure of the building should be undertaken by a structural engineer, to inform the time frame by which the structural repair works should be undertaken.

6.5 Contamination of the Site, Buildings and Infrastructure

The contamination of the Bantry Bay Explosives Magazine complex was investigated in a report prepared by Sinclair Knight Merz in April 1997. The general findings of the report concluded that the site is free of explosives, however, remedial works are required to the magazines prior to re-use or access by the public.

There are high levels of lead and zinc contamination recorded in the drainage areas around the concrete aprons of each of the magazine buildings, limited to the surface, caused by decaying roof structures, and which may be causing marine contaminations of the bay. Similarly the area around the Testing Shed contains high levels of lead and zinc. Furthermore, two dumping pits for rubbish were found in close proximity to the Testing Shed, which require more detailed review. There is also the potential for arsenic contamination inside the magazine buildings.

In general the remediation works recommended for the site included the following:

- Removal of the affected soils from around the magazines;
- Cleaning of the interior of the magazine buildings proposed for public use;
- Removal, renovation or replacement of the roof structures, to stop the spread of lead and zinc contamination from the corroding structures; and
- Areas not remediated be fenced off from public use.

Further recommendations of the report include the following:

- Consider the establishment of site specific acceptance criteria, permanent or temporary on-site storage and off-site disposal and/or recycling of waste material;
- The site is considered suitable in principle for development, with contamination management required in several areas; and
- Legal advice should be obtained on the issue of liabilities arising out of contamination conditions, and on potential contribution of the previous of the site to remediation costs.

In general, the recommended remediation works appear to be acceptable, however further detail as to their extent and the impact on the fabric of the site and buildings is required.

6.6 Managing the Landscape Setting

Please Note: A Bushland Management Report for Bantry Bay, compiled by Urban Bushland Management Consultants, is included as an appendix in Part F. This details management regimes for the indigenous flora and fauna communities of the Bay. Please refer to it for more detailed information on vegetation and fauna.

The setting for the former explosives depot is vital to the integrity of the place. It underlies the exclusive use of the zone when the depot was operating and highlights the purpose of the landscape as an isolating and absorbing factor in the event of a mishap and potential explosion from the depot.

This setting has now been formalised as part of Garigal National Park, where the natural values of the place have been recognised and incorporated as part of the National Park.

The settlement patterns surrounding Bantry Bay are restricted to the southern section of Bantry Bay and to the plateau areas above the escarpment and are the result of the requirements of the original setbacks around the complex, which reflect the exclusive use of the area around the complex. Further to this the residential areas in the upper reaches of Middle Harbour are informal in their form and layout, the result of steep slopes and an integration of much of the native vegetation cover. This contrasts with the formal layout of the complex and a cleared zone around the complex.

The isolation and form of the complex is highlighted by the contrast between the built elements and the bushland and natural foreshore. This contrast should be maintained.

The visual curtilage of the place is critical to the appreciation of the Magazine Complex. The backdrop should remain and not be allowed to be eroded.

6.6.1 Visual Curtilage

The visual curtilage identified for the complex takes into account the important visual and historic values of its landscape setting.

The visual curtilage includes the hillsides on either side of the bay, and is bound by the Wakehurst Parkway on the east, and the suburb of Killarney Heights to the west. The curtilage also includes the north eastern end of HC Press Park, and extends a short way up the Upper Middle Harbour.

6.6.2 Precinct 1: Western Shore

The landscape setting of the western shore can be considered as divided into three distinct precincts as follows:

Zone A: Flat concourse area around the magazine buildings

The ground surface consists of both grassed and concreted surfaces. There are the remains of the light rail system running through this area. There are a number of weed species, including *Coreopsis sp* and others (refer Appendices) within the area. The *Coreopsis sp* and other grasses located to the concourse area do not have a detrimental impact to the concourse. There is also a line of cultural planting, including *Hydrangea macrophylla* to the base of the cutting between two magazines, and extensive regrowth at the northern end around Examining Shed and Air Raid Shelter.

Much of the seawall to the front of the complex, has been replaced in 1988, and is in good condition. However the southern most end of the wall is in poor condition, and needs replacing.

Zone B: Immediate area behind the magazine buildings

This zone consists of the mounds between the magazine buildings, and represents a purposeful earth formation separating the magazines in the event of an accidental explosion. They consist of cut rock and built mounds with a roughly coursed sandstone wall approximately 7-9 metres high. The vegetation consists of relatively recent endemic native small trees and shrubs, weed species such as Pampas Grass and the remnant of the initial cultural planting to the mounds, being *Ficus sp.*

Zone C: Vegetated backdrop within the existing fence line

The vegetation in this zone consists of native regrowth dating from the closure of the complex in 1974. Typically, it is dominated by relatively short lived shrubs to small trees such as *Leptospermum sp*. and *Banksia sp*. The vegetation patterns reflect an absence of fire where many of the shrubs and small trees have collapsed and are at the end of their life cycle. There is some limited evidence of regrowth.

The area has a series of stone drains to the rear of the magazines which originate from the small concrete dam located to the upper and rear section of this zone. A wire fence, 1800mm high defines this zone from the remaining bushland to the west.

6.6.3 Precinct 2: Eastern Shore

The landscape setting of the eastern shore can be considered as comprising two different zones, as follows:

Zone D: Cleared and terraced land

This zone includes the cleared and terraced land.

Within this zone there remains a number of elements from the previous use of the eastern shore prior to the establishment of the magazine complex. These include the foundations of the former dance hall, sandstone terrace walls and grass terraces, built structures and some remnant buildings. Further to this there are a number of recreation facilities such as picnic benches, toilets and water supply which have been installed by NPWS.

The waterfront is comprised of the following three different treatments:

Formed:
- Seawall directly to the south of the jetty;

Disturbed:
- Sections of reclaimed land immediately to the north and south of the seawall and jetty;

Natural:
- Further to the south (from the entrance to the Old Bullock Track, and north of the jetty).

Zone E: Bushland backdrop behind the clearing

The bushland setting behind the cleared and terraced land comprises of representative native canopy trees and ground covers.

The recent fire of October 2000 has severely modified this zone at the time of this report.

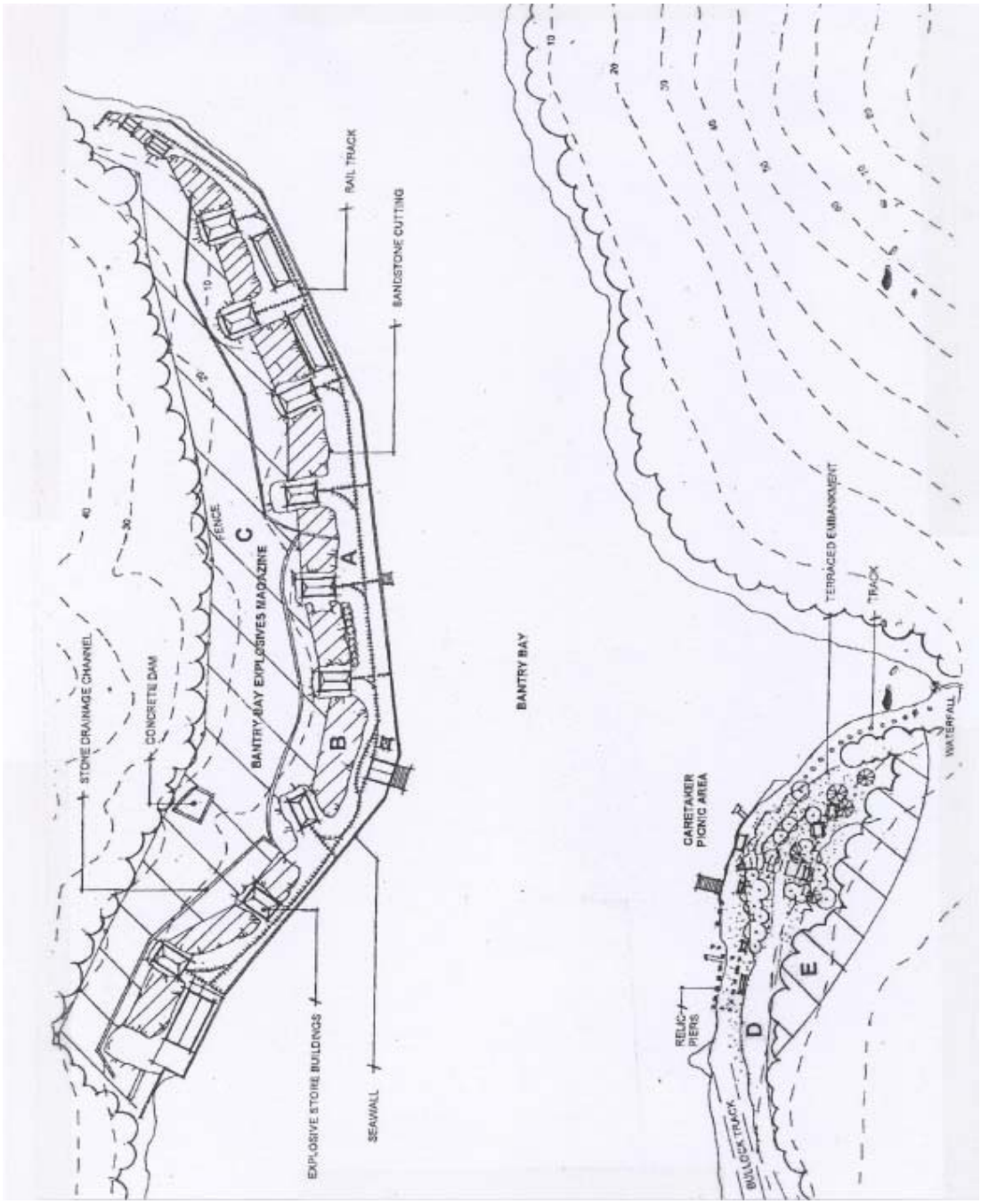

Figure 6.6.1 Managing the landscape setting (Not to scale)

6.7 Aboriginal Cultural Resources

NPWS, under the *National Parks and Wildlife Act 1974*, is the primary State government agency with legislative responsibility for the protection, conservation and management of Aboriginal heritage in NSW, both in and outside Service estate. The Service has recognised the right of the Aboriginal community to participate in the formulation of management structures and decisions which might affect Aboriginal Heritage. The recently formed Aboriginal Heritage Division oversees this function of the Service.

6.8 Security

At present the level of security provided at the site is minimal. A fence bounds the western side, while the waterfrontage of the site on the eastern side provides a level of security. A sign discouraging entry onto the site has been erected by NPWS, although previous signs inherited from the magazine complex would appear to have a greater impact against trespassing. Although the buildings have been made secure, there is evidence of vandals entering Magazine No. 16 through a rear drain and under the floor. A presence at the site is provided only during events, with a small ranger's hut located on the eastern shore.

In either the short or long term it is not realistic that a full time presence by the NPWS will be provided at the site. Security in the short term is best achieved through the retention of the existing signage. The long term security of the complex is best achieved through interpretation, and an increased usage of the site. A site presence is to be maintained during events in both the short and long term. Damage response is presently afforded by water access, with a NPWS boat and punt located at The Basin. This is the method preferred by the NPWS in the short term, until visitor use increases. Security of the complex into the long term should consider routine enforcement and maintenance presence, contamination issues and damage response.

Figure 6.8.1 Existing signage on western shore

Figure 6.8.2 Signage on western shore

6.9 Historical Archaeological Zoning Plan

6.9.1 Introduction

The historical research for this desktop survey is included in the body of the conservation plan, section 2.

In reconstructing layers of occupation, historic photos, maps and Explosives Department annual reports have been the major source of information. Three site visits were conducted and extensive photo documentation made of the archaeological features.

This archaeological zoning plan is an assessment of the fabric and physical evidence of human activity within the nominated boundaries of Bantry Bay. The area under investigation includes the eastern and western shores of Bantry Bay and the immediate offshore waters. On the western shore the boundary is defined by the fenceline, part way up the hill beyond the reservoir, meeting the shoreline at the northern and southern ends.

On the eastern shore the area includes the cleared terraces, the reclaimed foreshore to the north and the southern foreshore to the Bullock Track. It also includes the examining shed feature to the south.

The fabric includes buildings, structures, works, relics, deposits and other features that provide tangible physical evidence of the history of the human occupation of the bay since European settlement.

The *Heritage Act 1977* section 139 (1), states that:

A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.

A relic is defined in the Act as

a) Any deposit, object or material relating to the settlement of NSW, by Europeans, not being Aboriginal settlement and

b) which is over 50 years old

This archaeological zoning plan deals only with historical archaeological resources, as they have been found or are suspected to exist. This survey did not include sub-surface investigation or Aboriginal archaeology. The maritime archaeology of the Bay is not included as part of this brief, however a brief survey of the potential of the Bay to have archaeological remains is included.

The *Heritage Act* provides protection for all underwater heritage sites and relics 50 years of age within the inland waters of the State of NSW, including harbours and bays. The Waterways Authority control and own all waters in Middle Harbour up to the high water mark, including deposits on the harbour bed.

6.9.2 Preliminary Research Questions

The eastern and western shores of Bantry Bay, although part of the same cultural landscape, have very different histories of development. The eastern shore shows evidence of occupation and use from the earliest settlers of the region in the 1850s onward, with layers of occupation which continue to this day. The western shore was first developed with the building of the last public powder magazine in Sydney, circa 1910.

The layers of occupation on the eastern shore are therefore considerably more complicated than on the western shore. From examination of historic photos and maps, site survey and documentary sources, a map of the layers of occupation on the eastern shore has been created from a 1931 surveyor's base map (Figure 6.10.1).[44]

The basic research questions which are posed by the site are different for each shore. On the eastern shore the research questions concern its early occupation as a place of seasonal occupation by oyster-gatherers, timber cutters, lime burners and possibly others, for which no documentary records exist. Similarly the Old Bullock Track with its associated wharf and structures on the foreshore, has limited documentary evidence.[45]

Information on the period of occupation by the Walters family, the house and its gardens is very limited. This period which runs into the occupation period of the Pleasure Grounds, has little documentary evidence and no photographic images. The Pleasure Ground movement in Sydney has been recorded at a number of other sites, ie; Clifton Gardens, Killarney Heights, Audley, Lane Cove and Fairy Lands. The Bantry Bay terracing and remains of the dance hall can add to the known information on this social movement in Sydney, particularly as a number of Pleasure Grounds exist within NPWS estate.

The period of occupation by the explosives magazine is very well documented in official reports, photographs and archives, but this has tended to concentrate on the western shore and the actual magazines. The administrative and industrial functions of the eastern shore are less represented in the documentary record. In addition, a number of the structures of the eastern shore were relocated from Powderhulk Bay, for which we have very limited information, and which could contribute to research on the pre-1910 storage and testing of explosives.

[44] Plan of Bantry Bay, Middle Harbour, Parish of Manly Cove, County of Cumberland, Scale 80 feet to an inch, 1931. Department of Lands, Ms. 2768 Sy, Ms.164 Sy, Sheet 3 roll, c.274.
[45] Cawthorn, Janice, 1994, Old Bullock Track, Bantry Bay, Conservation Plan, NPWS

On the Western shore, the research questions focus on the design of the magazine complex and the techniques for handling, transporting and storing explosives. This is represented to a limited extent in documentary evidence. The comparative possibilities with earlier public magazines at Goat and Spectacle Islands and at RANAD Newington make the magazine complex of high significance for explosives storage research.

6.9.3 Types of Archaeological Elements

The historical archaeological resource of the Bantry Bay magazine reserve is extensive. There is a diverse range of elements spread over a large area on both shores. The categories of elements which are known or suspected to exist, are listed below.

Buildings and structures
Standing buildings on both shores, with wharves, sea-walls, excavated enclosures, reservoir, drains, septic tanks, and footings of buildings on the eastern shore.

Works and relics
Industrial sites associated with the powder magazine, such as the slipway rails, winch and boat cradle, harbour boom and anchorage buoys, and the light rail turntables and rails.

Deposits
Material remains of domestic refuse, artefact scatters, land fill, land reclamation, stratified accumulations of cultural material in rubbish pits and at the base of wharves and piers. The area most likely to contain rubbish pits and sub-surface remains is the eastern shore. It is not likely that rubbish was removed from the site until the period of occupation by the powder magazine and so a pit is likely to be found somewhere on the site.

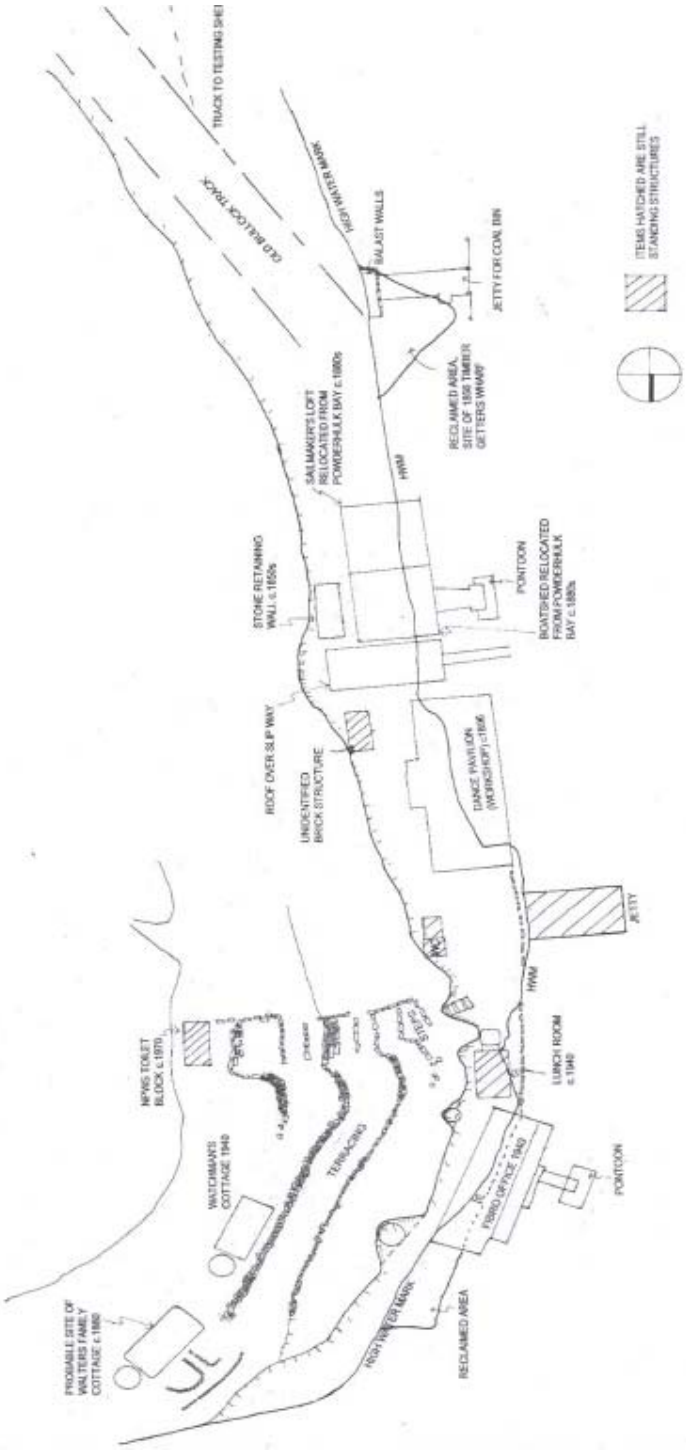

Figure 6.9.1 Structures and buildings of eastern shore, hatching denotes still standing, 2001.

Underwater relics
Items, relics and structures which are now underwater. This could include the remains of submarine cables, piers, wharves or moorings, sea walls, building fabric and relics including domestic deposits which were dumped or collapsed, and shipwrecks which sank into the Bay. It is quite possible that the floor of the Bay between the shores contains extensive archaeological resources as well as the relics which are visible above the water within the waters of the Bay.

Garden and landscape elements
Exotic trees, introduced plants and grasses, terracing and garden beds, modified landforms such as caves, creeks or wells, tracks, fences and roadways. Particularly on the eastern shore where there is evidence of landscaping from the period prior to occupation by the magazines.

6.9.4 Archaeological Potential

The potential of the archaeological resource of Bantry Bay is described below and the potential of each item, within each category of elements, is rated as high, medium or low. This potential has been assessed in regard to the preliminary research questions.

Buildings and structures
On the eastern shore there are four, intact standing buildings. These have a low potential to provide archaeological information on the occupation of the site, excepting the examining shed which is of medium-level potential. The examining shed can provide information on the workings of the Explosives Department as well as the structures of Powder Hulk Bay.

There were another nine buildings known to have been erected on the site at different stages of the site's occupation, which are now demolished. The footings, piers and walls of the demolished buildings have a high potential to provide information on the different periods of occupation on the eastern shore with enough information provided in the remains for measurements and some dates of construction to be ascertained.

The other structures on the eastern shore include the sea wall, stone retaining wall and the remains of the coal jetty piers. These have a medium-level potential to indicate the physical restraint placed on development of the steep site, the importance of waterborne transport in all periods of Bantry Bay's occupation and the nature of the working environment of the explosives magazine.

On the western shore there are 17 standing buildings which are mostly intact. These have a medium- level potential to provide information regarding fire, heat and spark prevention techniques in the building fabric, as well as information on the nature of explosives handling and storage in their arrangement and design.

The small detonator shed contains a partially intact light rail trolley, used for the transporting of explosives around the site. It has a very high potential as it is the only extant example known to exist. The examining shed is of medium level potential in providing information on the structures of Powder Hulk Bay.

The other structures on the western shore include the sea wall, reclaimed concourse, stone retaining walls and excavated embrasures These all have a medium-level potential to provide information on the construction of the site, the original topography of the shoreline and hillside and the original design intent which is not borne out in the later building additions.

Other structures include the reservoir and drainage system which has a low-level of potential to provide information on the fire, heat and safety concerns of the explosives magazine.

Works and relics
On the eastern shore there are three items associated with the slipway which have a high potential for providing information and interpretation of the industrial functions and working of the explosives magazine; a wooden boat cradle, in-situ winch and slipway rails embedded in an excavated ramp.

There are a number of iron buoys and chain, associated with lighter anchorages in the Bay and which have a medium-level potential to provide information on the site.

There is a single harbour boom which has been placed on the boat cradle of the slipway and this has a medium-level potential for providing information on the security measures which the Explosives Department used in Bantry Bay.

On the western shore there is an extensive light rail system, with turntables and intact rails. These contain a very high potential to provide information and interpretation on the transportation and handling of explosives, the original design of the site and the subsequent additions to it, as well as the siting of jetties and wharves which are no longer extant.

Deposits
On the eastern shore there five areas which contain unstratified deposits of building material and industrial relics. These have a low-level potential to provide information on the fabric of the demolished buildings and the nature of the industrial artefacts.

There is an unknown quantity of fill below the present concourse on the western shore, which was reclaimed prior to the construction of buildings for the explosives magazine, which may contain some artefactual material of low potential.

There is the potential for domestic rubbish pits to be found on either shore, although none were located during surveys for the present study, and if found these could be expected to contain medium potential to provide information on the early dance hall and occupation of the site by the Walters family.

Underwater relics
On the eastern side of the Bay there is the possibility for domestic and building material deposits to be found immediately offshore. These would contain a low-level potential to provide information on the fabric of demolished structures on the site and the nature of domestic occupation of the site.

On the western side of the Bay there is the possibility for domestic and building deposits to be found near the sea wall, associated with the collapsed jetties and sheds. There may also be the potential for explosives material which fell from boats, lighters and transports to be found in this area which would be of low-level potential.

Garden and landscape elements
On the eastern shore there is a series of stone terraces with steps and introduced grasses which have a medium-level potential to provide information on the occupation of the pleasure ground.

There is also an area of brick and stone garden edging which is possibly from the Walter's family occupation or from later explosives magazine occupation. These have a low-level potential to yield information on the nature of the domestic and industrial occupation of the site.

There is a number of tracks on the eastern shore; to the waterfall, to the examining shed and the Old Bullock Track. These tracks provide a high level of potential and interpretation to provide information from the period of earliest occupancy to the latest.

On the western shore there are a number of exotic plantings which have a low-level potential to provide information on the working environment of the site.

6.9.5 Significance of the Archaeological Resource

The significance of the archaeological resource is a measure of the contribution which the archaeology can make to information about the past uses and activities on Bantry Bay. It is measured against the resource's ability to contribute information which cannot be found in other sources, or can contribute to research questions.

Assessment of the significance of the historical archaeological resources has been made for the entire site rather than for individual features.

Both shores of Bantry Bay contain significant deposits, works, relics and structures from the period of occupation by the Public Powder Magazine, between 1914 and 1974. The eastern shore also contains deposits, structures and landscape features from earlier periods of occupation, from the 1850s timber cutters and seasonal occupation, to the Walters family and the pleasure ground, between the 1880s and 1907.

On the eastern shore, the archaeological resource makes a significant contribution to the understanding of the layered evolution of the explosive magazine facility. It provides information on the development of the foreshores, the limitations of the original topography, the original design of the facility, the nature of the previous facility at Powderhulk Bay, and the nature of the working environment. This information cannot be found in other sources.

The remains of slipway, boat cradle, winch, boom and boatshed/sailmaker's loft building foundations, make a significant contribution to the understanding of the industrial process of the magazine and the loose relics are the only remaining movable items associated with the public powder magazines.

The history of the pleasure ground occupation of the site is illustrated in gardens, terracing, tracks and stone foundations of the dance hall. The history of the site during this period is very unclear and the archaeological remains make a substantial contribution to the understanding of the uses of the site during this phase of occupation.

The Bullock track, the piers and possibly the garden edging from the Walters family, the reclaimed area adjacent to the track all illustrate occupation of the site prior to the dance hall. The stone retaining walls are possibly the sole remains of the seasonal occupation of the Bay by the timber getters, oyster gatherers and fishermen who used the area.

On the western shore the archaeological features make a significant contribution to the site, in that they illustrate the extensive reclamation of the shore and the concerns with transport, temperature and fire control for the facility.

The excavated embrasures and the design of the buildings as well as technical building details, illustrate explosives storage design principles of the time, which could provide good comparative data with other Sydney sites.

The extensive transportation system has a high significance for the contribution it makes to understanding the design of the site and its subsequent additions and the industrial processes of the site.

6.9.6 Archaeological Features

The survey area has been divided into 2 precincts; the eastern shore (A) and the western shore (B), including their immediate off-shore waters.

Figure 6.10.2 shows the archaeological features of the eastern shore and their immediate off-shore waters. The archaeological features have been numbered with reference to the precinct, and a consecutive number for each feature within each precinct. Photo references are in brackets.

In addition to these features, there is the possibility of other significant features which have not been identified because they are sub-surface remains.

Precinct A, eastern shore

A.1. An area of mixed deposits, footings, garden beds, possible site of the Walters' cottage, ca. 1888. Area near to a campsite marked on circa 1857 map. (Figures 6.10.3 and 4)
A.2. Building material and rubble scattered over rock face and upper terrace.
A.3. Brick pier foundations possibly from the 1940 watchman's quarters and one stone pier which maybe from dining hall, ca. 1890s.
A.4. Dry stone walling and terracing from pleasure grounds ca. 1890s. (Figure 6.10.5)
A.5. Stone sea wall, ca. 1914
A.6. Reclaimed area of rubble and concrete with brick pier and iron relics, ca. 1890s.
A.7. Stone pavers probably marking rear entrance of dance pavilion, ca. 1890s.
A.8. Iron harbour boom on wooden boat cradle, ca. 1940s. (Figure 6.10.6)
A.9 Bullock Track, 1856. (Figure 6.10.7)
A.10. Track to examining shed, ca. 1914.
A.11. Stone retaining walls, steps and pavers with raised platform, date unknown, appears to be C19th. (Figure 6.10.8)
A.12. Slipway winch set into concrete base, ca 1914.
A.13. Reinforced brick structure, unknown date.
A.14. Reclaimed area with industrial relics and stone piers from dance hall, ca. 1890s to 1914. (Figure 6.10.9)
A.15. Slipway rails set into concrete within excavated stone ramp, ca. 1914.
A.16. Five iron moorings very corroded, ca. 1880s. (Figure 6.10.10)
A.17. Reclaimed area of rubble and concrete, probable base for timber cutters wharf, ca. 1857.
A.18. Concrete piers from coal bin jetty, 1918
A.19. Concrete slab and concrete piers with iron bolts, base of sailmakers' loft, ca. 1914
A.20. Concrete piers with iron bolts, base of boatshed, ca. 1914. (Figure 6.10.11)
A.21. Area of mixed industrial relics and deposits, date unknown.
A.22. Iron chains from moorings, heavily corroded, ca. 1880s

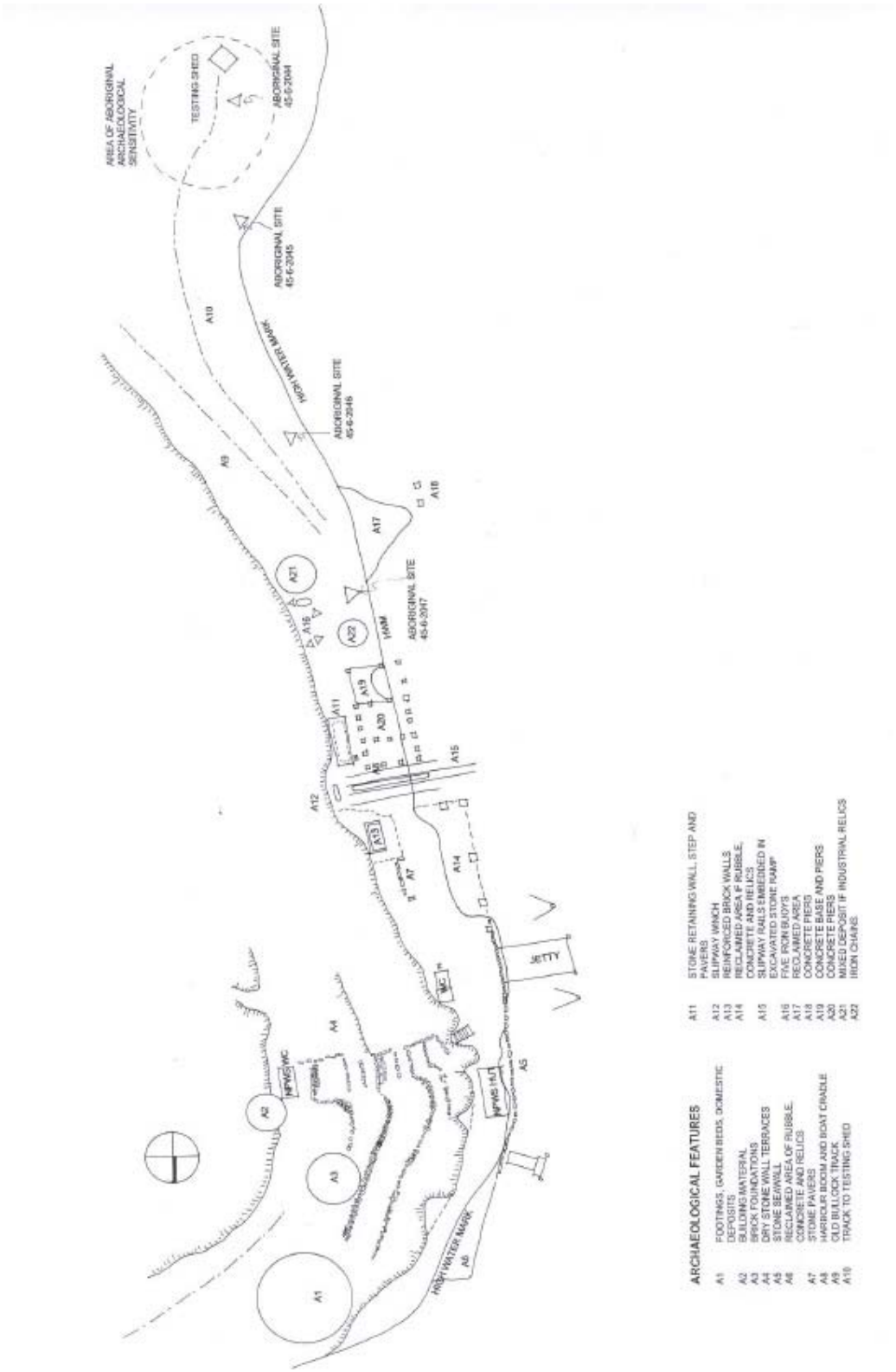

Figure 6.9.2 Precinct A. Eastern Shore

Figure 6.9.3 FEATURE A.1

Figure 6.9.4 FEATURE A.1

Figure 6.9.5 . FEATURE A.4

Figure 6.9.6 FEATURE A.8

Figure 6.9.7 FEATURE A.9

Figure 6.9.8 FEATURE A.11

Figure 6.9.9 FEATURE A.14

Figure 6.9.10 FEATURE A 20

Precinct B, Western Shore,

B.1 Reservoir and drainage system. (Figures 6.10.11 and 12)
B.2. Light-rail system and turntables.
B.3. Reclaimed concourse, rubble and concrete (Figure 6.10.13)
B.4 Detonator shed containing light-rail carriage (Figure 6.10.14)
B.5 Sea wall
B.6 Stone retaining walls (Figure 6.10.15)

Figure 6.9.11 FEATURE B.1

Figure 6.9.12 FEATURE B.1

Figure 6.9.13 FEATURE B.3

Figure 6.9.14 FEATURE B.4

Figure 6.9.15 FEATURE B.6

6.9.7 Archaeological Management Zones

The two shores and the immediate offshore waters of Bantry Bay have been divided into zones which relate to archaeological resource type and are illustrated in Figures 6.10.16 to 6.10.22

Specific archaeological features of the eastern shore have been identified and numbered and these are shown on Figure 6.10.2

The zones relate to different categories of archaeological material, and require specific conservation and management planning.

Zone 1. Standing buildings and structures.

Zone 2. Above ground works, relics and landscape elements of high significance.

Zone 3. Above ground works, relics and landscape elements of medium significance

Zone 4. Sub-surface and underwater deposits of low significance

6.9.8 Archaeological Management Policies

General conservation policies relating to archaeological resources in Bantry Bay are contained in the body of the conservation plan, Section 15.0. The following policies relate to the conservation and management of the archaeological resource within each zone.

As a general rule, the advice of the NPWS historical archaeologist or the NSW Heritage Office historical archaeologist, should be sought prior to any disturbance to archaeological features and deposits, remediation or development in areas possibly containing sub-surface deposits.

Zone 1

- Standing intact buildings and structures, including footings, walls, floors and piers should be conserved in-situ and interpreted.
- In the event of development works on either shore, on standing buildings or structures, an assessment process ought to take place to determine the impact of the proposed works on the significance and fabric of the structure.
- Sub-surface works around standing buildings and structures, including removal of soil for remediation purposes, should be carried out under the supervision of the NPWS historical archaeologist.
- The light rail trolley encased in the detonator store ought to be removed, conserved and used for interpretive purposes under a weather cover.
- NPWS should endeavour to retain the original alignment of the sea wall of the eastern shore when undertaking future maintenance works, and similarly with the stone retaining walls of the western shore.
- Architectural details of the magazines such as spark, blast and fire prevention systems, security and signage should be recorded, conserved in-situ and interpreted.

Zone 2

- Above ground works, relics and landscape elements of high significance ought to be recorded, conserved and interpreted.
- In the event of development works on above ground works, relics and landscape elements, an assessment process ought to take place to determine the impact of the proposed works on the significance and fabric of the resource.
- The Old Bullock Track and the waterfall track ought to be cleared and maintained for site access.

- The slipway ought to be conserved with some treatment of the metal rails and winch, and weather proofing of the wooden boat cradle. All items ought to remain in-situ excepting the harbour boom which ought to be removed from the cradle as it is causing further deterioration. The harbour boom ought to be retained on the site.

- The light rail system and turntables ought to be retained in-situ. Sub-surface work on the concourse, or replacement of the concourse ought to include replacement of the light rail in its original configuration.

- Regular removal of vegetation from the light rail ought to be a scheduled part of maintenance works.

Zone 3

- Above ground works, relics and landscape elements of medium significance ought to be assessed by NPWS historical archaeologist, and recorded prior to disturbance, or development works in the vicinity.

- The terraces of the eastern shore ought to be interpreted and replanting of appropriate tree species in the terrace area, after research into the possible original pleasure grounds design of the garden area.

- The anchorage buoys ought to be retained on site.

Zone 4

- Structures, sub-surface and underwater deposits of low significance should be recorded prior to substantial disturbance.

- Removal of the sub-surface deposits, including soil removal for remediation purposes, on the concourse on the western shore should be done under supervision of the NPWS historical archaeologist.

- Removal of the sub-surface deposits on the eastern shore should be done under supervision of the NPWS archaeologist.

- Removal of sub-surface deposits near to features A1 and A3, should be done under supervision of the NPWS historical archaeologist, with some prior investigation to determine the extent and significance of the deposits, prior to works.

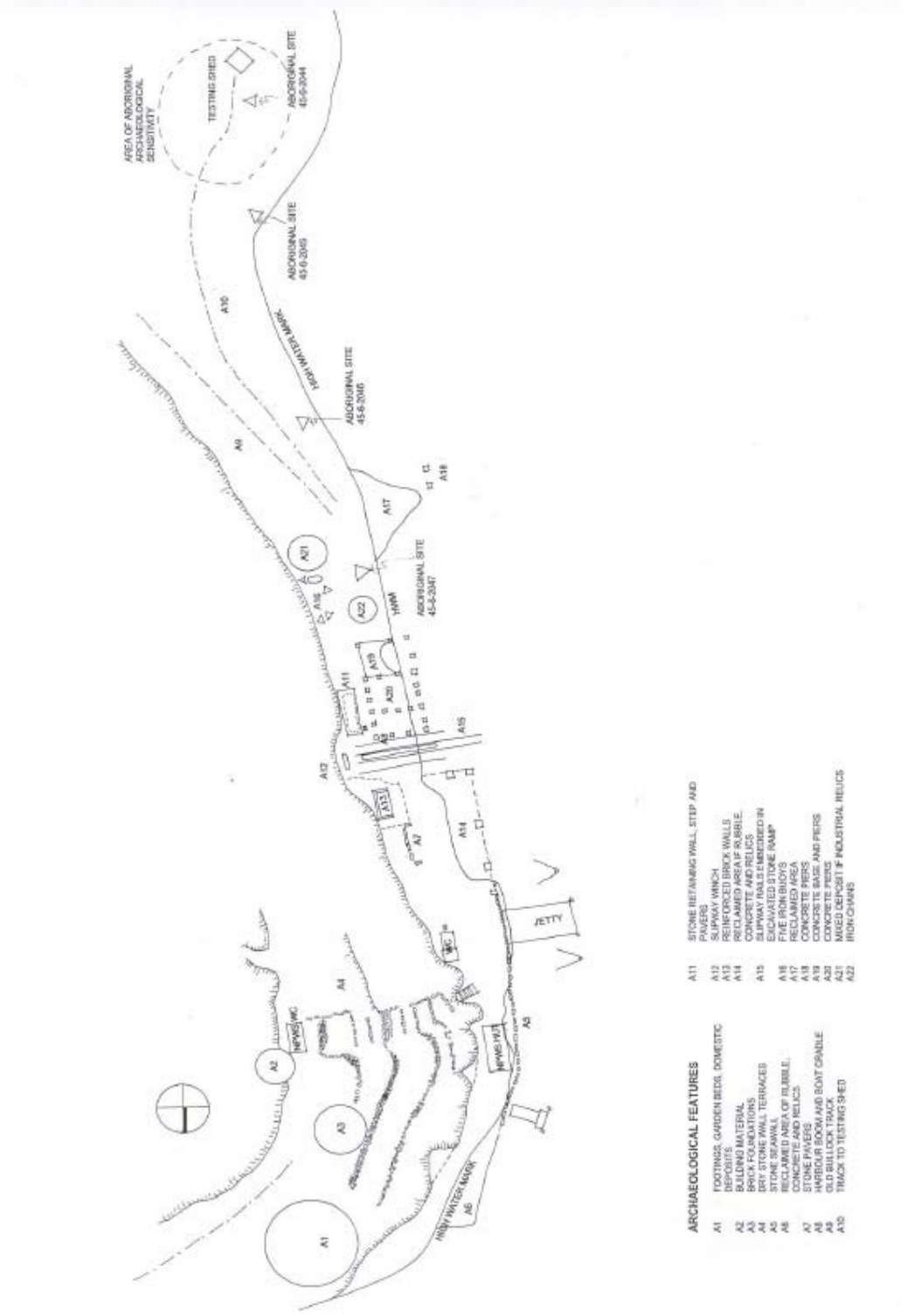

Figure 6.9.16 Archaeological features, eastern shore.

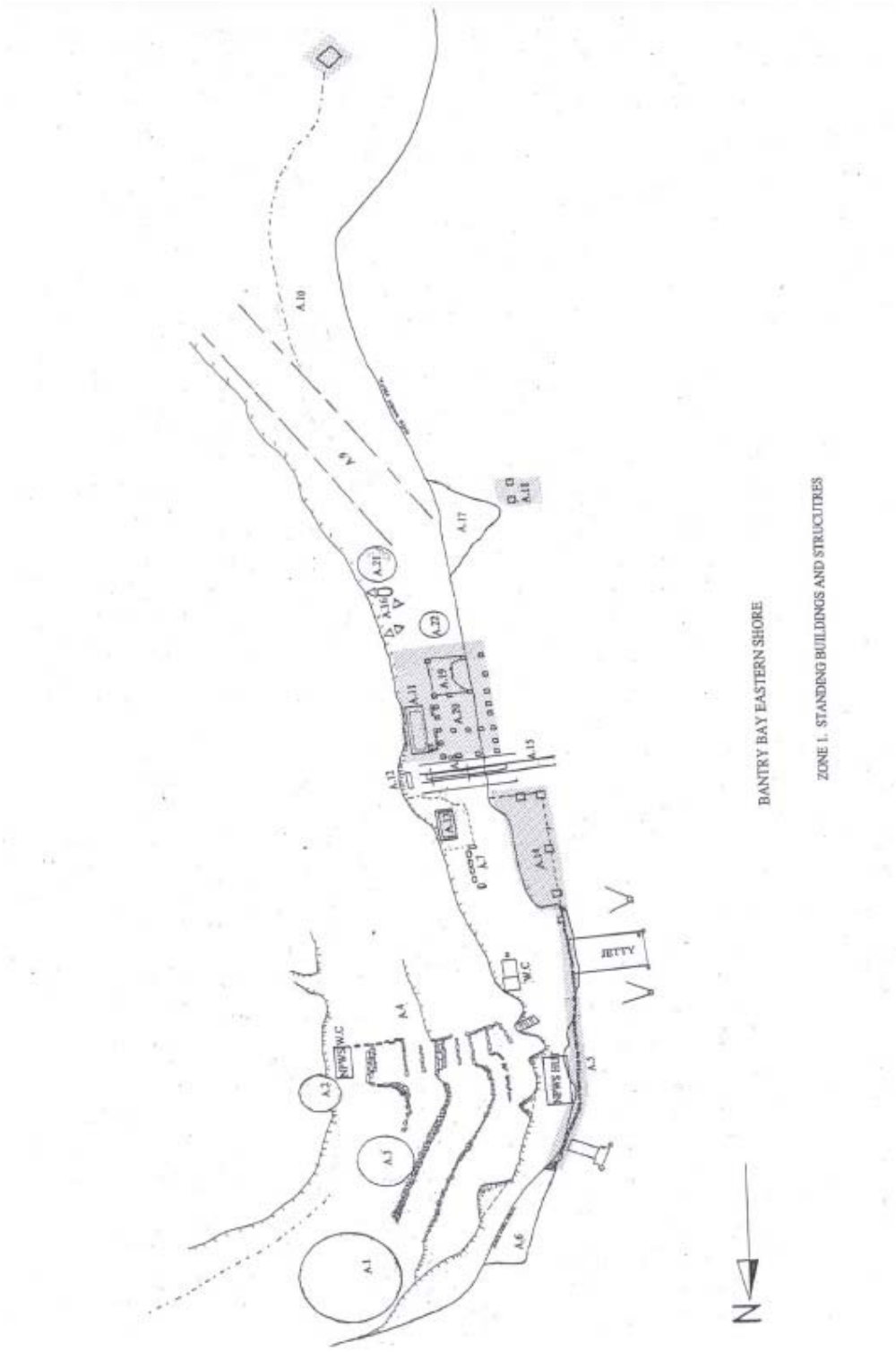

Figure 6.9.17 Zone 1. Eastern shore, standing buildings and structures, shown shaded.

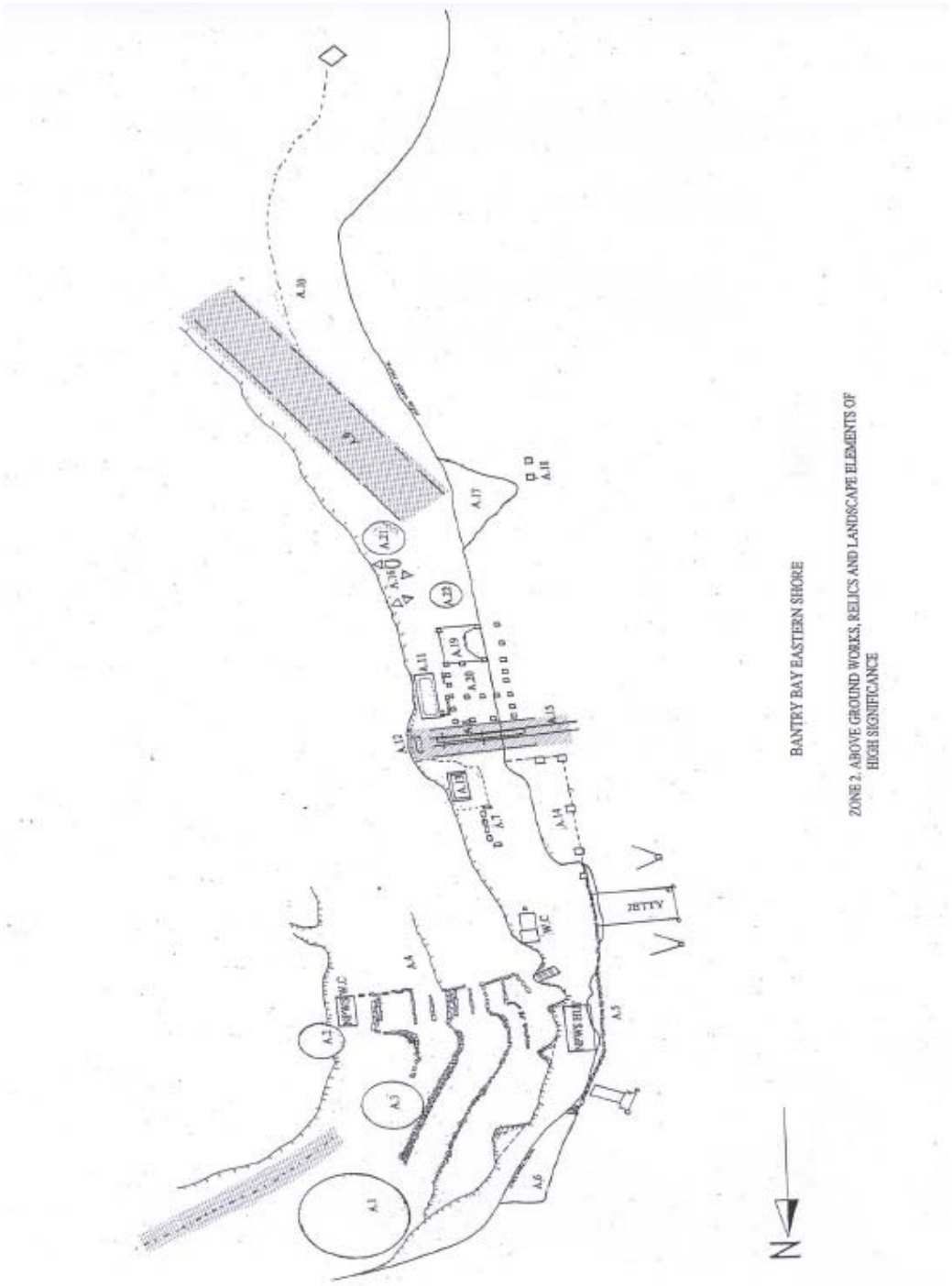

Figure 6.9.18 Zone 2. Eastern shore, above ground works, relics and landscape elements of high significance, shown shaded.

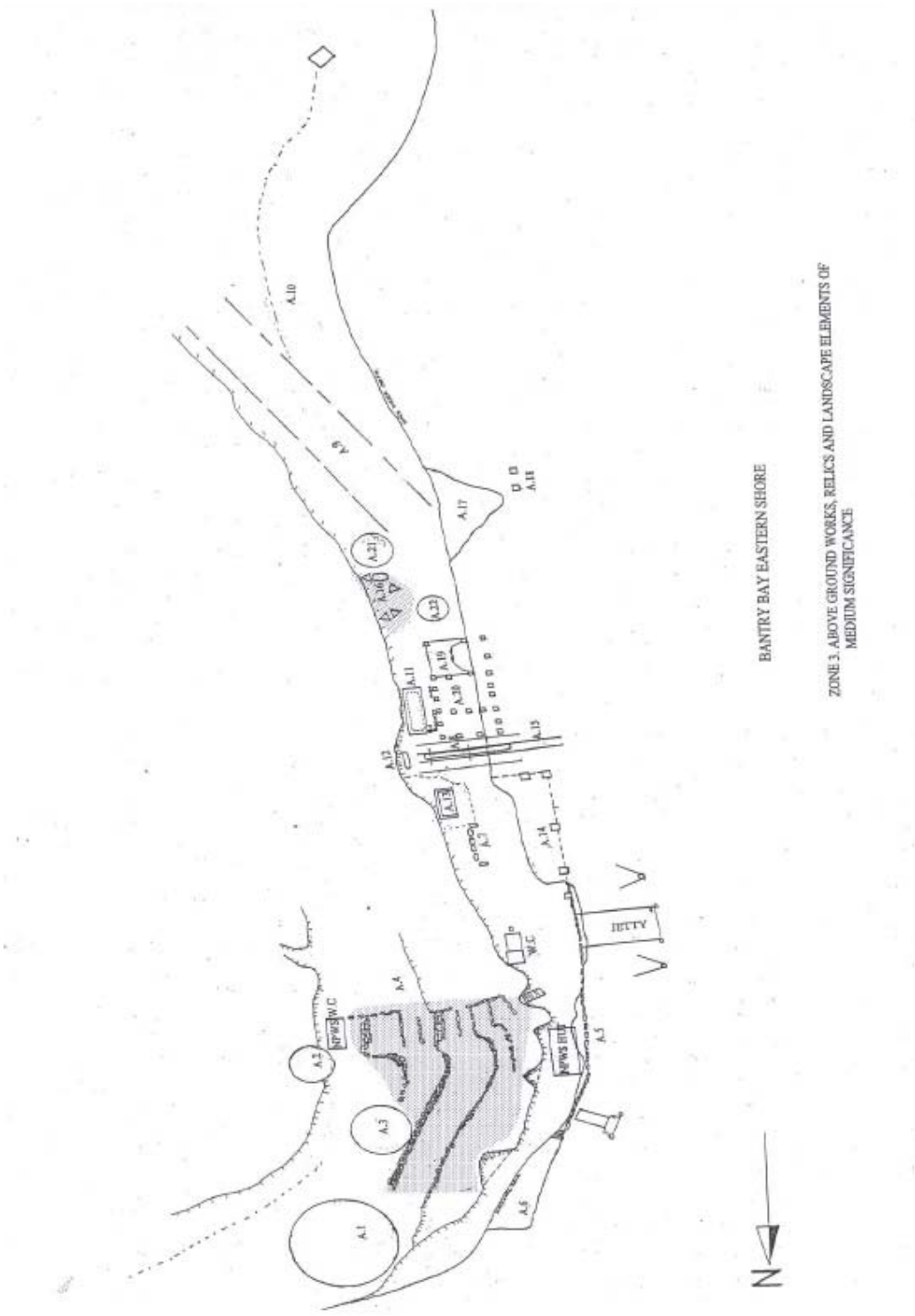

Figure 6.9.19 Zone 3. Eastern shore, above ground works, relics and landscape elements of medium significance, shown shaded.

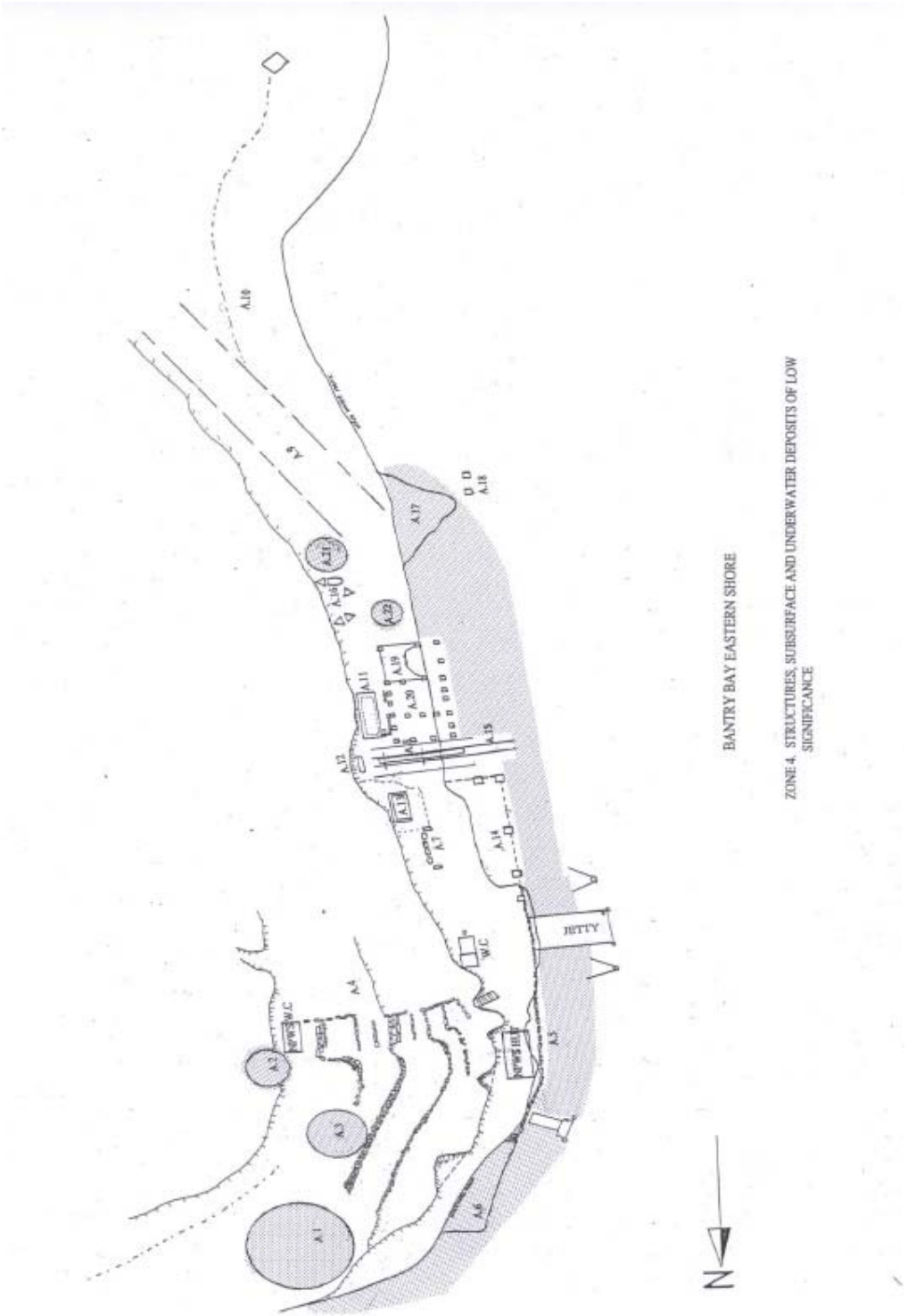

Figure 6.9.20 Zone 4. Eastern shore, structures, subsurface and underwater deposits of low significance, shown shaded.

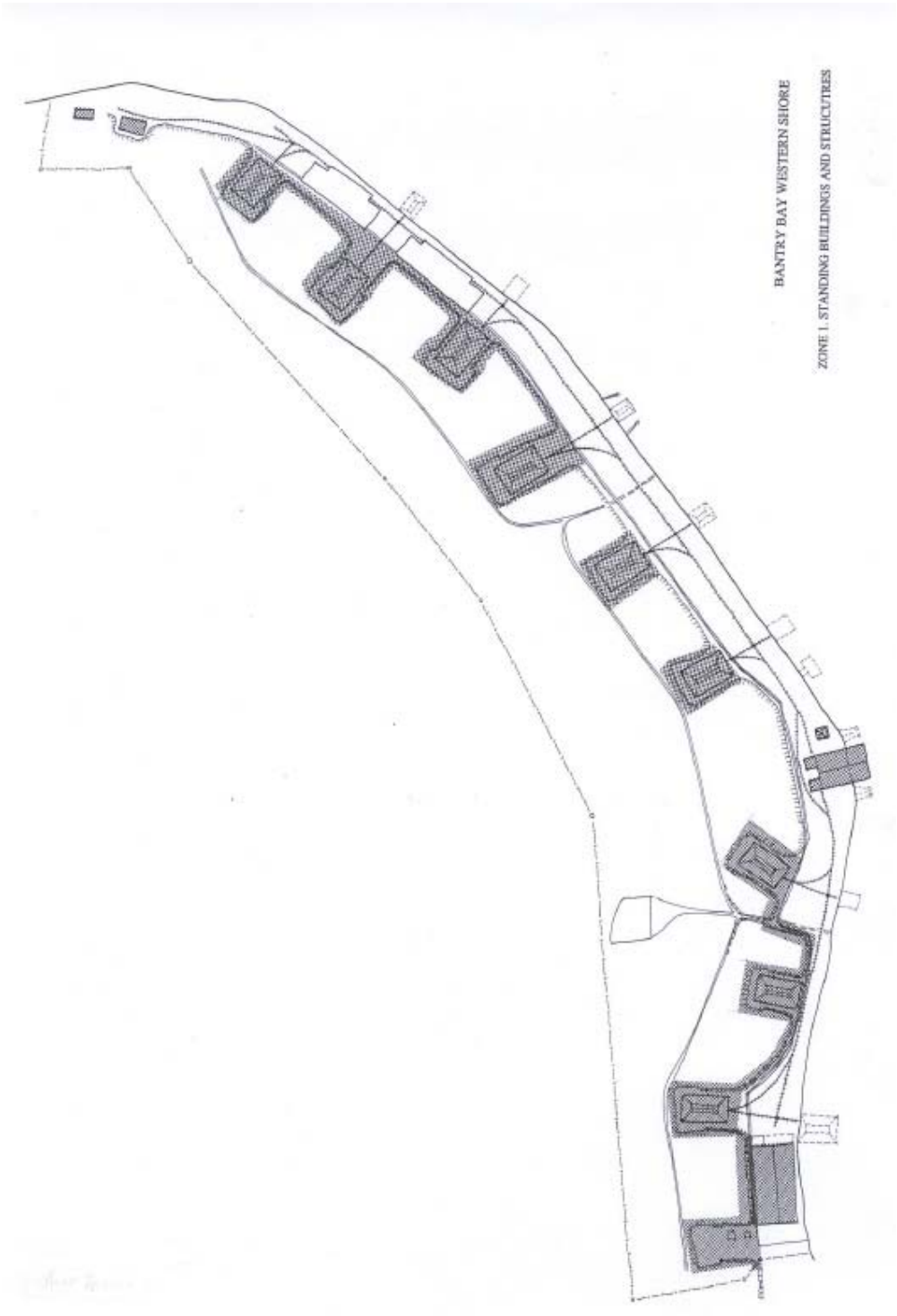

Figure 6.9.21 Zone 1. Western shore, standing buildings and structures, shown shaded.

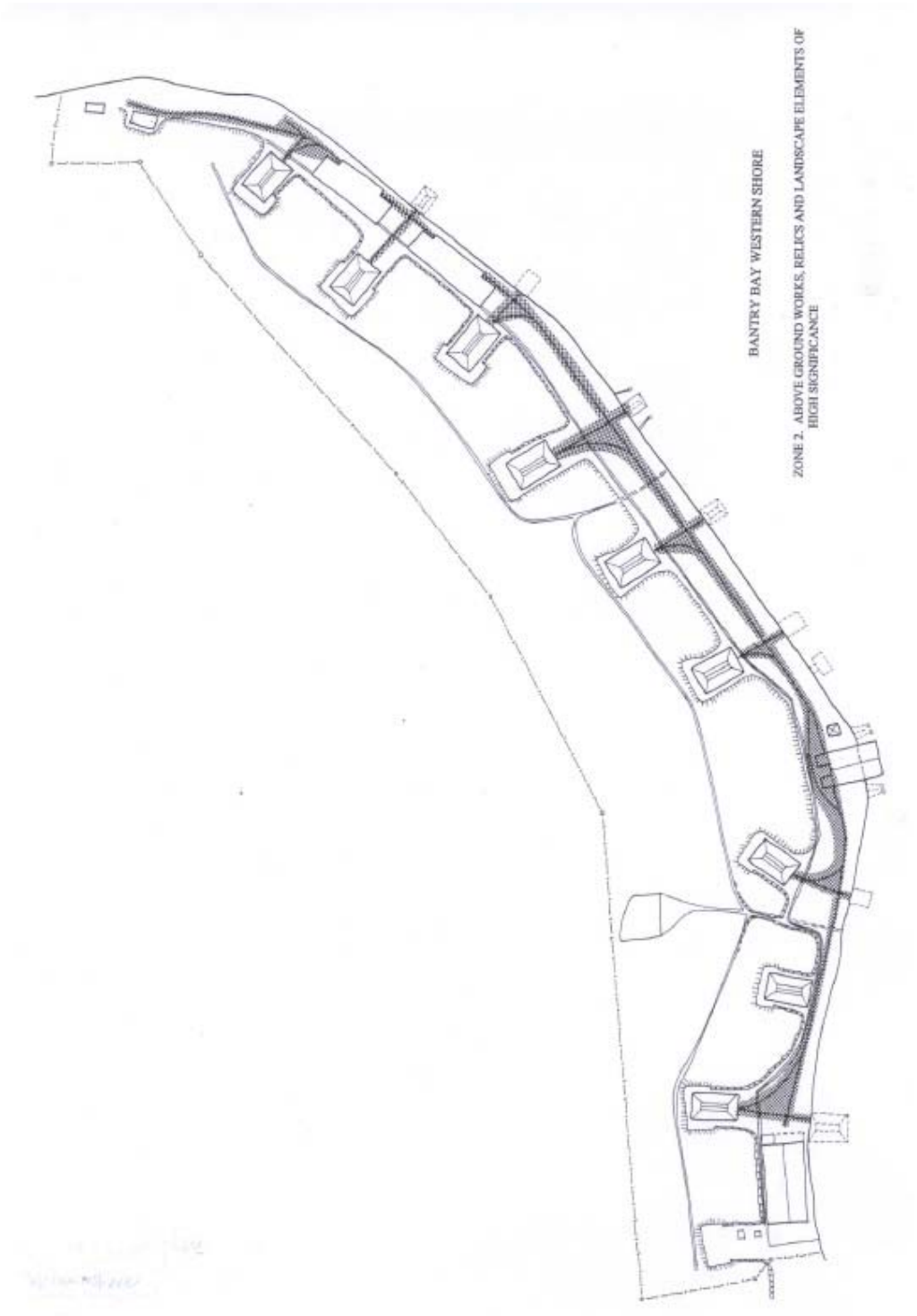

Figure 6.9.22 Zone 2. Western shore, above ground works, relics and landscape elements of high significance, shown shaded.

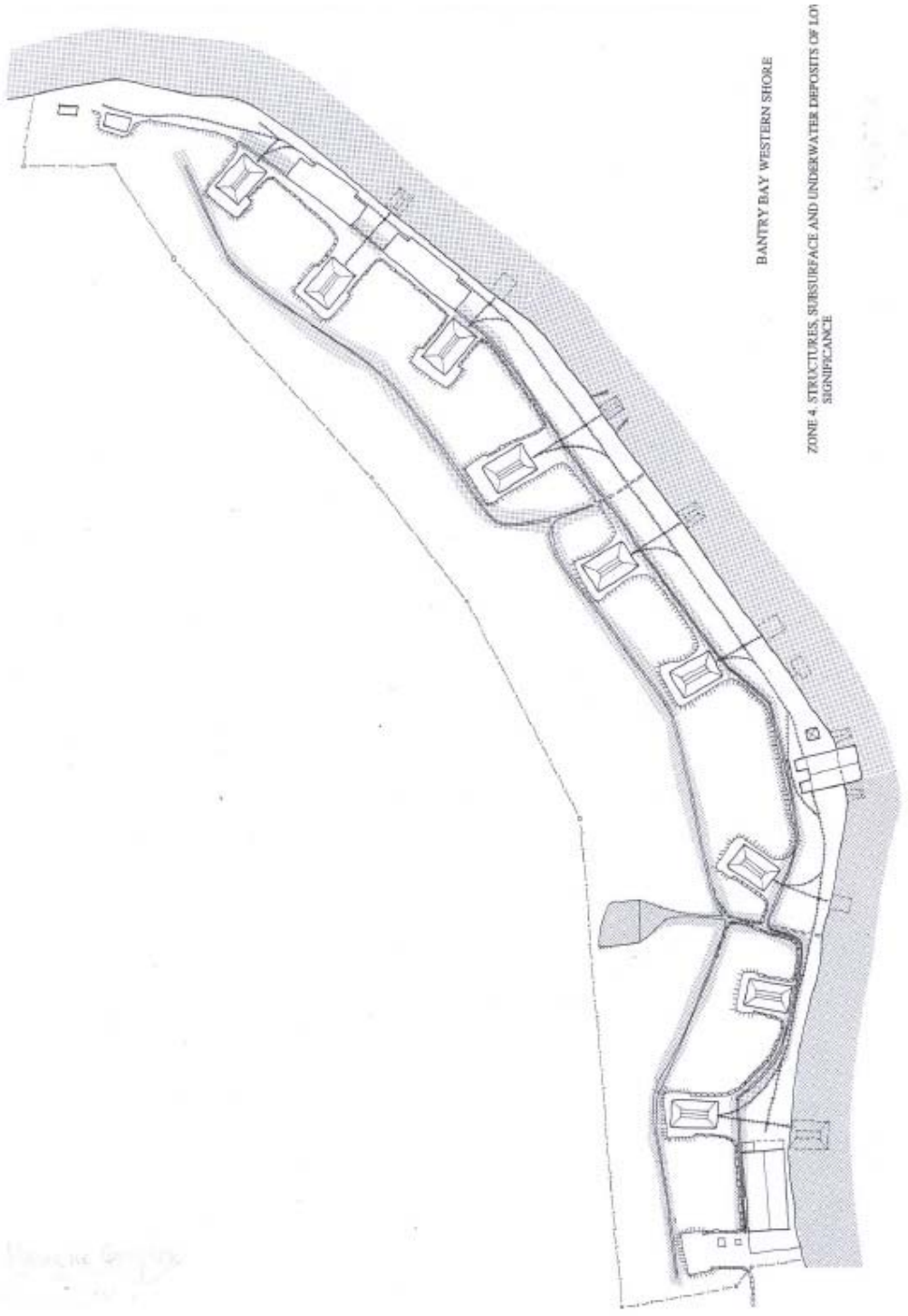

Figure 6.9.23 Zone 4. Western shore, structures, subsurface and underwater deposits of low significance, shown shaded.

7.0

ADAPTING TO A NEW DIRECTION

7.1 NPWS Opportunities

In the past heritage considerations have often been seen as restrictive in Australia, with historic buildings being regarded as so precious that they could only be used as museums. This attitude has matured, with reasonable and responsible re-use now regarded as a preferred option for historic buildings. Uses which relate relatively closely to the original are given preference, as these are considered to have the least impact since they require little change to the building fabric. The opportunities for re-use of heritage properties are now even greater, as is the ability to accept that new uses can be adapted to suit the character of existing buildings, rather than demanding unnecessary changes to the building fabric.

Throughout its life, both the western and eastern shores of the magazine complex and the bay between, have not been readily accessible to the public, given their potentially hazardous use. Since the closure of the complex, the bay has had a number of visitors, including boaters, picnickers and bushwalkers to the area, attracted more to its secluded location and picturesque setting, than to the actual magazine complex, which has acted more as a backdrop to the visit.

The existing landscape on either shore of the bay is a result of a number of functions which related to the operation of the complex, including fire protection and blast confinement, and earlier Aboriginal and European occupation at the bay prior to the establishment of the complex. The specific requirements for the safe operation of the magazine complex are no longer relevant, however these patterns should be recognised in the cultural landscape policies.

As a result of their limited public access in the past, their striking image within a picturesque setting, and level of public recognition, the Bantry Bay Explosive Magazine complex presents a remarkable opportunity for NPWS to capture this curiosity.

7.2 Selection of Appropriate New Uses

The existing structures and infrastructure of both shores of the bay represent opportunities for re-use and interpretation. Although re-use options are limited by the difficulties of access, contamination and costs of conservation/adaption, it is essential that representative examples of items of primary significance are retained for interpretative purposes. Decisions about the interpretative capacity and re-use potential of individual buildings and other features must take account of their particular and relative contribution to the overall significance of the place.

7.3 Uses Identified in the Past

Conservation of the extant buildings and infrastructure will provide extensive floor space within a limited variety of buildings for re-use. While many of the buildings were purpose designed and will need to be sensitively adapted, the floor space available will be suitable for a range of re-use possibilities, which are identified in section 7.6.

The 1982 Bantry Bay Planning Study, undertaken by Latona Masterman and Associates on behalf of the NPWS, identified a number of re-use submissions for the magazine complex, which had been received either prior to or during the course of the study. These included submissions from a range of groups, including commercial interests, government, education or community groups and interested individuals. The re-use of the magazine complex generated interest from a far wider section of Sydney population than the immediate local population at this time.

Commercial uses for the conservation and development of the complex identified at this time, included various proposals for restaurants or cafes, holiday units, pottery and craft shops, harbour swimming pool, private marinas, public boat ramp and "boatel", with associated car parks, roads into the site or a monorail. There was also interest in a steam train from Bantry Bay Shopping Centre to the complex, winding through the bushland and rocky escarpment.

Education based uses identified included a Field Study Centre with residential base to be managed by the Department of Education, a privately operated School of Sailing and Navigation/Marine Studies, a Research Institution to study coasts and foreshores, a commercially operated Industrial Design School, and a Residential Study Centre for the Sydney College of the Arts.

These proposals were generally not considered further at this time, as there had been no detailed study on the heritage value of the buildings, and the Lands Department and the NPWS were reluctant to give exclusive use of the site to either a commercial, community or government department.

Submissions from the National Parks Association of NSW, the Nature Conservation Council of NSW, the Upper Middle Harbour Conservation Society, and a number of local individuals recommended the inclusion of Bantry Bay within the Sydney Harbour National Park. It was generally considered that only the NPWS had the necessary expertise to effectively manage and conserve the complex and surrounds, and that the natural bushland of the bay would complement the relatively developed areas which comprised the Sydney Harbour National Park. It was also recommended that the former Castle Cove explosive reserve should also be included.

These submissions generally recommended that the bushland be retained for passive recreational use, visitor access should be strictly controlled and restricted to by foot or boat only, and that the historic buildings, structures and archaeological sites of the complex be protected.

A submission from the NSW Fisheries recommended that special emphasis should be placed on the protection of mangroves and sea-grass beds located in the headwaters of the bay and the existing closure of the area to commercial fishing should be retained.

Other interest groups in the re-use of the complex identified in the 1982 planning study included the Seaforth Preservation Association, Pittwater Flora and Fauna Society, Faculty of Science University of NSW, and Gould League of NSW.

7.4 Constraints Arising from the Re-use of the Magazine Complex

7.4.1 Contamination

The site is free of explosives, however contamination includes high levels of lead and zinc contamination, around the magazines of the western shore and the testing shed of the eastern shore. There is also the potential for arsenic contamination inside the magazine buildings.

NPWS should adopt a "risk management" approach towards the remediation of the site and buildings, with the aim of providing a safe level of public access, while respecting the heritage significance of the building, fabric and site infrastructure. NPWS should undertake remediation prior to the use of the site by the public. Such works could include the removal of affected soils from around the magazines and associated buildings, removal or stabilisation of roof materials, removal of asbestos and cleaning of the interiors proposed for public use. Where ever possible, the approach should be one of stabilising the contamination, where removal would have an impact on the heritage significance of the buildings and site, such as the potential conflict regarding the removal of the roof structure, or removal of the concrete concourse around the magazine buildings.

As such, it is the recommendation of this report that a Schedule of Remediation Works be prepared by a remediation specialist and conservation architect, which further details and costs the remediation works required. This schedule should be undertaken with a view to providing a safe level of public access to the site and within the buildings, as the preferred conservation option for the site.

The contamination of the site is a major constraint on the adaptive re-use of the site. Options for re-use and public access will need to be formulated with the health risks, costs of remediation and feasibility of adaptive re-use as primary factor in their formulation.

7.4.2 Provision of Access

The re-use of the magazine complex will need to consider the existing points and methods of access into the site. Presently access into Bantry Bay is by water or walking track (Figure 7.3.1). There is no road access into the site.

Pedestrian Access

Walking tracks into the western side of the bay include the Magazine Walking Track, which approaches the site from the southern end, running behind the magazine complex, and is an extension of the Flat Rock Walking Track along the northern shore of Middle Harbour, and the Cook Street Track, which approaches the site from the northern end. Walking tracks into the eastern shore include the Bluff Track, which approaches from the northern end, the Engravings Track, which extends parallel with the Wakehurst Parkway and along the ridgeline, the Old Bullock Track and the Timber Getters Track, which head down the hillside to the waterfront, and the Bay Track, which extends along the eastern shore line.

There is presently no possibility for circulation by walking track through the National Park around Bantry Bay, due to the presence of mangroves at the upper northern reaches of the bay. Access is either to the western or eastern shore only.

Three car parks adjoin the National Park, and act as access points into the Park. These are located at Seaforth Oval, the Wakehurst Parkway at the junction with Bantry Bay Road and in

Forestville Park to the north. The entrance from the Seaforth Oval car park, the closest of the three, is uninviting and difficult to locate, being located adjacent to a toilet block and behind cricket nets, and is poorly sign posted. The oval itself is unsavoury, with well known problems relating to drug and alcohol abuse.

Old Bullock Track

The Old Bullock Track provides a path to the eastern shore from Seaforth Oval, which in turn provides car parking and access to public transport. The present entry to the old Bullock Track from the oval is poor, hidden behind the topography of the oval, and poorly signposted. The structure of the Old Bullock Track has been progressively eroded through the lack of maintenance of drainage, walls and surfaces. This has led to a series of washouts and erosion of the structure of the path. Where the track passes through a minor creek, a small timber bridge that once crossed the creek no longer exists.

Waterborne Access

Water access to Bantry Bay is approximately ten minutes from Roseville Bridge and approximately 15-20 minutes from The Spit. Water access is presently limited to private boats, and the general lack of safe landing moorings tends to preclude public use because of the risk of liability involved.

No regular ferry service calls at Bantry Bay, however Captain Cook cruises operates twice daily cruises of the Middle Harbour (up past the Spit Bridge), however entry into Bantry Bay depends on the tide. Small boats are available for hire at the Spit, Roseville Bridge and Castle Cove. Water use by the wider community is subject to the opening times of the Spit Bridge.

A four-knot speed limit within the bay area, although imposed for safety reasons, has acted as a protection to the marine life and wetland flora.

Walking tracks and boat should remain the primary mode of access into the study area. NPWS should consider the upgrading of the walking tracks and their entrances in the short term, in particular the conservation of the Bullock Track, as the main access route to the eastern side.

A road into the complex is not recommended, given the high level of significance of the natural landscape on the hillsides around the bay, and the likelihood of Aboriginal sites not yet recorded over the hillsides. Any road into the site would have a significant impact on the isolated character and “pristine” nature of the bay.

Figure 7.4.1 Pedestrian access into Bantry Bay (Scale 1:25,000)

Compliance with Disability Code

There are no requirements for provision of access by the disabled to be made to either the western or eastern shores of the complex.

7.4.3 Provision/Upgrade of Services

Presently there are no services to the western shore, with the exception of reservoir water. The reservoir is located on the hill between Magazine No. 3 and No. 5, and is presently in a state of disrepair. Services, which were available to the western shore during the period of operation of the magazine complex, included telephone, septic tank waste disposal, potable tank water and reservoir water. The phone line was via a submarine cable from the eastern side.

Services to the eastern shore presently include water and telephone. Waste disposal from the eastern shore during the operation of the magazine complex was by means of direct disposal into the bay. There are presently two toilets located on the eastern shore, one at the waterfront, which is presently unconnected, and the other on the upper terrace. This upper level toilet is a pit toilet. Electricity to the eastern shore has been recently disconnected due

to damage caused by a fire in October 2000. There are no provisions by NPWS for rubbish removal from the eastern shore, relying on visitors to remove their own rubbish.

Any proposals for the re-use of the magazine complex on the western shore will need to consider the requirements for water, electricity and waste disposal.

In the short term the requirement for services on the western shore would be best achieved by bringing in services as required. Long term policies should consider the connecting of permanent services to the western shore.

Power to the eastern side should be reinstated in the short term, with consideration given to increasing the capacity now for long term re-use proposals for the site. NPWS should also consider the suitability of the pit toilet in the short term, its location, management and surrounding landscaping. The small toilet at the waterfront has heritage significance as an early structure of the magazine complex, and reinstatement of this use is not considered appropriate. Rubbish removal from the site should also be considered by NPWS.

7.4.4 "Catch Up" Works and On-going Maintenance

The condition of the buildings and site infrastructure of the magazine complex is such, that a sequence of "Catch Up" works are required to be undertaken in the short term, in order to stabilise, prevent further deterioration, and conserve the buildings into the future.

The short term approach towards the conservation management and maintenance of the buildings and site, should be to "do as little as possible, but all that is necessary", to stabilise and conserve the complex into the future, such that options for its re-use are retained, and the extent of work and expenditure required realising future re-use options is kept to a minimum.

NPWS should firstly undertake the "Catch Up" works identified within this CMP, and secondly implement the Maintenance Plan, which addresses the minimum standards for the maintenance and repair of heritage buildings listed on the State Heritage Register, established by the NSW Heritage Office. These relate to the weatherproofing, fire protection, security and essential maintenance of the significant buildings, site elements and archaeological relics.

The Receiving Shed would appear to have severe structural problems due to the corrosion of the steel reinforcement of the suspended concrete floor slab, corrosion of roof elements, and subsidence of the concrete piers supporting the front of the building. A number of repair works however should be implemented in the short term, and have been included in the "Catch Up" Capital Works. Further consideration should be given however, as to the manner in which the suspended concrete floor slab is repaired, including a Cost Analysis of the two primary options, and Risk Analysis of Failure of the building. These should be undertaken in the short term, prior to the development of any proposals for its re-use.

7.5 Options for Re-use

Options for re-use of the Bantry Bay Explosives Magazine complex and the surrounding area, are dependent on a number of constraints; its isolated location, restricted access, provision of services, the remediation of the contaminated soils and its low public profile.

The options for adaptive re-use that are outlined here are options that have been suggested in the past, or were raised as possibilities by NPWS staff and consultants. None of these options have been tested as to feasibility and are meant as general guides only, as to re-use options which would be compatible with the significance of the site.

The level of "attraction" regarding the public profile of the complex, requires a certain level of building conservation and site presentation. Run down or abandoned visual impressions, which would reflect badly on NPWS as responsible cultural asset managers, should be overcome with remedial "catch up" works and low cost maintenance before public programs can be fully implemented.

7.5.1 Short Term Opportunities

A number of short term options for the complex have been identified, which have varying requirements for access, services and infrastructure, and include the following:

Event Based Uses

Event based uses could include corporate functions, festivals etc, located on the eastern shore and overlooking the complex as a backdrop.

- Access into the site could be by either foot or by boat during the day, however restricted to access by boat at night. The restricted access should be considered a positive experience for the event.
- The provision of parking, well lit and sign posted walking tracks into the site is a consideration for this option.
- Consideration should be given to the mooring of boats on the eastern shore.
- Temporary services such as toilets, waste disposal, additional electricity and potable water could be provided and then removed, lessening long term impacts and infrastructure costs to the Service.
- Consideration should be given to the lighting of the complex on the western shore at night, to provide a scenic backdrop.
- Temporary accommodation required for events, eg. Marquees and can be brought in and removed as required.
- If enough interest is shown, there is the possibility of constructing a more permanent location for events, on the eastern shore.
- Events which focus on the eastern shore, with the western shore as scenery only would lessen the necessity for complete de-contamination of the western shore and repair of the magazine buildings to OH & S standards.
- Insurance issues for the Service would need to be considered.

Small, Controlled Day Tours

Small controlled day tours of the complex, either operated by NPWS or a private group. The tour could include a tea break on the eastern side, which has facilities (water, toilets) already provided, and various walking tours to other sites of interest, including the waterfall and Aboriginal carving sites.

- Provision of access could be by boat or on foot.

- A controlled and guided tour would require only representative examples of the magazines to be open for interpretation purposes. Decontamination of the site and buildings to a level suitable for public access onto the site could then be restricted to certain areas.

- Maintenance works would be needed to the site and buildings, so that they are in a reasonable state of repair for public access and interpretation.

- Consideration would need to be given to the mooring of boats on either side of the bay, in particular the western side.

- Services are not necessarily required to the western shore, but would need upgrading on the eastern shore to cater for numbers of people at one time.

- This option allows for partnerships with local historical societies, and groups interested in explosives and military history.

- Consideration of the content of NPWS tours, which should preferably provide a "continuum cultural landscape and conservation context", which includes interpretation of all of the historic layers of use and cultural associations of the bay, including Aboriginal, early European and the Explosives Magazine complex use.

- Insurance issues for the Service would need to be considered.

Sunrise, Sunset or Night Time Boat Tours

Sunrise, sunset or night time boat tours of the bay, by NPWS as part of a tour of the greater Middle Harbour.

- Consideration would have to be given to tides and water level, which may not facilitate entry into the bay by large boats.

- No access would be needed to either shore due to safety issues.

- Consideration of flood lighting of the western shore at night, from either across the bay (eastern side), the boat, or at the complex. Consideration would have to be made of the impact this would have on fauna in the bay.

- This option does not require the de-contamination of either shore nor the conservation of building interiors beyond maintenance to present a good visual appearance.

Links to similar Sydney Harbour sites.

- Bantry Bay should be brought into the stories of the greater Sydney Harbour. There is the potential for links and supporting information to be provided at Goat Island and Spectacle Island, also former explosives storage complexes.

- Consideration should be given to the publication of brochures, soft covered booklets etc., which place the Bantry Bay complex in the context of similar explosives storage complexes in Sydney Harbour, and which could be made available at Goat Island, Spectacle Island and the offices of Garigal National Park.

- Similar interpretation of the pleasure garden era of the Bantry Bay, with links to other former pleasure garden sites within Middle Harbour, and which are managed by NPWS, including Killarney Point in Garigal National Park, "Fairylands" in Lane Cove National Park, and Clifton Gardens in Sydney Harbour National Park.

Passive storage.

- Passive storage in the magazines of the western shore for robust items which do not require frequent access. Could be associated with NPWS equipment or other government surplus, or associated businesses which may use the eastern shore or Bay.

- Constraint is the boat only access to the site.

- Isolated location and frequency of use.

- Security of the site and buildings.

- The required remedial works to the buildings would include repair and weatherproofing of the magazines and de-contamination of the interiors should they require it.

Potential Film/Television Location

Include Bantry Bay on the list of potential film/television venues currently managed by NPWS.

- Implications of the restricted access onto either side of the complex, which can only be achieved by either foot or boat, may deter or act as an attraction depending on the type of location required. Should be promoted as an isolated backdrop and site.

- Limitations as to size and type of film equipment which could be brought into either side of the bay by boat or on foot.

- Remediation of at least part of the complex and buildings would be required, depending on the needs of the film makers.

- Provision of facilities, including toilets, showers, consistent potable water supply, waste disposal and electricity, could be temporary and supplied by users rather than the Service.

- The magazines could be used to securely house equipment during the filming process.

- Provision of a continued site presence may be warranted to ensure that the buildings are not damaged.

- Insurance issues for the Service would need to be considered.

Retain Recreational Use

Retain existing recreation and picnic use of eastern shore with no public access to the western shore.

- No access to the western shore required and therefore de-contamination would be less of an issues, excepting the testing shed on eastern shore.

- Landscape works would be needed to make existing picnic area more amenable, including works to open views to the complex on the western shore.

- Minor upgrading of existing services, including toilets, and provision of a consistent potable water supply.

- Access considerations would include parking, well signposted walking tracks, and interpretation.

- Interpretation of the complex, including the various layers of historical associations, and appropriate signage on the eastern shore and at points of the western shore for boat traffic to read.

Bush Walking

Promote existing bush walking tracks around the bay.

- Providing sufficient and amenable parking at start points.

- Interpretation of the complex within the bay, and its many layers of historical uses and cultural associations.

- Interpretation of Aboriginal sites.

- No requirement for access into the complex of the western shore.

Public moorings

NPWS to lease an increased number of public moorings within Bantry Bay.

- Capital expenditure is required to increase or maintain the existing moorings within the bay and negotiations with NSW Waterways.

- Consideration of the management and leasing of the moorings is required, without requiring a permanent site presence.

- There would be no requirement for access or mooring onto the western shore, therefore remediation would not be required.

- Provide a level of interpretation of the complex on the western shore, which is readily visible from the moorings.

- Security of site and buildings of the western shore should be considered, including ensuring buildings are locked and secure, and adequate warning signage.

- Access to the eastern shore for recreation, facility use and picnic ground use should be encouraged and would require the upgrade of picnic, water and toilet facilities.

7.5.2 Long Term Opportunities

A number of long term opportunities for the re-use of the complex have been identified, which all generally require a level of interest and capital expenditure, from various groups external to NPWS.

These are listed below, along with the various constraints that need to be considered.

Small maritime based business opportunity

There is the opportunity for a small boating business located on the eastern shore, for the construction or maintenance of small timber boats or the servicing of motorboats.

- Such a use does not require a passing trade and as Roseville and Seaforth boat ramps are located not too far away, access would not be a problem.
- The preferred location would be on the eastern shore, where existing infrastructure is amenable to such a business. Reconstruction of the former boatshed at the waterfront and re-use of the existing slipway would be acceptable for such purposes if they were done in a sympathetic manner.
- Such a business could not be easily accommodated on the western shore, given the seawall along the entire frontage of the complex, which would hamper operations, but the magazines could be used for storage for the business.
- May require some capital expenditure from NPWS for the provision of services, including toilet, water, electricity and waste disposal.
- Requires NPWS to identify interested parties and manage lease.
- Requires NPWS to liase with NSW Waterways for areas and structures below the mean High Water Mark.
- Insurance issues for the Service would need to be considered.
- Such a use would not restrict the current bushwalking and picnicking visitors and could in fact support them with increased services and options for food and water provisions. Such a use could also support boat tours of Middle Harbour with berthing facilities and tourist facilities, along the lines of Bobbin Head and the Halvorsen boatsheds.

Restaurant

- There is the opportunity for a small boutique restaurant located at the waterfront on the eastern shore.
- The isolation of the site means that the restaurant could not rely on passing trade for business and guests would have to be brought in by boat from a pre-arranged location. This could be an attraction, as with Berowra Waters restaurant.
- There is the possibility of linking the restaurant to either a NPWS or privately operated boat tour, or marina business.
- Capital expenditure and liaison with NSW Waterways is required to provide a suitable mooring for boats.

- Capital expenditure would be required by NPWS to provide/repair a reasonable location for a building which would be suitable.

- Interest and capital expenditure is required by an independent party.

- The receiving shed is considered to be most suitable site for a restaurant in an existing building, given its location over the water, however it does not easily allow views out to the bay. Further window openings to increase views would not be encouraged and the structural and de-contamination constraints on using the building are considerable.

- The preferred option would be the reconstruction of one of the buildings on the eastern shore, allowing the western shore to be a backdrop. The interpretive reconstruction of the former dance hall at the waterfront could accommodate a restaurant and views to the bay and complex.

- Consideration should be given to the provision of services, including electricity, potable water and waste disposal.

- Insurance issues for the Service would need to be considered.

Field Research / Education Centre

There is the potential for a field research or educational centre, within the complex on the western or eastern shore.

- Isolated location and restricted access by either walking track or boat is a concern, but could be incorporated into the field programme, by teaching bushwalking skills, marine studies, teaching of boat handling skills, sailing instruction, flora and fauna studies etc.

- There would need to be some consideration of security concerns, for NPWS and the park with large groups of children present in an isolated location.

- Consideration would need to be given to the provision of services, including electricity, toilets, waste disposal etc.

- If the centre was to be located on the western shore, adaptive re-use of the buildings would be required and involve large outlays fro the Service in remediation and repair and conversion. Construction of a new building on the eastern shore might prove more economically feasible.

- This option could include interpretation of the complex, and teaching about the significance of the site, as well as cultural and natural heritage in general.

- Insurance issues for the Service would need to be considered.

Overnight Camp for Education Groups (eg Sea Scouts/School Groups)

There is a limited opportunity for the complex to be adaptively re-used for an overnight camp for School/Scout groups or the like.

- Requires funding and support from other institutions, organisations or Education Department.

- Access to the site would by either walking track or boat.
- Remediation of the site and buildings on the western shore would not be necessary unless there was the need to adaptively use the magazines and receiving shed. This would not be a necessity as a new building on the eastern shore could prove more feasible, safe and amenable.
- Provision of services, such as a reliable water, electricity and sewerage would be required.
- Security would be required during periods when the complex is not in use.
- Insurance issues for the Service would need to be considered.

8.0

INTERPRETING THE CULTURAL RESOURCE

8.1 Introduction

Interpretation is defined in the ICOMOS *Burra Charter* as all the ways of presenting the cultural significance of a place. This significance, as outlined in Section 4.0 Assessment of Cultural Significance, means the aesthetic, historic, scientific, social and spiritual value of Bantry Bay.

Article 25 of the *Burra Charter* states that:

The cultural significance of many places is not readily apparent, and should be explained by interpretation. Interpretation should enhance understanding and enjoyment, and be culturally appropriate.

Bantry Bay is a site, which is in desperate need of interpretation in order to enhance its profile as a place of singular beauty and history within Sydney. It is blessed with enormous natural beauty, a picturesque cultural landscape, a well-documented history and is within the metropolitan boundary. The difficult aspect of an interpretation plan for Bantry Bay is the methodology of visitor access and management, and the means of conveying the story and significance of Bantry Bay to a wider audience than is currently possible.

Heritage interpretation provides access to our cultural heritage. Access can be physical, intellectual, emotional or spiritual and it does not necessarily imply unrestricted physical access to the place itself. Effective interpretation can be made from a distance, through media or 'off-shore' tourism. In the case of the western shore of Bantry Bay in particular, visitors could be given interpretive access and a good visitor experience from the deck of a boat or from a vantage point on the eastern shore.

This section will address options for the presentation and incorporation of Bantry Bay into existing NPWS interpretation and the approach which the NPWS could take in order to enhance the profile of Bantry Bay.

8.2 Interpretive Objectives

The aims of interpretation are to present not only the history of the place and fabric, but to explain the cultural significance of the place. The cultural significance of a place is generally not obvious to visitors. Significance can reside in values which are not immediately clear from looking at fabric. Social and spiritual significance for example can be quite abstract in that they are not revealed in a material sense. Significance is complex and evolving thing which interpretation needs to communicate in as clear a fashion as possible.

Interpretation is a vital part of conserving our cultural and natural heritage as it encourages appreciation, facilitates understanding and promotes protection. Bantry Bay has a very low profile in Sydney mythology, history and tourism. Garigal National Park is similarly burdened by a low profile, overshadowed by older and more established Parks to its north and south.

Bantry Bay could become a great drawcard to Garigal and a point of entry for the Park. It could also act as a focal point for discussions of the natural and cultural history of Middle Harbour and Middle Harbour Creek catchment.

Interpretation should seek to appeal to not only those visitors who make the considerable effort to visit Bantry Bay by boat or on foot, but also to those who may never go there, via publications, web-presence and NPWS information/education program. Interpretation of such a striking cultural landscape within Garigal can also provide a means of heightening awareness of the cultural values of NSW National Parks in general, thereby appealing to a broad range of visitors.

Obtaining a broad range of visitors, then providing interpretation, which seeks to respect and address the needs of all visitors in an equitable fashion, is a primary objective of interpretation. Best practice interpretation should seek to communicate to and interest all visitors.

8.3 Interpretation Methods

To attract visitors' assistance in raising the profile of Bantry Bay, interpretation of the site needs to start before visitors get there, ie. at the point of embarkation for boat trips, boat hire, ferry rides, car parks at the start of bushwalking tracks, at local information centres and at NPWS offices, other historic sites, information centres and web sites. Published material in the form of brochures, similar to the one issued for the NSW lighthouses, are very useful and graphic tools which can be transported to the site, as well as used by those who may never go there.

The general methods employed in interpretation of historic sites are publications, signage, guided tours and display. These can also now be incorporated into multi-media and web-based interpretation. Bantry Bay is too isolated and hard to secure to allow for display or an interpretation centre. Guided tours are feasible only as occasional events. The distribution of publications through NPWS offices and web-sites and local tourist centres is probably the most effective means of getting the story and significance of Bantry Bay to a wide audience, most of whom will never visit the site.

Guided tours and NPWS activities may be the best method of effectively managing visitors to Bantry Bay and ensuring they get the maximum benefit from the experience. Visits to the western shore will need to be carefully managed and limited, which in turn is reliant on the eventual remediation and conservation of the site. Tours could encompass the opening of one or two conserved buildings and picnics on the eastern shore. Harbour based tours by NPWS and commercial operators could include Bantry Bay with associated sites, such as Spectacle and Goat Islands and other sites in Middle Harbour. Scheduled open days at the bay could be advertised in association with National Trust magazines and web-sites, and activities such as Heritage Week.

Signage is the most common means of presenting the significance and history of historic sites to the public. Signage does not require an enormous financial input and it has the benefit of being permanently on-site, and within the landscape it describes. Signage at Bantry Bay has to take two distinct forms to allow for difficulties of access and limitations of access.

Signage on the western shore will need to address the possibility that most visitors will be reading ‘from ship to shore’. Access to the western shore is at this stage forbidden, due to the high level of contamination. Signage therefore needs to explain in very few words, on very large signs, the significance of the buildings and landscape. On the eastern shore a more detailed analysis, which could encompass graphics and photos and plans of the site, facing the western shore could service both those who land at the jetty and those who walk in.

Many of the individual features of the eastern shore could benefit from individual signage, especially the slipway and foundations, which explain the importance of boats for the magazine. Other signs could explain the landscaping and pleasure grounds and links to Flat Rock further up the Harbour. The Bullock Track requires signage along its length and at the major starting points for walkers, which incorporates the track, the bay and the history of the local area.

8.4 Visitor Management

Interpretation, brochures and information which seeks to encourage visitors to Bantry Bay will have to address issues of limitation of access to the western shore, the difficulties of access on foot and the limitations of facilities at the bay. It is vitally important that interpretation, which seeks to attract visitors, is honest in its appraisal of what they can expect, especially after an arduous hike or long boat trip to get there.

The provision of clean and useable facilities at historic sites is almost as important as good, clear interpretation. Toilets, clean water, shade and picnic facilities are minimum requirements for the eastern shore of Bantry Bay. The walk from Seaforth Oval is quite arduous in summer and the facilities once one gets there are lacking. To generate positive attitudes about the NPWS and the site, the facilities need a drastic overhaul. The presentation of the picnic area is poor and is certainly not as enticing as the western shore. The track to the waterfall is not signposted and the toilets are rancid. The barbecue facilities are for wood fires only, which are banned for much of the year, and no wood is provided. Planting on the terraces has been given minimal thought, and as a result there are trees now blocking the views of the western shore and not enough shade provided by shrubby species rather than canopy species.

Visitor facilities need to be more carefully thought out in order that they are sympathetic to the cultural landscape, not just NPWS standard issue. The lack of planning of the facilities on the eastern shore detracts from the cultural significance of the site, and needs to be rethought at the same instance as the signage. The eastern shore was designed to be a picturesque picnic place, and its significance as such needs to be respected in any future planning. The archaeological sensitivity of the Aboriginal midden and potential sub-surface archaeological deposit in the vicinity of the Testing Shed must also be considered in the siting of visitor facilities and access.

8.5 The Sense of Place

First impressions of a site can be hard to dislodge, and so a first impression needs to be positive. The journey to the place and the means of getting there are very important in setting the tone for the visitor. Those that make the trek by boat or foot to Bantry Bay will feel rewarded with the feeling of discovery of a forgotten part of Sydney, which one would not if access was by vehicle. This sense of isolation and romance is a very strong character of the approach by boat which passes from crowded foreshore development from The Spit to areas of more and more natural landscapes as one approaches Powderhulk Bay and Castle Cove, with a similar experience from the Roseville boat ramp. The walk along the Bullock Track from Seaforth Oval, gives spectacular views over the western magazines and bay, and a strong sense of the steep and rugged, secluded landscape.

Sense of place is a vital element in visitor experience of both natural and cultural sites. It mediates all aspects of the visitor experience and their remembrance of the site after the visit is over. It is vitally important to recognise what the unique sense of place for Bantry Bay is, and to preserve this as part of the significance of the site. Historic themes go some way to delivering the story of the bay in a thematic and therefore interesting narrative, but sense of

place, mood and feeling often have far greater impact on visitors. Bantry Bay has a distinct feeling about it, and its history, although dominated by the period of explosive storage, talks of isolation, attitudes to the Australian environment and leisure. Bantry Bay's sense of place is strongly associated with its natural and cultural setting and early occupation, and this should not be overlooked in favour of a history of magazine fabric.

To maintain the sense of seclusion that one feels in Bantry Bay, requires that the bay remain unspoilt and uncrowded. To maintain the sense of romance requires that the story of the bay be explained and narrated in a non-didactic, non-bureaucratic fashion. The lack of car access will more or less ensure that visitor numbers to the bay will never reach disproportionate levels and that the sense of isolation will be preserved. Preserving the sense of romance may be more difficult and it will require a careful narration to ensure that the administrative history of explosives regulations and technological minutiae of the fabric do not clog the story of occupation and development of the bay.

The sense of place of Bantry Bay is based mainly on the wonder of it being in the heart of Sydney and being so unknown and undeveloped. One is certain that there is an interesting story in the bay and the buildings demand curiosity about their function. Signage will assist in presenting this story, stimulating interest, respect and understanding of the site. Signage will not be sufficient to present the whole story and significance, and so publications, brochures and a web presence is recommended in addition to signage on site. In each of these, the sense of place of the bay should set the mood and tone for the interpretation.

8.6 Bantry Bay and the History of Sydney

Bantry Bay is perceived by many Sydneysiders as an isolated and remnant landscape. This perception is as much a result of its historical role which placed it out-of-bounds to the public and development, than it being a place without any relationship to or geographically isolated from Sydney.

Bantry Bay was reserved from development by the fact of it being an explosive magazine. This reservation has bequeathed to the suburbs of Middle Harbour a unique green belt among increasingly rare public foreshores. Until 1974, access to the bay was restricted, and so while other bays and harbours were being incorporated into the development and story of Sydney, Bantry Bay was left out and in some ways forgotten.

In fact Bantry Bay has strong associations with the history of Sydney, NSW government administration, Harbour shipping and with Middle Harbour development. The shape of the suburbs round Bantry Bay, Killarney Heights, Frenchs Forest, Forestville and Seaforth were formed in response to the reservation of the bay. Their history of development cannot be seen as separate from the story of the first reservation or the magazines. The development of the Harbour as the pre-eminent port of Australia is illustrated by the size and position of the magazines built to service the import and export of explosives through NSW. Sydney's role as the port for the Pacific War fleet is reflected in the choice of Bantry Bay as a storage depot for Allied armaments. The Explosives Department wharves, anchorages and depots in the Harbour, the older magazines at Spectacle and Goat Islands and Powderhulk Bay reflect the long history of explosives administration which culminated in the Bantry Bay magazines. All of these sites and historical developments place Bantry Bay firmly within the history of Sydney.

Some of the narratives, which could be used to convey this wider history, are:

- Aboriginal occupation and significance in Middle Harbour
- The beginnings of European settlement in Middle Harbour

- The ‘pleasure ground’ and picturesque nature in the late C19th
- The Public Magazines
- Powderhulk Bay
- The Explosives Department
- Bantry Bay and other Australian powder magazines (comparative structures, history, landscapes)
- Garigal National Park and a return to public recreation

Part D

Conservation Policies and Guidelines

9.0

PRIMARY CONSERVATION PHILOSOPHY

The primary conservation philosophy which sets the overall framework for the future conservation, management and re-use of the Bantry Bay Explosives Magazine complex, is one which will ensure that the complex is retained and conserved into the future, as an important component of the cultural heritage resource of Sydney and NSW.

- Conservation and management of Bantry Bay should recognise the important regional focus of the site, at a landscape level, within greater Sydney Harbour.

- NPWS, as custodian of a number of sites in Sydney Harbour, should manage the Bantry Bay complex in a manner which reflects the cultural significance of the complex, and its collective relationship with other similar industrial explosives complexes in Sydney Harbour. This policy encourages a coordinated management approach of the Bantry Bay complex, with adjoining NPWS entities, in particular Sydney Harbour National Park.

- The long term focus of conservation management of the Bantry Bay complex should aim to increase public awareness progressively, and promote the complex as a regional/local destination within Sydney and Middle Harbours, through managed interpretation and visitation programs.

- The initial short term focus should be on conserving the cultural values of the complex and its setting, by minimising the on-going deterioration of the buildings, landscape and site infrastructure, such that re-use options are kept open into the future.

- Conservation management should recognise the quarantined natural values of the overall setting of the complex, including its isolated nature, which is vital to its significance and interpretation as a former explosives storage complex.

- The conservation management of the complex should recognise the significance of the surrounding bushland of the bay, and HC Press Park opposite, for their contribution to understanding the threat of explosion, which underlies its exclusive zone of use.

- The management, conservation and interpretation of the immediate cultural landscape of the complex should recognise the various layers of Indigenous and European cultural significance.

10.0

NPWS OPERATIONAL MANAGEMENT POLICIES

10.1 Heritage Management Obligations

These general policies refer to the actions required of the NPWS managers of the Bantry Bay Explosives Magazine complex, generated by the various agencies and interest groups which have independently recognised the significance of the complex.

10.1.1 National Agencies

- NPWS should maintain a positive association with the Australian Heritage Commission as appropriate, in relation to the conservation management of the Bantry Bay complex. As such, NPWS should submit a copy of this CMP to the AHC, for their information.

- Subject to the introduction of the revised Commonwealth heritage management system, NPWS should recognise in its relationship to the Commonwealth, that the complex at Bantry Bay has been assessed as being of State significance.

10.1.2 NSW State Agencies

- Given its State Heritage Register listing, NPWS should conserve and manage the complex in accordance with the requirements of the *NSW Heritage Act 1977*, including the additional criteria outlined in the *Heritage Amendment Act 1998*.

- NPWS should seek endorsement of this Conservation Management Plan from the NSW Heritage Council, to enable the ongoing management of the complex in accordance with the CMP.

- NPWS should, as required, continue to refer any development proposals which fall outside the scope of this document and its policies, to the NSW Heritage Council.

- NPWS should manage all archaeological material, with the exception of Aboriginal relics, in accordance with the relevant archaeological management provisions of the *NSW Heritage Act 1977* and the *Heritage Amendment Act 1998*.

- NPWS should liaise with the NSW Heritage Council for the potential upgrade of the State Heritage Register entry, based on the material contained within this CMP.

- NPWS should ensure that the Bantry Bay Explosives Magazine complex is included on the NPWS s170 Register, prepared in accordance with the requirements of the *NSW Heritage Act 1977*.

- NPWS should respond to the heritage management aims of the Regional Environmental Plan No. 23 – Sydney and Middle Harbours, and other requirements under the *Environmental Planning and Assessment Act*.

- NPWS should continue to consult with the relevant representatives of the Metropolitan Local Aboriginal Land Council, in the preparation of conservation, interpretation and tourism programs, or development proposals for the complex.

- NPWS should liaise with NSW Waterways regarding the on-going or future management of areas or items below the High Water Mark, including seawalls, jetties and pontoons, and maritime archaeological elements.

- NPWS should liaise with NSW Waterways regarding the management of access to the bay by recreational vessels.

10.1.4 Local Government Agencies

- NPWS should approach Warringah Council to include the Bantry Bay Explosives Magazine complex as a heritage item in the *Warringah Local Environmental Plan 2000.*

- Listing of the complex in the *Warringah Local Environmental Plan 2000* should also consider the visual curtilage of the complex, as including the hillsides on either side of the bay up to the ridge tops.

- NPWS should endeavour to seek the listing of HC Press Park as a heritage item, with stronf historical associations with Bantry Bay, with Willoughby City Council.

- NPWS should liaise with Willoughby City Council to ensure that there is no negative impacts on the isolated nature of the visual curtilage of the complex.

- NPWS should encourage the continued listing of Bantry Bay as an Item of Environmental Heritage by Manly Council.

10.1.5 Community Groups

- NPWS should maintain a positive liaison with the National Trust of Australia (NSW) as appropriate, in relation to the conservation management of the complex. Major development proposals should be submitted to the National Trust for comment as a matter of courtesy

- NPWS should submit a copy of this CMP to the National Trust of Australia (NSW), such that the Trust is aware of the changes to the complex, and can update its heritage listing accordingly.

- NPWS should continue to take account of the philosophies, methodologies and guidelines contained in the Australia ICOMOS *Burra Charter*, in all conservation management programs for the complex.

- NPWS should continue to involve or consult with appropriate representatives of the local community, such as the Manly Warringah Pittwater Historical Society, during the preparation of major management or development proposals.

- NPWS should ensure that any major development proposals for the Bantry Bay complex are made publicly available to the broader Middle Harbour community.

- NPWS should ensure that future re-use options, which are in conflict with the provisions of REP No. 23, are subject to a full impact assessment.

- NPWS should encourage future re-use options which are in accordance with the original gazettal of Garigal National Park, under the *National Parks and Wildlife Act 1974*. Any future re-use options which emerge that are in conflict, should be the subject of a full impact assessment prior to further consideration.

10.2 Upgrade Plan of Management

- NPWS should incorporate the findings and recommendations of this CMP in a review and upgrade of the existing *Garigal National Park Plan of Management*.

- NPWS should ensure that the Service policies and practices under the *Environmental and Planning Assessment Act 1979* are implemented for all conservation management programs or re-use proposals of the complex.

10.3 Secure Adequate Funding for Long Term Maintenance Programs

- NPWS should endeavour to secure adequate, consistent and long term funding is made available for the implementation of remediaton programs, cyclical maintenance and upgrades for BCA and fire requirements, infrastructure and landscape features, landscape management programs, both cultural and natural, of the magazine complex and its setting.

- Garigal National Park Northern Beaches Area should ensure that submissions for funding for the continued maintenance of the cultural and natural features of the magazine complex are made at the appropriate time.

10.4 Staged Overall Development Programs

- NPWS should implement the overall conservation, remediation, adaptive re-use and cultural tourism programs on a staged basis over a number of years, and within funding limits. The primary objectives of the staged program will be to maintain the resource into the future, through cyclical maintenance of the buildings, site and landscape elements, and to progressively increase public awareness of the significance of the complex and its historic relationships with Sydney Harbour.

- Staged development should endeavour to meet the minimum requirements of the BCA, NSW Heritage Office minimum maintenance standards and fire safety regulations.

10.5 Maintain Security

- NPWS should foster increased visitor and neighbour awareness of the complex, as a means of providing increased security of the complex into the long term.

- The existing warning signs should be replaced in the long term. Any new warning signage on the western shore should be incorporated into the interpretation of the site, and be designed to present a more positive and non-aggressive message.

- The perimeter fence around the complex on the western shore should be maintained and repaired as required, as a means of ensuring security into the long term.

10.6 Review of the Conservation Management Plan

- Reviews of the Conservation Management Plan should be based on the *Burra Charter,* NPWS strategic directions and other guidelines developed by the NSW Heritage Office and the Service.

- Reviews should also take into account any relevant legislation, planning frameworks, appropriate literature and best practice conservation management practices and procedures.

- Reviews should be undertaken by experienced staff and conservation practitioners, in conjunction with relevant ownership and management representatives.

- NPWS should review the Conservation Management Plan every five years or subsequent to major programs of upgrading or re-use.

- The objective of the review process is to ensure that CMP remains relevant to the protection and conservation of the natural and cultural resources in the face of changed circumstances. Reviews should take account of any changed understanding of significance that has been developed in the intervening period

- Reviews should take into account any changed resources available to NPWS for the conservation, adaptive re-use and/or interpretation of the place.

11.0

CONSERVATION POLICIES FOR MANAGING CHARACTER

11.1 Conservation of Significance

- The Bantry Bay Explosives Magazine complex should be retained and conserved as an important component of the heritage resource of Sydney and NSW.

- NPWS should ensure that the future care, management and conservation of the magazine complex is based on a respect for the values expressed in the Statement of Cultural Significance of this CMP, and aim to retain and protect those values.

- The retention and integrated conservation of the historic fabric, features, artefacts, natural and cultural landscape characteristics, Aboriginal heritage features and archaeological resources, identified as being of primary and contributory significance are essential to the preservation and expression of the cultural significance of the complex.

- The future management and adaptive re-use of the complex by NPWS should aim to progressively increase public access and understanding of the cultural significance of the complex. Any adaptive re-use of the complex should be complementary to encouraging public access and understanding.

- NPWS should continue to utilise and promote the passive recreation use of the eastern shore. New facilities are acceptable provided that they are located within the existing clearings, and do not impact on the landscape or archaeological values of the site.

- The conservation management of the complex on the western shore should aim to stabilise deterioration, correct contamination problems and develop and implement a maintenance regime that meets minimum requirements of the NSW Heritage Office, the BCA and fire regulations.

11.2 Making Significance Accessible to the Public

- One of the primary components of the conservation management of the magazine complex, should be to make the values of the cultural significance of the complex physically, intellectually and/or emotively accessible to the public. These different forms of accessibility should be managed through visitor access facilities and interpretation programs, which evoke and acknowledge the complex and layered nature of the cultural significance.

- NPWS conservation management of the complex should include the development and implementation of the interpretation policies and programs recommended within this CMP, which reveal the cultural significance of the complex. Interpretation programs do not necessarily require access onto the western shore, or into any of the buildings, and

should focus on providing interpretation from the eastern shore and other vantage points, through the World Wide Web, brochures or booklets which raise the profile of the complex outside of visitation to the site, and special purpose tours or events.

11.3 Site Development Guidelines

Generally

- NPWS should carefully control the selection, design and installation of plaques, memorials and markers. Any such material shall be coordinated with overall site interpretation plans.

- The provision of new or extended infrastructure services to either the eastern or western shore of the complex, should be undertaken with minimal physical impact on the environs and visual character of the locality. Where possible, such infrastructure should utilise existing service corridors, which have already been disturbed by earlier development or infrastructure.

- NPWS should restrict the erection of any new buildings or major structures within the visual curtilage of the complex, ie. on the surrounding hillsides of the National Park around Bantry Bay, which would impair the visual isolation of the complex.

- Any site development proposals or programs must take account of Aboriginal and historical archaeological resources within the precinct.

Precinct 1: Western Shore

- No new structures should be constructed within the immediate curtilage of the magazine complex on the western shore.

Precinct 2: Eastern Shore

- NPWS should restrict the introduction of any new buildings within the immediate curtilage on the eastern shore to the provision of small support structures within approved programs of re-use, and where the additional accommodation that they provide cannot be adapted from within existing buildings.

- The design and siting of any new support buildings should avoid disturbance of any known Aboriginal or historical archaeological material or existing structures.

- The design and siting of any approved new support buildings should be carefully considered to minimise any impact on the visual setting and character of the eastern shore, in particular the cleared nature of the terraces.

- The construction of new compatible structures within the footprints of former waterfront structures on the eastern shore, is acceptable, including the former dance pavilion, boat shed or 1940s office.

- It is acceptable to erect replacement buildings on the sites of buildings of little or no significance, such as the NPWS toilet on the upper terrace of the eastern shore, provided these are designed to minimise any impact on the visual setting and character of the complex.

11.4 Decontamination

- NPWS should commission a remediation specialist and conservation architect to assess the costs and feasibility of de-contamination of the western and eastern shores of Bantry Bay, within an approved re-use programme.

- A remediation report needs to assess, within NPWS identified re-use options for the site, the different options which the Service has for remediation, and its obligations under the NPW Act, Garigal Plan of Management and State environmental legislation.

- Remediation options need to identify the difficulties of storage of contaminated soils and materials on the site and the costs of removal of contaminated material by boat.

- Immediate, short term actions by the Service should include the fencing or physical restriction of public access to the contaminated areas around the testing shed on the eastern shore. This needs to take into account the archaeological sensitivity of this area before any sub-surface works can be undertaken.

- Immediate, short term actions on the western shore should include signage erected on the jetty, which warns of risks to public safety on the site.

- Remediation options need to identify short and long term actions in order to provide a staged approach to the funding of remediation of the site.

- Remediation work should respect the heritage significance of the complex. The original fabric of the complex should be retained and the contamination stabilised wherever possible, without damage or destruction of significant fabric and archaeological deposits.

11.5 Provision of Access

11.5.1 Generally

- The existing means of access into the complex, either by boat or walking track, should be retained and encouraged.

- The construction of a roadway into either the eastern or western sides of the bay, is not a desired conservation outcome.

- NPWS should improve access and safety by improving the existing walking tracks and their entrances in the short term, in particular the Old Bullock Track.

- NPWS should liaise with NSW Waterways to ensure that the existing jetties on both the eastern and western sides are retained and upgraded as required for use by NPWS.

- NPWS should consider the provision of public moorings/anchorages within the bay, to support increased visitor access and interpretation of the complex, once remediation and re-use programmes have been finalised.

- There is no requirement by the NPWS to provide disabled access onto the site, however boat tours which cater for the disabled should be included within future interpretation and tourist planning.

11.5.2 Precinct 1: Western Shore

The primary access to the western shore is by water, and facilitated by the use of the present wharf. Secondary access may be gained from the suburb of Killarney Heights via a roughly made walking track that traverses the waterfront along Bantry Bay.

Pedestrian Access

- Pedestrian access to the complex should be facilitated within an overall strategy of access through Garigal National Park, where the complex forms a part of both the natural and cultural attributes of the place.

- The existing walking tracks to the western shore, from the suburb of Killarney Heights should be upgraded once remediation and re-use programmes are implemented.

Waterborne Access

- The covered timber jetties, on the western shore, which were demolished by the Service, could be reinstated to facilitate waterborne access and public use of the site, once remediation and re-use programmes are in place.

- The primary access to the complex on the western shore should remain by water.

- NPWS should liaise with NSW Waterways to ensure that the existing wharf is maintained.

11.5.3 Precinct 2: Eastern Shore

Pedestrian Access

- The existing pedestrian access routes to the eastern shore should be maintained and as part of the overall access strategy for Garigal National Park.

Old Bullock Track

- The Old Bullock Track should be promoted as one of the primary pedestrian access routes to the eastern shore and should be regularly maintained and conserved as a walking track.

- The start of the track should be signposted at Seaforth Oval and the historical significance of the track indicated in interpretive signage.

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- Vegetation within the track should be removed, particularly where it disturbs the sandstone retaining walls and cobblestone surface.

- Stonework, which has fallen away, should be reinstated.

- Drainage lines over the Old Bullock Tack should be cleared and made good.

- A small bridge should be reinstated at the location of the minor creek.

Waterborne Access

- NPWS should liaise with NSW Waterways, to ensure that the existing wharf to the eastern shore, which currently facilitates access by water, is maintained.

11.6 Provision/Upgrade of Services

- The requirement for services to the western shore, including toilet, waste disposal and electricity, should be assessed once remediation and re-use programmes have been finalised.

- NPWS should ensure that the existing services to the eastern shore are maintained and of good quality, including providing a dependable drinkable water source, and public toilet facilities.

- The small toilet building at the waterfront should be retained and interpreted as an early structure of the magazine complex. Its former use as a toilet should not be reinstated.

11.7 Catch Up Capital Works

Catch-up capital works are those works required to be undertaken prior to the implementation of the on-going maintenance plan. The aim is to overcome deterioration which has occurred from the deferred management of the site since its closure, and to bring the various buildings, site and landscape elements to a condition, which an on-going maintenance programme will stabilise and prevent accelerated deterioration. The catch-up capital works are listed in Section 18.5.1

- NPWS should implement the catch-up capital works identified as short term in section 18.5.1, as resources become available.

11.8 On-going Maintenance

- NPWS should adopt a “do as little as possible, but as much as necessary” approach to the conservation management and on-going maintenance of the various buildings in the short term. The aim is to stabilise and conserve the buildings into the future, such that options for the re-use of the complex are retained into the future.

- Maintenance inspections and activities should meet the minimum standards for maintenance and repair established by the NSW Heritage Office, BCA and fire regulations.

12.0

ABORIGINAL HERITAGE CONSERVATION AND MANAGEMENT POLICIES

12.1 Recognition of Significance

- The Aboriginal cultural heritage and archaeological significance of Bantry Bay should be recognised as an integral part of the cultural significance of the site.

12.2 Consultation with Aboriginal Communities

- The NPWS should continue to liaise with the Metropolitan LALC and traditional owners on matters relating to the protection, management and interpretation of the Aboriginal cultural heritage of Bantry Bay. The Metropolitan LALC and traditional owners should be consulted on any proposal for the conservation or maintenance of the European resources which might impact upon the known Aboriginal sites.

12.3 Protection of Aboriginal Cultural Resources

- The NPWS should recognise the Aboriginal archaeological sensitivity plan prepared for this CMP and integrate it into assessment and planning procedures for Bantry Bay.

- The Aboriginal archaeological features and elements should be integrated into the conservation, management and interpretive planning processes for the site.

12.4 Managing Aboriginal Heritage

- The NPWS should undertake a revision and upgrade of the current recordings for the midden sites within the eastern shore. Information supplied to the NPWS Aboriginal Sites Registrar as a result of this study should be added to the individual site forms. Garigal National Park should maintain an up to date Register print out, and retain copies of the up dated site forms.

- The grid reference for NPWS Site # 45-6-2045 provided on the NPWS Standard Site Recording Form is incorrect and requires re-assessment.

- NPWS should consider de-registration of Site # 45-6-2046 and -2047 or, at a minimum, a notation on the current NPWS Standard Aboriginal Site Recording Forms for Site # 45-6-2046 and -2047 that these sites have been largely disturbed or destroyed by European activities such as foreshore reclamation, retaining wall construction and that they contain evidence or more recent shellfish collection.

- Detailed mapping of the character, extent and conservation requirements of NPWS Site # 45-6-2044 is required prior to any new developments such as maintenance of the Old Bullock Track or the development of access tracks through the southern

portion of the eastern complex towards the Testing Shed or works associated with the stabilisation and maintenance of the Testing Shed.

- Regular monitoring of the impact on the condition of the middens of general building conservation programs and cultural tourism activities should be undertaken.

- Prior to any new developments requiring excavation or disturbance to existing fabric or sub-surface resources, NPWS should discuss the plans with the NPWS Central Aboriginal Heritage Unit Archaeologist and Aboriginal Sites Officer.

12.5 Managing Potential Aboriginal Heritage

- An area up to 20 meters wide on both sides of the length of the Old Bullock Track from the ridgetop to the Bantry Bay foreshore, should be surveyed for Aboriginal sites by a suitably qualified archaeologist. The survey should be undertaken prior to any track maintenance or upgrade to ensure such works will not adversely affect any sites.

- The re-recordings, archaeological survey of the Bullock track and any future development should be undertaken in consultation with the Metropolitan LALC and traditional owners and be made consistent with the guidelines for site recording provided in the NPWS 1997 Draft Aboriginal Cultural Heritage Standards and Guidelines Kit.

12.6 Interpretation and Cultural Tourism

- The precise location of Aboriginal heritage within the eastern complex should not be highlighted on any map or plan provided for in site interpretation programs.

- Signage indicating the Aboriginal occupation history of the area, the importance of archaeological sites to the Aboriginal and wider community and their protected status should be located at visitor access points.

13.0

LANDSCAPE CONSERVATION MANAGEMENT POLICIES

13.1 Managing the visual curtilage

- NPWS should ensure that the built environment of surrounding areas does not impinge on the visual curtilage of the magazine complex.

- No new development is allowed within the visual curtilage of the former explosives depot with the exception of building elements that relate to the eastern shore complex. (Refer Policy Eastern Shore)

- The existing natural systems are to be maintained and remediation works undertaken where necessary (ie. measures to restrict the siltation of water courses) particularly through the control of urban run off and weed infestation.

13.2 Landscape Management Policies

13.2.1 Precinct 1: Western Shore

- The objective for the landscape management of western shore is that the industrial function and fire and explosion reduction of the explosives storage complex may be clearly interpreted.

- Landscape management of the complex should aim to maintain vegetation, such that it does not threaten building fabric.

- The landscape management of the complex on the western shore should take into account the three precincts as follows (Figure 6.6.1):

  Zone A: Flat concourse area around the magazine buildings.

  Zone B: Immediate area behind the magazine buildings.

  Zone C: Vegetated backdrop within the existing fence line.

Zone A: Flat concourse area around the magazine buildings

- The landscape management of this zone should be complimentary to the built environment, by revealing the historic processes and operation of the site.

- The objective for this zone should be to facilitate the interpretation of the concourse as an operational requirement for the safe and expedient handling of explosives, and for the reduction of fire hazard in the storage of explosives at the complex.

- The concourse area should be mown on a regular basis (ie. three/four times a year) based on the seasonal growth patterns.

- Vegetation growing in and around the light rail system should be trimmed and maintained on a regular basis, for interpretation purposes.

- The extensive regrowth and invasive weed species present at the northern end of the complex around the Examining Shed and Air Raid Shelter should be removed on a regular basis.

- The cultural planting of *Hydrangea macrophylla* should be retained and trimmed in winter/spring.

Zone B: Immediate area behind the magazine buildings

- Landscape management of this zone should aim to interpret the isolating function of the mounds between the magazines, as a reduction in fire hazard in the storage of explosives, which is in contrast to the natural landscape of the surrounding topography.

- Vegetation on the mounds between the magazine buildings should be trimmed so as to reveal their shape and form.

- Cut back all weed species and taller native species to the mounds between the magazine buildings, with the exception of the significant cultural planting of the *Ficus,* which should be trimmed and contained to the rock face. The vegetation should be cut back to a point approximately level with the rear of the magazine buildings (Refer Figure 6.6.1).

- Planting in Zone B should be low native grasses and ground covers to reveal the form of the mounds.

- Planting may be facilitated through a controlled burning program and/or progressive removal of the taller shrubs to this zone.

Zone C: Vegetated backdrop within the existing fence line

- The aim of the landscape management of this zone is to establish a Reduced Fuel Zone (FRZ1), thereby revealing a strategy of protection for the built environment. (As outlined in the bushland management plan, section 20.0) The extent of this zone is defined by the existing fence line, and is subject to review by NPWS. (refer Figure 6.6.1)

- The Reduced Fuel Zone (FRZ1) requires a program of removal of fallen branches and leaf litter. This may be achieved by low intensity controlled burning.

- This zone may be partially burnt in sequence to ensure that a partial cover of vegetation is retained to the periphery of the magazines.

- The vegetation form which should be encouraged is a native canopy planting with clear understorey to maintain low fire risk to the area.

- This zone is to be monitored in response to seasonal growth patterns, depending on the rate of regrowth.

13.2.2 Precinct 2: Eastern Shore

- The landscape management of the eastern shore should take into account the two distinct zones, comprising the following:

  Zone D Cleared terraces at the waterfront.

  Zone E Vegetated backdrop surrounding the cleared terraces. (Refer Figure 6.6.1)

Zone D: Cleared and terraced land

- The eastern shore should be actively encouraged as a destination for the appreciation of the place and setting.

- The landscape management of the eastern shore should reflect the historic evolution of the place, including the Aboriginal and European habitation and settlement of the area, and the explosives storage use.

- The landscape management of the eastern shore should aim to reflect its importance for the supporting role that it played to the former explosives storage depot. Management should reflect its function as a clearing at the edge of the bay below the native forested slopes, which once supported a number of functions (workshop and ancillary buildings) related to the operation of the explosives magazines.

- The landscape management should also recognise the habitation patterns of the eastern shore prior to the explosives storage use.

- Conservation and upgrading of the Old Bullock Track should be undertaken in the short or medium term, including cutting back of the scrub, reinstating stonework which has fallen away, consolidation of the drainage, and topping up of gravel.

- The traditional picnic facilities provided by the NPWS however, including the timber benches, should be relocated to the periphery, to allow a greater appreciation of the site's historical occupation.

- The *Ficus sp*. trees have the potential to disturb the sandstone terrace walls, and eventually block views towards the western shore, and should be removed.

- All other existing vegetation, associated with the accommodation built and/or used as part of the explosives depot, should be retained, particularly the exotic planting (Cypress trees).

- The location of the former vegetable garden for the Walters' family cottage should be identified through interpretation of the archaeological features.

- The sections of natural foreshore which extend to the north and south of the reclamation and disturbed foreshore of the complex, should be retained. There should be no new structures or disturbance, which would impact on the natural values of this portion of the waterfront.

Zone E: Bushland backdrop behind the clearing

- This zone should be established as a Reduced Fuel Zone (FRZ1), the extent of which is subject to contemporary NPWS fire management regulations.

- The Reduced Fuel Zone (FRZ1) requires a program of removal of fallen branches and leaf litter.

- This zone may be partially burnt in sequence to ensure that a partial cover of vegetation is retained to the periphery of the magazines.

- The vegetation form which should be encouraged is a native canopy planting with clear understorey to maintain low fire risk to the area.

- This zone is to be monitored in response to seasonal growth patterns, depending on the rate of regrowth.

14.0

BUILT ENVIRONMENT CONSERVATION POLICIES

14.1 Conservation Principles and Processes

14.1.1 The Burra Charter

The conservation and management of the Bantry Bay Explosives Magazine complex should be undertaken in accordance with the principles and processes of *The Burra Charter* issued by Australia ICOMOS. These principles and processes are now the accepted standards for guiding conservation practice in Australia.

14.1.2 Consistent Terminology

In order to achieve a consistency in approach and understanding of the meaning of conservation by all those involved, a standardised terminology for conservation processes and related actions should be adopted. This has been adopted from *The Burra Charter* and meets NSW Heritage Office guidelines.

1. **Conservation** means all the processes of looking after a place so to retain its cultural significance. It includes maintenance and may, according to circumstance, include restoration, preservation, reconstruction and adaption, and will commonly be a combination of more than one of these.

2. **Maintenance** means the continuous protective care of the fabric, contents and setting of the place, and is distinguished from repair. Repair involves restoration or reconstruction and it should be treated accordingly.

3. **Preservation** means returning the fabric to a known earlier state by removing accretions of by re-assembling of refixing components without the introduction of new materials.

4. **Restoration** means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

5. **Reconstruction** means returning the place as nearly as possible to a known earlier state or the introduction of materials (new or old) into the fabric. It does not necessarily mean going back to the earliest stage of construction or even to one date for the entire place. Reconstruction is associated with recapturing the expression of the place at points in history which are either important or at which the place demonstrated a greater functional clarity or design expression. This is not to be confused with either re-creation or conjectural reconstruction which are outside the scope of *The Burra Charter*.

6. **Adaption** means modifying a place to suit proposed compatible uses.

7. **Compatible uses** means a use which involves no change to the culturally significant fabric which are substantially reversible, or changes which require minimal impact.

8. **Demolition** is confined to actions which reveal structures or relationships of much greater significance than the structure demolished, or that will remove intrusions which reduce the significance of the place. At times demolition may be considered if portions of the site can be opened for new construction that will facilitate the successful adaptation of the more significant components.

14.1.3 Treatment of Fabric, Features and Artefacts of Differing Grades of Significance

Conservation of the buildings, artefacts, fabric, natural and cultural landscape features, Aboriginal and archaeological resources should take account of the assessed levels of relative significance and intactness as identified within this CMP.

- In general, future change should be focussed on areas or elements which provide a lesser contribution to overall significance and are therefore less sensitive to change.

- Identified fabric, features and associated artefacts of **Primary Significance** should be conserved, through retention and interpretation. The appropriate conservation objectives and processes are maintenance, preservation and restoration. Limited or minor reconstruction is acceptable if there has been a minor loss of integrity.

- Adaption of fabric and spaces considered to be of **Primary Significance** is acceptable if the change of use is compatible to the physical characteristics of the space, can be achieved without loss of significant fabric and does not degrade the overall significance of the building or complex.

- Identified fabric, features and associated artefacts of **Contributory Significance** should be conserved, through retention and interpretation. The appropriate conservation objectives and processes are maintenance, preservation and restoration. Limited or minor reconstruction is acceptable if there has been minor loss of integrity.

- Adaption or alteration work to fabric or spaces of **Contributory Significance** is acceptable if the change of use is compatible to the physical characteristics of the space, can be achieved with only minor loss of significant fabric and does not degrade the overall significance of the building or complex.

- Identified fabric, features and associated artefacts of **Little or No Significance** should be either conserved, through retention and interpretation, or recorded prior to adaption or removal.

14.2 Conservation of Significant Characteristics

- The Bantry bay Explosives Magazine complex should be retained ad conserved as an important component of the heritage resource of Sydney and NSW.

- NPWS should approach the conservation, remediation and maintenance of the various buildings, site infrastructure and landscape setting of the complex with the general principle to “do as little as possible, but all that is necessary”. The priority should be to stabilise the buildings and complex keeping maintenance works to a minimum, once NPWS have identified the long term re-use options for the site.

- Retention and conservation of the historic fabric, features, artefacts, natural and cultural landscape characteristics, Aboriginal heritage features and archaeological

resources, identified as being of primary and contributory significance is essential to the preservation and expression of the cultural significance of the complex.

The following significant characteristics of the complex require particular care and protection:

Precinct 1: Western Shore

- The design and construction of the various buildings, site infrastructure and landscape setting, which make up the totality of the complex on the western shore.
- The external architectural imagery and integrity of the nine 1914 magazine buildings set in cuttings into the hillside, and the receiving shed projecting over the water.
- The external architectural imagery of the ancillary or support buildings, built in 1914, including the examining shed, small brick detonator shed and telephone exchange.
- The internal architectural and spatial integrity of the various 1914 magazine and ancillary buildings.
- The remnant infrastructure of the complex, including the light rail tracks and turntables, stone cuttings and retaining walls, original seawall sections, reservoir and drains.

Precinct 2: Eastern Shore

- Elements of archaeological potential which date from the pleasure grounds occupation, early timber cutters and the Walters family; reclaimed land, footings of former structures, terraces, old jetties and tracks and rubbish pits.
- Elements of archaeological potential which date from the period of occupation by the explosives department; slipway, remnant winches and trolley, footings, iron moorings and industrial deposits.

Precinct 3: Bay

- Elements of archaeological potential which date from the operation of the magazine complex, including the remains of piers from former jetties on the western shore, anchorages for the lighters, remains of a submarine cable, and deposits along the shoreline.

14.3 Conservation of Significant Fabric

Generally

- Building fabric of **Primary Significance** which survives from the original, 1914 phase of construction and operation of the explosives complex should be conserved in accordance with the levels of graded significance.
- Building fabric of **Contributory Significance** from post-1914 use and development of the complex should be conserved in accordance with the levels of graded significance.
- Materials such as face brick or stone, which were not originally painted, should remain unpainted.

- Materials such as timber or metal work which were originally painted, and for which an effective paint system is an integral part of their preservation, should remain painted.

- Where possible and cost effective, deteriorated building fabric should be repaired rather than replaced, including the steel roof structures, steel door and window shutters and timber joinery. If replacement is necessary, the new work should be based on the existing or historical evidence rather than conjecture. Replacement materials should match as reasonably close as possible, that which is removed.

- Detailing of the magazine buildings which specifically illustrates their operational uses, such as ventilation, spark protection, lightning rods, security measures, signage, fittings and fixtures, should be conserved in situ.

- Conservation works should not directly reconstruct faulty building detailing or inadequate earlier repairs, if to do so would continue the process of accelerated deterioration of significant building fabric.

- Intervention into the building fabric for non-conservation purposes should generally be restricted to programs of research, appropriate re-use or upgrading of service areas and facilities.

1914 Magazine Buildings (Nos. 2-8, 10 and 12) and Receiving Shed No. 1, assessed as being of Primary Significance.

- The original face brick walls, polychromatic brick and stone details should be retained and conserved.

- The existing roof form of the various magazine buildings and receiving shed should be retained and conserved.

- A structural and contamination assessment of the roof structure and roof sheeting of the magazine buildings should be undertaken. The preferred conservation option is to retain and conserve the original structure and sheeting wherever possible, and stabilise the corrosion and contamination as required. Where this is not possible however, the roof structure and sheeting could be replaced to match the original. This option does not inhibit the removal of all of the roof sheeting, and re-use of any salvageable sheets onto one or two of the magazine buildings only.

- A major cause of deterioration to the roof structures of the recessed magazine buildings has been from overhanging vegetation. The surrounding vegetation to the mounds between the magazine buildings, should be cut back and maintained clear of the buildings.

- A structural assessment of the receiving shed should be undertaken in the short term, prior to the Service determining any long term re-use and conservation options.

- The original timber parquetry floors within the original 1914 magazine buildings and receiving shed should be retained and conserved. Damaged or removed sections of flooring should be replaced to match the existing, pending the determination of future re-use.

- The internal rendered walls of the 1914 magazine buildings and receiving shed should be retained and conserved. Any likely contamination of these rendered walls should be assessed by a qualified remediation specialist, and stabilised.

1916 Magazine Buildings (Nos. 9, 14 and 16), assessed as being of Contributory Significance.

- The external face brick walls of these magazine buildings should be retained and conserved. Water damage should be assessed and repaired as necessary.

- The painted signage on the eastern facade of magazine No. 9 should be retained.

- The skillion roof form of magazines Nos. 14 and 16, and the gable roof form of magazine No. 9 should be retained and conserved. The preferred conservation option is to retain the original structure and sheeting wherever possible, and repair as required. Where this is not possible however, the roof structure and sheeting should be replaced to match the original.

- The cantilevered awning over the front of magazines Nos. 14 and 16 should be repaired and reconstructed for conservation purposes.

- The existing gutters and downpipes should be removed and replaced to match the existing in the short term.

- The timber verandah to the northern end of magazine No. 9 should be repaired, and the missing section reconstructed for interpretive purposes.

- Security screens over the rear gutters, which have been damaged or removed, should be repaired or replaced as required.

- The original timber floors within the later magazine buildings should be retained and conserved. Any damaged or missing sections of flooring, (including a hole in the floor of magazine No. 16) should be replaced to match existing.

- The asbestos sheeting to internal stud leaf walls and ceilings (magazines Nos. 14 and 16) should be removed in the short term. Replacement plasterboard sheeting should be applied as required, after their re-use has been determined.

- Drainage channels at the rear of magazines Nos. 14 and 16 should be cleared of debris and returned to working order.

Western Shore Examining Room, Telephone Exchange and Detonator Shed, assessed as being of Primary Significance

- The original form and fabric of the examining shed, including iron wall and roof sheeting, iron doors and shutters should be retained and conserved. Corrosion to the iron sheeting should be stabilised or repaired as required, and the sheeting repainted. Where this is not possible the iron sheeting could be replaced to match the existing.

- The internal timber boarded floor, walls and ceiling of the examining shed should be retained and conserved.

- The original external form and fabric of the detonator shed should be retained and conserved, including the face brick walls. The trolley inside the shed should be removed and conserved if feasible, for interpretation purposes.

- The skillion roof form of the detonator shed should be retained and conserved, although the structure and roof sheeting should be repaired or replaced as required.

Air raid shelter assessed as being of Contributory Significance

- The original form and fabric of the air raid shelter should be retained and conserved, including the painted brick walls, and reinforced concrete roof and floor structure.

Site Infrastructure on Western Shore assessed as being of Primary Significance.

- The light rail tracks and turntables should be retained and conserved for interpretation purposes. Any protruding pieces of tracks should be refixed to the ground where possible, or removed.

- The sandstone cut wall and sandstone block retaining walls around the magazines should be retained and conserved.

- The original sections of the seawall should be retained and maintained as required.

- The reservoir should be retained and conserved and re-used for interpretation purposes.

- The stone culverts should be retained and conserved in situ.

Site Infrastructure on Western Shore assessed as being of Little or No Significance.

- NPWS should liaise with NSW Waterways to ensure that the sea wall is monitored for structural stability, and the remaining section of the stone sea wall is upgraded. The preferred option for upgrading of the seawall is to stabilise the existing stone seawall and reconstruct using stone to match as required. If this option is not achievable, however, upgrading of the seawall in concrete could be considered acceptable.

Testing Shed and site infrastructure on Eastern Shore assessed as being of Primary Significance.

- The original form and fabric of the testing shed, including the iron wall and roof sheeting should be retained and conserved for interpretation purposes. Corrosion and contamination to the iron sheeting should be stabilised or repaired as required, and the sheeting repainted, where possible.

- The original form and fabric of the small waterfront toilet should be retained and conserved.

- The original seawall, jetty, sandstone terraces and reclaimed areas should be retained and conserved.

14.4 Reinstatement of Significant Missing Fabric

- Reinstatement of missing fabric or reconstruction should only occur where there is sufficient documentary or physical evidence, where it will contribute to the overall significance and where it is essential to the continuity and conservation of the particular building or site element.

- NPWS should liaise with NSW Waterways regarding the reconstruction of one or all of the sheltered jetties which formerly extended along the western foreshore, for interpretation and/or re-use purposes of the complex. Reconstruction of the sheltered jetties is considered to be a long term option, once suitable re-use options for the complex have been identified.

- Reinstatement of all of the missing lightning conductors is not essential to the conservation of the magazine buildings. Consideration should be given to the reinstatement of the lightning conductors to one of the magazine buildings for interpretation purposes.

14.5 Ordinance Compliance

- Approaches to compliance with the *Building Code of Australia* (BCA), as the operative building ordinance in New South Wales for the conservation and re-use of heritage buildings, should focus on the spirit and intent of the ordinances, where strict compliance would adversely affect the significance.

- Any future upgrading of the magazine buildings should take into consideration new approaches for the implementation of fire safety standards that do not harm the existing fabric.

- The key issues relating to compliance are fire resistance and egress provisions. It is essential that the buildings and their significant fabric are not degraded by inappropriate responses to the BCA.

14.6 Conservation of Moveable Heritage Items

- NPWS should ensure that remnant artefacts and movable heritage items, such as anchorages, winches, boat cradle, and other exposed archaeological material of significance, be retained and conserved in situ.

- The harbour boom, presently resting on the boat cradle, should be removed and placed in the vicinity of the harbour buoys, to which it is associated through use.

- The collection of timber jetty pylons, presently located at the site of the former dance hall, should be removed and placed elsewhere at the site, preferably towards the area at the start of the Old Bullock track.

- The light rail trolley within the former Detonators Shed should be relocated to either the Receiving Shed or other appropriate magazine building, which is to be made available to the public, for interpretive purposes.

- The various artefacts should be conserved and managed in accordance with the requirements of the *Heritage Amendment Bill 1998*.

- Retention and conservation of artefacts should also be undertaken in accordance with the interpretation policies contained in this CMP.

- NPWS should prepare an inventory of moveable heritage items presently located at the site.

14.7 Recording

- NPWS should undertake a periodic photographic recording and written recording of the buildings, site elements and context, in order to build up a comparative database for monitoring their condition. The recording should take into account all of the buildings, structures and site elements located on both the western and eastern shores.

- NPWS should ensure that any recording work meets the guidelines established by the NSW Heritage Office.

- Prior to, during and after any approved alterations or additions being made, either internally or externally to any building element or structure, or to the site infrastructure, a detailed photographic recording should be made of the existing state.

- Should any building or site element be demolished or removed, under approved programs of re-use, a photographic recording of the existing state should be undertaken prior to the commencement of any demolition work.

14.8 Managing Documentary Material

- Copies of all of the identified relevant documentary material collected for this CMP should be gathered together and stored in an accessible location.

14.9 Conservation Skills and Experience

The *Burra Charter* encourages the use of skilled and appropriate direction and supervision, from a range of disciplines, for conservation activities. The attitudes, skills and experience required, and creative approaches taken, in the context of a conservation project as quite different to those applied to the design of new buildings.

- Appropriate conservation skills and experience should be available within the project team assembled to deal with the conservation and re-use of the complex.

- Appropriate professional skills and experience assembled to work on the detailed conservation of the buildings could include conservation architects, landscape architects, archaeologists, structural engineers, remediation specialists, building code compliance advisers and cost planners as appropriate.

- Building contractors, project managers and trades personnel who are experienced with working on historic buildings should be selected to work on the proposed works.

14.10 On-going Maintenance Program

- NPWS should implement the Maintenance Plan included in this Conservation Management Plan.

- The primary objectives of the Maintenance Plan should be one of “do as little as possible, but all that is necessary”, to retain and stabilise the existing building fabric, retard deterioration and avoid the need for extensive capital repairs in the long term.

- Maintenance inspections and activities should meet the minimum standards for maintenance and repair established by the NSW Heritage Office, with regard to weatherproofing, fire protection, security and essential maintenance.

- Maintenance of the building fabric should be undertaken on a planned cyclical basis, with each item on a cyclical timetable according to its potential rate of deterioration.

- Maintenance activities should generally replace like with like, or ensure that the item is cleaned and maintained in its original condition.

- It is essential that maintenance work does not involve a slow process of degradation or irreversible change or replacement with non-matching materials.

- Inspection and maintenance should as far as possible, be conducted by those with professional knowledge and experience of buildings and materials.

- Cyclical maintenance inspections should also monitor the impact on significant fabric of general building conservation programs, visitor use and cultural tourism activities.

15.0

HISTORICAL ARCHAEOLOGICAL CONSERVATION POLICIES

- The archaeological significance of Bantry Bay should be recognised as an integral part of the cultural significance of the site.
- The NPWS should ensure that the historical archaeological zoning plan for the complex is integrated into the management processes and planning procedures for Bantry Bay.
- The archaeological features and elements identified within the Archaeological Zoning Plan (Refer to Figures 6.9.17 to 6.9.23), should be integrated into the conservation, management and interpretive planning processes for the site.
- No new works should be planned or undertaken at the complex, without reference to the Archaeological Zoning Plan, and responded to as required.
- The NPWS should record and document any archaeological features at risk of vandalism, removal or destruction, particularly collectable or moveable items.
- Prior to any new developments requiring excavation or disturbance to existing fabric or sub-surface resources, the NPWS should discuss the plans with the NPWS Historical Archaeologist and make an application for an excavation permit.

16.0

CONSERVATION POLICIES FOR ADAPTING TO NEW USES

The existing structures and infrastructure of both shores of Bantry Bay represent opportunities for re-use and interpretation. Although re-use options are limited by the difficulties of access, contamination and costs of conservation/adaption, it is essential that representative examples of items of Primary Significance are retained for interpretative purposes. Decisions about the interpretative capacity and re-use potential of individual buildings and other features, must take account of their particular and relative contribution to the overall significance of the place.

In programming and funding adaption of the buildings and infrastructure of the site, priority should be given to elements of Primary and Contributory Significance, and fabric which demonstrates the greatest need for repair/conservation. The overall question of contamination of the site will be of the greatest priority as on–site interpretation and adaption programmes will, to a large extent, be dependent on the outcomes of a remediation report which assesses the economic feasibility of de-contamination.

16.1 General Adaption Guidelines

- NPWS should undertake conservation management of the complex in the context of compatible re-use. Compatible re-use should be undertaken in the context of adapting the magazine complex and its cultural landscape to new conservation directions. Adaptive re-use should protect the cultural significance of the complex, and be undertaken in a manner, which does not detract from this significance.

- NPWS should ensure that any new uses selected for the existing buildings adopt the principle of “loose fit”, where the new use is adjusted as necessary to work within the available spatial and architectural configurations of the buildings.

- Adaption of a building’s interior, should ensure that the original fabric or significant architectural and spatial features are retained and interpreted as much as possible.

- The design of any approved internal alterations and additions should be minimal in extent and compatible with the scale, integrity and character of the individual building.

- Subdivision of larger internal spaces should be undertaken in a secondary manner, using such items as partitions that can eventually be removed and which do not cut into the existing finishes or detailing.

- External alterations or additions to existing buildings should be discouraged, however if required to meet approved interpretation, re-use or cultural tourism requirements, be of a minor nature, subservient to the primary architectural features and composition of the existing building, and located in areas which are relatively removed from the main circulation or public spaces within the complex.

- Intervention into the building fabric for additions or alterations to services should respect the integrity of the extant material, and not be detrimental to the original fabric.

- In general, the removal of any internal walls within the buildings identified as of primary significance is discouraged.

- Addition of any service rooms, such as kitchen or bathroom, is acceptable, provided that these are undertaken with minimal intervention into the original fabric, and constructed so as to be removable.

- Reconstruction of former buildings or structures, ie. the dance pavilion on the eastern shore, or one or all of the sheltered wharves on the western shore, is acceptable within approved programs of re-use or interpretation.

- Reconstructed buildings should be located at their original location, and be of a similar footprint, scale and style of the original buildings.

- There is the potential for the construction of new structures within the footprint of former waterfront structures on the eastern shore, including the former dance pavilion, boat shed or 1940s office.

16.2 Long Term Adaptive Re-Use Guidelines

Refer to section 7.0 for an analysis of the constraints of identified re-use options.

- Any adaptive re-use options sought for the complex should be open ended, provided that the long term conservation and management outcomes of this CMP are followed.

- Long term adaptive re-use of the eastern and western shores of Bantry Bay should be formulated in the context of the contamination problems of the site. Any adaptive re-use should be programmed only once de-contamination options and feasibility have been assessed.

- Any adaptive re-use of the site should take into account the minimum levels of conservation and repair of significant structures which are recommended by the NSW Heritage Office.

- NPWS should ensure that future re-use options, which are in conflict with the provisions of the REP No. 23, are subject to a full impact assessment.

- NPWS should encourage future re-use options which are in accordance with the original gazettal of Garigal National Park, under the *National Parks and Wildlife Act 1974*. Any future re-use options which emerge that are in conflict, should be the subject of a full impact assessment prior to further consideration.

- Any long-term re-use of the site which incorporates public visitation must take into account the need to provide safe access to the site, acceptable levels of public safety, and adequate services.

16.3 Preferred Choices for Adaptive Re-Use

16.3.1 Short Term

- Event opportunities on the eastern shore and utilising the western shore as a backdrop, including corporate functions, outdoor festivals etc, which could utilise

temporary services and structures and therefore have least impact on existing structures and recreational significance.

- NPWS or privately operated boat tours of the complex, allowing a certain degree of managed access onto the site, and into one or more of the magazine buildings, pending outcomes of contamination reports.

- Passive storage for NPWS equipment, or leased storage of robust items which can be transported by boat.

- Include Bantry Bay on the list of potential film venues currently managed by NPWS.

- Retain or upgrade access and picnic use of the eastern shore.

16.3.2 Long Term

- Small commercial business, preferably associated with boating/yachting in order to utilise existing waterfront structures on the eastern shore. (ie; along the lines of Bobbin Head)

- Research centre for educational purposes, eg. for archaeological/ environmental/interpretation purposes.

- Permanent function centre on the eastern shore, which could utilise a lower level of services, may be seasonal or of a very low-key nature.

17.0

POLICIES FOR INTERPRETING SIGNIFICANCE

17.1 Core Interpretation Principles

- Interpretation programs should provide equitable physical, spiritual and intellectual access to the cultural and natural significance of Bantry Bay.
- Interpretation of Bantry Bay should take into account and provide for the participation of people or groups, for whom the site has special association, meaning or significance.
- Interpretation of Bantry Bay should integrate the natural and the cultural values of the site.
- Interpretation should provide public awareness of the role of the NPWS in the conservation and management of the cultural and natural values of Bantry Bay.
- Interpretation of Bantry Bay shall take into account all periods of occupation and all participants in the history of Bantry Bay, and be presented in an accurate, accessible and insightful manner.

17.2 Interpretation policies

- Interpretation of the magazine complex should take account of the significance of the historic and Aboriginal archaeological resource.
- Interpretation relating to the Aboriginal heritage should not provide information on the precise location of sites unless supported by the MLALC or traditional owners.
- Interpretation should recognise Aboriginal social and spiritual values and association with Bantry Bay.
- The Old Bullock Track ought to be interpreted in relation to its links with Bantry Bay, and the development of Middle Harbour.
- The NPWS should endeavour to produce interpretative material which identifies the complex, its significance, its history and the place of Bantry Bay in the development of Middle Harbour and Sydney.
- Interpretation of Bantry Bay should include information and comparison with associated former pleasure garden sites within NPWS estate, such as Killarney Heights, Flat Rock, Lane Cove and Goat Island.
- Interpretation and visitor programs to Bantry Bay should endeavour to recognise and retain the unique sense of place of Bantry Bay.

- The NPWS should endeavour to provide commercial tourist operators working in the area, with information on the natural and cultural values of the Bay and appropriate behaviours in the NPWS estate.

- The NPWS should encourage the recognition of the natural and cultural values of the Bay in the surrounding residential neighbours and Middle Harbour region.

17.3 Visitor Management

- Visitor and public access into Bantry Bay should continue to be managed by the NPWS.

- The existing pedestrian and water borne access should be retained and encouraged to the complex on the eastern shore.

- Water borne and existing pedestrian access to the western shore should be retained and encouraged once the site has been cleared of decontamination.

- Entry points to the walking tracks into the bay should be made more amenable and identifiable to the public, with signage indicating that Bantry Bay is an historic site.

- The Old Bullock Track should be promoted as a means of access into the eastern shore.

- The magazine complex should be included in special purpose tours to be conducted by NPWS, similar to the discovery tours run in other NPWS parks.

- There should be a level of interpretation on both sides of the Bay, which is easily read and accessible from the water, to cater for boating traffic.

- Facilities on the eastern shore should be maintained as low-key day use and picnic facilities.

- The small toilet structure at the waterfront on the eastern shore should be retained and perhaps adapted to service the picnic area..

- The existing picnic tables provided by NPWS should be relocated to the edges of the cleared area, to allow a greater appreciation of the site's historical occupation.

- To facilitate interpretation of the eastern shore, an appropriate and suitably designed plan of the site and its archaeological features should be located on one of the walls of the built structures adjacent to the wharf. This sign should be discrete and in proportion with the building. The information contained within the sign should include the relationship of the eastern shore to the complex, and its many layers of historical associations.

Part E
Implementing the Plan

18.0

IMPLEMENTATION

18.1 Priorities and Staging

Works required to manage the landscape, conserve the buildings and site infrastructure, and open up cultural tourism opportunities will occur as NPWS funding allows.

In general NPWS staff and park managers will need to prioritise the potential activities to suit available resources. Some programs can be implemented quickly, while others will take some time to reach fruition or to become consolidated in the marketplace. The recommendations set out in this CMP have been prioritised into Short, Medium and Long Term actions.

This section sets out the implementation of the conservation, management and interpretation policies contained within this CMP.

18.1.1 Short Term Activities

Short term activities are those which can and need to be completed within one year.

They include immediate maintenance, the commission of further studies, particularly in relation to the contamination, and the endorsement of this CMP.

18.1.2 Medium Term Activities

Medium term activities are those which can and need to be completed within 2-5 years.

They include building and site maintenance, early planning work and assessing the feasibility of adaption opportunities for the complex.

18.1.3 Long Term Activities

Long term activities are those which can or should be undertaken within the next 5-10 years.

They recognise that some actions need to be planned and evaluated before they can be implemented, or will take a while to get started, given the available financial resources. They include the on-going management, conservation and monitoring programs that will consolidate Bantry Bay as a valuable resource for NPWS.

18.2 Landscape Management

Precinct 1: Western Shore	
Zone A	e area on a regular basis (ie. three/four times a year) based on the th patterns.
	Remove the extensive regrowth at the northern end of the complex around the Examining Shed and Air Raid Shelter.
	Remove vegetation and debris from the surface drains around the buildings on a regular basis ie. every three months.
	Trim and maintain the vegetation growing in and around the light rail system on a regular basis, based on seasonal growth patterns.
	Retain the *Hydrangea macrophylla*, and trim in winter/spring.
Zone B	Cut back all weed species and taller native species to the mounds between the magazine buildings, with the exception of the *Ficus*, to a point approximately level with the rear of the magazine buildings (Figure 6.6.2).
	Trim and contain *Ficus* to the rock face.
	New planting in this zone should be restricted to low native grasses and ground covers to reveal the form of the mounds.
	Facilitate planting through a controlled burning program and/or progressive removal of taller shrubs.
Zone C	Establish Reduced Fuel Zone (FRZ1). The extent of this zone is defined by the existing fence line, and subject to review by NPWS.
Precinct 2: Eastern Shore	
Zone D	Remove the *Ficus sp*. trees.
	Retain existing cultural plantings associated with the site's historical occupation, in particular the Cypress Trees.
Zone E	Establish a Reduced Fuel Zone (FRZ1), the extent of which is subject to review by NPWS.

18.2.1 Performance Criteria

Landscape management of the complex will vary depending on the regrowth rates of the vegetation found. As a general rule the following Performance Criteria for the Landscape Maintenance of the complex on the western shore should be observed.

Precinct 1: Western Shore	
Zone A	Grass to the concourse should not be allowed to reach higher than 100mm.
	Regrowth at the northern end of the site should be kept cut down to ground level.
	Vegetation should not threaten building or site fabric.
	Surface drains around the magazine buildings on the concourse should be kept clear of vegetation and debris.
Zone B	Vegetation on the mounds between the magazine buildings should be trimmed so as to reveal their shape and form.
	Vegetation should not threaten building fabric.
Zone C	Vegetation form to be encouraged has a native canopy planting with clear understorey to maintain low fire risk to the area.
Precinct 2: Eastern Shore	
Zone E	Vegetation form to be encouraged has a native canopy planting with clear understorey to maintain low fire risk to the area.

18.3 NPWS Management Implementation

Short Term Activities within 1 year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 Years
NPWS to endorse this Conservation Management Plan and place it on public exhibition..	Commission an Interpretation Plan for the complex.	Develop and implement interpretation of the complex, and encourage managed visitor access, once de-contamination has been undertaken.
Refer this CMP to NSW Heritage Council for endorsement.	Commission an Archaeological Survey and Engineers Report (prepared by a firm experienced in heritage documentation) of the Old Bullock Track.	Review this CMP after 5 years
Liaise with the NSW Heritage Council in the upgrade of the State Heritage Register listing in light of the findings of this CMP.	Establish that the complex can be managed in accordance with this CMP, without any further reference to the NSW Heritage Office.	Ensure funding for recurrent long term maintenance are made at the appropriate time.
Provide a copy of the CMP to the AHC and National Trust of Australia (NSW) for their information.	Review and amend the Garigal National Park Plan of Management in light of the findings and recommendations of this report as necessary	Ensure that any funding raised by the complex is available for its conservation management.
Liaise with NSW Waterways regarding the on-going management of areas or item below the High Water Mark.	Develop and implement a staged program for the realisation of long term re-use opportunities.	
Approach Warringah Council to list the complex as a heritage item in the Warringah Local Environmental Plan 2000.	Commission a structural engineer, conservation architect and quantity surveyor to further develop repair/reconstruction options, a Cost Analysis and Risk Analysis of Failure for the Receiving Shed.	
Approach Willoughby City Council regarding the listing of HC Press Park as a heritage Item.		.
Support the continued listing of Bantry Bay as a heritage item in the Manly Council LEP 1998.		
Commit NPWS funding for initial “Catch Up” capital works as outlined in Section 18.5.1.		
Commission a Schedule of Remediation Work of the complex on the western shore, to be undertaken by a de-contamination specialist and conservation architect.		

18.4 Conservation Management Implementation

Short Term Activities within 1 Year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 years
Maintain existing security regimes, including existing warning signs, regular inspections and maintenance of security locks and grilles to the buildings by the NPWS Ranger.	Promote the passive recreation use of the eastern shore, once de-contamination has been made safe.	Develop and implement programs of adaptive re-use once de-contamination issues have been addressed.
Maintain the existing walking tracks around the complex, within the overall strategy for access to the Garigal National Park.	Assess the patterns of walking tracks around the complex, with the aim of linking the established and recognised walking tracks of Garigal National Park.	Consider the provision of new picnic furniture, gas barbecue etc. as part of any long term programs to enhance the passive recreation use of the eastern shore.
Identify and maintain a clear potable water point on the eastern side.	Consider provision of connecting the walking tracks from the eastern to the western shore.	Ensure a clear potable water source to either/both of the eastern and western shores, as part of any programs for long term re-use.
	Upgrade the existing walking tracks to eastern shore and their entrances, particularly at Seaforth Oval.	Provide additional toilet facilities to either the eastern or western shores as required, as part of any programs for long term future re-use.
	Implement interpretation of the Old Bullock Track at the entrance at Seaforth Oval, outlining its significance and historical importance.	Provide electrical services into the western shore, as part of any programs for the long tern re-use of the complex. Replace existing warning signs on western shore with new signage incorporated into the interpretation of the complex.
	Continue to liaise with NSW Waterways to ensure the existing jetties are retained and upgraded as required.	
	Upgrade existing toilet facilities and provide a landscape screen.	
	Relocate the existing timber picnic benches on the eastern shore to the periphery of the clearing.	

18.5 Aboriginal Heritage Conservation Implementation

Conservation of the Aboriginal cultural heritage on the eastern shore will require a sustained commitment from the NPWS and a coordinated approach between the Central Aboriginal Heritage Archaeologist and Aboriginal Sites Officer, to ensure further deterioration to the sites is minimised and actions arising from the implementation of the Plan do not adversely affect the sites.

The Aboriginal heritage component of the Conservation Management Plan has identified a number of management and conservation policies and requirements, which are set out in Section 12. These focus on the condition and conservation needs of the Aboriginal sites having regard to improved access, proposed building maintenance, remediation works and the ensuing increase in visitor use. The highest priorities relate to an upgrade in the standard of site recording for the known sites, and the minimisation of impact of the upgrade of the Old Bullock Track and the stabilisation, de-contamination and maintenance of the testing shed on the eastern shore.

Short Term Activities within 1 year	Medium term Activities between 2-5 years	Long Term Activities between 5-10 years
Continue liaison with the MLALC and traditional owners on any major development proposals and site management processes	Re-record the known sites on the eastern shore, including accurate descriptions of site condition, past impacts and disturbances and detailed mapping of potential sub-surface archaeological deposits.	Conduct a periodic monitoring program to document changes in site condition, and assess further conservation requirements.
Review the current situation with Native Title claims and “Aboriginal Ownership” issues over the complex.	Develop appropriate and sensitive Aboriginal cultural heritage signage.	
Maintain the southern portion of the foreshore on the eastern shore as natural foreshore.	Limit public access to the testing shed and limit walking tours in this area to Aboriginal guided tours.	
Commission an Aboriginal archaeological survey of the Old Bullock Track.		

18.6 Landscape Conservation Implementation

Short Term Activities within 1 year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 years
Continue maintenance activities on the eastern and western shore including grass cutting and ensuring vegetation does not adversely impact on significant fabric.	Establish on-going programs of weed control and landscape management for each of the Landscape Zones, as outlined in Section 18.4.1.	Develop and implement continuing programs of research into the natural and cultural features of the landscape.
	Under the Act, noxious weeds identified as W2 should be fully and continuously suppressed and destroyed (Refer Section 20.0 *Overview of Flora and Fauna Populations: Recommendations for Bushland Management*).	Following programs of further research, update the Assessment of Significance with regard to the enhanced understanding of the natural and cultural landscape characteristics.
	Under the Act, noxious weeds identified as W3 must be prevented from spreading and its numbers and distribution reduced (Refer Section 20.0).	Coordinate landscape management programs with surveys for Aboriginal sites, to ensure that known Aboriginal sites are not further damaged by the landscape management of the site.
	Continue to manage the natural characteristics of the landscape backdrop, which contribute to the sense of isolation, in accordance with the Garigal National Park Plan of Management.	Continue to manage the natural characteristics of the landscaped backdrop in accordance with Service policies.
	Implement interpretation of the landscape features within the interpretation strategy of the overall site.	Monitor the impacts of tourism on the landscape heritage characteristics.

18.7 Built Environment Conservation Implementation

Short Term Activities within 1 year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 years
Periodically monitor the condition of all buildings in accordance with the Ongoing Maintenance Plan in Section 18.7.2 and Monitoring Activities Plan in Section 18.7.3.	Undertake works included as "Catch Up" capital works, which are outlined in Section 18.7.1.	Develop and maintain long term security regimes for the complex.
Ensure security of the magazine and ancillary buildings on the western shore through regular inspection of locks and grilles at each site visit.	Ensure the long term continuity of monitoring, maintenance and minor repair programs at the complex in accordance with the Ongoing Maintenance Plan and Monitoring Activities Plan outlined in Sections 18.5.2 and 18.5.3 respectively.	Undertake conservation and adaptive re-use works as required within programs of interpretation and re-use.
Remove roofing material presently stored within the Receiving Shed, which is not re-salvageable. Sheeting which is reusable should be retained for re-use.	Consider recommendations for the repair/reconstruction of the suspended concrete slab of the Receiving Shed in accordance with the findings of the development and cost analysis of the options, and risk analysis of failure of the building.	Repair/Reconstruct the Receiving Shed in accordance with the findings of the development and cost analysis of the options, and risk analysis of failure of the building.
Undertake photographic recording of the buildings, structures and site elements to record their context and current condition.	Review buildings in relation to BCA compliance and re-use concepts. Develop appropriate responses to BCA compliance as required.	Facilitate on-going fabric maintenance programs for items below the high water mark with NSW Waterways, including jetties and seawall.
	Prior to any development of the site, or demolition of individual buildings, structure or site elements, undertake a photographic recording of the existing state of the item.	

18.7.1 "Catch Up" Capital Works

Precinct 1: Western Shore	
Overall Buildings & Site	Commission and implement a Schedule of Remediation for the buildings and site, with a view of providing safe public access.
Magazine Buildings and Ancillary Buildings	Undertake a Structural Assessment of the roof structures of each of the magazine buildings in relation to its deterioration due to corrosion.
	Clean back, repair, stabilise corrosion and repaint the roof structures of the various magazine and ancillary buildings, in accordance with the Structural Assessment and Schedule of Remediation.
	Repair, repaint or replace the roof sheeting to match the original as required, in accordance with the Schedule of Remediation.
	Replace gutters and downpipes to all magazine buildings to match the original.
	Repair, stabilise corrosion, and repaint the existing iron doors, window shutters, hinges and lintels. Replace as required to match the original, in accordance with the Schedule of Remediation.
	Cut back the vegetation surrounding the recessed magazine buildings and embrasures, in accordance with the landscape management policies for Zone B (Refer Figure 6.6.1 and Section 13.2 Landscape Management Policies).
Moveable Heritage	Relocate the light rail trolley within the detonator shed to an undercover position on the western shore.
Stormwater Disposal Generally	Clean vegetation from surface drains around the various magazine buildings.
Seawall	Upgrade the outstanding section of the seawall to prevent further deterioration.
Receiving Shed	Replace the south eaves truss to match the existing in accordance with the Structural Assessment.
	Clean back, repair, stabilise corrosion and repaint the remaining roof structure, in accordance with the Structural Assessment and Schedule of Remediation.

	Replace roof sheeting to match the original in accordance with the Structural Assessment. Remove and replace, in accordance with the Structural Assessment.
	Replace gutters and downpipes to match the original.
	Remove and replace steel lintels over windows and doors and rusting purlins embedded in the brickwork in accordance with the Structural Assessment.
Precinct 2: Eastern Shore	
Testing Shed	Stabilise the timber structure of the testing shed in accordance with the Schedule of Remediation
	Replace of the iron wall and roof sheeting of the former testing shed in accordance with the Schedule of Rememdiation.
Old Bullock Track	Commission an Archaeological survey and Engineers report for the Old Bullock Track.
	Restore or reconstruct the Old Bullock Track, including cutting back the surrounding scrub, reinstate stonework which has fallen away, consolidation of drainage and topping of gravel.

18.7.2 Ongoing Maintenance Plan

The following Ongoing Maintenance Plan refers to cyclical maintenance works to the site and building fabric which should be implemented by NPWS as part of the process of ongoing management of the Bantry Bay Magazine Explosives complex. The maintenance works set out in this plan will ensure the conservation of significance of the complex.

A record of when this work is performed, and any faults found or repairs made should be recorded and kept along side this Ongoing Maintenance Plan.

Building Element	Every Year	Every 5 Years	Every 10 Years
Overall Buildings Generally	Monitor condition and carry out general cleaning. Check security and general safety.		
Face Brick Walls	Inspect condition, clean and undertake minor repairs as required.		
Joints in face brickwork	Inspect condition, clean and undertake minor repairs as required.		Re-pointing as required.
Stone Details (Anchor Blocks and Corbels)	Monitor condition, clean and repair as required on advice of expert assessment.	Monitor condition, clean and repair as required on advice from expert assessment.	
Polychromatic Brick Details	Inspect condition, clean and undertake minor repairs as required.		

Building Element	Every Year	Every 5 Years	Every 10 Years
Iron Work (Doors, Shutters and Vents)	Inspect condition, paintwork and working order.	Inspect and clean surface rust. Treat to stabilise and prevent further corrosion. Repair and repaint, or replace to match existing as required.	Strip, seal and repaint.
Painted Brick Walls	Inspect condition, clean and repair as required.		Strip and repaint.
Flat Iron Wall Sheeting	Monitor condition and paintwork. Repair and repaint as required.	Inspect and clean surface rust. Treat to stabilise and prevent further corrosion. Repair and repaint, or replace to match existing as required.	Strip, seal and repaint.
Iron Structure and Brackets		Inspect and clean surface rust. Treat to stabilise and prevent further corrosion. Repair and repaint, or replace to match existing as required.	
Corrugated Iron Roof Structure	Monitor condition. Repair, clean and treat any surface rust and repaint as required.		Replace as necessary.
Vents	Monitor condition. Repair as required.		Replace as necessary.
Lightning Conductors	Monitor condition. Refix or repair as required.		
Flashing	Monitor condition. Repair as required.		Replace as necessary
Reinforced Concrete Roof	Monitor condition. Repair as required.		

Building Element	**Every Year**	**Every 5 Years**	**Every 10 Years**
Downpipes and Gutters	Monitor condition and clear. Repair as required	Repair as required. Repaint gutters and downpipes.	Replace as necessary.
Internal			
Walls	Routine clean.	Inspect condition, clean and repair as required.	Repaint as required to match existing.
Timber Parquetry Floor	Inspect condition, clean and repair as required.		
Timber Floor Structure	Monitor condition.	Repair as required.	
Reinforced Concrete Ceiling	Inspect condition, clean and repair as required.		
Timber Work (Window and Doors Frames)	Inspect condition, paintwork and working order.	Repair and repaint as required.	Strip, seal and repaint.
Site Infrastructure			
Concrete Concourse	Monitor condition. Remove or replace dislodged sections of concrete as required. Mow grasses at regular intervals.		
Remnant Tracks and Turntables	Monitor condition. Remove or reset misplaced sections as required.		
Stone Cuttings and Retaining Walls	Monitor stability, repair as required.		

Building Element	Every Year	Every 5 Years	Every 10 Years
Seawall	Monitor stability, repair as required.		
Timber Jetty	Monitor stability, repair as required.		

18.7.3 Monitoring Activities Plan

The following building and site elements require regular monitoring for deterioration by NPWS staff.

Brickwork	Cracking to brickwork, cracking from settlement.	Commission a structural report to ascertain the reason for cracking. Consider the recommendations for repair in light of the graded significance of the building, and repair as appropriate.
	Rising damp	Check adequacy of stormwater drainage from around the building. Clean surface drains of debris and vegetation as required.
	Water staining of brickwork	Check stormwater drainage, including drainage from gutters and downpipes. Remove debris and vegetation, and repair any holes or cracks in the metalwork.
	Vandalism and graffiti	Remove graffiti as appropriate. Stabilise of repair damaged sections of brickwork as required.
Jointing	Excessive loss of mortar	Check stormwater run off, including drainage from gutters and downpipes. Clean of debris and vegetation, and repair any holes or cracks n the metalwork.
Stone work (Anchor Blocks and Corbels)	Further erosion of anchor blocks and corbels.	Check adequacy of site drainage from around the building.
Iron work (Doors, Shutters and Vents)	Further corrosion, flaking and bubbling of paintwork.	Remove flaking paintwork, treat iron for corrosion, and repaint with retarding paint. Check stormwater run off from the building, including drainage from gutters and downpipes. Clean as required. Repair any holes or cracks to the gutters or downpipes as required.

Building Element	Monitoring Condition	Action
Flat iron wall sheeting	Further corrosion, flaking and bubbling of paintwork.	Clean damaged surface, remove dilapidated paintwork. Treat corrosion, and repaint with retarding paint.
	Damage due to vandalism or graffiti.	Clean graffiti as required. Repair or replace any damaged sheeting to match existing as required.
Corrugated Iron Roof Structure	Lifting of roof sheeting.	Renew or replace fixing bolts. Refix sheeting.
	Corrosion, flaking or bubbling of painted surface.	Clean surface of dilapidated paintwork, treat corrosion, and repaint with retarding paint.
	Damage due to impact ie. fallen tree.	Commission a structural assessment of the building. Consider the recommendations for repair in light of the heritage significance of the building, and repair as appropriate.
	Damage due to vandalism.	Repair damage or replace damaged sheeting to match existing.
Lightning Conductors	Damage due to vandalism, storm damage.	Refix or replace damaged lightning conductors as required.
Downpipes and Gutters	Ineffective stormwater drainage.	Clean gutters and downpipes of debris and vegetation. Cut back surrounding and overhanging vegetation. Remove any blockages as required. Repair any holes or cracks.
	Corrosion	Clean surface of corrosion, treat, and repaint with retarding paint. Repair any holes or cracks to the gutters and downpipes.

Building Element	Monitoring Condition	Action
Internal		
Walls	Cracking	Undertake structural assessment to ascertain the cause of the cracking. Consider the recommendations for repair in light of the heritage significance of the building, and repair as required.
Timber parquetry floor	Further dampness to floor.	Check stormwater tightness of the roof structure, and repair sheeting as required.
Reinforced concrete ceiling	Cracking	Undertake structural assessment to ascertain the cause of the cracking. Consider the recommendations for repair in light of the heritage significance of the building, and repair as appropriate.
Security		
Grilles and padlocks	Damage through vandalism	Refix or replace grilles and padlocks as required.
Site Infrastructure		
Concrete concourse	Further excessive cracking of concrete.	Remove grass/weeds through mowing. Remove dislodged sections of concrete as required. Undertake a structural assessment of the seawall and concourse to determine whether further settlement of the concourse through water penetration is occurring.
Remnant tracks and turntables	Lifting of tracks.	Remove or reset misplaced sections of the track to reduce the trip hazard.
Septic tanks	Lids have been removed.	Ensure septic tanks remain covered for safety reasons Locate or replace lid as required.

Stone cuttings and retaining walls	Dilapidation of the stone retaining walls.	Cut back the creeping fig *(Ficus pumila)* to the stone retaining walls and reset stone work as appropriate. Sections of the creeping fig may need to be removed for the repair of highly dilapidated sections of the stone work, however should take into consideration the significance of the fig as a cultural planting of the complex.
Seawall	Dilapidation of the concrete, stone work.	Liaise with the NSW Waterways Authority regarding the appropriate method of repair of the seawall.
Timber jetty	Dilapidation of the timber structure.	Liaise with the NSW Waterways Authority regarding the appropriate method of repair of the jetty. Consider preparing a structural assessment to determine the scope of repairs.

18.8 Historical Archaeology Conservation Implementation

Short Term Activities within1 year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 years
Manage all historical archaeological material in accordance with the provisions of the *NSW Heritage Act 1977* and the *Heritage Amendment Act 1998*.	Consider the potential for further archaeological research, as outlined in the Archaeological Zoning Plan, to enhance the interpretation of the complex.	Continue to manage all historical archaeological material in accordance with the provisions of the *NSW Heritage Act 1977* and the *Heritage Amendment Act 1998*.
NPWS should remove the harbour boom which presently rests on the boat cradle, and relocate to the vicinity of the harbour buoys.	NPWS should prepare an inventory of moveable heritage items presently located at the site, and any known items that originate from the magazine complex.	Conduct archaeological assessments and research as appropriate to enhance interpretation programs.
	NPWS should record and document archaeological features or moveable items, which are in danger of vandalism, removal or destruction.	Update the Archaeological Zoning Plan as additional information comes to light through further research.
	NPWS should remove the timber jetty pylons, presently located at the site of the former dance hall, and place elsewhere at the site.	Liaise with the Service archaeologist and the NSW Heritage Office as appropriate with regard to the management of archaeological issues.
	NPWS should remove and relocate the light rail trolley, presently located within the detonator shed on the western shore, to an undercover position, either the receiving shed or other magazine building, for future interpretation purposes.	Liaise with the Service archaeologist, and make an application to the NSW Heritage Office for an excavation permit, prior to any new development, as required.

18.9 Adaptive Re-Use Implementation

Short Term Activities within 1 year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 years
	Investigate the development of the short term re-use strategies for the complex, which are identified in this CMP, once de-contamination issues have been addresed.	Identify the preferred re-use of the complex on the western shore.
	Develop and implement a staged program for the realisation of long term re-use opportunities.	Develop and implement programs of interpretation and re-use of the complex.

18.10 Interpretation Implementation

Short Term Activities within 1 year	Medium Term Activities between 2-5 years	Long Term Activities between 5-10 years
	Prepare a brief for the preparation of an Interpretation Plan, on finalisation of this CMP and pending results of Schedule of Remediation.	Include Bantry Bay in NPWS discovery tours of the western shore, which includes access onto the site and into one or more buildings.
	Prepare an inventory of all existing historic graphic material and documentary material, which can be used to support the Interpretation Plan.	Establish partnerships with private tour operators, to include Bantry Bay as part of their harbour tours.
	Commission the production of interpretive material.	Implement interpretation signage on the western and eastern shore.
	Commence educational/publicity campaign within the Service and private tour operators, to include Bantry Bay on harbour tours.	Include buildings in the long term interpretation of the complex, including access into one or all of the buildings.
	Commence NPWS managed water based tours to the western shore and visits to the eastern shore.	Reconstruct the lightning conductors to one of the magazine buildings for interpretation purposes.
	Incorporate Bantry Bay into bushwalking tours of the Garigal National Park.	Conserve the light rail trolley presently located within the detonator shed, and incorporate into programs for interpretation.
	Upgrade and maintain visitor facilities on the eastern shore, including toilets, shelter, water supply and barbeques.	

Part F
Supporting Material

19.0 BIBLIOGRAPHY

Adrian, P; Camilleri, A; Cohen, A; Lindeck, K; Ross, J; Scott-Mitchell, G; Tribe, D 1979. An Environmental Impact Statement on Proposed Alternative Uses of Bantry Bay Explosives Reserve.

Attenbrow, V 1990. The Port Jackson Archaeological project: Report on Stage 1. Unpublished report to AIATSIS and LALC's.

Attenbrow, VJ 1987. The Upper Mangrove Creek Catchment: A study of quantitative changes in the archaeological record. Unpublished PhD Thesis, University of Sydney.

Australia ICOMOS Charter for Places of Cultural Significance (The Burra Charter), Revised 2000.

Australia ICOMOS, 1991. Railway Heritage. Selected Papers from the ICOMOS Railway Heritage Conference, Powerhouse Museum, Sydney. October 1991.

Bowdler S 1971 Ball's Head: The Excavation of a Port Jackson Rock Shelter. Records of the Australian Museum 28: pp. 117-128.

Brew, K; Burton, C; Stuart, N and Williams, P 1982. Bantry Bay Marina Development Environmental Impact Statement – Report 80/82.

Campbell, WD 1899. Aboriginal Carvings of Port Jackson and Broken Bay. Mem. of the Geological Survey of NSW.

Dallas, M 1997. Kimbriki Recycling and Waste Disposal Centre Environmental Management Plan - Aboriginal Sites. Report to The Strategic Partners Group Pty Limited.

Department of Planning, Sydney, 1990 (updated March 1999). Sydney Regional Environmental Plan No. 23 – Sydney and Middle Harbour.

Gingra Ecological Surveys, 2000. Vegetation Survey of Garigal National Park, Middle Harbour Creek and Bantry Bay. Report for Sydney North Region, National Parks and Wildlife Service.

Godden Mackay and Austral Archaeology 1997. POW Project 1995 Destitute Children's Asylum Cemetery Archaeological Investigation Vol 2 Archaeology, Part 3 Aboriginal Archaeology.

Gunn, RG 1992. Garigal National Park Archaeological Survey. A management report to NPWS.

Koettig, M 1993. Kimbriki Recycling and Waste Disposal Centre: Survey for Aboriginal Sites within proposed extension. Report to Kinhill Engineers Pty Ltd as part of an EIS.

Latona Masterman and Associates, 1982. Bantry Bay Planning Study, Resource Document. Prepared for NSW National Parks and Wildlife Service.

Mann, JF 1885. Proceedings of the Geographic Society of Australia (NSW and Vic Branches) for 1883-84.

McCarthy, FD 1983. Catalogue of the Rock of the Sydney - Hawkesbury District NSW. 2 Vols. NPWS.

McDonald, J 1994. Dreamtime Superhighway: An Analysis of Sydney Basin Rock Art and Prehistoric information Exchange. PhD thesis, Australian National University 2 Vols.

McDonald, J 1992. The Archaeology of the Angophora Reserve Rock Shelter. Environmental Heritage Monograph Series No. 1. NSW NPWS.

Miles, D 1964. Preliminary Comments on Ball's Head archaeological excavation. Australian Natural History 14.

New South Wales Heritage Office, 2000. Movable Heritage Principles.

New South Wales Heritage Office, 2000. Minimum Standards for Maintenance and Repair.

NSW National Parks and Wildlife Service, 1991. Bantry Bay Explosives Magazine Conservation Plan.

NSW National Parks and Wildlife Service, 1989. Bantry Bay Explosives Magazine Complex, Davidson Park State Recreation Area: A Report of the Architectural Significance of the Buildings and Associated Cultural Resources.
NSW National Parks and Wildlife Service, May 2000. Bantry Bay Explosives Magazine Brief for Maintenance Works.

NSW National Parks Plan of Management, November 1998. Garigal National Park Plan of Management.

National Parks & Wildlife Service Register of Aboriginal Sites and Catalogue of Archaeological Reports.

Read, P 2000. Belonging: Australians, Place and Aboriginal Ownership. Cambridge University Press.

Rich, E 1988. Proposed Kimbriki Road Waste Disposal Depot Extension, Terry Hills: Archaeological Survey for Aboriginal Sites. Report prepared for the Warringah-Manly-Mosman Joint Services Committee.

Sinclair Knight Merz Pty Ltd, 1997. Bantry Bay Powder Magazine Explosives and Environmental Assessment. Prepared for NSW National Parks and Wildlife Service.

Upper Middle Harbour Conservation Committee in consultation with the Department of Environment, Australian Museum 1973. Bantry Bay – The Case of Conservation.

19.1 Sources of Illustrations

Benson D and Howell J 1994. Natural Vegetation of the Sydney Area 1:100,000 Map Sheet, provided within Cunninghamia 3(4)

Chapman, GA and Murphy, CL 1989. Soil Landscapes of the Sydney 1:100,000 Map Sheet*, Soil Conservation Service of New South Wales, Sydney.*

Department of Mineral Resources, photographs of Bantry Bay Explosives Magazine complex.

Herbert, C 1983. *Geology of Sydney 1:100,000 Map Sheet 9130*. NSW Department of Mineral Resources.

Mitchell Library, photographs of Bantry Bay.

20.0 BUSHLAND MANAGEMENT REPORT

The following report *Overview of Flora and Fauna Populations: Recommendations for Bushland Management*, has been prepared by Urban Bushland Management Consultants Pty Ltd in December 2000.

This report reviews the flora and fauna populations and natural features of the Bantry Bay study area, and makes recommendations relating to the management of the indigenous bushland.

1.0 INTRODUCTION

1.1 Background Information

The Bantry Bay Explosives Magazine Complex was established in 1908 following advice from the "Report of the Committee of Inquiry" that explosives stored in Powder Magazines and Hulks in Middle Harbour should be moved to a location less susceptible to explosions (Latona Masterman & Associates, 1982). A total of 701 acres and 2 roads were allocated to for the storage facility. Work commenced in 1910 and in 1915 the new magazines at Bantry Bay were declared "Public Magazines" (Latona Masterman & Associates, 1982). Figure illustrates the location of the Magazine Complex.

The Bantry Bay Complex was extremely well designed, with tram tracks linking the recessed nine (9) magazines to the Major Receiving Magazine and jettys on the waterfront (Latona Masterman & Associates, 1982). During its time of operation, the complex was a highly specialised and industrious port facility, utilising a variety of boats and specialist hand trolleys to transport goods between the boats and the magazines (Latona Masterman & Associates, 1982).

The event of new technologies and resident pressure eventuated the official announcement of the closure of the Bantry Bay facility in June 1972. The Complex was closed in May 1974 and incorporated into the Davidson Park State Recreation Area. In 1992 Davison State Recreation Area was subsequently incorporated into Garigal National Park. Since operations have ceased at Bantry Bay, the care and maintenance of the buildings has been a major problem (Latona Masterman & Associates, 1982).

Shortly after being included in Garigal National Park, a major stabilisation program was undertaken on the western seawall, but there were insufficient funds to complete the work (NPWS, 1998). Most of the buildings are in relatively sound condition, but have been subject to vandalism, and most the fittings have been removed (NPWS 1998).

The Complex has been listed on the State Heritage Register under the NSW *Heritage Amendment Act 1996* and the Register of the National Estate, and has been classified by the National Trust of Australia (NSW).

1.2 Report Purpose

The first Bantry Bay Explosives Magazine Conservation Plan was prepared by the NSW National Parks and Wildlife Service in 1991. In order to comply with new environmental legislation (*Threatened Species Conservation Act 1995*), and in accordance with Service policy to update its Conservation Plans on a regular basis, the NPWS has required a reassessment of the site's conservation values to be undertaken and a new Conservation Plan to be developed.

Taylor Brammer Landscape Architects Pty. Ltd. has been commissioned by the Service to update the Conservation Management Plan for the Bantry Bay Explosives Magazine. The updated Conservation Plan will articulate the philosophy and set the direction for overall conservation of the Complex within the context of envisioned future use.

1.3 Scope of works

As part of the Taylor Brammer project team, Urban Bushland Management Consultants Pty. Ltd. (UBMC) has been commissioned to carry out a review of the site's flora and fauna populations and other natural features, and to make recommendations relating to the management of the indigenous bushland.

Tasks carried out by UBMC include:

- Research into current knowledge of the study area (Magazine Complex) and the surrounding bushland (Figure 1);

- Identification of species/communities/habitats of conservation significance occurring or potentially occurring on-site and in the surrounding area;
- Assessment of the conservation significance of the native bushland using indicators such as structural integrity, floristic composition, size, connectivity and surrounding land uses;
- Documentation of all species/communities/habitats of conservation significance at local, regional, state and national levels;
- Summary of previous vegetation maps of Bantry Bay;
- Identification of the client's legal obligations with respect to existing environmental legislation (*Threatened Species Conservation Act 1995, Noxious Weeds Act 1993*; and
- Development of policies to rehabilitate indigenous bushland and strategies to ameliorate threats to the site's conservation values.

1.4 Previous Investigations

A number of earlier studies, surveys and investigations were consulted during the preparation of the current report. The main titles are listed below:

- Latona Masterman and Associates (1982) *Bantry Bay Planning Study.* Unpublished report for NSW National Parks and Wildlife Service.
- Upper Middle Harbour Conservation Committee in consultation with the Department of Environmental Studies, The Australian Museum (1973) *Bantry Bay – the Case for Conservation*
- Gingra (2000) Vegetation Survey of Garigal National Park, Middle Harbour Creek and Bantry Bay. Unpublished report for NSW National Parks and Wildlife Service.
- National Parks & Wildlife Service (1998) *Garigal National Park Plan of Management.* NSW NPWS

Summary information and relevant reports reviewed in the preparation of this report are supplied in Appendix 1.

1.5 Planning and Legal Framework

1.5.1 Land Tenure

The Bantry Bay Explosive Magazine Complex is located within Garigal National Park and is owned and managed by the NSW National Parks and Wildlife Service (NPWS). Bantry Bay is located within Warringah Local Government Area.

1.5.2 Planning and Legislative Framework

A number of State Government Acts have relevance to the current and on-going management of remnant bushland in the study area. The most relevant items are summarised below.

Warringah Local Environmental Plan 2000
Warringah LEP 2000 was gazetted on 5 December 2000 and applies to all development carried out in Warringah LGA since that date.

LEP 2000 utilises place based development controls, which replace the previous 'zone based' controls. This means that instead of using generic terms such as 'residential', 'commercial', 'industrial' and other zone names to control development, LEP 2000 identifies localities on maps, and describes specific controls for each of 73 localities in separate locality statements.

National Parks and Wildlife Act 1974
The Director-General of the NPWS has a statutory responsibility under the National Parks and Wildlife Act 1974 (*NPW Act 1974*) for the "care, control and management of National Parks, nature reserves, historic sites and Aboriginal areas". This responsibility is delegated to the District Manager.

Part 5, section 7 of the Act requires that plans of management be prepared for each national park, nature reserve, historic site, state game reserve or karst conservation areas as soon as possible after dedication. Section 4(a-d) has regard to the objectives of a plan of management, which includes the conservation, preservation and protection of the above-listed areas. Further, Part 2, Section 8(3)(b) states that the Director shall arrange for such works as he considers necessary for, or in connection with, the management and maintenance thereof (sic).

In Garigal National Park, statutory responsibilities in terms of the *NPW Act 1974* relate to the conservation and management of the natural environment (flora, fauna and geological landscapes), and to the protection of sites of Aboriginal archaeological significance and the historic Explosives Magazine Complex.

As management activities related to the conservation and future maintenance of the Magazine Complex will impact both on the built environment and the surrounding bushland, the Service is obliged to have regard to the terms of the Act.

Heritage Act 1997
The Heritage Act 1997 aims to conserve the environmental heritage of the State. Under the Act, environmental heritage is described as “those places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance”. Items of state heritage significance are listed on the State Heritage Register kept by the Heritage Council of NSW. This register contains over 1200 items identified as being of particular significance to the State.

Threatened Species Conservation Act 1995
The *Threatened Species Conservation Act* 1*995* aims to conserve threatened species, populations, ecological communities and their habitats; to promote their recovery; and manage the processes that threaten or endanger them.

The NSW Scientific Committee established by the *Threatened Species Conservation Act 1995* has listed a number of threatened species (flora and fauna) under Schedules 1 and 2 of the Act, and those plant communities considered to be at risk of extinction as ‘endangered ecological communities’ under Schedule 3.

The 'eight-part test' (as determined by section 5A of the *Environmental Planning and Assessment Act 1979*) allows decision makers to assess whether a proposed development or activity is likely to have a significant effect on threatened species, populations or ecological communities, or their habitats. An 'eight-part test' will need to be done for the study area if a Development Application is submitted to Council within any area of high conservation value.

Recent (Gingra 2000) and earlier (Benson and Howell 1994, Adrian *et al* 1979, Upper Middle Harbour Conservation Committee 1973) flora surveys in the study area have not recorded any vegetation communities or species listed under the Schedules of the Act. However, one (1) species of conservation significance has been identified in the bushland around Bantry Bay (*Eucalyptus luehmanniana*) although this species has not been recorded in the study area. See Section 2.6 for further information.

Noxious Weeds Act 1993
The *Noxious Weeds Act 1993* replaces weed control legislation dating from the early part of the century (*Local Government Act, 1919*). The new Act brings important changes that are designed to streamline administration and improve the implementation of noxious weed control. There is an increased emphasis on urban and environmental weeds. It encourages community co-operation and promotes a co-ordinated approach to the control of noxious weeds throughout the State. The Act allows for the declaration of noxious plants in four categories - W1 to W4. Noxious plants are categorised according to the specific action required to control them. Bushland or ‘environmental weeds’ are generally grouped in category W4.

The Act states that “public authorities must control noxious weeds on land under their control, to the extent necessary to prevent the weeds spreading to adjoining land”. This is a major change in the legislation, as public authorities were previously exempt from the legislation. As a public authority, the

National Parks & Wildlife Service is required to take the appropriate action required to control noxious weeds occurring on land under their care and control.

A total of five (5) noxious weeds were recorded in the study area at Bantry Bay (see section 2.5). *Lantana camara, Rubus fruticosus* are listed as W2 *weeds,* and *Ageratina adenophora, Cortaderia selloana, Parietaria juncea*) are listed as W3 weeds. Under the terms of the Act, specific actions required of the landowner and public authorities are as follows:

- For a **W2** noxious weed, the weed must be fully and continuously suppressed and destroyed.
- For a **W3** noxious weed, the weed must be prevented from spreading and its numbers and distribution reduced.

Rural Fires Act 1997
The *Rural Fires Act* came into force at the beginning of 1997, and replaces the *Bush Fires Act 1949*. Under the *Rural Fires Act 1997*, the Service is a fire authority and is responsible for controlling fires in national parks and ensuring that they do not cause concrete damage to neighbouring land or property. This responsibility includes the implementation of fuel management programs. The Service may also assist with the control and suppression of fires adjacent to the National Park

Garigal National Park is included within the areas of the Warringah/Pittwater and Hornsby/Ku-ring-gai District Fire Protection Committees (NPWS 1991). Cooperative arrangements for fire suppression area detailed in Part 2 Division 3 and Part 3. Fire Management Strategies for the Park are briefly covered in the Service's District Fire Management Plan and will be covered in more detail in the Garigal National Park Fire Management Plan (in preparation) (NPWS 1991).

Fire activities are undertaken with assistance of the local Volunteer Bushfire Brigades. The Brigades and Service have a good working relationship, which is actively fostered for mutual benefit (NPWS 1991).

2.0 SITE DESCRIPTION

2.1 Location and Regional Setting

The former Bantry Bay Explosives Magazine Complex is located on the shores of Bantry Bay, on Middle Harbour. The historic Magazine Complex forms part of Garigal National Park which encompasses 2,150 hectares of bushland, including the upper reaches of Middle Harbour and part of the catchment of Narrabeen Lakes (NPWS 1998). Most of the National Park is surrounded by residential development along the ridgetops and is easily accessible by road and by water, although there is no vehicular access to Bantry Bay. Reserves, Crown Land and other national parks located adjacent to or within the vicinity of Garigal National Park include Ku-ring-gai Chase National Park, Sydney Harbour National Park and Manly Warringah Memorial Park (NPWS 1998).

The study area includes the Magazine Complex on the western side of Bantry Bay and the extent of the cleared picnic area on the eastern side of the Bay. The CMP will focus on the 13 magazines and other buildings that together comprise the western part of the Magazine Complex. A narrow strip of steep waterfront land links the Bantry Bay Magazine Complex to the rest of the National Park.

2.2 Topography, Geology and Soil Landscapes

Bantry Bay is part of the Hornsby Plateau sub-region of the Hawkesbury sandstone region (Upper Middle Harbour Conservation Committee 1973). This region was created during the Triassic Period when it formed the bed of a freshwater basin.

The landform around Bantry Bay rises to approximately 110 metres ASL and is typically divided by drowned river valleys and watercourses. Rocky outcrops and cliffs are frequent, offering views down Middle Harbour, south to Sydney, and west to the Blue Mountains. The Magazine Complex was constructed on level ground along the shoreline, although part of this land has been reclaimed (or reformed) for construction purposes.

Two (2) distinct geological formations occur within the study area and around Bantry Bay generally. The shorelines, hillslopes and ridges comprise Triassic Hawkesbury Sandstone (map unit Rh), while the estuarine environment at the head of the Bay comprises Quaternary alluvial and estuarine sediment deposits (map unit Qha) (Herbert, 1983). The former consists of medium to coarse-grained quartz sandstones, with very minor shale and laminite lenses, while the latter consists of silty to peaty quartz, sand, silt and clays with shell layers.

Within the Bantry Bay area soil depth varies from nil to a few centimetres in depressions on the plateau, to a metre or more in the gullies (Upper Middle Harbour Conservation Committee 1973). Three (3) soil landscapes occur around Bantry Bay. Soils of the colluvial Hawkesbury (ha) soil landscape occur along the eastern and western shorelines of the Bay, while soils of the estuarine Mangrove Creek (mg) soil landscape occur at the head of the Bay. Soils of the erosional Lambert soil landscape occur upslope of the Hawkesbury soil landscape on the western side of Bantry Bay.

2.3 Climate

The closest metrological station to Bantry Bay is located at Riverview. Climatic records collected over the past 96 years indicate an average annual daily maximum temperature of 22.1°C, and an average annual minimum daily temperature of 12.1°C – a range of 10°C. The warmest days are experienced in January (average daily maximum temperature 26.3 °C) and the coldest in July (average daily minimum temperature 6.2°C). Average annual rainfall is 1140.3mm, with March experiencing the highest average number of raindays (13.1).

2.4 Vegetation

2.4.1 Native Plant Communities

For the purposes of this report, the Bantry Bay study area has been divided into three (3) management zones. These are:

- Magazine Complex on the western foreshores and lower slopes (to the boundary of the National Park);
- Eastern foreshores (extending from the foreshores to the extent of the picnic area); and
- Estuarine area at the head of Bantry Bay.

The western and eastern sections of the study area from the shoreline to the upslope boundaries of the Magazine Complex were surveyed in detail, but due to time and budgetary constraints, the estuarine area at the head of the Bay (which lies outside the Magazine Complex) was not surveyed.

Figures 1a and b which follow illustrates vegetation communities as mapped by Gingra (2000) and the Upper Middle Harbour Conservation Committee (1973)

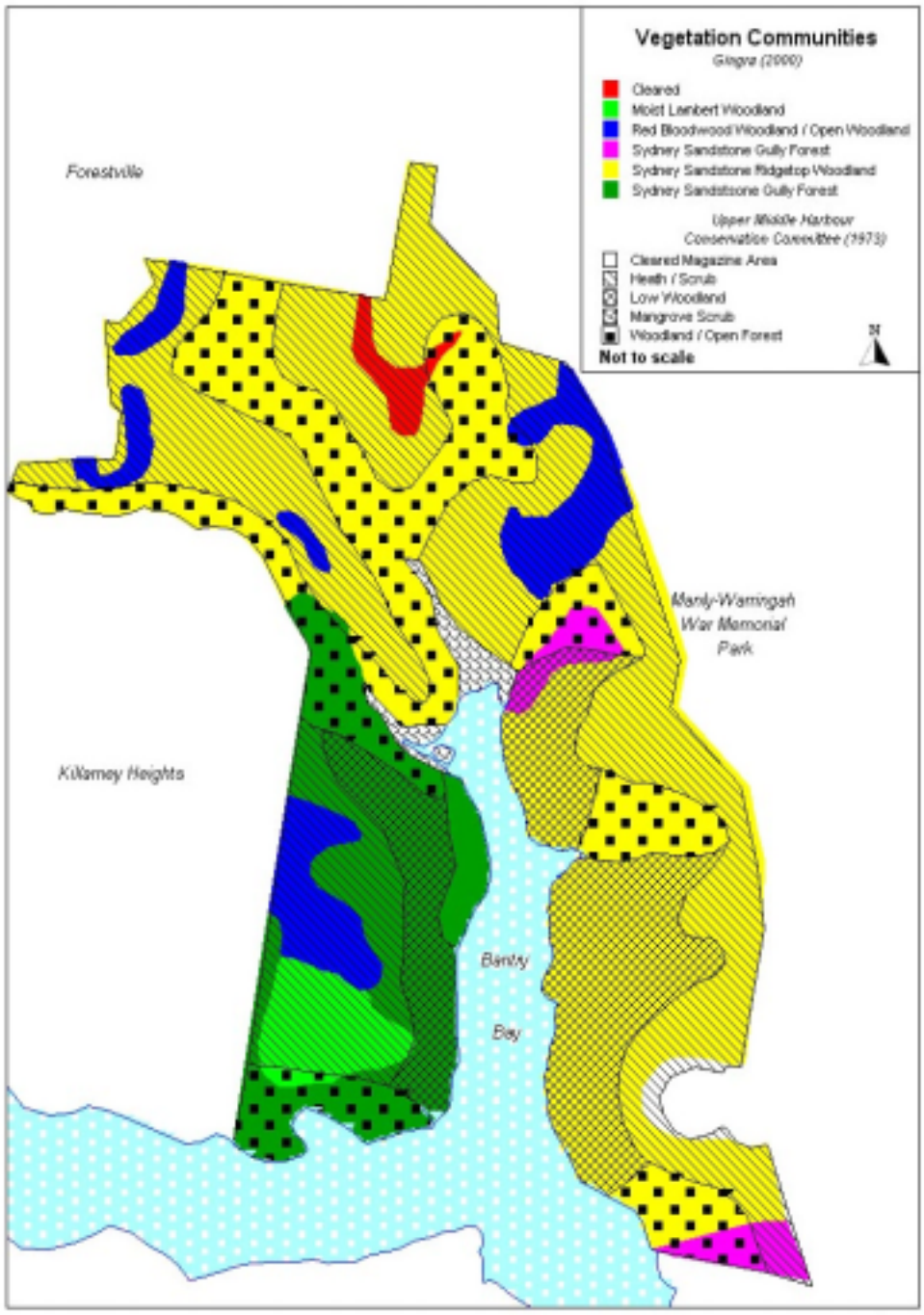

Figure 1a. Vegetation Communities as mapped by Gingra, 2000.

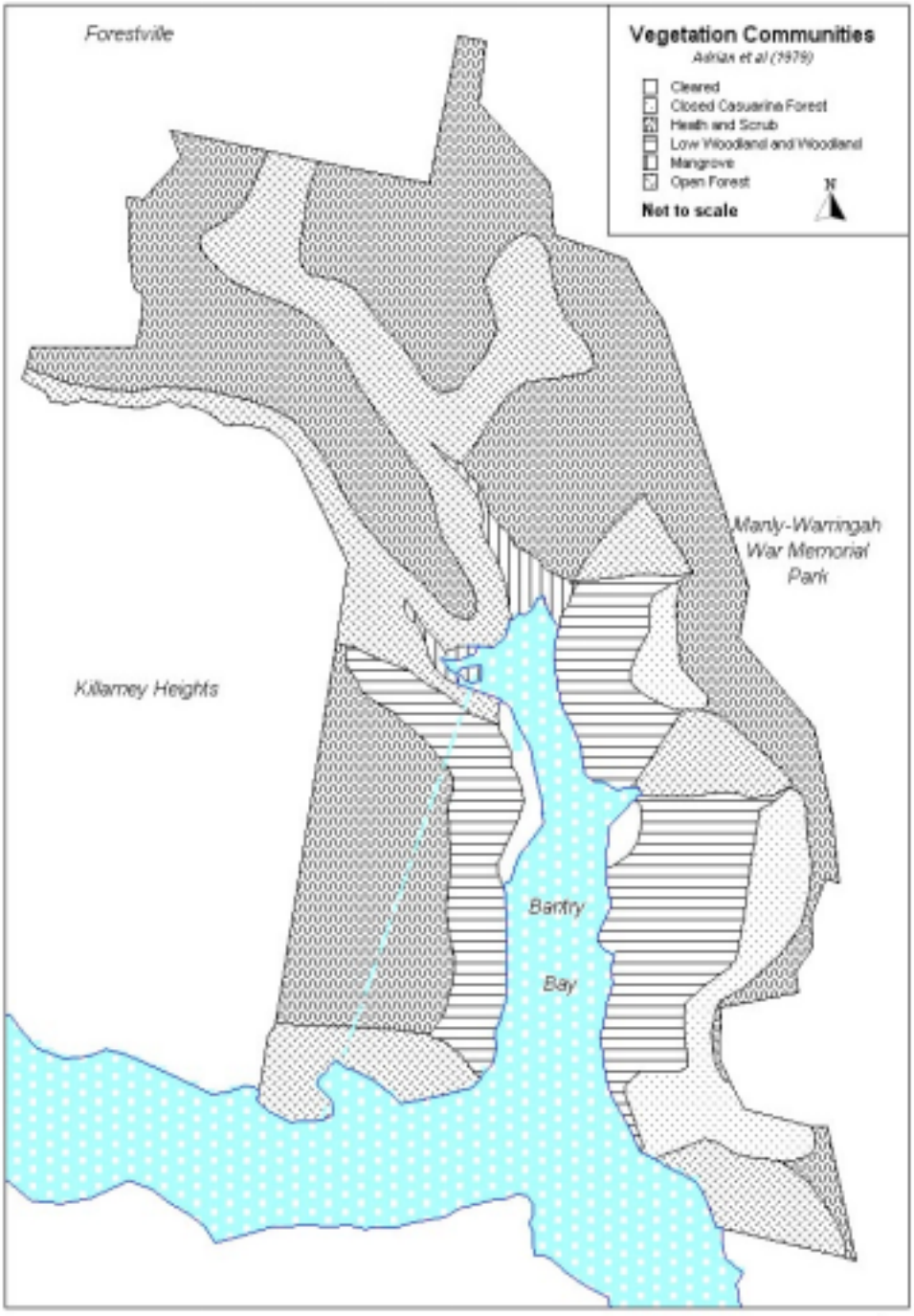

Figure 1b. Vegetation Communities as mapped by Adrian et al, 1979

Table 1: Vegetation communities on western side of Bantry Bay (to the boundary of the National Park)

Author(s)	Map scale	Vegetation Communities	Comments
Benson and Howell (1994)	1:100 000	Coastal Sandstone Heath (map unit 21g)	This unit has been subdivided into eight (8) sub-units; of which three (3) occur around Bantry Bay: ▪ Shrubland with *Baeckea imbricata* (on shoreline) ▪ Open Heath / Closed Scrub with *Banksia ericifolia, Darwinia fascicularis* ▪ Open to Closed Heath with *Banksia ericifolia* and *Allocasuarina distyla*
Gingra (2000)	1:28 571	▪ Sydney Sandstone Gully Forest ▪ Red Bloodwood Woodland/Open Woodland ▪ Moist Lambert Woodland	
Adrian *et al* (1979)	1:20 000	▪ Heath and Scrub ▪ Open Forest ▪ Low woodland and woodland	
Upper Middle Harbour Conservation Committee (1973)	1:9 657	▪ Woodland/Open Forest ▪ Low Woodland ▪ Heath/Scrub	Low woodland and Woodland/Open Forest directly adjoin the Cleared magazine area.

Table 2: Vegetation communities at the head of Bantry Bay

Author(s)	Map scale	Vegetation Communities	Comments
Benson and Howell (1994)	1:100 000	Sydney Sandstone Ridgetop Woodland (map unit 10ar)	This unit has been subdivided into three (3) sub-units, one (1) of which occurs around Bantry Bay: Woodland to Low Woodland – typical species include *Banksia ericifolia, Hakea teretifolia Corymbia gummifera, Eucalyptus haemistoma, E. sparsifolia and E. racemosa* (low woodland)
Gingra (2000)	1:28 571	▪ Sydney Sandstone Ridgetop Woodland ▪ Sydney Sandstone Gully Forest ▪ Red Bloodwood Woodland/Open Forest	
Adrian et al (1979)	1:20 000	▪ Open Forest ▪ Heath and Scrub ▪ Mangrove	The dominant mangrove species is *Avicenna marina* Occurs in estuarine area at head of Bay (not surveyed)
Upper Middle Harbour Conservation Committee (1973)	1:9 657	▪ Mangrove Scrub ▪ Woodland/Open Forest ▪ Heath/Scrub ▪ Low Woodland	Mangrove Scrub occurs on intertidal mudflats in the tidal mouths of the two streams of Bantry Bay

Table 3: Vegetation communities along the eastern side of Bantry Bay (extending from the head of Bantry Bay to National Park Boundary, upslope of the picnic area)

Author(s)	Map scale	Vegetation Communities	Comments
Benson and Howell (1994)	1:100 000	▪ Sydney Sandstone Ridgetop Woodland (map unit 10ar) ▪ Sydney Sandstone Gully Forest (10ag)	Both unit has been subdivided into three (3) sub-units. Typical canopy species in 10ag consist of *Eucalyptus piperita, Corymbia gummifera, Angophora costata.* This association occurs upslope of the Magazine Complex: around the stone drainage channel and the concrete dam.
Gingra (2000)	1:28 571	▪ Sydney Sandstone Ridgetop woodland ▪ Sydney Sandstone Gully Forest ▪ Red Bloodwood Woodland/Open Woodland	
Adrian et al (1979)	1:20 000	▪ Low Woodland and Woodland ▪ Open Forest ▪ Closed Casuarina Forest ▪ Heath and Scrub	
Upper Middle Harbour Conservation Committee (1973)	1:9 657	▪ Woodland/Open Forest ▪ Low Woodland ▪ Heath/Scrub	Low woodland and Woodland/Open Forest directly adjoin the Cleared magazine area.

Note: the area immediately along the shoreline on both sides of Bantry Bay was cleared at the time of development. Consequently, native bushland is not represented on the foreshores of the Bay within the limits of the Magazine Complex.

2.5 Weeds and Introduced Flora

Limitations on access and restricted development have until recently protected the native vegetation communities around Bantry Bay. However, over the past several decades, residential development along the ridgelines to the north and north-west, and the eastern ridge have significantly altered natural hydrological regimes and disrupted nutrient cycles. This has resulted in the establishment of weed plumes below development and degradation of drainage lines, in some areas extending to the foreshores of the Bay itself. Exotic plants have been introduced into the Magazine Complex and a number of weed species have naturalised in and immediately around the site.

Along the western shoreline of Bantry Bay, weeds are gradually colonising all cleared and disturbed areas. Weeds are especially widespread on the landing platform and on the lower slopes behind the Magazine Complex. Creeping Fig (*Ficus pumila*) is of particular concern, as this robust woody climber is threatening the integrity of built structures (such as stone retaining walls) within the Magazine Complex.

Much of the bushland on the eastern side of Bantry Bay was burnt during recent (October 2000) bushfires. However, the lower slopes comprising the picnic area and landing platform were not burnt. Weeds and non-indigenous garden introductions occur around the foreshores, site buildings and throughout the picnic grounds.

Table 4: Weeds, introduced and non-indigenous native plants recorded

Botanic Name	Common Name	Western Side	Eastern Side	Noxious in Warringah Shire (Category)	Comments
Ageratina adenophora	Crofton Weed	X	X	W3	Drainage lines
Aira ? caryophylleas	Silvery Hair Grass or Blown Grass	X			
Andropogon virginicus	Whiskey Grass	X			
Briza spp.	Shivery / Quaking Grass	X			
Callistemon hypericifolia	a Bottlebrush		X		Planted – picnic area
Conyza spp.	Fleabane	X			
Coreopsis lanceolata	Coreopsis				Cleared areas near western landing platform
Cortaderia selloana	Pampas Grass	X		W3	
Cynodon dactylon	Common Couch Grass	X	X		
Cedrus deodara	Deodar		X		Planted
Erigeron karvinskianus	Seaside Daisy	X			
Ficus pumila	Creeping Fig	X			Threatens rock walls & other structures
Hydrangea macrophylla	Hydrangea	X			Not invasive - heritage planting ? – western side
Hypochaeris radicata	Cat's Ear / Flatweed	X	X		
Lantana camara	Lantana	X	X	W2	Small numbers
Lonicera japonica	Japanese Honeysuckle	X	X		Picnic area & surrounds

Melaleuca styphelioides	Prickly-leaved Paperbark		X		Planted – picnic area
Nephrolepis cordifolia	Fishbone Fern	X	X		Planted – picnic areas / invasive
Parietaria juncea	Pellitory	X	X	W3	Around picnic area & steps
Plantago lanceolata	Plantago	X	X		
Polygonum aviculare	Japanese Knotweed	X			
Rubus fruticosus	Blackberry	X	X	W2	Bushland edges
Sporobolus africanus	Parramatta Grass	X	X		
Stenopatorum secundatum	Buffalo Grass	X	X		
Yucca aloifolia	Spanish Bayonet		X		Planted – picnic area

NB: small herbaceous weeds (forbs and grasses) are not listed.

2.6 Conservation Significance

2.6.1 Species of Conservation Significance

Approximately 35 species of conservation significance occur within Garigal National Park, of which five (5) species are classified as 'threatened' (NPWS 1998).

Table 5 lists vegetation species considered to have high conservation significance that have been recorded within a 10km radius of Bantry Bay. In addition to these species, it is possible that *Haloragodendron lucasii* (endangered, 2ECi) and *Leptospermum deanei* (vulnerable, 2V) recorded elsewhere in Garigal Park, may also occur in the general vicinity of Bantry Bay (Thomas pers comm).

Table 5: Vegetation Species of High Conservation Significance Recorded Within a 10km Radius of Bantry Bay.

Botanical Name	Common Name	TSC Act Classification	ROTAP Classification
Acacia bynoeana	-	Endangered	3VC-
Caladenia tessellata	-	Vulnerable	3V
Eucalyptus camfieldii	Heart-leaved Stringybark	Vulnerable	2VCi
Melaleuca deanei	Deane's Honeymyrtle	Vulnerable	3RC-
Pimelea curviflora var. *curviflora*	-	Vulnerable	not listed
Syzygium paniculatum	Magenta Lillypilly	Vulnerable	3Vci
Tetratheca glandulosa	-	Vulnerable	2VC-

(Source: NPWS Wildlife Atlas Database, December, 2000)

The Upper Middle Harbour Conservation Committee (1973) identified small patches of a ROTAP species - *Eucalyptus luehmanniana* (2RCa) - within the Heath/Scrub vegetation community of Bantry Bay (exact location not identified). Another species of significance, *Eucalyptus capitellata* (No ROTAP code), was identified by Gingra (2000) within the Sydney Sandstone Ridgetop Woodland of Bantry Bay (exact location not identified).

Some additional species not recorded by Gingra (2000) or the Upper Middle Harbour Conservation Committee (1973), but which are considered likely to occur within the vicinity of Bantry Bay, are listed below. These species are locally significance (Thomas pers. comm.) or are listed by Briggs and Leigh (1995).

- *Angophora crassifolia* - 2RCa
- *Eucalyptus saligna* (Sydney Blue Gum) - not listed by Briggs and Leigh (1995)
- *Gonocarpus salsoloides* (Nodding Raspwort) - 3RCa
- *Lomandra brevis* - 2RC
- *Rulingia hermannifolia* (Wrinkled Kerrawang) - 3Rca

2.6.2 Communities of Conservation Significance

According to Gingra (2000), the only vegetation community of conservation significance within the Garigal West section of the National Park is Estuarine Forest. This community is considered significant due to its limited distribution in the Sydney Region. Although Estuarine Forest was not recorded in the Bantry Bay area by Gingra (2000), the Upper Middle Harbour Catchment Committee (1973) and Adrian *et al* (1979) recorded areas of Mangrove Scrub between tide levels on mudflats in both arms of Bantry Bay (Figures 1a and 1b). Furthermore, the Bantry Bay Conservation Plan (NPWS 1991) states that the mangroves and sea grass communities of Bantry Bay are significant in the context of greater Sydney Harbour due to their large size and good health.

None of the vegetation communities in the Bantry Bay area are listed under the Schedules of the *Threatened Species Conservation Act 1995*. However, Coastal Sandstone Heath has a very restricted distribution in the Sydney Metropolitan Region. Further, the mesic phases of Sydney Sandstone Gully Forest are generally considered to have high local conservation significance (Thomas pers comm).

2.7 Fauna

2.7.1 Species Present

It is possible that many of the species which formerly occurred in the area are no longer present due to impacts such as habitat destruction, limited fragment size, predation by introduced animals, and

isolation by arterial roads (NPWS 1998). The greatest threats to native fauna in the area are predation by, and competition with feral and domestic cats, foxes and dogs. However, declining water quality and altered fire regimes are also factors which potentially threaten the survival of native fauna within the Park (NPWS 1998). Nevertheless, the high structural and floristic diversity of Garigal National Park, in combination with an adjacent estuarine wetland, offers those fauna species that remain a wide variety of habitats (NPWS 1998).

Approximately 18 native mammals, 160 native birds and 23 native reptile species have been recorded within Garigal National Park. Table 6 lists those species recorded, or presumed to be present within Bantry Bay.

Table 6: Fauna species recorded in the Bantry Bay study area

	Recorded	Expected to be present	Possibly present
Mammals	**10**	**4**	**6**
Monotremes	1		
Marsupials	5	4	
Placentals	4		
Reptiles and Amphibians	**38**		
Geckoes	4		
Legless lizards	2		
Skinks	12		
Dragons	3		
Monitors	2		
Worm Snakes	1		
Pythons	1		
Brown Tree Snakes	1		
Front-fanged Snakes	11		
Tortoises	1		
Frogs	Several species to be identified		
Toads	Several species to be identified		
Birds	**127**		

(Source: Upper Middle Harbour Conservation Committee 1973)

2.7.2 Conservation Significance

Of those species recorded within Bantry Bay, only one (1) species - The Southern Brown Bandicoot (*Isoodon obesulus*) - is listed as 'endangered' under Schedule 1 of the *Threatened Species Conservation Act 1995.*

3.0 BUSHLAND MANAGEMENT ISSUES

3.1 Past and Current Management Practices

When the Bantry Bay Magazine Complex was in use as an explosives depot, photographic evidence indicates that the surrounding bushland was totally cleared, with clearing extending from the shoreline upslope almost to the western ridgeline. In order to guard against bushfire, all clearing was carried out by hand, and with the exception of some minor garden planting, the site was kept free of all vegetation (NPWS, pers comm).

Since the incorporation of Bantry Bay into Garigal National Park, only intermittent clearing work has been carried out, aimed at preserving the integrity of the Magazine buildings. However, the eastern side of the Bay, which is open to the public as a picnic area, receives regular maintenance: lawns are slashed and rubbish is removed from the site.

In recent months, a maintenance crew using day labour has been working to remove weeds and native regrowth from the area immediately around the buildings in the Magazine Complex (NPWS, pers comm). Intrusive vegetation, including extensive areas of Creeping Fig, has been removed from the protective earth bunds around the Magazines and from the building's gutters and eaves. Weeds and regrowth vegetation on the landing platform were not treated at this time, and this area continues to be dominated by grasses and other herbaceous weeds, with a scattered regrowth of native shrubs and small trees.

The native bushland immediately upslope of the Magazine Complex has regenerated to a near-natural form. The former pathway to the concrete dam is now overgrown, and in the absence of fire, the surrounding slopes carry a heavy fuel load. While most of the bushland around the Magazine Complex is relatively weed-free, the area between the buildings and the stone drainage channel support small populations of woody weeds such as Lantana and Blackberry, while Creeping Fig is firmly established on stone retaining walls and on rock cuttings.

3.2 Management Issues

The main issues to be addressed when considering the management of the native bushland and the preservation of the built environment at Bantry Bay are as follows:

1. Threat from bushfires;
2. Deterioration of building fabric as a result of weed incursion and native regrowth;
3. Weed control; and
4. Management of buffer / interface zones between built and natural environments.

Another issue which will impact in the future, and which must be addressed in the forthcoming Conservation Plan is that of public access.

3.2.1 Fire Hazard

The Magazine Complex on the western side of Bantry Bay escaped damage in the recent (October 2000) fires due to the efforts of the NPWS and a large team of fire fighters. In contrast, the western slopes extending up to Wakehurst Parkway suffered considerable damage, and most of the bushland on the eastern side of the Bay was reduced to mineral soil. The fire, which was deliberately set, highlights the need for the NPWS to actively manage the bushland around the Magazine Complex in order to ensure that future bushfires do not threaten the historic site.

The heavy fuel load remaining on the unburnt section of the western slopes has been discussed (section 3.1). The October bushfire has reduced the fuel load further upslope on the western side of the Bay, but bushland in protected gullies has not been affected.

Scattered native regrowth, comprising fire-prone pioneer species such as *Allocasuarina*, *Hakea, Kunzea* and *Acacia* have established on the landing platform, on the earth bunds around the magazines, and on rock cuttings. The area between the buildings on the foreshores and the stone drainage channel and concrete dam (once completely cleared of vegetation) has regenerated to form dense bushland. Having remained unburnt for some years, this area presents a fire hazard and poses a direct threat to the Magazine Complex.

Built structures on the eastern side of the Bay are associated with the public picnic grounds. The buildings, lawns and most of the landscape specimens planted in this area escaped damage in the recent fires. As the surrounding bushland has been completely burnt, there will be no further threat from bushfire for some years. However, as the dry sandstone woodland and scrub will rapidly re-establish, consideration must be given to future management of the fire threat on the eastern side of the Bay.

3.2.2 Deterioration of Building Fabric as a Result of Weed Incursion and Native Regrowth

Weeds and native bush are reclaiming the lower slopes and the landing platform behind the Magazine Complex, while grasses and herbaceous weeds are growing on the cement paths and disused railway tracks. Until a recent 'clean-up' operation organised by the NPWS, weeds and bush were growing in the fabric of the buildings: in walls, around window frames, and on roofs. Unless this invasive vegetation is controlled, this regrowth has the potential to destroy the fabric of the historic site.

3.2.3 Weed Control

Weeds in native bushland and around the Magazine Complex should be controlled, with particular attention to species declared as 'noxious plants' (see Table 2.5). Many of the weeds around Bantry Bay are soft-fruited species which are spread by birds and other animals (Lantana, Blackberry, Honeysuckle). Other weeds are distributed by wind (Pampas Grass, African Love Grass, *Parietaria*) and water (*Montbretia,* Crofton Weed), and some species such as Creeping Fig, Fishbone Fern, Wandering Jew and *Coreopsis* are also capable of spreading into bushland by vegetative means.

Weeds entering Bantry Bay via urban stormwater flows must be controlled at source, that is on the ridgetops and at the head of drainage lines which issue from developed areas. As only minor, ephemeral drainage lines impact on the area around the Magazine Complex, this source of weed invasion is considered to be a minor issue. However, woody weeds (as above) and several introduced vines/scramblers were noted to occur in moist areas below the concrete dam.

Weeds in the picnic area on the eastern side of the Bay include a number of garden escapes (Honeysuckle, Fishbone Fern, Buffalo Grass) and extensive areas of *Parietaria juncea* or Asthma Plant – a W2 noxious weed - occur on the landing platform and concrete steps.

3.2.4 Management of Buffer / Interface Zones Between Built and Natural Environments.

The management of bushland at its interface with the built environment will require site-specific strategies. For example, the need to reduce fuel levels will require periodic hand selective clearing of undergrowth, and the disposal off-site of debris. It would be advisable to establish a series of fuel-free and fuel-reduced zones at the interface, which are subsequently more intensively managed than adjoining bushland areas.

If at some future time, the public is allowed to access the Bantry Bay Magazine Complex, then provision must be made for safe walking tracks in and out of the Complex, and enhanced landing platforms. All such facilities must be maintained.

No planting other than ground cover species should to be carried out in the interface zone, and native bush is not to be encouraged to regenerate. As regeneration will proceed unaided over time, regular inspection and removal of shrub and tree species will be necessary.

Weed control is particularly important in the interface zone, as failure to control even small infestations at this point will ultimately lead to larger and expensive-to-treat weed populations in the adjoining bushland.

3.2.5 Other Issues

There is no regular NPWS presence on-site, therefore the whole area is open to vandalism, including arson. At present, there is no public access to the Magazine Complex from the water, but the site is accessible via a walking track from Forestville on the western side of the Bay.

The picnic area on the eastern side of the Bay is open for public use, with access from the water and overland from Fairlight Oval. There are no facilities available at the picnic area, which led to rubbish dumping and acts of vandalism. Given this area's isolation, the possibility of arson is high.

4.0 MANAGEMENT RECOMMENDATIONS

4.1 Fire Hazard

A fuel-free zone of at least 10 metres in width should be created and maintained at the rear of the Magazine Complex. All understorey vegetation (shrubs, small trees) and leaf litter should be cleared from this zone. Fallen timber and branches should also be removed and deep leaf litter raked up and removed off-site. Large trees (particularly smooth-barked species) may remain in place, provided that there are no branches are allowed to overhang or intrude into the magazine's building envelope. The recommended fuel-free-zone roughly corresponds to the area between the rear of the buildings and the stone drainage channel

Another, fuel-reduced zone of similar width should then be created upslope of zone 1 (on the far side of the stone drainage channel). The fuel load can be reduced considerably by removing fallen branches, as well as raking and removing any areas of deep leaf litter. It may also be advisable to cull dense thickets of fire-prone species such as *Allocasuarina* and *Kunzea.*

A similar treatment should be applied to the bushland slopes on the eastern side of the Bay once the native plant community has re-established. These fuel-free and fuel-reduced zones must be maintained on a regular basis, and it is likely that clearing work will be required once every two (2) to three (2) years, depending on rates of growth and weather conditions.

It is highly recommended that a special Fire Management Plan be prepared for the Bantry Bay Magazine Complex. This Plan should be prepared by a specialist in fire ecology and should be consistent with and complement the objectives of the Garigal National Park Plan of Management (1991).

4.2 Deterioration of Building Fabric as a Result of Weed Incursion and Native Regrowth

The growth of weeds and other unwanted vegetation on the landing platform fronting the Magazine Complex and on disused land around the buildings must be controlled in order to avoid further damage to the buildings and associated infrastructure.

The Creeping Fig, which was probably planted some years ago as an ornamental, has spread over the stone retaining walls and rock cuttings. Its thick roots have penetrated deep into the cut-stone walls and suckers on the branches have gained a firm hold on the exterior. It will not be possible to physically remove this large climber, as any attempt to detach it will result in destabilisation of the walls. Creeping Fig is best treated using a tree injection method to apply a systemic herbicide. A cordless drill, brace and bit, or hatchet may be used to wound the stem before applying 1-2mls of undiluted glyphosate (marketed as Roundup). Each large stem must be treated separately, and the process must be repeated after several months wherever leaves or green tissue survive. Dead Fig may be left in place, and the smaller branches will eventually disintegrate. If the plant is bearing ripe fruit at the time of treatment, this must be removed and bagged to reduce the chances of it being eaten by animals or even by visiting children.

Vegetation should not be allowed to grow on, or immediately adjacent to any built structures. Ferns, grasses and other vegetation should be removed from niches created in deteriorating concrete and brick, and these areas kept free through regular maintenance. It may be appropriate to apply a residual herbicide to control weeds growing on brick, concrete and stonework.

Native shrubs and trees growing on the landing platform (Magazine Complex) should be cut out and the rootstock poisoned with glyphosate. Any regrowth should be treated as it appears.

4.3 Weed Control

Woody weeds such as Lantana should be treated using the cut-stump method, which requires the application of undiluted glyphosate to the cut stem/branch within two (2) minutes of cutting. This technique may also be used to eradicate the unwanted native regrowth on the landing platform in front of the Magazine Complex. Blackberry may be dug out if infestations are small, or sprayed with a herbicide such as metsulfron (Garlon) according to label directions.

Herbaceous weeds such as *Parietaria,* Crofton Weed, M*ontbretia* and introduced grasses are best treated using diluted glyphosate as a foliar spray (see label directions). Foliar spraying should not be used in areas where native plants could be affected by spray drift. Similarly, foliar spraying is not advised near water (in drainage lines, near concrete dam).

The dense weed populations on the landing platform (Magazine Complex) may be controlled more effectively if the underlying accumulation of soil and litter is 'scalped', thereby removing soil and weed biomass from the cement pathways and disused rail lines. A small bobcat could be used most effectively, although the job could be done by hand, and once cleaned off, the underlying hard surfaces would be relatively easy to maintain with a foliar spray.

4.4 Management of Interface Zone Between Built And Natural Environments.

The extent of the interface zone between bushland and the built environment on both sides of Bantry Bay should be agreed, surveyed and mapped. Ideally, the boundaries of the interface zone should be pegged to ensure that routine maintenance work does not exceed these boundaries. The creation of fuel-free and fuel-management zones is considered to be of prime importance, and these areas should be established as an early priority in any future works program.

Weed control in bushland (see section 4.1.3) should be carried out while weed populations are still small and scattered. Where bushfire has removed the weed biomass, an opportunity exists to effectively treat regrowth and possibly to eradicate some of the more troublesome species.

The disposal of weed debris and vegetation cleared as part of the hazard reduction program will be a major problem. Debris may be piled and composed provided that suitable sites may be located within the complex, or they may be burnt *in situ* if this does not pose a danger to the Magazine Complex.

Note that weeds stacked into piles may not compost adequately and there is always the danger that some weeds will regenerate unless they are either covered to accelerate composting, or over-sprayed with glyphosate at regular intervals.

5.0 REFERENCE LIST

Adrian P, Camilleri A, Cohen A, Lindbeck K, Ross J, Scott-Mitchell G, Tribe D (1979) *An Environmental Impact Statement on Proposed Alternative Uses of Bantry Bay Explosives Reserve*

Benson D. and Howell J. (1994) Natural Vegetation of the Sydney Area 1:100 000 Map Sheet, provided within *Cunninghamia 3(4)*.

Brew K, Burton C, Stuart N, Williams P (1982) *Bantry Bay Marina Development Environmental Impact Statement – Report 80/82*

Chapman, G.A. and Murphy, C.L. (1989) *Soil Landscapes of the Sydney 1:100 000 Map Sheet*, Soil Conservation Service of New South Wales, Sydney.

Gingra Ecological Surveys (2000) *Vegetation Survey of Garigal National Park, Middle Harbour Creek and Bantry Bay* – Report for Sydney North Region, National Parks and Wildlife Service, Hornsby

Herbert, C. (1983) *Geology fo the Sydney 1:1000 000 Sheet 9130* NSW Department of Mineral Resources

Latona Masterman and Associates (1982) *Bantry Bay Planning Study*

NSW National Parks and Wildlife Service (1991) *Bantry Bay Explosives Magazine Conservation Plan*

NSW National Parks and Wildlife Service (1998) Garigal National Park Plan of Management

Upper Middle Harbour Conservation Committee in consultation with the Department of Environmental, Australian Museum (1973) *Bantry Bay – The Case For Conservation*

6.0 APPENDICES

Appendix 1: Literature Review - A Summary of Relevant Reports and Publications

Author	Title	Summary of Findings
Gingra Ecological Surveys (2000)	*Vegetation Survey of Garigal National Park, Middle Harbour Creek and Bantry Bay* – Report for Sydney North Region, National Parks and Wildlife Service, Hornsby	♦ Documents the major vegetation types of the Garigal West section of the Garigal National Park. Includes a vegetation map and brief descriptions of each vegetation community and species and communities of conservation significance, a short discussion on weed species and management and fire ecology.
NSW National Parks and Wildlife Service (1998)	Garigal National Park Plan of Management	♦ A legal document that outlines how Garigal National Park will be managed I the years ahead
Benson D. and Howell J. (1994)	Natural Vegetation of the Sydney Area 1:100 000 Map Sheet, provided within *Cunninghamia 3(4)*.	♦ Maps the vegetation of the Sydney Basin at a scale of 1:100 000, including all remnant vegetation greater than 5 ha. ♦ Provides a description of all classified community types, including information on its geology, structure and diagnostic species.
NSW National Parks and Wildlife Service (1991)	*Bantry Bay Explosives Magazine Conservation Plan*	♦ Focuses on the conservation of the historical Bantry Bay Magazine Complex. ♦ Provides information on the historical background of Bantry Bay, detailed descriptions of the current state of each building, statements on the significance of Bantry Bay, a consideration of management and significance constraints and a list of conservation policies and necessary actions.
Benson D. and Howell J. (1990)	*Taken for Granted : the Bushland of Sydney and its Suburbs*	♦ Provides an overview of the native vegetation communities in the Sydney Region. ♦ Gives a historic perspective, and identifies changes in diversity and distribution.
Chapman, G.A. and Murphy, C.L. (1989)	*Soil Landscapes of the Sydney 1:100 000 Map Sheet*, Soil Conservation Service of New South Wales, Sydney.	♦ Maps the soil landscapes of the Sydney Basin at a scale of 1:100 000. ♦ Provides a description of all classified soil landscape types, including information on its parent rock, structure and limitations.
Halpin E, Llewellyn, Morrison K, Rawling	Davidson Park SRA: Basis for a Plan	

J, Staib B, Stephens A, Wright H (1983)		
Brew K, Burton C, Stuart N, Williams P (1982)	*Bantry Bay Marina Development Environmental Impact Statement – Report 80/82*	♦ A small Environmental Impact Statement for a proposed marina development at Bantry Bay ♦ Includes flora and fauna species lists and a vegetation map
Latona Masterman and Associates (1982)	*Bantry Bay Planning Study*	♦
Adrian P, Camilleri A, Cohen A, Lindbeck K, Ross J, Scott-Mitchell G, Tribe D (1979)	*An Environmental Impact Statement on Proposed Alternative Uses of Bantry Bay Explosives Reserve*	♦ A small Environmental Impact Statement for four (4) proposed alternative uses of Bantry Bay Explosives Reserve ♦ Includes brief descriptions of the major vegetation units in Bantry Bay, including a vegetation map. Species lists are included as a separate Appendix. ♦ Fauna species lists are contained in 3 separate Appendices that accompany the main document.
Upper Middle Harbour Conservation Committee in consultation with the Department of Environmental, Australian Museum (1973)	*Bantry Bay – The Case For Conservation*	♦ Documents the native flora and fauna species recorded in Bantry Bay Explosives Reserve, including species lists and an A3 sized vegetation map.

21.0 LETTER FROM THE MLALC

The following letter from the MLALC addresses the contemporary and archaeological Aboriginal heritage issue for the Bantry Bay Explosives Magazine complex.