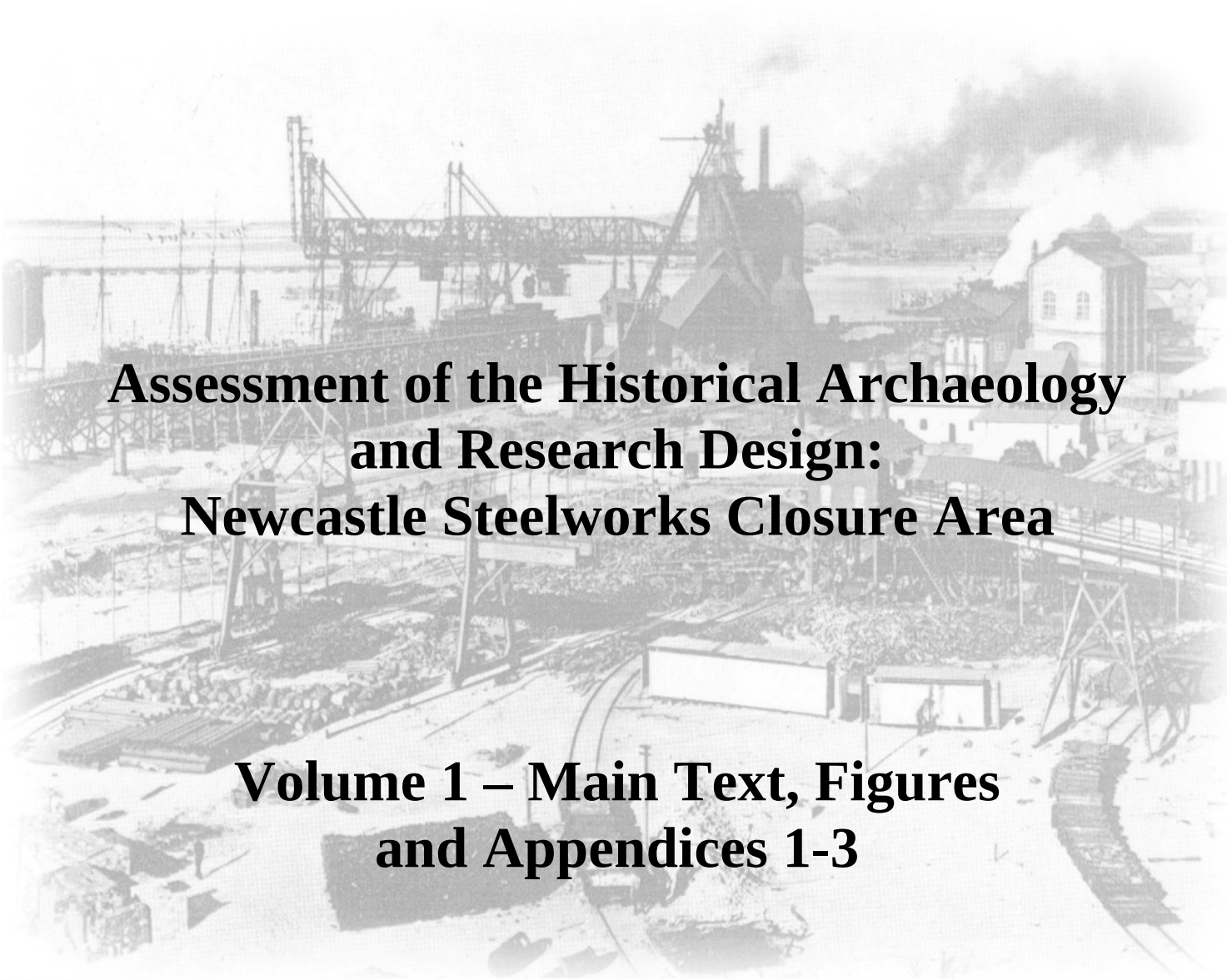
Appendix I

Archaeology Reports and Management Action Plan

Regional Land Management Corporation



Assessment of the Historical Archaeology and Research Design: Newcastle Steelworks Closure Area

Volume 1 – Main Text, Figures and Appendices 1-3

May 2005

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Umwelt
Environmental Consultants

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Cover Plate: *View of the BHP Steelworks in 1917.*

1.0 INTRODUCTION

Regional Land Management Corporation (the Corporation) has commissioned Umwelt (Australia) Pty Limited (Umwelt) to assess the historical archaeology of the area known as 'the Heritage Area' contained within the Closure Area of the former BHP Newcastle Steelworks at Port Waratah, New South Wales (the Study Area). The Study Area is proposed for redevelopment as a multi-purpose goods handling terminal (the development). The Corporation proposes to undertake clearance and levelling of the Study Area to facilitate its remediation and re-development. The proposal is subject to protocols for the management of the historical heritage values of the Study Area. Historical studies have shown that the site accommodated early industrial development beginning in the 1860s and followed by land reclamation and diversification into the large-scale steel manufacturing industry of BHP that was instrumental in the economic and social growth and development of Newcastle City.

This document addresses the potential for subsurface archaeological resources and records the study and analysis of potential material evidence of and/or associated with former site developments identified in an Archaeological Management Action Plan *[Umwelt 2004]* (the Plan – see **Appendix 1**). Based on the results of the archaeological assessment and the potential physical impact of projected site works, the document develops a Research Design to support an application to the NSW Heritage Office for an Excavation Permit pursuant to s140, *Heritage Act* 1977 (the Act). In this context, this document should be read with the following prior documentary material:

- 'Conservation Plan for BHP Steelworks, Port Waratah Site', (the Conservation Plan). *[EJE –Fenwick 1991]*

- Archival Records and Statements of Heritage Impact: Proposed Demolition of –

  a) No 1 Blast Furnace.
  b) No 1 Blower House.
  c) Original Open Hearth Building.
  d) No 1 Bloom & Rail Mill Building.
  e) Steel Foundry.
  f) DC Substation.
  g) Original Timber Wharves.
  h) No 3 Blast Furnace.
  i) AC Saltwater Pumphouse.
  j) Power House.
  k) Open Hearth Change House.
  l) Mould Conditioning Building.
  m) No 4 Blast Furnace.
  n) BOS Plant.

  Where the *Archival Record of No 1 Blast Furnace* is referred to herein as *[EJE/AR 2000a]* and the *Statement of Heritage Impact* is referred to as *[EJE/SHI 2000a]*.

- 'Draft Archaeological Management Plan: BHP Steelworks Site, Newcastle, NSW', (the AMP). *[Umwelt 2001a]*

- 'Archaeological Management Action Plan', Appendix 31 in 'Draft Archaeological Management Plan: BHP Steelworks Site, Newcastle, NSW', (AMAP 2001). *[Umwelt 2001b]*

- 'Archaeological Management Action Plan: Non-Heritage Area, BHP Newcastle', (AMAP 2002). *[Umwelt 2002a]*

- 'Assessment of the Historical Archaeology and Research Design: Newcastle Steelworks Closure Area', (Non-Heritage Area Assessment), in particular with reference to the Hunter River Copper Smelter, the No 1 Pig Mill, the No 2 Blast Furnace and the Ferro-Manganese Furnace. *[Umwelt 2002b]*

- 'Archaeological Management Action Plan: Non-Heritage Area, BHP Newcastle', (AMAP 2004) of which copy is attached as **Appendix 1**. *[Umwelt, 2004]*

This report addresses the potential for subsurface material evidence across the Heritage Area in general and in particular in the precincts of 14 structures of the former BHP Steelworks. Such possible subsurface material evidence might be associated with the former buildings or the reclamation for and use and operation of the site, but is not considered to extend to the footings/foundations of demolished buildings where indicated. These precincts are:

- No 1 Blast Furnace;

- No 1 Blower House;

- Original Open Hearth Building;

- No 1 Bloom Mill and Rail Mill Building, not including the footings/foundations of the building but including Soaking Pits);

- Steel Foundry/Open Hearths, not including the footings/foundations of the building;

- DC Substation, not including the footings/foundations of the building;

- Original Timber Wharves;

- No 3 Blast Furnace, not including the footings/foundations of the building;

- AC Saltwater Pump House, not including the footings/foundations of the building;

- Power House, not including the footings/foundations of the building;

- Open Hearth Change House, not including the footings/foundations of the building;

- Mould Conditioning Building, not including the footings/foundations of the building;

- BOS Plant, not including the footings/foundations of the building; and

- No 4 Blast Furnace, not including the footings/foundations of the building.

The report also acknowledges the assessment of the following precincts which were included in the studies and planning for management of the heritage values of the Non-Heritage Area *[Umwelt 2002a]*:

- the Hunter River Copper Smelting Co (also known as the Wallaroo Mining and Smelting Company) complex;

- the No 1 Pig Mill;

- the No 2 Blast Furnace; and

- the Ferro-manganese Furnace.

In the context that these four precincts are actually located within the Heritage Area, summaries of their archaeological, historical and physical contexts and the evaluation of their significance are included for the sake of completeness, although in respect of each an Excavation Permit has issued pursuant to s140 of the *Heritage Act* 1977.

The Study Area has been evaluated according to standardised criteria by reference to the determinable individual elements of its past and present structural archaeological and historical heritage and their collective values as components of the historic heritage of the Study Area and its locality. This report does not address the potential of the Study Area as a resource for Aboriginal cultural heritage.

1.1 OBJECTIVES OF THE STUDY

Historical material relating to the development of the Study Area is relatively diverse and in regard to some elements, sparse. Recent publications, although readily available, are largely general in nature and specific historical information relevant to this report has been obtained chiefly from historical BHP publications and from archives now maintained by BHP-Billiton Limited. This study integrates the results of investigation of archaeological and physical context with historical and archival records. The principal objective of the study was to identify the potential, and if possible, the likely nature of material cultural evidence that may be located within the Study Area possibly at risk from direct or peripheral effects of the development.

Within the framework of this general objective, the study was undertaken on the basis that it may identify archaeological resources within, and provide insights into the development of, the Study Area and its occupational and social fabric that are not available from the historical record. In abstract, archaeological interpretation of the Study Area individually, and collectively/comparatively with other archaeological and historical studies, may contribute to a better understanding of such relevant historical themes as:

- the establishment and evolution of a seminal integrated iron and steel manufacturing plant in Australia and its operation over the greater part of the 20th Century;

- the nature of the contribution of the BHP Newcastle Steelworks to the socio-economic development of the City of Newcastle;

- the development and diversification of local, regional and national economies;

- the development of the BHP Company and the diversification of the Company's operations;

- the recycling and/or adaptive re-use of land and buildings during the lifetime of the establishment;

- the involvement of Australia in two World Wars;

- the influence on the early completion of the rail system;

- the expansion of transport facilities across the Newcastle industrial area;

- major changes to the flow of the Hunter River and Throsby Creek; and

- in respect of all of the above, the different emphases and inferences that may attach to the historical phases of use/occupation/development of the Study Area.

Within this context, this study makes an evaluation of the cultural significance of the archaeological resource of the Study Area and of the impact on heritage values of the proposed future use. After reviewing issues and options for management, recommendations are made about the management of the archaeological/heritage values of the Study Area and its environs.

1.2 STUDY RATIONALE

This study was undertaken to identify, and if relevant, to define research criteria and objectives in support of an application to the Heritage Office for grant of an Excavation Permit pursuant to s140 of *Act*. Having regard to the implications of the projected development, it is prudent to obtain the issue of an excavation permit from the NSW Heritage Council in respect of the whole of the Study Area. It is acknowledged that the demolition of existing buildings has not been the subject of an application for such an Excavation Permit, but rather undertaken within the framework of a Development Consent granted by the Minister for Planning.

Conditions relating to archaeology and heritage contained in the Minister's Development Consent will be satisfied within this report through:

- development of an Archaeological Management Action Plan (see **Appendix 1**);

- the assessment of the significance of potential subsurface material evidence, based upon the heritage context of the Study Area;

- submission to the NSW Heritage Office of an appropriate Research Design and application for Excavation Permit pursuant to s140 of the *Act*; and

- receipt of such Excavation Permit and execution of development within the conditions thereof.

1.3 LOCATION AND FEATURES OF THE STUDY AREA

The Study Area is located on the south bank of the Hunter River at Port Waratah, New South Wales, approximately 4.2 kilometres north-west of Newcastle CBD. Other relevant information about the location of the Study Area is shown in **Table 1.1**.

Table 1.1 - Location Data

Topographic Map Sheet	9232-2-S
Grid reference/range (centre)	$_{3}$8400. $_{63}$5950
Parish	Newcastle
County	Northumberland
Local Government Area	Newcastle City

The regional location of the Study Area is shown on **Figure 1.1** and the Study Area is defined in **Figure 1.2**. The Study Area is located within the former Newcastle Steelworks, now referred to as 'The Closure Area'. Also shown in **Figure 1.2** are the approximate areas of cut during the proposed remediation and the location of the potential heritage sites relevant to this report.

1.4 METHODOLOGY AND REPORTING

This study and analysis has been undertaken broadly within the framework of the *NSW Heritage Manual* of the Heritage Office and the Department of Urban Affairs and Planning (now Department of Infrastructure, Planning and Natural Resources). The sequential steps of the study have been as follows:

- the archaeological and historical context of the Study Area has been researched and reviewed, with particular attention to the dominant aspects of land use from the initial development of the site. The physical context of the Study Area has been reviewed in the course of a physical survey. Research results are summarised in **Section 2** of this report;

- the cultural significance of the archaeological resource has been assessed and a formal statement of cultural significance is contained in **Section 3**;

- the condition and integrity of the archaeological resource has been reviewed and an evaluation made of the physical impact of proposed use, dealt with in **Section 4**;

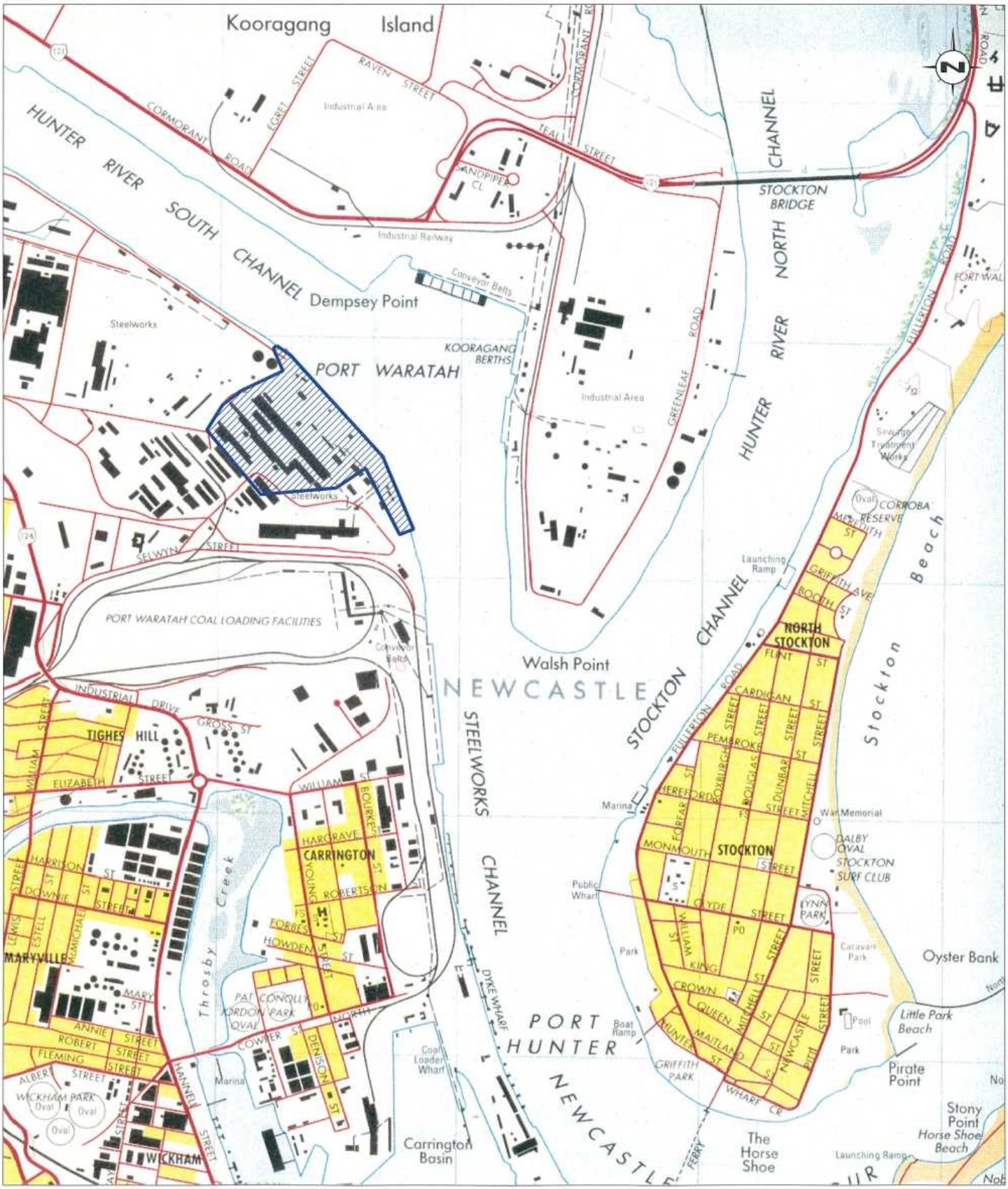
- the report identifies the issues and options for management of the archaeological resource and its values in the environment of its proposed future use in **Section 5**. On the basis of issues and options, the heritage themes and research questions, in **Section 5** the report makes recommendations for the appropriate management of the heritage resource in the form of a research design;

- in consequence of the consideration of the assessment of significance, the condition/integrity of the resource, projected physical impact and the mitigation and research potential of recommendations, a statement of heritage impact is presented in **Section 6**; and

- references and authorities used in this assessment are listed **Section 7**.

1.5 STUDY PERSONNEL

Paul Rheinberger, Senior Archaeologist, Umwelt (Australia) Pty Limited, undertook this study and wrote this report.



Source: Newcastle 1:25 000 Topographic Map

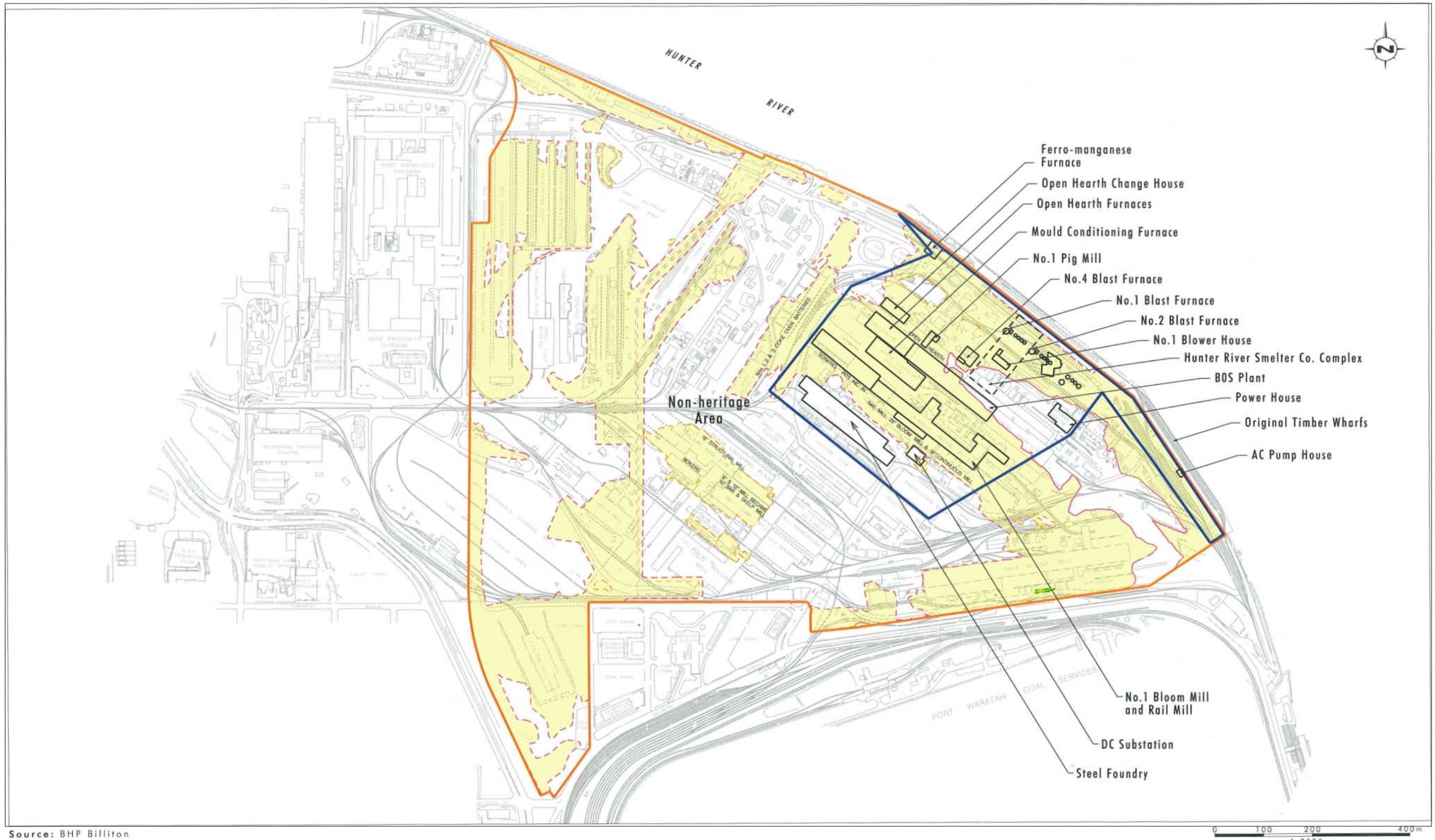
0 0.25 0.5 1.0km
1:22 000

FIGURE 1.1

Locality Plan

Legend

Study Area



Source: BHP Billiton

Legend

- Heritage Area / Study Area
- Closure Area Boundary
- Approximate Areas of Cut during Remediation

FIGURE 1.2

Detail of Study Area

2.0 CONTEXT STUDIES

2.1 INTRODUCTION

The site of the former BHP Newcastle Steelworks at Port Waratah is a place of considerable importance in the history of Australian non-ferrous and ferrous metal processing in particular and industrial manufacturing technology and development in general. The site is also synonymous with the elevation of Newcastle to the peak of industrial significance in Australia, and the primary motivation for Newcastle's subsequent economic and social growth. The Study Area is know to have been the site of the Hunter River Smelting Co copper smelting operation, with which was associated the Torrens Tin Smelter and an unspecified number of workers' residences.

By reviewing the archaeological, historical and physical contexts of the Study Area, this context study sets out to indicate the specific activities known to have been carried out within the Study Area as a guide to appreciating the nature and/or likelihood of the existence of sub-surface material evidence and a resource for on-site predictive modelling.

2.2 COMPARATIVE SITES

Comparative sites were disclosed within Australia for a number of the elements and structures considered in this report.

2.2.1 Copper Smelting Works

Register of the National Estate:

- Mulloon Copper Mines and Smelter (former), Mulloon, NSW (indicative place);
- Frogmore Secondary Copper Mine and Smelter, Boorowa, NSW (indicative place); and
- Bolla Bollana Copper Smelter, Arkaroola, SA (registered).

Australian Heritage Places Inventory:

- Chillagoe Smelters, Chillagoe, Queensland; and
- The Peake Group, via Oodnadatta, SA.

NSW State Heritage Inventory:

- Gordonbrook Copper Smelter and Site, Copmanhurst, NSW;
- remains of Newcastle Coal and Copper Smelter, Merewether, NSW; and
- site and remains of Cremorne Copper Smelter, Cremorne, NSW.

Otherwise:

- sites and remains at Kapunda, Moonta and Burra, South Australia;
- site and remains at Mt Lyell, Tasmania;
- site only, Lithgow, NSW;
- Mt Isa Mines (Mt Isa) and Copper Smelters Ltd (Townsville) Smelters, Queensland; and
- copper smelter, Port Kembla, NSW.

2.2.2 Blast Furnaces

Register of the National Estate:

- Lithgow Blast Furnace, Inch Street, Lithgow.

NSW State Heritage Inventory:

- No 3 Blast Furnace Site, Newcastle;
- No 4 Blast Furnace and Stove, Newcastle; and
- remnant No 1 Blast Furnace.

Australian Heritage Places Inventory:

- Chillagoe Smelters, Chillagoe, Queensland;
- Ilfracombe Iron Company Mine, Beaconsfield, Tasmania;
- Ironworks blast Furnace Site, Lithgow, NSW;
- Irvinebank State Treatment Works, Irvinebank, Queensland;
- Lal Lal Blast Furnace, Lal Lal, Victoria;
- Wallace Smelting Works; Bethanga, Victoria; and
- Yelta Mine and Smelter Historic Site, Moonta, South Australia.

Otherwise:

- site and remains, original blast furnace and plant, Mittagong, NSW;
- remains of the mine, blast furnace and plant, Bogolong, NSW; and
- operational blast furnaces at Port Kembla, NSW, and Whyalla, SA.

2.2.3 Other Resources

There is no recorded site that compares with the Ferro-Manganese Blast Furnace, although ferro-manganese is produced by the smelter at Bell Bay, Tasmania. There appear to be no specifically recorded comparatives for the remaining functional elements of the Study Area although some (for example, stoves and blowers as attributes of blast furnaces) appear as components of the above listings. The examples of comparative sites for the particular large plants/undertakings complements rather than diminishes the heritage attributes of the Study Area in that the study of material evidence exposed in the Study Area may enlarge the understanding of past/evolving industrial technology and practice.

2.3 REVIEW OF ARCHAEOLOGICAL CONTEXT

A substantial archaeological resource concerning the structural elements identified in the Study Area exists in prior archaeological and heritage studies. An extensive documentary resource relevant to the Study Area is available in the form of BHP publications, prior historical publications and studies and in the huge body of plans, drawings, photographs and reports contained in BHP archives.

In terms of broader studies, the Study Area has been reconnoitred in the course of the heritage studies for the Newcastle City Wide Heritage Study 1996/7 and was the subject of a Conservation Plan in 1991. Research of the Register of the National Estate maintained by the Australian Heritage Council, the State Heritage Register and State Heritage Inventory maintained by the NSW Heritage Council, and the Register of the National Trust (NSW) revealed no recognition, recording or registration of heritage resources within the Study Area.

This review of archaeological context does not set out to deal in detail with individual aspects or the collective values of the archaeological context but rather to indicate the character of archaeological evidence which is presently, or is likely to be, located sub-surface on the Study Area. It is anticipated that each element dealt with hereunder will be preserved in sub-surface material evidence, and in above-surface evidence, below ground level L2. Each of the subsections indicates the source of the limited data represented and it should be understood that the archaeological record is dealt with in detail in those sources.

2.3.1 The Hunter River Smelting Co Complex Precinct

The BHP Steelworks site presently reveals no visible evidence of activity in the precinct prior to the construction of the Steelworks. During the reclamation process that was integral to the construction of the BHP Steelworks, it seems likely that at least some buildings, and certainly some parts of buildings, were left undisturbed up to the level of reclamation and that filling was placed around a range of surviving material evidence. There is some likelihood also, that damage may have been caused by the sinking of piles prior to the construction of the concrete beds for the No 1 Blast Furnace and its peripheral structures and plant *[EJE/Fenwick 1991:98]*. The Hunter River Smelting Co complex is dealt with in detail in **Appendix 2** *[Extract: Umwelt 2002b]*.

The anticipated location of the remnants of buildings of the Hunter River Smelting Co complex and the associated Torrens Tin Smelter is shown in **Figure 2.1**. The location is projected for excavation as part of the proposed 'cut-and-fill' operation.

2.3.2 No 1 Blast Furnace Precinct

The No 1 Blast Furnace was erected on a slab of mass concrete 44 feet square and 17 feet thick, the foundation for which was reinforced with 225 timber piles in 15 rows of 15. There is currently no residual material evidence of the building or plant of the No 1 Blast Furnace, but it would be expected that the floor and material evidence below the floor will have survived.

Similarly, the foundations for the stove for the No 1 Blast Furnace comprised a slab of mass concrete 132 feet long, 29 feet wide and 15 feet thick, supported on 342 timber piles in 9 rows of 38. It would be expected that the floor and supporting foundations would have survived, although there is now no surface evidence of the stove construction.

The location of the remnants of No 1 Blast Furnace is shown in **Figure 2.1** which indicates that the site is projected for disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 3** *[EJE/AR 2000a* and *EJE/SHI 2000a]*.

2.3.3 No 1 Blower House Precinct

Although the No 1 Blower House was not used for its original purpose for a considerable period, the building itself survived, together with some additions dating from the 1940s. The building precinct reflected changes in its operational function. The only item of plant and equipment that remained in the building as part of its original inventory was a travelling crane and track.

The location of the No 1 Blower House footprint is shown in **Figure 2.1**, which indicates that the site is projected for partial disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 4** *[EJE/AR 2000b* and *EJE/SHI 2000b]*.

Source: BHP Billiton

Legend

- Heritage Area / Study Area
- Area to be filled from Extg (L1) to L2

FIGURE 2.1

Location of Heritage Building Precincts and Cut/Fill Areas

2.3.4 No 1 Pig Mill

Because of its early and relatively short history within the Study Area (see below), there have been no known archaeological studies dedicated to the No 1 Pig Mill. Drafting resources exist in the BHP Billiton archive and some historical references have been made in in-house BHP publications. The No 1 Pig Mill appears in some published plans, but otherwise, the only significant archaeological reference is in Umwelt *[2002b]*.

The anticipated location of the No 1 Pig Mill footprint is shown in **Figure 2.1**, which indicates that the site is projected for partial disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 2** *[Extract: Umwelt 2002b]*.

2.3.5 No 2 Blast Furnace Precinct

The original structure of No 2 Blast Furnace was demolished in mid-September 1946, the shell cut into pieces of approximately 30 tonnes each taken to scrap. The rebuild had a 17% greater volume and increased production capacity. The rebuilt furnace was blown out for the last time on 15 March. All that remains of No's 1 and 2 Blast Furnaces is raw metal intrusion in the base of the No 1 Blast Furnace, colloquially referred to as 'The Button'. Nothing remains above the surface to mark the location of the No 2 Blast Furnace although the footing or bed almost certainly remains sub-surface and would be anticipated to be of the same style and construction as that of No 1 Blast Furnace.

The location of the No 2 Blast Furnace footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 2** *[Extract: Umwelt 2002b]*.

2.3.6 Ferro-Manganese Blast Furnace Precinct

The context of the Ferro-manganese Blast Furnace is almost entirely historical. The furnace was built at the suggestion of the Commonwealth Government towards the end of World War I to secure at all times an adequate supply of foundry pig iron for the Government's requirements. Ferro-manganese was required for steel manufacture/refining and was, at this time, expensive, in short supply and not obtainable from overseas. The furnace was completed in less than a year going into operation on 17 July 1918 and was demolished on 29 June 1934. It stood 100 feet (~30 metres) tall on the riverside, west of No 1 Blast Furnace as shown in **Figure 2.1**. Many components were salvaged for re- use: 10 000 firebricks from the brick stoves, 80 tonnes of scrap from the blasted-out gas mains and foundations; the cast house building recycled for the new 12 inch mill; the lift structure for later use at the blast furnaces. The area was graded and paved and the blast furnace was largely forgotten.

The location of the Ferro Manganese Blast Furnace footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 2** *[Extract: Umwelt 2002b]*.

2.3.7 Original Open Hearth Building Precinct

The original Open Hearth Building survived, although steel making by the open hearth process was discontinued many years ago. The building consisted of a riveted steel frame construction but there was little evidence of the former work process, except for some steelwork and brickwork associated with the Nos. 2 and 3 Open Hearth Furnaces.

The location of the Original Open Hearth Building footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance over substantially its whole area; its

archaeology and heritage values are dealt with in detail in **Appendix 5** *[EJE/AR 2000c* and *EJE/SHI 2000c]*.

2.3.8 No 1 Bloom and Rail Mill Building Precinct

The No 1 Bloom and Rail Mill Building had been partly demolished by 2000 but substantial elements of the partly steel frame and partly brick building remained. The floor and foundations have survived. Parts of the building retained original light fittings, switching gear and other minor elements.

The location of the No 1 Bloom and Rail Mill Building footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; its' archaeology and heritage values are dealt with in detail in **Appendix 6** *[EJE/AR 2000e* and *EJE/SHI 2000e]*.

2.3.9 Steel Foundry Precinct

In 2000, the Steel Foundry remained in the form of a steel frame and metal clad building of substantial proportions. The original building had been extended on three occasions during the 1940s and, with plant additions, during the period from 1950 to 1970. The building contained a range of items of structural and non-structural plant and the floor, floor recesses and footings have survived.

The location of the Steel Foundry footprint is shown in **Figure 2.1**, which indicates that the site is not projected for any substantial disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 7** *[EJE/AR 2000f* and *EJE/SHI 2000f]*.

2.3.10 DC Substation Precinct

The DC Substation remained intact in 2000 and identified its immediate precinct, comprising a riveted steel frame building with columns encased in brickwork and with brick infill walls, other than in part of the eastern elevation. The building contained a range of original equipment, including generator sets and switching gear.

The location of the DC Substation footprint is shown in **Figure 2.1**, which indicates that the site is projected for minor disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 8** *[EJE/AR 2000g* and *EJE/SHI 2000g]*.

2.3.11 Original Timber Wharves Precinct

The wharfage that survived along the bank of the Hunter River in 2000 was constructed partly of timber and partly of concrete. It was not anticipated that any original wharf material would have survived, partly because of the depredation of the *teredo* worm in piles and framing timbers. The *teredo* worm was/is, particularly active in Newcastle Harbour.

The location of the Original Timber Wharves footprint is shown in **Figure 2.1**, which indicates that the site is for disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 9** *[EJE/AR 2000h* and *EJE/SHI 2000h]*.

2.3.12 No 3 Blast Furnace Precinct Complex

The original No 3 Blast Furnace was demolished in 1960. The No 3 Blast Furnace that survived in 2000 resulted from the complete rebuilding project that occurred thereafter and comprised the furnace, stoves and fans, and charging and delivery facilities. The structural component of the No 3 Blast Furnace remained substantially intact. Although the substance of the No 3 Blast Furnace Complex has been demolished, the surface and sub-surface

components remain and there was a substantial inventory of components available for interpretive purposes.

The location of the No 3 Blast Furnace Complex footprint is shown in **Figure 2.1**, which indicates that the site of the projected for disturbance; its archaeology and heritage values are dealt with in detail in **Appendix 10** *[EJE/AR 2000i* and *EJE/SHI 2000i]*.

2.3.13 AC Saltwater Pump House Precinct

The structure of the AC Saltwater Pump House remained substantially intact in 2000. The earliest component of the building had been constructed of concrete block, with later extension in brick and metal cladding. The early part of the building appears to be suffering from subsidence. The building contained a range of components relating to its earlier history, including pumps, a gantry crane, switching gear and light fittings.

The location of the AC Saltwater Pump House footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; it is dealt with in detail in **Appendix 11** *[EJE/AR 2000j* and *EJE/SHI 2000j]*.

2.3.14 Power House Precinct

The Power House was constructed of a riveted steel framework encased in concrete. The suggestion was that while some of the concrete work may have been cast-in-place, at least some of the beams were pre-cast. This form of construction appears to have provided a better resistance to corrosion for load-bearing components of the framework. The building was substantially intact in 2000 and contained a range of components, including original turbines and electrical switching and control equipment.

The location of the Power House footprint is shown in **Figure 2.1**, which indicates that the site is not projected for disturbance; its' archaeology and heritage values are dealt with in detail in **Appendix 12** *[EJE/AR 2000k* and *EJE/SHI 2000k]*.

2.3.15 Open Hearth Change House Precinct

The structure of the Open Hearth Change House remained substantially intact in 2000, although the internal configuration of the building had been substantially altered during the early 1980s. The building was of reinforced concrete frame with brick infill and appeared to be sound, although the condition of reinforcing metal components was clouded. Despite the refit of the building, some examples of early furnishing and equipment remained, particularly lockers and crib facilities.

The location of the Open Hearth Change House footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; its' archaeology and heritage values are dealt with in detail in **Appendix 5** *[EJE/AR 2000c* and *EJE/SHI 2000c]*.

2.3.16 Mould Conditioning Building Precinct

In 2000, the Mould Conditioning Building survived only in frame and cladding, consisting of a riveted steel frame and corrugated metal cladding. As a relatively late addition to the structural inventory of the plant, these factors alone were of technical interest but the use of welded steel on a skillion connection between the Mould Conditioning Building and the Open Hearth Building indicated a shift in emphasis from rolled sections to welded metal. The building was not used for its original purpose after 1971 when the Mould Conditioning Plant was demolished.

The location of the Mould Conditioning Building footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; its' archaeology and heritage values are dealt with in detail in **Appendix 5** *[EJE/AR 2000c* and *EJE/SHI 2000c]*.

2.3.17 No 4 Blast Furnace Precinct

The No 4 Blast Furnace remained structurally (substantially) intact in 2000. The construction of the No 4 Blast Furnace reflected the solution of particularly difficult problems contained in the site. The foundations for the No 4 Blast Furnace contained approximately 5800 cubic yards of concrete and the lowest operational point of the building was the skip pit, located 36 feet below ground level and 28 feet below mean high water level. The demolition of above-ground elements will not have compromised the sub-surface material evidence.

The location of the No 4 Blast Furnace is shown in **Figure 2.1**, which indicates that the site is projected for disturbance; its' archaeology and heritage values are dealt with in detail in **Appendix 13** *[EJE/AR 2000l* and *EJE/SHI 2000l]*.

2.3.18 BOS Plant Precinct

The Basic Oxygen Steel (BOS) Plant existed as the most recent evolutionary development in steel making at BHP Steelworks. The plant was housed in a metal framed and clad building that overlapped part of the former Mould Conditioning Building and Open Hearth Building. A substantial component of operational plant including cranes, gantry and operational equipment remained at the site in 2000.

The location of the BOS Plant footprint is shown in **Figure 2.1**, which indicates that the site is projected for disturbance over most of its footprint; its' archaeology and heritage values are dealt with in detail in **Appendix 14** *[EJE/AR 2000m* and *EJE/SHI 2000m]*.

2.4 REVIEW OF HISTORICAL CONTEXT

The potential for exposure of material evidence arises in part from the origin of the present ground level and in part from the activities historically undertaken within the Study Area. This review commences with a reference to the outcome of the reclamation process undertaken from 1913 (**Section 2.4.1**). The balance of the review summarises the relevant historical features of individual sites very briefly and concludes with references to historical sources. Features of the historical record are itemised by date.

2.4.1 Formation of the Ground

The anticipation of exposure of material evidence is generally conditioned by observations made by David Baker (BHP's manager 1915-1924), reported in his "Reminiscences" *[BHP Review, October 1935]*, that one of the first decisions for the construction of the BHP Newcastle plant was the fixing of the ground level. After considerable discussion, the final agreement was for a ground level, at the blast furnace 10 feet above mean high water level, at the open hearth, 12 feet and for the big mills, 13 feet. Sand/spoil dredged for the shipping channel provided the necessary fill to establish the ground for the furnaces, open hearth and mills. Suction dredges dumped a huge volume of fill onto the Study Area. Many tools were apparently lost to the dredging as recounted in the BHP Review (in Jay, 1999 pp 128):

> *When the sand pump was working you never knew whether you would find things next day as you left them. The landscape changed continuously and there must be an enormous amount of tools buried under the works. If future ages ever excavate on the site of the*

works, much missing machinery, which at the time could not be accounted for, will be unearthed, upon which our descendants may speculate.

For a more detailed treatment of the history of historical and filled ground of the Study Area, see **Appendix 2** *[Extract: Umwelt 2002b]*.

2.4.2 The Hunter River Smelting Co Complex

1859 Wallaroo Mining and Smelting Company (WMSC) was formed in South Australia to exploit copper discoveries at Wallaroo in that state.

1865 *et seq* falling world price of copper forced copper producers to seek economies.

1866 WMSC decided to commence smelting in Newcastle.

1867-68 The formation of the Hunter River Smelting Co (HRSC) was finalised in 1868 as a wholly-owned subsidiary of WMSC. The smelter was built on a low-lying riverfront site at Port Waratah, northwest of Throsby Creek.

1868 In July, the first refined copper was produced.

1871 Additional furnaces were planned to be built.

1872 In September, an extension to one of the jetties was completed at a cost of £4000; ore consumption was projected to reach 30000 tonnes annually.

1885 22 furnaces were in use.

1889 20,000 tonnes of ore per annum was being treated in 19 furnaces; ore was being supplied in concentrated form and the plant was exporting 60 tonnes of refined copper per week.

1890 WMSC merged with Moonta Mining Company as the Wallaroo and Moonta Mining and Smelting Company (Wallaroo-Moonta).

1892 Wallaroo-Moonta resolved to concentrate its copper smelting activities in South Australia and to run down the Port Hunter smelter.

1893 In June-July, production at the Port Waratah smelter ceased and in the same year, flooding caused considerable damage to the residual plant.

1895 Plant and equipment was dismantled and salvaged for re-use at Wallaroo-Moonta's smelter at Wallaroo, SA.

1913 The two copper smelter buildings and stacks and an associated tin smelter to the east were still in evidence, as was the "T" wharf and rail facility.

[Turner 1980:69-79; EJE 1991:12 and Figs 34, 107, 108].

For a more detailed treatment of the history of The Hunter River Smelter Co complex, see **Appendix 2** *[Extract: Umwelt 2002b]*.

2.4.3 No 1 Blast Furnace

1913 24 January: driving of timber piles commenced for the foundations for the No 1 Blast Furnace.

1914 8 March: No 1 Blast Furnace blown in.

1915 Iron production was rated at 350 tonnes per day.

1916 No 1 Blast Furnace was relined.

1919 No 1 Blast Furnace was relined.

1924 No 1 Blast Furnace was relined.

1926 No 1 Blast Furnace was relined.

1929 No 1 Blast Furnace was relined.

1934 No 1 Blast Furnace was relined and the furnace was fitted with a McKee top, as a result of which its cubic capacity was significantly increased.

1938 The gas cleaning plant was commissioned.

1943 No 1 Blast Furnace was relined and remodelled, and the cast house floor was enlarged.

1964 No 1 Blast Furnace was relined and modified.

1971 No 1 Blast Furnace was relined and modified.

1975 No 1 Blast Furnace was relined and modified.

1979 No 1 Blast Furnace was relined and modified.

1982 Average daily production was recorded as 900 tonnes. No 1 Blast Furnace was de-commissioned.

1988 No 1 Blast Furnace was demolished.

For a more detailed treatment of the history of the No 1 Blast Furnace see **Appendix 3** *[EJE/AR 2000a* and *EJE/SHI 2000a]*.

2.4.4 No 1 Blower House

1914 Construction commenced.

1915 Construction completed.

1941 Extension to accommodate the first of the turbo blowers.

1963 Vertical blowers, having been gradually phased out but remaining as standby equipment, removed.

1963 Blower House converted to Power Department workshop.

1989 Used by Blast Furnace Maintenance Department until closure.

1999 September, closure.

For a more detailed treatment of the history of No 1 Blower House, see **Appendix 4** *[EJE/AR 2000b* and *EJE/SHI 2000b]*.

2.4.5 No 1 Pig Mill

1915-6 Approx — First pig casting machine [No 1 Pig Mill] established during the first phase of construction, associated with rail system per-way and rolling stock, cranes and pig iron storage yards.

1921 — No 2 Pig Mill built and storage yard established, remote from the No 1.

1933 — No 1 Pig Mill dismantled and…

1934 — …re-erected adjacent to the No 2.

1939 — Site of No 1 Pig Mill redeveloped for building(s) associated with the Open Hearth Steelmaking plant.

For a more detailed treatment of the history of No 1 Pig Mill, see **Appendix 2** *[Extract: Umwelt 2002b]*.

2.4.6 No 2 Blast Furnace

1916 — Planning for the Blast Furnace underway, accelerated by war demand, pile driving, setting of mass concrete bed commenced.

1918 — 4 December 1981: No 2 Blast Furnace blown in – daily capacity of 450 tonnes.

1921 — No 2 Blast Furnace was blown out and relined after averaging 332 tonnes per day production (tpd).

1924 — Furnace blown out and relined after averaging 235 tpd.

1927 — Furnace blown out and relined after averaging 338 tpd.

1927-8 — Furnace down for 204 days for rebuild after averaging 468 tpd.

1929-33 — Furnace down for 1663 days for reconstruction after averaging 697 tpd.

1946-7 — Furnace demolished and reconstructed after averaging 630 pd.

1957 — Furnace blown out and relined after averaging 651 tpd.

1962 — Furnace blown out and relined after averaging 905 tpd.

1970 — Furnace blown out and relined after averaging 1075 tpd.

1977-8 — Furnace blown out for major reline &c relined after averaging 1296 pd.

1985 — Furnace finally blown out after averaging 1248 tpd and total production of 17,504,638 tons/tonnes;
Blast furnace structure demolished, no subsequent redevelopment of the site.

For a more detailed treatment of the history of No 2 Blast Furnace, see **Appendix 2** *[Extract: Umwelt 2002b]*.

2.4.7 Ferro-Manganese Blast Furnace

1915-6 Government pressure to develop capacity to produce continuous supply of foundry pig-iron.

1916 Planning for Ferro-manganese Blast Furnace commenced.

1917 Construction commenced.

1918 17 July: Ferro-manganese Blast Furnace blown in.

1918-24 In blast in five campaigns, total production: 7 345 tonnes of ferro-manganese, 24 992 tonnes of pig iron.

1934 29 June: demolition commenced, with salvage/re-use of components (eg: 10 000 firebricks from stoves; gas mains/foundations blasted for 80 tonnes of scrap; cast house dismantled/recycled for the new 12 inch mill; lift structure salvaged for use at blast furnaces.

For a more detailed treatment of the history of the Ferro-manganese Blast Furnace, see **Appendix 2** *[Extract: Umwelt 2002b]*.

2.4.8 Original Open Hearth Building

1915 Building completed with two furnaces.

1915 August, third furnace commissioned.

1916-17 Four additional furnaces installed and 100 tonne open hearth mixer.

1922 Open hearth mixer converted to two 400 tonne mixers; further two furnaces commissioned.

1932 No 10 furnace commissioned, capacity 125 tonnes; three bay extension to the building completed; new chimney stack completed; manufacture/installation of 100 tonne crane; two 100 tonne fabricated steel ladles and fourteen ingot cars and eight charging cars commissioned.

1935 Further one bay extension on the western end for storage; 60 tonne crane and 10 tonne auxiliary hoist installed; charging machine manufactured.

1936 No 11 furnace completed; four bay extension to the east of the building; commencement of excavations for No 12 furnace and building extension.

1937 Completion of No 12 furnace and building extension; No 13 furnace commissioned; five bay extension to the western end of the building authorised (NB. No 13 furnace always known as “A” furnace - superstition).

1944 No 14 open hearth furnace commissioned.

1945 Further extension to the western end of the building.

1957 Decision to replace the existing fourteen open hearth furnaces with five modern open hearth furnaces; construction of new open hearth furnace building adjacent to the old building; decision instead to install BOS plant; new building over and around the original building but maintaining the original crane.

1957-62 Open hearth furnaces progressively demolished.

1965 2 December, last tapping of an open hearth furnace at Newcastle Steelworks.

For a more detailed treatment of the history of the Open Hearth Building, see **Appendix 5** *[EJE/AR 2000c* and *EJE/SHI 2000c]*.

2.4.9 No 1 Bloom and Rail Mill Building

1915 24 April, opening of the rolling mill.

1917 Modification to allow rolling of steel plates.

1921 Additional tilt table installed; fixed roller table installed on the delivery side.

1924 Soaking pit building extended to accommodate additional row of soaking pits.

1932 Second shear installed; four bay extension to the soaking pit building; 18 inch continual mill built.

1933 Installation of the 90 inch plate mill and the 18 inch bar mill; 15 tonne mill crane installed.

1934 Two additional rows of soaking pits installed; building extended by three bays.

1939 Original steam engines decommissioned.

1940 Pulpit partially rebuilt; two bay extension of the building to accommodate a further row of soaking pits.

1939-45 Additional cranes installed.

1954 Further extension to soaking pits and two bays of building.

1958 Further additional row to the soaking pits and further extension by two bays of the building.

1961-65 Major rehabilitation of the mill.

1969 Original soaking pit building from A to H rows replaced; new building constructed over the old.

1970 Soaking pit A, B and C rows demolished; work commenced on new recuperative soaking pits #19-23.

1971 Installation of recuperative soaking pits #19-23 completed; decision to build new bloom mill.

1973 Construction of new bloom mill.

1975 New bloom mill commissioned but mothballed.

1979 New bloom mill commenced production.

1982 18 October, last ingot from No 1 Bloom Mill.

1982-88 All soaking pits except recuperative decommissioned.

1985 Eastern area of the building restored as the tundish repair shop and mould segment workshop (with the construction of the bloomcaster).

For a more detailed treatment of the history of the No 1 Bloom and Rail Mill building, see **Appendix 6** *[EJE/AR 2000d* and *EJE/SHI 2000d]*.

2.4.10 Steel Foundry

1917 Steel Foundry installation completed.

1918 Building extended.

1919 Building extended again - production increased to 4184 tonnes.

1927 Second open hearth furnace constructed; 12 bays added to building.

1933 Acid furnace rebuilt, length of bath extended; air regenerative chamber increased substantially.

1936 Further extension of the Steel Foundry - main building extended by two bays, furnace building by four bays, additional annex to northern side, extension to eastern side and six bays.

1941-46 Series of building extensions by 18 bays.

1949 Office extended.

1952 Substantial plant additions including 70 tonne crane.

1956 Foundry roof partially resheeted.

1957 Weighbridge installed.

1961 Final addition of three bays to the west and five bays to the northeast of the building.

1968 Additional roll casting pit.

1970 Acid furnace ceased operation.

1970 *et seq* major resheeting of building.

1971 Open hearth furnace decommissioned; replaced by two 50 tonne electric induction furnaces; stress relieving furnace commissioned.

1983 Centrifugal casting plant commissioned.

1990 *et seq* ceased operations, furnaces demolished, pits filled; building thereafter used for storage.

For a more detailed treatment of the history of the Steel Foundry, see **Appendix 7** *[EJE/AR 2000e* and *EJE/SHI 2000e]*.

2.4.11 DC Substation

1915 Commissioned, prime source of DC electricity to plant.

1921 Ten employees working in the powerhouse.

1924 Two 1000 kW motor generators installed (planning for AC powerhouse had commenced 1920 and AC powerhouse under construction).

1933 Interior of the building repainted; by this time referred to as the DC Substation; replacement of wooden internal facilities with steel; reorganisation of condenser room platform strain tanks and the like.

1935 DC Substation contained the original three generating sets and three 1000 kW motor generator sets.

1935 Building extended for AC-DC converters.

1936 Installation of two 1500 kW motor generator sets, old steam driven units maintained on standby; HT switch gear transferred; DC switchboard extended and modified.

1955 (Approx) No 1 motor generator set transferred to AC saltwater pump house.

1960 *et seq* distribution centre for AC power and DC power produced by converters.

1999 September, decommissioned.

For a more detailed treatment of the history of the DC Substation, see **Appendix 8** *[EJE/AR 2000f* and *EJE/SHI 2000f]*.

2.4.12 Original Timber Wharves

1912 October, plans for the original wharf completed.

1913 20 December, "Anglo-Egyptian" arrived at new wharf, discharged construction material for No 1 Blast Furnace.

1915 19 January, "Emerald Wings" berthed with the first cargo of iron ore from Whyalla.

1916 November, first extension of the original 600 foot long wharf structure completed.

1917 November, second extension to wharfage completed, total length of wharfage now being 1 300 feet.

1925 All wharf extended by 225 feet; screening device installed; wharf under the ore bridge double reinforced and concreted.

1928 Replacement of broken and badly damaged piles by 22 pairs.

1936 About 17 head stocks renewed; rail track timbers replaced; 14 stringers fitted to the wharf face.

1937 Additional ore bridge constructed; No 2 berth strengthened with 13 new piles and new head stocks in steel; new head stocks with steel girders beneath railway; replacement of some decking and bridge track girders; No 3 berth repaired with head stocks and girders.

1938 Timbers under No 1 berth reported in poor condition, replaced with steel superstructure; fire service main installed under wharf deck; wharf face timber renewed and reconditioned.

1939 Forty nine piles renewed.

1948 The first of the Yampi class ore carriers commissioned.

1950s Size of bulk carriers straining the capacity of the wharf and basin depth.

1959 Wharf side of runway redesigned as independent structure, depth of basin proposed to be extended to 35 feet from the current 26 feet.

1964 Decision to support the ore yard independently from wharf structure; 464 new piles of 30 inch ID steel casing driven.

1970 *et seq* centre section of the wharf subsided as a result of pile failure.

1999 September, decommissioned.

For a more detailed treatment of the history of the original wharves, see **Appendix 9** *[EJE/AR 2000g* and *EJE/SHI 2000g]*.

2.4.13 No 3 Blast Furnace

1921 August, No 3 Blast Furnace commissioned, capacity 600 tonnes per day.

1925 Furnace relined.

1930 Furnace relined, capacity by now increased by 15%; McKee top installed; Ross dust catcher fabricated and erected.

1940 Furnace totally relined and reconditioned; hearth size increased to 16 feet 3 inches; brickwork in No's. 1, 2 and 3 stoves demolished; each stove fitted with pressure burners.

1950 Furnace relined; hearth increased to 17 feet 9 inches.

1960 January - April, No 3 Blast Furnace demolished and completely rebuilt, hearth diameter increased to 20 feet; 18 April furnace blown in.

1967 Furnace relined.

1977 Furnace relined; hearth increased to 21 feet 3 inches.

1980 *et seq* No 3 Blast Furnace shut down, relined.

1985 Furnace recommissioned after total rebuild and reshaping.

1989 May, second cast house and slag granulator added.

1991 Major repair, scrubber removed and replaced.

1999 No 3 Blast Furnace decommissioned.

For a more detailed treatment of the history of the No 3 Blast Furnace, see **Appendix 10** *[EJE/AR 2000h* and *EJE/SHI 2000h]*.).

2.4.14 AC Saltwater Pump House

1924 Pump House completed; initial equipment - two pumps.

1925 Wooden frames of suction screens replaced with steel; complete overhaul of both pumps, fitting of roller thrust bearings.

1927 *et seq* steam power replaced by AC electric motors, installation of electrical switch gear and motor starting equipment.

1937 Extension to original pump house building; three DC powered axial flow pumps installed.

1957 No 1 motor generator set transferred from the DC Substation, installed in the western end of the pump house (power for the luffing cranes on the wharf); extension of switch gear.

1970s Second storey added to the western end of the pump house; original pump house and 1937 eastern extension roofing renewed.

1983 Two new pumps installed outside the building.

1968-94 Nos. 3, 4 and 5 pumps progressively decommissioned due to decreasing demand from the power plant boilers.

1999 September, decommissioned.

For a more detailed treatment of the history of the AC Saltwater Pump House, see **Appendix 11** *[EJE/AR 2000i* and *EJE/SHI 2000i]*.

2.4.15 Power House

1923 Decision to construct AC power plant.

1923-24 Construction period, initial stage the driving of 505 piles as basic foundation.

1924 November, plant commissioned, of two 5000 kW 25 cycle alternators with switch gear, steam turbines and peripherals.

1925 February, 8 inch steam main connection to blast furnace / rail mill boilers.

1933 Capacity of the AC power plant exceeded with the electrification of the merchant skelp and strip mill.

1936 Additional boiler capacity installed; planning for the installation of additional Parsons turbo alternators.

1938 Commissioning of two additional Parsons 18750 kW turbo alternators; five new boilers installed in a new building (the power plant boilers).

1959 November, No 6 boiler commissioned.

1968 No 7 power plant boiler commissioned.

1975 February, conversion completed from 25 cycle to 50 cycle generation (No's. 1 and 2 continued at 25 cycles).

1980-83 The (original) AC boilers shut down progressively, the last in December 1983.

1984 The use of 25 cycle power ceased.

1984 No 1 alternator failed, replaced with an 8.25 mW alternator.

1987 No 2 alternator failed, replaced by a turbo alternator.

1995 January, internal power generation ceased and all turbo alternators decommissioned.

For a more detailed treatment of the history of the Power House, see **Appendix 12** *[EJE/AR 2000j* and *EJE/SHI 2000j]*.

2.4.16 Open Hearth Change House

1936-37 Construction between November 1936 and May 1937 for use of Open Hearth Furnace employees; shower area of painted rendered walls without dividing walls and overhead pipes with regular shower roses; lockers in three separate areas; lunch room between two locker sections on the top floor; eastern end of the change house, an annex containing two air compressors and three tar pumps.

1960-65 Open hearth production declined, as did employment in this department.

1965 *et seq* building occupied by other departments progressively.

1965 Regulatory pressure commenced for improvement of facilities.

1980 Planning for improvement of change house facilities; new plumbing with more private showering facilities; exhaust fans installed, non-slip tiles applied to floors and walls tiled; original lockers removed; dining facilities installed in lieu of individual crib seats.

For a more detailed treatment of the Open Hearth Change House, see **Appendix 5** *[EJE/AR 2000c* and *EJE/SHI 2000c]*.

2.4.17 Mould Conditioning Building

1942 Mould Conditioning Building constructed.

1971 Mould Conditioning Plant demolished.

1987 Use of ingot moulds phased out with the introduction of the bloom caster.

1991 Mould Conditioning Building demolished other than frame, roof cladding and roof ridge.

For a more detailed treatment of the history of the Mould Conditioning Building, see **Appendix 5** *[EJE/AR 2000c* and *EJE/SHI 2000c]*.

2.4.18 No 4 Blast Furnace

1960 7 October, expenditure authorised for the construction of the No 4 Blast Furnace incorporating (and destroying) the site of the former Brass Foundry (1926-49+).

1963 July, No 4 Blast Furnace blown in.

1965 Modification to allow fuel injection through blow pipe walls.

1970 Furnace partially relined and converted to high top pressure.

1973 Relined and converted to stave cooling; mud gun, tuyere stock and bleeders replaced.

1979 Furnace relined.

1989 Partial reline, Paul Wurth top installed.

1999 September, decommissioned; large crack detected on the underside of the downcomer; for safety reasons, decided to walk away from the furnace, leaving it burdened with 800 tonnes of coke and metallics.

For a more detailed treatment of the history of the No 4 Blast Furnace, see **Appendix 13** *[EJE/AR 2000l* and *EJE/SHI 2000l]*.

2.4.19 BOS Plant

1958 Decision to install five 350 tonne modern open hearth furnaces in lieu of the existing 14 open hearths and the new building was commenced.

1959 Decision revised for installation of BOS furnaces.

1962 December, the first 200 tonne furnace commissioned.

1963 Second BOS furnace commissioned.

1967 Fifty tonne BOS furnace commissioned with associated four strand continuous billet casting.

1970 Installation of additional precipitators and larger oxygen lances.

1974 BOS plant produced its record annual output of 2.19 million tonnes.

1976 Fifty tonne furnace decommissioned.

1979 Fifty tonne furnace recommissioned and upgraded to 60 tonne capacity.

1980-81 Secondary fume collection system installed; leaded steel facilities provided in the No 1 BOS shop.

1982 Composite blowing equipment installed on both 200 tonne furnaces.

1981-82 Ladle additive system installed; 60 tonne furnace decommissioned.

1987 Replacement of both BOS vessels, installation of new hoods and new fume collection system.

1989 Provision of sub-lance main-lance and flux handling facilities matched BOS plant output to capacity of bloom caster; three ladle handling cranes installed.

1990 Ladle metallurgy furnace commissioned.

1991 Secondary fume system upgraded.

1992 Ladle lining measuring equipment installed.

1993 Old precipitators demolished.

1997 Desulphurisation demolished.

1999 September, decommissioned.

For a more detailed treatment of the history of the BOS Plant, see **Appendix 14** *[EJE/AR 2000m* and *EJE/SHI 2000m]*.

2.5 REVIEW OF PHYSICAL CONTEXT

This Section briefly summarises the nature of material evidence in respect of each individual element that was observed during field investigation, together with a reference to the accessible record. The accessible record is in turn divided into contemporary photography, archival plans and records and historical photography.

2.5.1 Formation of the Ground

The surface of the Study Area presented essentially was that achieved by filling at the inception of the BHP Steelworks, marked by the footprint, either in footings or slabs, of the plant elements previously identified (apart from the Hunter River Smelter Co complex, possibly the Ferro-Manganese Blast Furnace and the No 1 Pig Mill). In that environment, it appeared that the sub-surface of the Study Area would reveal not only the footings of the buildings but also items of moveable material evidence associated with the construction and industrial operation of the plants historically located on the Study Area. The surface indicators of the plants are addressed in **Sections 2.5.2** to **2.5.19**.

2.5.2 The Hunter River Smelting Co Complex

No material evidence of this complex remains above the surface, however it seems most likely that structural improvements and fixed plant (where remaining in 1913) was simply removed to the level of the proposed filled surface. The residue was then filled around and, although disturbed by the installation of piling for the No 1 Blast Furnace and its ancillaries probably substantially remains *in situ*. There is one historical photograph that suggests the filling process in relation to one of the copper smelter dwelling *[copied Umwelt 2000b: Plate 3.5]* but there appears to be serial photography of this site contemporary with the filling of the precinct. No plans of the smelter precinct have been located, although there is substantial archival material in newspapers (The Newcastle Chronicle and the Newcastle Morning Herald) during its lifetime. Photographs of the plant between 1880 and 1890 provide an insight into its disposition, broadly revealing depicting two long, narrow smelter buildings with a shared stack and the peripheral building of the Torrens Tin Smelter. Furthermore, the

disposition of the plant was indicated in a series of Knaggs charts of Newcastle Harbour, of which the best is probably the 1880 chart *[copied Umwelt 2000b: Figure 3.2]*. In the result, the approximate position of the structural elements of the precinct can be estimated.

2.5.3 No 1 Blast Furnace

No 1 Blast Furnace field investigation revealed that "the button" or salamander is the only material evidence of the No 1 Blast Furnace.

The record of the field investigation of the No 1 Blast Furnace is contained in **Appendix 3** *[EJE/AR 2000a]*, with pre-demolition photography at Section 6, archival material at Section 9, historical photography at Section 3(8) and at Section 10.

2.5.4 No 1 Blower House

Pre-demolition field investigation revealed the survival of the brick and metal clad walls of the No 1 Blower House together with substantial pipework associated with its function and the generally bare internal components other than the travelling crane, the remains of the Blower flywheel pit and the contents of the mezzanine.

The record of the field investigation of the No 1 Blower House is contained in **Appendix 4** *[EJE/AR 2000b]*, with pre-demolition photography at Section 6, archival material at Section 9, historical photography at Section 3(8) and at Section 10 and at Section 1(2) and Section 3(7, 8 and 9), as well as the cover.

2.5.5 No 1 Pig Mill

No material evidence remains on the surface of the location of the No 1 Pig Mill although its location, as an adjunct of the original Open Hearth plant is indicated in site plans dated 1913, 1924 and 1929, and absent from that of 1933 plan *[copied Umwelt 2000b: respectively Figures 3.3, 3.4, 3.5 & 3.6]*. In the latter plan, the site of the No 1 Pig Mill had been absorbed into the Open Hearth Stockyard and the site was later (after 1949) occupied by a building apparently associated with No 4 Blast Furnace (ca. 1963). The former location of the No 1 Pig Mill can be estimated with reasonable accuracy from these sources.

2.5.6 No 2 Blast Furnace

No material evidence remains of the No 2 Blast Furnace, which was demolished after its last campaign in 1985. The position of the blast furnace is shown on plans from 1918 to 1985 *[examples copied Umwelt 2000b: Figures 3.4-3.7]* and in numerous photographs over its long life *[examples copied Umwelt 2000b: plates 3.12-3.17]*. It is anticipated that the mass concrete bed of the structure has survived demolition. The former location of the No 1 Pig Mill can be estimated with reasonable accuracy from these sources and excavation will almost certainly expose the concrete bed.

2.5.7 Ferro-Manganese Blast Furnace

No material evidence remains of the Ferro-Manganese Blast Furnace, which was demolished 29 June 1934. The position of the blast furnace is shown on plans from 1924 to 1929 *[examples copied Umwelt 2000b: Figures 3.4 & 3.5]* and in photographs, mainly associated with its demolition *[Umwelt 2000b Plates 3.18 & 3.21]*. The site appears subsequently to have been occupied by an element of the Coke Handling Plant It is anticipated that some substantial fragment, at least, of the mass concrete bed of the structure has survived demolition. The former location of the Ferro-Manganese Blast Furnace can be estimated with reasonable

accuracy from these sources and excavation will possibly expose part, at least, of the concrete bed.

2.5.8 Original Open Hearth Building

Prior to its demolition, the original Open Hearth Building was preserved principally in its residual frame and cladding. The then of its function and survival was clouded by modification that had been effected to accommodate the BOS Plant, its function and peripherals. Internally, the footprints of open hearth furnaces No's. 2 and 3 remained in a limited form in the floor of the BOS Plant.

The record of the field investigation of the original Open Hearth Building is contained in **Appendix 5** *[EJE/AR 2000c]*, with pre-demolition photography at Section 6, archival material at Section 9, historical photography at Section 3(8) and at Section 10 and at Section 1(2) and Section 3(7, 8 and 9), as well as the cover.

2.5.9 No 1 Bloom and Rail Mill Building

Material evidence of the No 1 Bloom and Rail Mill Building consisted of the surviving part of the building, footings of the early Rail Mill pre-heater furnace, the location of the soak and pit area which has been modified, residue of the soak and pit building, the bloom mill motor room building in brick, the bloom mill dust extractor, ground level concrete slabs of former installations, the structure of the No 1 roll shop and part of the bloom mill motor room travelling crane and rail. The majority of these remains have survived the demolition of the above-ground residue.

The record of the field investigation of the No 1 Bloom and Rail Mill Building is contained in **Appendix 6** *[EJE/AR 2000d]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9, historical photography at Section 3(8) and at Section 10 and the cover.

2.5.10 Steel Foundry

Investigation of the Steel Foundry prior to its demolition revealed the frame and structure of the foundry building and welding bay, the furnace building and annealing furnace, the electrical workshop, the dust collector, the internal structural fitting of the main building, the core oven, the spindle of the No 9 casting pit and crane track. The footprints of the building footings, the furnaces, the core oven and the casting pit survived demolition.

The record of the field investigation of the Steel Foundry is contained in **Appendix 7** *[EJE/AR 2000e]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. The only historical photography is located on the cover.

2.5.11 DC Substation

The DC Substation survived to demolition as a mainly brick and partly metal clad, substantial building with a considerable body of surviving peripherals, external transformers, pipework and cabling infrastructure. Internally, much of the historical fitting remains including generating, switching and handling equipment. The footprint of the building was defined by footings and floor, with the shadow of former ground-floor installations.

The record of the field investigation of the DC Substation is contained in **Appendix 8** *[EJE/AR 2000f]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9, historical photography on the cover only.

2.5.12 Original Timber Wharves

No evidence of the original Timber Wharves was able to be sighted during the field investigation and it is suspected that little or no evidence remains partly because of the attack of the *teredo* worm and partly because of the need for continuing repair, replacement and upgrading of the facilities.

The record of the field investigation of the original Timber Wharves is contained in **Appendix 9** *[EJE/AR 2000g]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. Occasional historical photography is also located at Section 1(2) and Section 3(7-12) on the cover.

2.5.13 No 3 Blast Furnace

Accepting that the No 3 Blast Furnace presently represented on the site is not that which began operating in August 1921 but is essentially a 1985 blast furnace, the No 3 Blast Furnace was substantially intact on the site prior to its demolition. Material evidence then present included not only the furnace structure but blower pipework, cowper stoves, larry car hoppers, lines and skips, the slag granulator, gas washer, dust catcher and examples of peripherals such as torpedo ladles, rail cars and track. Apart from examples of moveable heritage, the substantial mass-concrete bed of the furnace has survived demolition.

The record of the field investigation of the No 3 Blast Furnace is contained in **Appendix 10** *[EJE/AR 2000h]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. Occasional historical photography is also located at Section 3(8-9) and on the cover.

2.5.14 AC Saltwater Pump House

The AC Saltwater Pump House survives substantially intact including substantial ancillary plant in the form of large diameter pipework, electrical fittings, old and new pumps, internal electrical switch gear and cranes.

The record of the field investigation of the AC Saltwater Pump House is contained in **Appendix 11** *[EJE/AR 2000i]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. Apart from occasional historical photography on the cover and at Section 3(8) no historical photography has been located.

2.5.15 Power House

Survey in 2000 revealed that the Power House remained intact. The building included some original features despite substantial modification over its long life. At the time of survey, the alternating plant and management reticulation and control plant was installed however this was removed prior to demolition. The concrete floor and the shadow of ground-floor plant survived building demolition.

The record of the field investigation of the Power House is contained in **Appendix 12** *[EJE/AR 2000j]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. Historical photography is located at Section 10 and at Section 3(7-9) and on the cover.

2.5.16 Open Hearth Change House

At survey in 2000, the historical Open Hearth Change House was represented by the building that was once dedicated entirely to this function and in which, while the post-1980 employee hygiene facilities remained substantially intact, examples of the pre-1980 furnishings/fittings

were also found. The footprint of the building remains together with the shadow of early subdivisions and uses.

The record of the field investigation of the Open Hearth Change House is contained in **Appendix 5** *[EJE/AR 2000c]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. No historical photography has been located.

2.5.17 Mould Conditioning Building

Only the structural steel framework to top plate level and the roof and clerestory of the original Mould Conditioning Building survived in 2000. The use of moulds was made redundant with the introduction of bloom casting. The footprint of the structure remains in the outline of post footings.

The record of the field investigation of the Mould Conditioning Building is contained in **Appendix 5** *[EJE/AR 2000c]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. No historical photography has been located.

2.5.18 No 4 Blast Furnace

Field investigation of the No 4 Blast Furnace in 2000 revealed that this plant was substantially intact, including the furnace, pipework, charging ancillaries, Cowper stoves, flues and dust collecting equipment. The furnace then still contained approximately 800 tonnes of coke and metallic residue, unable to be tapped as the result of a metal failure in the downcomer. Post-demolition, the footprint of the furnace, its bed and most of the charging/delivery car tracks remain in the concrete slab bed.

The record of the field investigation of the No 4 Blast Furnace is contained in **Appendix 13** *[EJE/AR 2000l]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. Historical photography is located at Section 10 and at Section 3(9-10) and on the cover.

2.5.19 BOS Plant

The BOS Plant building had been substantially a conversion of the original Open Hearth building and survived in 2000 with evidence of its various extensions and containing, as has been observed above, residual elements of Nos. 2 and 3 Blast Furnaces. The BOS Plant was then substantially intact including precipitous pipework, the furnaces themselves, the extraction equipment, cranes, weighbridge, rail track, ladle cars, ladles and with definition of the unique 2-aisle charging system. The footprints of the building, the furnace bed and charging and delivery car tracks have survived in the ground floor sealing.

The record of the field investigation of the BOS Plant is contained in **Appendix 14** *[EJE/AR 2000m]*, with pre-demolition photography at Section 6 and (digital proofs) at Section 13(2), archival material at Section 9. Historical photography is located at Section 10 and at Section 3(7-8) and on the cover.

2.5.20 The Archive Drawings Register

In relation to the heritage resources mentioned above in this Section, attention is drawn to the master copy of the archive report prepared in conjunction with the archival records of individual elements. The archive report master copy contains a full listing of all relevant drawings contained in the BHP archive.

2.6 INTEGRATION OF CONTEXT ELEMENTS

Based on the data revealed in the reviews of archaeological and historical context and field study of the physical context, the following definition of archaeological and heritage sensitivity can be made:

2.6.1 Zones of 'No Potential Archaeological Sensitivity'

Zones of '***No Potential Archaeological Sensitivity***' are those areas of the Study Area that have, in the course of all context studies and in the light of work undertaken on the Study Area to date, have not demonstrated any significant association with its historical heritage values. The zones of 'No Potential Archaeological Sensitivity' are taken to include:

- areas outside the Study Area, as delineated by the 'blue line' by **Figure 1.2**, and
- post-closure demolition rubble placed above the pre-closure surface level, and
- natural materials below the base of fill placed for land reclamation or site preparation purposes for the former BHP Newcastle Steelworks.

2.6.2 Zones of 'Potential Archaeological Sensitivity'

Zones of ***Potential Archaeological Sensitivity***' are those areas:

- within the Study Area, as delineated by the 'blue line' by **Figure 1.2**, and
- within fill placed for land reclamation or site preparation purposes for the former BHP Newcastle Steelworks, but
- excluding those areas contained with the definition in **Section 2.6.1** of zones of '*No Potential Archaeological Sensitivity*'.

3.0 ASSESSMENT OF SIGNIFICANCE

3.1 THE CONCEPT OF SIGNIFICANCE

The *Heritage Act*, 1977 (NSW) defines items of environmental heritage to be:

> *Those buildings, works, relics or places of historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic* ***significance*** *for the state of New South Wales.* [Our emphasis]

and defines *a relic* falling within that definition to be:

> *Any deposit, object or material evidence -*
>
> *(a) which relates to the settlement of the area that comprises NSW, not being Aboriginal settlements; and*
> *(b) which is 50 or more years old.*

In the context of this report, significance is the measure of the value and importance of elements of the archaeological record to cultural heritage. While the fabric of the archaeological record is the subject of the assessment of heritage significance, the assessment itself is conditioned by the environmental and historic context of the site. Furthermore, an evaluation of heritage significance is not static but evolutionary, as a function of evolving community perspectives and cultural values.

The approach to the assessment of heritage significance affirmed by the NSW Heritage Office adopts as a foundation the four values of the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter). These values are broadly accepted Australia-wide, as ***historical***, ***aesthetic***, ***scientific*** and ***social classifications*** of significance. The implications of these classifications are as follows:

- ***Historical significance*** considers the evolutionary or associative qualities of an item with aesthetics, science and society, identifying significance in the connection between an item and cultural development and change.

- ***Aesthetic significance*** addresses the scenic and architectural values of an item and/or the creative achievement that it evidences. Thus, an item achieves aesthetic significance if it has visual or sensory appeal and/or landmark qualities and/or creative or technical excellence.

- ***Social significance*** is perhaps the most overtly evolutionary of all classifications in that it rests upon the contemporary community appreciation of the cultural record. Evaluation within this classification depends upon the social spiritual or cultural relationship of the item with a recognisable community.

- ***Scientific significance*** involves the evaluation of an item in technical and/or research terms, considering the archaeological, industrial, educational and/or research potential. Within this classification items have significance value in terms of their ability to contribute to the better understanding of cultural history or environment and their ability to communicate, particularly to a broad audience within a community. *(Marquis-Kyle & Walker 1992, 21-23)*

As a component of the holistic concept of significance, archaeological significance has been described as a measure by which a site may contribute knowledge, not available from other sources, to current research themes in historical archaeology and related disciplines (*Bickford & Sullivan, 1984 19-26; Sullivan & Bowdler 1984)*. Archaeology is concerned with material evidence and the archaeological record may provide information not

available from historical sources. An archaeological study focuses on the identification and interpretation of material evidence to explain how and where people lived, what they did and the events that influenced their lives.

Considerations material to archaeological study include:

- whether a site, or the fabric contained within a site, contributes knowledge or has the potential to do so. If it does, the availability of comparative sites and the extent of the historical record should be considered in assessing the strategies that are appropriate for the management of the site; and

- the degree and level at which material evidence contributes knowledge in terms of 'current research themes in historical archaeology and related disciplines'.

In relation to 'current research themes in historical archaeology and related disciplines', the direction of historical archaeology implies, and is conditioned by, considerations of historical, scientific, cultural, social, architectural, aesthetic and natural values. *Historical* value lies at the root of many of the other values by providing a temporal context and continuity, thereby providing an integrating medium for the assessment of social, cultural and archaeological significance. *Scientific* value depends upon the ability of an item to provide knowledge contributing to research in a particular subject or a range of different subjects. *Cultural* value attaches to material evidence that embodies or reflects the beliefs, customs and values of a society or a component of a society and/or have the potential to contribute to an understanding of the nature and process of change and its motivation. *Social* value derives from the way people work(ed) and live(d) and from an ability to understand the nature, process of change and its motivation. Social significance is closely related to cultural significance, in its concern with the practicalities of socio-cultural identification. *Architectural* value depends on considerations of technical design (architectural style, age, layout, interior design and detail), the personal consideration (ie. the work of a particular architect, engineer, designer or builder) and technical achievement (construction material, construction technique, finish). *Aesthetic* value addresses the manner in which an item comprises or represents creative achievement, epitomising or challenging accepted concepts or standards. *Natural value* attaches to items that either support or manifest existing natural processes and/or systems or provide insights into natural processes and/or systems.

In order to provide a ready reference to the ***degree of significance or the distinctiveness*** of an item in general terms, the item may be described as being either 'Rare' or 'Representative' within its community/cultural/geographical level.

The final denominator of significance is the ***level of significance*** of an item. *Level* is assessable in two classifications pursuant to NSW Heritage Office *(2001)* depending upon the breadth of its identifiable cultural, community, historical or geographical context. Thus recognition of an item at the:

Local level identifies the item as being significant within an identifiable local and/or regional cultural and/or community group and/or historical/geographical heritage context;

State level identifies the item as being significant within an identifiable State-wide cultural and/or community group and/or historical/geographical heritage context;

but on a broader front, by derivation, recognition of an item at the:

National level identifies the item as being significant within an identifiable national cultural and/or community group and/or historical/geographical heritage context.

International level identifies the item as having implications of significance for an identifiable cultural and/or community group both nationally and abroad and/or a world-wide historical/ geographical heritage context.

In order to provide a standardised approach to the assessment of the value and degree of 'items' and of individual 'elements' within or contributing to items, the NSW Heritage Office *(2001:9)* has defined a series of criteria that will be used by the Heritage Council of NSW as an assessment format within NSW. The seven criteria address:

Criterion (a) the importance of an item in the course or pattern of the cultural or natural history of NSW or a local area [ie: *historical*].

Criterion (b) the existence of a strong or special association between an item and the life or works of a person or group of persons important in NSW or local cultural or natural history [ie: *historical*].

Criterion (c) the importance of an item in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW or a local area [ie: *aesthetic*].

Criterion (d) the existence of a strong or special association between an item and the social, cultural or spiritual essence of a particular community or cultural group within NSW or a local area [ie: *social*].

Criterion (e) the potential of an item to provide information that will contribute to an understanding of the cultural or natural history of NSW or a local area [ie: *scientific*].

Criterion (f) the quality of an item to possess uncommon, rare or endangered aspects of the cultural or natural history of NSW or a local area [ie: *rare* degree of significance].

Criterion (g) the demonstration by an item of the principal characteristics of a class of cultural or natural place or cultural or natural environment within NSW or a local area. [ie: *representative* degree of significance].

Under the same criteria, where this is relevant, the individual contribution of separate elements of a place may be evaluated according to a five-stage grading system, where:

Exceptional indicates that is a rare or outstanding element, contributing directly to the assessment of an item's significance at the appropriate level;

High indicates that an element exhibits an advanced degree of original fabric and is a key element in the assessment of an item's significance at the appropriate level;

Moderate indicates that an element has been modified or has degraded, with little individual heritage value, but that makes an interpretive contribution in the assessment an item's significance at the appropriate level;

Little indicates that an element has been modified or has degraded to a degree that detracts from the assessment of an item's significance at the appropriate level; and

Intrusive indicates that an element is damaging in the assessment of an item's significance at the appropriate level.

In this report, grading of individual elements is assessed in terms of their contribution to the heritage values of the former BHP Steelworks as an entity.

3.2 ASSESSMENT OF THE SIGNIFICANCE OF THE STUDY AREA

In this section, the heritage significance of the Study Area is assessed upon the basis of the range of criteria discussed in **Section 3.1**. The following sub-sections (**Sections 3.2.1 – 3.2.6**) deal with significance by providing an overview according to the classifications established by Australia ICOMOS and detail according to the criteria defined in NSW Heritage Office (2001) while **Section 3.2.7** provides a summary of the assessment in table form (**Table 3.1**).

For the sake of brevity and also to arrange the various precincts in terms of their various associations, the 18 elements have been ordered under the following five groupings:

- pre-steelworks development: the Hunter River Smelting Co Precinct;
- early iron-smelting and product management: the precincts of No 1 Blast Furnace, No 1 Blower House, No 2 Blast Furnace, No 1 Pig Mill and No 3 Blast Furnace;
- ferro-manganese smelting: the Ferro-Manganese Blast Furnace Precinct;
- early steel-making and product management: the precincts of the Original Open Hearth Furnaces, the No 1 Bloom Mill and Rail Mill, the Steel Foundry, the Open Hearth Change House and the Mould Conditioning Building;
- power and operational services; the precincts of the DC Substation, the Original Timber Wharves, the AC Saltwater Pumphouse and the Power House; and
- the final evolutionary stage of the process: the precincts of the No 4 Blast Furnace and the BOS Plant Precinct.

3.2.1 Pre-Steelworks Development Precinct:

Hunter River Smelting Co.

3.2.1.1 Overview

The Hunter River Smelting Works represents the earliest phase of metal smelting in Australia, in common with the Newcastle Coal and Copper Company at Burwood and the English and Australian Company at Broadmeadow. Having regard to the huge amount of filling and substantial footings undertaken by the BHP Steelworks, it is probable that some residual remains at considerable depth.

The surface of the Study Area retains no visible or identifiable material evidence of its original industrial development. Disturbance may well reveal artefactual material related to its use which has the potential to enhance the record of early industrial development.

3.2.1.2 Detail

The Hunter River Smelting Co precinct is significant because:

Criterion (a): [Historical] …it is significantly associated with early industrial development in the Newcastle area and particularly the smelting of metal ores and the early extension of Newcastle Harbour. The site shows the continuity of its use for smelting purposes over 140 years.

Criterion (b): [Historical] …it has a strong relationship with the people who established and who worked in the early industry but the site has been substantially modified and is no longer accessible to provide evidence of this association.

Criterion (c): [Aesthetic] …it contains evidence (currently neither exposed nor accessible) of technical innovation and evolution supporting a creative solution to industrial and commercial problems.

Criterion (d): [Social] …it provides insights into the industrial environment and the social condition of the group of people in the Lower Hunter area which was continuously involved in the smelting and metal production for more than a century.

Criterion (e): [Scientific] …it is an archaeological site, with the potential to yield information about:

- the nature and location of former buildings, processes and works;
- the technology and physical realisation of early industrial operations and non-ferrous ore treatment ranging from ore stockpiling through smelting and metal management to transport;
- artefacts lost and/or abandoned in the later dredging and filling of the site.

Criterion (g): [Representativeness] potentially contains attributes of typical early copper smelting technology in common, at the local scale, with the remains of the Newcastle Coal and Copper Company smelter at Burwood Beach.

3.2.2 Early Iron-Smelting and Product Management Precincts:

No 1 Blast Furnace;
No 1 Blower House;
No 1 Pig Mill;
No 2 Blast Furnace;
No 3 Blast Furnace.

3.2.2.1 Overview

The No 1 and No 2 Blast Furnaces were the first blast furnaces built at the Newcastle Steelworks and were the foundation of steelmaking operations in the Hunter. The No 1 Blower House was developed to house plant integral to the operations of Blast Furnaces, while at the end of the process, the No 1 Pig Mill represented the process for management of smelted iron for on-sale in the form of 'pig-iron'. The No 3 Blast Furnace was constructed only marginally after the plant commenced operation and was planned from inception as the third of four blast furnaces.

This group of early iron smelting and management plants and operations represents the earliest phase of construction at the steelworks and was an integral part of the foundation of the steel industry in the Hunter. The scale of the operation, of which this group is part, comprised a quantum leap in technology, commitment and funding from the earlier iron-steel operations at Lithgow (where Sandford and Hoskins had always been under-funded), Mittagong and Bogolong.

3.2.2.2 Detail

The 'Early Iron Smelting and Product Management Precincts' are significant because

Criterion (a): [Historical]

…they represent:

- the first large scale facility for the smelting of iron ore (as distinguished from the operations of Hoskins and predecessors at Lithgow);
- the initial stage of reducing iron ore in steel-making and are inextricably associated with the early production of steel manufacture in the Hunter;
- the evolution of large plant, particularly blast furnaces, over lives respectively in excess of 50 years, it being recalled that the No 1 Blast Furnace was the first fully mechanised blast furnace constructed in Australia;
- the reduction of molten iron into pigs for sale to consumers in the form of 'pig-iron;
- the early development and the expansion of the steel making works.

Criterion (b): [Historical]

…they have a strong relationship with the people involved in the establishment of the BHP Newcastle plant, both the planners and the workers. By derivation, they are also fundamental to the development of peripheral suppliers and consumers of services and material and the associated secondary industries established in the Newcastle and Lower Hunter area.

Criterion (c): [Aesthetic]

…they represent an aesthetically distinctive development in the innovative technology in construction and fabrication of the elements that occupied their locations, and they contain elements that exemplify a particular process and function involved in the steel-making process.

Criterion (d): [Social]

…they are identified, in microcosm, with the creation of work and community creation in the Waratah/Mayfield area of Newcastle and the contribution of the BHP Steelworks to the social fabric of Newcastle and the Lower Hunter.

Criterion (e): [Scientific]

…they have the potential to yield sometimes unique archaeological information regarding the location and incidents of the buildings, plant and operations within the precincts. In respect of the No 1 Pig Mill, for example, extremely limited information is available from archival documents and archival photographs.

Criterion (g): [Representativeness]

…they represent essential first components of the steel-making plant constructed in the Newcastle/Hunter area.

3.2.3 Ferro-Manganese Smelting Precinct:

The Ferro-Manganese Blast Furnace

3.2.3.1 Overview

Largely lost to local knowledge, this relatively small blast furnace was associated with a significant war time effort in the production of pig iron during the First World War. It also played a significant part in the production of ferro-manganese, then vital to the refining of steel, when world supply was both very expensive and substantially inaccessible.

This furnace was dais to have been completely demolished including the foundations and it is possible that no material evidence remains.

3.2.3.2 Detail

The 'Ferro-Manganese Smelting Precinct' is significant because:

Criterion (a): [Historical] …through its function within the BHP Newcastle Steelworks, the Ferro-manganese Blast Furnace was associated with a significant phase in the iron and steel making industry in Australia particularly during the First World War.

Criterion (b): [Historical] …it has a strong relationship with the people involved in early stages of the iron and steel industry, although it appears that residual fabric has been so modified that it can no longer provide evidence of this association.

Criterion (c): [Aesthetic] …it was aesthetically distinctive in appearance until demolition in 1924. The furnace exemplified technical innovation and achievement in the early 20th Century.

Criterion (d): [Social] …it may provides insights into the industrial environment and associated work practices together with the social condition of the group of people in the Lower Hunter area in the early 20th Century and during the First World War.

Criterion (e): [Scientific] …it may possibly retain some potential to contribute to the understanding of the evolutionary history of the steelworks site, although the authorities suggest that it may contain no material evidence.

Criterion (g): [Rarity] …although no material evidence appears to have survived, precinct symbolises a significant process of considerable importance in the history of the BHP Steelwork's iron and steel making industry. The process was unique during its short production life and reflected:

- an *ad hoc* approach to a temporary national problem; and
- the ability of BHP to respond to a short-term need and to national/Government concerns.

3.2.4 Early Steel-Making and Product Management Precincts:

Original Open Hearth Furnaces;
No 1 Bloom Mill and Rail Mill;
Steel Foundry;
Open Hearth Change House;
Mould Conditioning Building.

3.2.4.1 Overview

These precincts represent the chain of production of steel from smelted iron from the inception of the BHP Steelworks, based around the Open Hearth Furnace. By the end of 1915, three open hearth furnaces were in operation and within two years the number had more than doubled. Open hearth steelmaking was fairly conventional technology at the time and the open hearth process produced ~31 Mt of steel over the 50 years of its operation. Output from the Open Hearth Furnaces was cast into blooms and ingots for further processing, one of the earliest contracts for processed steel being the supply of rail for railway construction, while steel was also critical to the war effort and to manufacturers of war material and during wartime in the absence of imported steel and in the reconstruction and domestic growth period that followed, for domestic applications.

3.2.4.2 Detail

The 'early steel-making and product management precincts' are significant because:

Criterion (a): [Historical]

…they represent the first large scale and heavily mechanised undertaking for the production of steel, in a chain of production that included both processing of raw product for external marketing to foundries and as a base for in-plant secondary rolling/re-processing primary working of product (the Rail Mill, Steel Foundry). The specific type of production was significantly associated with early industrial development in the Newcastle area and predicated by State and National demand. It demonstrates the initial stage of evolutionary use and development from 1917 to the closure of the steelworks. Similarly, the Mould Conditioning Plant and the Open Hearth Change House made significant contributions to the smooth operation of the steel-making process by respectively maintaining moulds for managing molten product and catering to the socio-industrial needs of the workforce.

Criterion (b): [Historical]

…they have a strong relationship with the people involved from early stages of the iron and steel industry and throughout the life of the steelworks.

Criterion (c): [Aesthetic]

…of its landmark qualities and particular technology, in representing, as a discrete group and in combination with other mills and processes, an aesthetically distinctive class of operations dedicated to the manufacture and primary and secondary processing of steel. It contains elements that exemplify particular processes and function uniquely identified with the production of steel goods.

Criterion (d): [Social]

…of its association with the creation of employment and the identifiable social fabric of such suburbs as Waratah and Mayfield, while peripherally stimulating the development of communities in Newcastle and the Lower Hunter areas that profited from contracts and supplies . The Open Hearth Change House was an early example of corporate concern for employee conditions although post-dating by about 10 years the development of a similar facility at the Sulphide Corporation at Cockle Creek.

Criterion (e): [Scientific]

Has the potential to yield archaeological information regarding the location and incidents of building and plant, to compliment information available from archival documents and archival photographs.

Criterion (g): [Representativeness]

Has attributes of a particular technology specific to the evolution of the steel making industry in Australia and the associated activities of value adding to raw product through primary processing.

3.2.5 Power and Operational Services Precincts:

DC Substation;
Original Timber Wharves;
AC Saltwater Pumphouse;
Power House.

3.2.5.1 Overview

These precincts record the location of facilities that were critical from inception of planning, to the operation of the BHP Steelworks and to the functions of the Study Area in particular. The wharves were an early development of the BHP Steelworks, allowing delivery of incoming plant, equipment and components and subsequently provided the foundation of product delivery. The electricity production facilities reflect the independence of the development and the evolution of industrial supply technology, to which the pump house was inextricably linked in its supply of water for boilers throughout the plant for steam generation and for cooling purposes in a superheated technology.

3.2.5.2 Detail

The 'Power and operational services' precincts are significant because:

Criterion (a): [Historical]

..of their importance as peripheral functions of the total steel manufacturing process, in the supply of electric power, water and a platform for transport into and from the plant. The electrical facilities importantly reflect the changes in technology over the life of the plant, while the evolution of wharfage accurately reflects the rapidly increasing transport demands of the plant.

Criterion (b): [Historical]

..by their integration within the total plant structure, they derive a strong relationship with the people involved in the early steel making industry and the associated secondary industries, established in the Newcastle and Lower Hunter area.

Criterion (c): [Aesthetic]

…although not generally aesthetically distinctive, the power and water supply facilities demonstrate significant initiative and technological responsiveness in their establishment and evolution.

Criterion (d): [Social]

…of their association with the provision of electric power to nearby settlements and into the Newcastle power supply and social fabric of Newcastle and the Lower Hunter areas created from that work.

Criterion (e): [Scientific]

…they have the potential to yield archaeological information regarding the location and incidents of the building and plant to complement information available from archival documents and archival photographs.

Criterion (g): [Representativeness]

…they have attributes of particular technologies specific to the evolution of the steel making industry in Australia and the associated activities of value adding to product for direct consumption.

3.2.6 The Precincts of the Final Evolutionary Stage of the Process:

No 4 Blast Furnace; BOS Plant.

3.2.6.1 Overview

These precincts record the location and subsurface structural technology of the two elements that contributed most significantly to the modernisation of production techniques at the BHP Newcastle Steelworks in the mid-20th Century. Each plant represented the then cutting edge of production technology:

- the No 4 Blast Furnace allowing consideration of the retirement without production loss of No's 1 and 2 Blast Furnaces In turn, the No 4 Blast Furnace underwent a series of modifications that maintained its pre-eminent technological position; and

- the BOS Plant was the first basic oxygen steel making hearth constructed in Australia and was a technological quantum leap over the previously employed open hearth technology in its direct control and monitoring of oxygen levels throughout the steel-making process. Its introduction allowed the retirement of the open hearths, of which 17 were in operation at the time of its introduction.

3.2.6.2 Detail

The 'No 4 Blast Furnace and BOS Plant' precincts are significant because:

Criterion (a): [Historical]

…at once, they represent the adoption and implementation of advanced technology respectively in iron-smelting and steel-making, the progressive improvement in their processes and operation and the terminal form of both processes at the BHP Newcastle Steelworks.

Criterion (b): [Historical]

…they embody the strong relationship with the people involved in the steel making industry in Newcastle in its most advanced form and reflect the adaptability of the plant workforce, many of who were employees of long standing and facilitated the dramatic technological changes associated with the introduction of both plants. In the later history of the plant, more than at any other time, the plant and its principal processes increasingly involved the contribution of people and undertakings in the Newcastle and Lower Hunter area as contractors and service providers.

Criterion (c): [Aesthetic]	…of their landmark qualities and, as they evolved and were modified, represented the cutting edge of technology in the smelting of iron ore and the subsequent manufacture of steel.
Criterion (d): [Social	… in their continuation of the modernisation of the process at the BHP Newcastle Steelworks, they were integrally associated with the maintenance of employment and the generation of related secondary industries and the social fabric of Newcastle and the Lower Hunter areas created from that work.
Criterion (e): [Scientific]	…they have the potential to yield archaeological information regarding the location and incidents of the building and plant to compliment information available from archival documents and archival photographs.
Criterion (g): [Representativeness]	Has attributes of a particular technology specific to the evolution of the steel making industry in Australia and the associated activities of value adding to product for direct consumption.

3.2.7 Summary

The significance of the Study Area and its individual elements is summarised in terms of **Section 3.1** in **Table 3.1**.

Table 3.1 - Summary of Assessment of Significance

Precinct of the –	*Against Technical Criteria:*		*Explanatory*		
	Classification:	*Evaluation:*	*Grading*	*Degree:*	*Level:*
…Study Area, as a whole	Historical (a), (b),	Representative (g)	Not applicable	Representative	Local*
	Aesthetic (c)	Representative (g)			
	Social (d)	Representative (g)			
	Scientific (e)	Representative (g)			
…Hunter River Smelting Co	Historical (a), (b),	Representative (g)	Exceptional	Representative	Local*
	Aesthetic (c)	Representative (g)			
	Social (d)	Representative (g)			
	Scientific (e)	Representative (g)			
…Early iron-smelting & product management: No 1 Blast Furnace No 1 Blower House No 1 Pig Mill No 2 Blast Furnace No 3 Blast Furnace	Historical (a), (b),	Representative (g)	High	Representative	Local*
	Aesthetic (c)	Representative (g)			
	Social (d)	Representative (g)			
	Scientific (e)	Representative (g)			
Ferro-Manganese Blast Furnace	Historical (a), (b),	Rare (f)	High	Rare	State
	Aesthetic (c)	Rare (f)			
	Social (d)	Rare (f)			
	Scientific (e)	Rare (f)			
…Early steel-making & product management: Original Open Hearth Furnaces, No 1 Bloom Mill and Rail Mill Steel Foundry Open Hearth Change House Mould Conditioning Building	Historical (a), (b),	Representative (g)	High	Representative	Local*
	Aesthetic (c)	Representative (g)			
	Social (d)	Representative (g)			
	Scientific (e)	Representative (g)			
…Power and operational services: DC Substation Original Timber Wharves AC Saltwater Pumphouse Power House	Historical (a), (b),	Representative (g)	High	Representative	Local*
	Aesthetic (c)	Representative (g)			
	Social (d)	Representative (g)			
	Scientific (e)	Representative (g)			
…Final evolutionary stage of the process: No 4 Blast Furnace BOS Plant	Historical (a), (b),	Representative (g)	High	Representative	Local*
	Aesthetic (c)	Representative (g)			
	Social (d)	Representative (g)			
	Scientific (e)	Representative (g)			

* Where used in the above Table, the term 'Local' is defined to include the Newcastle urban area and the Hunter Valley, and the Central Coast, Mid-Coast and Central and Northern Tablelands areas of the State.

4.0 CONDITION, INTEGRITY AND IMPACT

This section addresses matters that combine with the assessment of significance to allow a formal *Statement of Heritage Impact* to be appropriately validated. *Condition* considers the physical state of the fabric of the resource and its potential for survival. *Integrity* observes the degree to which the residual material evidence is an appropriate representation of the resource in its original form. *Physical Impact* assesses the nature and extent to which the resource will be modified as the result of the projected development.

4.1 CONDITION

The condition of heritage resources and/or individual elements that have been identified above is assessed on a five-stage scale, that is to say:

[i.] *intact*, where the material evidence allows a complete recording of the resource without archaeological hypothesis;

[ii.] *substantially intact*, where the material evidence is incomplete but the recording of material evidence will be sufficient to allow an accurate archaeological reconstruction, with hypotheses based on the archaeological record only;

[iii.] *standing ruin*, where the material evidence is incomplete and the recording of material evidence will be sufficient to define the footprint of the resource and some of its elevations and features but will be insufficient to allow an accurate archaeological reconstruction of the resource without hypotheses based on the archaeological record and on a range of outside sources;

[iv.] *ruin*, where the material evidence is incomplete and the recording of material evidence may be sufficient to define part, or the whole, of the footprint of the resource but will be insufficient to allow an archaeological reconstruction of the resource/its features, perhaps spatially and certainly vertically, without hypotheses based on the archaeological record and on a range of outside sources, and in circumstances where the validation of the reconstruction cannot be assured; and

[v.] *archaeological site*, implying a mostly sub-surface residue, where the material evidence suggests the former presence of an archaeological resource that cannot be defined without sub-surface investigation.

4.2 INTEGRITY

The integrity of archaeological resources and/or individual elements that have been identified above is assessed on a five-stage scale, that is to say:

[i.] *Intact*, where the resource has remained virtually unchanged its form and/or design and/or function can be totally discerned from the material evidence;

[ii.] *Minor Modification*, where the resource has been modified or deteriorated cosmetically and/or in a manner that does not inhibit the discernment of its form and/or design and/or function by archaeological interpretation of the material evidence;

[iii.] *Material Modification*, where the resource has been modified so that its form and/or design and/or function cannot be discerned only by archaeological interpretation and without reference to external sources;

[iv.] *Major Modification*, where the resource has been so modified that attempted discernment of its form and/or design and/or function cannot be achieved by archaeological interpretation of the material evidence and requires a heavy reliance on external sources and in circumstances where discernment one or more elements may be equivocal; and

[v.] *None*, where the integrity of the resource has been completely destroyed and the evidence for its form and/or design and/or function is totally external.

4.3 SUMMARY OF CONDITION AND INTEGRITY

The condition and integrity of the heritage resources of the Study Area is summarised in **Table 4.1**.

Table 4.1 - Summary of Condition of Resources

Resource	Condition	Integrity
Study Area Surface Generally	Archaeological Site	Material Modification
Hunter River Copper Smelting Works	Archaeological Site	Major modification
No 1 Blast Furnace Precinct	Archaeological Site	Major modification
No 1 Blower House Precinct	Archaeological Site	Major modification
No 1 Pig Mill	Archaeological Site	Major modification
No 2 Blast Furnace Precinct	Archaeological Site	Major modification
Ferro-manganese Furnace Precinct	Archaeological Site	Major modification
Original Open Hearth Furnace Precinct	Archaeological Site	Major modification
No 1 Bloom and Rail Mill Building Precinct	Archaeological Site	Major modification
Steel Foundry Precinct	Archaeological Site	Major modification
DC Substation Precinct	Archaeological Site	Major modification
Original Timber Wharves Precinct	Archaeological Site	Major modification
No 3 Blast Furnace Precinct	Archaeological Site	Major modification
AC Saltwater Pump House Precinct	Archaeological Site	Major modification
Power House Precinct	Archaeological Site	Major modification
Open Hearth Change House Precinct	Archaeological Site	Major modification
Mould Conditioning Building Precinct	Archaeological Site	Major modification
No 4 Blast Furnace Precinct	Archaeological Site	Major modification
BOS Plant Precinct	Archaeological Site	Major modification

4.4 PHYSICAL IMPACT

This statement of physical impact acknowledges at the outset that prior to the preparation of this document, the buildings formerly located on the Study Area have been demolished to the level of ambient ground. This document further acknowledges the present application of exceptions to ss139(1) and (2) created by the Heritage Council pursuant to s139(4) of the Act in respect of the foundations of standing buildings and the devolution of the power to local government authorities to permit the demolition/modification of standing buildings. Apart from the matters falling within the framework of the above concessions, the re-development of the Study Area that is presently projected will result in the:

- excavation and/or filling of the surface/sub-surface in association with the construction of wharves, a container storage area and associated buildings, and an industrial subdivision involving:

  - excavation to a depth at one location of ~2.0 metres, but averaging less than 1.0 metre, across substantial parts of the Study Area; and

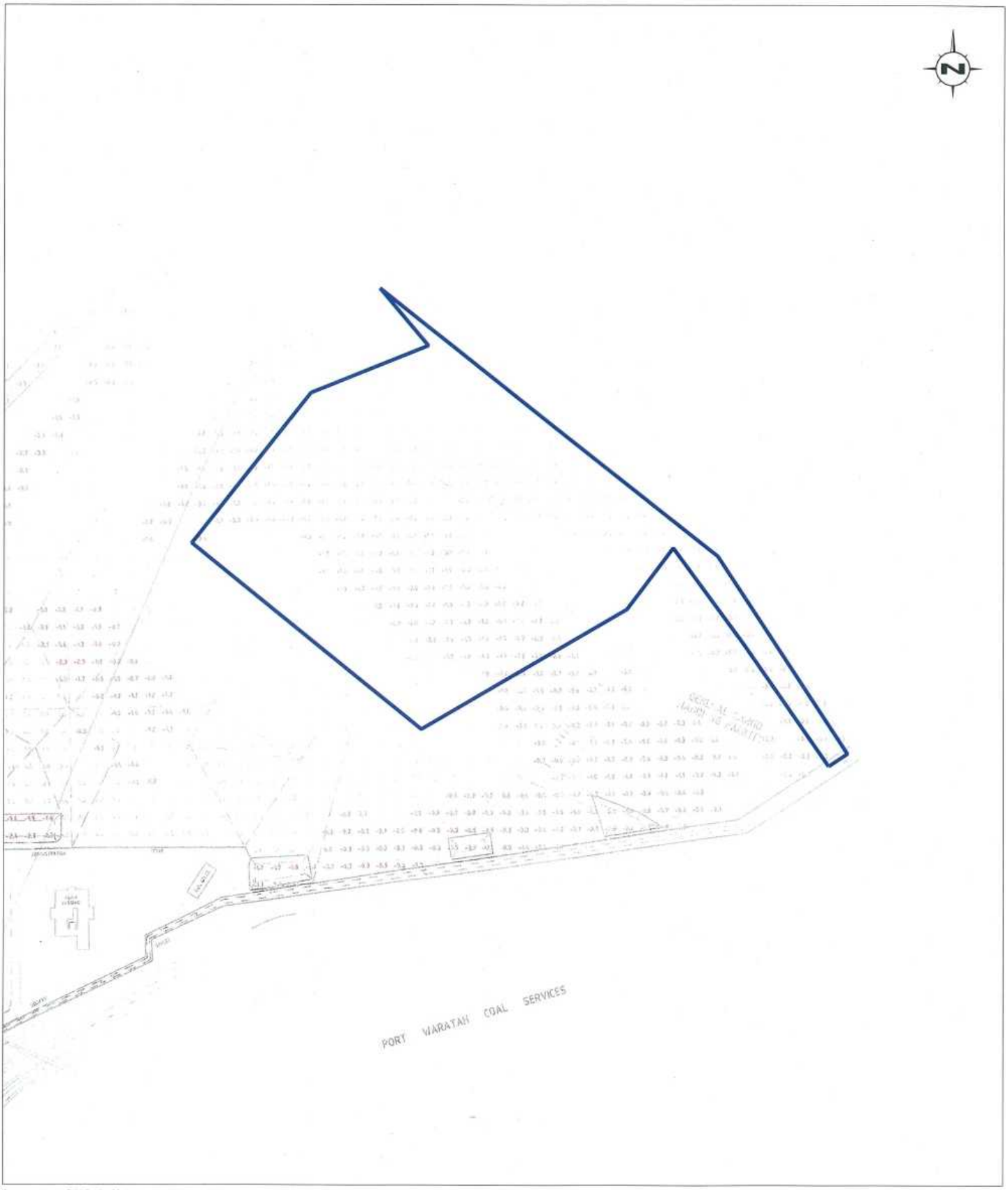
  - the use of clean 'cut' material and additional clean fill to cover the balance of the Study Area surface, prior to surface sealing;

- excavation in discrete areas, not presently identified, for footings and relevant services for the above developments; and

- the movement of machinery, vehicle and workers across the exposed surface of the Study Area pre- and post-excavation, in the construction process.

The footprint of past use and incidents of the projected development is shown on **Figures 1.2** and **2.1**. The spatial extent and depth of proposed excavations across the Study Area is shown on **Figure 4.1**.

The impact of proposed development upon the heritage values of the Study Area are addressed in the formal Statement of Heritage Impact at **Section 6**.



Source: BHP Billiton

0 100 200 400m
1:7500

Legend
Heritage Precinct Area

FIGURE 4.1

Spot Excavation Depths
Across Cut Area Detail

5.0 ISSUES AND RECOMMENDATIONS

This section defines the issues for management of the heritage resources of the Study Area in the light of **Section 4.4** and the evidence contained in this study that has contributed to the Statement of Heritage Impact.

5.1 ISSUES AND OPTIONS FOR SITE MANAGEMENT

Ideally, culturally significant archaeological resources might be conserved *in situ* within the framework of the Burra Charter. Such a course is frequently impossible or impractical and questions are posed by the conflicting claims of cultural heritage on the one hand and progress and development on the other. Relevant to the concurrent questions of site conservation and site management/usage are the following matters:

- *heritage legislation*, the major implications of which are summarised in **Table 5.1**. In particular this summary addresses the implications of the *Heritage Act* 1977 (NSW) and the *Environmental Planning and Assessment Act* 1979 (NSW);

Table 5.1 - A Summary of Statutory Provisions (NSW)

The *Heritage Act*, 1977 (NSW)…	provides for the protection of historic heritage and provides the process and criteria for listing of heritage deposits and/or relics that are of State significance on the state Heritage Register and those that are of Local significance on the State Heritage Inventory. Archaeological sensitivity and the potential for heritage value may be indicated by historical research and/or site-based archaeological study. Where historical research and/or archaeological study indicates sensitivity, the discovery of relics is highly likely if the ground surface is disturbed. The Heritage Act defines a relic as: *Any deposit, object or material evidence -* *(a) which relates to the settlement of the area that comprises NSW, not being Aboriginal settlements; and* *(b) which is 50 or more years old.* The Act further provides statutory protection from disturbance/destruction of sites and relics in a range of descriptions (ss. 24-34, 35A-55B, 130, 136-7, 139) and for their registration of listing (ss. 26(2)(b), 35A, 36, 37, 44). In particular, it provides that no disturbance or excavation may proceed for the discovery of relics except with an Excavation Permit and that an excavation permit is required if a relic is: • listed on the State Heritage Register (s60); and • not listed on the State Heritage Register (s. 140).
The *Environmental Planning and Assessment Act* 1979 (NSW)…	contains similar protective measures to those contained in the *Heritage Act*. The act also provides for sites to be in Local and Regional Environmental Plans, as sites in development control plans or subject to development controls and/or as subject to planning controls or additional conservation provisions (ss.24-72, 76).

- *the cultural significance* of archaeological resources. In present circumstance, cultural significance of the Study Area as a whole has been evaluated to a mainly representative degree at the local level. Individual elements within the Study Area have been evaluated generally at a moderate to provisionally exceptional grade, at a generally representative degree and at local level. In distinction, the site of the Ferro-Manganese Furnace has been provisionally assessed at a rare degree and State level;

- *the condition and integrity* of residual archaeological fabric. The condition of the cultural heritage resource of the Study Area has been evaluated as an 'archaeological site' and its integrity as 'major modification/none';

- *the nature and potential impact* of the proposed re-development of the Study Area, that is to anticipate that:

  - alteration/penetration of the present ground surface will disturb and/or modify and/or expose the residual sub-surface context, possibly containing material evidence;

  - peripheral activities (eg: movement of vehicles and plant on the site) have the potential to disturb, damage or destroy residual material evidence;

  - construction will result in penetration of the surface at predictable locations;

  - proposed filling of part(s) of the residual surface will modify the resource by concealing its attributes;

- the formal *Statement of Heritage Impact*, which is summarised as:

  - the projected development will result in modification of the heritage landscape of the Study Area and the context of the elements that collectively confer significance on the Study Area;

  - the impact on the heritage values of the Study Area will be discernible to a mainly representative degree at the local level; and

  - the effect of re-development may be mitigated by archaeological recording of the material evidence, integrating recording the archival material and recording and salvaging artefacts.

The options for conservation management that are theoretically available to address these issues range from taking no conservation management action to preserving all elements of archaeological resource *in situ*:

Option 1: ***Taking no conservation management action*** would (theoretically) allow development to proceed unobstructed but would almost certainly result in the destruction or irretrievable modification of the archaeological/heritage resource. In that the archaeological resource is non-renewable, such an option might result in the loss not only of the archaeological resource but also of the opportunity of recording and interpreting the resource and thereby preserving:

- for future study, an opportunity to incorporate data about the resource into further studies; and

- the present and future, a tangible account of the heritage values of the Study Area.

In present circumstances, this option is considered inappropriate.

Option 2: ***Preserving all elements of the archaeological resource*** would, on the other hand, restrict or prevent any modification or the destruction of the resource and thereby secure the archaeology at the expense of the projected re-

development, in an environment where the existence and implications of any such resource would not be properly investigated, evaluated or recorded.

In present circumstances, this option is considered inappropriate

Option 3: ***Alternative courses*** lie in:

1. ***varying (where necessary) projected or future development*** to minimise impact on the archaeological resource, and/or

2. ***archaeological investigation and recording***, with or without further excavation, of any part of the resource that has the potential to be disturbed, damaged or destroyed by development, by plane survey, text, plan and elevation drawings, and photography, and/or

3. ***archaeological monitoring*** of the development process, or

any appropriate combination of the above.

The result of such alternative courses would be that either elements of the archaeological resource would be conserved or that those modified or destroyed would be fully and appropriately recorded and the nett loss in heritage values would be minimised.

In the present circumstances, the combination of components 2 and 3 of this option is considered an appropriate conservation management action.

5.2 HERITAGE THEMES

The heritage values of individual heritage elements and precincts may derive significance as the result of what they contribute the cultural essence of, and/or the reflection or consequence cast on them by, their context and environment. Consideration of heritage values in this context involves an appreciation of the underlying historical influences that have shaped and continue to shape the area. Historical themes have been developed to allow categorisation of the major forces or processes that have historically contributed to the development of a heritage context or environment and provide a framework within which the heritage significance of an item can be demonstrated.

Historical themes are considered at National, State and local levels:

- the nine National themes address broad issues of the development of Australia as a nation, with classifications related to Australia's natural evolution, peopling the nation, developing a range of economies, settling the country, work, education, government, cultural development and the phases of life in Australia;

- the 38 State themes, sub-classified under the National themes, address:

  - (Australia's natural evolution) the natural environment;
  - (peopling the nation) Aboriginal, convict and ethnic origins, and migration;
  - (developing a range of economies) agriculture, commerce, communication, the cultural landscape, events, exploration, fishing, forestry, health, industry, mining, pastoralism, science, technology and transport;
  - (settling the country) urbanisation, land tenure, utilities and accommodation;
  - (work) labour;
  - (education) education;

- (government) defence, government and administration, law and order and welfare;
- (cultural development) domestic life, creative endeavour, leisure, religion, social institutions and sport; and
- (the phases of life in Australia) birth and death, persons.

Local themes reduce the National and State themes to their association with and/or impact upon the activities of local society and the inter-relationships between people, social groups, the environment and their cultures and values.

On the basis of the historical and archaeological research and with reference to themes adopted for use in the NSW heritage management system, the Study Area (as the area of foundation and evolution of manufacturing and primary processing of the BHP Steelworks) is material to the themes set out in **Table 5.2**.

Table 5.2 – Relevant Heritage Themes

National	State	Local Application
(1) Peopling Australia	Ethnic influences	Activities in the post-World War II period, absorbing and integrating into the workforce large numbers of immigrants who brought to the workforce a cross-section of working and social culture not in evidence at the inception of the project.
	Migration	In the immediate post-War period, many of the immigrants were likely to have been displaced persons whose first residence in Australia was at the Greta Migrant Camp.
(2) Developing local, regional and national economies	Commerce	The BHP Steelworks was the most extensive industrial development ever undertaken in the Hunter region. At inception, the BHP Steelworks involved advanced technology in solving problems of site establishment, and the application of cutting edge technology in its plant. High technology was the motivation for the evolution of the site and the plant over its near-century of existence. Activities involved the full range of raw materials receival, storage and management; processing, manufacturing and value-adding; and delivery facilities with integrated transport services. It further endowed Newcastle with an identifiable cultural (industrial) landscape on the southern bank of the Hunter River and in its frontage to major thoroughfares, while imprinting its worker ethic indelibly on the consciousness of the city and the country in such widely published scenes such as ‘;the change of shift’, ‘tapping the furnace’ and ‘the rolling mill’.
	Environment – Cultural Landscape	
	Industry	
	Technology	
(3) Building settlements, towns and cities	Towns, suburbs and villages	The BHP Steelworks was associated with the establishment and development of: • Newcastle as an industrial city, the primary steel-producing centre in Australia city and as a centre of National strategic importance; and • at the local level was instrumental in motivating the growth of the Waratah/Mayfield area of the city as a dormitory suburb principally occupied by its employees.

Table 5.2 – Relevant Heritage Themes (cont)

National	State	Local Application
(4) Working	Labour	Activities in: • providing large-scale employment opportunities for about 75 years for skilled and non-skilled labour; and • in absorbing for its labour requirements large numbers of immigrants, particularly after World War II.
(5) Governing	Defence	Activities in both World Wars in responding to the call for efficient production of steel, in World War I for ferro-manganese and in World War II for its part in the manpower movement and for providing, in Essington Lewis, the man equipped to oversee and manage National productivity.
(6) Developing Australia's cultural life	Domestic life	Activities associated with living and working in the Waratah/Mayfield suburban area, associated with the co-location of the BHP Steelworks.

5.3 RESEARCH QUESTIONS AND RESEARCH DESIGN

5.3.1 Research Questions

In the investigation of the archaeology of the Study Area, attention will be directed to obtaining responses to the following research questions:

[i.] What information can the archaeological/material evidence provide about:

a) the technology employed at various stages in the industrial development, evolution and operation of the Study Area?
b) the social component of the operation of the BHP Steelworks in terms of people at work, and people interacting with a large industrial undertaking?

[ii.] Do the footprints of and in the various precincts individually and collectively reveal specific details that complement or distinguish archival records and the historical context?

[iii.] What can the material evidence and artefacts reveal of the work practices and techniques of people engaged in working in the Study Area, particularly in the period before 1930?

[iv.] How does the material evidence reflect the changing and/or evolving use of structural developments in the Study Area?

[v.] Does the evidence of people in the industrial landscape in the Study Area differ from the evidence of people in other industries in the Newcastle area?

[vi.] Can all, or any, different stages in the use of the Study Area and of individual precincts be determined from the material evidence?

[vii.] Is there any evidence that points to ethnic differences in the workforce, and can this be related to specific periods?

5.3.2 Research Design

Research of the Study Area has been designed on the basis of:

- the archaeological and historical contexts of the Study Area;
- consideration of the potential fabric of the Study Area and its components;
- the integration information revealed in all elements of context;
- the assessment of the significance of the archaeological material;
- the appraisal of the condition and integrity of the archaeological resource;
- appreciation of the actual and heritage impacts of the proposed development;
- acknowledgement of the issues and options for management of the resource;
- the heritage themes relevant to the Study Area; and
- the research questions that have been posed in respect of the Study Area in the light of its relevant heritage themes.

It is recommended that any disturbance of the surface area of the Study Area should be within the protocols of the following Research Design:

1. In general, in connection with the development, the attention of the developer and all contractors, sub-contractors and employees is directed to the provisions of the *Heritage Act* 1977 (NSW) and in particular to:

    a) the definition of relic under that Act;

    b) the provisions of sections 24-34, 35A-59, 130, 136-7 139 and 146 of that Act;

    c) the requirement for, and the conditions that may attach to, a grant of an Excavation Permit under s60 of the Act in respect of a site that is registered on the State Heritage Register; and/or. s140 of the Act in respect of a site that is not so registered;

    d) the basic requirements that if:

        [i.] a relic is suspected, or there are reasonable grounds to suspect a relic in ground, that is likely to be disturbed damaged or destroyed by excavation;

        [ii.] any relic is discovered in the course of excavation that will be disturbed, damaged or destroyed by further excavation;

    the developer must notify the Heritage Office of New South Wales or its delegate and suspend work that might have the effect of disturbing, damaging or destroying such relic until the requirements of Heritage Office have been satisfied.

2. Having regard to the implications of **Recommendation 1**, that an Excavation Permit be obtained from the NSW Heritage Office prior to the commencement of re-development work on the Study Area to the extent that no excavation, modification or disturbance should commence prior to the issue of said Excavation Permit in the vicinity of the:

   - Hunter River Smelting Co Precinct;
   - No 1 Blast Furnace Precinct;
   - No 1 Blower House Precinct;
   - No 1 Pig Mill Precinct;
   - No 2 Blast Furnace Precinct;
   - Ferro-Manganese Blast Furnace;
   - Original Open Hearth Building Precinct;
   - No 1 Bloom and Rail Mill Building Precinct;
   - Steel Foundry Precinct;
   - DC Substation Precinct;
   - Original Timber Wharves Precinct;
   - No 3 Blast Furnace Precinct;
   - AC Saltwater Pump House Precinct;
   - Mould Conditioning Building Precinct;
   - No 4 Blast Furnace Precinct; and
   - BOS Plant Precinct.

   Such excavation should thereafter proceed strictly in compliance with such conditions as may attach to the said Excavation Permit, and further, according to additional protocols having regard to the definition of zones of Potential Archaeological Sensitivity in **Section 2.6** as follows:

   - Prior to the commencement of any such excavation work at any location of Potential Archaeological Sensitivity within the Study Area, the Corporation and/or its duly authorised officer(s), employee(s) and contractor(s) shall consult with the Archaeologist to determine the level of requirements that may exist for archaeological investigation.

     - The Archaeologist will communicate the classification of the location of such projected excavation as being of either '***High***' or '***Moderate***' Potential Archaeological Sensitivity.
     - The classification may be expressed by either or both of area and depth.
     - If directed by the Archaeologist, the Corporation will undertake exploratory or sampling excavations to clarify the level of sensitivity.
     - The classification of a location will be changed as appropriate during the course of the works if conditions are not as generally anticipated, and at the discretion of the Archaeologist.

   - At locations classified as zones of High Potential Archaeological Sensitivity, in general, excavations will be undertaken by excavator(s) fitted with mud bucket(s) or by such other methods (having regard to the nature, density and level of compaction of sub-strate) as are appropriate from both an operational and archaeological perspective. Such excavation(s) shall be undertaken, as determined to be appropriate in all the circumstances by the Archaeologist, under the direction or supervision of the Archaeologist[1]. Excavated material will be side cast to a spoil pile for archaeological examination. During the progress of the excavation the Archaeologist may, as required, direct that excavation be halted to allow observations and/or measurement and/or archival recording of the excavation, artefact(s) or material evidence. If the progressive results of excavation warrant

[1] The meanings of the terms 'direction' and 'supervision' are defined at Recommendation 3.

this action, the Archaeologist may change the classification of the location to one of Moderate Potential Archaeological Sensitivity.

- At locations classified as zones of Moderate Potential Archaeological Sensitivity, in general, excavation may proceed using excavator(s) fitted with toothed buckets or by such other methods (having regard to the nature, density and level of compaction of sub-strate) as are appropriate from both an operational and archaeological perspective. Such excavation(s) shall be undertaken, as determined to be appropriate in all the circumstances by the Archaeologist, under the direction or supervision of the Archaeologist. Excavated material will be side cast to a spoil pile for archaeological examination. The Archaeologist may, as required, direct that excavation be halted to allow observations and/or measurement and/or archival recording of the excavation, artefact(s) or material evidence. If artefacts or material evidence are exposed during construction that warrants this action, the Archaeologist may change the classification of the location to one of High Potential Archaeological Sensitivity.

- The Archaeologist may direct that excavated materials be sieved to a sieve size appropriate for the objects being encountered and the nature of excavated soils.

- In general, the nature of site remediation may preclude the entry of personnel into open excavations however, where consistent with occupational health and safety considerations, the Archaeologist may enter the excavation to take further observations, measurements, or excavate with hand methods.

3. Where used in Recommendation 2 and elsewhere in this document, the words:

   - 'direction…of the Archaeologist' shall be taken to indicate that the Archaeologist shall:

     - provide a briefing and induction to all contractors, sub-contractors and persons employed in excavation work in a particular work area. Such briefing and induction shall include detailed information about the nature and probable location of material evidence that is anticipated in the particular area, the style of excavation that may be undertaken in the particular area and instruction of the appropriate course of action in the event that material evidence is exposed;

     - survey work-in-progress at intervals that are regular and established by reference to the archaeological potential in the particular work area in order to be satisfied that the level of anticipated archaeological potential is being realised and that the excavation is appropriate to the actual archaeological and heritage values of the particular work area;

     - where necessary, provide revised operational instructions for excavation in the particular work area; and

     - be available at all times to consult on site with the relevant personnel to address specific issues revealed or anticipated as the result of work-in-progress.

   - 'supervision of the Archaeologist' shall be taken to indicate that the Archaeologist shall:

     - provide a briefing and induction to all contractors, sub-contractors and persons employed in excavation work in a particular work area. Such briefing and induction shall include detailed information about the nature and probable

location of material evidence that is anticipated in the particular area, the style of excavation that may be undertaken in the particular area and instruction of the appropriate course of action in the event that material evidence is exposed;

- be physically present on site to:
  - monitor work-in-progress in order to be satisfied that the level of anticipated archaeological potential is being realised and that the excavation is appropriate to the actual archaeological and heritage values of the particular work area;
  - provide guidance on the continuation, and style and location, of ongoing excavation in the particular work area;
  - expeditiously complete archaeological investigation and site recording of any exposed material evidence so as to cause minimal interruption of the work-in-progress; and
- where necessary, provide revised operational instructions for excavation in the particular work area;

4. In the planning of the project, the Corporation should provide time and resources for the completion of any heritage recording, investigation and study recommended below.

5. During the course of excavations, the operation of the excavator will be monitored and directed by the Archaeologist as set out in Recommendation 2 and to the extent that the archaeologist shall be responsible to direct operations in any particular area of work:

   a) to cease to allow timely and appropriate archaeological examination and archival recording to proceed; and

   b) in an appropriate orientation and/or from an appropriate angle or direction.

6. Where this is appropriate, the archaeologist will cause work to cease or be suspended in a specific area in order to allow detailed manual investigation. In a detailed manual investigation, the archaeologist will employ small hand tools such as trowels, brushes and the like, or alternatively the *planum* process.

7. The development will be monitored in the following manner:

   a) excavation and drill voids: progressively by inspection for remnant elements of former buildings, examples of former building materials and otherwise, all material evidence related to the use and/or occupation of the Study Area;

   b) spoil from excavation and drilling: for soil type and structure, to attempt to differentiate historical ground from reclamation; and

   c) spoil from excavation and drilling: for material evidence related to either the construction of former buildings or human occupation of buildings or the site. Where this is warranted, spoil may be sieved mechanically through a mesh of screen aperture appropriate to the size and nature of artefact(s) anticipated and the soil type.

8. *In situ* building elements or examples of building materials and substantial artefacts will be recorded:

a) by description of nature, type, fabric/material, shape, dimension and mass on a building elements index field sheet and in terms of found context in a building elements context field sheet;

b) by plan and section field drawings;

c) by archival photography in three formats (viz: colour and monochrome print and colour transparency); and

d) where relevant and/or appropriate, by the salvage of representative sample(s).

9. Artefacts will be conserved, identified and, where possible, analysed for implication, significance, provenance and post-depositional effects and recorded:

   a) in the field, individually by provenance, nature, type, fabric/material, shape, dimension and mass on an artefact recovery index field sheet and in terms of found context in a context field record sheet; and

   b) in post-fieldwork management, will be cleaned, catalogued according to typology, features and provenance, and interpreted in the context of the total excavation results.

10. The material, information and data produced in the field monitoring, recording and artefact management processes will be taken into the reporting of the archaeological study (see **Recommendation 11**).

11. Upon the completion of examination and analysis and cataloguing, artefacts will be appropriately conserved and packed, an inventory will taken of packing and all packed material will be deposited with the Corporation, or otherwise with such public repository as the Corporation may direct, for permanent archiving.

12. The results of monitoring, recording, analysis and inventory, together with plans and archival photographs, will be integrated into a report of which copies will be provided to the Corporation, the Heritage Office of NSW, the Newcastle Regional Library (Local History Section) and the State Library of NSW. One copy will also be set aside to be lodged with and remain as part of the deposit of artefacts.

13. Subject to the provisions of **Recommendation 1**, there presently appears to be no basis or reason for monitoring or future investigation of the balance of the Study Area.

14. Subject to the compliance with all of the above, there appears to be no reason for further constraint or modification of the proposed re-development on archaeological/heritage grounds.

6.0 STATEMENT OF HERITAGE IMPACT

This Statement of Heritage Impact forms part of this report and is made in respect of the Study Area defined in **Section 1** of this report. The Statement addresses the Study Area and its components in terms of the assessment of its/their significance determined in **Section 3** and its/their condition and integrity assessed in **Section 4.3**, in the context of projected physical impact described in **Section 4.4**. The Statement of Heritage Impact has been prepared, in common with this report, by Paul Rheinberger, Senior Archaeologist, Umwelt (Australia) Pty Limited, for Regional Land Management Corporation.

In general terms, the following observations are made concerning the planning and proposed realisation of the development:

> Having regard to the assessments of cultural significance, condition and integrity and the statement of the physical impact of the proposed development, it is suggested that there will be a limited impact upon the heritage values of the Study Area as the result of the projected re-development.
>
> The major impact on the residual material fabric of the Study Area will result from the modification of its ground surface by cutting and filling to achieve a uniform level described as 'Level 2' (L2). The cut-and-fill operation, the ramifications of which are illustrated on **Figure 4.1** will involve:
>
> a) excavation to a depth at one location of ~2.0 metres, but averaging less than 1.0 metre, across substantial parts of the Study Area; and
>
> b) the use of clean 'cut' material and additional clean fill to cover the balance of the Study Area surface, prior to surface sealing.
>
> The surface will also be broken episodically for trenching of essential services across the Study Area. On the other hand, substantial exemplary material evidence stands to be exposed by excavation, and identified.

On the basis of all of the above, the following statements are made:

1. The following aspects of the proposal respect or enhance the heritage significance of the Study Area for the following reasons:

a) the potential exposure of material evidence of the Hunter River Smelting Co Complex will enable the recording, definition, interpretation and comprehension of this important site, without destroying the whole of the resource;

b) the exposure of material evidence of the beds, footings and sub-surface structural elements of the various building precincts of the Study Area will allow the investigation, recording and interpretation of the technology used in the early 20th Century construction, without destroying the whole of the resource;

c) the proposed excavation of substantial parts of the Study Area will allow the salvage, repair/conservation and subsequent reinstatement and display of artefacts that may have been associated with the operation of the Hunter River Smelting Co Complex, the filling of the Study Area and/or the construction and operation of the various facilities within the Study Area from time to time;

d) recording, definition and modification to L2 will allow the conservation of plant and machinery beds and sub-surface structural and plant elements below L2, of which remains of the Hunter River Smelting Co Complex, blast furnace beds, pits

and floor elements of the Mould Conditioning Building, Open Hearth Building and BOS Plant Precincts and footings of other precincts are dominant and defining elements;

e) the proper reporting of the archaeology of the Study Area will put into the public domain information about the Study Area that either complements or confirms the historical material contained in archives and thus allows the creation of a more reliable reference resource;

f) the further excavation of the Study Area will do little more damage to the heritage resource than has been already effected in the demolition of the plant and buildings to ambient ground level;

g) the completion of its re-development will permit the interpretation of the former uses of discrete areas of the Study Area by signage and by marking on its surface treatment according to an interpretation plan to be developed out of the studies of the standing structures and the archaeology of the Study Area.

2. The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:

a) the proposed excavation will result in the modification of the surface and immediate sub-surface of the Study Area causing the exposure of material evidence and the displacement of some elements of material evidence from their *in situ* location. The reasons for excavation are as follows:

- the purposes for undertaking the re-development of the Study Area call for the reduction of the surface to level L2 and for the provision of an even horizontal surface;

- it is impractical and uneconomical to raise the level of the Study Area to the height of its highest point by reason, in the first instance of the flow-on effect upon related infrastructure and in the second instance of the amount of fill required;

- there is significant contamination of the immediate surface of large parts of the Study Area and excavation will facilitate the removal and remediation of those areas of contamination that are not to be covered by adequate depth of fill;

b) the potential impact of the proposed excavation on the heritage values of the Study Area will be mitigated by undertaking the field studies according to the methodology recommended in **Section 5**.

3. The following sympathetic solutions have been considered and discounted for the following reasons:

– filling the Study Area to the level of its highest point: this solution has been discounted because of the failure to address contamination issues and because the quantity of fill required would make the project uneconomical, having regard to the consequent need to fill the whole of the Closure Area to the same level.

4. Attachments:

– this Statement of Heritage Impact relies upon the attachments to the report generally.

5. References:

– the references used in the compilation of this Statement of Heritage Impact are detailed at **Section 7** of this report.

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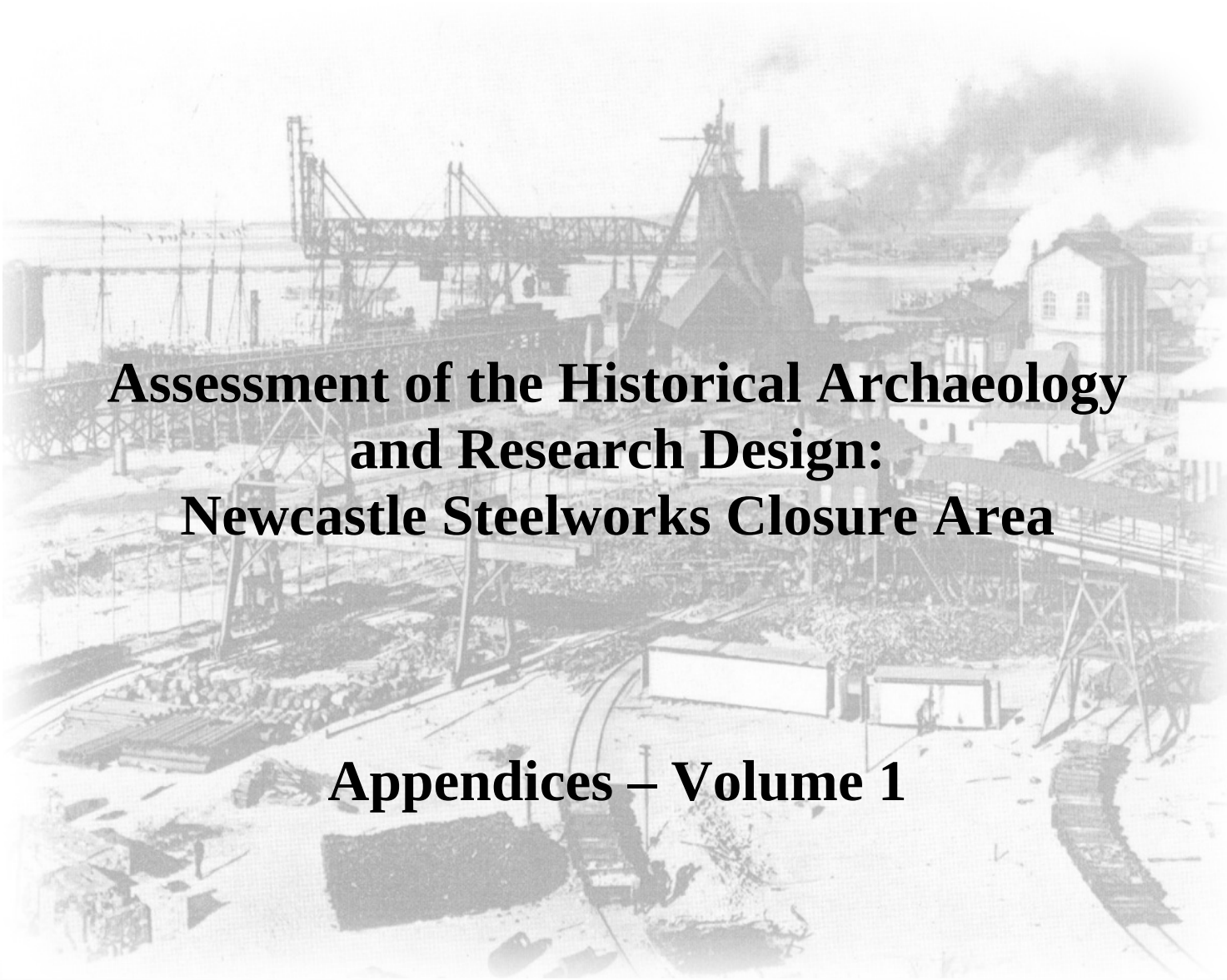
Regional Land Management Corporation



Assessment of the Historical Archaeology and Research Design: Newcastle Steelworks Closure Area

Appendices – Volume 1

May 2005

Prepared by:

Umwelt
Environmental Consultants

APPENDICES – VOLUME 1

APPENDIX 1

Archaeological Management Action Plan, 2004

CLOSURE AREA – FORMER BHP NEWCASTLE STEELWORKS

Archaeological Management Action Plan

Prepared by: **Umwelt (Australia) Pty Limited**		Authorised: **Peter Jamieson**
Prepared for: **Regional Land Management Corporation**		Authorised: **Paul Bender**
Title: **Archaeological Management Action Plan – Heritage Area**		
Page Number: 1	Issue Date: /07/04	**Project Identification – Excavation for Remediation, Site Levelling and Services Trenching**
Total Pages: 5	Issue Number: 1	

1.0 PREAMBLE

This Archaeological Management Action Plan (the Plan) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of, and in the anticipation of works to be undertaken by, the Regional Land Management Corporation (the Corporation) in its management of the site of the former BHP Newcastle Steelworks. The Plan is to be read in conjunction with 'Archaeological Management Action Plan: Non-Heritage Area, BHP Newcastle' *[Umwelt 2002]* (the AMAP 2002) prepared under instructions from BHP-Billiton Limited. The Plan has been prepared in compliance with Section 3(vi) of the AMAP 2002 and applies specifically to that area of the Newcastle Steelworks Closure Area (the Closure Area) described as the Heritage Area (as defined below and in Figure 1).

2.0 OBJECTIVE

The objective of the Plan is to ensure that the site preparation activities that are planned for the Heritage Area are undertaken so as to comply with statutory requirements and development consent conditions relating to the archaeological/heritage values that are mentioned in Section 3 below.

3.0 REFERENCES AND CONSTRAINTS

3.1 STATUTORY CONSTRAINTS

This plan acknowledges the constraints imposed by the *Heritage Act* (NSW) 1977 (the *Act*), and in particular:

s4 which defines 'relic' as 'any deposit, object or material evidence:
- [a] which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and
- [b] which is 50 or more years old.'

s139 which provides that where a person knows or reasonably suspects that the disturbance or excavation of land will or is likely to result the discovery, disturbance, damage or destruction of a relic, that person may only excavate in accordance with an excavation permit issued by the NSW Heritage Council pursuant to s140 of the Act.

s146 which provides that where person(s) are aware of or believe they have discovered or located a relic (whether or not an excavation permit has been issued by the NSW Heritage Council), they must:

[a] within a reasonable time thereafter, notify the location or discovery to the NSW Heritage Council unless they reasonably believe the Heritage Council is aware of the location of the relic; and

[b] as required by the Heritage Council, supply such particulars of the relic as it may reasonably require.

3.2 CONSENT CONDITIONS

The following consent conditions relate to archaeology and heritage:

6.3 The Applicant shall prepare and submit an Archaeological Management Plan for the Closure Area prior to the commencement of site preparation works. The plan shall be prepared in consultation with the Heritage Council and approved by the Director-General.

6.4 If during the site preparation and/or construction phases of the development, an unexpected archaeological relic is discovered, excavation shall cease and an excavation permit under the Heritage Act 1977, shall be obtained from the NSW Heritage Office.

3.3 ADMINISTRATIVE CONSTRAINTS

This plan also acknowledges the concerns and observations of the NSW Heritage Office (the Heritage Office) that:

- an Archaeological Assessment identifying the sub-surface archaeological resources of the whole of the closure area should be prepared;
- in the projected cut-and-fill operation on the closure area, filling is unlikely to have any impact on potential heritage resources;
- upon completion of the Archaeological Assessment, a research design should be completed in respect of the archaeological investigation and recording of the closure area; and
- an excavation permit must be obtained from the Heritage Office before projected work is undertaken in proximity to any potential heritage resource.

3.4 QUALIFICATIONS

3.4.1 Definitions

Where used in this document, the following words and phrases consistently have the following meanings:

Archaeological Assessment: Means a study undertaken to establish the heritage significance of a potential heritage resource according to the standardised criteria of the NSW Heritage Office, to identify the issues for heritage values arising associated with projected works and to make appropriate recommendations for the management of the resource.

Archaeological Management Plan: Means a document establishing management criteria and procedures that are applicable to specified archaeological units or zones that are defined in an archaeological zoning plan. The provisions of an archaeological management plan may be included within a heritage study or an environmental planning instrument.

Archaeological Potential: Means the degree to which material evidence is present on a study area and further the degree to which such material evidence presents an opportunity for research and interpretation. The assessment of archaeological potential usually is based on a study of the archaeological, historical and physical or spatial site contexts.

Closure Area: Means the whole of the area indicated on the attached **Figure 1**.

Demolition : And words directly derived from 'demolish', means destruction by the most effective means of the fabric of buildings, structural elements and items of fixed plant to ground level L1 and includes the finishing of residual elements trimmed and horizontal at or immediately below L1.

Excavation Permit: Has its statutory meaning within ss139-140 of the *Heritage Act* (NSW) 1977.

Heritage Area: Defines that area of the Closure Area indicated on **Figure 1**, that contains the precincts of the following buildings and/or relics located within the closure area that have been identified as heritage resources in previous studies, assessments and particularly in 'Conservation Plan for BHP Steelworks Port Waratah Site' *[EJE & Fenwick 1991]* (the Conservation Plan) and/or in 'Draft Archaeological Management Plan: BHP Steelworks Site, Newcastle, NSW' *[Umwelt 2001]* (the Management Plan) and/or 'Assessment of the Historical Archaeology and Research Design: Newcastle Steelworks Closure Area' *[Umwelt 2002]* (the Research Design):

- Hunter River Copper Smelting Works;
- No 1 Blast Furnace;
- No 1 Blower House;
- No 1 Pig Mill
- No 2 Blast Furnace
- Ferro-manganese Blast
- Furnace
- Original Open Hearth Building;
- No 1 Bloom Mill and Rail Mill Building;
- Steel Foundry;
- DC Substation;
- Original Timber Wharves;
- No 3 Blast Furnace;
- AC Saltwater Pump House;
- Power House;
- Open Hearth Change House;
- Mould Conditioning Building;
- No 4 Blast Furnace;
- BOS Plant.

Non-Heritage Area: Refers to the closure area to the exclusion of the Heritage Area, as shown on **Figure 1**.

Potential Heritage Resource/s: Describe/s the only locations on the closure area where historical research has indicated the possible presence of material evidence of former site use and/or occupation and/or functional structure/s that were constructed prior to 1952 and subsequently demolished, and describes the location of the following potential sites:

- No's 1, 2 & 3 Coke Oven Batteries;
- No 1 Pig Mill;
- 18" Structural Mill;
- Boilers;
- 9" & 12" Mill, and 10" Bar and Skelp Mill;

These potential resources have been previously identified by research, are located on **Figure 1** and were assessed in the Research Design.

Projected Work: Has the meaning described in detail in **Section 2.3.4** of this plan.

3.3.2 Heritage Values

This plan adopts the assessments of archaeological potential and heritage values, the identification and qualification of heritage precincts and the guidelines and directions proposed for the closure area in the Conservation Plan, as and to the extent modified by the Management Plan and the Research Design.

The projected work anticipated by this plan is specified directly to address those areas, precincts, buildings and relics identified as lying within the Heritage Area.

3.3.3 Application

This plan relates to the disturbance of the ground and site remediation works in those parts of the closure area that have been previously assessed as possessing archaeological potential and heritage value in the Conservation Plan and identified in Condition 6.1 of the Development Consent.

3.3.4. The Projected Work

With regard to the management of archaeological and heritage resources generally, this plan acknowledges that:

3.3.4.1 buildings and fixed plant within the Heritage Area will be demolished to the level of existing ground (L1). Other than in areas that require excavation for the purpose, or in the process, of:

3.3.4.1.1 remediation,
3.3.4.1.2 trenching for provision and/or reticulation or services, and
3.3.4.1.3 cutting as part of the cut-and-fill leveling process of the Closure Area,

it may be expected that material evidence existing below this level will not be disturbed, damaged or destroyed;

3.3.4.2 excavations remediation, trenching and/or cutting as detailed in **Sections 3.3.4.1.1** – **3.3.4.1.3** inclusive have the potential to modify, damage or destroy relics;

3.3.4.3 the total area requiring excavation within the Closure Area, and the projected excavation within the Heritage Area, is shown on **Figure 1**;

3.3.4.4 a substantial base archaeological resource exists in the form of plans and photographs maintained in the BHP Billiton archives and the reports of previous studies.

4.0 STRATEGIC ACTION PLAN

The following strategic actions are adopted, at the time(s) indicated, in connection with the heritage management of the projected work:

ACTION REQUIRED	TIMING
4.1 Adoption of this plan and submission of copy to the Director General for approval.	Prior to the preparation of site preparation works.

	ACTION REQUIRED	TIMING
4.2	As soon as possible after the adoption of this plan, an archaeological heritage assessment shall be completed in respect of each potential heritage resource and such assessment/s, a research design and application for excavation permit shall be lodged with the NSW Heritage Office in respect of the Heritage Area.	As part of the planning process and prior to the commencement of works in the Heritage Area.
4.3	The projected work shall not commence within the precinct of any potential heritage resource until an excavation permit shall have been issued by the NSW Heritage Office and shall proceed strictly within any conditions imposed by the Office in such excavation permit.	Pending issue of Excavation Permit by the Heritage Office.
4.4	Any proposed remediation and/or excavation undertaken in pursuance of an excavation permit will comply with the conditions and requirements of such excavation permit and such conditions and requirements will be incorporated into the relevant schedule or works.	At commencement of site preparation works and continuously throughout the projected work.
4.5	All personnel involved in demolition and remediation will be required to attend a comprehensive site induction, prepared by the Project Archaeologist, covering the heritage implications of the study area. The site induction will include a briefing on the requirements of the *Act*, in relation to relics and the proposed archaeological management strategies.	Prior to the entry of personnel onto the worksite – At commencement of site preparation works and continuously throughout the projected work.
4.6	The Project Archaeologist, reporting to the designated officer of the Corporation, will be responsible for the implementation of the Plan.	At commencement of site preparation works and continuously throughout the projected work.
4.7	Strategies 4.1 to and including 4.4 shall not constrain nor cause to be postponed the commencement of the projected work in the Non-Heritage Area, but subject always to the provisions of the AMAP 2002 and of the *Act*.	Immediate.

Adopted the day of 2004.

For and on behalf of Regional Land Management Corporation:

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