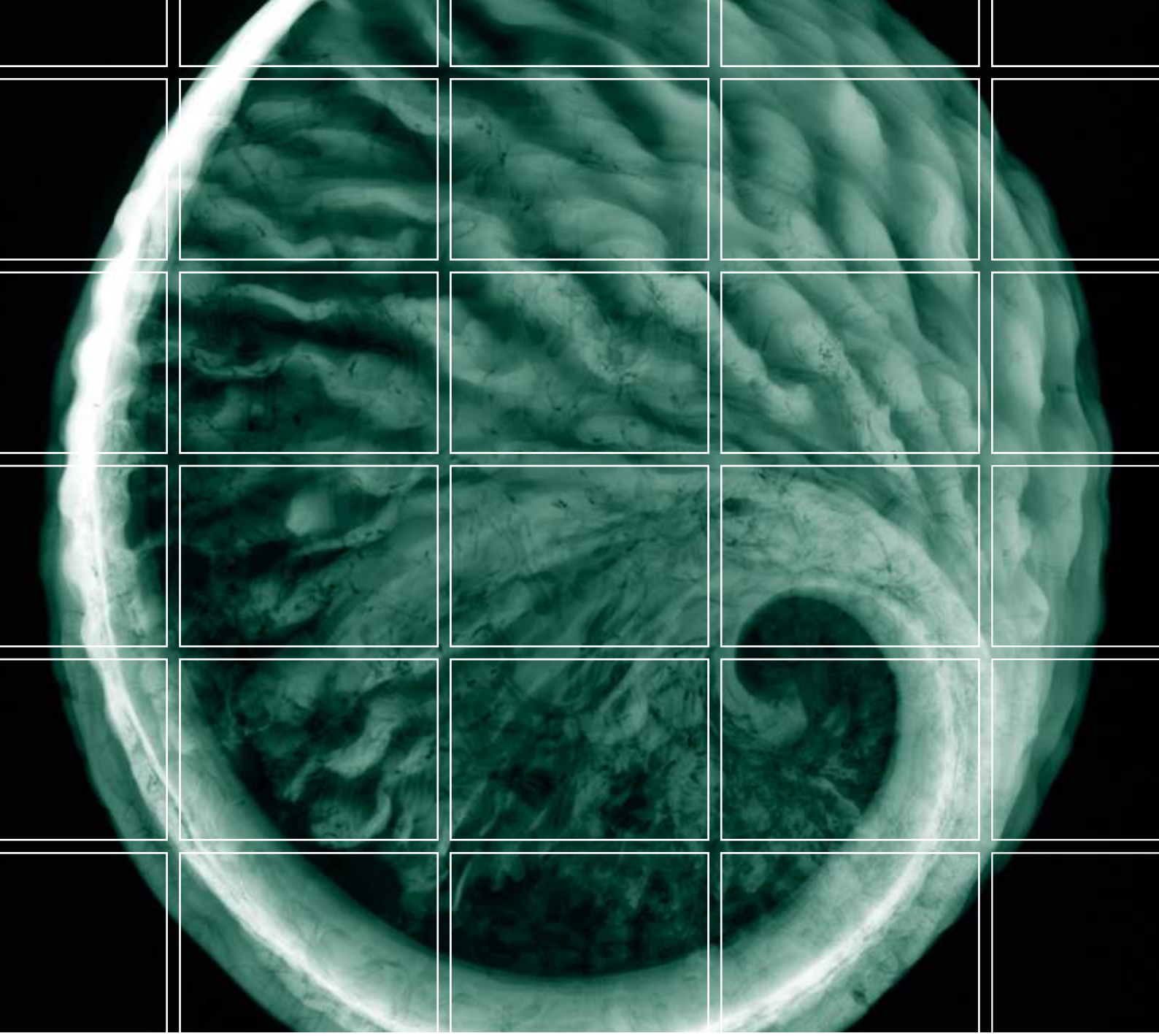

Incitec Fertilizers Limited
Cockle Creek

Heritage Assessment

for Manidis Roberts Pty Ltd

October 2008

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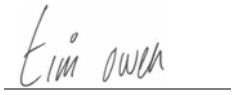
Approved by:	*Tim Owen*
Position:	Project Manager
Signed:	
Date:	*October, 2008*
Approved by:	*Steve Laister*
Position:	Project Director
Signed:	
Date:	*October, 2008*

Environmental Resources Management Australia Pty Ltd Quality System

FINAL REPORT

Manidis Roberts Pty Ltd

Incitec Fertilizers Limited
Cockle Creek

Heritage Assessment

October 2008

Reference: 0080481

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EXECUTIVE SUMMARY

Environmental Resources Management Pty. Ltd. Australia (ERM) was commissioned by Manidis Roberts Pty. Ltd. (Manidis Roberts), to prepare a Heritage Assessment (HA) and Statement of Heritage Impact (SoHI) for lands at the current site of Incitec Fertilizers Limited (IFL), Cockle Creek, NSW. These lands are subject to proposed development under Part 3A of the *NSW Environmental Planning and Assessment Act* (EP&A Act) 1979. This SoHI considers the historical archaeology and built heritage, as well as the Aboriginal heritage and archaeology of the study area. It assesses the potential impacts of the proposed works and identifies impact mitigation actions where required.

The study area is approximately 15 hectares of land in the vicinity of Boolaroo in the local government area of Lake Macquarie. On 22 July 2005 the site was issued with a declaration of remediation site under Part 3, Division 3 of the Contaminated Land Management Act 1997 (CLMA 1997) "The EPA may declare land to be a remediation site if the land has…been found to be contaminated in such a way as to present a significant risk of harm."

The overall aim of the heritage assessment is to ascertain whether there are any heritage values associated with the area that could potentially be affected by the proposed works, and provide relevant mitigation measures for impacts to these heritage values where necessary.

This heritage assessment identified several historic heritage concerns within the site. These concerns are generally associated with the study area's local significance and included: an unchanged chain of manufacture for phosphate fertilizer since the earliest phase of plant activity (c.1913); as well as several heritage buildings (1910s & 1950s) attesting to the early industrial landscape of the Hunter region. The implications and need for remediation at the site will impact on these heritage values.

In addition to the historical data, several Aboriginal heritage sites were identified in an AHIMS search in the vicinity of the IFL site, although none of these were located immediately within the study area. It was found that the study area has been too despoiled by industrial activities to yield any archaeological resources or Aboriginal objects.

The outcome is that this HIA identifies several aspects of local significance and heritage value within the site of IFL at Boolaroo. However, as many of these heritage concerns are outweighed by the health and safety issues identified as part of the remediation project, mitigation measures as suggested by this report should be implemented prior to demolition and remediation to ensure an accurate archival record of the land and plant's history.

ABBREVIATIONS

AHIMS:	Aboriginal Heritage Information Management System
Burra Charter:	Australian best heritage practice reference that provides guidance for the conservation and management of places of cultural significance (cultural heritage places).
CLMA:	Contaminated Land Management Act 1997
DECC:	Department of Environment and Climate Change
DGRs:	Director General Requirements
ERM:	Environmental Resources Management
HA:	Heritage Assessment
HIA:	Heritage Impact Assessment
IFL:	Incitec Fertilizer Limited
SHI:	State Heritage Inventory
SHR:	State Heritage Register
SOHI:	Statement of Heritage Impact
RNE:	Register of the National Estate

1 INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Manidis Roberts Pty Ltd (Manidis Roberts) to prepare a Heritage Impact Assessment (HIA) for Incitec Fertilizer Limited (IFL) lands, at Cockle Creek, which are subject to proposed development under Part 3A of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The HIA considers the potential historical archaeology and built heritage, Aboriginal heritage and archaeology of the study area, the potential impacts of the proposed works and identifies impact mitigation actions where required.

The current report provides the results of a site visit, comprehensive heritage value assessments, and heritage impact analysis as well as background historical research into the study area.

1.1 PROJECT AND PLANNING CONTEXT

IFL proposes to undertake demolition and remediation works at their 15 ha Cockle Creek site, located within the township of Boolaroo and in the local government area of Lake Macquarie. The current proposal involves the demolition of the existing manufacturing and distributing centre and associated facilities, and the remediation of soil and groundwater.

On the 6th March 2007 the Director General Requirements (DGRs) for environmental assessment were issued for the site. The requirements for the heritage portion are:

"The environmental assessment must include a Heritage Impact Assessment/Statement prepared in accordance with Statements of Heritage Impact guidelines issued by the NSW Heritage Office and Lake Macquarie Council requirements"

This report is in fulfilment of the requirements for the heritage portions of the DGRs.

1.2 THE STUDY AREA

This report focuses on the land currently home to IFL, fertiliser manufacturing and distribution plant. IFL's holdings are referred to as the site, study area or the IFL site throughout this report.

The site has been used by heavy industry since the late 19th century. The location of the study area (and the boundary/limit of the study) is provided in *Figure 1*.

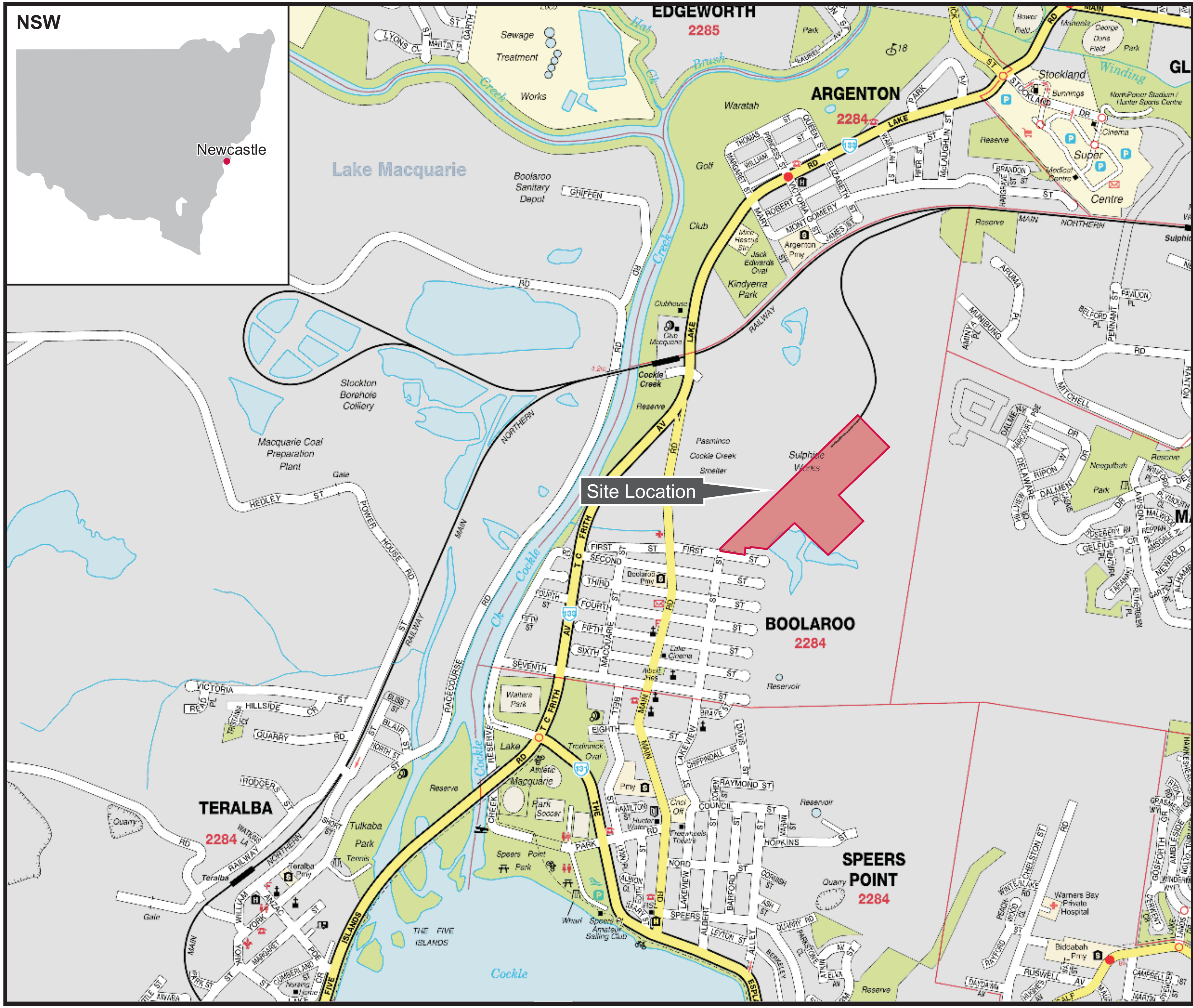

Figure 1
Location Map

Client:	Manidis Roberts		
Project:	Incitec Pivot Remediation and Demolition Heritage Assessment		
Drawing No:	0080481s_01		
Date:	11/03/2008	Drawing size:	A4
Drawn by:	ML	Reviewed by:	-
Source:	UBD		
Scale:	Refer to Scale Bar		

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1.3 METHODOLOGY

The overall aim of this assessment was to ascertain whether there are any heritage values associated with the IFL Cockle Creek study area which may be affected by the proposed demolition and remediation. If so, then appropriate and relevant mitigation measures would need to be provided for these impacts prior to, during and following future development. To achieve these aims the following objectives were established;

- to undertake a preliminary background review of potential heritage items within and adjacent to the study area; including Aboriginal heritage items.
- to identify and record all heritage objects and places within the study area through a site visit;
- to assess the significance of all heritage objects, sites, relics and places within the study area in accordance with relevant NSW heritage guidelines;
- to assess the archaeological potential of the study area to contain further heritage sites and culminating in an archaeological zoning plan (AZP);
- to assess the impact of the proposed development on heritage values through a Statement of Heritage Impact (SoHI); and
- to prepare recommendations on the management and mitigation of potential impacts caused by development to any heritage values associated with the study area.

ERM's approach to the preparation of the detailed site assessment was based on the following best practice guidelines:

- NSW Heritage Office Assessing Significance Guideline;
- NSW Heritage Office Statements of Heritage Impact Guideline.
- The Australia ICOMOS Burra Charter 1999 (Burra Charter).

1.4 METHODOLOGY FOR THIS ASSESSMENT

The methodology for preparing an archaeological assessment in New South Wales is defined in the *Archaeological Assessment Guidelines*, 1996, produced by the NSW Department of Urban Affairs and Planning and the NSW Heritage Office.

The methodology used in the preparation of this report are consistent with the guidelines of the *NSW Heritage Manual* for the assessment of significance and the principals outlined in the *Australian ICOMOS Charter for the Conservation of Places of Cultural Significance* – The Burra Charter.

This heritage assessment has been based upon a full day site inspection, historical maps and photographs, archival research at the NSW State Archives, Land Titles and Lake Macquarie Local History Library.

ERM has taken into account the connections between the current study area and the adjacent Pasminco Cockle Creek Smelter site. These two sites are closely linked through their historical development (and the resulting impacts on the town of Boolaroo); although operated as separate companies. Heritage reporting for the Pasminco site has been previously prepared by Conybeare Morrison (2004).

1.5 EXISTING HERITAGE STATUS

The preliminary background investigation included a search of the NSW Heritage Office State Heritage Register (SHR) and Inventory (SHI), the DECC Aboriginal Heritage Information Management System database (AHIMS), the Lake Macquarie Local Environment Plan (LEP), The Register of the National Estate (RNE) and the National Trust Register. It was found that no previously recorded historic heritage sites existed within the study area, although several were located in close proximity.

While the adjacent Pasminco site (the known historically as the sulphide works/plant, but referred to as the Pasminco site throughout this report) was assessed to have elements with State heritage value (Conybeare Morrison 2004); the Pasminco site has not been entered on the NSW State Heritage Register. Although the Pasminco site and the current study area are positioned adjacent to each other, and have historical connections, they are recognised as individual industrial sites, with different histories and separate industrial processes.

The study area does not have any registered Aboriginal sites within its boundary, although several Aboriginal sites were located in the vicinity.

1.6 AUTHORS

This report has been authored by Guadalupe Cincunegui (ERM Archaeologist) and Dr. Tim Owen (ERM Senior Archaeologist). This report has been reviewed by Shelley James, (ERM Senior Heritage Consultant).

2 HISTORICAL CONTEXT

2.1 PHYSICAL DESCRIPTION

The study area is a 15 ha site located within the Lake Macquarie local government area, forming part of the Cardiff/Glendale area. The study area is located within the Lower Hunter region, approximately two hours north of Sydney, and half an hour south west of the regional centre of Newcastle. The town centre of Boolaroo is located 0.5 kilometres from the site, while Maitland, Raymond Terrace and Toronto are regional neighbours.

2.2 BACKGROUND

The settlement and development of Boolaroo is closely tied with the development of the sulphide works which was later divided into the sulphide works and the phosphate fertilizer plant.

Given the close geographical proximity to each other it is important to establish the separation between the two industrial sites. The two sites are:

- the sulphide works, also referred to as the sulphide plant, the Sulphide Corporation or the Pasminco site. This site is referred to as the Pasminco site throughout this report; and

- the superphosphate plant, also referred to as the phosphate fertilizer plant or the IFL site.

The subject of this investigation is the IFL site. NB the Pasminco site was the subject of a heritage assessment by Conybeare Morrison (2004).

The history of the study area (including the earliest history which pertains to the Pasminco site) included in this report is based on historical photographs and documents as well as plans and reports which have provided a detailed picture from the earliest land grants in the mid 19th century to the present day.

Information detailing the earliest land use in the local area is generally lacking. The land is described variously as being virgin bushland and used for animal grazing. However the past use of the study area is dominated initially by the nineteenth century history of the Pasminco site, its purchase and use of the adjoining land and the early twentieth century establishment of the Phosphate Fertilizer Plant (which became the IFL site), in the area subject to this investigation.

2.3 19TH CENTURY HISTORY OF BOOLAROO AND SURROUNDING AREA

There are numerous local reports written regarding the history of the Boolaroo area prior to the establishment of the industrial site in 1895. These include a centenary history of both the Boolaroo Public School[1] and the Boolaroo Uniting Church.[2] From these accounts and early Parish plans it appears that the earliest owner of the land, William Brooks did not build or develop this stretch of land; but rather centred his developments on his land at Speers Point.

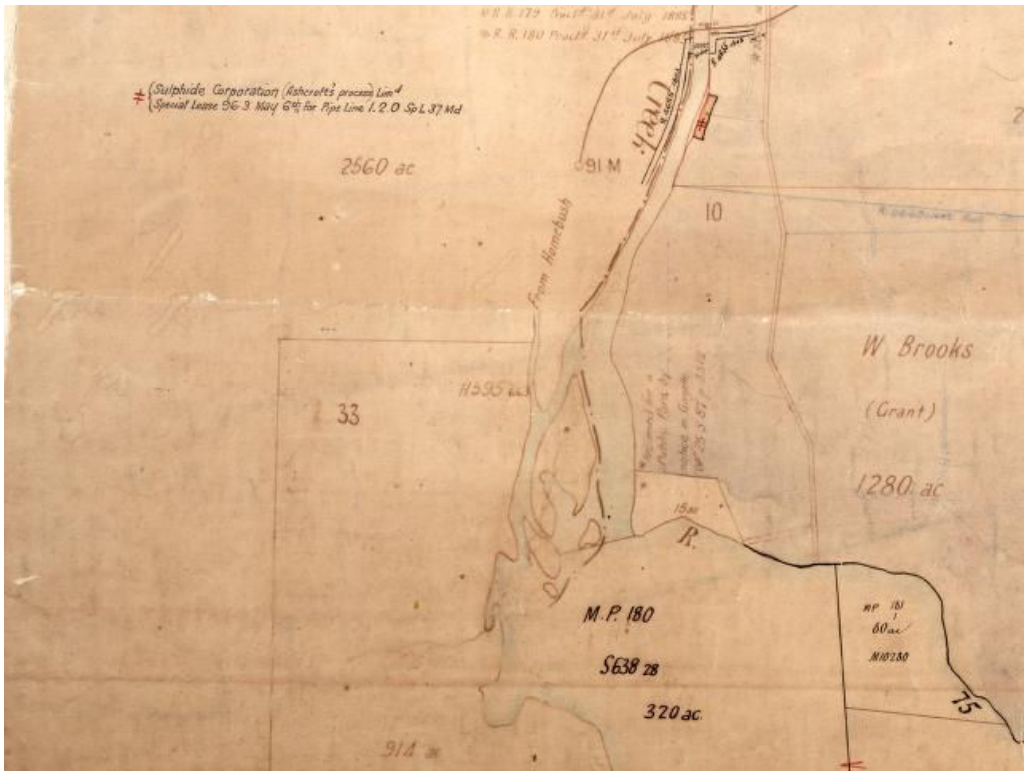


Figure 2.1 1897 Teralba Parish Maps. Image Source: Department of Lands, Parish Maps Image ID 10869501

[1] Boolaroo Public School 1900-2000 a century of memories, Elspeth Brady, Boolaroo Public School Centenary Parents and Teachers Association.

[2] One hundred years of ministry: a century from Methodist to Uniting Chuch at Boolaroo 1900-2000. Wanda Porter, Boolaroo Uniting Church Centenary Group. 2000.

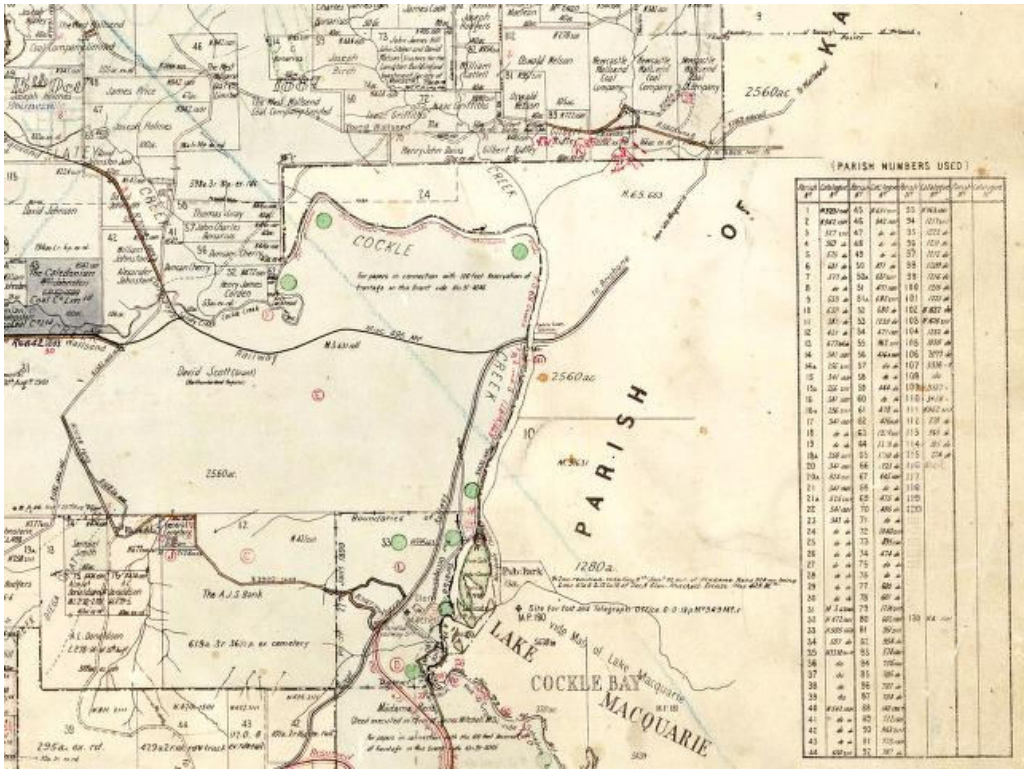
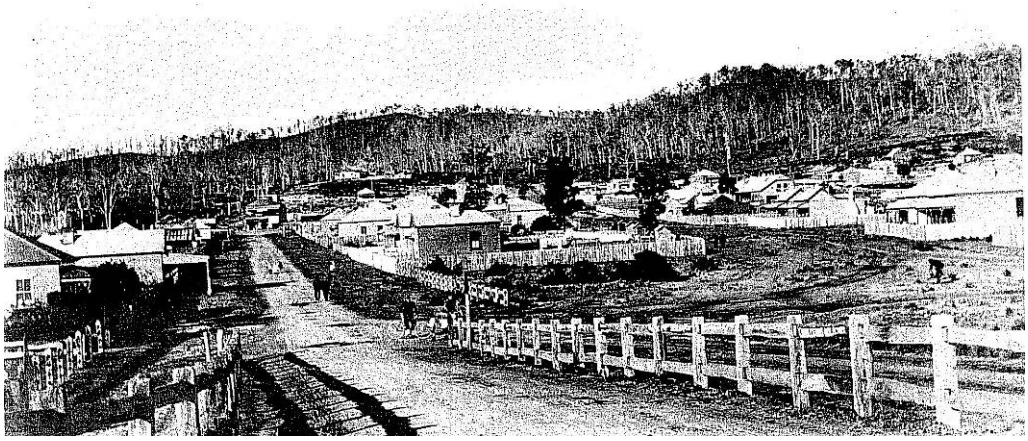


Figure 2.2 ***1885 Teralba Parish Maps, Image Source: Department of Lands, Parish Maps, Image ID 14902001***

2.3.1 Boolaroo

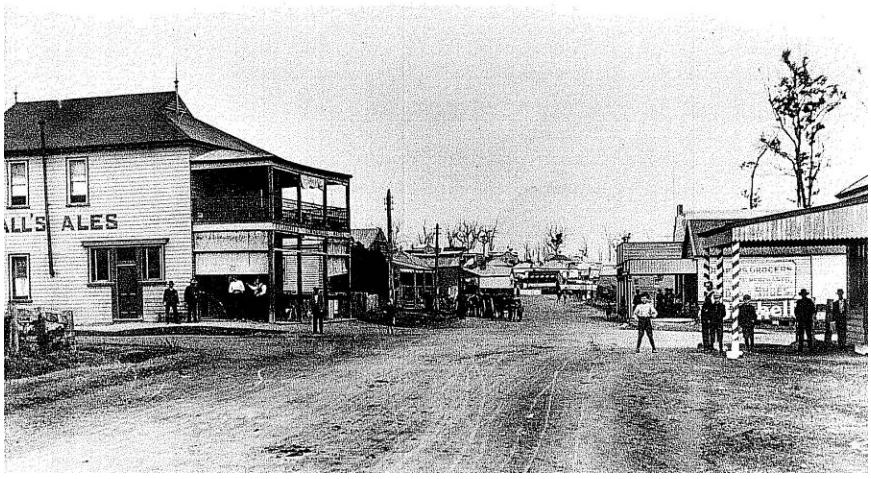
The current town of Boolaroo was cleared from an area consisting of heavily timbered and scrubbed lands, known by the original inhabitants, the Awakbal Aboriginals, as "the place of many flies". The study area lies within a government land grant, selected in 1829 and given in 1839 to William Brooks within the Parish of Teralba. This grant extended from the present railway line at Cockle Creek down to the lake, along the shore of the lake to Fairfax Road and then north to join the railway line again in the vicinity of Cardiff railway workshops.

It appears that early settlers in the area tried their hand at farming and orchards. In addition fishing, logging and coal mining was common in the area. A coal mine was opened by William Brooks on his holding at the end of Hopkins Street and coal was transported to the Speers Point Jetty on a line of trolleys and shipped from the Lake. The high cost of running this coal mine made its closure inevitable and in 1847 it was closed.



Photograph 2.1 Boolaroo circa. early 1900's view from Watkins's Bridge. (Mitchell Library Small Picture Files 'Boolaroo')

Some of the earliest settlers in the area were a community of Chinese gardeners who established market gardens near the delta of Cockle Creek and the railway bridge. These market gardens survived for quite some time and were said to "hold a near record for continuous occupation for about seventy years"[3].



Photograph 2.2 Main Road Boolaroo circa. Early 1900. (Mitchell Library Small Picture Files 'Boolaroo')

[3]P.3 Sulphide Retrospect in Cockle Creek News by Sulphide Corporation July 1954.

From early plans and records it would seem that the land within the study area remained as virgin bushland or for some animal grazing until the establishment of the Sulphide Corporation (on Pasminco lands). While there is no evidence of earlier structures/buildings on the site this does not mean the site was unused, but rather that temporary buildings/fence lines could have been used which were not featured on plans. The likelihood of this seems slim given the descriptions of the land being cleared thoroughly prior to construction of the sulphide plant in 1895.

The opening of the sulphide works by the Sulphide Corporation (on Pasminco lands) in the late 1890's is closely tied with the development of two towns, Boolaroo and Argenton;

> "Boolaroo and Argenton were brought into existence by the establishment of the Smelting works at Cockle Creek…When the works were started the two townships were formed and certain speculators bought land and erected houses"[4].

Even at this early stage it is apparent that members of the community were not ignorant of the downside of living in such close proximity to an industrial plant. "The roof of the buildings should be tiles or slate, as the arsenic and sulphur vomited from the sulphide works destroys the iron"[5]. In spite of this, the town quickly grew, acquiring a school for the local children in 1900[6] and churches of various denominations by 1920[7].

2.3.2 *The Sulphide Corporation*

The history of the Sulphide Corporation dominates the history of the area and eventually the current study area. In 1892 a company known as the Sulphide Corporation (Ashcroft's Process) Ltd. was registered in London. It planned to establish a plant to treat ore from the company's central mine at Broken Hill on a site near Cockle Creek. The reasons for choosing Newcastle as the location for the sulphide works are explained by the Corporation's first Chairman, the Earl of Kintore, in the following letter:

---

[4] Cockle Creek News "Sulphide Retrospect" by the Sulphide Corporation July 1954:3

[5] Boolaroo School File 1918-33 Bundle A, State Records (Ref5/15018). From a letter from the Chief Inspector 15th February 1899 submitted 15/2/1899, Approved 16/2/1899.

[6] Boolaro Public School 1900-2000 A centenary of Memories, Elspeth Bradbury.

[7] A hundred years of ministry: A Century from Methodist to Uniting Church, Boolaroo 1900-2000. Wanda Porter for the Boolaroo Uniting Church Centenary Group.

> "the place selected for the erection of the company's works is Newcastle, New South Wales which offers exceptional advantages for the purpose of being situated on the sea, with good port and harbour facilities, and having ample supplies of coal in the immediate vicinity. It also has the advantage of possessing a good wharfage and railway accommodation and an abundant supply of salt and water; all of them essential for our purpose. Newcastle is also a port of call and coaling station for steamers to and from all leading Australian ports so that freights can be easily arranged for both in respect of plant and machinery and the company's ores and products"[8].

The land was cleared for the first stage of the Cockle Creek works (the sulphide plant, on Pasminco lands) in 1895 and the first buildings were constructed between 1896 and 1897.

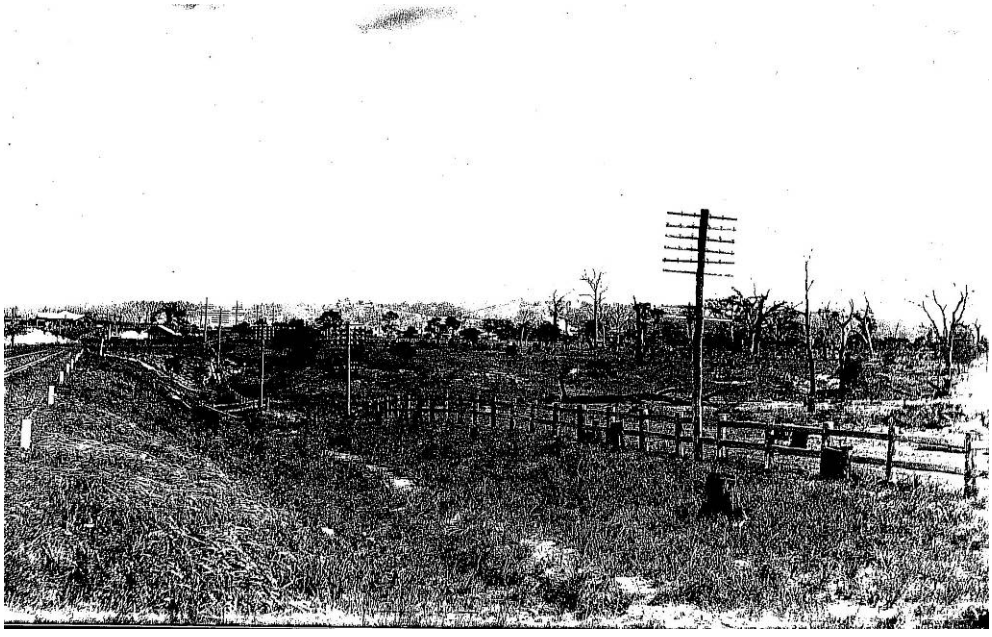
> "The year 1895 was a memorable one for the small settlement known as Cockle Creek, word had come to this locality that a large Broken Hill Company had selected this site for the establishment of an extensive treatment plant to deal with ore from their Broken Hill mine…soon great activity was in evidence on the site. Gangs of men were engaged in tree felling and clearing the dense growth of scrub, whilst others were busy on the construction of dams and railway sidings. The bush was practically in a virgin state and well interlaced with vines and brush growth"[9]

[8] P4 The Centenary of Operations 1897-1997 at Cockle Creek. Celebration of a Century. Pasminco Cockle Creek Smelter.

[9] P.2 "Sulphide Retrospect" Cockle Creek News by Sulphide Corporation, July 1954.

Photograph 2.3 Cockle Creek Smelting/sulphide works 1899 (Mitchell Library Small Picture Files 'Cockle Creek'')

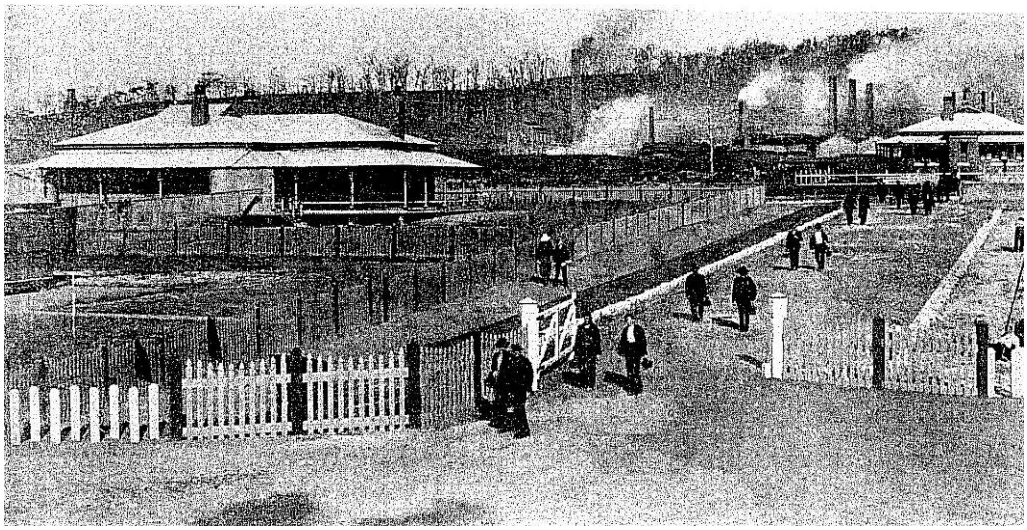
As a result of the construction of the plant, in 1887 a railway siding was established at what became known as "Sulphide Junction". This junction enabled trains to connect with the main line to Newcastle and its port facilities.



Photograph 2.4 1918 Cockle Creek Station (Mitchell Library Small Picture Files 'Cockle Creek')

During construction of the sulphide works (Pasminco), workers housed themselves in temporary canvas dwellings and other shelters, situated where the old entrance gates now stand.

Initially operations at the sulphide works were intended to extract zinc from Broken Hill ore by the electrolytic process (known as the Ashcroft Process) but this did not prove to be commercially viable and the works were converted to an ordinary lead smelting works. In 1906 the sulphide works opened a second plant which provided residents of the Hunter with employment after hardships endured, including flooding in the mid-1890s and the collapse of the banking sector[10].



Photograph 2.5 ***The Works of the Sulphide Corporation with Manager's residence left foreground, circa. Early 1900's. (Mitchell Library Small Picture Files 'Cockle Creek')***

2.3.3 The Site of IFL

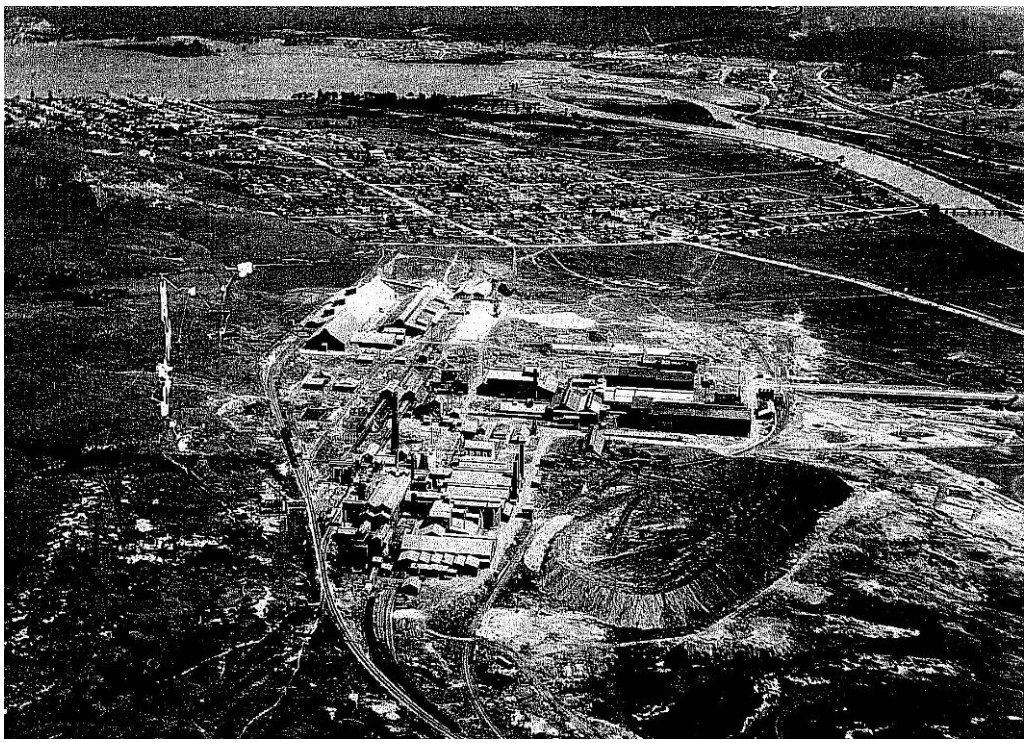
The IFL superphosphate plant came into existence as a means of disposing of the by product from other industrial processes. The IFL superphosphate plant was originally established in 1913, with two main shed, the sandstone office and brick assay labs. Materials were brought into the site via a short branch extension of the existing railway line. These structures were erected at the edge of the older pre-existing Pasminco sulphide plant, on land which had not previously used for industrial processes.

[10]The centenary of operations 1897-1997 at Cockle Creek; celebration of a century. Pasminco Cockle Creek smelter, ed. K. Powell, p.5.

In the early 1920s low metal prices had forced the closure of many mines, and, as a result smelting at Cockle Creek became financially non-viable. In 1922 lead smelting was finally discontinued. Closure of the smelter enabled the growth of other areas within the plant, such as the expansion of the sulphuric acid, super phosphate and mixed fertilizer plants (the current study area). A further addition of a cement plant was made in 1924. Although smelting ceased at this time,the production of lead and zinc was later resumed.

The site was initially expanded in the 1930s and again refurbished and expanded in the 1950s. This saw the construction of a further two sheds but no rearrangement to the original site configuration.

The IFL site remained connected to the sulphide works (which became Pasminco) up to the time of the Pasminco plant's closure. The two plants had a close relationship given that one of the by-products of the Pasminco sulphide plant was sulphuric acid. This acid was pumped through connecting pipes from the Pasminco site to the IFL site and mixed with phosphate in order to manufacture fertilizer. Therefore, the by-product of the sulphide plant facilitated the existence of the IFL fertilizer plant further cementing together the history of the two sites.



Photograph 2.6 Circa. 1950. Sulphide works and fertilizer plant looking South towards Speers Point. (Mitchell Library Small Picture Files 'Cockle Creek')

A basic chronology of the IFL site is provided in *Table 2.1*.

Table 2.1 IFL Cockle Creek Site Chronology

Date	Event
Pre-1910	The sulphide works/plant (Pasminco) was established c.1895. The IFL site remains un-used land adjacent to the Cockle Creek Smelter Site. The only building present is the sandstone and brick office building, connected to the assay office (constructed c.1890s).
1913	The sulphuric and superphosphate (IFL site) plants are commissioned.
1914	IFL Superphosphate plant is extended.
1917	Fertiliser Shed No 2 under construction.
1937	Installation of new equipment due to increased demand for superphosphates and acid production. A Bradfield superphosphate plant, an electric shovel and bagging conveyors are installed.
1938	Extension to the superphosphate shed.
1952	Two sheds were reconditioned – one a baulk store the other a workshop.
1953	Two new phosphate stores are added, along with two Bradley-Poitte air-swept mills and a Broadfield Acidulating unit. A new access road to the superphosphate site is added.
1954	The superphosphate plant extensions are completed.
1960s	Greenleaf Fertilizers are established to take on the increasing demands for fertilizer.
1969	The company's holding in Greenleaf Fertilizers is sold to Australian Fertilizers Ltd.

3 SITE VISIT

An inspection of the study area was undertaken on the 7th of March by Guadalupe Cincunegui (ERM) and Tim Owen (ERM), facilitated by Nick Johnson (Manidis Roberts). They study area was inspected for heritage buildings, evidence of features visible at the surface level and the potential for the site to contain a sufficient depth of surface deposits to hold archaeological relics.

3.1 STUDY AREA INSPECTION- DISCUSSION

The inspection involved a survey of accessible areas of the site and making detailed notes and photographing areas of potential heritage concern. Health and safety issues meant that it was not possible to enter many of the industrial buildings (including the four sheds).

Site inspection revealed three structures possibly related to the earliest phase of the site, although these have been substantially modified through subsequent site use and requirements (two sheds and the sandstone and brick building). A further two sheds have been added following the initial development. No development was evident with connection to the original Pasminco site (elements of which was assessed as having a level of State heritage significance [Conybeare Morrison 2004]).

The possibility of intact archaeological deposits relating to use of the site prior to the fertiliser plant cannot be completely disregarded. However, nothing obvious presented itself during site inspection in this regard. Coupled with the historical review of the plant's history and associated photographs, it can be judged that the IFL site has a low level of archaeological potential.

It was noted during the site inspection that industrial activity on the site for a period of more than 100 years has had a profound effect on the landscape. Several areas that may have retained archaeological value of an Aboriginal nature have been quite severely affected.

Therefore the identified heritage values associated with the IFL site are connected to:

1. the site's intangible history and the function of the place;
2. the four sheds, sandstone and brick office and the branch railway line, with wooden gantry.

These items have been found to have a level of local significance and are not connected to the State significant heritage items which were located on the Pasminco site (c.f. Conybeare Morrison 2004).

3.2 IDENTIFIED SITE FEATURES

3.2.1 Preamble

The site visit identified a number of site elements which were constructed in the late 19th – early 20th century and are representative of the continued use of the site for the manufacture of fertilizer. Each of these elements is discussed below.

3.2.2 Archival photography

A series of digital archival quality photographs were taken during the site visit. These images, a photo log and general plan showing location of photos are found in *Annexe A*. *Photographs 3.1* to *3.8* illustrate these elements.

Legend

- Incitec Pivot Limited Cockle Creek Site
- Gantry

Figure 3.1

Annotated Site Features Plan

Client:	Manidis Roberts	
Project:	Incitec Pivot Remediation and Demolition Heritage Assessment	
Drawing No:	0080481s_02	
Date:	13/03/2008	Drawing size: A4
Drawn by:	ML	Reviewed by: -
Source:	-	
Scale:	Refer to Scale Bar	

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3.2.3 *Descriptions of Site Elements*

Sandstone and Brick Building

This building stands at the centre of the study area and currently houses several offices of IFL staff. It is made of machine made bricks with sandstone foundations, corners (Quoins), and double sash windows with sandstone lintels. There is a newer add on building with a wide sloping veranda on the northern half of the building. It is suggested that this building was originally an office, with the assay lab attached, constructed c. late 1890s. It was the first item constructed on the IFL site.

The external condition of the building is fair but has clearly been modified for current use. The interior of this building retains little of its original design, with a modern fit out for offices. The primary evidence for modifications are at the southern and eastern ends of the building.

On the southern side of the house is a corrugated iron addition, several bricked up windows with sandstone lintels and a couple of holes are cut into the sandstone corner blocks, possibly for some kind of support beam. The eastern end of the building may have once had a veranda but this too has been removed, evidence of which are rectangular holes cut into the sandstone corner blocks.

Photograph 3.1 Eastern façade of sandstone and brick building

Photograph 3.2 Southern façade of sandstone and brick building

Sheds 1-4

Sheds 1 through to 4 were surveyed from the exterior only; health and safety prohibiting entry. Sheds 1 and 2 are made of galvanized iron and asbestos or fibro sheeting. They are large structures with straight walls and a separate sloping roof. Shed 1 has a railway line running parallel to the interior wall of the shed through the northern side.

Shed 3 is an asbestos and steel structure with sloped sides and a ridge ventilator at the top. It is in a fairly poor condition with the roof appearing quite brittle and flaking.

Sheds 4 is a large rectangular sheds with a sloping roof made from corrugated sheets of asbestos/fibro and steel. This shed was not accessed internally.

Photograph 3.3 Shed 1 (left) and Shed 2 (right) with railway line running through Shed 1.

Photograph 3.4 Shed 3 (right) with end of Shed 2 on left.

Photograph 3.5 Northern end of Shed 4

Railway Line

There is a single railway line running North East to South West along the western boundary of the site abutting the Pasminco smelter site (*Photograph 3.6*). This connects to Cockle Creek station and "Sulphide Junction" and runs partly into Shed 1. The railway line appears to be a short branch extension of the larger regional railway network, built entirely to service the IFL fertilizer plant. Although this branch line connects to the larger regional railway network, it does not have any further significance other than its direct connections to the current study area.

Gantry

The wooden gantry runs parallel to the railway line described above and is in a dilapidated state (*Photograph 3.7)*. It consists of a wooden 'A' frame gantry with steel pegs, support pegs and circular upright poles with rectangular horizontal beams. Railway lines run through the middle. The entire structure is elevated to approximately 2.5-3 metres in height. The design of this gantry is typical of other observed across NSW (author's personal observations).

Photograph 3.6 Railway line running South West.

Photograph 3.7 Wooden Gantry

Landscape

The landscape of the site has been extremely modified due to over 100 years of continuous industrial use. The site is characterised by wide flat grassy plains abutting small rises to the east, with some shrubs and no trees. The site is elevated from the Pasminco site on what is probably a natural elevation.

The original landscape has been modified through quarrying of stone material from the eastern rises to create a flat site; on which Sheds 3 and 4 are located. Evidence of this quarrying can be seen through cut bedrock (c.f. Photographs *3.5, 3.8* and *Annex A*).

Photograph 3.8 Elevation of IFL site is shown in relation to Pasminco site.

3.2.4 Discussion

The study area was developed in the early 20th century as part of the Sulphide Corporation (IFL) plant. When work was scaled down in the 1920's, this part of the site was re-established as a fertilizer manufacturing plant. The intention being to make use of the sulphuric acid produced as a by-product by the sulphide works (the Pasminco plant). This process remained active until the closure of the Pasminco plant when IFL was forced to outsource their supply of sulphuric acid to continue production. The site continues to be operational, using techniques and methods initiated in the early 20th century.

3.3 ARCHAEOLOGICAL RESEARCH POTENTIAL

The history of the study area indicates that any pre-1900 potential archaeological resources are likely to have been severely and detrimentally impacted by the industrial use of the site and therefore this level of archaeological potential is low.

The current site itself is of heritage value given the unchanged manufacturing process, the plants association with the original Sulphide Corporation plant and the association of the two manufacturing plants with the establishment of the two towns of Boolaroo and Argenton. Furthermore, the site provides an insight into the early industrial landscape of the Hunter and greater Newcastle area.

However, the site has not be redeveloped or modified since the original construction of the four shed and one building. This means that it is unlikely for archaeological deposits to be present (this is an important consideration when compared in context with the Pasminco site adjacent to the current study area. This adjacent site does contain archaeological deposits as it was redeveloped following an initial phase of industrial activity).

Indigenous archaeological research potential was also assessed for this report, see Annexe B. An AHIMS search was carried out of the area within which the site is located, however while there are Aboriginal sites in the vicinity, the closest site is at a distance of 1 kilometre. Furthermore, the destruction of the natural landscape by industrial works is likely to have seriously impacted any intact archaeological deposits.

3.4 EVALUATION OF RESEARCH POTENTIAL

Bickford and Sullivan examined the concept of research potential in an influential paper published, in 1984, and re-defined the potential of an item in terms of Australian historical research. The results of their paper are identified in three questions, each devised to address the ability of the archaeological resources of any site to investigate the scientific potential of the site and how that potential can further current knowledge:

1. can the site contribute knowledge that no other resource can?

2. can the site contribute knowledge which no other site can?

3. is this knowledge relevant to general questions about human history or other substantive questions relating to Australia's history, or does it contribute to other major research questions?

The assessment of the archaeological resources of the Cockle Creek site is addressed below.

3.5 ASSESSMENT OF ARCHAEOLOGICAL RESEARCH POTENTIAL

1. *Can The Site Contribute Knowledge That No Other Resource Can?*

The site is variously described as being "virgin bushland" when construction of the sulphide plant began, being used for grazing. Grazing is an activity that does not leave significant traces in the archaeological record. Consequent use of the site for industrial purposes is likely to have severely impacted on any pre-1900 residual archaeological deposits.

The site does have the potential to yield information regarding the manufacturing processes involved in the production of phosphate based fertilizer. These production processes have remained largely unchanged since the plant started its operations.

Additionally, the site is significant to the local community given its role in the emergence of surrounding townships. However, the site does not offer a unique source of knowledge regarding this region.

2. *Can The Site Contribute Knowledge Which No Other Site Can?*

The IFL site is locally significant as it is representative of early industry in the Hunter region. Much of the importance of the IFL site comes from its relationship and early association with the Pasminco sulphide plant. The establishment of the plant was instrumental in the development of the local surrounding communities and as such is significant on a local level.

The IFL site is a significant resource for the history of industrial manufacture in NSW. Of particular importance is the manufacturing process of phosphate fertilizer, as this has remained largely unchanged since the plant first began functioning. However, it should be noted that this process is not unique to the IFL site.

3. *Is This Knowledge Relevant To General Questions About Human History Or Other Substantive Questions Relating To Australia's History, Or Does It Contribute To Other Major Research Questions??*

The IFL site is an important site in the context of early Hunter regional industrial history. Its origins as part of the Sulphide Corporation's site at Cockle Creek and its history of continuous manufacture make it an excellent early example of the Hunter industrial heritage. Methods of production which have been employed at this plant could be recorded prior to cessation of function so that they are recorded for future knowledge. Furthermore, the association of this industry with the development of local communities should not be dismissed.

4 SIGNIFICANCE ASSESSMENT

4.1 PRINCIPLES OF ASSESSMENT

Heritage sites, objects and places hold value for communities in many different ways. The nature of those heritage values is an important consideration when deciding how to manage a heritage site, object or place and balance competing land-use options. The many heritage values are summed up in an assessment of "Cultural Significance".

The Legislation guide to management of heritage places is the Burra Charter (The Australia ICOMOS Charter for Places of Cultural Significance). The Burra Charter defines cultural significance thus:

- Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.
- Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.
- Places may have a range of values for different individuals or groups.

In terms of current research, it is necessary to assess the significance of the potential archaeological resources of the study area in accordance with heritage best practice guidelines. In NSW, a foundation for assessing cultural heritage significance has been provided by the NSW Heritage Office publication Assessing Heritage Significance. These are seven criteria against which assessment is made:

- *Criterion (a) – an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).*
- *Criterion (b) – an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).*
- *Criterion (c) – an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).*
- *Criterion (d) – an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.*
- *Criterion (e) - an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).*

- *Criterion (f) – an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);*

- *Criterion (g) – an item is important in demonstrating the principal characteristics of a class of NSW's*

  Cultural or natural places; and/or

  Cultural or natural environments.

These assessment criteria provide an indication as to the significance of an item, but are not specific to the potential archaeological resources of a site. The dilemma faced by consultants and developers is that the development can result in the destruction of a finite resource, which once removed cannot be replaced or re-recorded. Therefore the significance of the resource needs to be understood as being linked to scientific research value;

A site or resource is said to be specifically significant when its further study may be expected to help answer questions. This scientific significance is defined as research potential (Kerr 1996).

This is equated with Criterion (e) which is understood as also referring to the research value of the item or place. The assessment under criteria has been informed by chapter 4 of this report.

4.2 *HERITAGE ASSESSMENT*

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

Since the late 19th century, the site of IFL has been part of an active industrial zone which played an important role in the history of the local Hunter region. The site provided jobs and security to local residents, as well as fertilizer, which was sold across Australia. Therefore the study area meets this criterion at a local level.

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

The study area does not meet this criterion.

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

The resources of the IFL site at Cockle Creek do not demonstrate an aesthetic characteristic in NSW or the local area. The study area does not meet this criterion.

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

The IFL site has a strong association with the life of the people of Boolaroo. The town was effectively brought to life by the construction of the sulphide works and subsequently the fertilizer plant. It is well documented that work at the plant provided an economic relief for local families during periods of recession and hardship. As such it is culturally significant for the local community. The study area meets this criterion at the local level.

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

Development of the site seems to have taken place in one phase, with additional construction taking place as required. The pre-1900 archaeological resources of the area are uncertain. Although early records variously denote the site as virgin bushland/grazing lands, wooden structures, fences and remnants of the 'tent city' used during the construction of the plant could be retained in the archaeological record. However there is low potential for the occurrence of relics.

The post-1900 activities at the study area are unlikely to have created an archaeological record that would provide further understanding of the local area's history; therefore the study area does not meet this criterion.

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

The resources of the site do not satisfy the guidelines for this criterion.

Criterion (g) – an item is important in demonstrating the principal characteristics of a class of NSW's

Cultural or natural places; and/or

Cultural or natural environments.

The site is important as it is presents an ongoing industrial process of fertilizer manufacture starting in the early 20th century and continuing to this day. In addition, the layout and architecture of the site presents an intact example of early 20th century industrial landscape. The study area meets these criterions on a local level.

4.3 SUMMARY STATEMENT OF SIGNIFICANCE

The heritage of the IFL site is of local significance given its close association and influence on the surrounding communities. Furthermore, the site is significant as an early example of twentieth century industrial heritage in the Hunter region and demonstrates the key characteristics of manufacturing procedures and industrial architecture. These heritage values manifest through the built heritage features of the study area and the current (and original) manufacturing process.

5 LEGISLATION GUIDELINE

5.1 THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (PART 3A).

The proposed demolition and remediation works are proposed under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A 1979). Part 3A of the EP&A 1997 consolidates the assessment and approvals process for all major projects that require Ministerial approval. The new Part 3A applies to projects deemed to be critical infrastructure, major projects and other projects declared by the Minister.

As the proposed project will be an 'approved project' for the purpose of Part 3A of the EP&A Act, section 75U of the Act therefore suspends the requirements for an excavation permit under section 139 of the Heritage Act. However, the requirements for notification under section 146 would still apply if any archaeological 'relics' (within the meaning of the Heritage Act) were to be found as the project proceeds. In this event (and the event of preparing an archaeological research design for the investigation of the above mentioned sites/areas) consultation and advice could be sought on appropriate management from the Department of Planning.

The statement of commitments defines the environmental management and mitigation measures the proponent is prepared to make for on the site. The statement of commitments is made in accordance with *EP&A Act 1979*: Part 3A Division 2 Section 75F [6].

A Draft Statement of Commitments has been prepared as part of the Environmental Assessment (Manidis Roberts 2008: Chapter 9). The draft Statement of Commitments defines the environmental management and mitigation measures the proponent is prepared to make for on the site.

Under the current proposal, the IFL site will be subject to a demolition and remediation program that will involve the removal of all structures and contaminated lands.

The historical use of the IFL site has resulted in extensive contamination of both the soil and groundwater. A detailed description of the nature and extent of contamination can be found in the 'Conceptual Remediation Action Plan' (RAP) (S&G draft 2008). This report details the contamination associated with the study area, including all soil horizons, ground water and built elements. It is noted that:

- all soil within the study area is contaminated and poses a significant public health risk;
- ground water associated with the study area is contaminated and presents a risk of re-contaminating adjacent recently remediated land;
- contaminants present at the study area include heavy metals, fluoride, nitrogen species, phosphorus, sulphate and asbestos which are present in the slag impacted fill material (which is located across the study area) and waste materials (such as brick, metal, plastics, glass, cement sheeting, timber and rock) (S&G draft 2008: Table 1); and
- all site buildings and structural members and sheeting contains asbestos and heavy metals, as a result of dust deposition and adsorption (2008: Table 1).

This heritage study has determined that the study area is of local heritage significance due to its close association with the local community and the development of the towns of Boolaroo and Argenton. Furthermore the site is significant as an early example of industrial heritage in the Hunter region due to its continued existence as a fertilizer manufacture plant from the early 20th century until 2008. The environmental remediation of the site will therefore impact these identified heritage values.

Options for the remediation program are discussed in Manidis Roberts (2008). Options included: do nothing; treat and remove groundwater; and extract, treat and re-inject groundwater. For general environmental reasons the third option was selected as the most appropriate course of action.

The RAP will involve the targeted remediation of contamination 'hotspots' at the northern area of the site (Stage 1). This action will reduce the contamination level of the groundwater system, prior to the installation of the containment cell (in Stages 2 to 4).

The first stage of remediation (Stage 1) will treat localised groundwater contamination 'hotspots' along the northern boundary of the study area; Stages 2-4 will remediate the remainder of the study area. The consequence of Stage 1 remediation will necessitate the removal of the gantry (see *Figure 3.1* and *Section 3.2.3*). Stage 2 remediation will necessitate the removal of all other site elements, i.e. buildings and any equipment.

It is proposed that the site will be remediated to a standard that would allow future residential development, although no plans for any development have been provided.

6.1 STATEMENTS OF HERITAGE IMPACT

The following assessment of heritage impact has been developed to consider the impacts of the remediation and demolition of the IFL site. The NSW Heritage Office guideline *Statements of Heritage Impact* (1996, revised 2002), has been utilised for the preparation of this Statement of Heritage Impact (SoHI).

Two SoHI have been prepared. These relate to the Stage 1 and Stages 2-4 of remediation, described above.

6.1.1 SOHI Stage 1 Remediation

Stage 1 remediation will negatively impact the heritage values of the railway gantry, which is a component of the IFL site and is of local heritage significance.

Potential Impacts and Reason for Impact

Stage 1 of the project involves the treatment of groundwater hotspot contamination on the IFL site. These hotspots are detailed in the Conceptual RAP (S&G draft 2008).

Remediation for Stage 1 will result in the demolition of the disused gantry, due to the required location of the groundwater remediation system (Manidis Roberts 2008). Remediation of ground water is necessary to minimise impacts to human health and environmental impacts currently affecting the site and its surrounding areas. The majority of groundwater contaminants are heavy metals including lead, zinc and arsenic (S&G draft 2008). The environmental assessment of the site states that the IFL site's groundwater contamination is well in excess of the ANZECC 2000 criteria (S&G draft 2008).

- *Have all options for retention and adaptive re-use been explored?*

The gantry cannot be retained as it is located over one of the groundwater 'hotspots' (S&G draft 2008). S&G draft 2008 has noted that all structural members at the site (which include the gantry) contain asbestos and heavy metals. Therefore it is unfeasible, in the interests of environmental remediation and public health and safety, for the gantry to be retained, in situ or following removal/dismantling.

- *Can all of the significant elements of the heritage item be kept and any new development be located elsewhere on the site?*

As noted above the gantry contains high levels of heavy metals. Retention of these elements could pose a significant risk to public health. It is therefore not recommended that they be retained.

- *Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?*

The remediation program for IFL's land has been necessitated by the remediation program for the adjacent Pasminco site. The program for groundwater remediation at the IFL site has been prepared in order to prevent re-contamination of land surrounding the study area. It is therefore not possible to delay the demolition of the gantry beyond the proposed remediation schedule.

- *Has the advice of a heritage consultant been sought? Have the consultant's recommendations been implemented? If not, why not?*

ERM heritage consultants have been engaged to prepare this report. The recommendations within this report will be used to inform Manidis Roberts' compliance processes and development strategy for this site.

6.2 SOHI STAGE 2-4 REMEDIATION

Potential Impacts and Reason for Impact

S&G (draft 2008: 4.3) details the program of intended works. Stage 2 will involve the establishment of a containment cell in the northern portion of the site. Stage 3 will involve the demolition of all existing site buildings and infrastructure and remediation of all contaminated soil beneath the former buildings. All contaminated materials from the buildings (including asbestos) will be subject to appropriate remediation, removal and disposal procedures. Stage 4 will involve the demolition of all remaining site infrastructure and remediation of any residual soil from the southern portion of the site.

- *Have all options for retention and adaptive re-use been explored?*

The buildings on the site are not suitable for adaptive re-use purposes due to contamination related to the use of the site as a fertilizer plant. This contamination requires the buildings and soils beneath to be removed from site, rendering retention unfeasible. ERM has been advised that the contamination at the site would pose a significant public health risk if not remediated. Further, the buildings are constructed from, and contain, hazardous asbestos material. Asbestos within the buildings is in a poor friable condition and has contaminated the site. Any retained material containing asbestos, or asbestos fibre, would pose a significant risk public health risk.

- *Can all of the significant elements of the heritage item be kept and any new development be located elsewhere on the site?*

Significant elements of buildings on the site include the sandstone and brick building and the industrial fabric relating to the operation and function of the site as a super phosphate production facility. As previously discussed, the remediation program does not allow for retention of any building elements given the high levels of contamination across the site and the public health and safety risks that these contaminates represent. S&G (draft 2008) have detailed that all site fabric has become contaminated by asbestos and heavy metals, as a result of dust deposition and adsorption.

Previous discussion between IFL and Council has tried to establish whether any site elements could be retained for future interpretation and/or use. Clarification relating to the type and level of contamination associated with all site features suggests that public access and display of any retained materials does not appear appropriate.

- *Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?*

Demolition is proposed for standing elements at the IFL site to facilitate remediation. It is known that all buildings and associated machinery are contaminated; therefore cessation of plant operations would trigger an appropriate timing to commence remediation of the area. As such, a staged program of remediation has been developed, which will result in a remediated site that does not poses environmental and public health risks.

- *Has the advice of a heritage consultant been sought? Have the consultant's recommendations been implemented? If not, why not?*

ERM heritage consultants have been engaged to prepare this report. The recommendations within this report will be used to inform Manidis Roberts' compliance processes and development strategy for this site.

6.3 SOHI RESULTS

The IFL site has heritage values at the local level. Ideally these values would be retained for future appreciation and interpretation following the cessation of plant operations. However the extent of contamination across the site, which is a result of the historical production methods from the subject site and the adjacent Pasminco site, poses significant environmental and public health risks.

The level of contamination necessitates the removal of all heritage buildings and equipment from the study area. Given the level of contamination associated with a century of heavy metals adsorption and chemical/asbestos dust accumulation, it is not recommended that any site elements be retained as these could pose a future public health risk.

6.4 HERITAGE MANAGEMENT

This report has identified that the site is of local heritage significance, however due to the high levels of contamination to the site buildings cannot be retained. The following strategies have been therefore developed to manage the adverse heritage impacts of the remediation work. The management measures form a statement of commitment, as defined under Part 3A of the *EP&A Act* 1979.

6.4.1 Heritage Management Strategy

Archival Photographic Recording

An archival photographic recording should be prepared for the IFL site, in accordance with the NSW Department of Planning (Heritage Office) Guidelines 2001 (revised 2005) *Photographic Recording of Heritage Items Using Film or Digital Capture*. The level of recording should be for sites of local significance.

This archival recording should focus on the industrial process and capture the modes and methods of manufacturing super phosphate. In doing so it will also capture and record the standing structures associated with the site. In addition a measured drawing of the railway gantry could be prepared to supplement the archival recording.

The archival recording and any other material produced should be lodged with the NSW Heritage Branch (Department of Planning), local council and the local library. This will provide public access to these documents.

Community Consultation

In order to record the significance of the place's history and importance to the local community, it is recommended that a community open day be held, where local residents are able to bring photographs, stories and other memorabilia for recording (such an event should be held off site, for the obvious reasons). The outcomes from this public consultation should be included in the archival recording, thus capturing the significance of the facility to the local community.

Future Heritage Interpretation

An interpretation strategy (such as a history publication, and/or interpretation signage to be placed within any new development) could be prepared for the site. This could provide a tangible connection between the former industrial site and any new development.

Unforseen Archaeological Relics Being Found

In the event of any unforeseen archaeological relics being found, remediation work must be stopped and the Heritage Council must be notified. Any unforeseen archaeological relics located within the study area may require archaeological investigation, dependent upon the outcomes of a health and safety assessment.

6.5 CONCLUSION

The remediation work will result in the loss of a place and its equipment, which has a level of local heritage significance. This impact is unavoidable due to the environmental and public health needs for the remediation to occur. The adverse heritage impacts of the remediation works can be managed through a range of activities that will record and communicate the heritage values of the site to current and future generations. Given the environmental and public health imperatives for the proposed works, the recommended health management measures are considered an appropriate approach.

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