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MACDONALDTOWN GASWORKS ARCHAEOLOGICAL TEST EXCAVATION REPORT FOR RAILCORP

AUGUST 2010

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Cover illustration:
Gas Worker, by Stephen Adam, c 1878. One of a series of twenty stained glass windows made for Maryhill Burgh Halls (Glasgow) showing local trades and professions, this one depicts a gas worker stoking a furnace with gas plant in the background.
(Source: http://theglasgowstory.com/images/TGSE00471_m.jpg)

EXECUTIVE SUMMARY

BACKGROUND

Archaeological testing was undertaken on the site of the former Macdonaldtown Gasworks as part of the pre-remediation and approvals process. The archaeological testing was to determine the extent and condition of archaeological remains which had survived on the former Macdonaldtown Gasworks. Five test trenches were opened and the results are presented within this report.

RESULTS

All the trenches revealed ground level remains under an average of about 250mm of local demolition material, coke residue and introduced fill.

The buildings, which used to house the retorts and the purifiers are shown in the c1917 photograph (Figure 6), and do not appear to be substantial, were confirmed by the results of the test excavation. They were shed like structures and would not have represented innovative design in their own right. It is highly likely that the Eveleigh Railway Workshops had or still have similar structures. Therefore from a heritage perspective these structures are not considered to be significant in themselves. The annulus for the northern located gasholder on the site appears to be almost completely preserved, however, there was no evidence of any specific equipment relating to the gas manufacturing processes preserved on the site.

RECOMMENDATIONS

1. The site is part of the State Heritage Listed Eveleigh Railway Works and the standing (southern) gasholder is reported to be the last one in the State. It is therefore recommended that RailCorp commission a comprehensive archival study combined with a history of the Macdonaldtown Gasworks, including a comparative analysis of gasworks and with the Eveleigh Railway Workshops.
2. The remediation of the site, particularly machine excavation around the State heritage listed southern gasholder, is to be adequately planned and supervised by RailCorp in order to avoid any damage to the structure.
3. The contamination levels in and around the brick annulus of the northern gasholder will be assessed by separate assessments. The bricks themselves are not thought to be contaminated but this will need to be confirmed. The bricks may need to be removed because of the excavations inside the annulus and around the outside of the annulus. If so, the removal is to be undertaken with care, so that if possible, the bricks can be reused. Archaeological monitoring to record the removal, the depth of the annulus and its general construction details should be undertaken during excavation and removal of the annulus. Archival recording of the top of the annulus should be

carried out prior to any removal - with minimal excavation recommended. If the bricks need to be removed and cannot be reused, the northern gasholder should be represented in some similar form. This recommendation is also discussed within the Heritage Interpretation Plan submitted by City Plan Heritage in August 2010.

4. An archaeological excavation in the area of the Retort House should be carried out to look specifically for the evidence of the retorts. This would entail machine stripping, hand excavation and recording of the uncovered features to Heritage Branch standards.
5. An archaeological excavation in the area probably containing the footprint of the superintendent's residence should be carried out to record the structural layout of the building. This would entail machine stripping, some hand excavation and recording of the uncovered features to Heritage Branch standards.
6. Due to the high contamination of the area resulting from the nature of coal gas production and the limited original information associated with the ground level remains - no further physical archaeological investigation or monitoring, apart from the recommendations under points 3, 4 and 5 should be necessary.
7. Heritage interpretation of the history of the site and its connection to NSW Railways and the Eveleigh Railway Workshops should be undertaken as part of the remediation phase of the project. This aspect has been outlined in City Plan Heritage's Macdonaldtown Gasworks Heritage Interpretation Plan, August, 2010.

1.0 INTRODUCTION

1.1 BACKGROUND

City Plan Heritage were engaged by Incoll on behalf of Rail Corporation New South Wales (RailCorp) to undertake a program of Archaeological Test Excavations and to prepare a Heritage Interpretation Plan in accordance with NSW Heritage Office guidelines. The investigations were specific to a triangular portion of land off Burren Street in Macdonaldtown known as the former Macdonaldtown Gasworks (the site). The archaeological work formed part of RailCorp's pre-remediation plan for the site. The testing took place between 9/6/2010 and 25/6/2010. The aim was to determine the condition and extent of the expected remains. The site is listed on the State Heritage Register as part of the Eveleigh Railway Works, Listing No. 01140.

The subject site had previously been assessed for archaeological potential in 2004 and then in 2006. An Archaeological Research Design Report was prepared in March 2010 by City Plan Heritage which was submitted to the Heritage Branch of the NSW Department of Planning with the Excavation Permit Application for the test trenching program. The two previous archaeological reports were included as the relevant background information with the Archaeological Research Design Report.

This report includes discussion and results of the test trenches, the background history and the significance of the site, as well as recommendations for management of the archaeology and heritage. The attachments consist of the Section 60 Excavation Permit Approval, all relevant plans relating to the site and the trenches, the digital colour photographs and the digital photographic catalogue.

A hard copy archival recording report, to Heritage Branch guidelines for State heritage items, has been prepared as a separate report. It includes the digital colour photographs, as well as black and white photographs, all on archival quality paper.

1.2 THE PLANNED REMEDIATION IMPACT ON THE ARCHAEOLOGICAL REMAINS

RailCorp owns a triangular area of land located off Burren Street, Macdonaldtown which formerly operated as a gasworks. It is located adjacent to the Eveleigh Railway Works and originally operated, up until the late 1950s, as part of the Eveleigh workshops. The buildings located on the land were cleared or demolished in the 1950s, with the exception of a standing gasholder, reported to be the only example left standing in NSW. The gasholder continued to be used until the 1970s for the storage of gas, with gas transported to it. The site has remained in RailCorp ownership since that time and has largely been used for storage of rail

construction materials. Archaeological assessment reports previously carried out in 2004 and 2006 noted that archaeological remains were still located at the site.

Previous environmental investigations carried out from 2000 through to 2008 on the site identified the presence of coal by-products; including tar, coke and ash throughout the central portion of the site where the processing activities were performed. Contaminated fill materials, mainly comprising coke, ash and demolition waste, were also identified in other areas of the site. This contamination has been declared by the NSW Environment Protection Authority (EPA) to pose a Significant Risk of Harm to human health and/or the environment, as defined by the *Contaminated Land Management Act* 1997 (CLM Act).

RailCorp is therefore initiating a remediation project which has two separate phases. The first phase of the project ("Planning Phase") will provide greater definition in relation to key project constraints, and will therefore allow more accurate scoping of the second phase ("Remediation Phase"). RailCorp plans to remediate and validate the site in order to allow the preparation of a Site Audit Statement (SAS) by an EPA Accredited Site Auditor, declaring the site suitable for Commercial/Industrial Use (railway purposes).

The first stage, the Planning Phase, includes the submission of a Part 3A Project Approval for the next stage, Remediation, under the *Environmental Planning & Assessment Act* 1979 (EP&A Act). The archaeological test excavations that are the subject of this report were carried out as part of the Planning Phase, which included amongst other assessments, community consultation, geotechnical and heritage assessment works.

It is the subsequent stage, the physical remediation works of the overall project that will impact on the site. As part of the planned remediation, excavations will need to take place across the majority of the site. The proposed remedial action plan that RailCorp will follow was provided to City Plan Heritage.[1] The known archaeological remains and remnant structures will be affected by the remediation process. Therefore, the program of test excavations was planned for the site in order to assess and identify the remains, prior to the remediation.

1.3 SITE LOCATION

The former Macdonaldtown Gasworks site is located off Burren Street, Erskineville and covers an area of 7,732 square metres. It is identified as Part of Lot 50 in DP1001467 and the land is zoned "Railways Zone" under the Sydney Regional Environment Plan No. 26 (SREP 26).

[1] CH2MILL, Remedial Action Plan, Former Macdonaldtown Gasworks – Burren Street, Erskineville, NSW, Final Report to Rail Corporation NSW, December 2007

The site is listed on the State Heritage Register (SHR No. 01140) as part of the Eveleigh Railway Workshops, and it is included in the S.170 Heritage and Conservation Register (SRA102) with particular listing for the standing gasholder. The site is bound to the north by the Macdonaldtown Stabling Yard (owned by RailCorp), to the east and south by the Illawarra Rail Line (owned by RailCorp), and to the west by privately owned residential properties on Burren Street (see the plans and aerial photographs in this report).

The gasworks site is currently used for the ad-hoc storage of railway materials and is secured by an 1800mm high chainwire fence on most boundaries. A concrete noise wall has recently (2007) been constructed along the southern boundary of the site to mitigate noise impacts associated with trains in the area.

The site is generally covered by low lying weeds, shrubs and trees, and some small stockpiles of soil, fill materials and other wastes are present. The main site feature is the standing gasholder which is positioned close to the western site boundary. The gasholder consists of an aboveground steel frame, with a telescoping steel bell (in two sections) which rests inside a brick annulus (underground). The gasholder is approximately 20 metres in diameter and 12-13 metres in height. The annulus is approximately 6 metres deep at the outer edge and the base of the annulus is likely to be domed in the centre.

Other site features include the brick annulus of a second gasholder to the north of the standing gasholder (this was previously demolished and filled with assorted building waste materials), two concrete tar wells, a disused signalling shed, and a number of concrete slabs / retaining walls on the northern site boundary. Railway services are also present within a ground level concrete trough on the western embankment and a Sydney Water sewer line is located beneath this same embankment.

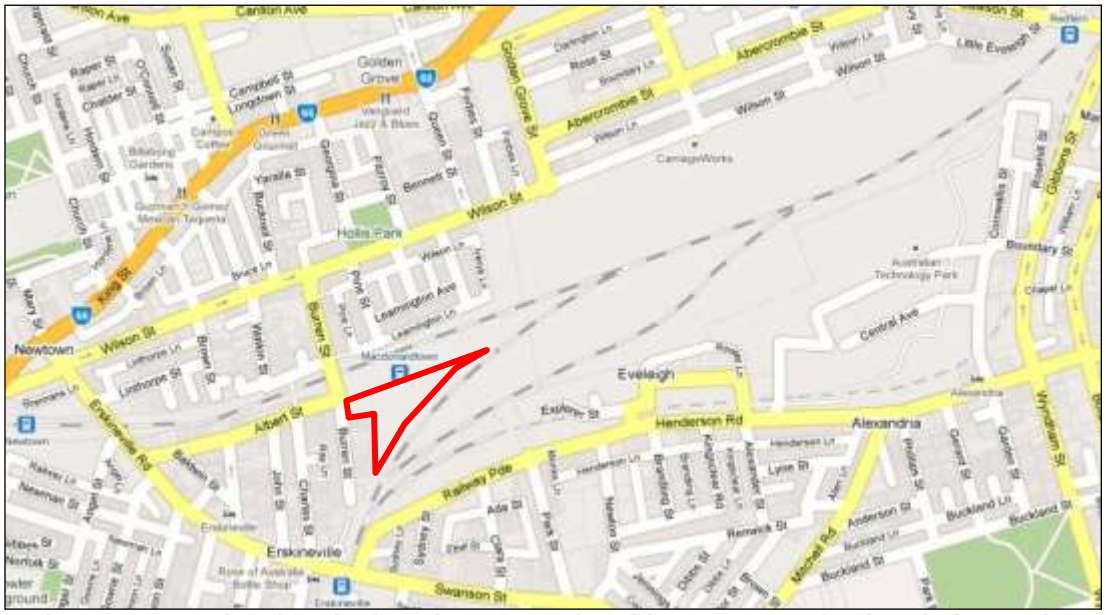

Figure 1: Map showing the location of Macdonaldtown Gasworks, in relation to the wider area and railway stations
(Source: Google maps online)

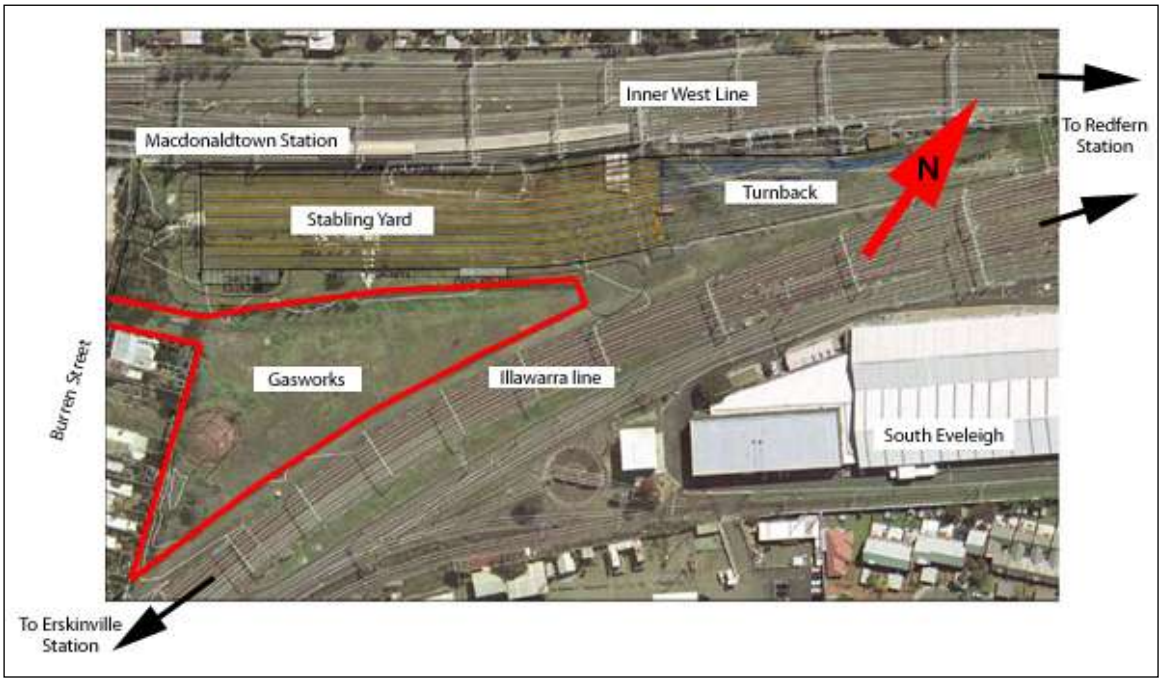

Figure 2: The site plan provided by RailCorp NSW, with the adjacent railway properties identified. The approximate extent of the site is indicated here in red.
(Source: RailCorp NSW)

Figure 3: Looking southwest, the site with the opened test trenches.
(Source: F. Reidel - all photographs, unless otherwise stated, were taken by F. Reidel during the test excavations on site.)

1.4 METHODOLOGY

This Archaeological Excavation Report has been prepared in accordance with the guidelines for "Historical Archaeology Code of Practice", prepared by the New South Wales Heritage Office of the Department of Planning, 2006.

The program of archaeological test excavations was undertaken via the conditions laid out in the approved Application under S60 of the NSW Heritage Act, 1977, Application No. 2010/S60/21. The approval is attached to this report in Appendix 1.

1.5 AUTHOR IDENTIFICATION AND ACKNOWLEDGEMENTS

This report has been written by Franz Reidel (Excavation Director) and Gina Scheer (Heritage Consultant). Kerime Danis (Manager) has reviewed and endorsed the report.

The field work was carried out by Gina Scheer and Franz Reidel with Bob Stanton as machine operator. Bryan Kidd and Anthony Dimech from Incoll Management provided onsite support. Daniel Wedgwood of RailCorp provided the archive plans reproduced in this report.

2.0 HISTORY

2.1 SITE OCCUPATION AND LAND USE

The following is a summary of the historical development of the site. The sources for the history are listed in the Bibliography for this report. A site history was also undertaken for the 2004 archaeological assessment of the site, by Banksia Heritage + Archaeology.

The gasworks at Macdonaldtown was constructed on part of the land resumed by the Crown for railway purposes (see Figure 5). The railway system was established in 1855, with the western line from the city (Central) initially to Granville. This set the boundary line for the northern side of the Macdonaldtown triangle.

The southern boundary was formed by the 1857 establishment of the Illawarra line, with Erskineville Station opening nearby the subject site in 1884 to serve the rapidly expanding population (due to subdivision of the large estates). The railway station at Macdonaldtown was opened in 1878 at a site slightly west of the current location, adjacent to Charles Street. The main suburban railway line through Macdonaldtown was quadruplicated in 1892, which is when the station was reportedly moved to its present site, near the Gasworks. The third boundary was the rear of the residential lots located along the eastern side of Burren Street. The triangle of land comprising the subject site does not appear to have been actively used from the 1850s through to the construction of the Gasworks during the 1890s. The land of the site was acquired by the railways from 'Trust J. Wilson' on 2 July 1888. The site has been in railway ownership ever since, with none of the original parcel of land sold.

In 1878 the Railway Commissioner had entered into an agreement with a Mr. John Louis Castner to fit and maintain the new gas lights in carriages and to supply gas for them from his works at Redfern for a period of five years. Castner went on to operate gasworks for the railways at sites in Redfern, Newcastle, Bathurst and Junee. The Railway Commissioners took over Castners works in 1884. The Railways subsequently established Gasworks at Werris Creek, a second works at Junee, two further works at Redfern in Sydney, and the subject site at Macdonaldtown (Eveleigh).

A December 1917 article by a Railways Gas Superintendent, H. C Brooks, entitled *Railway Gasworks and Gas making Macdonaldtown* has provided valuable information on the working of the site and the processes that were involved in manufacturing and processing gas. Brooks states that the existing works were erected in the year 1892 and that; *"The type of settings are of generator principal, the retorts and furnaces being shovel fed."*[2] He also noted that little additions beyond expected maintenance and repairs were made to the Macdonaldtown site in the years up to 1917.

[2] Brooks, H.C., 1917, 68

The nature of the works on site was also described in a 2003 article for the Bulletin of the Australian Railway Historical Society by Jim Longworth. He noted that: *"In addition to producing gas for burning, the works produced vast quantities of coke that was used in the dozens of coke-fuelled low temperature forges that were scattered around the various shops within the Eveleigh workshops."*[3]

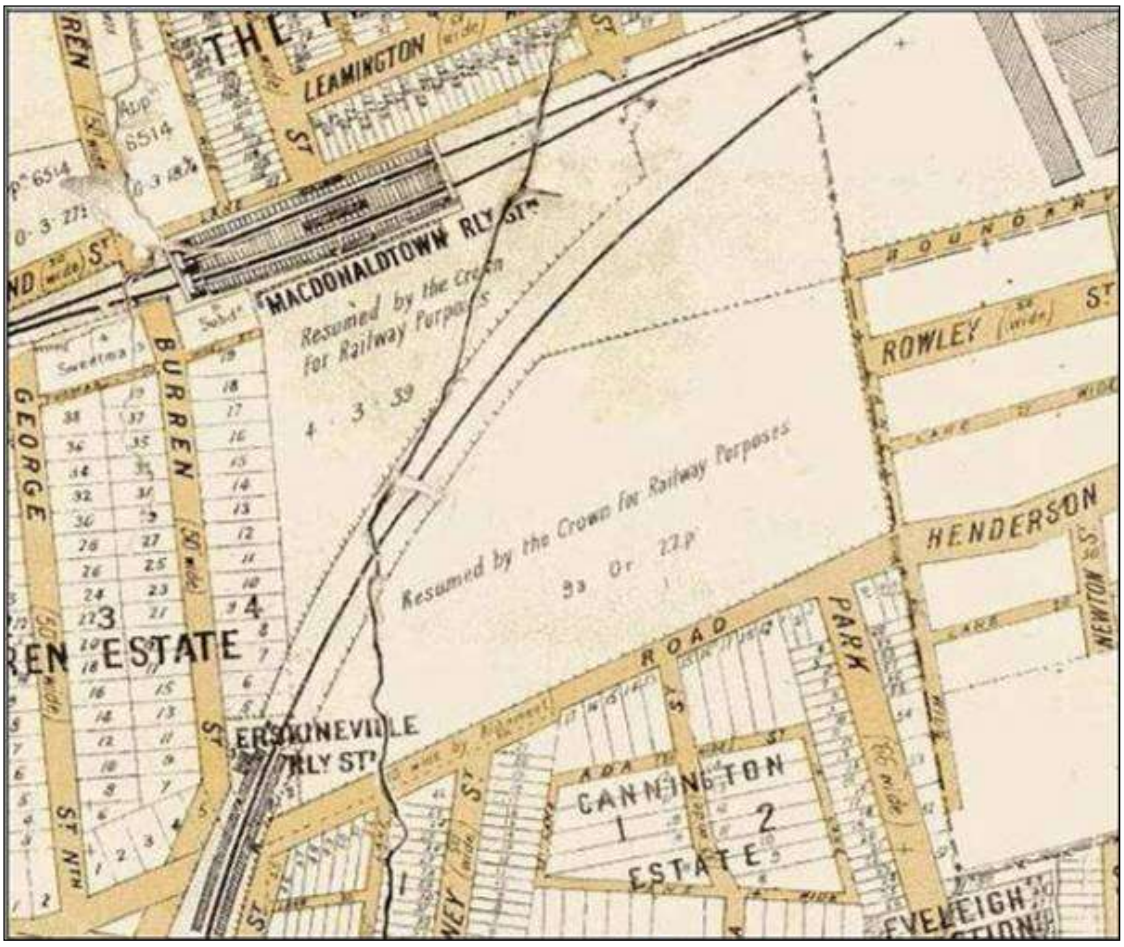

Figure 5: undated, c.1890s plan of Newtown Municipality showing the residential subdivisions around the railway line infrastructure.
(Source: City of Sydney Council Archives, Newtown Borough)

Longworth also provided a chronology of the subject site in his 1999 report to the State Rail Authority of NSW. The dates and details are as follows and are accompanied by the relevant site plans provided by RailCorp Archives:

- In 1892 the Eveleigh gasworks were completed. While the location and overall form of the works was built as per the designs, the detailed layout of the various components that comprised the works as finally built was slightly different to that as originally proposed. There were three Gasholders proposed, however, only two were constructed.

[3] Longworth, J., "A brief history of NSW Railway Gasworks", 2003, 207

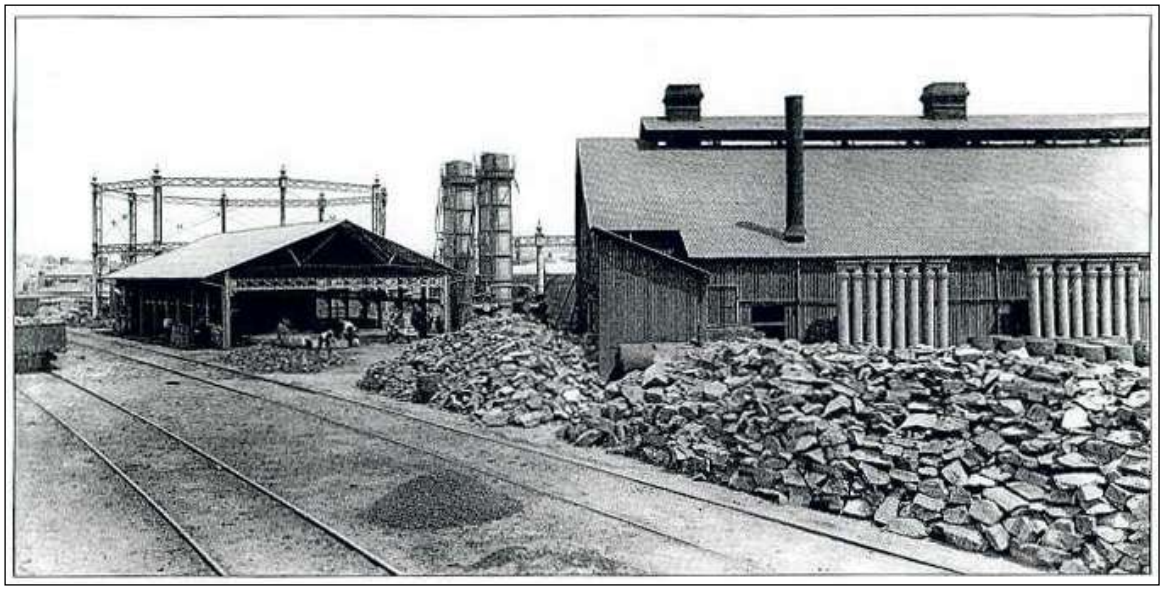

Figure 6: The Gasworks, photo, c.1917. This view shows the retort house (in the foreground), condensers, washers, purifiers (in the open sided purifying shed) and gasholders.
(Source: Image from NSW Railway and Tramway Magazine, December 1917, p.68)

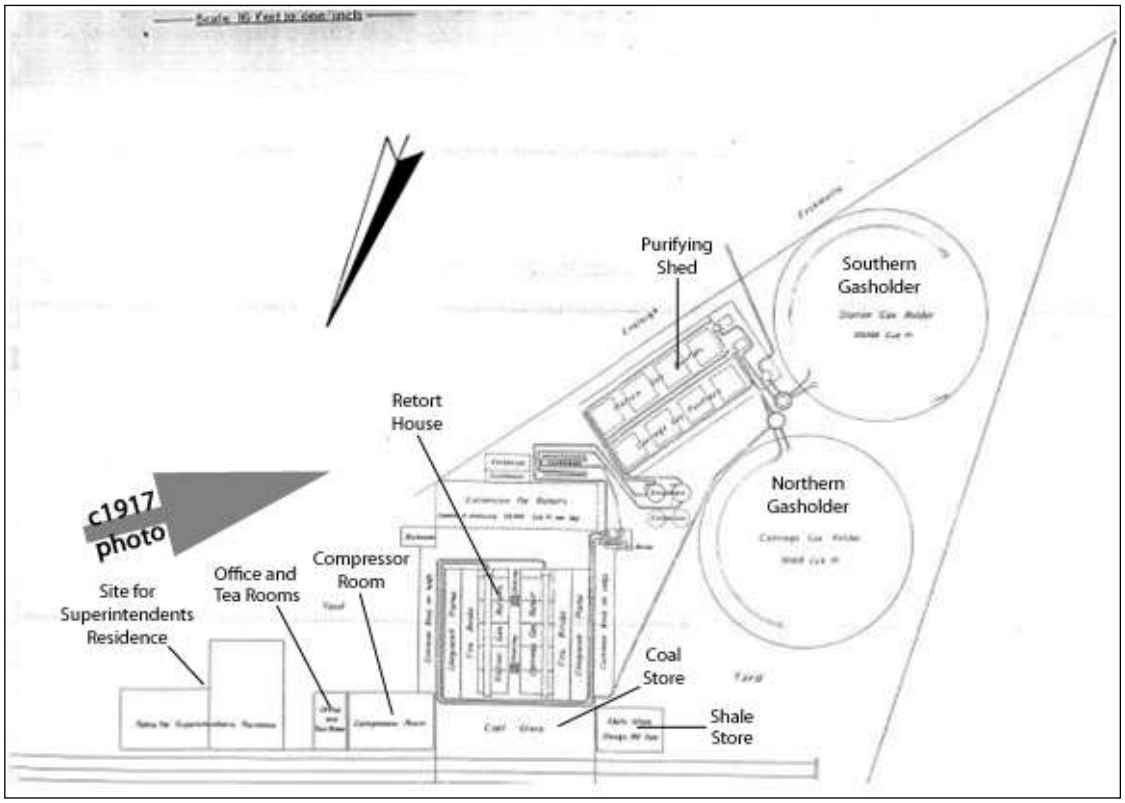

Figure 7: The Gas Works Eveleigh General Arrangement, plan c.1917. This plan names each section of the structures on the site, which have been highlighted with arrows. It dates from the same period as the photo on the previous page at Figure 4.
(Source: Reproduced in Eveleigh Gasworks Site History, 1999 Jim Longworth, Rail Services Australia Environmental Services)

- Nothing further is mentioned until the 1940s. In c.1942 – there were two tar wells in use on the site, and there was a proposed connection of the 'Aeration Cylinder for Waste Water' to the sewer. During 1944, 1945, 1949, 1950, and 1952, minor modifications were made to the works.

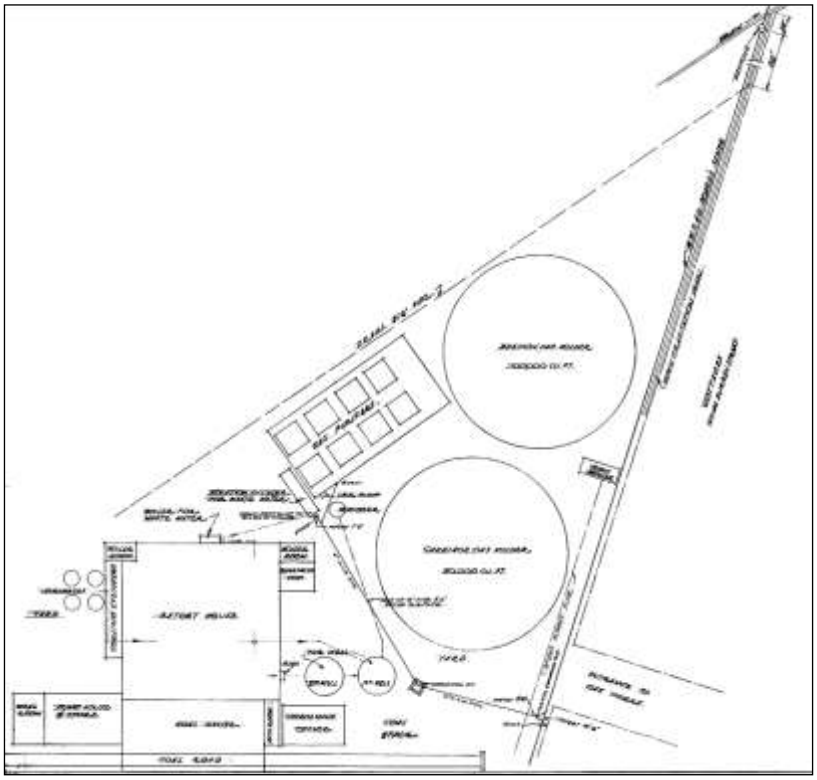

Figure 8: 1942 plan of the site, showing the structures at the time, prepared by the Department of Railways for connection to the sewer.
(Source: Central Plan Room Civil Database, Archives, No. 0071417_A0c)

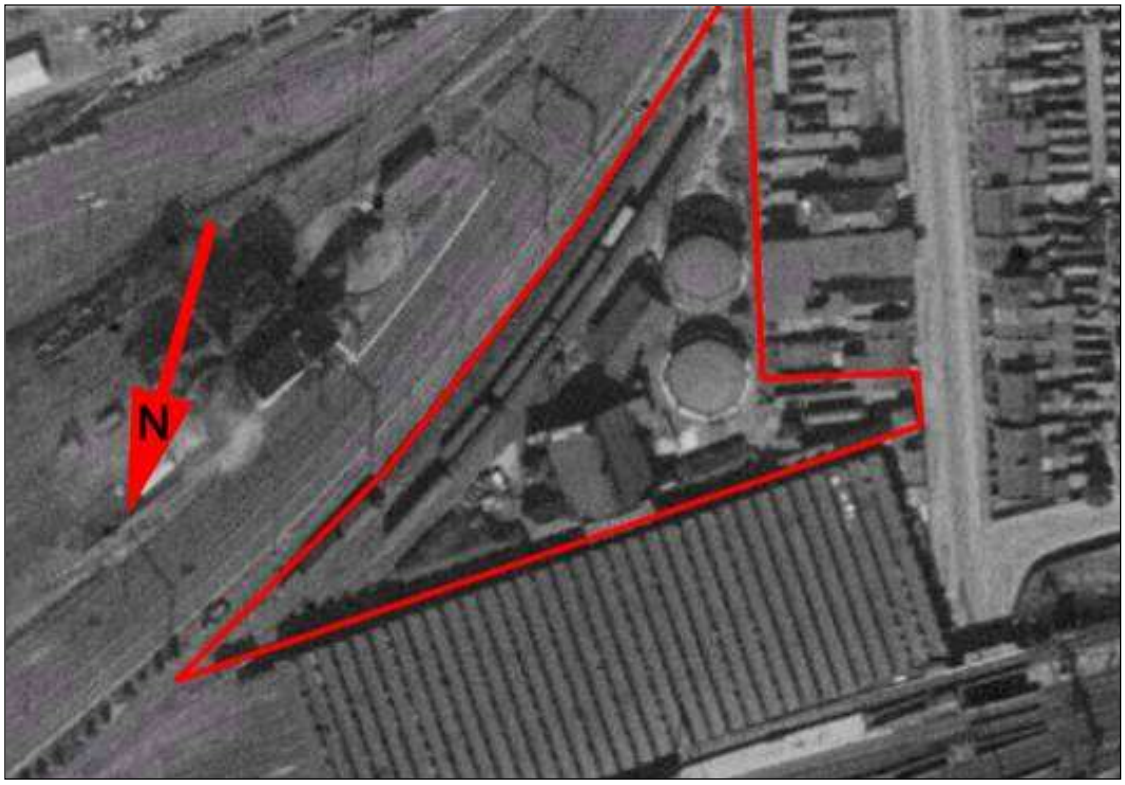

Figure 9: The 1943 aerial of the subject site showing the buildings and structures during the operation of the Gasworks. The approximate site area is outlined in red.
(Source: NSW Department of Lands Spatial Information Exchange.)

- 1950s – The use of inferior coal damaged the machinery and on-site production of gas therefore ceased. The tanks were used to store gas that had been piped from the Railway Gasworks at the Mortlake Central Distribution Plant. Longworth notes that in about 1958 the gas producing plant was demolished.
- In 1962, the southern gasholder, which was the holder used for storing gas for station lighting was shown as extant.

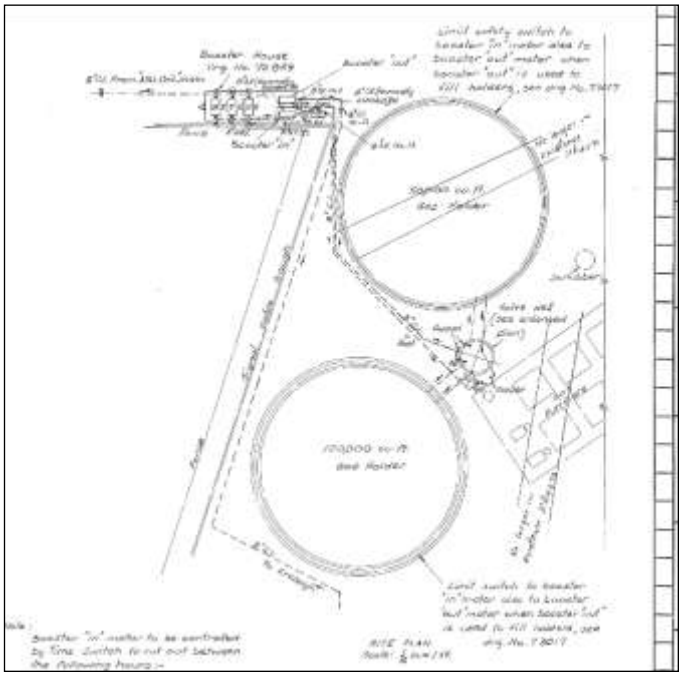

Figure 10: 1954 plan of the two gasholders on the site, Plan Title is "Macdonaldtown Gas Plant – Gas from "AGL CO." Valve well arrangement and site plan. 15.6.1954.
(Source: Central Plan Room Civil Database, Archives, No. 0298700_A0c)

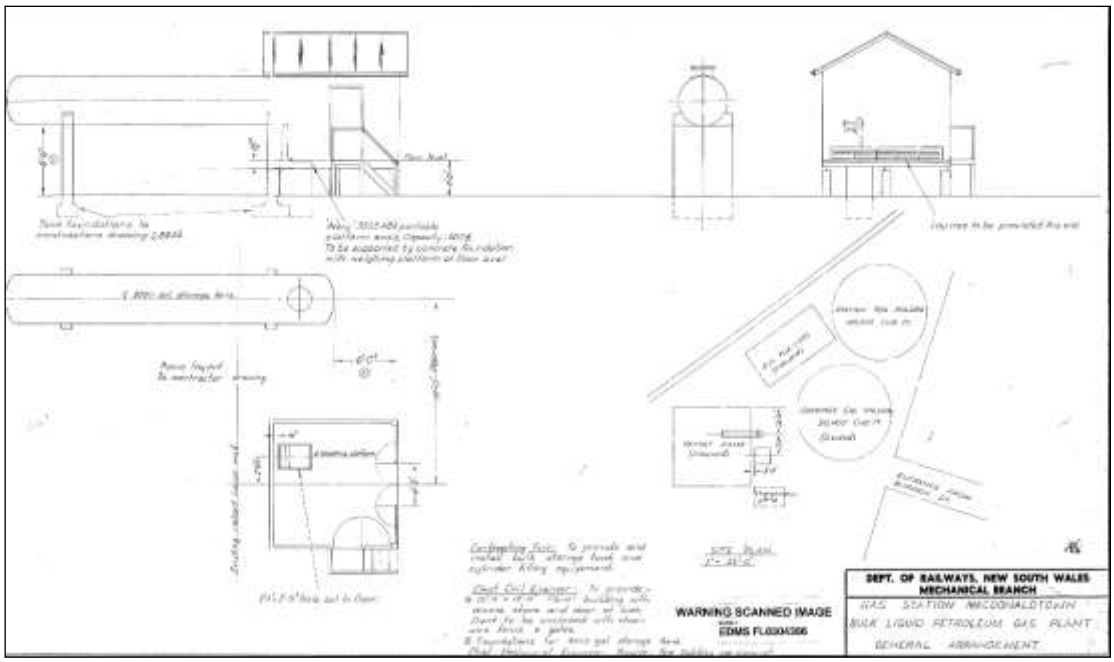

Figure 11: 1961 plan of the site still shows both Gasholders, the Purifying Shed and the Retort house and a 'chargeman's office' still on the site. The plans are for liquid petroleum gas storage on the site to be within an enclosure with a fibro building for the weighing house.
(Source: Central Plan Room Civil Database, Archives No. 0304386_C0c)

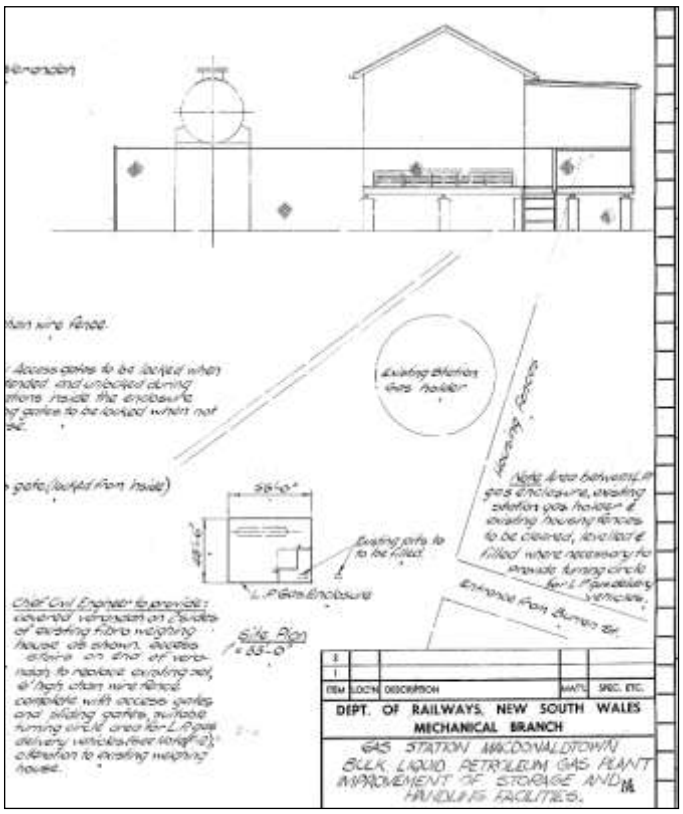

Figure 12: 1965 Plan of the site shows only the northern Gasholder and an enclosure and fibro building for the weighing house. Note the tar wells were to be filled at this time and the area entered from Burren Street leveled.
(Source: Drawing No. 94020, Central Plan Room Civil Database, Archives, No. 0300393_A0c)

- Mid 1970s the site is finally closed down as a pumping and gas storage plant.
- Today the land is vacant railway corridor land with the southernmost gasholder still extant. [4]

The Burren Street properties bordering the site have been its neighbours throughout the establishment and development of the Gasworks. After the site closed completely in the 1970s and up until the 2000s, residents of the adjacent Burren Street properties had used parts of the vacant land of the subject site for recreational purposes.

In 2010 the site continues to be used by RailCorp as a temporary storage area, accessible via road adjacent to the rail corridor and via the Stabling yard entry from Burren Street. The area is not publicly accessible, as the former Gasworks road access from Burren Street, adjoining the residential properties is now securely locked.

The site has been subject to a number of environmental assessments including the previous archaeological investigations in 2004 and 2006.

[4] Longworth, J. 1999, 3

2.2 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

The study area has been subject to two archaeological assessments in the past, with differing recommendations. The 2004 Banksia Heritage + Archaeology report prepared for NSW State Rail recommended that there was one high significance item, the standing gasholder, and three items of low or medium archaeological significance, identified in the report as Elements 7, 8 and 9, listed in the List of Features at 2.3 below and based in the western corner, near Burren Street. That report recommended monitoring during the remediation works.[5]

The 2006 report by Heritage Concepts Pty Ltd for Parsons Brinckerhoff Australia, produced a more comprehensive list of recommendations for the site, and included the following measures:

> *It is recommended that a program of archival photographic recording is carried out for all items prior to the commencement of any remediation works. The archival recording should take place for all gasworks elements and any other items identified during the program of archaeological test excavation.*
> *It is recommended that a program of archaeological monitoring is carried out during the remediation process in areas identified as having archaeological potential.*
> *It is recommended that significant elements of the gasworks unearthed during the remediation and archaeological monitoring process are retained in situ if contamination levels allow.*[6]

2.3 LIST OF FEATURES

The following features were identified as elements in the previous assessments by Banksia Heritage + Archaeology and Heritage Concepts. Item 14 (the Superintendents Residence) was added by this 2010 report.

The structures are numbered in the photographs on the following page using the numbering shown below. This report deals mainly with the results of the test excavation, for more information on other features see the previous reports and the plan attached to this report at Appendix 2.

1. Southern Gasholder
2. Northern Gasholder
3. Purifying Shed
4. Signalling / Connection Shed
5. Retort House
6. Cleaning Shed (located to the north of study area)

[5] Banksia Heritage + Archaeology, *Macdonaldtown Station works archaeological assessment – draft,* for NSW State Rail and Fitzwalter Group, April 2004
[6] Heritage Concepts Pty Ltd, *Archaeological Assessment & Remediation Management Strategy for the former Macdonaldtown Gasworks*, for Parsons Brinckerhoff, 2006

7. Retaining Wall
8. Structure (un-named)
9. Concrete Slab
10. Cable Trenching
11. Retaining Wall
12. Two Tar Wells
13. Condensate Pit
14. Superintendents Residence

3.0 PROGRAM OF TEST TRENCHES

3.1 RESEARCH QUESTIONS PROPOSED IN THE ARCHAEOLOGICAL RESEARCH DESIGN

The March 2010 Archaeological Research Design Report also prepared by City Plan Heritage noted that (from the previous reports) it was evident remains existed on the site but that their extent and condition were not known. The program of test trenching was therefore designed to be located to maximize the chances of picking up surviving structures like walls, footings, floors, or others.

General research questions included:

- What is the condition and extent of the surviving archaeological evidence?
- What is the nature of the extant archaeological features; for example, is there evidence of the former activities, such as the purifying process? Can these elements be dated?

Remedial excavations and the movement of heavy machinery both have the potential to impact upon the known archaeological remains and remnant structures on the site. If necessary, the remains will need to be identified and protected.

Site specific research questions for the Macdonaldtown Gasworks consisted of the following:

- What is the extent and the condition of the below ground remains?
- Which elements would require removal due to the presence of significant contamination?
- Do the below ground remains contribute new information about the use and development of this Gasworks site?
- How do the remains of this site compare with the other Rail Gasworks sites identified in the history? That is, is this a representative site?
- What can it contribute for the relationship with the nearby Eveleigh railway sites?
- Is there evidence remaining of access and transport links to Eveleigh?
- What evidence remains for the processing on the site? For example, the retorts, or purifiers?
- What elements can be retained on site during / following the site remediation works?

Note: It was assumed that we would not encounter a substantial amount of artefact material that would warrant collection during the archaeological testing program, or that artefacts would be suitable for collection owing to possible contamination.