



Douglas Partners

Geotechnics • Environment • Groundwater

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REPORT

on

LIMITED PHASE 1 CONTAMINATION ASSESSMENT

PROJECT STAR

UNION STREET, PYRMONT

Prepared for

SYDNEY HARBOUR CASINO PROPERTIES PTY LTD

Project 45648

June 2008



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GN:jlb
Project 45648
12 June 2008

REPORT ON LIMITED PHASE 1 CONTAMINATION ASSESSMENT
PROJECT STAR
UNION STREET, PYRMONT

1. INTRODUCTION

This report details the methodology and results of a Limited Phase 1 Contamination Assessment undertaken by Douglas Partners Pty Ltd (DP) for the proposed development of the vacant site on the southern side of the existing Star City Casino, located at Union Street, Pyrmont. The site is identified as Lot 121, in Deposited Plan 828957. The investigation was commissioned by Taylor Thompson Whitting Pty Ltd, on behalf of Sydney Harbour Casino Properties Pty Ltd. It is understood that the proposed development will include construction of a new tower building (16 storeys above ground and five basement levels).

The investigation included a review of site information as described in Section 2, Scope of Works, and a site walk-over. The objective of the current investigation is to provide preliminary information on the potential for soil and/or groundwater contamination due to previous or current site activities.

2. SCOPE OF WORKS

The scope of the Limited Phase 1 Contamination Assessment was as follows:

- Undertake a site history search including a title deeds search, a review of historical aerial photographs, a search of Contaminated Land Register for Notices issued under the *Contaminated Land Management Act 1997*;
- Review available site information with reference to local geology and Department of Water and Energy groundwater bore database;
- Conduct a walk-over inspection of the site to identify signs of potential contamination;
- Provision of a Limited Phase 1 Contamination Assessment Report, providing general comments on the potential for or existence of contamination due to previous or current site activities.

Council records obtained under the *Freedom of Information Act* and WorkCover historic records on the storage of Dangerous Goods were not accessed. The limitations with regard to the extent of the scope of work for this assessment were imposed by a strict deadline for reporting. Soil and groundwater sampling was not part of the scope of work.

3. SITE DESCRIPTION

The site of the proposed development has an irregular pentagon shape and covers an area of approximately 4,756 m². The investigation area is identified as Lot 121, in Deposited Plan 828957. A locality map (Figure 1) and a photographic plan of the site (Figure 2) are shown in Appendix A.

The site is bounded by Star Hotel – Star City Casino to the north, Edward Street to the east, Union Street to the south and Pyrmont Street to the west. The surrounding area has residential and commercial landuse (refer to Photograph 1, Appendix B).

At the time of the site inspection the site was a vacant land, operating as storage and formerly a site office area for construction works. Sandstone rubble/fragments (possibly representing the top of sandstone outcrop) were observed at the north-eastern section of the site (refer to Photograph 2, Appendix B). Based on anecdotal information from workers on the site and DP's site inspection observations it appears that the site is underlain by natural sandstone bedrock, which had been partially covered with variable thicknesses of filling to form/level the site for access purposes. The depth to rock and depth of filling across the site could not be verified.

There were two small stockpiles of filling material observed at the western section of the site.

4. REGIONAL GEOLOGY, TOPOGRAPHY AND HYDROGEOLOGY

Reference to the Sydney 1:100 000 Geological Series Sheet 9130 indicates that the site is underlain by Hawkesbury Sandstone. Hawkesbury Sandstone typically comprises medium to coarse grained quartz sandstone with some shale bands or lenses.

The topography of the region comprises gently undulating terrain sloping downwards towards the north-east and foreshore area adjoining Pyrmont Bay. Sandstone outcrop is present to the east of the site in the alignment of the Light Rail which passes beneath Star City and also further to the north of the site.

It is anticipated that the pre-development geology of the site would have comprised a relatively shallow residual soil profile (typically less than 2 m thickness) overlying Hawkesbury Sandstone bedrock. The level of bedrock is likely to step down towards the north-east in a series of natural benches and cliffs which have now been obscured and modified by past development.

Past development has modified the surface topography and it is likely that the subsurface profile is variable, comprising both filling (of currently unknown materials) and possibly shallow residual soils overlying sandstone bedrock. Surface water is expected to flow

towards Pymont Bay which is approximately 200 m to the north-east. It is considered that any surface infiltration/groundwater would locally flow towards the north-east, as seepage along weathered joints and bedding planes. A true regional aquifer would be at some depth below the ground surface.

5. SITE HISTORY

5.1 Site History

A site historical information review was conducted, comprising a title deeds search, a review of historical aerial photographs, a search of the Contaminated Land Register for Notices issued under the *Contaminated Land Management Act 1997*, as well as a groundwater bore search of the Department of Water and Energy database. The full site history search information is presented in Appendix C.

5.2 Title Deeds

A historical title deeds search was performed to obtain ownership or occupancy information on the property, including company names and the occupations of individuals. The title information, particularly through company names, can assist in the identification of previous land uses and can therefore assist in establishing whether there were potentially contaminating activities occurring at the site. The title deeds search identified a number of Lots (historic) with respect to the site which are identified as coloured sections, as marked on the attached cadastre (see Appendix C). The title deed search results are summarised in Tables 1- 8. In establishing the possible use of the site, information has also been drawn from other sources such as aerial photographs.

Table 1 - Historical Title Deed Record for the Orange Section

Date	Owner/Occupier	Possible Site Use
1922 - 1929	Resch's Limited	Brewing/Pub
1929 - 1948	Tooth & Co. Limited	Brewing/Pub
1948 - 1964	The Sydney County Council	Power generation/distribution
1964 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 2 - Historical Title Deed Record for the Blue Section

Date	Owner/Occupier	Possible Site Use
1919 - 1929	Resch's Limited	Brewing/Pub
1929 - 1942	Tooth & Co. Limited	Brewing/Pub
1942 - 1964	The Sydney County Council	Power generation/distribution
1964 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 3 - Historical Title Deed Record for the Pink Section

Date	Owner/Occupier	Possible Site Use
1918 - 1949	Municipal Council of Sydney (for the Municipal Council of Sydney Electric Lighting Act) (now Sydney County Council)	Power generation/distribution
1949 - 1991	?Sydney County Council	Power generation/distribution
1991 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 4 - Historical Title Deed Record for Aqua Green Section

Date	Owner/Occupier	Possible Site Use
Till 1951	Formerly Marian Street	Street
1951 - 1991	The Sydney County Council	Power generation/distribution
1991 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 5 - Historical Title Deed Record for the Yellow Section

Date	Owner/Occupier	Possible Site Use
1907 – 1916	Ada Louisa Grinham (<i>Married woman</i>)	Residential
1916 – 1967	Municipal Council of Sydney	Power generation/distribution
1967 – 1993	Electricity Commission of NSW	Power Station
1993 – 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 6 - Historical Title Deed Record for the Green Section

Date	Owner/Occupier	Possible Site Use
1878 - 1946	Her Most Gracious Majesty Queen Victoria	Crown land
1946 - 1964	The Sydney County Council	Power generation/distribution
1964 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 7 - Historical Title Deed Record for the Purple Section

Date	Owner/Occupier	Possible Site Use
1850 - 1927	George Bennett (<i>Master Mariner</i>) (& His deceased estate)	Residential
1927 - 1929	Reginald Ernest Burcher (<i>Grazier</i>)	Residential
1929 - 1942	John Francis Gaha (<i>Medical Practitioner</i>)	Residential
1942 - 1991	The Sydney County Council	Power generation/distribution
1991 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

Table 8 - Historical Title Deed Record for the Red Section

Date	Owner/Occupier	Possible Site Use
1903 - 1942	Francis Buckle (<i>Ship Owner</i>) The part marked (A) in the hatched area was purchased by Francis Buckle on 06.07.1903, the remaining parts were purchased prior to 1896 Conveyance date unknown.	Residential
1942 - 1991	The Sydney County Council	Power generation/distribution
1991 - 1993	Electricity Commission of NSW	Power Station
1993 - 1997	Sydney Electricity (Energy Australia Ltd)	Power Station
1997 - current	# Casino Control Authority	Vacant

Current Registered Proprietor

According to the title deeds, the green, orange, blue, purple and red sections were separated from the rest of the site by the former Marian Street (the aqua green section) until 1951 when it was closed, and was absorbed into the Sydney County Council property. The likely use was as part of the Pyrmont power station. In 1991 it became property of Electricity Commission of NSW.

The orange and blue sections of the site potentially had similar past uses, based on a common ownership. In particular the uses may have included brewing/pub use from 1919 (blue section) /1922 (orange section) to 1942 (blue section)/1948 (orange section), and later as part of Pyrmont power station as property of Sydney County Council from 1942/1948 to 1964 and later as property of the Electricity Commission of NSW from 1964 to 1993.

The purple and red sections probably had a residential use until 1942, when they became part of the Sydney County Council property. From 1991 to 1993 these sections were owned by the Electricity Commission of NSW.

The green section was Crown Land from 1878 to 1946 and property of Sydney County Council from 1946 to 1964. From 1964 to 1993 this section was owned by Electricity Commission of NSW.

The yellow and pink sections probably had a residential use until 1916 and 1918, respectively, when they became property of Municipal Council of Sydney (for the Municipal Council of Sydney Electric Lighting Act) with possible power station use. In 1967 (yellow

section) and 1991 (pink section) these sections became the property of the Electricity Commission of NSW which possibly continued their use as power station till 1993.

All sections were property of Sydney Electricity (Energy Australia Ltd) from 1993 to 1997 and of the Casino Control Authority from 1997 till present.

The title deed search results for the site are included in Appendix C.

5.3 Aerial Photographs

Aerial photographs from 1930, 1951, 1961, 1970 and 1986 were obtained from the NSW Department of Lands Office and the 1943 and 2006 images were obtained from the NSW Department of Lands website (www.lands.nsw.gov.au) on 6 June 2008. The aerial photographs are presented in Appendix C. These aerial photos were reviewed to assess the likely past uses of the site. The findings are summarised below.

1930 – The site was divided by the former Marian Street into two sections. The northern section consisted of large industrial type building which extends north of the site and is believed to be Pyrmont Power Station. The southern section of the site consisted of commercial/residential type buildings. There are large industrial buildings visible north, east and west of the site and residential/commercial buildings south of the site.

1943 – No significant change to the landuse or the surrounding area was observed from the 1930 photograph. The stacks of the power station and coal stockpiles are clearly visible on this aerial photograph. A large industrial type building was constructed on the southern side of Union Street.

1951 – All site buildings visible on the 1943 aerial photograph were demolished and three large industrial type buildings were constructed on the site. A similar type of building was constructed east of the site. These buildings are believed to be part of Pyrmont Power Station, possibly the switch gear house. The stacks can be seen to be discharging a heavy plume of black smoke.

1961 – No significant change to the land use or the surrounding area was observed from the 1951 photograph. A plume of light coloured smoke or water vapour can be seen discharging for the power station just to the north of the site.

1970 - Some of the buildings at the northern section of the power station, to the north of the site, were demolished.

1986 – No significant change to the land use or the surrounding area was observed from the 1970 photograph.

2006 – The site consists of vacant land. The buildings of the Star City Casino, north of the site, are clearly visible where previously Pymont power station was situated. The surrounding areas consist of residential/commercial type of buildings.

5.4 Regulatory Notices Search

A search of Notices on the DECC website on 6 June 2008 indicated that there are seven former Notices (six Remediation Orders and one Revocation Notice) reported to have been issued for Lots 121 and 122, Deposited Plan 828957 under the *Environmentally Hazardous Chemicals Act*, the antecedent Act of the *Contaminated Land Management Act, 1997* in relation to the regulation of contaminated land. A list and details of the notices issued is attached in Appendix C. The notices issued were as follows:

1. Remediation Order 129, issued on 3 May 1989, revoked on 13 May 1994

This notice was issued by State Pollution Control Commission (SPCC) to the Electricity Commission of NSW under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice was in relation to the site 'being contaminated by the prescribed activity of the disposal of chemical wastes, namely polychlorinated biphenyl (PCB) wastes'.

2. Remediation Order 139, issued on 27 June 1989, revoked on 13 May 1994

This notice was issued by SPCC to the Electricity Commission of NSW under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice was in relation to the 'proposed asbestos removal works to be carried out at Pymont Power Station'.

3. Remediation Order 166, issued on 17 April 1990, revoked on 13 May 1994, Annexure 1 – Approval to Conduct Works

This notice was issued by SPCC to the Electricity Commission of NSW under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice was in relation to the decontamination of the site which involved '(1) removal of asbestos, (2) removal of drums and vessels which contain various chemical wastes, e.g. PCB wastes, and (3) decontamination of soil possibly contaminated with chemical wastes e.g. PCB, Hydrocarbon' and the demolition of 'the four stacks, where asbestos cement sheeting had been used for internal lining'.

4. Remediation Order 167, issued on 27 April 1990, revoked on 13 May 1994, Annexure 2 – Approval to Conduct Works

This notice was issued by SPCC to the Electricity Commission of NSW under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice had similar purpose as Order 166.

5. Remediation Order 200, issued on 13 February 1991, revoked on 13 May 1994, Annexure 3 – Approval to Conduct Works

This notice was issued by SPCC to the Electricity Commission of NSW under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice specified the locations of the asbestos air monitoring and thresholds required during the asbestos removal works.

6. Remediation Order 370, issued on 11 January 1994, revoked on 13 May 1994, Annexure 3 – Approval to Conduct Works

This notice was issued by SPCC (antecedent regulatory authority to the EPA) to Pacific Power (the registered business name of Electricity Commission of NSW) under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice was in relation to the required validation of the site subsequent to its decontamination. The validation requirements were in accordance with a Work Plan prepared by Dames and Moore entitled "Validation of Pyrmont Power Station for Pacific Power", dated 7 January 1994.

7. Revocation Notice 379, issued on 13 May 1994

This Notice was issued by the SPCC to Pacific Power under Section 35 of the Environmentally Hazardous Chemicals Act, 1985. This notice was issued to revoke the previous remediation notices. It states that 'EPA received a report entitled "Site assessment Report, Soil Conditions Former Pyrmont Power Station, for Pacific Power" by Dames & Moore Pty Ltd, dated 2 May which concludes that the site had been remediated in accordance with the acceptable limits for medium density residential housing purposes, subject to excavation or backfilling of the water-filled sumps on site, disposal of any contaminated sediments contained within sumps and removal of potentially PAH contaminated soil at the south-east corner of the site when the sewer main is decommissioned.

5.5 Groundwater Bore Search

A groundwater bore search of the Department of Water and Energy website database (previously held by the Department of Natural Resources) was conducted. Two groundwater bores in a 4 km radius were located north-west of the site and one south-east of the site. The information available for those bores on the website indicates that the bores were installed for monitoring purposes to a depth of 4 m, 4.8 m and 9 m. However, there are no details about the water levels detected. These bores are sufficiently distant to the site to not have relevance to site conditions. The groundwater bore search map and the available groundwater bore details are attached in Appendix C.

6. POTENTIAL CONTAMINANTS

The main source of potential soil contaminants on the subject site is likely to be associated with the former site use as part of the Pymont power station. These are considered to include:

- Asbestos;
- Polychlorinated hydrocarbons (PCB);
- Petroleum Hydrocarbons (TPH);
- Benzene, toluene, ethyl benzene and xylene (BTEX).
- Polycyclic aromatic hydrocarbons (PAH)
- Heavy Metals.

Based on the Notices search, the site was remediated and validated in 1994, subject to excavation or backfilling of the water-filled sumps on site, disposal of any contaminated sediments contained within sumps and removal of potentially PAH contaminated soil in the south-eastern corner of the site.

Another potential source of contamination is the filling of unknown origin used to form the site. Fill from unknown sources has the potential to contain a wide variety of contaminants including those listed above and also including:

- Organochlorine pesticides;
- Phenol.

The current site and surrounding land uses are not considered to be significant in terms of the potential to adversely impact the site.

7. CONCLUSIONS AND RECOMMENDATIONS

The scope of work for the current assessment comprised a site walkover inspection, review of site history and groundwater bore search.

A review of historical information indicated that the site was previously in an industrial area and was divided in two main sections by the former Marian Street until 1951 when it was closed. It appears that the site was used mainly for residential purposes from at least 1850 (the year of the earliest records) until at least 1916/1918. The section north of the former Marian Street had been used as power station since at least 1916/1918 when it became the property of the Municipal Council of Sydney for the Municipal Council of Sydney Electric Lighting Act and later as property of the Electricity Commission of NSW, which possibly continued their use as power station till 1993. Part of the section south of the former Marian Street possibly had brewing or pub/residential use from at least 1919 till at least 1942. The southern section had a possible power station use when it became the property of the Electricity Commission of NSW and later Sydney Electricity from at least 1942 until at least 1997. All sections were the property of Casino Control Authority from 1997 till present.

The main source of potential soil contaminants on the subject site is likely to be associated with the former site use as part of Pyrmont power station possibly including power distribution uses, for example, switch gear house. Based on the *Environmentally Hazardous Chemicals Act* Notices search, the site was remediated to a standard suitable for medium density residential purposes and finally validated in 1994. The validation was subject to excavation or backfilling of the water-filled sumps on the site, disposal of any contaminated sediments contained within sumps and removal of potentially PAH contaminated soil. The original investigation and validation reports have not been accessed and reviewed due to time constraints. Documents confirming that the required additional remediation works had been conducted have also not been accessed and reviewed.

DP understands that the site has been remediated, validated and reported under the Notices issued under the *EHC Act* and the SPCC has lifted the Notices in relation to the property on condition that the contaminated sludges, waste water and PAH contamination have been removed. On this basis, DP considers the potential for contamination associated with the site for a commercial land use is, therefore, likely to be generally low subject to a satisfactory review of the relevant documentation in relation to the fulfilment of the abovementioned conditions and, also, the validation of this part of the overall Pyrmont power station site. Confirmation of the quality of the fill presently on the site would also be

required. If documentary evidence cannot satisfactorily confirm the above an intrusive investigation would be required to confirm the status of the site.

8. LIMITATIONS OF THIS REPORT

The scope of the site assessment activities and consulting services undertaken by DP were limited to those detailed in the proposal dated 3 June 2008 and accepted by Mr Hung Nguyen from Taylor Thompson Whitting Pty Ltd on behalf of Sydney Harbour Casino Properties Pty Ltd.

DP cannot provide unqualified warranties with regards to site contamination nor does DP assume any liability for site conditions not observed or accessible during the time of the investigations. In addition, site characteristics may change over time due to activities such as spillages of contaminating substances. These changes may occur subsequent to DP's investigations and assessment.

This report, its associated documentation and the information herein have been prepared solely for the use of Sydney Harbour Casino Properties Pty Ltd. Any reliance assumed by third parties on this report shall be at such parties' own risk.

DOUGLAS PARTNERS PTY LTD



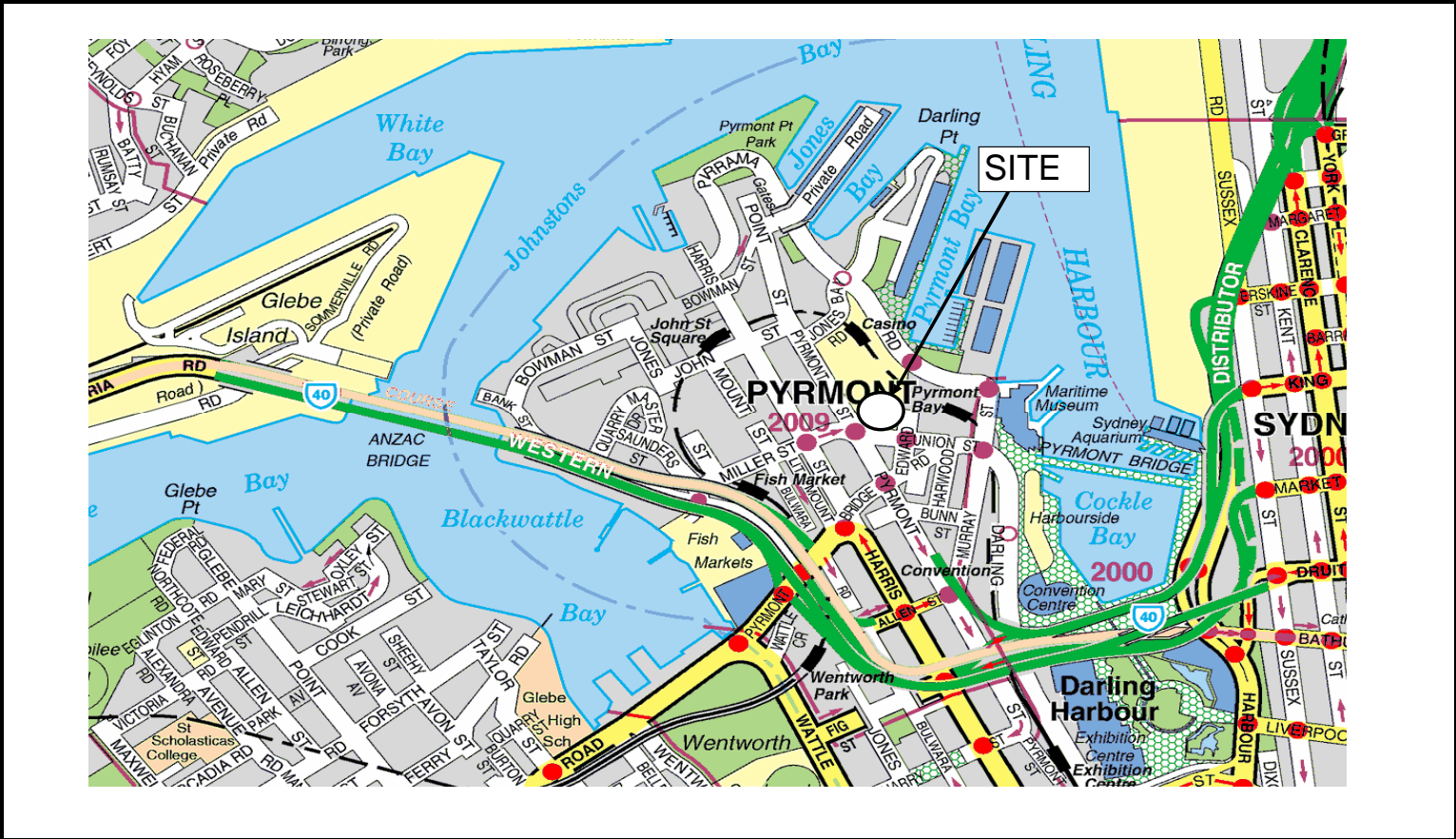
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APPENDIX A
Site Location



Limited Phase 1 Contamination Assessment
 Union Street, Pyrmont
 Site Location

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Figure
 1





Limited Phase 1 Contamination Assessment
Union Street, Pyrmont
Site Boundary

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Figure
2



APPENDIX B
Site Photographs



Photo 1: General view of the site



Photo 2: Sandstone rubble/fragments visible at the north-eastern section of the site

Limited Phase 1 Contamination Assessment Star Hotel - Star City Casino Union Street, Pymont	Project 45648	June 2008	Plate 1
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