Fishermans Bend Urban Renewal Area - Groundwater Quality Assessment

Environment Protection Authority

28-Aug-2015

Desktop Study and Preliminary Regional Conceptual Site Model

Fishermans Bend Urban Renewal Area

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Client: Environment Protection Authority

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Table of Contents

Executive Summary

AECOM Australia Pty Ltd (AECOM) was requested by Environment Protection Authority Victoria (EPA) to prepare this Desktop Study and Preliminary Regional Conceptual Site Model (PRCSM) for the Fishermans Bend Urban Renewal Area (FBURA) (the site).

The site is a precinct of 240 hectares (ha), and has an anticipated development timeframe of over 40 years to achieve a mixed-use precinct with medium to high density residential areas. As seen on **Figure F1**, the site is currently divided into four 'sub-precincts' referred to as Wirraway, Sandridge, Lorimer and Montague.

The Desktop Study aimed to review existing publically available data to determine key factors that may be influencing shallow groundwater within the site on a regional scale. For the purposes of assessing baseline groundwater quality from a regional perspective, AECOM has reviewed significant environmental conditions in broad terms as either being related to natural or anthropogenic (ambient) sources. This included particular consideration of the following sources of information, as they have the potential to have significant influence on the overall groundwater migration and quality:

- Inorganic substances that are naturally present in the environment.
- Organic substances that may be present in the environment as a result of organic matter decomposition or as the products of incomplete combustion.
- Tidal influences.
- Former swamp and wetlands.
- Geological Features.
- The sewer network across the site, particularly the Hobsons Bay Main Sewer and Melbourne Main Sewer.
- The drainage and stormwater system.
- Uncontrolled filling (including filling of former quarries/landfills).

Point sources of contamination have also been considered (and identified where possible) during this Desktop Study to ensure that any future groundwater sampling plan aims to avoid sampling groundwater that may be influenced by point sources of contamination.

It is intended that the information obtained as part of the Desktop Study and PRCSM will be used during the development of a Groundwater Sampling and Analysis Quality Plan (SAQP) for a baseline regional groundwater investigation at the site. The outcomes of that investigation will be considered in relation to the findings of the Desktop Study and the PRCSM to assist in further conceptualising the site. Based on our review, AECOM makes the following recommendations:

- A SAQP should be developed in consideration of the natural and anthropogenic influences on regional groundwater conditions.
- A groundwater investigation should be conducted on a regional scale to gain a holistic understanding of groundwater flow and possible contaminant movement via groundwater. This investigation should be used to obtain site specific data to further inform and refine the PRCSM.
- AECOM is of the opinion that the best approach to characterising and assessing the baseline regional groundwater quality of the site is to adopt a grid based approach to obtaining groundwater data and avoid the point sources identified to date. This will allow assessment of contaminant concentrations in terms of consistency with background concentrations or influence/impact by known former and current industry practices, including known hotspots, reclaimed land and landfills.
- Sewers and drains should be investigated further if discrepancies in groundwater elevation are apparent in the vicinity of the sewer and drainage locations during any future sampling works.
- Further consideration of tidal influence on the regional groundwater quality including the impacts of regular flushing of water, salinity and migration pathways needs to be further assessed as part of future investigations. This will be best addressed by collection of site specific gauging and survey data.
- Melbourne Water drillers logs should be reviewed once proposed sampling locations are identified to obtain an appreciation of the expected stratigraphy in the immediate area of identified drilling locations. This will assist in understanding expected conditions which will be valuable during installation and well construction.

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was requested by Environment Protection Authority Victoria (EPA) to prepare this Desktop Study and Preliminary Regional Conceptual Site Model (PRCSM) for the Fishermans Bend Urban Renewal Area (FBURA) (the site). Please refer to **Figure F1** to view the site location.

The site is a precinct of 240 hectares (ha), and has an anticipated development timeframe of over 40 years to achieve a mixed-use precinct with medium to high density residential areas. As seen on **Figure F1**, the site is currently divided into four 'sub-precincts' referred to as Wirraway, Sandridge, Lorimer and Montague.

The Desktop Study and PRCSM is part of a broader project that aims to determine the baseline regional groundwater quality across the study area to assist in the development of a strategic approach to management of contaminated land across the precinct size site. This Desktop Study and PRCSM report is considered to be an evolving document, which should be updated throughout the course of the project as more data and information comes to hand.

2.0 Objective and Scope of Works

2.1 Objective

The objective of the Desktop Study is to gather and assimilate information on the site setting to inform the PRCSM for the project.

The information obtained as part of the Desktop Study and PRCSM will assist in the development of a Groundwater Sampling and Analysis Quality Plan (SAQP) for a baseline regional groundwater assessment at the site.

2.2 Scope of Works

The scope of works undertaken to achieve the objective included reviews of the following information sources:

- Topography, geology and hydrogeology maps
- Historical aerial photographs
- Twelve (12) Environmental Audit reports within close proximity to the sub-precincts
- Priority Sites Register (PSR)
- Visualising Victoria's Groundwater
- Historic and current tidal trends.
- Melbourne Metropolitan Board of Works (MMBW) historical maps
- City of Port Phillip records
- City of Melbourne records (note – limited information available)
- Public Records Office of Victoria (PROV)
- Preliminary Land Contamination Report (Golder, June 2012)
- Addendum to Fishermans Bend Infrastructure Assessment (GHD, December, 2012)
- Fishermans Bend Heritage Study (Biosis, 11 June 2013)

Information from the above sources was used to:

- Supplement existing knowledge relating to regional contamination issues and support the planning of future groundwater investigations.
- Identify and develop an initial understanding of potential pathways of contaminant migration across the site from identified sources and receptors on a regional scale.

Further definition and understanding of these pathways will be developed as site specific data and additional historical information becomes available. This may result in more localised interpretation for specific pathways where necessary.

3.0 Regulatory Setting

3.1 EPA and the Environment Protection Act

In Victoria, protection of the environment is regulated by the Environment Protection Authority (EPA) which is established via the *Environment Protection Act 1970* (the Act). EPAs role is to be an effective environmental regulator and an influential authority on environmental impacts. EPA is responsible for the regulation of pollution and administration of the Act via its compliance and enforcement actions. EPA recommends and assists in the development of environment policy and prepares guidelines to further guide stakeholders in compliance with the Act.

3.2 State Environmental Policy

State Environment Protection Policy (SEPP) is subordinate legislation and provides further detail on interpretation and expectations for compliance with the Act. A number of policies have been published and include:

- State Environment Protection Policy - *Prevention and Management of Contamination of Land*;
- State Environment Protection Policy - *Groundwaters of Victoria*;
- State Environment Protection Policy - *Waters of Victoria*,
- State Environment Protection Policy – *Ambient Air Quality*;
- State Environment Protection Policy – *Air Quality Management*;
- State Environment Protection Policy - *Control of Noise from Industry, Commerce and Trade; and*
- State Environment Protection Policy - *Control of Music Noise from Public Premises*.

Some of these policies have been amended or varied and there is currently a review being undertaken to contemplate the amalgamation of the Waters of Victoria and Groundwaters of Victoria SEPPs.

For the purpose of this project the SEPPs for Groundwaters of Victoria and Waters of Victoria (as this relates to the point of discharge for groundwater) are most relevant. These are discussed in the following sections.

3.2.1 SEPP Groundwaters of Victoria

The State Environment Protection Policy (Groundwaters of Victoria) 1997 (SEPP GoV) applies to the management of groundwater quality in Victoria. The purpose of the policy is:

"to maintain and where necessary improve groundwater quality sufficient to protect existing and potential beneficial uses of groundwaters throughout Victoria"

Beneficial use means a use of the environment or any element or segment of the environment which is:

- Conducive to public benefit, welfare, safety, health or aesthetic enjoyment and which requires protection from the effects of waste discharges, emissions or deposits or of the emission of noise; or
- Declared to State Environment Protection Policy (SEPP) to be a beneficial use.

The SEPP (GoV) defines beneficial uses of groundwater on the basis of background salinity, measured as total dissolved solids (TDS). Groundwater is considered to be polluted where current and / or future protected beneficial uses for the relevant segment are precluded. Beneficial uses of groundwater are considered precluded when relevant groundwater quality objectives have been exceeded, or where non-aqueous phase liquid is present.

The SEPP GoV allows for the EPA to establish Groundwater Quality Restricted Use Zones (GQRUZ) where one or more beneficial uses are precluded due to contamination. It also indicates that if such a zone is established then the groundwater within the zone must be managed to enable the groundwater to be contained within the restricted use zone. Where pollution of groundwater has been established it must be cleaned up otherwise, in accordance with clause 19(2)(b), groundwater must be cleaned up to the extent practicable (CUTEP).

3.2.2 SEPP Waters of Victoria

The State Environment Protection Policy (Waters of Victoria) (SEPP WoV) was originally Gazetted in 1988. Since then a number of variations have been published. These include:

- Variation to the State Environment Protection Policy (Waters of Victoria) – Insertion of Schedule F6. Waters of Port Phillip Bay [27 August 1997]
- Variation to the State Environment Protection Policy (Waters of Victoria) – Insertion of Schedule F7. Waters of the Yarra Catchment [22 June 1999]
- Variation to the State Environment Protection Policy (Waters of Victoria) [4 June 2003]

The purpose of the SEPP (WoV) [clause 5] *is to help achieve sustainable surface waters by setting out the environmental values and beneficial uses of water that Victorians want, and the environmental quality required to protect them.*

The SEPP (WoV) is an important policy document for this project where the point of discharge for groundwater is the surface waters of the Yarra Port or Hobsons Bay.

3.3 National Environment Protection Measure

The National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM) is the premier guidance document in Australia for the assessment of site contamination. The NEPM is made under the *National Environment Protection Council Act 1994* and is given effect by individual legislation and guidelines in each state and territory. In Victoria, these include the regulatory frameworks established in the relevant State environment protection policies.

The NEPM guidance document was subject to a review process that commenced in 2004 and concluded with the NEPC approving an amending instrument to the 1999 NEPM in April 2013 (NEPC, 2013, *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*). The amended 2013 NEPM guidance came into effect on 16 May 2013. The amendment includes repealing all the original schedules to the 1999 NEPM guidance and the substitution of new schedules. Implementation of the amended 2013 NEPM is the responsibility of each state jurisdiction.

It is noted that the SEPP (PMCL) was varied on 24 September 2013 to capture modifications to the schedules within the NEPM.

3.4 EPA Guidelines

As noted above, EPA is responsible for the publication of guidelines to further assist stakeholders to understand their environmental obligations and provide advice relating to compliance.

EPA guidelines which are most relevant to this project and which describe the procedural elements for establishing whether groundwater has been cleaned up to the extent practicable are discussed in the following sections.

3.4.1 EPA Publication 759.2

EPA Publication 759.2 *Environmental auditor (contaminated land): Guidelines for issue of certificates and statements of environmental audit* (February 2014) is relevant to this project as it includes guidance to auditors regarding expectations and interpretation of CUTEP process. This project is not subject to a statutory environmental audit, however, certain elements of the project reference the procedural steps in establishing groundwater pollution, the clean up of groundwater pollution and groundwater quality restricted use zones.

3.4.2 EPA Publication 840.1

EPA Publication 840.1 *The Clean Up and Management of Polluted Groundwater* (February 2004) provides details on EPA's requirements and expectations for developing and implementing the clean up and management of polluted groundwater to ensure the protection of human health and the environment. Where polluted groundwater has been identified, EPA's role is to require clean up of the pollutants. If it is impracticable to clean up groundwater to the level needed to restore beneficial uses, EPA may accept that clean up to the extent practicable has occurred and that, subject to appropriate ongoing management, further clean up is not required.

When clean up to protect beneficial uses is not practicable (or where clean up has not yet occurred or is currently occurring), polluted groundwater should be managed to ensure the protection of human health and the environment.

3.4.3 EPA Publication 862

As noted above, the SEPP (GoV) allows for the establishment of groundwater quality restricted use zones (GQRUZ) as a tracking and information tool to be applied when the beneficial uses of groundwater are precluded due to pollution. EPA Publication 862 *Groundwater Quality Restricted Use Zone* (July 2002) discusses the various aspects and impacts of GQRUZ for Victorians.

4.0 Site Setting

The site is located in the south-west of Melbourne and is bound by Lorimer Street to the north, Todd Road to the west, Williamstown Road / Boundary Street to the south and City Road to the east. The Yarra River is beyond Lorimer Street at the northern boundary of the site, while the Westgate Freeway separates the Lorimer sub-precinct from the other three sub-precincts.

The site is generally used for heavy and light commercial and industrial processes which are described further in **Section 4.1**. The following table summarises the relevant site details. Please refer to **Figure F2** for the current zoning and **Figures 3a** and **3b** for overlay conditions across the site.

Table 1 Site Information

Precinct	Area (ha)	Municipality	Current Zoning	Current Overlays
Wirraway	90	City of Port Phillip	IN1Z B3Z PPRZ PUZ6	EAO HO CLPO SBO RXO
Sandridge	80	City of Port Phillip	IN1Z B3Z PPRZ PUZ6	HO SBO DDO
Lorimer	45	City of Melbourne	IN1Z B3Z	CLPO SBO DDO
Montague	25	City of Port Phillip	IN1Z PUZ2 MUZ B1Z PUZ4	EAO HO SBO DDO

Notes:
Overlays: EAO = Environmental Audit Overlay, HO = Heritage Overlay, DDO = Design and Development, SBO – Special Building, CLPO = City Link Project, RXO = Road Closure.
Zoning: B1Z, B3Z = Business Zones, IN1Z = Industrial Zones, PPRZ – Public Park and Recreation Zones, PUZ2, PUZ4, PUZ6 = Public Use Zones, MUZ = Mixed Use Zones.

4.1 Overview of Current and Historical Land Uses

Golder (June, 2012) lists former and current land uses for each sub-precinct. Rather than repeat this work and re-list all of these former and current land uses, AECOM has reviewed them when assimilating our regional historical information to ensure there are no significant differences. Please refer to **Appendix A** for the original table prepared by Golder. Note that **Appendix A** refers to the 'Fennel sub-precinct' and 'Plummer sub-precinct', which are now the Sandridge and Wirraway sub-precincts respectively.

We note that, whilst it is important to understand where the possible point sources of contamination exist across the sub-precincts on an individual 'site by site' basis, this Desktop Study is regionally focused. As such, a holistic approach to assessing current and historic land uses is required.

Current and historical uses across the site are also summarised on **Figures F4a – F4d** and **F5a – F5d**, and further described in the following sections. The sources of information used to develop these figures include Melways maps, Council records, MMBW maps, information from the Public Records Office of Victoria, aerial photographs, information obtained from surrounding Audit reports and Golder (June, 2012).

4.1.1 Historical Land Use Overview

According to Biosis (June, 2013), Aboriginal occupants of the Fishermans Bend area may have travelled regularly across the site prior to mid 1800's, however, travel along the south side of the Yarra River would have been difficult due to swamps and thick tree scrub. This is supported by our observations made in **Section 5.3.2** regarding the presence of swamp land in 1864. Biosis further refers to a series of shallow swamps and wetlands along the line of the present Westgate Freeway, which may have provided good camp sites. The observation of low lying swamps and proximity to Melbourne is important, as the site was seen as a convenient dumping ground for fill and rubbish. It also later attracted industries that were generally shunned from the commercial and residential parts of Melbourne, as described below.

4.1.1.1 Wirraway (formerly Plummer) and Sandridge (formerly Fennel)

The Wirraway and Sandridge sub-precincts (i.e. the central and western portions of the site) have been grouped together for this report when discussing historical land use, as they were both not established for industrial purposes until the late 1920s. Despite this, vacant undeveloped land was still present in the Wirraway sub-precinct until the early 1970s.

Prior to the 1920s, the Wirraway and Sandridge sub-precincts were generally used for sand quarrying, grazing, a rifle range, a golf course and various airfields.

4.1.1.2 Lorimer and Montague

Both the Lorimer sub-precinct and part of the Montague sub-precinct were developed for industrial uses from the mid to late 1800s. The most prominent land uses included animal and animal product processing, boiling down works, bone mills, manure and glue factories, soap and candle makers.

4.1.2 Current Land Use Overview

As seen on **Figures F4a – F4d**, notable current land uses across the site includes:

- Automotive industries including vehicle manufacturing plants, car dealerships, auto mechanics and other vehicle services.
- Manufacturing industries such as timber yards, printing works, plastic and packaging manufacturing, concrete works.
- Possible metal fabricators.
- Transport and logistics industries including container and freight services, distribution centres storage and warehousing (including Australia Post).
- Various other industrial and commercial uses.
- Various public infrastructure and facilities including tram depot and workshop, substations, essential services (e.g. ambulance), parklands and reserves, railway reserves and roads.
- Limited residential use.
- Pockets of vacant land also exist across each of the precincts.

4.2 Existing Sewer and Drainage Infrastructure

The following report has been reviewed to assess the existing sewer and stormwater infrastructure at the site:

- *Addendum to Fishermans Bend Infrastructure Assessment* (GHD, December 2012).

Please refer to **Figure F6** for a copy of existing sewerage assets, and **Figure F7** for existing stormwater / drainage assets.

In addition to this report, Melbourne Water has provided 12 documents which include information relating to geological investigations along the Hobsons Bay Main Sewer, and cross sections of portions of the Main Sewer.

Of the 12 Melbourne Water documents, the following is considered to be potentially valuable to future groundwater sampling investigations at the site:

- *Melbourne Water, Hobsons Bay Main Sewer, Site Plan and Longitudinal Geological Section Between Manhole 37 and Monhole 38* (Coffey, February 1993).

- *Hobsons Bay Main Relieving Sewer, Linacre Road and Buff Road Section, Geological Section and Borehole Locations* (Melbourne and Metropolitan Board of Works, Department Engineering Geology Section, 6 March 1975)
- *Hobsons Bay Main Relieving Sewer, Hampton Street, Geological Section* (Melbourne and Metropolitan Board of Works, Department Engineering Geology Section, 24 July 1974)
- *Hobsons Bay Main Relieving Sewer, Hampton Street, Geological Profile and Borehole Location Plan* (Melbourne and Metropolitan Board of Works, Department Engineering Geology Section, 27 February 1974)

The remaining 8 Melbourne Water documents relate to geological studies near portions of the Hobsons Bay Main Sewer, and the proposed lowering of Hobsons Bay Main Sewer under the Yarra River, which is not considered to be directly relevant to this Desktop Study at this point in time.

According to information received by Melbourne Water on 7 July 2015, the main sewers that are relevant to the study area include the Hobsons Bay Main Sewer and the Melbourne Main Sewer. Sewer information that may be useful to the proposed regional groundwater sampling program at the FBURA is discussed in **Section 4.2.1**.

4.2.1 Hobsons Bay Main and Melbourne Main Sewer (Melbourne Water Assets)

As seen on **Figure F6**, the Melbourne Main sewer runs south from the Yarra River through Fennell Reserve to Swallow Street, where it connects to the Hobsons Bay Main. **Figure F6** also shows that the Hobsons Bay Main runs along Swallow Street from the south-east, through the Garden City Reserve and then along Howe Parade towards Spotswood.

Construction of the Melbourne Sewerage Scheme commenced in Werribee in 1892 and took 15 years to complete. In late 1893, construction of the first sections of the Hobsons Bay Main commenced (Museum Victoria), while the Melbourne Main was first built between 1894 and 1897 (Melbourne Water website).

According to the Melbourne Water Community Bulletin (24 May 2013), the original Melbourne Main Sewer was constructed from a variety of materials ranging from bluestone, brick, cast iron and Portland cement and concrete sourced from local suppliers.

Given the date of construction of the Hobsons Bay Main, it is likely that it too was constructed of similar materials. Therefore, due to the age and likely construction methodology, it is possible that the Hobsons Bay Main has integrity issues, which may result in an influence to the flow of groundwater at the site and movement of chemicals of potential concern (CoPC) via groundwater.

Further, an article from The Age on 11 February 1905 titled *The Sewerage System, Condition of Hobsons Bay Main* also states that "*one of the main sewers* (Hobsons) *in connection with the metropolitan sewerage scheme had broken its back, and at that particular spot had sunk several feet below its original level*". It goes on to say that "*there is not the slightest doubt that the sewer has there settled in at least one place…. by the impossibility of finding a solid bottom in the bend owing to the prevalence of water*." There is also some suggestion that the sewer is not 'nearly' waterproof or sandproof.

According to a diagram in Victoria Institute of Engineers (1905), the Hobsons Bay Main is approximately 22 feet (or 6 – 7 mBGL).

In contrast, the Melbourne Main Sewer underwent replacement works prior to 2012 to mitigate hydraulic constraint in the sewerage system. As such, the integrity of the Melbourne Main Sewer is likely to have significantly improved. The updated Melbourne Main at the site is likely to sit at a depth between 10 and 15 mBGL and generally consist of concrete and steel.

The location of both of the mains at the site (**Figure F6**) and possible construction methodology will help to inform any assessment on groundwater levels at the site and may explain localised discrepancies (if identified). We recommend that this potential influence be considered during any future groundwater gauging and sampling events.

4.2.2 Melbourne Water Drainage System

According to GHD (December 2012), the following drains exist across the FBURA:

- An 1800 (1.8 m) outer diameter (OD) Melbourne Water drain extends along Johnson Street which forms the boundary between the Sandridge and Montague Precincts.
    - This drain outfalls to the Yarra River in the marina north of Lorimer.

- A 1500 (1.5 m) OD Melbourne Water drain that extends from the intersection of Gittus and Brady Streets in the Sandridge Precinct north beneath the Westgate Freeway, and through the Lorimer Precinct.
    - This drain outfalls to the Yarra River near Point Park.
- A 1500 (1.5 m) OD Melbourne Water drain extends along Anderson Street in the Sandridge Precinct, beneath the Westgate Freeway then along Hartley Street in the Lorimer Precinct.
    - This drain outfalls to the Yarra River north of South Wharf Drive.
- A 1650 (1.65 m) OD Melbourne Water drainage pipeline extends along Salmon Street and outfalls into Hobsons Bay.

Based on our review, it is unclear what depth the above drains are positioned, however, this should be investigated further if discrepancies in groundwater elevation are apparent in the vicinity of the drainage locations during any future sampling works.

4.3 Topography

AECOM has reviewed topography maps on Land Channel from a regional perspective. The topography across the entire site is generally relatively flat with a gradual decline in elevation towards the Yarra River at the east-northeast, and to Hobson's Bay located to the south of the site.

The elevation of the site was found to range from 0 - >4 mAHD, which is consistent with Golder (2012). This is likely to result in a slightly variable depth to the underlying groundwater table.

The main topographic observations made across the entire site include:

- The areas immediately north of the Wirraway sub-precinct looks to have been built up for construction of the freeway.
- There is a ridge of higher land that runs from west to east (starting from the Wirraway sub-precinct) that continues to drop in gradient towards the level of the Yarra River, which is located to the north – northeast of the site.
- There appears to be a saddle of depression between the two high points along the ridge in the Wirraway sub-precinct.
- There is a slight plateau on the southern side of the entire site itself.
- The gradient which is north of the site towards the Yarra River is slightly steeper than the gradient towards Hobson's Bay, the mouth of the Yarra River, located to the south of the site.
- It is likely that the higher elevation noted in the northern portions of the Wirraway sub-precinct will reduce surface water run-off to the north of the site.

AECOM has also made the observations below when comparing the topography maps with the preliminary estimates of fill thickness provided in Golder (2012). Note that the fill thickness estimates provided were estimates (only), and the observations made below are provided to assist in interpretation of groundwater flow across the site following groundwater gauging / sampling works.

- The topography of the south-west portion of the Lorimer sub-precinct appears to be have been significantly influenced by historical fill activities. Whereas, the eastern half of the Lorimer sub-precinct appears to follow a more natural topography towards the banks of the Yarra River (i.e. less influenced by fill material).
- The topography within the Montague sub-precinct also seems to have been largely influenced by historical filling activities along rail lines and the southern areas. In contrast, the central portion of the Montague sub-precinct is likely to be more representative of natural topographic conditions, as it has had only minimal fill (<1 m) according to (Golder, 2012).
- The natural topography within the Sandridge sub-precinct slopes down towards the north-east despite the fact that the areas in the north-east have had 1 – 2 m of fill. Whilst this slope appears to follow a natural gradient (even with fill), the central areas between Ingles and Bridge Streets appear to still have a higher elevation despite having less fill.
- The topography of the Wirraway sub-precinct has been extensively influenced by historical filling activities, however, it is noted that the topography still flows in a natural southern direction towards Hobson's Bay.

4.4 Geological Conditions

The site is located in the Yarra delta, which is comprised of a number of flat lying sedimentary deposits. Together these deposits are known as the Yarra Delta group.

The Yarra Delta Group is described as dipping in a south-westerly direction due to an erosion surface which has been cut into the Tertiary and Silurian aged formations underlying the Yarra delta group (Nelson, 1996).

As described below, the site is located above the Yarra Delta group on Recent Quaternary aged sediments likely to have been deposited by Yarra River within the past 2 million years.

According to the Melbourne 1:63,360 Geology Map and the Melbourne 1: 250,000 Geology Map, the majority of the site is underlain by Quaternary aged Port Melbourne Sands consisting of raised beach ridges, bedded and cross-bedded well sorted sand, shelley sand and minor silty or clayey sand. The Melbourne and Suburbs 1:31,680 Geology Map also indicate the presence of alluvial fields, mud flats, beach and estuarine deposits.

Based on our reviews of Audit reports across the site (**Section 5.6**), limited reviews of groundwater bores across the site (**Section 4.7**), and the information obtained in Golder (2012), the fill thickness overlying the Port Melbourne Sands across the site is expected to be highly variable but generally between 0.5 and 2 meters (m). We note that fill is likely to be considerably thicker in areas where old landfills or quarries were present (as described in **Section 4.2**).

The fill in a small portion of the site (i.e. north eastern corner) is likely to overly the slightly older Coode Island Silt (Qri) which is described as silt, silty clay, sandy clay dark grey with minor peat and shell beds. The following geological units underlie the Coode Island Silt (from youngest to oldest):

- The pleistocene aged Fishermens Bend Silt (Qpf) described as silty clay, pale grey to pale brown, with some minor sandy clay and silt the upper part of the formation is mottled and fissured.
- The pleistocene aged Moray Street Gravel (Qpg) described as quartz gravel and sand, with minor silt, clay and carbonaceous clay.
- The tertiary aged Newport Formation (Tmn) described as silt, grey and green, with calcareous silt, silty clay and minor limestone.
- Miocene aged Older Volcanics (Tvo) described as dense blue / black basalt.
- The Eocene aged Werribee Sand (Tew) described as sand, sandy and silty clay, with pyritic and lignitic quartz sand.

The bedrock below the site and the surrounding area is the Upper Sulurian aged Dargile formation which is described as sandstone, siltstone, minor shaley siltstone which is thinly and regularly bedded. Please refer to **Figure F8**.

During our geological review, we attempted to identify any potential ancient river channels or waterways at the site that could potentially influence preferential pathways. As described above, and as seen on **Figure F8**, these features are not apparent in the study area. However, additional features may (such as re-alignment of the Yarra River to the north-west of the site, deep sewer lines and filled quarries).

4.5 Hydrogeological Conditions

According to the 12 Audit reports reviewed within 1 km of the site (**Section 5.6**), the average depth to groundwater in the Port Melbourne Sands is approximately 3 meters below ground level (mBGL). Based on the topography of the site, regional groundwater within the local aquifer system is expected to flow to the north towards the Yarra River or west towards Port Phillip Bay.

As detailed in **Section 0**, and according to the *Victorian Groundwater Beneficial Use Map Series: South Western Victoria, Water Table Aquifers* (DCNR, 1995), the concentration of total dissolved solids (TDS) in groundwater in the upper aquifer in the study area is expected to range between 1,001 mg/L and 3,500 mg/L which falls within “Segment B” according to the SEPP (GoV). The following protected beneficial uses are considered relevant under this segment:

- Maintenance of Ecosystems
- Potable mineral water supply

- Agriculture, parks and gardens
- Stock watering
- Industrial water use
- Primary contact recreation
- Buildings and structures

Section 6.4 provides a discussion on the TDS values reported during Audits undertaken within 1 km of the site.

Based on the 12 Audit reports reviewed as part of this Desktop Study (**Section 5.6**), groundwater within the site has a high potential to be influenced by natural and anthropogenic preferential pathways (e.g. deep sewer lines, filled quarries, former swamps and low lying wetlands that have since been filled).

Brief hydrogeological descriptions for each of the geological units discussed above are listed in **Table 2** below. Classification and hydraulic conductivities have been sourced from Leonard (1992).

Table 2 Hydrogeological Descriptions for each Geological Unit

Geological Unit (Youngest to Oldest)	Brief Hydrogeological Description
Port Melbourne sand (Qrp)	Unconfined aquifer. Medium porosity. K= 10^{-6} to 10^{-4} m/s.
Coode island silt (Qri)	Aquitard. Medium porosity. As there are sand layers and lenses, the horizontal hydraulic conductivity (Kh= 10^{-8} to 10^{-7} m/s) is generally greater than the vertical hydraulic conductivity (Kv= 10^{-9} to 10^{-8} m/s).
Fishermens Bend silt (Qpf)	Aquitard. Medium porosity. As there is fissuring, the vertical hydraulic conductivity (Kv= 10^{-8} m/s) may be greater than horizontal hydraulic conductivity (Kh= 10^{-9} to 10^{-8} m/s).
Moray Street Gravel (Qpg)	High yielding confined aquifer. Medium porosity. Hydraulic conductivity is likely to range between 10^{-5} and 10^{-4} m/s.
Newport formation (Tmn)	Aquitard. Medium porosity. Hydraulic conductivity is likely to range between 10^{-9} to 10^{-7} m/s.
Older Volcanics (Tvo)	Confined aquifer. Low to high hydraulic conductivity depending on the extent of weathering (K= 10^{-7} to 10^{-5} m/s).
Werribee sand (Tew)	Potentially high yielding aquifer. Medium porosity. Hydraulic conductivity is likely to range between (K= 10^{-8} to 10^{-5} m/s).

4.6 Tidal Information

The following section refers to tidal information that is reported by the Bureau of Meteorology (BOM) in meters above sea level (MASL).

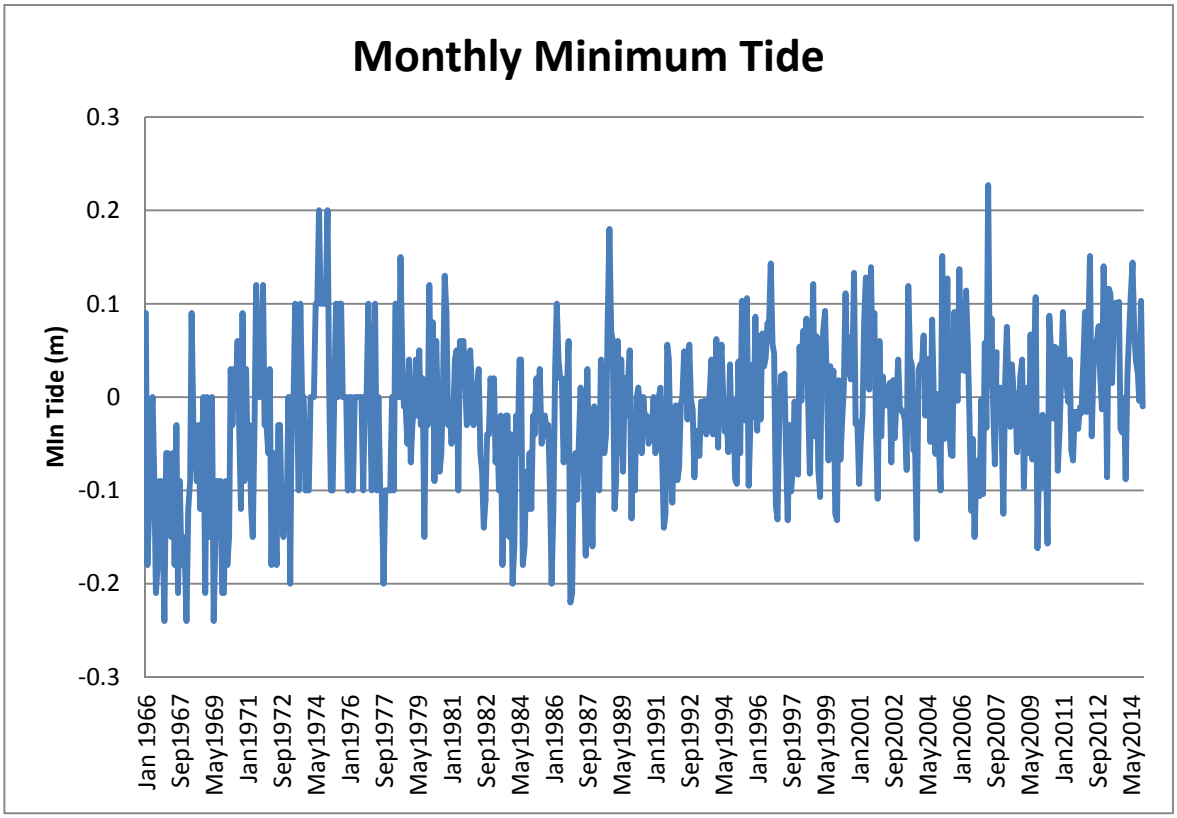
Note that in 1971 the mean sea level for 1966-1968 was assigned the value of 0.0 m on the Australian Height Datum (AHD). The resulting datum surface, with minor modifications in two metropolitan areas, has been termed the AHD.

Groundwater depth and elevation reported in future groundwater investigations should be reported in both meters below ground level (mBGL) and mAHD. In order to assess tidal influence, the magnitude of, and trends in, fluctuations of tidal data (reported by BOM in MASL) during future gauging/sampling events should be compared to the magnitude of, and trends in groundwater depth and elevation data (in mBGL and mAHD) obtained during that time, as AHD is roughly equivalent to mean sea level.

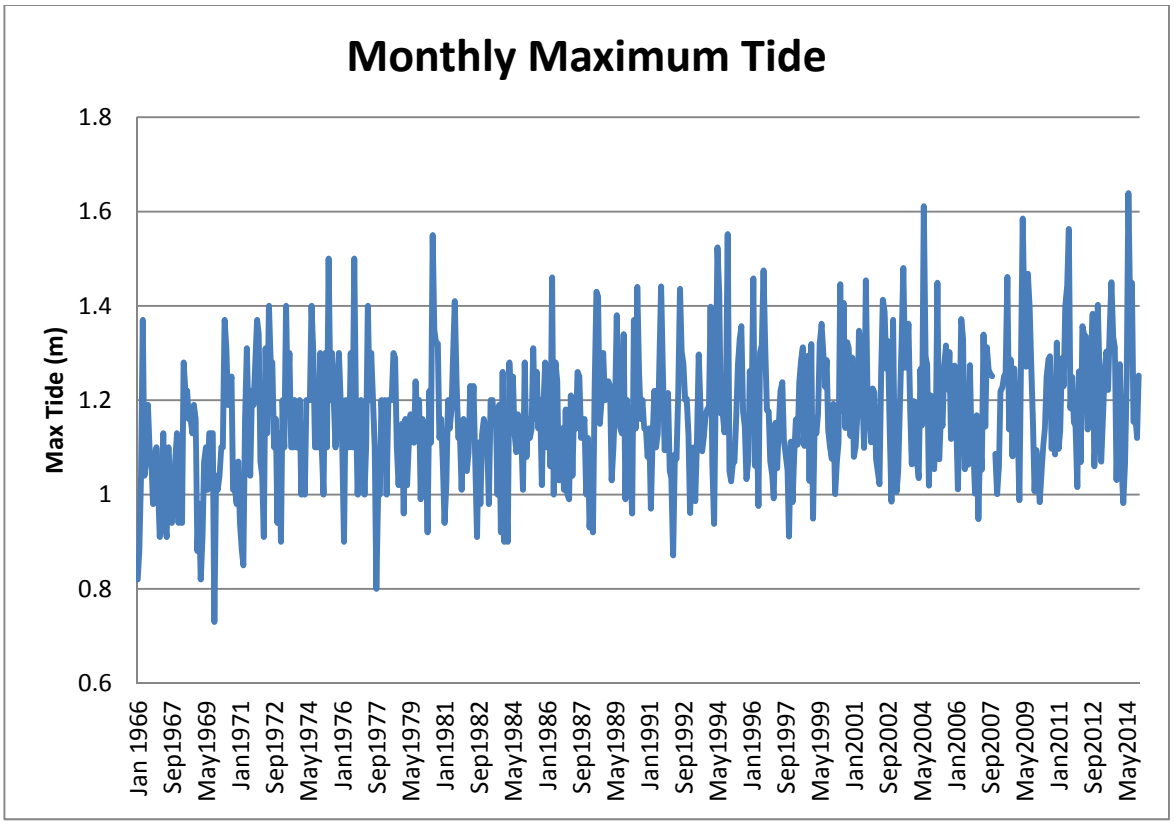
AECOM has reviewed the BOM (2014), *Monthly sea levels for Williamstown - 1966 to 2014* and makes the following observations:

- The mean, maximum and minimum tide heights near the study area have been fluctuating throughout the review period (1966 to 2014), however, there also appears to be general increasing trend in tide heights over this time.
- The lowest of the minimum tide heights was -0.24 MASL, which occurred at 1300 hours (1pm) on 2 December 1966.
- The highest of the maximum tides was 1.639 MASL, which occurred at 0400 hours (4am) 24 June 2014.
- The highest of the mean tides was 0.759 MASL, which occurred in December 2005.
- The lowest of the maximum tides was 0.73 MASL, which occurred in October 1969.
- The highest of the minimum tide heights was 0.227 MASL, which occurred in May 2007.
- The average monthly sea level is 0.555 m.

Graphs 1 to 2 below depict the Monthly Minimum Tides and Monthly Maximum Tides between 1966 and 2014.



Graph 1 Monthly Minimum Tide between 1966 and 2014



Graph 2 Monthly Maximum Tide between 1966 and 2014

Based on the information presented above in relation to tidal variation (up to 0.759 MASL), the elevation of the site (0 - >4 mAHD) and the average depth of groundwater (approximately 3 meters below ground level (mBGL), there is expected to be significant tidal influence on the shallow groundwater. This tidal influence is expected to be greater particularly closer to the Yarra River to the north of the site and is likely to become damped towards the south. Further consideration of this on the regional groundwater quality including the impacts of regular flushing of water, salinity and migration pathways needs to be further assessed as part of future investigations.

4.7 Existing Groundwater Bores

A search of the Visualising Victoria's Groundwater (VVG) website was conducted for registered bores within a 1km radius of the site. The search found 337 groundwater bores registered on the VVG website. Of these:

- 28 are reported to have a groundwater depth < 6 mBGL
- 121 are registered as use for groundwater investigation purposes (ranging between 3 and 36 m – assumed to be 'below top of casing')
- 8 are registered as use for domestic purposes (ranging between 4 and 8.5 m)
- 11 are registered as use for domestic and stock purposes (ranging between 4 and 10 m)
- 6 are registered as use for irrigation purposes (ranging between 6 and 6.1 m)
- 78 are registered as use for observation purposes (ranging between 4 and 38 m)
- 3 are registered as use for 'miscellaneous' purposes (ranging between 9.14 and 13.07 m)
- 17 are registered as 'use unidentified use'
- 92 registered bores have no comment in relation to use

In addition to the above search, Melbourne Water has provided information that indicates 495 Melbourne Water groundwater bores also exist within 1km of the site. Detail such as standing water levels (SWLs), bore depth or

use have not been provided, however, some of the associated bore logs are available. The results of the searches are presented in **Appendix B**, while locations of the bores are provided in **Figure F9**.

As detailed above, AECOM has undertaken a preliminary review of the groundwater bore data to gain an overview of the spread of groundwater bores across the study area, and to ascertain which bores are potentially installed in shallow groundwater. This information was further used to identify existing / known groundwater bores on-site which are considered to be potentially useful to the sampling and analysis program that is to be conducted as part of the project.

Our approach to determining potentially suitable groundwater bores was driven by four key elements including:

- Maximising site coverage
- Likely screen interval (i.e. within the shallow groundwater table)
- Proximity to possible point source/s of contamination
- Publically accessible

AECOM identified between 4-6 groundwater wells on each of the four sub-precincts to be potentially suitable for the groundwater investigation. AECOM attempted to locate these existing groundwater wells across the site on 16-17 and 23 July 2015 in order to inspect each of them, and confirm whether or not they are in a condition that would enable groundwater sampling.

During this process, AECOM identified 2 existing groundwater wells that are potentially suitable for the groundwater investigation. One existing well, located along the northern boundary of the Montague sub-precinct is considered to be appropriate based on our observations to date and the second well (located in the eastern corner of the Montague sub-precinct) needs to be cleared of roots and developed prior to sampling. AECOM will include both of these wells within the SAQP.

It is recommended that the information obtained from the VVG website and Melbourne Water be reviewed prior to undertaking any groundwater drilling works at the site to obtain an appreciation of the expected stratigraphy in the immediate area of identified drilling locations, to assist in understanding expected conditions which will be valuable during installation and well construction.

5.0 Historical Review

5.1 Priority Sites Register (PSR)

Priority sites are sites for which the EPA has issued a Cleanup Notice pursuant to Section 62A, or a Pollution Abatement Notice pursuant to Section 31A or 31B (relevant to land and / or groundwater) of the *Environment Protection Act* 1970. These are generally sites where pollution of land and / or groundwater presents a potential risk to human health or to the environment. The condition of these sites is not compatible with the current or approved use of the land without active management to reduce the risk to human health and the environment.

A review of the PSR on 30 June 2015 showed that there are no properties within 1 km of the site boundaries listed on the PSR.

It is noted that the review of the PSR completed as part of the Golder (2012) study identified one Audit site on the PSR located at 82 Montague Street, South Melbourne located within the Montague sub-precinct. This Audit site has since been issued with a 53X Statement of Environmental Audit and a Groundwater Quality Restricted Use Zone (GQRUZ) been placed over the Audit site. A detailed review of the Audit undertaken at this property can be found in **Section 5.6.**

5.2 Historical Aerial Photographs

AECOM has reviewed historical aerial photographs that range between 1930 and 1989. Please refer to **Figures F10 – F16** for a copy of these aerial photographs, and **Table 3** for a summary of our key observations of the photographs. Particular interest has been paid to any apparent reclaimed land, former water bodies.

Table 3 Summary of Observations from Review of Aerial Photographs

Year	Key Observations
1931	**Sandridge:** - The photograph shows that some potential sand quarrying is visible north of Williamstown Road and east of what is now Graham Street within the Sandridge sub-precinct. - A small number of paddocks appear to have been subdivided with accompanying farm sheds in the northern section of the sub-precinct, adjacent to what appears to be an oval shaped track (which partially covers some of the Lorimer sub-precinct as well). - Williamstown Road and Ingles Street appear to be established, however, there is no substantial access into the central areas of the Sandridge sub-precinct. - Established features appear to include the Port Melbourne Cricket Ground, some street front industrial facilities along Ingles Street and residential subdivision is widespread to the south of Williamstown Road.
1942	**Wirraway:** - Only the far eastern section of the Wirraway sub-precinct is visible, however, some large sheds are visible on the east side of Salmon Street in what is now the Port Melbourne Industrial Estate. - Despite the size of the 1931 aerial photograph, it is reasonable to assume that the central portion of the Wirraway sub-precinct has been reclaimed from swamp land since 1931 and now consists of at least 25 buildings of the size (approximately). - A waterbody exists to the north of what is now Woolboard Road. Due to its size (approximately 2.35 ha), is it possible that it is a disused quarry. **Sandridge:** - The sand quarrying visible in the previous 1931 photograph no longer appears to be in operation. Due to its size (approximately 3.35 ha), is it possible that it is a disused quarry. A waterbody exists in the area that is approximately now the end of Graham Street. **Lorimer:** - Much of the Lorimer sub-precinct appears to be farming or grazing land. - The river frontage immediately north of the sub-precinct has been developed into what appears to be functioning wharves.

Year	Key Observations
	- There are some major industrial facilities at the north of the sub-precinct (possibly the South Melbourne Abattoir) and some smaller sheds or industrial facilities in the east of the sub-precinct. **Montague:** - The western and northern sections of the sub-precinct are visible in this image. Residential and small industrial lots are present south of the Port Melbourne Light Rail line, with larger industrial buildings visible north of the rail line.
1951	**Wirraway:** - Industrial development is fairly established along Salmon Street and near the corner of Salmon Street and Williamstown Road. - Much of the western and northern portions of the sub-precinct appear to be occupied by undeveloped lake / swampland areas. - JL Murphy Reserve is established with multiple ovals visible. **Sandridge:** - Development of industrial facilities along Ingles Street and Williamstown Road has noticeably increased since the 1942 photograph. - Sand quarrying appears to be now taking place south of the corner of Ingles Street and Lorimer Street. - The water body mentioned in the description of the previous photograph is no longer present, and has perhaps been converted for sand quarrying. - The oval shaped track described in the 1931 photograph is no longer visible. **Lorimer:** - A possible water body is visible in the south western corner of the Lorimer sub-precinct. Small scale sand mining immediately to the east of this water body is visible. - Significant industrial activity is visible across the majority of the sub-precinct. **Montague:** - Larger industrial facilities appear to be centred around the Rail line and in the northern sections of this sub-precinct. - All of the sub-precinct appears to have been subdivided and the road plan appears the same as that that is in place today.
1962	**Wirraway:** - Sand quarrying has commenced at the area north-east of the corner of Todd Road and Williamstown Road. - A group of possible waterbodies are visible immediately north-east of the precinct boundary, where the Citylink Lorimer Street exit ramp now exists. **Sandridge:** - Sand quarrying appears to have ceased in this photograph. - The area immediately east of the former quarry location has been developed for industrial purposes. **Lorimer:** - The south western corner of the Lorimer sub-precinct appears to be have been developed for industrial purposes, and no sand mining appears to be taking place in this photograph.

Year	Key Observations
1970	**Wirraway:** - Much of the former swampland in the central and western portions of the sub-precinct has now been filled and developed for industrial uses. - The apparent water bodies under the existing Citylink Lorimer Street exit ramp have appear to have been filled, however, the land remains vacant. - Construction appears to have commenced on the Westgate Freeway. **Sandridge:** - The entire sub-precinct has now been subdivided and developed for industrial / commercial uses. Grazing and quarrying no longer occurs in the sub-precinct and the central and western portions in particular have seen significant development.
1982	**Wirraway:** - Industrial development appears to be even more widespread in this photograph, with more swamp land filled in to the north-west of the sand quarry at the corner of Todd Road and Williamstown Road. - The area at the far west of the sub-precinct has been cleared and is operating as a municipal tip (as verified by historical review). - The Westgate Freeway is now complete. - The Lorimer Street exit ramp is in place. - Some vacant land still exists in the north-eastern corner of the sub-precinct. **Sandridge:** - The sub-precinct appears to be largely unchanged. **Lorimer:** - Further development of large industrial facilities has taken place as well as replacement of previously existing buildings. **Montague:** - The Montague sub-precinct appears largely unchanged.
1989	**Wirraway:** - Much of the municipal tip is green, indicating that much of tip area is either capped and / or no longer in use as a tip. **Sandridge:** - The Sandridge sub-precinct appears to be largely unchanged. **Lorimer:** - The Montague Street Bridge over the Yarra River is now in place. **Montague:** - The Montague sub-precinct appears to be largely unchanged.

5.3 Council Records

As detailed in **Table 1**, the site lies within both the City of Melbourne and City of Port Phillip municipalities.

AECOM has attempted to gather as much information from both Councils in relation to the development of the site, underground services, drainage works, reclaimed land etc. The results of this investigative work are summarised in the following sections.

5.3.1 City of Port Phillip

The following key sources of historical information were obtained from Kay Rowan, a Historian for the City of Port Phillip, on 9 and 13 July 2015:

- Three (3) folders on the FBURA which mostly consist of newspaper articles, photographs and brochures. Information that is considered relevant to the Desktop Study and PRCSM from these folders is provided in **Table 4** below.
- Historical Council Rates books from the years 1934 and 1944. Overall, this source provides a broad picture of the type of dwellings and industries that existed at the FBURA in the 1930's and 1940's.
    - Occupiers of potential interest included Distillers Pty Ltd (Normanby Road), Constructions Pty Ltd (Williamstown Road), Aviator (Aerodrome of Williamstown Road), Furniture Timbers Pty Ltd (Plummer Street), Metropolitan Gas Co. (Graham Street), Motor Mechanics (436 Williamstown Road, Poolman Street, Walter Street), Rubber Makers (Poolman Street, Graham Street), Leather Makers (51 Poolman Street), Oil Refineries Ltd (2 Poolman Street), Dairyman (various at Fishermans Beach, Graham Street, Ingles Street) and Oil merchants (various on Ingles Street).
- A scanned book titled *"Fishermans Bend - A Centre of Australian Aviation"* by John Kepert (1988). The book details the locations of the aerodromes and the landing grounds in the Port Melbourne area, and includes a figure outlining these locations (See **Figure F17d**).

Table 4 Reviewed Documents from the City of Port Phillip

Document / Information Source	Date	Comments
Newspaper clipping dated Thursday 6 May 1937	1937	One of the first houses built at the FBURA (nearly 80 years prior to 1937) was moved to Port Melbourne to clear a landing ground for an aircraft factory.
Hopton's Aeronautical Data Collection	19 May 1939	Title "Second Airport Needed". The Minister for Civil Aviation requests the Victorian Government grant land at the FBURA for a second aerodrome for use by training and private aircraft (for seaplane and commercial air services and for adequate military defence). Council approved the airport.
Newspaper clippings regarding a new kindergarten	1941	Fishermans Bend community centre opened 9 September 1941 and contained a baby centre and a kindergarten (5 Batman Avenue – possibly within the housing estate above).
Written agreement between the City of Port Melbourne and the City of South Melbourne in relation to the Municipal Tip	1950	The document is an agreement by the City of Port Melbourne to allow the City of South Melbourne to deposit refuse such as household refuse, sweepings from the streets and businesses in the 'tip' at the FBURA. The tip address is not provided.
Photographs in the Herald Weekly Times	1960	These photographs show the portion of the settlement which was to be demolished to make room for the reclamation works.
Series of letters between a Mr Desmond Martin and the City of Port Melbourne	1985-1986	<u>Summary of letter from Mr Martin to Council:</u> Mr Martin is writing a book on a pilot from the Fishermans Bend area and is seeking information in relation to another pilot who operated aircraft from a paddock near the 'present' A.N.L. Terminal for Tasmanian Ferries (thought to be set up around 1920).

Document / Information Source	Date	Comments
		Summary of letter from Council to Mr Martin: Council indicated that the terminal was an airfield in Port Melbourne which was located north of Williamstown Road opposite the 'present' Centre Avenue Shops. Two planes operated from the airfield. It is said that one plane crashed in the early 1920's, however, it is not clear if this occurred at the FBURA. Summary of letter from Mr Martin to Council: In 1931, a fire occurred at the 'Port Melbourne Former Drome 9' in which all aircraft in the store were burnt. The location of this fire cannot be confirmed, however, the location of known aerodromes is provided in **Figure 17c** and **17d.**
Newspaper article – *Port goes High-Tech* (Emerald Hill and Sandridge Times)	20 Dec 1989	Article discusses the proposal for the 15 ha technology park planned for Turner Street. The main establishments in the area (employing 3,400 people) are Aerospace Technologies of Australia (ASTA), manufactures advanced military and commercial equipment for British Aerospace, the Brazilian Navy, the U.S. Custom Service and the Airforces of Thailand, Indonesia and the Philippines), Hawker de Havilland, Aeronautical Research Laboratory (established '50 years ago') and Holden's Engine Company.
Emerald Hill, Sandridge & St Kilda Times	1992	This newspaper article discusses the 'upcoming' Herald and Weekly Times plant to be built at the Lorimer Street Complex, Fishermans Bend. It was noted that the plant has 6 German presses, more than 180 m worth of presses, and state-of-the-art supporting technology.
DSTO 60 anniversary 1939-1999 (large brochure)	1999	60th anniversary of the DSTO site in 1999: The Department of Defence took over responsibility for the laboratory in 1974. This brochure discusses the technologies developed at the site (e.g. fatigue tests) and a detailed history of when it was owned and by whom.
Investigation of various amenity matters in relation to concrete dwellings in the FBURA	14 Dec 2001	The housing estate (bound by Todd Road, Williamstown Road, Howe Pde, Barak Road, The Boulevard) comprises 55 acres, 376 dwellings, community facilities, and open spaces and was developed between 1939 and 1942.
Trust News Volume 32, Issue 1, August 2003	2003	Port Melbourne: Graham Carey established "Melbourne Aerodrome and Air Station" at Port Melbourne in early 1919. It was situated north of Williamstown Road, just east of the Graham St alignment. In 1919 Mr Carey purchased several Maurice Farman "Shorthorn" aircraft from the RAAF and conducted aerial taxi flights, joy rides and aerial photography flights.
Trust News Volume 32, Issue 1, August 2003	2003	Fishermans Bend: The first aerodrome licence in Australia was issued to the Shaw-Ross Engineering and Aviation Company on 1 June 1921. By 1929, encroaching housing and power lines made the site unsuitable and operations were transferred to Essendon Airport.

Document / Information Source	Date	Comments
Trust News Volume 32, Issue 1, August 2003	2003	Coode Island: In 1926, H.J.Larkin moved his diverse operations from Essendon Aerodrome to one central operation at Coode Island. He leased 118 acres of land from the Melbourne Harbour Trust and constructed a factory, offices and hangars. Aerodrom Licence No. 22 was issued on 1 Oct 1927. The complex was opened on 20 Oct 1927. Larkin ceased operations in early 1934 and the site was used by the RAAF during the war years. The area was finally vacated and cleared in 1960 when Swanston Dock was constructed.
Trust News Volume 32, Issue 1, August 2003	2003	Commonwealth Aircraft Corporation: Created in 1935 by major Australian companies including BHP, GM-Holden and ICI. Its factory was built adjacent to the FBURA airfield and was ready for occupation in Oct 1937. The first aircraft produced was the Wirraway of which more than 700 were produced. In 1939, the Commonwealth established the ARL on Lorimer St for its proximity to the CAC. The CAC went on to produce the Mustang, Sabre, and Mirage fighters. By the 1950s, Avalon airport was being used and the FBURA was closed.

5.3.2 City of Melbourne

AECOM has contacted the City of Melbourne, however, the City of Melbourne has indicated that they do not have a Historian. There appears to be limited historical information available from the City of Melbourne in relation to the site, however, we have been provided with two survey images from 1864 and 1948 (**Figures F18a** and **F18b** respectively).

The 1864 image shows some apparent swamp land within the following areas of the site:

- North, north-east and east of the Sandridge sub-precinct (approximately ¼ of the sub-precinct area).
- North of the Montague sub-precinct.
- South-west of the Lorimer sub-precinct.
- North-east of the Wirraway sub-precinct (note this is a very small area of the sub-precinct).

In addition, the image identifies the Yarra River to the west, north and north-east of the site. Further north again, is an area of land which appears to have been cleared.

Some residential dwellings appear to exist south east of the site, and the railway line is apparent through the Montague sub-precinct.

The 1948 image indicates that the Yarra River has been diverted to the north-west of the site since 1864. It is understood that this is due to the creation of Coode Island as a result of the excavation of the Coode Canal in 1886 between a point on the Yarra River just below the Victoria Dock to just above the Stony Creek Backwash. This work cut off a bend of the Yarra previously known as Fishermans Bend, and a stretch known as Humbug Reach and reduced the trip from the bay to the Melbourne docks by about two miles (Biosis, 2013).

We can therefore infer that a significant amount of dredging was required to complete this work. According to writing on the image, material was dredged to a depth ranging between approximately 20 and 31 feet (or 6.09 and 9.45 m). Dredging also occurred in Hobsons Bay to depths between approximately 34 and 36 feet (10.37 and 10.98 m).

The area of potentially cleared land to the north of the Yarra River that was identified in the 1864 image appears to have been infilled. One possibility is that the material dredged from the Yarra River was used to fill this area.

However, it is also not unreasonable to assume that some of the dredged material was used across the FBURA, particularly as the previously identified swamp areas across the FBURA are no longer present in the 1948 image.

Additional observations of the 1948 image include:

- Presence of the Golf Course to the north of the Wirraway sub-precinct.
- Development of roads in Sandridge, Lorimer and Montague sub-precincts.

5.4 Melbourne Water

Information obtained from Melbourne Water includes:

- A list of all Melbourne Water groundwater bores in the FBURA (including eastings and northings), and drillers logs pertaining to the groundwater bores (where available).
- Information on the existing Hobsons Bay Main Sewer (**Section 4.2**).
- A pdf of the wetland map from 1788.

AECOM has plotted the Melbourne Water groundwater bore locations and the VVG Groundwater bores located within 1km of the site on **Figure F9**.

There are many drillers logs available for the Melbourne Water groundwater bores. These logs contain a vast range of detail ranging from minimal to significant. Based on our preliminary review of the drillers logs to date, the observed conditions during drilling works are consistent with the expected geological conditions (**Section 4.4**). The drillers logs will be interrogated further as the project progresses and groundwater data is collated.

Figure F17a – 17d (Key Historical Features) includes an outline of the wetlands from a 1788 Melbourne Water map. The wetlands appear to be reasonably consistent with the information seen on **Figures F18a** and **F18b**. As such, the following areas appeared to be covered by wetlands:

- North, north-east and east of the Sandridge sub-precinct.
- North of the Montague sub-precinct.
- South-west of the Lorimer sub-precinct.
- North-east of the Wirraway sub-precinct.

5.5 Public Records Office of Victoria (PROV)

The PROV was used for sourcing MMBW Detailed Base Plans for the Sandridge and Wirraway sub-precincts. This information is discussed below.

Other resources sometimes available at the PROV includes Local Parish Plans that record details about the usage of Crown Land properties and historical survey field books that show historical levels throughout the site.

AECOM undertook a search for this material, however, there was little available with relevance to the site and / or the Desktop Study.

5.5.1 Melbourne Metropolitan Board of Works Plans

The Melbourne Metropolitan Board of Works (MMBW) detailed base plans dated 1896 – 1933 were reviewed for the entire site in order to identify significant historical point source facilities, significant conduits for groundwater / contaminant movement, and historical sewer lines that could contribute to regional contamination or locally influence groundwater flow conditions.

The information obtained from this review is provided on **Figure F17a** – **F17d**. This information is considered to be critical to the development of a SAQP and the conceptual understanding of groundwater flow direction across the site as infrastructure such as deep sewer lines have the potential to act as preferential pathways.

AECOM has compared the historical infrastructure and other noteworthy land uses obtained from the MMBW maps (**Figure F17a** – **F17d**) to the current sewer / drainage infrastructure (**Section 4.2**), aerial photographs and previously reported historical land uses. The following noteworthy observations can be made:

- The information obtained from the MMBW maps appears to be fairly consistent with historical aerial photographs, the 1788 wetlands map and the current understanding of the placement of sewer/stormwater lines. Note that the shape of the former landfills/quarries on these figures are approximate (only) as they are based on historical aerial photographs. It is likely that some of these landfill/quarry areas were once joined in places.
- A 24" WAG Shell fuel pipeline is seen to be located in the south west corner of the Wirraway sub-precinct parallel to a gas transmission pipeline and Hobsons Bay Main Sewer.
- It is clear on these figures that the areas of former swamp land and former landfills/quarries are significant across the Sandridge, Lorimer and Montague sub-precincts.
- A redundant sewer line (-3.5 mAHD) is present within the Sandridge sub-precinct.
- At least three aerodromes were once present on or in the immediate vicinity of the site, as seen on **Figure 17d**.

5.6 Review of Certificates and Statements of Environmental Audit

The EPA publishes a list of properties for which a Certificate or Statement of Environmental Audit (CoEA or SoEA) has been issued under Part IXD of the *Environment Protection Act* 1970. A review of the list of CoEA's and SoEA's (as of 17 July 2015) indicated that there were 50 sites either on or within 1 km of the site boundaries that have been issued with a CoEA or SoEA. **Figure F19** shows the Audit reports identified as part of this Desktop Study, as well as the existing Groundwater Quality Restricted Use Zones across the study area.

A brief summary of each of these Audit reports is presented in **Appendix C**. In accordance with our proposed scope of works, a detailed review of 12 of the Audit reports was undertaken to gain a greater understanding of environmental conditions and issues typically encountered across the site.

The following initial detail was considered when selected the 12 Audit reports for review:

- Location and proximity to the site. Note that only 6 Audit reports have been prepared across the site area.
- Extent and quality of a groundwater assessment.
- Presence of a discussion on background and ambient groundwater conditions.
- Historical land uses and reference to possible point sources of contamination.
- Coverage of Audit reports across the site.

5.6.1 Summary of Audit Review Findings

Whilst there are some specific point source facilities across the precinct, there is a common theme in running through the Audit report findings, and that is that contamination exists on a regional scale from sources including natural geological breakdown, regional fill material and compromised sewers.

Some of the noteworthy points that are commonly made in the 12 environmental Audit report findings include the following:

- Groundwater aquifer yields are generally too low across the site to provide viable and sustained extraction for industrial uses, and the current number of extraction wells in the vicinity of the site is low.
- Significant tidal influences are seen in the western section of the Wirraway sub-precinct, as demonstrated by groundwater levels and TDS concentrations.
- Most beneficial uses of groundwater within the site are not applicable due to proposed high density land uses and the urban setting, thus groundwater clean-up is not always required for the issue of a Statement of Environmental Audit.
- Ecological receptors across the site are generally the Yarra River and Hobson's Bay, which are deemed unlikely to be significantly impacted by the amount of contaminant discharge.

- Reducing exposure pathways between contaminated fill material and future occupants is often recommended to be implemented via the importation of new fill or a sealed surface prior to occupation.
- The local groundwater table is generally similar to 0 m AHD, and as a result, local groundwater flow is highly influenced by sewers, the Yarra River and Hobson's Bay.

5.6.2 CARMS No. 49997-1

Table 5 Carms 49997-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Lorimer Precinct
Audit Site Address	844 Lorimer Street, Port Melbourne
Audit Date	11 July 2006
Previous Land Uses	Service Station
CoPC's	Petroleum hydrocarbons, BTEX, heavy metals, VHC's
Audit Outcome	Statement
Average TDS reported	224 - 519 mg/L
Approximate depth to groundwater	2 – 3 mBGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

The Audit site is a former service station. An EPA clean up notice was issued to remove risks associated with stockpiled contaminated spoil material excavated during removal of four on-site UST's. One UST remained in place and contaminated soil remained stockpiled on-site thereby posing a secondary contamination source risk.

Background and Ambient Groundwater Conditions

Samples collected from groundwater bores up-gradient of the Audit site were used to evaluate background groundwater conditions. The expected TDS conditions based on published references were 2,400 – 11,000 mg/L, however, the average measured TDS during the sampling program was 224 - 519 mg/L.

Contaminant concentrations specific to the Audit site were found to be in low concentrations in down-gradient groundwater bores, and groundwater quality was considered to be consistent with regional conditions when compared with up gradient bores.

Conclusions

Groundwater from all five groundwater monitoring bores was found to have high turbidity, however, this is said to be representative of the regional groundwater conditions and no significant source for groundwater impact was found to be present on-site.

It is likely that contaminants in soil at the excavation locations have leached into groundwater, however, this was considered to be localised and unlikely to compromise beneficial uses at the site. Elevated concentrations of VHC's were found near the primary point sources.

Considering the low concentration of residual contaminants at the site and the difficulty in further excavation works due to the proximity of electrical cables and building footings, no further remediation was necessary at the site. It was also noted that new fill material and /or paving will be laid down on-site to cover existing exposed ground, thus the exposure pathway to future users was to be removed.

5.6.3 CARMS No. 50667-1

Table 6 CARMS 50667-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Montague
Audit Site Address	82 Montague Street, South Melbourne
Audit Date	2 May 2011
Previous Land Uses	Chrome electroplating facility
CoPC's	Organic solvents, alkaline cleaning agents, chromic acid, sulphuric acid
Audit Outcome	Statement –Commercial and Industrial
Average TDS reported	1,760 mg/L
Approximate depth to groundwater	1.5 mBGL
Hydraulic head influence from sewer or tides	Yes. Sewer likely acting as a drain.

Summary

The site was primarily used as a chrome electroplating facility from 1950-1994. The Victorian Railway Commission and VicTrack have owned the site since 1913, however, uses outside of the period of operation of the chrome electoplating business are unknown.

The chrome electroplating building was partly decommissioned for a time, exposing the contaminated floor to rainfall and increasing the risks of contaminant infiltration. Some chromium was found to have migrated into the groundwater in the deeper sections of the Port Melbourne Sands.

Groundwater Conditions – Audit site

Although the groundwater was expected to discharge into the Yarra River to the north of the Audit site, the groundwater table was measured at -1 m AHD. Consequently, local groundwater flows were found to be heavily influenced by the sewer network running along property boundaries. Hydraulic head fluctuations around the sewer caused it to change between a sink and source in the local system, however, drawdown of the local groundwater table in the vicinity of the sewer indicated that it most often acts as a drain.

Groundwater Conditions – Background and Ambient

Expected TDS conditions based on published references were 1,000 – 3,500 mg/L. TDS values in a similar range were measured from sampled groundwater bores and this was attributed to background conditions.

The contaminants showing exceedances included chromium, cadmium, copper, nickel and zinc. These were not considered in the assessment to be representative of background conditions or regionally occurring.

Conclusions

It was concluded by the Auditor that off-site sources were unlikely to be contributing to observed contamination and that the Audit site was the source of groundwater contamination in this instance. The Auditor stated that an impervious barrier (such as paving, concrete) must be laid down to remove the exposure pathway to future users of the site. A GQMP was also implemented for the site and a GQRUZ was put in place on the land title (see **Figure F18**).

5.6.4 CARMS No. 37104-1

Table 7 CARMS 37104-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Wirraway
Audit Site Address	Corner Todd Rd and Williamstown Rd
Audit Date	5 November 1999
Previous Land Uses	Landfill
CoPC's	Heavy metals, PAH
Audit Outcome	Statement
Average TDS reported	2,700 – 5,800 mg/L
Approximate depth to groundwater	2 – 3 mBGL
Hydraulic head influence from sewer or tides	Yes. Possible tidal influence.

Summary

Sand was mined at the Audit site to a depth of 8m, before filling with domestic and industrial rubbish, which continued until 1991. Geological conditions and contaminant concentrations were found to be highly heterogeneous at the Audit site, however, exceedances of some heavy metals and PAH were noted at the site in both soil and groundwater. Most of the Audit site was capped with 0.3-0.5 m of cover material, however, there were some areas where rubbish was still visible. Some methane was also being emitted through the ground surface, however, this was seen to be occurring at a diminishing rate.

Groundwater Conditions – Audit site

Groundwater was measured at 2 – 3 m BGL, and monitoring data indicated that groundwater was flowing to the south-southwest towards Hobson's Bay and the Yarra River. It was noted that there may be a separation of flow between Hobson's Bay and the Yarra River. Groundwater at the site was found to be contaminated with heavy metals and PAHs.

Groundwater sampling was conducted on two separate occasions, several days apart. There were significant differences in groundwater levels between these events (approximately 300 mm between these two occasions), suggesting that tidal influence on groundwater is significant in this section of the site.

Groundwater Conditions – Background and Ambient

Whilst a detailed discussion of background or ambient groundwater quality was not available, it was noted that adjacent waste disposal and industrial facilities were likely to have contributed to the measured contamination as well as the activities on the site itself. The Auditor stated that "*groundwater contamination is extensive in the area and contributed to by a number of sources*". Regional contaminants of concern included heavy metals (arsenic, lead, copper, mercury), phenolics, ammonia, volatile chlorinated organics and hydrocarbons.

Conclusions

The site was found to be suitable for use as a secondary school playing field, provided that direct contact between future users and contaminated fill material is avoided by capping the contaminated material with new imported fill.

Leachate testing indicated low mobility of contaminants in the fill material

5.6.5 CARMS No. 62298-1

Table 8 CARMS 62298-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Off-site, approximately 0.8 km south of Wirraway and Sandridge
Audit Site Address	97 Stokes Street, Port Melbourne
Audit Date	16 February 2009
Previous Land Uses	Primary School, blacksmith, laundry, bread factory, paint factory
CoPC's	Lead, PAH, BaP
Audit Outcome	Statement – High density Commercial and Industrial
Average TDS reported	820 – 30,000 mg/L
Approximate depth to groundwater	4 – 5.5 mBGL
Hydraulic head influence from sewer or tides	Yes. Possible tidal influence in south-west section of site.

Summary

The contaminants observed at the site were thought to be unrelated to site activities, and instead representative of regional conditions. In particular, the fill material that is typical of the region was thought to have contributed to observed contamination. Key contaminants in the soil were not present in the groundwater, and immobility was confirmed by leachate results.

Groundwater Conditions – Audit site

The groundwater table was measured at approximately 4.5-5 m BGL across the site, which equates to -2 to -2.5 m AHD. A brick sewer main to the north of the site was found to draw local groundwater flows, which were initially thought to flow south towards Hobsons Bay. Measured TDS varied greatly across the site, ranging from 820 mg/L in the east to 30,000 mg/L in the west of the site. This was likely to be due to interactions with seawater and potential intrusion from the main sewer line.

There were six registered bores for irrigation purposes and six registered bores for domestic purposes within 1 km of the Audit site.

Groundwater Conditions – Background and Ambient

Due to the proximity of the site to the coast, the Assessor stated that tidal interactions with local groundwater had notable impacts when comparing groundwater data in the south-western section of the site with other groundwater bores across the site. Concentrations of sulphate, calcium, sodium, chloride, magnesium, potassium all supported this.

Conclusions

A small area of the site was found to pose an unacceptable risk to health of future residents. The Auditor stated that a capping of the contaminated soil at this area would be sufficient to block exposure pathways to future residents. The Assessor instead chose to recommend excavation of the contaminated material in addition to importing new fill.

5.6.6 CARMS No. 38456-3

Table 9 CARMS 38456-3 Key Audit Information

Site Information	Detail
Sub-Precinct	Wirraway
Audit Site Address	Lot 1B, 69-119 Salmon Street, Port Melbourne
Audit Date	10 November 1999
Previous Land Uses	Landfill, public works depot, storage warehouses, fuel storage
CoPC's	Metals, asbestos, TPH, lead, BTEX
Audit Outcome	Statement – Commercial / Industrial purposes
Average TDS reported	931 – 4,440 mg/L
Approximate depth to groundwater	3 mBGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

The Audit site comprised a former landfill and storage warehouses including fuel storage facilities. Contaminants associated with these facilities presented a contamination risk to the Audit site, as well as a fuel station to the north-west of the Audit site, outside the boundaries of the Wirraway Precinct.

There was a low risk posed by methane emissions at the Audit site, however, industry standards for building on sites with landfill gas were to be followed to minimise associated health risks.

Groundwater Conditions – Audit site

The water table at the Audit site was found to lie at approximately 3 m BGL, within the fill material. Diverse wastes in the fill material were likely to have contributed to contaminant loading in the groundwater, in particular PAHs. Water table contours indicated that groundwater tends to mound at the landfill area of the Audit site due to infiltration and flows outwards from that area. There was also some increased flow at the north-western part of the Audit site due to remedial extraction works at a nearby service station.

Conclusions

There was minimal groundwater contamination present at the Audit site, and it was noted that the existing contamination was present in insufficient concentrations to pose any threat to human or ecological receptors considering the likely future uses. The soil contamination in areas adjacent to the landfill was considered to be due to original fill material that was not associated with landfill operations or other activities on the Audit site.

Contaminant concentrations in soil generally fell within the allowable range for industrial / commercial purposes, although replacement soil was to be imported for areas where planting of gardens is intended. Soil in some other areas was classified as low level contaminated fill material due to the presence of metals, PAHs and rubble such as coke, ash, glass and bricks. As such, this was to be managed as low level contaminated soil in accordance with EPA requirements if excavated and removed from the site.

5.6.7 CARMS No. 26919-1

Table 10 CARMS 26919-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Sandridge
Audit Site Address	Corner Williamstown Rd and Derham Street
Audit Date	22 December 1995
Previous Land Uses	Service station
CoPC's	TPH, Metals, BTEX, PAH
Audit Outcome	CoEA
Average TDS reported	880 – 1,200 mg/L
Approximate depth to groundwater	2.2 – 2.5 mBGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

This Audit site was previously used as a fuel service station with six UST's that were considered the highest risk of the contamination sources at the Audit site. A remediation program was carried out prior to the completion of this audit, which involved the removal of the six UST's, excavation of the surrounding fill from the pit floor and walls, backfilling the excavation with crushed concrete, and sparging of contaminated groundwater.

Groundwater samples were analysed for TPH, BTEX and lead (only), thus a comparative indication of typical regional contaminants such as metals and PAHs was not possible.

Groundwater Conditions – Audit site

The groundwater table at the Audit site was found to be 2.2 - 2.5 m BGL. Groundwater flow is south towards Hobsons Bay, although it is thought that some mounding of groundwater occurs at the UST pits due to increased infiltration through the porous material. The TDS at the Audit site was found to be approximately 880 – 1,200 mg/L, which indicates that groundwater under the site is in good condition when compared with general aquifer conditions.

There are a number of registered groundwater bores used for domestic and irrigation purposes in the vicinity of the Audit site.

Conclusions

The sparging remediation system was installed at the Audit site, pumping fresh air into the soil at a 4.5 m depth to mobilise volatile compounds. This resulted in benzene concentration in the most impacted groundwater bore to be reduced to below guideline levels for raw water for drinking water supply. All other BTEX and TPH analytes were also reduced to concentrations below the laboratory LOR in all groundwater bores.

5.6.8 CARMS No. 45435-1

Table 11 CARMS 45435-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Lorimer
Audit Site Address	349 Ingles Street, Port Melbourne
Audit Date	9 March 2001
Previous Land Uses	Storage warehouses, commercial offices
CoPC's	Metals, TPH, MAH, Phenols, VHCs, Cyanide, Pesticides
Audit Outcome	Statement –Commercial / Industrial
Average TDS reported	1,200 mg/L
Approximate depth to groundwater	2.5 mBGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

The Audit site has previously been home to warehouses used for storage of chemicals, oil and textiles. The main sources of contamination relate to fill material, pesticides used for maintenance around warehouses and small fuel leaks from parked vehicles.

Exceedances of PAHs and heavy metals were found within the fill material at the Audit site.

Groundwater Conditions

Groundwater flow at the Audit site was assumed to be generally north towards the Yarra River, although it was acknowledged that there may be some other localised influences on the Audit site. Evaluation of the flow direction was not possible in this study because well heads were not surveyed. Groundwater was found to sit at approximately 2.5 m BGL and TDS was measured at approximately 1,200 mg/L. There were no reported domestic groundwater bores within 1 km of the Audit site.

Concentrations of all analysed contaminants in groundwater at the Audit site were found to fall below either laboratory LORs, ANZECC groundwater quality guidelines (1992) for irrigation or NHMRC drinking water guidelines.

Conclusions

Groundwater sampling results indicated that there have been no impacts on groundwater at the Audit site. The most concerning source of contamination on the Audit site was the foreign fill material. The Auditor considered the Audit site to be suitable for commercial and industrial uses provided the future users do not come into direct contact with contaminated fill material.

5.6.9 CARMS No. 68702-1

Table 12 CARMS 68702-1 Key Audit Information

Site Information	Detail
Sub-Precinct	Sandridge
Audit Site Address	14 Woodruff Street, Port Melbourne
Audit Date	7 January 2014
Previous Land Uses	Chemical manufacturing facility
CoPC's	TPH, BTEX, Phenols, Metals, PCBs, TRH, PAHs
Average TDS reported	420 – 10,000 mg/L
Approximate depth to groundwater	1.2 - 2.7 m BGL
Hydraulic head influence from sewer or tides	Yes. Sewer likely to be acting as a drain.

Summary

The Audit site housed a chemical manufacturing facility from 1896 – 2013, which primarily produced soaps, cleaning products and oleo products. The EPA issued a Pollution Abatement Notice for the Audit site in order to determine the potential for soil and groundwater contaminants to have migrated from the Audit site. There were at least four petrol UST's at the Audit site as well as a number of above ground chemical storage tanks that were considered likely to have caused contamination. The Audit site is currently almost entirely sealed with bitumen or concrete where buildings are not present.

Soil pH varied across the site due to potential spills of acidic and neutralising chemicals to treat by products, and the influence of alkaline products in the production of soaps and cleaners.

Groundwater Conditions – Audit site

The groundwater table at the Audit site was encountered at 1.2 - 2.7 m BGL, and the flow direction was inferred from measured water levels to be flowing south-west towards a sewer running along Ingles Street, via which it will eventually reach Port Phillip Bay. Drawdown of the water table was also noted in the vicinity of the sewer, confirming its action as a local groundwater drain.

TDS at the Audit site was measured between 420 and 10,000 mg/L, which was consistent with expected conditions in the region.

Groundwater Conditions – Background and Ambient

The regional groundwater flow was expected to be north towards the Yarra River; however, this was altered locally at the Audit site to flow south-west towards the Ingles Street sewer.

Conclusions

There were some minor exceedances of heavy metals in groundwater sampled at the Audit site, however, these were deemed not to have migrated off the Audit site and the Auditor noted that the groundwater was unlikely to be used for domestic or irrigation purposes in the vicinity of the site.

There are some remaining secondary sources in the soils at the Audit site, however, exposure pathways to this material were likely to be eliminated during development, and future users were to be made aware of this.

5.6.10 CARMS No. 61183-2

Table 13 CARMS 61183-2 Key Audit Information

Site Information	Detail
Sub-Precinct	Montague
Audit Site Address	63-67 Whiteman Street, Southbank
Audit Date	9 September 2009
Previous Land Uses	Seed merchant, metalworks, motor trimmers, cordial manufacturer, commercial
CoPC's	Metals, PAH, ammonia, cyanide
Audit Outcome	Statement –High density Commercial / Industrial
Average TDS reported	2,000 – 26,000 mg/L
Approximate depth to groundwater	1 – 1.5 mBGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

The Audit site was used for light industrial purposes for nearly 100 years. These activities were generally low impact, and regional fill material as well as a sewer leak adjacent to the site, were considered to be the highest risk sources of contamination.

Soil analysis returned elevated concentrations of sulphur across the site, which was likely to be due to background conditions resulting in high sulphur concentrations in the underlying Coode Island Silt. This was also considered to be potential acid sulphate soil, however, this was found to not cause contamination issues if the soil remained undisturbed.

Groundwater Conditions – Audit site

The average depth of groundwater in the Port Melbourne Sands aquifer encountered at the Audit site was 1-1.5 mBGL, and direction of groundwater flow was generally north-northwest towards the Yarra River, which is approximately 260 m from the Audit site.

Measured TDS ranged from 2,000 – 26,000 mg/L.

Groundwater Conditions – Background and Ambient

High concentrations of ammonia and cyanide were likely to be due to both ambient effects of contaminated fill material from the South Melbourne and West Melbourne Gasworks that has been used widely across the region, and elevated ammonia levels in Coode Island Silt.

No background groundwater samples were assessed in this study, however, the groundwater samples taken at the Audit site were considered to be representative of regional conditions.

Conclusions

The elevated concentrations of contaminants such as metals, cyanide, ammonia and PAHs in soil and groundwater at the Audit site were attributed to the regionally high conditions. In this regard, there would be no benefit to human or ecological receptors in clean-up of soil and groundwater at the Audit site. It was also considered unlikely that groundwater will be extracted for domestic or irrigation purposes due to the high density urban setting, hence possible exposure pathways to human receptors are unlikely. This was supported by the groundwater database search, which found that there were no registered bores listed for domestic purposes within 1km of the Audit site.

5.6.11 CARMS No. 67827-1

Table 14 CARMS 67827-1 Key Audit Information

Site Information	Detail
Sub-Precinct	East of Montague
Audit Site Address	68 Ingles Street, Port Melbourne
Audit Date	19 December 2013
Previous Land Uses	Retail, electrical engineer, car detailing
CoPC's	Metals, TPH, PAHs, PCBs
Audit Outcome	Certificate
Average TDS reported	690 – 710 mg/L
Approximate depth to groundwater	2 m BGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

The Audit site was changed from a general store to a car detailer in 1993. Operations from the car detailing business and an electrical engineering business are considered likely to have been point sources of contamination, although no underground or above ground fuel storage tanks were recorded to have existed on-site. Fill material that occurs on a regional scale was thus the most likely source of contamination at the Audit site.

Some excavation works occurred to remove contaminated soils that exceeded adopted criteria for BaP and some metals, and the remaining soil was not considered to pose an ongoing contamination risk.

Groundwater Conditions – Audit site

The sampled groundwater at the Audit site was measured to have a TDS of approximately 700 mg/L, and the groundwater table was encountered at 2 m BGL (-0.3 m AHD). The Auditor noted that the general flow direction in the area was likely to be north towards the Yarra River.

Groundwater Conditions – Background and Ambient

A range of metals including chromium (VI), cobalt, copper, manganese, nickel, selenium and zinc returned concentrations exceeding adopted assessment criteria. These were concluded by the Assessor to be consistent with regional conditions that likely result from fill material and other anthropogenic influences. The Auditor also noted that the uniformity of copper, nickel and zinc concentrations in natural soils across the site indicated that these are likely to be associated with the Port Melbourne Sands formation, leading to elevated concentrations of these metals in groundwater.

Conclusions

ASLP was used to determine the leachability of contaminants in the fill material, and it was found that the potential mobility of the contaminants is low. Considering that there were no significant point sources found at the site and that the contaminant exceedances in soil and groundwater were low, it was concluded that groundwater contaminant concentrations at the Audit site were consistent with regional conditions in an urban setting. Hence, the Auditor concluded that the Audit site was not posing a health or ecological risk. It was recommended that further assessment takes place if any groundwater extraction takes place in the future.

5.6.12 CARMS No. 33298-9

Table 15 CARMS 33298-9 Key Audit Information

Site Information	Detail
Sub-Precinct	Off-site near Lorimer, Sandridge, Wirraway
Audit Site Address	Melbourne Citylink Lorimer Off Ramp
Audit Date	22 March 1999
Previous Land Uses	Various industrial
CoPC's	PAHs, TPHs, metals, VOCs, phenols, PCBs
Audit Outcome	Statement –Road Reserve, Industrial and Public Open Space Use
Average TDS reported	1,000 – 22,000 mg/L
Approximate depth to groundwater	2.2 and 2.8 m BGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

The Audit site is the area under the existing Lorimer Street exit ramp from the Westgate Freeway, at the interception of the Lorimer, Wirraway and Sandridge sub-precincts. The area was originally low lying swamp land, however, at the time of the Audit, the Audit site comprised very little natural vegetation and was primarily covered by paved surface and industrial buildings.

Part of the Audit site (near Graham Street) was once an operating sand quarry, and heterogeneous fill material comprising various soils and bricks, glass, concrete, rubber and domestic waste was encountered up to 7 m BGL.

Groundwater Conditions

Groundwater was encountered at depths between 2.2 and 2.8 m BGL and was expected to flow north-northwest from the Audit site towards the Yarra River. Due to sealed surfaces across the majority of the site, recharge from infiltration at the Audit site was not thought to be a major contributor to groundwater locally, impeding the pathway of surface contaminants to groundwater. TDS of groundwater was measured to be in the range 1,000 and 22,000 mg/L, which was consistent with expectations from nearby groundwater monitoring results, and the saline background conditions of groundwater in the Docklands vicinity.

Conclusions

The construction works for the Citylink ramp, carparks and landscaped areas have resulted in a substantially reduced area for potential exposure of occupiers of the Audit site to be exposed to contaminated soil. Most of the fill material existing on-site prior to Citylink works would have been classified as Fill Material or Low Level Contaminated Material.

The mobility of the commonly encountered contaminants was found to be low, and there were no groundwater supply bores within 1 km of the Audit site. Groundwater quality at a previously Audited site down-gradient of the Audit site also suggested that there was no significant migration of contaminants from the Audit site and hence clean-up was not required at the Audit site.

5.6.13 CARMS No. 71587-2

Table 16 CARMS 71587-2 Key Audit Information

Site Information	Detail
Sub-Precinct	Off Site (200m from Montague Sub-Precinct Boundary
Audit Site Address	79-83 Market Street, Southbank
Audit Date	10 November 2014
Previous Land Uses	Boilermaker, transport company, automotive workshop, warehouse
CoPC's	Heavy metals, PAHs
Audit Outcome	Certificate
Average TDS reported	2,100 – 2,500 mg/L
Approximate depth to groundwater	6 – 8 m BGL
Hydraulic head influence from sewer or tides	Not reported.

Summary

A certificate of Environmental Audit was requested by the landowner who proposed to develop high density residential apartments. A number of contaminant concentrations exceeded adopted criteria in both groundwater and soil. All beneficial uses of groundwater were precluded by contamination at the Audit site.

Groundwater Conditions – Audit site

The groundwater table at the site was encountered between 6 and 8 m BGL (approximately -0.2 m AHD), and the groundwater was assumed to flow north towards the Yarra River. Groundwater quality was observed to be similar in all three monitoring wells on the Audit site.

Groundwater Conditions – Background and Ambient

Audit reports from six surrounding EPA Audit sites were reviewed by the Assessor. Four of the five sites at which a groundwater investigation was undertaken reported exceedances of adopted criteria of metals, and Auditors at each of these sites agreed that these exceedances were likely due to background conditions.

The Auditor noted that elevated concentrations of boron, cobalt, copper, vanadium and TDS were due to their natural occurrence in the local geology and hydrogeology.

Conclusions

It was concluded that whilst groundwater beneath the Audit site was polluted, the Audit site was not the source of pollution. The contaminants showing exceedances in local groundwater were considered to be due to either regional background / ambient conditions, or up-gradient sources. A thin layer of exposed fill material on the Audit site was requested to be removed by the Auditor.

The Auditor also proposed that a GQRUZ be implemented across the title of the Audit site.

6.0 Preliminary Regional Conceptual Site Model

Fundamental to identifying risk assessment issues is the development of a Conceptual Site Model (CSM). A CSM is a site-specific qualitative description of the source(s) of contamination, the pathway(s) by which contaminants may migrate through the environmental media, and the populations (human or ecological) that may potentially be exposed. This relationship is commonly known as a Source-Pathway-Receptor linkage. Where one or more elements of a linkage are missing, the exposure pathway is considered to be incomplete and no further assessment is required.

In the context of this assessment, the PRCSM aims to describe source-pathway-receptor linkages that are ubiquitous across the study area. Therefore, it is focussed on linkages associated with diffuse sources of pollution that may influence the potential beneficial uses of groundwater in the study area. Point sources of contamination are therefore not discussed herein as it is considered they will be assessed on a site-specific basis rather than on a regional basis. Similarly, beneficial uses of land are not discussed herein because it is considered these will be assessed on a site-specific basis.

6.1 Identification of Regional Sources of Impact to Groundwater

Regionally significant environmental conditions can be described in broad terms as either being related to natural or anthropogenic (ambient) sources. These are discussed separately below.

6.1.1 Natural Conditions

Inorganic substances are naturally present in the environment. Natural background concentrations of metals in soil and groundwater depend on the geological parent material and can be highly variable (ASC NEPM 2013).

Organic substances may be present in the environment as a result of organic matter decomposition (e.g. hydrocarbons) or as the products of incomplete combustion (e.g. polycyclic aromatic hydrocarbons and dioxins).

The preferred approach to determining the natural background concentration of a particular analyte is via direct measurement at a known unpolluted reference site. However, this is often challenging in an urban setting due to the added influence of diffuse anthropogenic impacts.

6.1.2 Anthropogenic (Ambient) Conditions

A wide range of anthropogenic activities may contribute to the ambient background concentration of both inorganics and organic compounds. These are typically activities that occur as diffuse (non-point) sources not attributable to any particular site or operation.

In an urban setting these may include:

- Deposition of atmospheric pollution.
- Leakage and other emissions from motor vehicles on public roads.
- Leakage from waste water utilities (stormwater and sewer).
- The use of pesticide and fertiliser on public land.
- Backfilling with uncontrolled fill during early land reclamation activities.

6.2 Regional Chemicals of Potential Concern

A number of the Audit reports reviewed in **Section 5.6** have indicated the presence of both naturally occurring and anthropogenic background impacts in groundwater not attributed to the site being audited. These groundwater chemicals of potential concern (CoPC) for the PRCSM are summarised in **Table 17**.

Table 17 Background Concentrations Reported in Previous Audits Relevant to the Study Area

CoPC Identified Exceeding Beneficial Use Criteria	Concentration Range (µg/L)	CARMS No.	Inferred Source Description
1,1-Dichloroethane	1.3 - 4.2	71587-2	Highest concentrations measured in up-gradient well, auditor concludes that these are likely to exist on a wide scale from an up-gradient source.
1,2-Dichloroethane	1.8 - 11	71587-2	Highest concentrations measured in up-gradient well, auditor concludes that these are likely to exist on a wide scale from an up-gradient source.
Ammonia	0.06 - 0.37	66298-1	Audit site is in relatively close proximity to a sewer
Ammonia	7,700 - 170,000	61183-2	Audit report states that the elevated ammonia is likely to be primarily due to gasworks wastes and to a lesser extent natural conditions.
Arsenic	3 - 32	66298-1	Audit report states that contaminants in soil and groundwater did not match, and thus heavy metals exceedances in groundwater were attributed to regional conditions
Arsenic	82	38456-3	Industrial facilities, regional fill material and landfill
Arsenic	11 - 140	33298-9	Industrial facilities, regional fill material and landfill
Boron	1,100 - 4,000	71587-2	Audit report deems this to be naturally occurring
Bromomethane	1 - 2	71587-2	Highest concentrations measured in up-gradient well, auditor concludes that these are likely to exist on a wide scale from an up-gradient source.
Cadmium	1 - 5	33298-9	Industrial facilities, regional fill material and landfill
Chromium	2 - 6	49997-1	Regional fill material. Audit report states that similar concentrations were found in up-gradient background wells
Chromium	2	67827-1	Regional fill material
Chromium	1 - 66	66298-1	Audit report states that contaminants in soil and groundwater did not match, and thus heavy metals exceedances in groundwater were attributed to regional conditions
Chromium	18 - 120	33298-9	Industrial facilities, regional fill material and landfill
Chromium	1 - 38	61183-2	Chromium is commonly observed in groundwater around Melbourne and this is considered likely to represent background conditions
Chromium (VI)	10 - 39	71587-2	Regional fill material
Cobalt	4	67827-1	Regional fill material
Cobalt	4 - 46	71587-2	Audit report deems this to be naturally occurring
Copper	1 - 2	49997-1	Audit report states that similar concentrations were found in up-gradient background wells

CoPC Identified Exceeding Beneficial Use Criteria	Concentration Range (µg/L)	CARMS No.	Inferred Source Description
Copper	10	67827-1	Regional fill material
Copper	200 - 280	37104-1	Exceedances were reported at up-gradient locations and sources are considered to be surrounding industry as well as the Audit Site
Copper	4 - 42	66298-1	Audit report states that contaminants in soil and groundwater did not match, and thus heavy metals exceedances in groundwater were attributed to regional conditions
Copper	40	33298-9	Industrial facilities, regional fill material and landfill
Copper	6 - 20	71587-2	Audit report deems this to be naturally occurring
Copper	1 - 6	61183-2	Natural geology
Cyanide	5 - 38	61183-2	Regional fill material, specifically from gasworks waste
Cyanide	5 - 38	61183-2	Audit report notes that many plants contain cyanide, and this could be present in groundwater due to natural breakdown of organic material in Coode Island Silt. There was no cyanide recorded in any of the 55 soil samples taken at the Audit Site.
Fluoride	3,100	67827-1	Regional fill material
Fluoride	2,100	71587-2	Leaking sewers
Lead	10 - 990	37104-1	Exceedances were reported at up-gradient locations and sources are considered to be surrounding industry as well as the Audit Site
Lead	77 - 3,600	33298-9	Industrial facilities, regional fill material and landfill
Manganese	150	67827-1	Regional fill material
Nickel	4 - 470	49997-1	Audit report states that similar concentrations were found in up-gradient background wells
Nickel	92	67827-1	Regional fill material
Nickel	78 - 100	37104-1	Exceedances were reported at up-gradient locations and sources are considered to be surrounding industry as well as the Audit Site
Nickel	2 - 35	61183-2	Natural geology
Nitrate	7,100 - 39,000	71587-2	Audit report notes that there have been leaking sewers in the area and nitrate contamination often exists regionally
PAH	118 - 477	37104-1	Exceedances were seen at up-gradient locations and sources are considered to be surrounding industry as well as the Audit Site.

CoPC Identified Exceeding Beneficial Use Criteria	Concentration Range (µg/L)	CARMS No.	Inferred Source Description
Selenium	32	67827-1	Regional fill material
Selenium	1 - 89	61183-2	Selenium is commonly observed in groundwater around Melbourne and this is considered likely to represent background conditions
Sulfate	2,400 - 472,000	61183-2	Natural geology
TCE	140 - 270	71587-2	Highest concentrations measured in upgradient well, auditor concludes that these are likely to exist on a wide scale from an upgradient source.
Tin	5 - 14	61183-2	Natural geology
TPH	250 - 1,230	61183-2	Some TPH is expected in swampy environments where significant decay of plant matter is occurring.
Vanadium	6 - 32	71587-2	Audit report deems this to be naturally occurring
Zinc	4 - 77	49997-1	Audit report states that similar concentrations were found in up-gradient background wells
Zinc	130	67827-1	Regional fill material
Zinc	50 – 1,300	37104-1	Exceedances were reported at up-gradient locations and sources are considered to be surrounding industry as well as the Audit Site
Zinc	16 - 24	66298-1	No discernible difference between zinc concentrations at up-gradient and down-gradient locations
Zinc	420 - 8,100	33298-9	Industrial facilities, regional fill material and landfill

6.3 Regional Groundwater Exposure Pathways

Receptors in the study area may interact with groundwater in a number of ways as follows:

- Groundwater may discharge to surface water receptors and influence water conditions affecting ecological receptors. Groundwater flow direction and rate may also be influenced by natural and anthropogenic preferential pathways (e.g. historic stream channels or deep sewer lines).
- Groundwater may be abstracted for either domestic or non-domestic uses (e.g. potable water supply, irrigation or industrial use).
- Groundwater may be in direct contact with infrastructure (e.g. utilities or building foundations). Under such conditions, chemicals present in groundwater may permeate these structures or human receptors may come into contact with groundwater during maintenance works.
- Vapours derived from groundwater may migrate through the subsurface and into overlying buildings.

6.4 Beneficial Uses of Groundwater

According to the *Victorian Groundwater Beneficial Use Map Series: South Western Victoria, Water Table Aquifers* (DCNR, 1995), the concentration of total dissolved solids (TDS) in groundwater in the upper aquifer in the study area is expected to range between 1,001 mg/L and 3,500 mg/L which falls within "Segment B" according to the SEPP (GoV).

Given that groundwater at the site has been assessed as Segment B, the following protected beneficial uses are considered relevant:

- Maintenance of Ecosystems
- Potable mineral water supply
- Agriculture, parks and gardens
- Stock watering
- Industrial water use
- Primary contact recreation
- Buildings and structures

A wide range of TDS values have been recorded in the Audit reports reviewed in **Section 5.6**, as summarised in **Table 18**. The lower end of the range of reported values may indicate a potential for use of the groundwater for potable water supply purposes, in addition to the beneficial uses listed above. The upper end of the range of reported values may indicate that in areas the groundwater is not suitable for use for potable water supply or irrigation purposes.

Table 18 TDS Ranges Reported in Previous Audits Relevant to the Study Area

Audit Report CARMS No.	TDS Range (mg/L)
49997-1	224 - 519
67827-1	690 - 710
33298-9	1,000 - 22,000
71587-2	2,100 - 2,500
37104-1	2,700 - 5,800
38456-3	931 - 4,440
62298-1	820 - 30,000
26919-1	880 - 1,200
68702-1	420 - 10,000
50667-1	1,760
61183-2	2,000 - 26,000
45435-1	1,200

6.5 Future Land Use Scenarios and Potential Receptors

The site has an anticipated future use as a mixed-use precinct with medium to high density residential sub-precincts. The potential receptors to groundwater contamination are discussed below in the context of the protected beneficial sues of groundwater.

Table 19 Potential Receptors

Beneficial Use of Groundwater	Identified Receptors
Maintenance of Ecosystems	Based on the site setting, topography and findings of previous assessments, groundwater is considered likely to flow in a south to south west direction. Groundwater may therefore discharge to the Yarra River and Hobsons Bay and influence aquatic ecosystems in this water body.
Potable water supply	The site is located in an area of reticulated water supply which reduces the likelihood of extraction for potable use. However, owing to the low TDS reported in some areas, this beneficial use of groundwater cannot be excluded.
Potable mineral water supply	The site is not located within a designated mineral water zone therefore this groundwater beneficial use is considered unlikely to be realised.
Agriculture, parks and gardens	The site is located in an area of reticulated water supply which reduces the likelihood of extraction for irrigation use. However, owing to the low TDS reported in some areas, this beneficial use of groundwater cannot be excluded.
Stock watering	The site is located in an area of reticulated water supply which reduces the likelihood of extraction for stock watering use. Such a use is also considered unlikely to be realised under the anticipated future land use and urban setting. However, owing to the low TDS reported in some areas, this beneficial use of groundwater cannot be excluded.
Industrial water use	It is considered unlikely that following redevelopment industrial land uses will continue in the area and therefore this groundwater beneficial use is considered unlikely to be realised. Furthermore it is considered likely that any groundwater extracted for industrial purposes would require treatment prior to use owing to the variable salinity.
Primary contact recreation	Based on the site setting, topography and findings of previous assessments, groundwater is considered likely to flow in a south to south west direction. Groundwater may therefore discharge to the Yarra River and Hobsons Bay and be contacted by recreational users of these waterways.
Buildings and structures	Groundwater is relatively shallow across the study area and has the potential to come into contact with building foundations, basement structures and subsurface utilities. Vapours derived from groundwater may migrate through the subsurface and into buildings.

6.6 Potentially Complete Source-Pathway-Receptor Linkages

Potentially complete regional source-pathway-receptor linkages based on the above information are summarised in the PRCSM (**Appendix D**).

7.0 Data Gap Assessment

Some data gaps which may impact the assessment have been identified based on review of the data from previous investigations. These are summarised in **Table 20** below. The manner in which data gaps have been addressed in the assessment is also summarised.

Table 20 Summary of Data Gaps

Data Gaps	Potential Significance	Manner in Which Addressed in the Assessment
There are few EPA Audit sites within the boundaries of the site.	The low density of EPA Audit reports reduces certainty of site wide contamination profiling as it becomes more likely that sampling has encountered hotspots.	12 Audit reports for properties within 1 km of site boundaries and with diverse historical land uses have undergone detailed reviews to ensure that a range of sampling programs are validated against one another in order to accurately characterise background conditions.
There are no sources providing reliably complete lists of point sources and boundaries of historic landfills.	Significant point sources need to be identified and delineated to ensure sampling plan avoids targeting these locations.	A variety of sources have been reviewed to identify significant point sources (**Section 5.0**). These have been validated against the Golder (2012) Land Contamination Study.
Some EPA Audit reports reviewed neglect inclusion of background sampling in site analysis.	Increases risk that contamination profile indicated by review of EPA Audit reports is influenced by point sources and does not reflect Site wide conditions	EPA Audit reviews have put particular emphasis on discussion of background conditions findings that are relevant to the site as a whole.

8.0 Contamination Profiling Model

AECOM is developing a Contamination Profiling Model (CPM) in consultation with EPA to provide a framework to further evaluate the potential risks within the four sub-precincts. It is anticipated that the CPM may be used by EPA to assist in decision making regarding:

- Whether groundwater conditions at a site are indicative of regional or site-specific impacts.
- Where site-specific groundwater impacts are identified, whether beneficial uses are potentially precluded and further assessment may be warranted.

The model will assign rankings to contamination levels (e.g. high, medium, low or not applicable) and will also account for potential contamination migration pathways, distance to sensitive receptors, and potential redevelopment. The CPM will be in a simple and visual format with the intention that information gathered in subsequent phases of work can be put into the model with relative ease at a later date as needed.

The proposed principles for selecting criteria and inputs for the model are outlined below and will be refined in consultation with EPA as more site-specific information becomes available.

8.1 Data Inputs

It is anticipated that regional groundwater conditions for the CPM will be characterised based on:

- The outcomes of this Desktop Study (in particular, the information summarised in **Table 17** and **Table 18**).
- Subsequent investigation works that aim to determine the baseline groundwater quality across the FBURA precinct.
- The PRCSM and any subsequent refinements to this.

8.2 Risk Assessment Methodology

It is proposed that the CPM utilise a qualitative risk assessment approach based on a Consequence/ Likelihood matrix, as described in IEC/ISO 31010 guidance. An example matrix is provided in **Table 21**.

Table 21 Consequence/ Likelihood matrix

Likelihood	Consequence Rating			
	Major	**Moderate**	**Minor**	**Negligible**
Almost Certain	Higher risk	Higher risk	Intermediate risk	Intermediate risk
Likely	Higher risk	Higher risk	Intermediate risk	Lower risk
Possible	Higher risk	Intermediate risk	Lower risk	Lower risk
Unlikely	Intermediate risk	Intermediate risk	Lower risk	Lower risk

The Consequence/ Likelihood matrix provides a means of combining qualitative or semi-quantitative ratings of consequence and probability to produce a level of risk or risk rating .It is commonly used as a screening tool when many risks have been identified, for example to define which risks need further or more detailed analysis, which risks need treatment first, or which need to be referred to a higher level of management. This has been identified as a suitable risk assessment methodology based on the following:

- Flexibility to deal with qualitative or quantitative data.
- Flexibility when setting the scoring scale to give extra weight to consequences or to probability, if required.
- Relatively easy to use.
- Provides a rapid ranking of risks into different significance levels.

Preliminary definitions of each of the Consequence and Likelihood classifications are suggested in **Table 22**, however these will be further developed in consultation with EPA.

Table 22 Proposed Consequence/ Likelihood Descriptions

Category	Classification	Definition
Consequence	Major	- Short-term (acute) exposure leads to irreversible effects on identified receptors. - Concentrations of relevant CoPC in groundwater significantly exceed regional background conditions and Tier 1 screening criteria. Intervention action may be considered prior to or concurrent with further assessment.
	Moderate	- Chronic exposure leads to irreversible effects on identified receptors. - Concentrations of relevant CoPC in groundwater exceed regional background conditions and Tier 1 screening criteria and warrant further evaluation of potential risks to beneficial uses of groundwater
	Minor	- Chronic exposure leads to reversible effects on identified receptors. - Concentrations of relevant CoPC in groundwater exceed regional background conditions but do not exceed Tier 1 screening criteria.
	Negligible	- No measurable statistically significant adverse effect on identified receptors. - Concentrations of relevant CoPC in groundwater are equal to or less than regional background conditions
Likelihood	Almost Certain	- There is a complete pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
	Likely	- There is a complete pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
	Possible	- There is a complete pollutant linkage and circumstances are possible under which an event could occur. However, it is not certain that even over a long period such an event would take place, and is less likely in the shorter term.
	Unlikely	- Either no complete pollutant linkage or if there is a pollutant linkage, circumstances are such that it is improbable that an event would occur even in the very long-term.

9.0 Conclusions and Recommendations

The Desktop Study aimed to review existing publically available data to determine key factors that may be influencing shallow groundwater within the site on a regional scale. For the purposes of assessing baseline groundwater quality from a regional perspective, AECOM has reviewed significant environmental conditions in broad terms as either being related to natural or anthropogenic (ambient) sources. This included particular consideration of the following sources of information, as they have the potential to have significant influence on the overall groundwater migration and quality:

- Inorganic substances that are naturally present in the environment.
- Organic substances that may be present in the environment as a result of organic matter decomposition or as the products of incomplete combustion.
- Tidal influences.
- Former swamp and wetlands.
- Geological Features.
- The sewer network across the site, particularly the Hobsons Bay Main Sewer and Melbourne Main Sewer.
- The drainage and stormwater system.
- Uncontrolled filling (including filling of former quarries/landfills).

Point sources of contamination have also been considered (and identified where possible) during this Desktop Study to ensure that any future SAQP aims to avoid sampling groundwater that may be influenced by point sources of contamination.

The results of this study have been incorporated into a Preliminary Regional Conceptual Site Model (PRCSM), which is presented in this document. It is intended that the information obtained as part of the Desktop Study and PRCSM will be used during the development of a Groundwater Sampling and Analysis Quality Plan (SAQP) for a baseline regional groundwater investigation at the site. The outcomes of that investigation will be considered in relation to the findings of the Desktop Study and the PRCSM to assist in further conceptualising the site.

9.1 Conclusions

The finding of this work identified the following aspects in relation to the regional groundwater quality and influencing factors across the site.

Conclusions resulting from the Desktop Study and PRCSM are as follows:

- The site is located in the south-west of Melbourne and is bound by Lorimer Street to the north, Todd Road to the west, Williamstown Road/Boundary Street to the south and City Road to the east. The Yarra River is beyond Lorimer Street at the northern boundary of the site, while the Westgate Freeway separates the Lorimer sub-precinct from the other three sub-precincts.
- Prior to European settlement the site was generally low lying swamp/wetlands. Post European settlement the site has been highly modified including sections filled through land reclamation, quarried and used for a variety of industrial and agricultural purposes. The Lorimer and Montague precincts were developed and used for grazing and industrial purposes from the mid 1800's, with the Wirraway and Sandridge sub-precincts being developed for quarrying, grazing and industrial purposes from the early 1900's. All four sub-precincts are still developed as a mix of light and heavy industrial uses to date.
- The site is underlain by flat lying sedimentary deposits of the Quaternary aged Yarra Delta group and the topography of the site is generally flat with an elevation ranging between 0->4 mAHD.
- The average depth of the shallow groundwater in the site is approximately 3 mBGL and is expected to flow to the north towards the Yarra River, or west towards Port Phllip Bay.

- Factors influencing regional groundwater flow identified as part of this review include the following:
    - Tidal influence. Based on the tidal variation (up to 0.759 MASL), the elevation of the site (0 - >4mAHD) and the average depth of groundwater (approximately 3 mBGL), there is expected to be significant tidal influence on the shallow groundwater. This tidal influence is expected to be greater particularly closer to the Yarra River to the north of the site and is likely to become damped towards the south. Further consideration of this on the regional groundwater quality including the impacts of regular flushing of water, salinity and migration pathways needs to be further assessed as part of future investigations.
    - Existing stormwater and drainage infrastructure. Both deep and shallow stormwater and sewerage infrastructure exist throughout the site. This includes the Hobson Bay Main and Melbourne Main Sewer which were constructed in the late 1800's, as well as stormwater infrastructure including the Melbourne Water Drainage System. The integrity of these assets was unable to be determined, however, due to the age, construction methodology and depth of some of these assets, they can potentially have influence on groundwater flow. From review of existing reports, no reliable information could be determined in relation to if these assets are having a significant influence on the flow of shallow groundwater within the site, however, this should be further considered following the outcome of intrusive investigations and sampling.
    - Former landfills and quarries. Former quarry locations and landfills were identified within the site. They were generally located in the Wirraway and Sandridge precincts and have the potential to have significant influence on regional groundwater flow direction, as they have been excavated to depths greater than the shallow aquifer. Two of the twelve audit reports reviewed within 1km of the site indicated that former landfill areas impacted water table contours and created groundwater mounding. This influence of former landfills and quarries should be further considered following the outcome of intrusive investigations and sampling.

Further consideration in addition to those factors mentioned above was also reviewed. This included consideration of geological influence such as the presence of ancient river channels and drainage pathways, as well as the influence of land reclamation and other historical practices including diverting and dredging the Yarra River (up to depths between 6.09 and 10.98 m). The results of this review did not identify definitive factors in respect to these activities that could be considered as significantly influencing regional groundwater flow, however, it is possible that dredged material was used to fill areas of the site and therefore affect movement of groundwater. These factors will continue to be considered in relation to the findings of intrusive investigations and in the further development of the CSM.

- Based on published literature, the concentration of total dissolved solids (TDS) in groundwater in the upper aquifer in the study area is expected to range between 1,001 mg/L and 3,500 mg/L which falls within "Segment B" according to the SEPP (GoV). However, a wide range of TDS values have been recorded in the 12 Audit reports reviewed within 1km of the site, which show that the lower end of the range may indicate a potential for use of the groundwater for potable water supply purposes.
- From the review of available information including the Audit reports, regional groundwater quality (natural and ambient) may comprise of metals, petroleum hydrocarbons, dioxins, nitrates, sulphates and pesticides.

The information obtained from this review is considered to be critical to the development of a SAQP and the conceptual understanding of regional groundwater conditions across the site as there are a number of natural and anthropogenic influences (detailed above) that have the potential to influence groundwater flow direction and movement of contamination via groundwater.

9.2 Recommendations

Based on our review, AECOM makes the following recommendations:

- A SAQP should be developed in consideration of the natural and anthropogenic influences (identified during this Desktop Study) on regional groundwater conditions.
- A groundwater investigation should be conducted on a regional scale to gain a holistic understanding of groundwater flow and possible contaminant movement via groundwater. This investigation should be used to obtain site specific data to further inform and refine the PRCSM.

- AECOM is of the opinion that the best approach to characterising and assessing the baseline regional groundwater quality of the site is to adopt a grid based approach to obtaining groundwater data and avoid the point sources identified to date. This will allow assessment of contaminant concentrations in terms of consistency with background concentrations or influence/impact by known former and current industry practices, including known hotspots, reclaimed land and landfills.
- Sewers and drains should be investigated further if discrepancies in groundwater elevation are apparent in the vicinity of the sewer and drainage locations during any future sampling works.
- Further consideration of tidal influence on the regional groundwater quality including the impacts of regular flushing of water, salinity and migration pathways needs to be further assessed as part of future investigations. This will be best addressed by collection of site specific gauging and survey data.
- Melbourne Water drillers logs should be reviewed once proposed sampling locations are identified to obtain an appreciation of the expected stratigraphy in the immediate area of identified drilling locations. This will assist in understanding expected conditions which will be valuable during installation and well construction.

10.0 References

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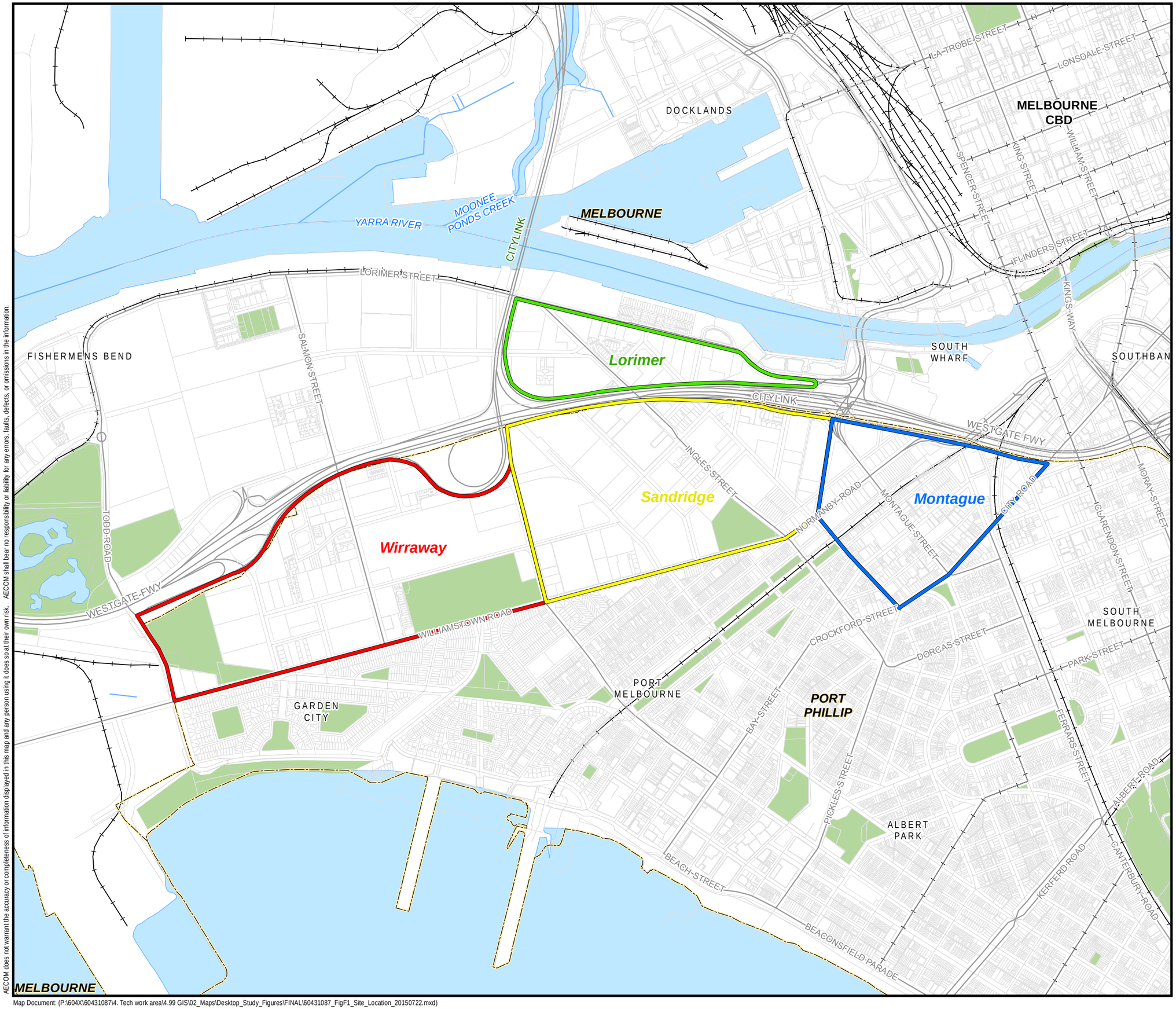
Figures



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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800
metres
1:15,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- LGA Boundary
- Major Roads
- Roads
- Rail
- Watercourse
- Waterbody
- Park/Reserve

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

SITE LOCATION

EPA

FBURA Baseline Groundwater Investigation

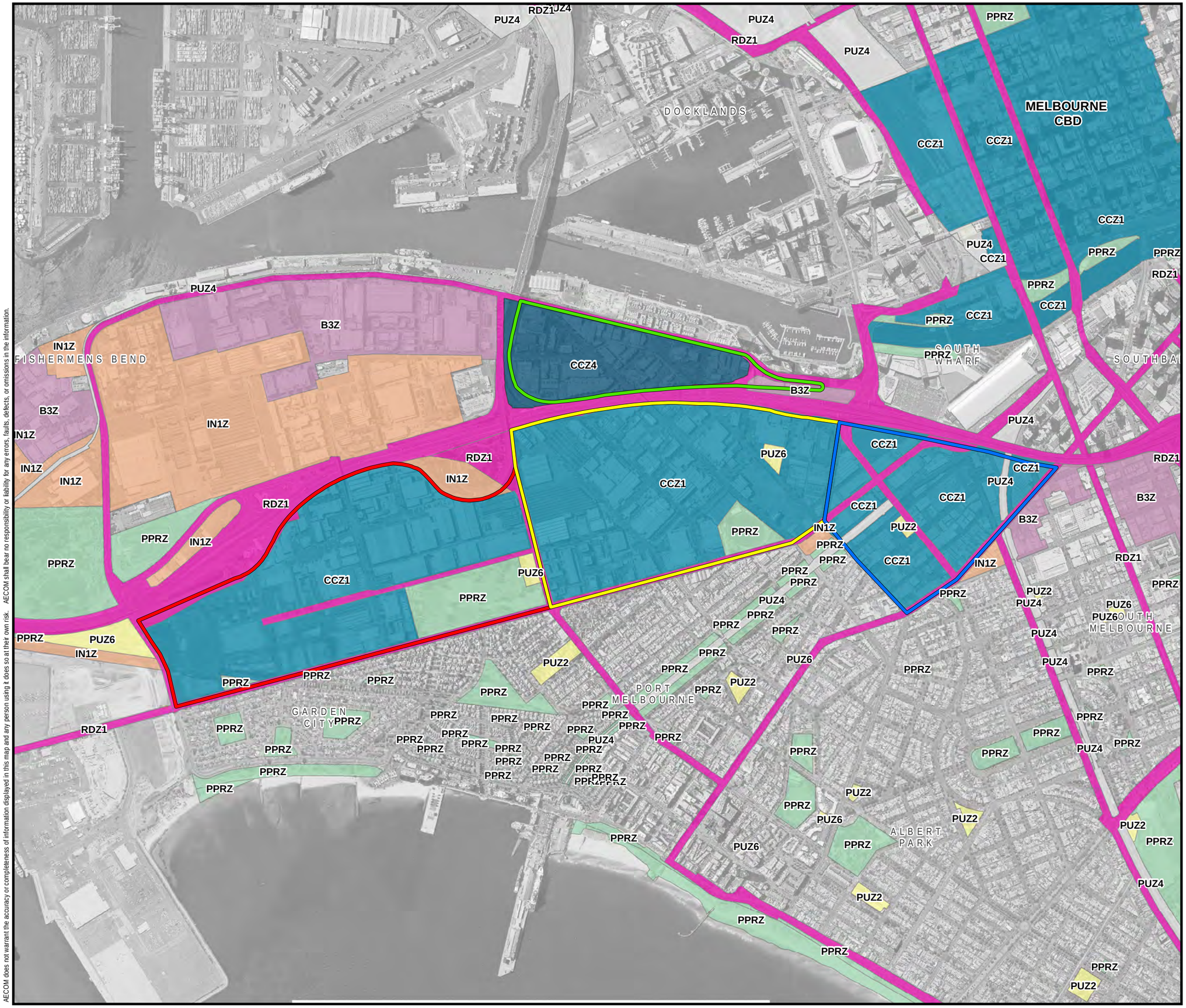
Fisherman's Bend, Port Melbourne, VIC

Figure

F1

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF1_Site_Location_20150722.mxd)

A3 size



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metres
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LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Planning Zone

- Business 3 Zone
- Industrial 1 Zone
- Capital City 1 Zone
- CCZ4
- Public Use 2 Zone - Education
- Public Use 4 Zone - Transport
- Public Use 6 Zone - Local Government
- Public Park and Recreation Zone
- Road Zone - Category 1

CURRENT PLANNING ZONES

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F2

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF2_Planning_Zones_20150722.mxd)

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800

metres

1:15,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Design Development Overlay
- Heritage Overlay
- Special Building Overlay

CURRENT PLANNING OVERLAYS - HERITAGE AND LAND MANAGEMENT

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F3a

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF3a_Planning_Overlays_Heritage_Land_Management_20150722.mxd)

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LAST MODIFIED DJB22 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800

metres

1:15,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Airport Environs Overlay
- City Link Project Overlay
- Development Contributions Plan Overlay
- Environmental Audit Overlay
- Melbourne Airport Environs Overlay
- Public Acquisitions Overlay
- Restructure Overlay
- Road Closure Overlay

CURRENT PLANNING OVERLAYS - OTHER

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F3b

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF3b_Planning_Overlays_Other_20150722.mxd)

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 50 100 200
metres

1:5,000 (when printed at A3)

LEGEND

- Petrol Stations
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

CURRENT LAND USES - LORIMER

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F4a

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF4_Current_Land_Use_20150722.mxd)

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DATUM GDA 1994, PROJECTION MGA ZONE 55

0 40 80 160

metres

1:4,000 (when printed at A3)

LEGEND

- Petrol Stations
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

CURRENT LAND USES - MONTAGUE

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F4b

Map Document: (P:\604X\6043108l\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF4_Current_Land_Use_20150722.mxd)

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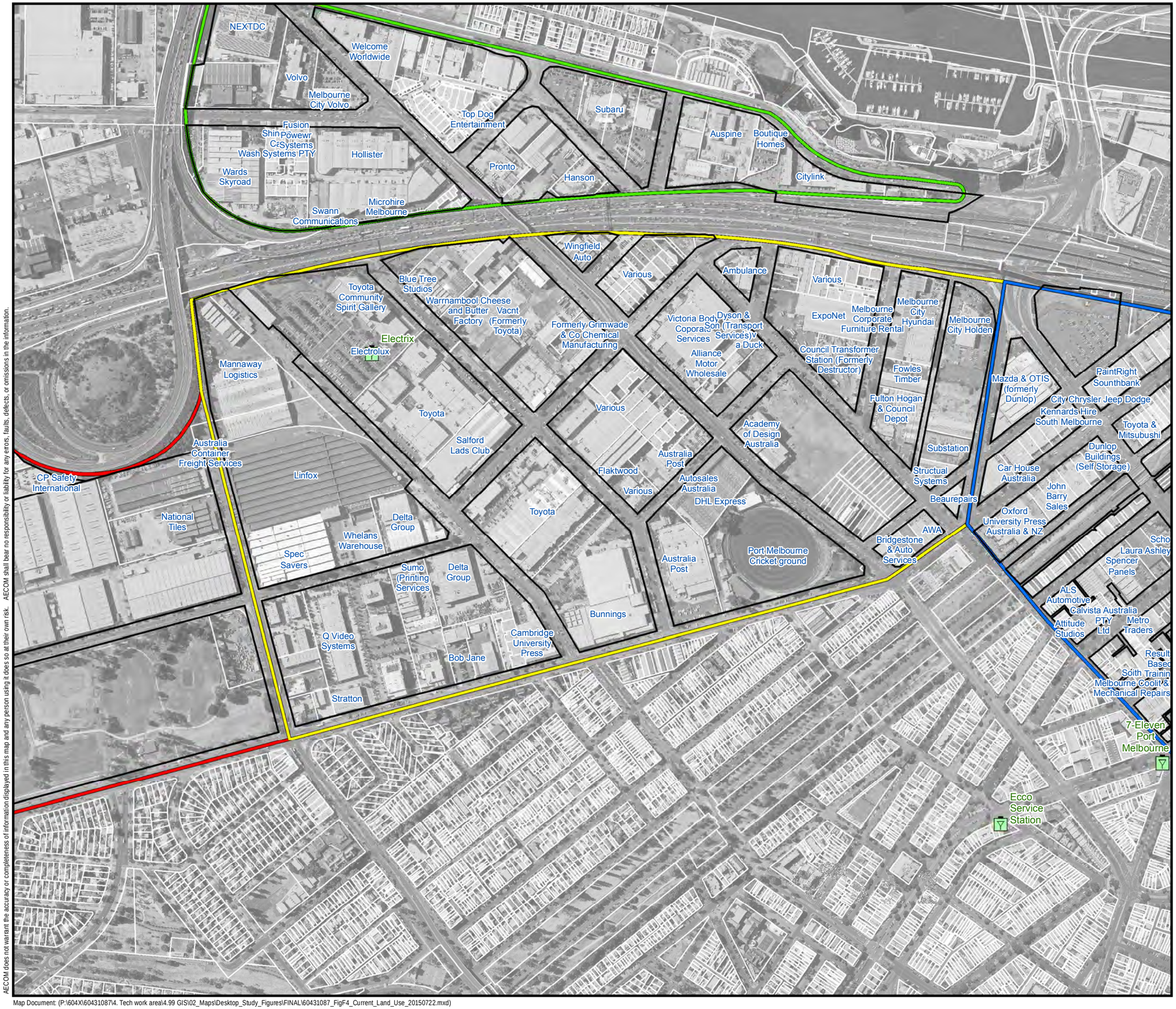

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

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metres
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LEGEND

- Petrol Stations
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

CURRENT LAND USES - SANDRIDGE

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F4c

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF4_Current_Land_Use_20150722.mxd)

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DATUM GDA 1994, PROJECTION MGA ZONE 55

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metres
1:7,000 (when printed at A3)

LEGEND

- Petrol Stations
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

CURRENT LAND USES - WIRRAWAY

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F4d

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF4_Current_Land_Use_20150722.mxd)

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 50 100 200
metres

1:5,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Former Quarry / Landfill

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

HISTORICAL LAND USES - LORIMER

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F5a

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF5_Historical_Land_Use_20150722.mxd)

A3 size

Unknown (possibly part of council depot)

May have formed part of Dunlop Rubber operations

Unknown

Dunlop Rubber

Tram depot, residential, unknown if commerical and industrial sites formerly existed

Laconia Wollen mills (building still remains)

Unknown

Unknown

Unknown

Kellow-Faulkner Pty Ltd (car Blacksmith, fitting and machine shop, servicing) Steel fabrication, Engineering workshop, dry cleaning equipment manufacturers

Dunlop and Dunlop Automotive (storage), Timber yard (not clear if for processing or storage)

Dunlop Rubber

Possible former service station (west end), McPherson's machinery

Melbourne Theatre Co. (1970 to late 2000s)

An historic building and possible former service station

Dunlop Rubber

North side - railway easement. South side generally unknown. Chrome electroplating plant formerly located at 80 Montague Street

Unknown. In particular former use of now AWA site (with observed vent pipe) is unknown

Possible former service station, other former uses unknown

School, residential, unknown if commerical and industrial sites formerly existed

Hotels, Residential, unknown if commerical and industrial sites formerly existed

Residential, unknown if commerical and industrial sites formerly existed

Residential, unknown if commerical and industrial sites formerly existed

PROJECT ID 60431087
CREATED BY DJB
LAST MODIFIED DJB24 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 40 80 160
metres
1:4,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Former Quarry / Landfill

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

HISTORICAL LAND USES - MONTAGUE

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F5b

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF5_Historical_Land_Use_20150722.mxd)

A3 size

PROJECT ID	60431087
CREATED BY	DJB
LAST MODIFIED	DJB24 JUL 2015

AECOM
www.aecom.com

N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 60 120 240

metres

1:6,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Former Quarry / Landfill

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

HISTORICAL LAND USES - SANDRIDGE

EPA

FBURA Desktop Study

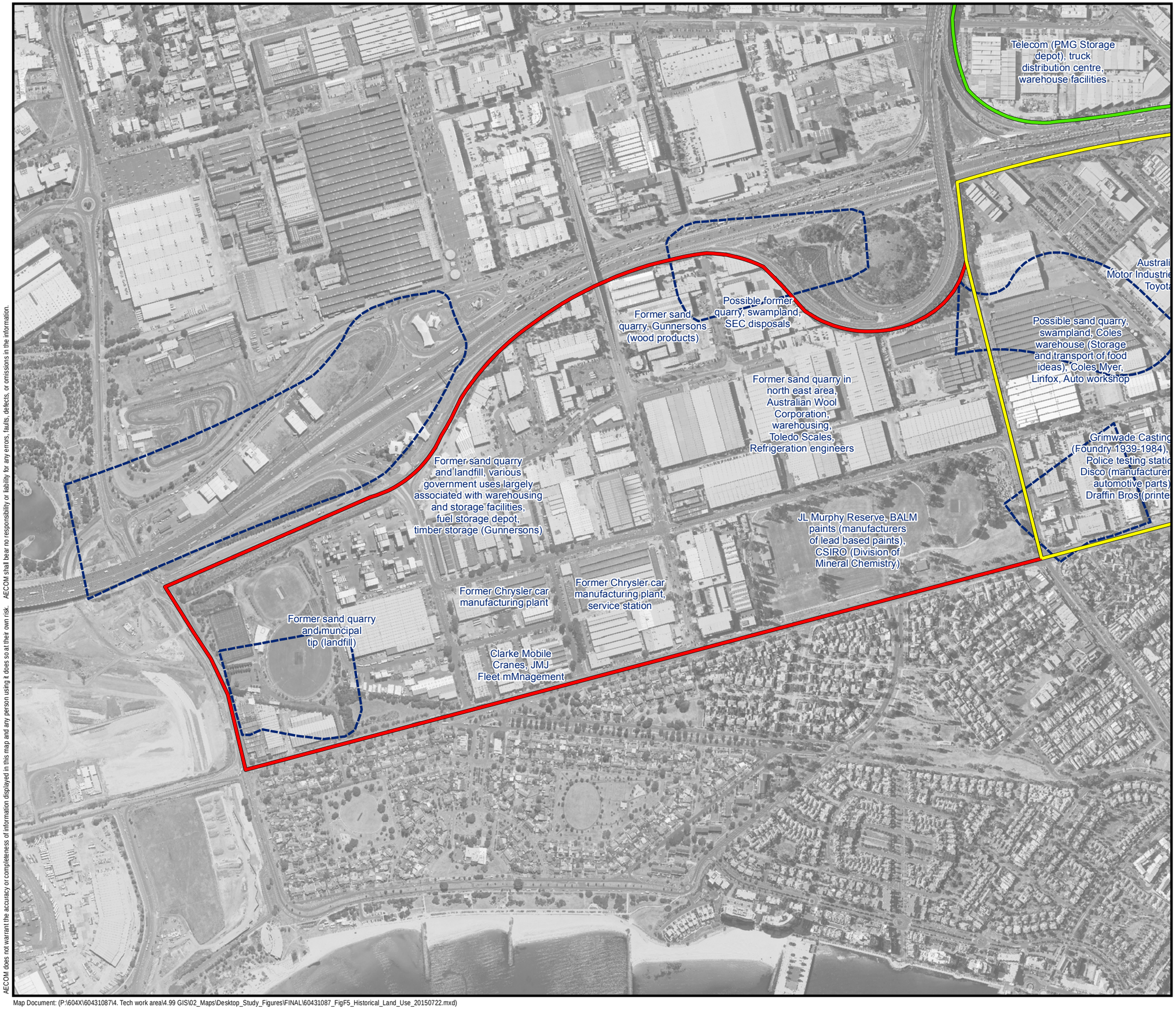
Fisherman's Bend, Port Melbourne, VIC

Figure

F5c

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF5_Historical_Land_Use_20150722.mxd)

A3 size



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CREATED BY DJB
LAST MODIFIED DJB24 JUL 2015

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 70 140 280
metres
1:7,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Former Quarry / Landfill

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

HISTORICAL LAND USES - WIRRAWAY

EPA

FBURA Desktop Study

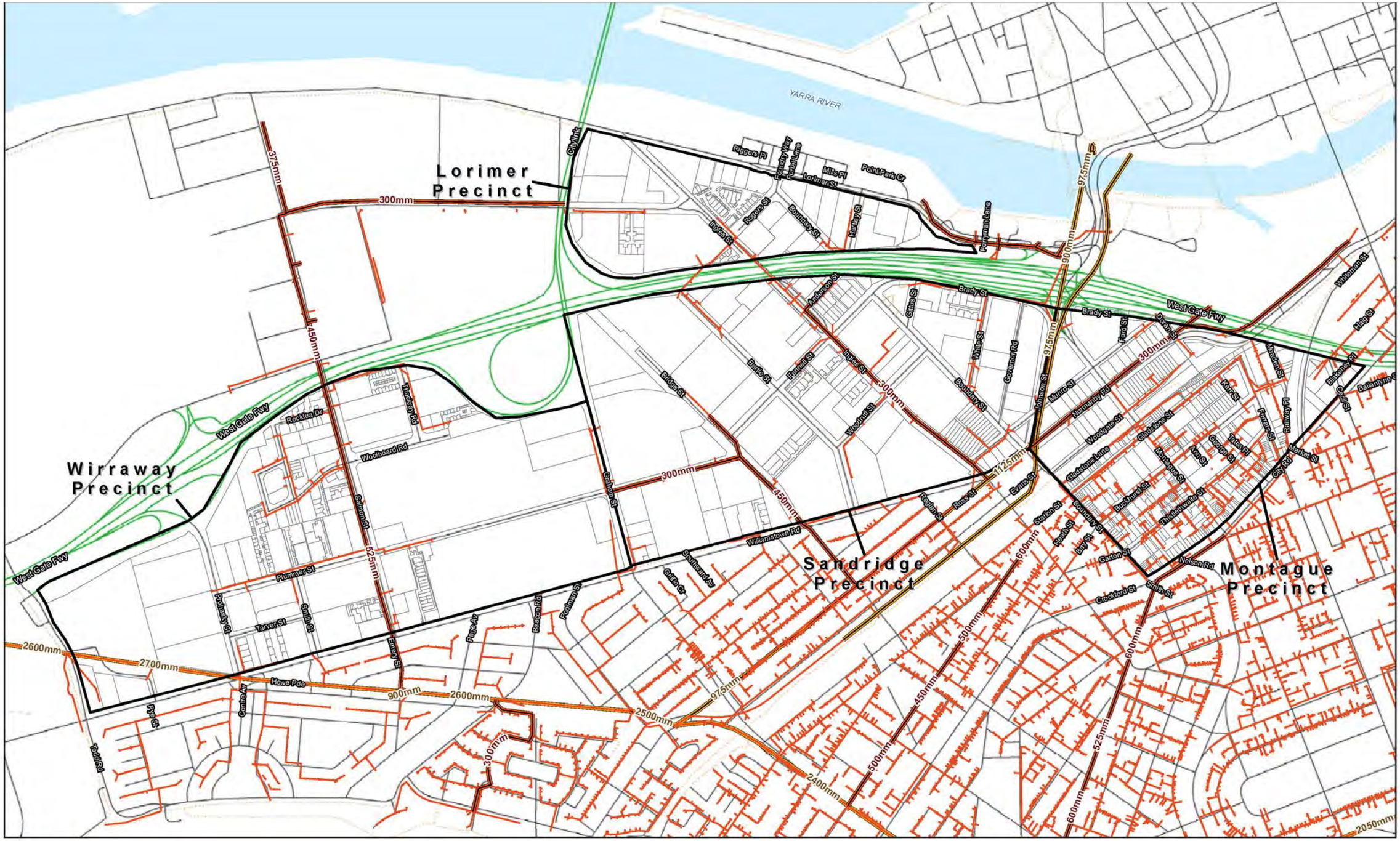
Fisherman's Bend, Port Melbourne, VIC

Figure

F5d

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF5_Historical_Land_Use_20150722.mxd)

A3 size



PROJECT ID: 60431087
CREATED BY: DJB
LAST MODIFIED: DJB 22 JUL 2015

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0 400m

LEGEND

- Precincts
- South East Water Sewer Main
- Melbourne Water Sewer Main
- South East Water Local Sewer Network

Data sources:
Figure from
Infrastructure-Assessment-GHD_December-2012

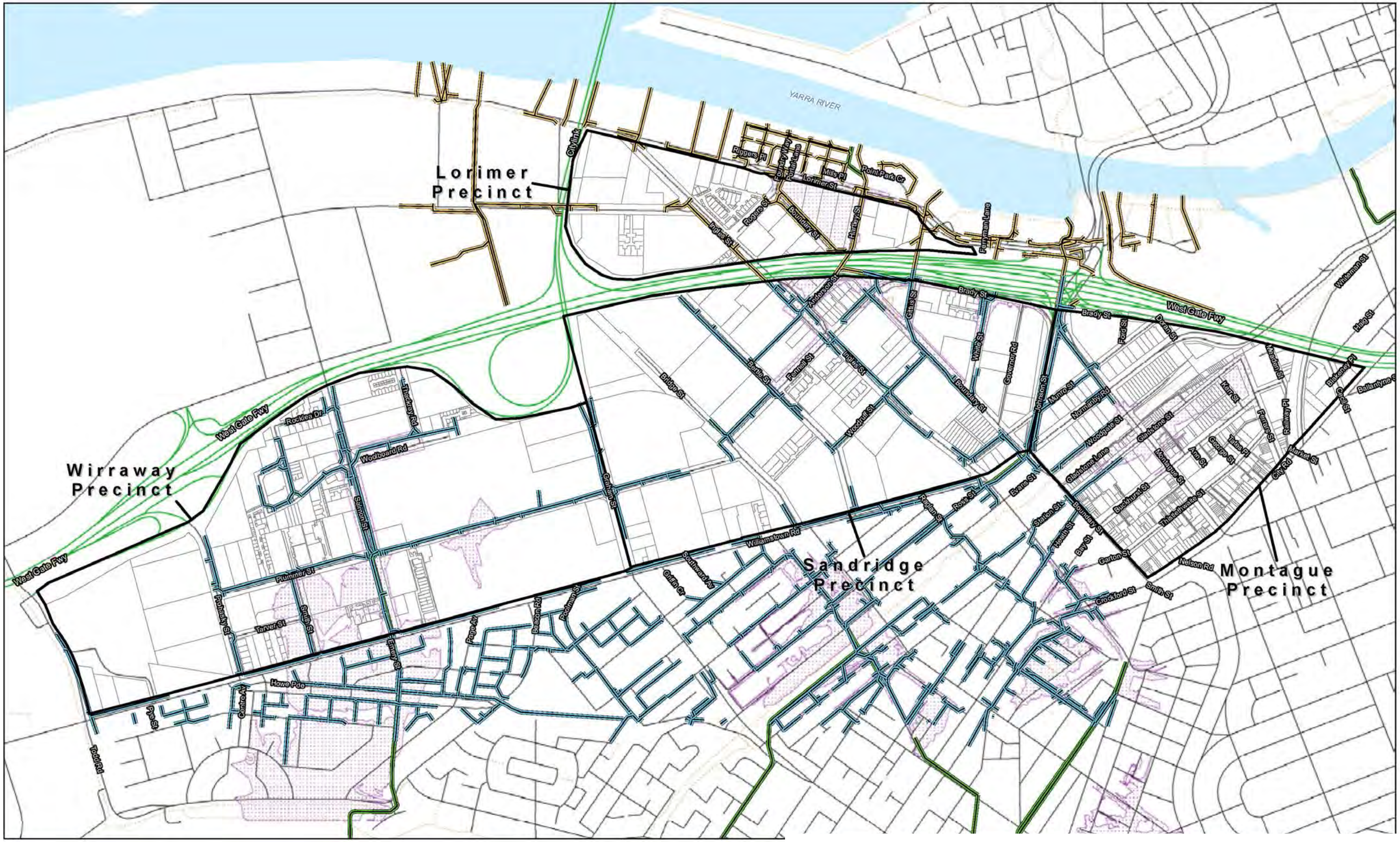
CURRENT SEWER INFRASTRUCTURE

EPA
FBURA Desktop Study
Fisherman's Bend,
Port Melbourne, VIC

Figure
F6

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF6_Sewer_Infrastructure_20150722.cdr)

A3 Size



PROJECT ID:	60431087
CREATED BY:	DJB
LAST MODIFIED:	DJB 22 JUL 2015

AECOM
www.aecom.com

0 400m

LEGEND

- Precincts
- Melbourne Water Drainage Assets
- City of Port Phillip Drainage Assets
- City Of Melbourne Drainage Assets

Planning overlay

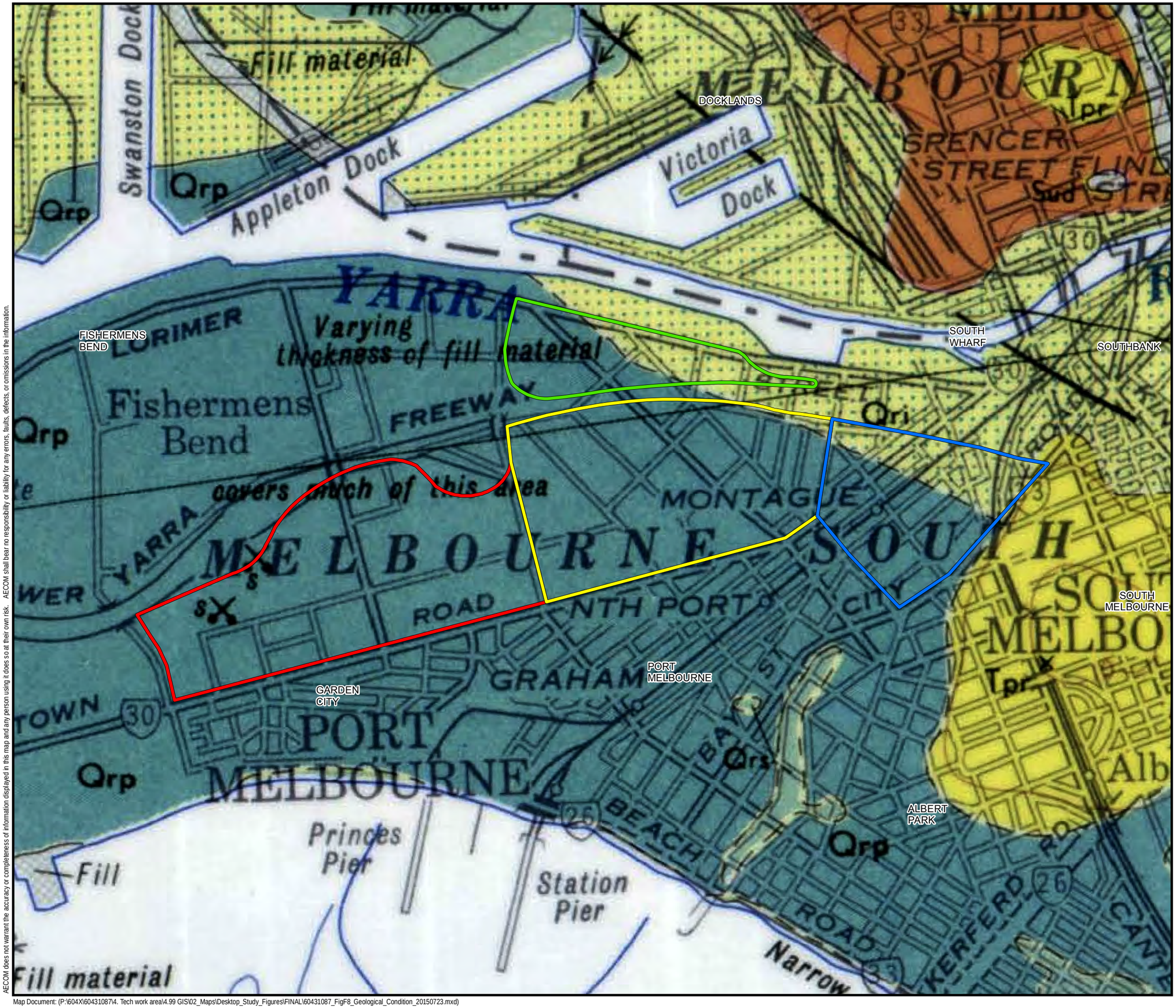
- Special Building

Data sources:
Figure from
Infrastructure-Assessment-GHD_December-2012

CURRENT STORMWATER INFRASTRUCTURE

EPA
FBURA Desktop Study
Fisherman's Bend,
Port Melbourne, VIC

Figure
F7



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CREATED BY DJB
LAST MODIFIED DJB24 JUL 2015

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800
metres

1:15,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

NEWER VOLCANICS

Qrp *Raised beach ridges: bedded and cross bedded well sorted sand, shelly sand, minor silty or clayey sand*

Qrs *Coastal swamp deposits: fine sand, silt, silty clay often with shell beds*

Qri *Silt, silty clay, sandy clay, dark grey, minor peat and shell beds*

BRIGHTON GROUP

Tpr *Sand, red-brown, yellow, and white, well bedded to cross bedded; silty sand, minor gravel, sometimes includes clay balls*

Data sources:
Base Data: (c) 20XX (data source)
(additional data)

GEOLOGICAL CONDITIONS

EPA

FBURA Desktop Study

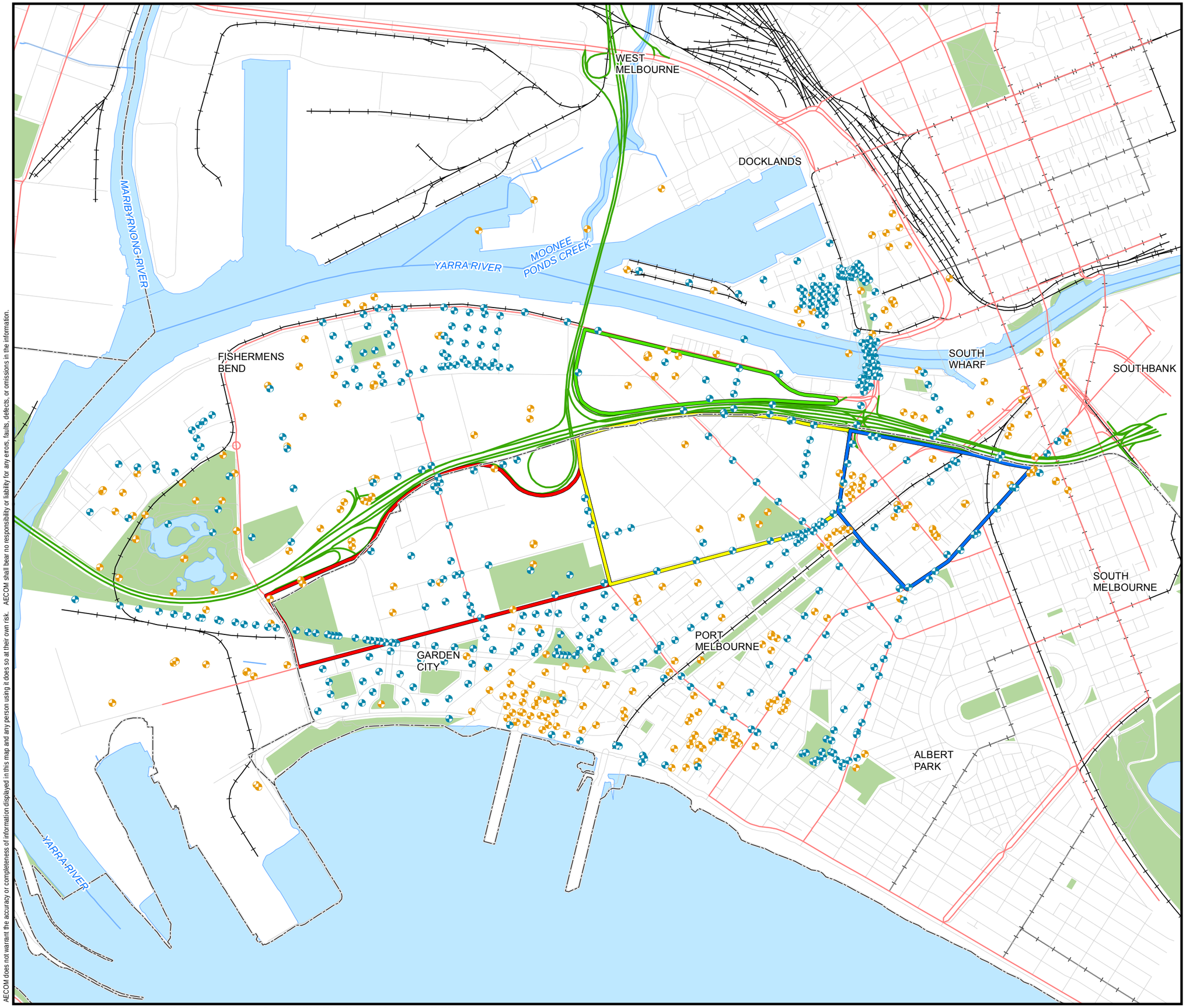
Fisherman's Bend, Port Melbourne, VIC

Figure

F8

Map Document: (P:\604X\6043108?\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF8_Geological_Condition_20150723.mxd)

A3 size



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LAST MODIFIED DJB23 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 237.5 475 950
metres

1:18,000 (when printed at A3)

LEGEND

- Melbourne Water Groundwater Bore Location
- VVG Groundwater Bore Location
- LGA Boundary
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 20XX (data source)
(additional data)

VISUALISING VICTORIA'S GROUNDWATER AND MELBOURNE WATER GROUNDWATER BORES WITHIN 1KM OF THE SITE

EPA

FBURA Bore Census Survey

Fisherman's Bend, Port Melbourne, VIC

Figure

F9

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF9_Regional_Bore_Locations_20150723.mxd)

A3 size

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CREATED BY	DJB
LAST MODIFIED	DJB 23 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 40 80 160

metres

1:4,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1931

EPA

FBURA Desktop Study

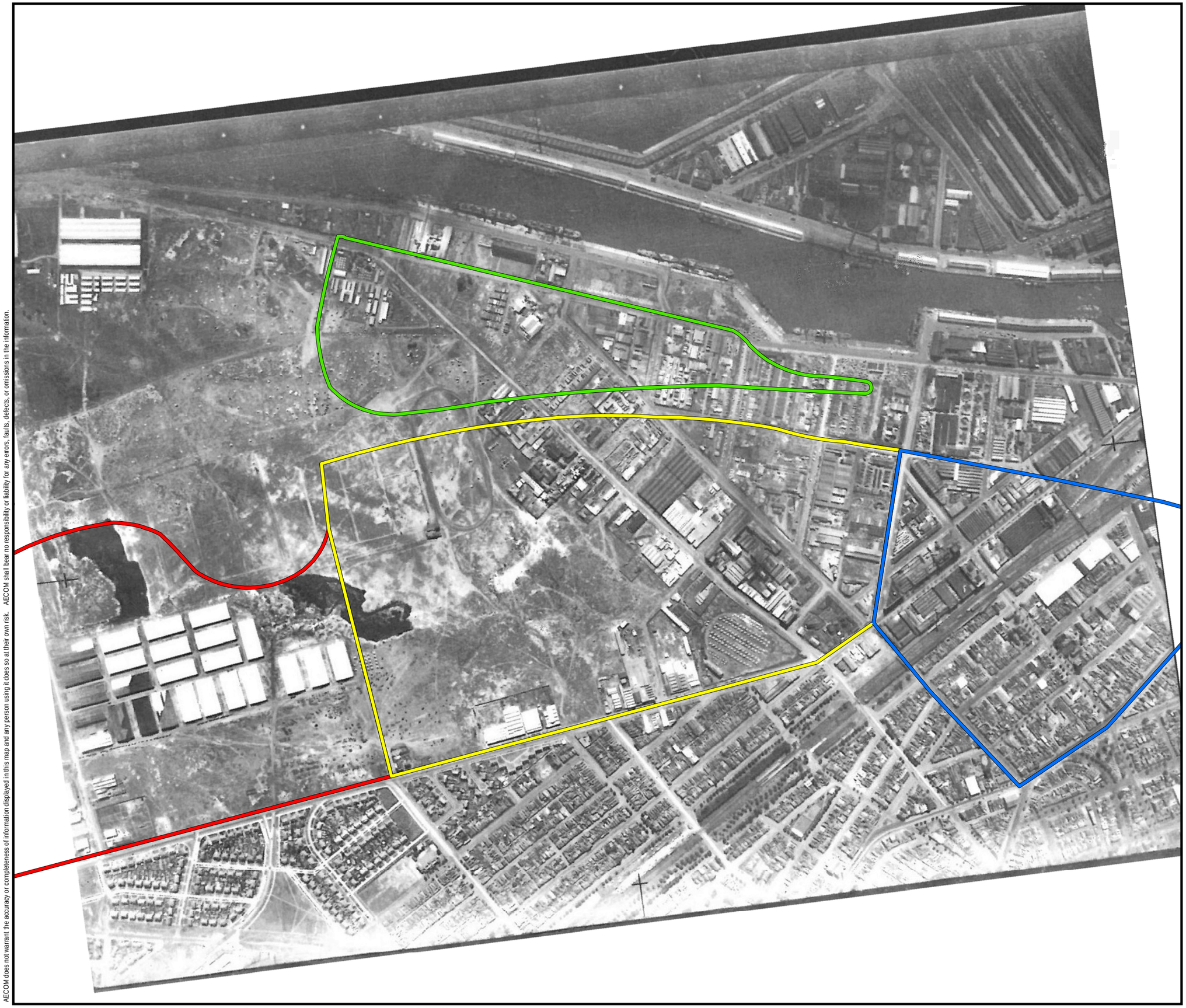
Fisherman's Bend, Port Melbourne, VIC

Figure

F10

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF10_Historical_Aerial_1931_20150723.mxd)



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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 90 180 360
metres

1:8,500 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1942

EPA

FBURA Desktop Study

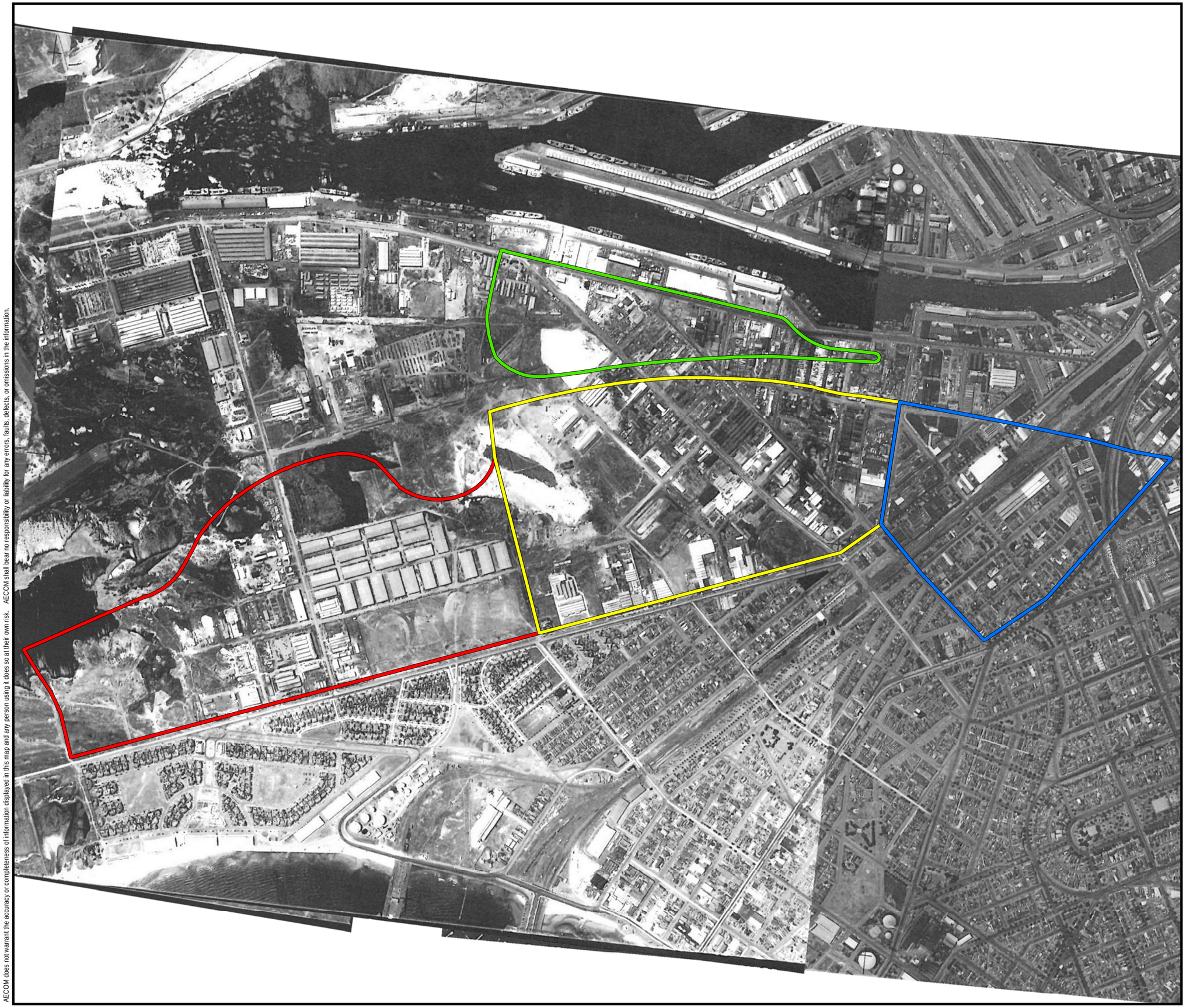
Fisherman's Bend, Port Melbourne, VIC

Figure

F11

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF11_Historical_Aerial_1942_2015023.mxd)



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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 125 250 500
metres

1:12,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1951

EPA

FBURA Desktop Study

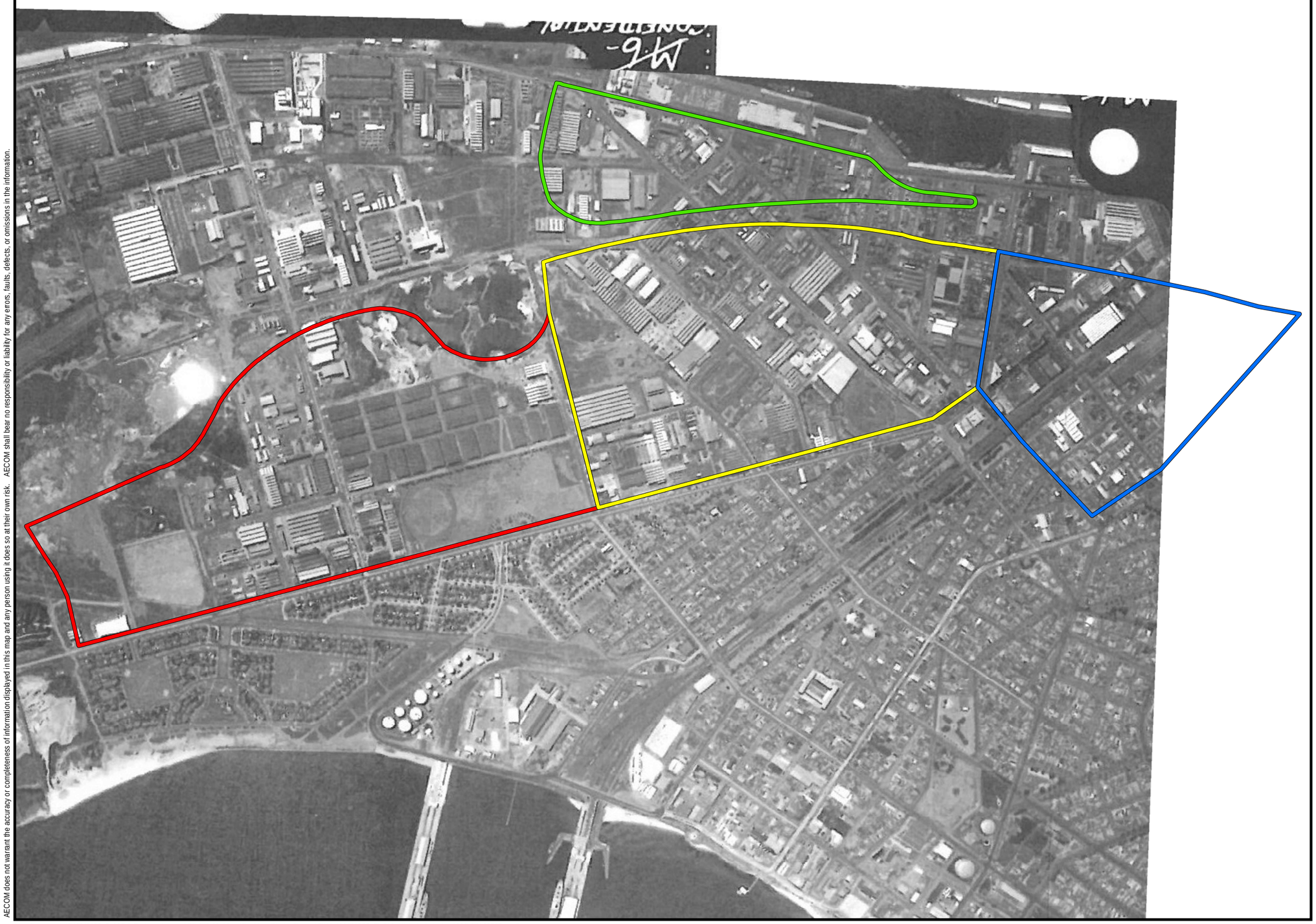
Fisherman's Bend, Port Melbourne, VIC

Figure

F12

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF12_Historical_Aerial_1951_20150723.mxd)



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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 125 250 500
metres

1:12,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1962

EPA

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Fisherman's Bend, Port Melbourne, VIC

Figure

F13

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF13_Historical_Aerial_1962_20150723.mxd)

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 115 230 460
metres

1:11,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1970

EPA

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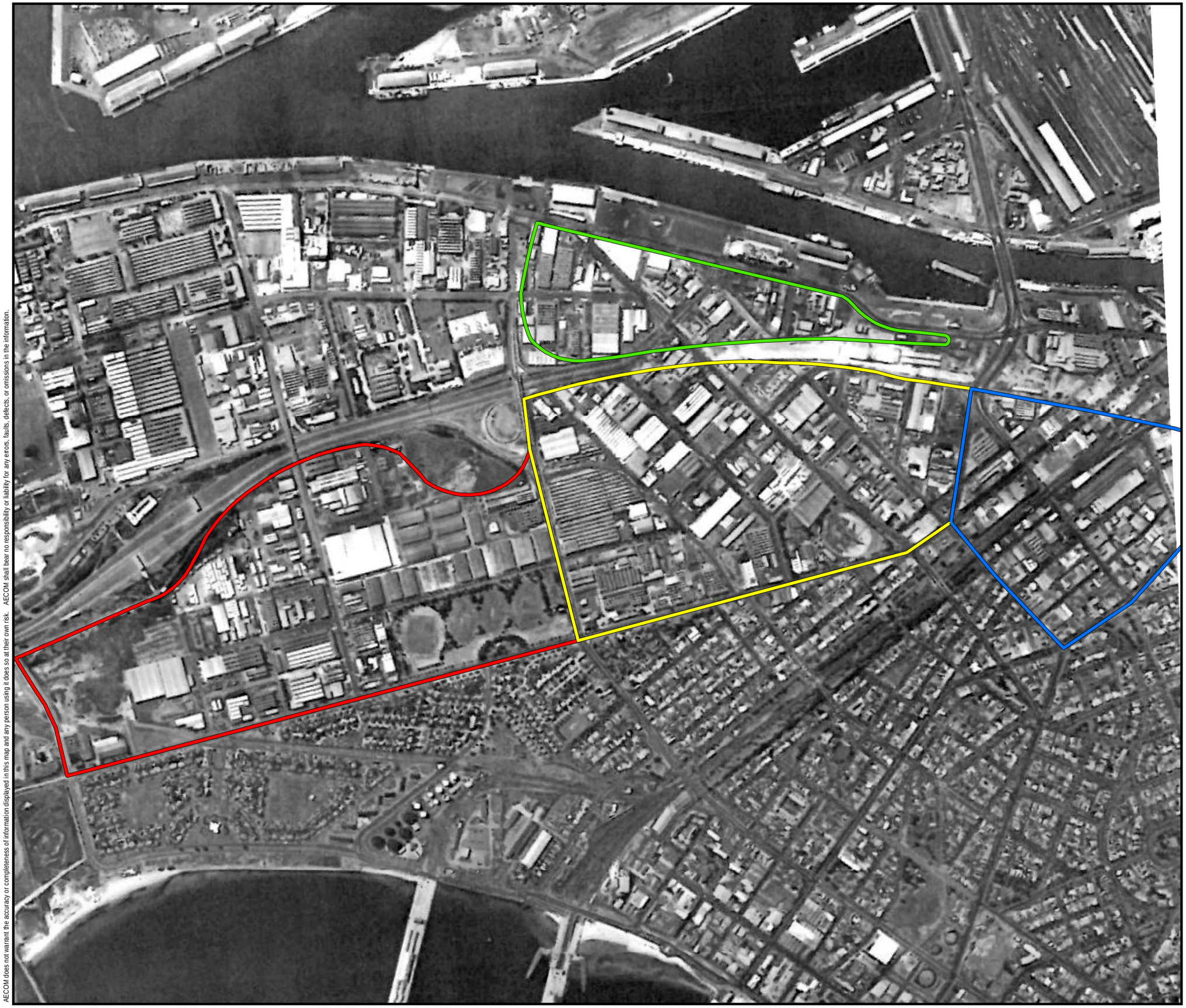
Fisherman's Bend, Port Melbourne, VIC

Figure

F14

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF14_Historical_Aerial_1970_20150723.mxd)



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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 115 230 460
metres

1:11,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1982

EPA

FBURA Desktop Study

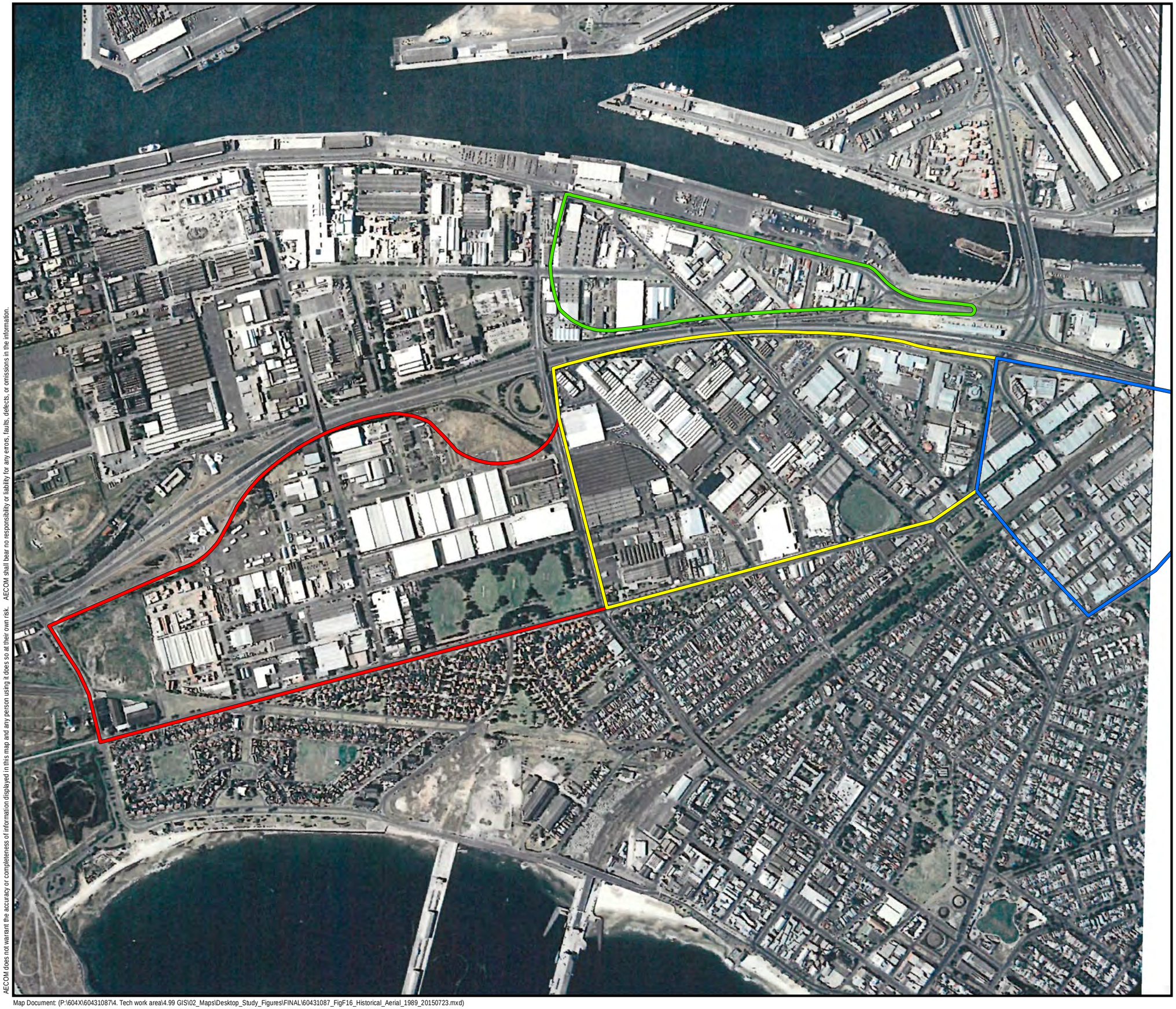
Fisherman's Bend, Port Melbourne, VIC

Figure

F15

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF15_Historical_Aerial_1982_20150723.mxd)



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LAST MODIFIED DJB 23 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 115 230 460

metres

1:11,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Photographs from Land Victoria Aerial Photography storage facility

HISTORICAL AERIAL PHOTOGRAPHY - 1989

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F16

Map Document: (P:\604X\6043108714. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF16_Historical_Aerial_1989_20150723.mxd)

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 50 100 200
metres
1:5,000 (when printed at A3)

LEGEND

Historic Utilities

- 24" Shell Fuel Pipeline
- Water
- Gas
- Rail
- Swerage/ Stormwater
- Hobson's Bay Main
- Transmission Line
- 1895
- 1933
- 1954
- 1968
- Historical Aerodrome
- Historical Quarry / Landfill
- Wetlands (1788)
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

KEY HISTORICAL FEATURES - LORIMER

EPA

FBURA Desktop Study

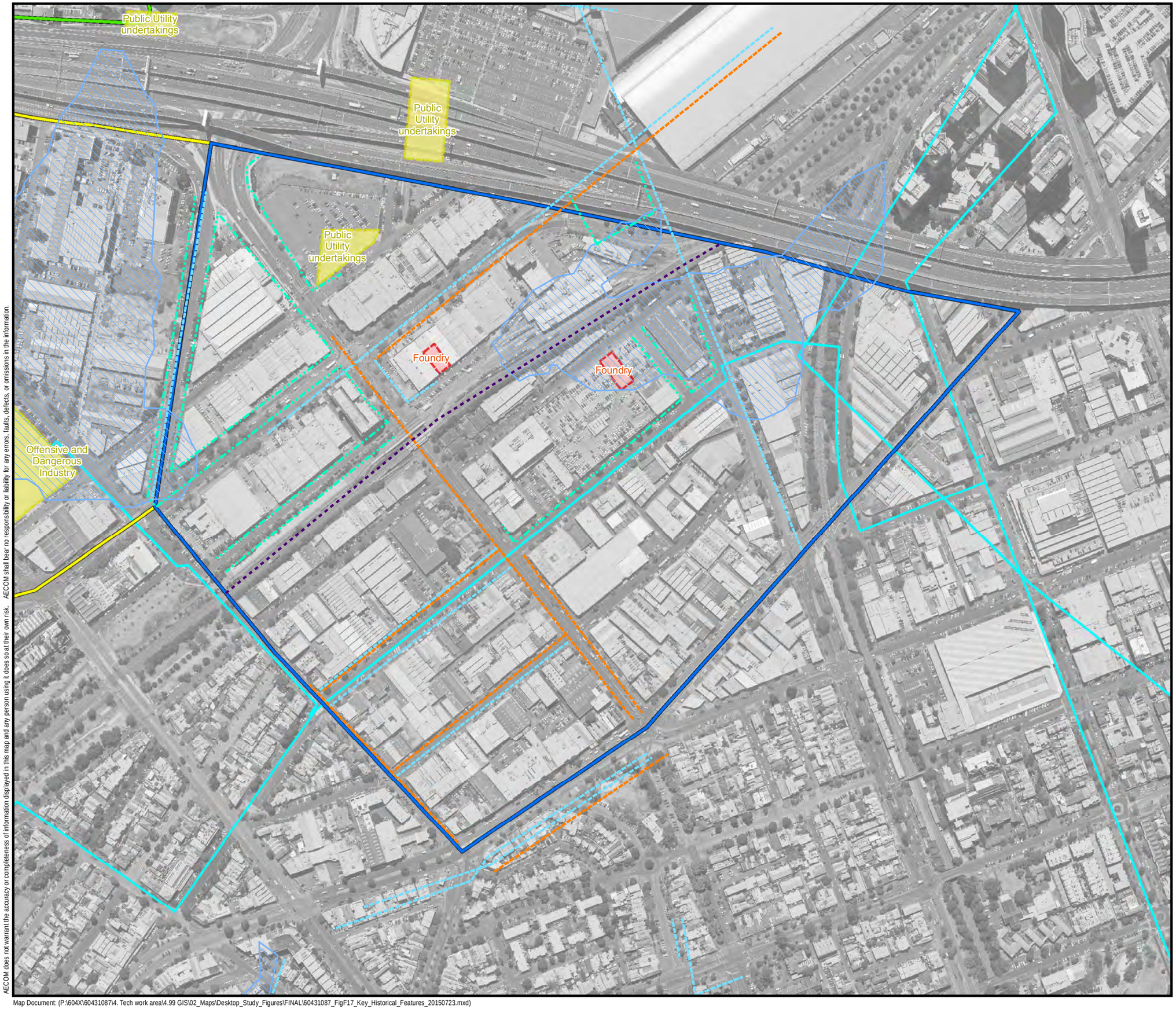
Fisherman's Bend, Port Melbourne, VIC

Figure

F17a

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF17_Key_Historical_Features_20150723.mxd)



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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 40 80 160
metres
1:4,000 (when printed at A3)

LEGEND

Historic Utilities

- 24" Shell Fuel Pipeline
- Water
- Gas
- Rail
- Swerage/ Stormwater
- Hobson's Bay Main
- Transmission Line
- 1895
- 1933
- 1954
- 1968
- Historical Aerodrome
- Historical Quarry / Landfill
- Wetlands (1788)
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

KEY HISTORICAL FEATURES - MONTAGUE

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F17b

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF17_Key_Historical_Features_20150723.mxd)

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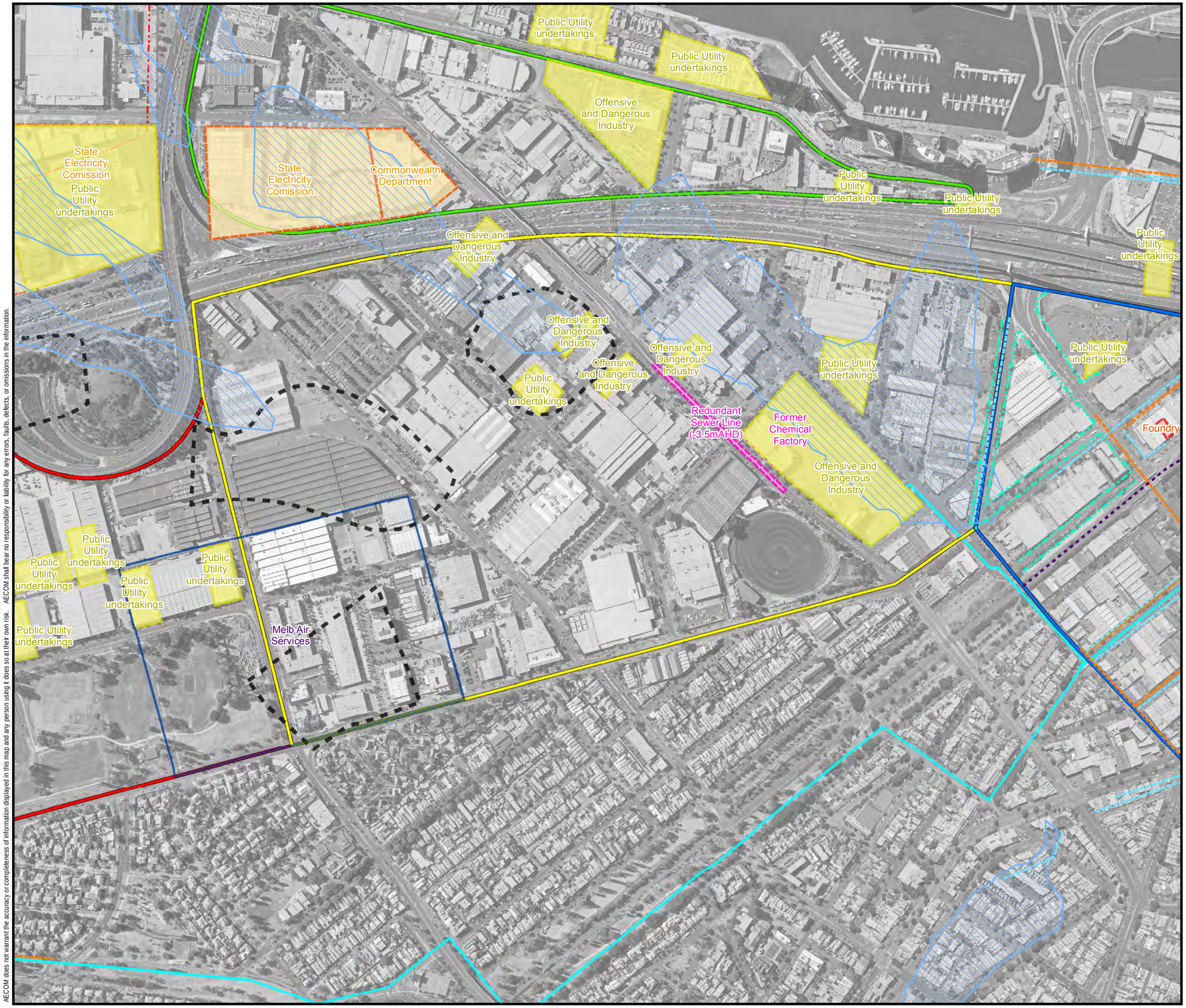

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LAST MODIFIED	DJB24 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 60 120 240

metres

1:6,000 (when printed at A3)

LEGEND

Historic Utilities

- 24" Shell Fuel Pipeline
- Water
- Gas
- Rail
- Swerage/ Stormwater
- Hobson's Bay Main
- Transmission Line
- 1895
- 1933
- 1954
- 1968
- Historical Aerodrome
- Historical Quarry / Landfill
- Wetlands (1788)
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

KEY HISTORICAL FEATURES - SANDRIDGE

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F17c

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF17_Key_Historical_Features_20150723.mxd)

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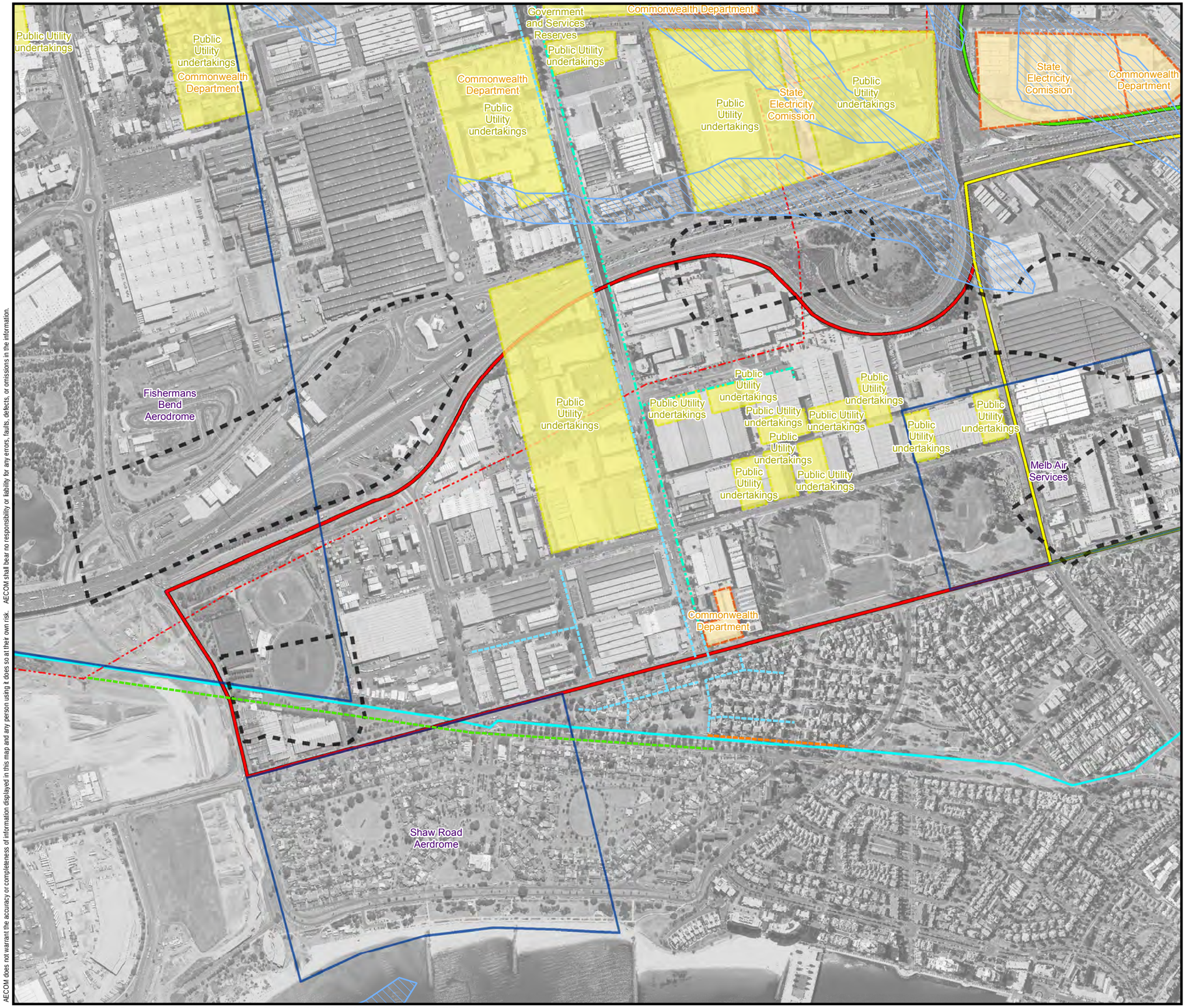

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 70 140 280
metres
1:7,000 (when printed at A3)

LEGEND

Historic Utilities

- 24" Shell Fuel Pipeline
- Water
- Gas
- Rail
- Swerage/ Stormwater
- Hobson's Bay Main
- Transmission Line
- 1895
- 1933
- 1954
- 1968
- Historical Aerodrome
- Historical Quarry / Landfill
- Wetlands (1788)
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

KEY HISTORICAL FEATURES - WIRRAWAY

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F17d

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF17_Key_Historical_Features_20150723.mxd)

A3 size

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LAST MODIFIED DJB23 JUL 2015

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 325 650 1,300
metres

1:25,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

CITY OF MELBOURNE MAP 1864

EPA

FBURA Desktop Study

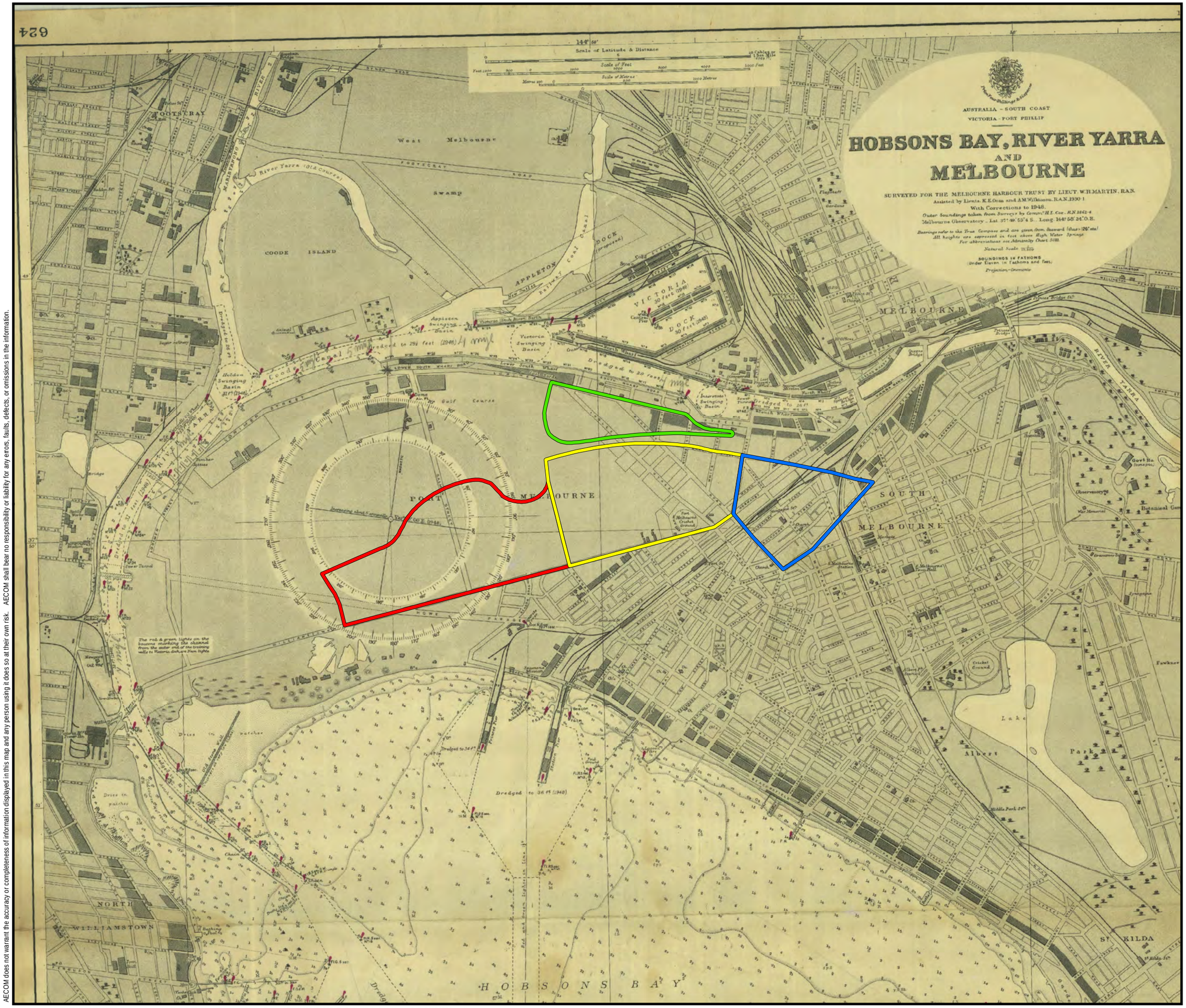
Fisherman's Bend, Port Melbourne, VIC

Figure

F18a

A3 size

Map Document: (P:\604X\604310871\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF18a_Historical_Map_1864_20150723.mxd)



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CREATED BY	DJB
LAST MODIFIED	DJB23 JUL 2015

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 275 550 1,100

metres

1:25,000 (when printed at A3)

LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

CITY OF MELBOURNE MAP 1948

EPA

FBURA Desktop Study

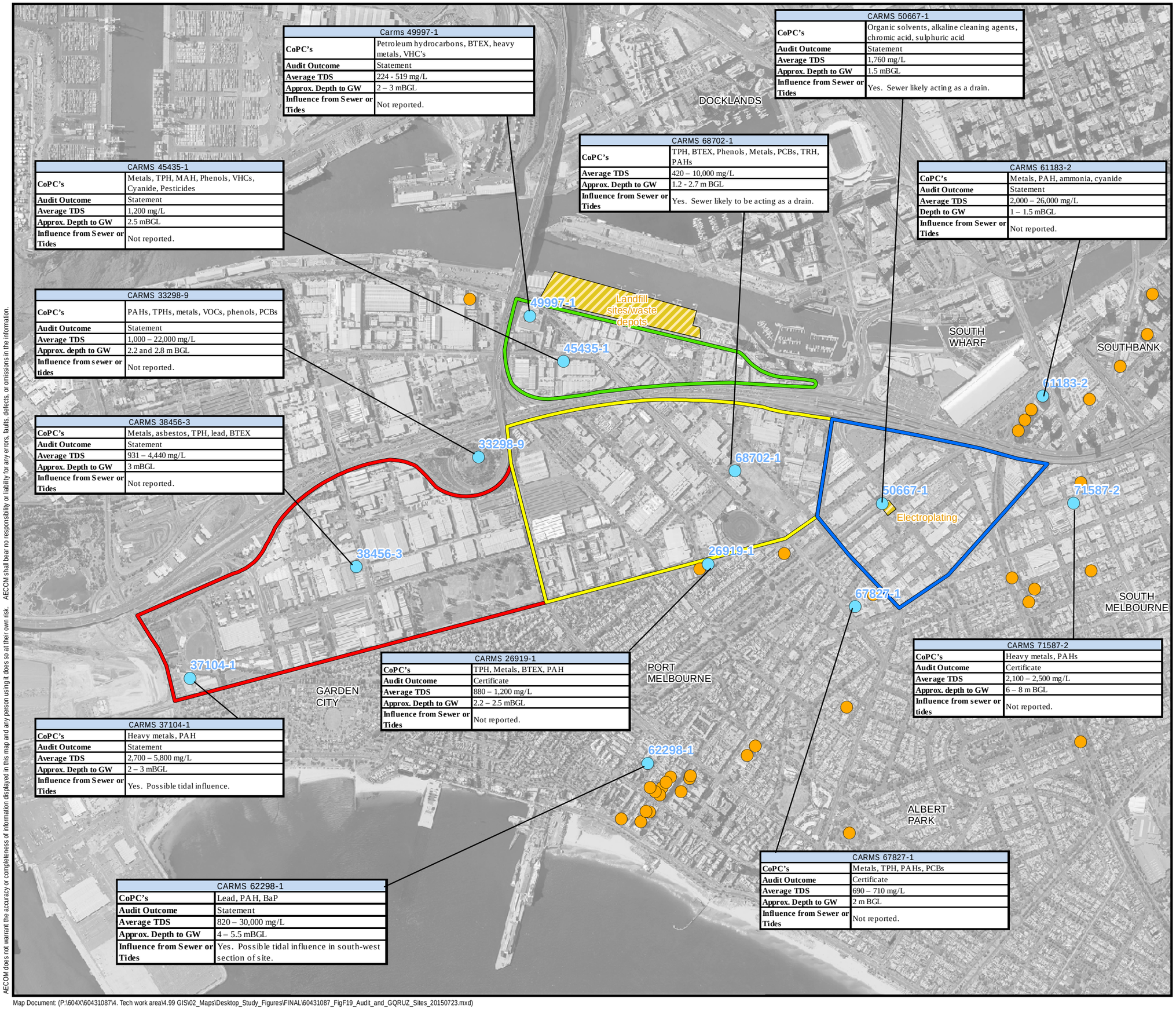
Fisherman's Bend, Port Melbourne, VIC

Figure

F18b

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF18b_Historical_Map_1948_20150723.mxd)

A3 size



Carms 49997-1	
CoPC's	Petroleum hydrocarbons, BTEX, heavy metals, VHC's
Audit Outcome	Statement
Average TDS	224 - 519 mg/L
Approx. Depth to GW	2 – 3 mBGL
Influence from Sewer or Tides	Not reported.

CARMS 50667-1	
CoPC's	Organic solvents, alkaline cleaning agents, chromic acid, sulphuric acid
Audit Outcome	Statement
Average TDS	1,760 mg/L
Approx. Depth to GW	1.5 mBGL
Influence from Sewer or Tides	Yes. Sewer likely acting as a drain.

CARMS 68702-1	
CoPC's	TPH, BTEX, Phenols, Metals, PCBs, TRH, PAHs
Average TDS	420 – 10,000 mg/L
Approx. Depth to GW	1.2 - 2.7 m BGL
Influence from Sewer or Tides	Yes. Sewer likely to be acting as a drain.

CARMS 61183-2	
CoPC's	Metals, PAH, ammonia, cyanide
Audit Outcome	Statement
Average TDS	2,000 – 26,000 mg/L
Depth to GW	1 – 1.5 mBGL
Influence from Sewer or Tides	Not reported.

CARMS 45435-1	
CoPC's	Metals, TPH, MAH, Phenols, VHCs, Cyanide, Pesticides
Audit Outcome	Statement
Average TDS	1,200 mg/L
Approx. Depth to GW	2.5 mBGL
Influence from Sewer or Tides	Not reported.

CARMS 33298-9	
CoPC's	PAHs, TPHs, metals, VOCs, phenols, PCBs
Audit Outcome	Statement
Average TDS	1,000 – 22,000 mg/L
Approx. depth to GW	2.2 and 2.8 m BGL
Influence from sewer or tides	Not reported.

CARMS 38456-3	
CoPC's	Metals, asbestos, TPH, lead, BTEX
Audit Outcome	Statement
Average TDS	931 – 4,440 mg/L
Approx. Depth to GW	3 mBGL
Influence from Sewer or Tides	Not reported.

CARMS 37104-1	
CoPC's	Heavy metals, PAH
Audit Outcome	Statement
Average TDS	2,700 – 5,800 mg/L
Approx. Depth to GW	2 – 3 mBGL
Influence from Sewer or Tides	Yes. Possible tidal influence.

CARMS 26919-1	
CoPC's	TPH, Metals, BTEX, PAH
Audit Outcome	Certificate
Average TDS	880 – 1,200 mg/L
Approx. Depth to GW	2.2 – 2.5 mBGL
Influence from Sewer or Tides	Not reported.

CARMS 62298-1	
CoPC's	Lead, PAH, BaP
Audit Outcome	Statement
Average TDS	820 – 30,000 mg/L
Approx. Depth to GW	4 – 5.5 mBGL
Influence from Sewer or Tides	Yes. Possible tidal influence in south-west section of site.

CARMS 67827-1	
CoPC's	Metals, TPH, PAHs, PCBs
Audit Outcome	Certificate
Average TDS	690 – 710 mg/L
Approx. Depth to GW	2 m BGL
Influence from Sewer or Tides	Not reported.

CARMS 71587-2	
CoPC's	Heavy metals, PAHs
Audit Outcome	Certificate
Average TDS	2,100 – 2,500 mg/L
Approx. depth to GW	6 – 8 m BGL
Influence from sewer or tides	Not reported.

PROJECT ID 60431087
CREATED BY DJB
LAST MODIFIED DJB24 JUL 2015

AECOM
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DATUM GDA 1994, PROJECTION MGA ZONE 55

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metres
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LEGEND

- EPA Audit Sites
- EPA Audit Sites - Reviewed
- GQRUZ Sites
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 20XX (data source)
(additional data)

LOCATION OF AUDIT SITES AND EXISTING GROUNDWATER QUALITY RESTRICTED USE ZONES (GQRUZ)

EPA

FBURA Desktop Study

Fisherman's Bend, Port Melbourne, VIC

Figure

F19

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF19_Audit_and_GQRUZ_Sites_20150723.mxd)

A3 size

Appendix A

Historical and Current Land Uses (Golder, 2012)

FISHERMANS BEND CONTAMINATION STUDY
Table B1 - Summary of Former and Current Site Uses
Place Victoria
127613038

Precinct	Approximate Area (ha)	Precent wide historical use and / or actives	Sub-precinct Historical Use and / or activities	Sub-precinct Current Use and / or activities	Development Status (within the past 20 years)	Environmental Audit Status	Observations made during the drive-bys	Known former and current industries present in sub-precinct (refer to list at the base of this table for associated potential contaminants of interest)													
								Fill	General Industrial	Automotive Industries	Fuel Merchant (bulk storage of fuel)	Timber works	Rubber Processing	Woollen Mill	Animal and animal product processing	Former Landfill / Sand Quarry	Concrete production	Paint manufacturing	Print works	Engineering	Drycleaning
Lorimer Street Precinct:																					
L1	4.0	The portion of the Study Area within South Melbourne (the Lorimer Street Precinct and part of the Montague Street Precinct) was established as an industrial area from the mid to late 1800s, particularly for use for animal and animal product processing including abattoirs, boiling down works, bone mills, manure and glue factories, soap and candle makers.	Service station, Charlesworth Rubber, cigarette manufacture, printers	Various commercial and industrial uses including a Volvo car sales and dealership. One area is undergoing redevelopment and one lot is vacant.	All recently redeveloped or currently undergoing redevelopment with exception of one strip of land adjacent to the Bolte Bridge overpass.	One Audit completed (refer to Table B2, Appendix B2)	Bowser noted at Volvo site indicating presence of UST(s)	✓	✓	✓	✓		✓							✓		
L2	6.7		Telecom (PMG storage depot), truck distribution centre, warehouse facilities.	Various commercial and industrial uses including Geotechnical Engineering (engineering firm).	All recently redeveloped	One Audit completed (refer to Table B2, Appendix B2)		✓	✓												✓	
L3	3.9		Service station, Adams Pest Control, CSR (timber mill), Gibson wood turners, possible abattoir.	Various commercial and industrial uses	All recently redeveloped or currently undergoing redevelopment or vacant.	No Audits completed.		✓	✓	✓	✓	✓			✓							
L4	2.3		Unknown	Pronto Mixed Concrete, Hanson Concrete	Does not appear to have been redeveloped recently	No Audits completed.	Bowser area noted at Pronto site indicating presence of USTs	✓	✓	✓							✓					
L5	2.2		South Melbourne Abattoir (MMBW plan dated 1901)	Subaru dealership and servicing	All recently redeveloped	No Audits completed	Bowser noted at Subaru site indicating presence of UST(s)	✓	✓	✓												
L6	4.2		Timber yard	Auspine, plumping supplier, large portion appears vacant. Eastern portion occupied by CityLink.	Eastern portion occupied by City Link has been redeveloped	No Audits completed.		✓	✓			✓										
Plummer Street Precinct:																					
P1	17.2	Prior to the 1920s, the central and western portions of the Study Area (the Plummer Street and Fennell Street Precincts) were used for sand quarrying, grazing, a rifle range, a golf course and various air fields. It is understood that uncontrolled sand carting from the area was undertaken until the 1870s when attempts were made for sand quarrying to occur in designated areas.	Former sand quarry and municipal tip (landfill).	Melbourne Grammar Sports Oval, Detmold Group (plastics / packaging), parkland, Tricables (cable manufacturers), shipping container yard. Site located at 5 Prohasky Street appears to be unoccupied.	No significant redevelopment	One Audit completed (refer to Table B2, Appendix B2)	A vent pipe and signage indicating the presence of a UST noted at the Detmold Group site.	✓	✓	✓						✓					✓	
P2	13.9		Former sand quarry and landfill, various government uses largely associated with warehousing and storage facilities, fuel storage depot, timber storage (Gunnersons).	Various commercial and industrial uses including Lorbek Luxury Cars (including servicing), Australian Furniture Timber, self storage, print works, some vacant land present.	More than half of the area redeveloped	Various Audits completed (refer to Table B2, Appendix B2)		✓	✓	✓	✓	✓				✓				✓		
P3	2.0		Former Chrysler car manufacturing plant	Niche Transport, M.I. Warehousing	No significant redevelopment	No Audits completed.	A vent pipe indicating the presence of a UST noted at the Niche Transport site.	✓	✓	✓												
P4	2.0		Clarke Mobile Cranes, JMJ Fleet Management	Various commercial and industrial uses. Includes film company mobile vans (e.g. lighting, catering vans).	Predominately redeveloped	No Audits completed.		✓	✓	✓												
P5	4.5		Former Chrysler Car manufacturing plant, service station	Service station, indoor paintball, Tile Liquidators, Auto Sales, On Demand (digital printers), commercial buildings (Intralot). Heritage overlays exist over the service station and over some of the former Chrysler plant buildings.	No significant redevelopment	No Audits completed.	USTs present at service station, vent pipes noted. A further vent pipe indicating the presence of a UST noted near the western boundary (Smith Street side).	✓	✓	✓	✓											
P6	3.8		Former sand quarry, Gunnersons (wood products)	Gunnersons, Southbank Auto Auctions, Direct Dial Cars, Kennards self storage and new business park (various commercial and industrial uses).	New business park in north east portion and a new building in within the Gunnderson's site in the 1990s, but otherwise not recently redeveloped.	No Audits completed.	A vent pipe indicating the presence of a UST noted on what appears to be Gunnderson's land.	✓	✓	✓		✓										

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								Fill	General Industrial	Automotive industries	Fuel Merchant (bulk storage of fuel)	Timber works	Rubber Processing	Woollen Mill	Animal and animal product processing	Former Landfill / Sand Quarry	Concrete production	Paint manufacturing	Print works	Engineering	Drycleaning
P7	2.9		Possible former quarry, swampland, SEC disposals	Gilbert Transport, various commercial and industrial uses	Predominantly redeveloped	No Audits completed.		✓	✓	✓											
P8	17.1		Former sand quarry in north east area, Australian Wool Corporation, warehousing, Toledo Scales, Refrigeration engineers.	Port Melbourne Industrial Estate (various commercial and industrial uses, predominantly warehousing), Austpac, National Tiles, Aalto (possible metal fabricators), Go Karting.	Predominantly redeveloped (during the mid to late 1980s)	No Audits completed.	Interceptor trap noted at the Aalto site (facing onto Graham Street).	✓	✓											✓		
P9	14.9		JL Murphy Reserve, BALM paints (manufacturers of lead based paints), CSIRO (Division of Mineral Chemistry)	JL Murphy Reserve, self storage facility (within former BALM site), council depot, new business park, Absolute Electronics, substation.	Largely not redeveloped	No Audits completed.		✓	✓									✓		✓		
Fennell Street Precinct:																						
F1	10.7	Prior to the 1920s, the central and western portions of the Study Area (the Plummer Street and Fennell Street Precincts) were used for sand quarrying, grazing, a rifle range, a golf course and various air fields. It is understood that uncontrolled sand carting from the area was undertaken until the 1870s when attempts were made for sand quarrying to occur in designated areas.	Possible sand quarry, swampland, Coles warehouse (storage and transport of food items), Coles Myer, Linfox, Auto workshop.	Delta Group, Whelans Warehouse, Container and freight services (Mannaway), Spec Savers, warehousing (Linfox).	No significant redevelopment	No Audits completed.		✓	✓	✓												
F2	9.3		Grimwade Castings (foundry 1939 - 1984), MFB, Police testing station, Disco (manufacturers of automotive parts), Draffin Bros (printers).	Delta Group, Cambridge University Press, Sumo printing services, Bob Jane, MFB (heritage Overlay), residential (next to MFB), new business park.	Approximately half of block has been redeveloped with redevelopment works currently being undertaken	No Audits completed.		✓	✓	✓										✓	✓	
F3	8.0		Australian Motor Industries Group, Toyota.	Toyota, Salford Lads Club (café), new business park (Ericsson, Sharp), warehouse (Globe).	Predominantly redeveloped. Southern portion of block fronting onto Fennell Street has not been redeveloped.	No Audits completed.	A vent pipe indicating the presence of a UST noted on what appears to be the Globe warehouse site.	✓	✓	✓												
F4	5.9		Gas Plant and Equipment P/L (boiler makers), State mail centre.	Bunnings, business park, Toyota.	Predominantly redeveloped, however building running from Bridge street through to Bertie Street appears to be not redeveloped (possibly rendered on Bertie Street side)	No Audits completed.	Bowser noted at site facing onto Fennell Street (appears to be associated with the Toyota site)	✓	✓	✓												
F5	5.5		Australian Motor Industries Group, Toyota, Felton Grimwade & Co (chemical manufacturing), Nightingale Chemicals (disinfectants), United Oil (oil storage).	Power Group, Zax Amusements, various commercial and industrial uses in new business park.	Approximately half of the block has been redeveloped	No Audits completed.		✓	✓	✓	✓											
F6	3.9		Australia Post, Hydro Vacuum Fumigation, Moore Hydraulics	Flaktwoods (industrial fan manufactures), Toyota Green, various commercial and industrial uses in new business park	More than half of block has been redeveloped, however a development facing onto Fennell Street appears to have maintained part of the original building brick wall.	No Audits completed.		✓	✓	✓											✓	
F7	6.0		Port Melbourne Oval, possibly part of Unilever operations.	Port Melbourne Oval, nursery, Australia Post, Australian Auto Group.	Australia post building appears to be the most recently redeveloped site. Unknown when this occurred.	No Audits completed.		✓	✓	✓					✓							

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								Fill	General Industrial	Automotive Industries	Fuel Merchant (bulk storage of fuel)	Timber works	Rubber Processing	Woollen Mill	Animal and animal product processing	Former Landfill / Sand Quarry	Concrete production	Paint manufacturing	Print works	Engineering	Drycleaning
F8	0.4		Valvoline Oil merchants	Winfield Automotive services, various commercial and industrial uses.	Apart from Winfield site, sub-precinct has been redeveloped	No Audits completed to date		✓	✓	✓											
F9	1.2		Unknown	Various commercial and industrial uses in new business park.	All redeveloped with exception of vacant area at eastern end of the sub-precinct.	No Audits completed.		✓	✓												
F10	2.8		Shell Terminal depot, Boral plasterboard	Luv-A-Duck, Dyson and Son P/L (transport services), other various commercial and industrial uses.	Approximately half of the sub-precinct (northern area) has been redeveloped.	No Audits completed.		✓	✓	✓	✓										
F11	3.9		Unilever (formerly Kitchen and Sons and Apollo Candle works).	Unilever, Symex, Australian Academy of Design (all of this sub-precinct has an historic overlay).	Not redeveloped	No Audits completed.	ASTs noted. There is significant potential for USTs to be present.	✓	✓						✓						
F12	0.5		Unknown. In particular former use of now AWA site (with observed vent pipe) is unknown.	Bridgestone Tyre Centre, AWA (computer servicing and logistics).	No significant redevelopment	No Audits completed.	A vent pipe indicating the presence of a UST noted on the AWA site.	✓	✓	✓											
F13	0.4		Unknown	Ambulance	Redeveloped	No Audits completed.		✓	✓												
F14	3.4		Council depot, destructor (incinerator) since at least 1900.	City of Port Phillip depot, Dyson and Son P/L (second site), Expohire, various commercial and industrial uses in new business park.	Partially redeveloped	No Audits completed.	Bowser noted at site which appears to be occupied by Dyson and Son P/L (who also occupy land within sub-precent F14)	✓	✓	✓											
F15	2.5		Unknown (possibly part of council depot)	Fowels Auctions and timer yard, Fultan Hogan yard, City of Port Phillip depot.	Partially redeveloped	No Audits completed.		✓	✓			✓									
F16	2.6		Dunlop and Dunlop Automotive (storage), Timber yard (not clear if for processing or storage).	Substation, Structural Systems, Staging Rentals, vacant land, various commercial and industrial uses in redeveloped area in north portion.	Northern third of sub-precinct redeveloped	No Audits completed.		✓	✓	✓		✓	✓							✓	
F17	0.1		An historic building and possible former service station.	Beaurepaires	Not redeveloped	No Audits completed.	The layout of the Beaurepaires site indicates it may be a former service station	✓	✓	✓	✓										
Montague Street Precinct:																					
M1	1.0	The portion of the Study Area within South Melbourne (the Lorimer Street Precinct and part of the Montague Street Precinct) was established as an industrial area from the mid to late 1800s, particularly for use for animal and animal product processing including abattoirs, boiling down works, bone mills, manure and glue factories, soap and candle makers.	Dunlop Rubber	Mazda Dealership and servicing, Otis Elevator Company.	Not recently developed. Older style buildings considered likely to be part of former Dunlop Rubber operations.	No Audits completed.		✓	✓	✓			✓							✓	
M2	1.0		Dunlop Rubber	Various commercial and industrial uses within new development	All recently redeveloped	No Audits completed.		✓	✓				✓								
M3	1.7		Dunlop Rubber	Various commercial and industrial uses in new development, self storage (within former Dunlop buildings)	All recently redeveloped with the exception of the eastern end where former Dunlop building remains (under a heritage overlay).	No Audits completed.		✓	✓				✓								
M4	1.6		North side - railway easement, south side generally unknown. Chrome electroplating plant formerly located at 80 Montague Street.	Railway on north side, various commercial uses on south side including car servicing and Tysesen Krupp (elevators). Former chrome electroplating site at 80 Montague street is vacant.	No significant redevelopment	One Audit completed (refer to Table B2, Appendix B2)	Environmental groundwater monitoring wells noted in footpath adjacent to 80 Montague Street.	✓	✓	✓										✓	

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								Fill	General Industrial	Automotive Industries	Fuel Merchant (bulk storage of fuel)	Timber works	Rubber Processing	Woollen Mill	Animal and animal product processing	Former Landfill / Sand Quarry	Concrete production	Paint manufacturing	Print works	Engineering	Drycleaning
M5	2.1		School, residential, unknown if commercial and industrial sites formerly existed	Various commercial and industrial uses including car servicing. Small pocket of residential use in north west, heritage listed school facing onto Montague Street, car servicing. Possible former hotel on corner of Buckhurst and Boundary Streets (under a heritage overlay).	Only central area of block appears to have been redeveloped	No Audits completed.	Possible use of imported fill under ramp up to carpark facing onto Boundary Street.	✓	✓	✓												
M6	2.0		Residential, unknown if commercial and industrial sites formerly existed	Various commercial and industrial uses including car servicing. Small pocket of residential, hotel (all with heritage overlay).	Only central area of block appears to have been redeveloped	No Audits completed.		✓	✓	✓												
M7	2.1		Residential, unknown if commercial and industrial sites formerly existed.	Various commercial and industrial uses including car servicing. Small pocket of residential (all with heritage overlay) and possible hotel.	No significant redevelopment	No Audits completed.		✓	✓	✓												
M8	1.6		May have formed part of Dunlop Rubber operations	Carpark	No buildings onsite	No Audits completed.		✓	✓				✓									
M9	1.1		Former use unknown	Various commercial and industrial uses including car servicing.	Partially redeveloped	No Audits completed.	Interceptor trap noted on site facing on to Normanby Road	✓	✓	✓												
M10	1.3		Laconia Woollen mills (building still remains)	Total Tools, various commercial and industrial uses including car dealership (Toyota and Mitsubishi) and servicing.	Partially redeveloped	No Audits completed.		✓	✓	✓				✓								
M11	2.5		Tram depot, residential, unknown if commercial and industrial site formerly existed	Car servicing, tram depot and workshop, residential (heritage overlay).	No significant redevelopment	No Audits completed.		✓	✓	✓												
M12	2.1		Possible former service station (west end), McPherson's Machinery	Car servicing, Carlins auto auctioneer, pest control, Industrial Hub (new commercial use development), car parking.	Partially redeveloped (MAB "Industry Business Hub"), large portion currently vacant	No Audits completed.		✓	✓	✓												
M13	0.3		Unknown	Map Coffee warehouse	Does not appear to have been redeveloped	No Audits completed.		✓	✓													
M14	2.0		Possible former service station, other former uses unknown	Classic Blue, car servicing, Tucks Industrial Packings and Seals, print works and other various commercial and industrial uses.	Partially redeveloped	No Audits completed.	A vent pipe indicating the presence of a UST noted at the Classic Blue site	✓	✓	✓											✓	
M15	1.9		Residential, hotels, former commercial and industrial site uses unknown	Various commercial and industrial uses including car servicing, restaurant, Regal Seafoods, Gym (possible former garage), Precision Group (adhesives, bearings and plastics), Chappell and Clegg Consolidated (power machinery).	No significant redevelopment	No Audits completed.		✓	✓	✓										✓	✓	
M16	0.7		Unknown	Various commercial uses	Existing building appears to have been renovated / refurbished	No Audits completed.		✓	✓													
M17	0.8		Melbourne Theatre Co. (1970 to late 2000s)	Car servicing, Honda lawnmower sales.	No significant redevelopment	No Audits completed.		✓	✓	✓												
M18	0.7		Unknown	Tile sales and other various commercial uses.	Partially redeveloped	No Audits completed.		✓	✓													

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								Fill	General Industrial	Automotive Industries	Fuel Merchant (bulk storage of fuel)	Timber works	Rubber Processing	Woollen Mill	Animal and animal product processing	Former Landfill / Sand Quarry	Concrete production	Paint manufacturing	Print works	Engineering	Drycleaning
M19	1.2		Blacksmith, fitting and machine shop, Steel fabrication, Engineering workshop, dry cleaning equipment manufacturers.	Central Motor Auctions, other buildings appear vacant.	No significant redevelopment	No Audits completed.		✓	✓	✓										✓	✓
M20	0.7		Kellow-Faulkner Pty Ltd (car servicing).	Car parking, car servicing, other commercial uses.	No significant redevelopment	No Audits completed.	Possible vent pipe indicating the presence of a UST noted the site facing onto Cecil Street	✓	✓	✓											

Data sourced from 'drive-by' assessment of the Study Area, review of publically available for completed Statutory Environmental Audits for sites within and in the vicinity of the Precincts, review of historic aerial photographs and maps (Melbourne Metropolitan Board of Works (MMBW), Melways and published books (refer to main report for a full list of references).

Fill:
- Heavy metals (As, Cd, Cu, Cr, Hg, Pb, Ni, Zn) and potentially cyanide
- Polycyclic aromatic hydrocarbons (PAHs)
- Petroleum hydrocarbons (total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (MAHs) and phenols
- Pesticides / herbicides associated with spraying of weeds and pests
- Asbestos associated with the construction and demolition of existing and former buildings

General Industrial sites:
- Heavy metals (As, Cd, Cu, Cr, Hg, Pb, Ni, Zn) and metalloid associated with imported fill and various industrial waste streams (e.g. foundries and other metal works, timber works, paint works, printing works etc).
- Polycyclic aromatic hydrocarbons (PAHs) associated with imported fill, use and storage of fuels and oils and various industrial waste streams.
- Petroleum hydrocarbons (total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (MAHs) and phenols associated with the use and storage of fuels and oils and various industrial waste streams.
- Solvents (non-chlorinated solvents (e.g. kerosene, petroleum ether, white spirit, turpentine, phenol, acetone, MEK, MIBK, MBK) and chlorinated solvents (e.g. PCE, TCE, and breakdown products)) associated with the
- Polychlorinated biphenyls (PCBs) associated with substations.

Automotive Industries (includes vehicle manufacturing plants, auto mechanics, service stations and other vehicle services (e.g. panel beaters)
- Those potential contaminants of interest listed for General Industries

Timber Industries
- Those potential contaminants of interest listed for General Industries and CCA (copper, chromium and arsenic), creosotes, solvents and adhesives

Rubber Processing
- Those potential contaminants of interest listed for General Industries and rubber (natural and synthetic) and sulphate

Woollen Mill
- Those potential contaminants of interest listed for General Industries and calcium chloride, naphthalene, creosotes, various acids (e.g. sulfuric)

Animal and Animal Product Processing
- Those potential contaminants of interest listed for General Industries and inorganics including high salinity (TDS), nutrients (ammonia, nitrates, phosphate, sulphates) and caustic and chlorinated chemicals (alkalinity, pH, sodium hypochlorate, phosphates)

Former Landfill
- Those potential contaminants of interest listed for General Industries and methane and hydrogen sulphide and other landfill gasses associated with landfill sites

Concrete Productions
- Those potential contaminants of interest listed for General Industries and high alkalinity (lime)

Paint Manufacturing
- Those potential contaminants of interest listed for General Industries.

Print works
- Those potential contaminants of interest listed for General Industries

Engineering / Foundries
- Those potential contaminants of interest listed for General Industries

Drycleaning
- Those potential contaminants of interest listed for General Industries and in particular PCE

Council Depot and other Depots
- Those potential contaminants of interest listed for General Industries

Appendix B

Groundwater Bore Search Results within 1km of the Site

LIST_TITLE	LIST_NUMBE	BOREHOLE_N	MW_ASSET_I	REPORT_NUM	EASTING	NORTHING	SRL	BOREHOLE_D	DRILLED_DA	LOG	SOURCE_PLA	SOURCE_P_1	BOREHOLE_1	DATE_CAPTU	CAPTURED_B	DATE_LAST_	UPDATED_BY	MI_PRINX
HOBSONS BAY	HOBSONS BAY MAIN	10			315394.564	5810569.756	0	0		D	MMBW 800':1" B	800':1"	10	20020617	MRR - Andrew Mullen			893
HOBSONS BAY	HOBSONS BAY MAIN	19			316363.347	5810430.534	0	0		D	MMBW 800':1" B	800':1"	19	20020617	MRR - Andrew Mullen			667
HOBSONS BAY	HOBSONS BAY MAIN	18			316243.147	5810444.682	0	0		D	MMBW 800':1" B	800':1"	18	20020617	MRR - Andrew Mullen			668
HOBSONS BAY	HOBSONS BAY MAIN	17			316122.963	5810463.518	0	0		D	MMBW 800':1" B	800':1"	17	20020617	MRR - Andrew Mullen			669
HOBSONS BAY	HOBSONS BAY MAIN	19			316404.923	5810427.195	0	0		D	MMBW 800':1" B	800':1"	19	20020525	MRR - Andrew Mullen			10238
HOBSONS BAY	HOBSONS BAY MAIN	18			316302.27	5810442.142	0	0		D	MMBW 800':1" B	800':1"	18	20020525	MRR - Andrew Mullen			10239
HOBSONS BAY	HOBSONS BAY MAIN	17			316198.66	5810455.299	0	0		D	MMBW 800':1" B	800':1"	17	20020525	MRR - Andrew Mullen			10240
HOBSONS BAY	HOBSONS BAY MAIN	16			316111.172	5810467.667	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Andrew Mullen			10241
HOBSONS BAY	HOBSONS BAY MAIN	15			316033.075	5810476.645	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10242
HOBSONS BAY	HOBSONS BAY MAIN	14			315955.984	5810487.783	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10243
MELBOURNE	ME/033	9			316639.295	5811961.958	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10460
MELBOURNE	ME/033	8			316843.752	5812003.07	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10461
MELBOURNE	ME/033	7			317045.982	5812032.694	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10462
MELBOURNE	ME/033	6			317247.222	5812037.563	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10463
MELBOURNE	ME/033	5			317449.172	5812033.794	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10464
MELBOURNE	ME/034	17			315660.51	5810978.895	0	0		D	MMBW 800':1" B	800':1"	17	20020617	MRR - Andrew Mullen			1289
MELBOURNE	ME/034	18			315469.049	5811008.569	0	0		D	MMBW 800':1" B	800':1"	18	20020617	MRR - Andrew Mullen			1290
MELBOURNE	ME/034	14			316283.238	5810881.534	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10331
MELBOURNE	ME/034	15			316085.057	5810905.989	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10332
MELBOURNE	ME/034	16			315861.049	5810949.081	0	0		D	MMBW 800':1" B	800':1"	16	20020617	MRR - Andrew Mullen			1288
MELBOURNE	ME/046	6			317130.741	5811485.933	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10468
MELBOURNE	ME/047	0			316768.096	5811849.451	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10590
MELBOURNE	ME/047	0			316690.114	5811894.732	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10591
MELBOURNE	ME/047	0			316721.704	5811774.935	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10592
MELBOURNE	ME/047	0			316843.776	5811808.199	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10594
MELBOURNE	ME/047	0			316753.542	5811651.01	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10595
MELBOURNE	ME/047	0			316820.309	5811641.122	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10596
MELBOURNE	ME/047	0			316944.359	5811658.099	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10597
MELBOURNE	ME/047	0			317032.45	5811663.018	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10599
MELBOURNE	ME/047	0			317008.059	5811754.81	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10600
MELBOURNE	ME/047	0			316900.961	5811821.446	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10601
MELBOURNE	ME/047	0			316962.377	5811903.34	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10603
MELBOURNE	ME/047	0			316864.803	5811943.582	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10604
MELBOURNE	ME/047	0			316800.015	5811727.535	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10593
MELBOURNE	ME/047	0			316933.854	5811699.681	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10598
MELBOURNE	ME/047	0			316982.34	5811845.841	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10602
MELBOURNE	ME/048	1			315612.049	5811250.2	0	0		D	MMBW 800':1" B	800':1"	1	20020617	MRR - Andrew Mullen			1784
MELBOURNE	ME/048	2			315708.361	5811233.994	0	0		D	MMBW 800':1" B	800':1"	2	20020617	MRR - Andrew Mullen			1785
MELBOURNE	ME/048	3			315800.5	5811220.576	0	0		D	MMBW 800':1" B	800':1"	3	20020617	MRR - Andrew Mullen			1786
MELBOURNE	ME/048	4			315895.237	5811208.729	0	0		D	MMBW 800':1" B	800':1"	4	20020617	MRR - Andrew Mullen			1787
MELBOURNE	ME/048	5			315994.476	5811288.133	0	0		D	MMBW 800':1" B	800':1"	5	20020617	MRR - Andrew Mullen			1788
MELBOURNE	ME/048	6			316004.693	5811378.815	0	0		D	MMBW 800':1" B	800':1"	6	20020617	MRR - Andrew Mullen			1789
MELBOURNE	ME/048	7			316167.846	5811188.393	0	0		D	MMBW 800':1" B	800':1"	7	20020617	MRR - Andrew Mullen			1790
MELBOURNE	ME/048	8			316460.203	5811327.665	0	0		D	MMBW 800':1" B	800':1"	8	20020617	MRR - Andrew Mullen			1791
MELBOURNE	ME/055	13			317499.818	5811761.588	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10394
MELBOURNE	ME/055	14			317422.059	5811770.906	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10395
MELBOURNE	ME/055	15			317343.056	5811777.825	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10396
MELBOURNE	ME/055	16			317265.338	5811787.323	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Andrew Mullen			10397
MELBOURNE	ME/055	10			317354.336	5811855.999	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10399
MELBOURNE	ME/055	9			317276.256	5811865.357	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10400
MELBOURNE	ME/055	8			317286.819	5811943.152	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10401
MELBOURNE	ME/055	7			317364.404	5811935.123	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10402
MELBOURNE	ME/055	5			317520.977	5811917.307	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10404
MELBOURNE	ME/055	4			317531.548	5811994.852	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10405
MELBOURNE	ME/055	3			317454.936	5812003.15	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10406
MELBOURNE	ME/055	1			317298.718	5812021.236	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10408
MELBOURNE	ME/055	12			317509.886	5811839.373	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10393
MELBOURNE	ME/055	11			317433.538	5811848.101	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10398
MELBOURNE	ME/055	6			317444.48	5811926.475	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10403
MELBOURNE	ME/055	2			317377.144	5812012.158	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10407
MELBOURNE	ME/058	1			317071.709	5811704.959	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10543
MELBOURNE	ME/058	2			317146.936	5811727.025	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10544
MELBOURNE	ME/058	4			317242.572	5811806.649	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10546
MELBOURNE	ME/058	5			317249.333	5811894.002	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10547
MELBOURNE	ME/058	3			317235.727	5811739.313	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10545
MELBOURNE	ME/077	3			316436.958	5811385.993	0	0		D	MMBW 800':1" B	800':1"	3	20020617	MRR - Andrew Mullen			1662
MELBOURNE	ME/077	4			316491.422	5811127.745	0	0		D	MMBW 800':1" B	800':1"	4	20020617	MRR - Andrew Mullen			1663
MELBOURNE	ME/077	7			316112.12	5811022.386	0	0		D	MMBW 800':1" B	800':1"	7	20020617	MRR - Andrew Mullen			1664
MELBOURNE	ME/077	9			315796.847	5811246.551	0	0		D	MMBW 800':1" B	800':1"	9	20020617	MRR - Andrew Mullen			1668
MELBOURNE	ME/077	11			315980.639	5811419.417	0	0		D	MMBW 800':1" B	800':1"	11	20020617	MRR - Andrew Mullen			1669
MELBOURNE	ME/077	13			316041.469	5811464.548	0	0		D	MMBW 800':1" B	800':1"	13	20020617	MRR - Andrew Mullen			1671
MELBOURNE	ME/077	14			316081.849	5811495.981	0	0		D	MMBW 800':1" B	800':1"	14	20020617	MRR - Andrew Mullen			1672
MELBOURNE	ME/077	2			316372.459	5811629.655	0	0		D	MMBW 800':1" B	800':1"	2	20020617	MRR - Andrew Mullen			1661
MELBOURNE	ME/077	6			316026.891	5811335.593	0	0		D	MMBW 800':1" B	800':1"	6	20020617	MRR - Andrew Mullen			1665
MELBOURNE	ME/077	12			316016.822	5811445.731	0	0		D	MMBW 800':1" B	800':1"	12	20020617	MRR - Andrew Mullen			1670
MELBOURNE	ME/082	1			317248.838	5811739.743	0	0		D	MMBW 800':1" B	800':1"	1	20020529	MRR - Andrew Mullen			10005
MELBOURNE	ME/082	2			317275.456	5811743.032	0	0		D	MMBW 800':1" B	800':1"	2	20020529	MRR - Andrew Mullen			10006
MELBOURNE	ME/082	3			317308.506	5811747.161	0	0		D	MMBW 800':1" B	800':1"	3	20020529	MRR - Andrew Mullen			10007
MELBOURNE	ME/082	4			317366.128	5811752.53	0	0		D	MMBW 800':1" B	800':1"	4	20020529	MRR - Andrew Mullen			10008
MELBOURNE	ME/082	5			317405.527	5811740.522	0	0		D	MMBW 800':1" B	800':1"	5	20020529	MRR - Andrew Mullen			10009
MELBOURNE	ME/082	6			317445.23	5811740.132	0	0		D	MMBW 800':1" B	800':1"	6	20020529	MRR - Andrew Mullen			10010
MELBOURNE	ME/082	7			317482.98	5811738.903	0	0		D	MMBW 800':1" B	800':1"	7	20020529	MRR - Andrew Mullen			10011
MELBOURNE	ME/082	8			317528.712	5811737.593	0	0		D	MMBW 800':1" B	800':1"	8	20020529	MRR - Andrew Mullen			10012
MELBOURNE	ME/082	9			317578.368	5811734.244	0	0		D	MMBW 800':1" B	800':1"	9	20020529	MRR - Andrew Mullen			10013
MELBOURNE	PM/005	1			316998.18	5811941.622	0	0		D	MMBW 800':1" B	800':1"	1	20020529	MRR - Andrew Mullen			10001
MELBOURNE	PM/005	2			316985.44	5811985.613	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10002
MELBOURNE	PM/005	3			316960.414	5812037.253	0	0		D	MMBW 800':1" B	800':1"	3	20020529	MRR - Andrew Mullen			10003
MELBOURNE	PM/005	4			316916.596	5812032.554	0	0		D	MMBW 800':1" B	800':1"	4	20020529	MRR - Andrew Mullen			10004
MELBOURNE	PM/013	11			315617.582	5810538.543	0	0		D	MMBW 800':1" B	800':1"	11	20020617	MRR - Andrew Mullen			894
MELBOURNE	PM/013	12			315715.699	5810523.046	0	0		D	MMBW 800':1" B	800':1"	12	20020617	MRR - Andrew Mullen			895
MELBOURNE	PM/013	13			315814.246	5810508.299	0	0		D	MMBW 800':1" B	800':1"	13	20020617	MRR - Andrew Mullen			896
MELBOURNE	PM/013	15			315953.288	5810487.093	0	0		D	MMBW 800':1" B	800':1"	15	20020617	MRR - Andrew Mullen			671
MELBOURNE	PM/013	14			315889.654	5810496.521	0	0		D	MMBW 800':1" B	800':1"	14	20020617	MRR - Andrew Mullen			672
MELBOURNE	PM/013	16			316016.905	5810477.665	0	0		D	MMBW 800':1" B	800':1"	16	20020617	MRR - Andrew Mullen			670
CITY RING ROA	CRRW	11			319407.905	5811988.573	2.1	0	19990101	G			0	0				160321
CITY RING ROA	CRRW	12			319415.904	5812115.567	2.2	0	19990101	G			0	0				160324
MELBOURNE	ME/007	1			319165.114	5811944.491	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10409
MELBOURNE	ME/007	2			318896.381	5812052.63	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10410
MELBOURNE	ME/007	3			318727.299	5812104.989	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10411
MELBOURNE	ME/007	4			318854.755	5812175.665	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10412
MELBOURNE	ME/007	5			318478.405	5812161.698	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10413
MELBOURNE	ME/007	6			318227.822	5812219.637	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10414
MELBOURNE	ME/007	7			319036.907	5812133.344	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10415
MELBOURNE	ME/007	8			319147.583	5812189.853	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10416
MELBOURNE	ME/007	9			319237.982	5812233.374	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10417
MELBOURNE	ME/017	1			319188.326	5812358.799	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10476
MELBOURNE	ME/017	2			319022.658	5812270.966	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10477
MELBOURNE	ME/018	1			319222.538	5812136.233	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10478
MELBOURNE	ME/018	2			319215.834	5812101.16	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10479
MELBOURNE	ME/018	3			319213.096	5812065.167	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10480
MELBOURNE	ME/018	9			319174.176	5812070.096	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10481
MELBOURNE	ME/018	8			319175.215	5812107.349	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10482
MELBOURNE	ME/018	12			319145.332	5812145.931	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10484
MELBOURNE	ME/018	13			319144.309	5812111.048	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10485
MELBOURNE	ME/018	14			319140.508	5812074.925	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10486
MELBOURNE	ME/018	17			319106.89	5812146.071	0	0		D	MMBW 800':1" B	800':1"	17	20020525	MRR - Andrew Mullen			10487
MELBOURNE	ME/018	19			319096.401	5812078.365	0	0		D	MMBW 800':1" B	800':1"	19	20020525	MRR - Andrew Mullen			10489
MELBOURNE	ME/018	22			319051.824	5812084.494	0	0		D	MMBW 800':1" B	800':1"	22	20020525	MRR - Andrew Mullen			10490
MELBOURNE	ME/018	21			319056.318	5812117.647	0	0		D	MMBW 800':1" B	800':1"	21	20020525	MRR - Andrew Mullen			10491
MELBOURNE	ME/018	23			319051.238	5812051.55	0	0		D	MMBW 800':1" B	800':1"	23	20020525	MRR - Andrew Mullen			10492
MELBOURNE	ME/018	15			319136.599	5812038.423	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10494
MELBOURNE	ME/018	10			319164.635	5812035.063	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10495
MELBOURNE	ME/018	11			319161.609	5812000.94	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10496
MELBOURNE	ME/018	7			319183.485	5812145.571	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10483
MELBOURNE	ME/018	18			319100.598	5812113.398	0	0		D	MMBW 800':1" B	800':1"	18	20020525	MRR - Andrew Mullen			10488
MELBOURNE	ME/018	20			319093.309	5812046.501	0	0		D	MMBW 800':1" B	800':1"	20	20020525	MRR - Andrew Mullen			10493
MELBOURNE	ME/018	16			319131.825	5812000.83	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Andrew Mullen			10497
SOUTH MELBO	ME/026	14			319237.743	5812193.892	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Scott Black			18802
SOUTH MELBO	ME/026	23			319251.027	5812192.922	0	0		D	MMBW 800':1" B	800':1"	23	20020525	MRR - Scott Black			18803
SOUTH MELBO	ME/026	24			319262.951	5812191.082	0	0		D	MMBW 800':1" B	800':1"	24	20020525	MRR - Scott Black			18804
SOUTH MELBO	ME/026	32			319276.054	5812190.342	0	0		D	MMBW 800':1" B	800':1"	32	20020525	MRR - Scott Black			18805
MELBOURNE	ME/026	13			319295.761	5812188.823	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Scott Black			18806
MELBOURNE	ME/026	30			319306.704	5812187.513	0	0		D	MMBW 800':1" B	800':1"	30	20020525	MRR - Scott Black			18807
MELBOURNE	ME/026	21			319264.476	5812205.539	0	0		D	MMBW 800':1" B	800':1"	21	20020525	MRR - Scott Black			18808
MELBOURNE	ME/026	20			319251.473	5812207.109	0	0		D	MMBW 800':1" B	800':1"	20	20020525	MRR - Scott Black			18809
MELBOURNE	ME/026	15			319239.285	5812208.559	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Scott Black			18810
MELBOURNE	ME/026	0			319252.116	5812221.246	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Scott Black			18811
MELBOURNE	ME/026	22			319262.679	5812220.196	0	0		D	MMBW 800':1" B	800':1"	22	20020525	MRR - Scott Black			18812
MELBOURNE	ME/026	9			319303.158	5812224.336	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Scott Black			18813
MELBOURNE	ME/026	33			319313.787	5812223.896	0	0		D	MMBW 800':1" B	800':1"	33	20020525	MRR - Scott Black			18814
MELBOURNE	ME/026	19			319323.327	5812222.596	0	0		D	MMBW 800':1" B	800':1"	19	20020525	MRR - Scott Black			18815
MELBOURNE	ME/026	18			319331.697	5812222.166	0	0		D	MMBW 800':1" B	800':1"	18	20020525	MRR - Scott Black			18816
MELBOURNE	ME/026	0			319342.243	5812220.826	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Scott Black			18817
MELBOURNE	ME/026	7			319283.912	5812222.696	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Scott Black			18818
MELBOURNE	ME/026	3			319294.351	5812227.935	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Scott Black			18819
MELBOURNE	ME/026	25			319291.63	5812218.866	0	0		D	MMBW 800':1" B	800':1"	25	20020525	MRR - Scott Black			18820
MELBOURNE	ME/026	36			319335.407	5812212.968	0	0		D	MMBW 800':1" B	800':1"	36	20020525	MRR - Scott Black			18821
MELBOURNE	ME/026	28			319316.681	5812215.357	0	0		D	MMBW 800':1" B	800':1"	28	20020525	MRR - Scott Black			18822
MELBOURNE	ME/026	27			319307.52	5812215.297	0	0		D	MMBW 800':1" B	800':1"	27	20020525	MRR - Scott Black			18823
MELBOURNE	ME/026	26			319299.175	5812216.537	0	0		D	MMBW 800':1" B	800':1"	26	20020525	MRR - Scott Black			18824
MELBOURNE	ME/026	6			319292.793	5812209.799	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Scott Black			18825
MELBOURNE	ME/026	11			319321.381	5812206.119	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Scott Black			18827
MELBOURNE	ME/026	0			319329.808	5812205.099	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Scott Black			18828
MELBOURNE	ME/026	5			319367.871	5812179.515	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Scott Black			18829
MELBOURNE	ME/026	0			319350.811	5812202.97	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Scott Black			18830
MELBOURNE	ME/026	35			319325.075	5812231.564	0	0		D	MMBW 800':1" B	800':1"	35	20020525	MRR - Scott Black			18831
MELBOURNE	ME/026	0			319315.189	5812245.311	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Scott Black			18832
MELBOURNE	ME/026	17			319339.984	5812243.502	0	0		D	MMBW 800':1" B	800':1"	17	20020525	MRR - Scott Black			18833
MELBOURNE	ME/026	0			319350.778	5812182.214	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Scott Black			18835
MELBOURNE	ME/026	1			319370.329	5812195.801	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Scott Black			18836
MELBOURNE	ME/026	4			319385.567	5812176.655	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Scott Black			18837
SOUTH MELBO	ME/026	2			319365.554	5812164.648	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Scott Black			18838
MELBOURNE	ME/026	10			319312.047	5812207.229	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Scott Black			18826
MELBOURNE	ME/026	16			319327.698	5812256.659	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Scott Black			18834
CITY RING ROA	CRRW	7			318988.908	5811466.567	1.4	0	19990101	G			0	0				160567
CITY RING ROA	CRRW	8			318654.9	5811509.579	1.4	0	19990101	G			0	0				160568
MELBOURNE	ME/033	4			317654.42	5812012.438	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10465
MELBOURNE	ME/033	3			317868.557	5811963.978	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10466
MELBOURNE	ME/033	2			318023.332	5811920.096	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10467
MELBOURNE	ME/067	8			318564.476	5811673.076	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10281
MELBOURNE	ME/067	6			318451.639	5811519.057	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10282

LIST_TITLE	LIST_NUMBE	BOREHOLE_N	MW_ASSET_I	REPORT_NUM	EASTING	NORTHING	SRL	BOREHOLE_D	DRILLED_DA	LOG	SOURCE_PLA	SOURCE_P_1	BOREHOLE_1	DATE_CAPTU	CAPTURED_B	DATE_LAST_	UPDATED_BY	MI_PRINX
MELBOURNE	ME/067	7			318703.988	5811528.515	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10284
MELBOURNE	PM/002	1			317922.559	5811710.398	0	0		D	MMBW 800':1" B	800':1"	1	20020529	MRR - Andrew Mullen			10015
SOUTH MELBO	SM/009	5			319107.046	5811445.561	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Scott Black			18797
MELBOURNE	SM/018	8			318584.398	5811578.085	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10548
MELBOURNE	SM/018	7			318998.456	5811470.626	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10549
MELBOURNE	SM/021	1			318756.506	5811876.855	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10469
MELBOURNE	SM/021	3			318731.636	5811730.844	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10470
MELBOURNE	SM/021	4			318718.567	5811662.778	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10471
MELBOURNE	SM/021	5			318704.689	5811602.849	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10472
MELBOURNE	SM/021	7			318659.139	5811500	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10473
MELBOURNE	SM/021	8			318900.347	5811548.281	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10474
MELBOURNE	SM/021	9			318886.865	5811501.39	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10475
SOUTH MELBO	SM/021	10			318934.444	5811703.87	1.3	0	19990101	G			0	0				169197
TULLAMARINE	TFWY	71			318360.894	5811761.568	16.4	0	19990101	G			0	0				167256
MELBOURNE S	1071	8034			318550.903	5810854.58	0	0	19990101	G			0	0				161927
MELBOURNE S	1071	8033			318550.903	5810854.58	0	0	19990101	G			0	0				161926
CITY RING ROA	CRRW	304			319378.904	5811820.576	-0.5	0	19990101	G			0	0				160562
CITY RING ROA	CRRW	4			319396.905	5811389.573	1.6	0	19990101	G			0	0				160564
CITY RING ROA	CRRW	5			319357.894	5811612.568	1.6	0	19990101	G			0	0				160565
CITY RING ROA	CRRW	10			319811.904	5811265.567	1.2	0	19990101	G			0	0				160319
CITY RING ROA	CRRW	106			319366.907	5811691.572	1.5	0	19990101	G			0	0				160320
CITY RING ROA	CRRW	115			319371.904	5811714.568	1.6	0	19990101	G			0	0				160323
CITY RING ROA	CRRW	13			319369.908	5811674.576	1.5	0	19990101	G			0	0				160325
CITY RING ROA	CRRW	14			319374.905	5811699.571	1.4	0	19990101	G			0	0				160326
CITY RING ROA	CRRW	146			319401.894	5811853.57	2.7	0	19990101	G			0	0				160327
CITY RING ROA	CRRW	15			319363.905	5811649.571	1.3	0	19990101	G			0	0				160328
CITY RING ROA	CRRW	154			319360.904	5811857.569	2.7	0	19990101	G			0	0				160329
CITY RING ROA	CRRW	155			319361.893	5811856.569	2.7	0	19990101	G			0	0				160330
CITY RING ROA	CRRW	156			319348.906	5811858.579	2.7	0	19990101	G			0	0				160331
CITY RING ROA	CRRW	16			319346.894	5811680.574	1.6	0	19990101	G			0	0				160332
CITY RING ROA	CRRW	17			319392.906	5811639.573	1.2	0	19990101	G			0	0				160333
CITY RING ROA	CRRW	18			319332.901	5811647.571	1.6	0	19990101	G			0	0				160334
CITY RING ROA	CRRW	19			319404.904	5811702.57	1.4	0	19990101	G			0	0				160335
CITY RING ROA	CRRW	20			319362.907	5811643.572	1.3	0	19990101	G			0	0				160337
CITY RING ROA	CRRW	201			319399.907	5811852.57	2.7	0	19990101	G			0	0				160338
CITY RING ROA	CRRW	202			319384.907	5811853.57	2.7	0	19990101	G			0	0				160339
CITY RING ROA	CRRW	206			319407.905	5811818.567	-0.5	0	19990101	G			0	0				160340
CITY RING ROA	CRRW	211			319363.905	5811825.575	-0.5	0	19990101	G			0	0				160341
CITY RING ROA	CRRW	213			319414.906	5811788.573	-0.5	0	19990101	G			0	0				160342
CITY RING ROA	CRRW	216			319400.904	5811787.573	-0.5	0	19990101	G			0	0				160343
CITY RING ROA	CRRW	217			319386.903	5811791.572	-0.5	0	19990101	G			0	0				160344
CITY RING ROA	CRRW	220			319371.904	5811790.572	-0.5	0	19990101	G			0	0				160345
CITY RING ROA	CRRW	222			319422.904	5811752.57	2.3	0	19990101	G			0	0				160346
CITY RING ROA	CRRW	226			319394.893	5811755.569	2.5	0	19990101	G			0	0				160348
CITY RING ROA	CRRW	230			319430.903	5811720.576	1.7	0	19990101	G			0	0				160349
CITY RING ROA	CRRW	231			319414.906	5811724.576	1.6	0	19990101	G			0	0				160350
CITY RING ROA	CRRW	236			319387.901	5811724.576	1.6	0	19990101	G			0	0				160352
CITY RING ROA	CRRW	237			319437.904	5811688.573	1.6	0	19990101	G			0	0				160353
CITY RING ROA	CRRW	239			319408.903	5811691.572	1.6	0	19990101	G			0	0				160355
CITY RING ROA	CRRW	240			319394.893	5811693.572	1.6	0	19990101	G			0	0				160356
CITY RING ROA	CRRW	3			320049.904	5811295.571	1.6	0	19990101	G			0	0				160357
CITY RING ROA	CRRW	306			319381.906	5811756.569	2.5	0	19990101	G			0	0				160563
CITY RING ROA	CRRW	6			319367.904	5811740.572	1.5	0	19990101	G			0	0				160566
CITY RING ROA	CRRW	114			319371.904	5811717.567	1.6	0	19990101	G			0	0				160322
CITY RING ROA	CRRW	224			319399.907	5811754.57	2.5	0	19990101	G			0	0				160347
CITY RING ROA	CRRW	234			319401.894	5811723.576	1.6	0	19990101	G			0	0				160351
CITY RING ROA	CRRW	238			319422.904	5811690.572	1.6	0	19990101	G			0	0				160354
CITY RING ROA	CRRW	301			319392.906	5811822.576	-0.5	0	19990101	G			0	0				160358
HOBSONS BAY	HOBSONS BAY MAIN	51			318487.311	5810130.874	0	0		D	MMBW 800':1" B	800':1"	51	20020525	MRR - Andrew Mullen			10244
HOBSONS BAY	HOBSONS BAY MAIN	52			318597.501	5810050.82	0	0		D	MMBW 800':1" B	800':1"	52	20020525	MRR - Andrew Mullen			10245
HOBSONS BAY	HOBSONS BAY MAIN	54			318792.796	5809917.987	0	0		D	MMBW 800':1" B	800':1"	54	20020525	MRR - Andrew Mullen			10247
HOBSONS BAY	HOBSONS BAY MAIN	55			318908.815	5809834.983	0	0		D	MMBW 800':1" B	800':1"	55	20020525	MRR - Andrew Mullen			10248
HOBSONS BAY	HOBSONS BAY MAIN	53			318703.196	5809980.284	0	0		D	MMBW 800':1" B	800':1"	53	20020525	MRR - Andrew Mullen			10246
MELBOURNE	ME/ 67	9			319319.592	5810853.25	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10252
MELBOURNE	ME/ 67	8			319236.597	5810736.183	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10253
MELBOURNE	ME/ 67	7			319133.87	5810613.418	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10254
MELBOURNE	ME/ 67	6			319059.583	5810488.033	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10255
MELBOURNE	ME/ 67	4			318884.168	5810241.312	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10259
MELBOURNE	ME/ 67	3			318786.554	5810101.4	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10260
MELBOURNE	ME/ 67	1			318523.378	5809730.024	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10262
MELBOURNE	ME/ 67	5			318974.362	5810373.446	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10256
MELBOURNE	ME/ 67	2			318627.87	5809878.115	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10261
MELBOURNE	ME/034	2			318440.499	5810184.424	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10319
MELBOURNE	ME/034	1			318656.022	5810016.027	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10320
MELBOURNE	ME/034	3			318337.888	5810341.102	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10321
MELBOURNE	ME/034	0			319153.875	5809776.345	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10340
MELBOURNE	ME/034	0			319148.44	5809804.55	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10341
MELBOURNE	ME/034	0			319170.506	5809869.116	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10342
MELBOURNE	ME/034	0			319197.05	5809860.428	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10343
MELBOURNE	ME/034	0			319119.11	5809751.87	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10339
MELBOURNE	ME/034	0			319194.626	5809803.42	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10344
MELBOURNE	ME/035	12			319167.868	5810393.382	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10257
MELBOURNE	ME/035	11			319263.141	5810503.01	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10258
MELBOURNE	ME/035	13			319075.951	5810275.965	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10263
MELBOURNE	ME/035	14			319002.134	5810205.519	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10264
MELBOURNE	ME/035	15			318947.645	5810096.181	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10265
MELBOURNE	ME/035	20			318360.753	5809737.473	0	0		D	MMBW 800':1" B	800':1"	20	20020525	MRR - Andrew Mullen			10270
MELBOURNE	ME/035	36			320332.309	5811365.617	0	0		D	MMBW 800':1" B	800':1"	36	20020617	MRR - Andrew Mullen			12166
MELBOURNE	ME/035	4			320279.931	5811303.21	0	0		D	MMBW 800':1" B	800':1"	4	20020617	MRR - Andrew Mullen			12167
SOUTH MELBO	ME/035	18			319325.587	5809904.24	0	0		D	MMBW 800':1" B	800':1"	18	20020617	MRR - Andrew Mullen			11785
MELBOURNE	ME/035	7			319777.04	5810794.512	0	0		D	MMBW 800':1" B	800':1"	7	20020617	MRR - Andrew Mullen			11805
MELBOURNE	ME/035	9			319537.86	5810624.755	0	0		D	MMBW 800':1" B	800':1"	9	20020617	MRR - Andrew Mullen			11806
MELBOURNE	ME/035	10			319391.768	5810535.763	0	0		D	MMBW 800':1" B	800':1"	10	20020617	MRR - Andrew Mullen			11807
MELBOURNE	ME/035	6			319928.071	5810902.1	0	0		D	MMBW 800':1" B	800':1"	6	20020617	MRR - Andrew Mullen			11808
MELBOURNE	ME/035	5			320107.65	5811132.814	0	0		D	MMBW 800':1" B	800':1"	5	20020617	MRR - Andrew Mullen			11809
MELBOURNE	ME/035	16			318823.091	5809902.75	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Andrew Mullen			10266
MELBOURNE	ME/035	38			320371.996	5811411.898	0	0		D	MMBW 800':1" B	800':1"	38	20020617	MRR - Andrew Mullen			12165
MELBOURNE	ME/039	11			319075.044	5810910.998	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10345
MELBOURNE	ME/039	12			319112.629	5810936.173	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10346
MELBOURNE	ME/039	13			319143.757	5810961.478	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10347
MELBOURNE	ME/039	10			319058.527	5810905.229	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10348
MELBOURNE	ME/039	8			319020.027	5810896.621	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10350
MELBOURNE	ME/039	7			318999.297	5810890.712	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10351
MELBOURNE	ME/039	6			318981.338	5810886.413	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10352
MELBOURNE	ME/039	4			318889.396	5810863.898	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10354
MELBOURNE	ME/039	3			318698.117	5810814.817	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10355
MELBOURNE	ME/039	2			318515.248	5810766.757	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10356
MELBOURNE	ME/039	1			318319.095	5810713.378	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10357
MELBOURNE	ME/039	15			319251.077	5811025.635	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10359
MELBOURNE	ME/039	22			319787.793	5811463.078	0	0		D	MMBW 800':1" B	800':1"	22	20020617	MRR - Andrew Mullen			9720
MELBOURNE	ME/039	21			319755.065	5811427.865	0	0		D	MMBW 800':1" B	800':1"	21	20020617	MRR - Andrew Mullen			9721
MELBOURNE	ME/039	20			319735.101	5811412.348	0	0		D	MMBW 800':1" B	800':1"	20	20020617	MRR - Andrew Mullen			9722
MELBOURNE	ME/039	19			319720.96	5811400.93	0	0		D	MMBW 800':1" B	800':1"	19	20020617	MRR - Andrew Mullen			9723
MELBOURNE	ME/039	18			319707.338	5811389.663	0	0		D	MMBW 800':1" B	800':1"	18	20020617	MRR - Andrew Mullen			9724
MELBOURNE	ME/039	17			319574.15	5811268.807	0	0		D	MMBW 800':1" B	800':1"	17	20020617	MRR - Andrew Mullen			9725
MELBOURNE	ME/039	16			319408.862	5811153.44	0	0		D	MMBW 800':1" B	800':1"	16	20020617	MRR - Andrew Mullen			9726
MELBOURNE	ME/039	9			319036	5810900.51	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10349
MELBOURNE	ME/039	5			318961.68	5810881.344	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10353
MELBOURNE	ME/067	1			319049.597	5810962.998	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10193
MELBOURNE	ME/067	5			318578.848	5811390.232	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10283
MELBOURNE	ME/067	4			318699.098	5811268.787	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10285
MELBOURNE	ME/067	3			318819.125	5811159.259	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10286
MELBOURNE	ME/067	2			318928.144	5811059.749	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10287
MELBOURNE	ME/067	14			319826.804	5811258.089	0	0		D	MMBW 800':1" B	800':1"	14	20020617	MRR - Andrew Mullen			9752
MELBOURNE	ME/067	13			319781.806	5811231.194	0	0		D	MMBW 800':1" B	800':1"	13	20020617	MRR - Andrew Mullen			9753
MELBOURNE	ME/067	12			319694.045	5811160.658	0	0		D	MMBW 800':1" B	800':1"	12	20020617	MRR - Andrew Mullen			9754
MELBOURNE	ME/067	11			319527.553	5811023.036	0	0		D	MMBW 800':1" B	800':1"	11	20020617	MRR - Andrew Mullen			9755
MELBOURNE	ME/067	10			319412.185	5810932.604	0	0		D	MMBW 800':1" B	800':1"	10	20020617	MRR - Andrew Mullen			9756
MELBOURNE	ME/070	17	3010		319206.731	5811000.58	0	0		D	MMBW 800':1" B	800':1"	17	20020525	MRR - Andrew Mullen			10189
MELBOURNE	ME/070	16	3010		319158.212	5810953.76	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Andrew Mullen			10190
MELBOURNE	ME/070	15	3010		319140.764	5810940.062	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10191
MELBOURNE	ME/070	14	3010		319105.578	5810911.668	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10192
MELBOURNE	ME/070	13	3010		319057.167	5810879.565	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10194
MELBOURNE	ME/070	12	3010		319038.737	5810864.967	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10195
MELBOURNE	ME/070	11	3010		319021.479	5810852.76	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10196
MELBOURNE	ME/070	10	3010		318965.605	5810805.499	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10197
MELBOURNE	ME/070	9	3010		318885.348	5810745.371	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10198
MELBOURNE	ME/070	8	3010		318786.29	5810666.257	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10199
MELBOURNE	ME/070	7	3010		318739.437	5810630.144	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10200
MELBOURNE	ME/070	6	3010		318634.929	5810545.521	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10201
MELBOURNE	ME/070	5	3010		318558.63	5810483.604	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10202
MELBOURNE	ME/070	4	3010		318488.342	5810427.745	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10203
MELBOURNE	ME/070	3	3010		318408.654	5810364.707	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10204
MELBOURNE	ME/070	18	3010		319236.449	5811056.919	0	0		D	MMBW 800':1" B	800':1"	18	20020525	MRR - Andrew Mullen			10288
MELBOURNE	ME/070	20	3010		319277.258	5811253.02	0	0		D	MMBW 800':1" B	800':1"	20	20020525	MRR - Andrew Mullen			10290
MELBOURNE	ME/070	21	3010		319300.585	5811352.03	0	0		D	MMBW 800':1" B	800':1"	21	20020525	MRR - Andrew Mullen			10291
MELBOURNE	ME/070	22	3010		319323.476	5811448.371	0	0		D	MMBW 800':1" B	800':1"	22	20020525	MRR - Andrew Mullen			10292
MELBOURNE	ME/070	23	3010		319343.761	5811543.782	0	0		D	MMBW 800':1" B	800':1"	23	20020525	MRR - Andrew Mullen			10293
MELBOURNE	ME/070	25	3010		319376.629	5811716.387	0	0		D	MMBW 800':1" B	800':1"	25	20020525	MRR - Andrew Mullen			10295
MELBOURNE	ME/070	27	3010		319422.921	5811865.167	0	0		D	MMBW 800':1" B	800':1"	27	20020525	MRR - Andrew Mullen			10296
MELBOURNE	ME/070	2	3010		318322.748	5810313.718	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10205
MELBOURNE	ME/070	19	3010		319258.259	5811156.479	0	0		D	MMBW 800':1" B	800':1"	19	20020525	MRR - Andrew Mullen			10289
MELBOURNE	ME/070	24	3010		319357.02	5811616.107	0	0		D	MMBW 800':1" B	800':1"	24	20020525	MRR - Andrew Mullen			10294
MELBOURNE	ME/070	26			319397.524	5811834.584	0	0		D	MMBW 800':1" B	800':1"	26	20020617	MRR - Andrew Mullen			12169
MELBOURNE	ME/099	1			319321.365	5811909.639	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10358
	MMS2	1			319385.905	5811876.575	1.5	0	19990101	G			0	0				171001
MELBOURNE	PM/003	2			318124.484	5810910.688	0	0		D	MMBW 800':1" B	800':1"	2	20020529	MRR - Andrew Mullen			9970
MELBOURNE	PM/003	3			318061.23	5810891.672	0	0		D	MMBW 800':1" B	800':1"	3	20020529	MRR - Andrew Mullen			9974
MELBOURNE	PM/003	1			318187.442	5810928.895	0	0		D	MMBW 800':1" B	800':1"	1	20020529	MRR - Andrew Mullen			9975
MELBOURNE	PM/006	3			319259.949	5810018.327	0	0		D	MMBW 800':1" B	800':1"	3	20020617	MRR - Andrew Mullen			11003
MELBOURNE	PM/006	2			319341.229	5810128.785	0	0		D	MMBW 800':1" B	800':1"	2	20020617	MRR - Andrew Mullen			11004
MELBOURNE	PM/006	1			319410.173	5810229.994	0	0		D	MMBW 800':1" B	800':1"	1	20020617	MRR - Andrew Mullen			11005
MELBOURNE	PM/006	8			319209.518	5809912.707	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Scott Black			21715
MELBOURNE	PM/006	7			319207.86	5809797.171	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Scott Black			21716
MELBOURNE	PM/011	2			319048.682	5809794.991	0	0		D	MMBW 800':1" B	800':1"	2	20020526	MRR - Andrew Mullen			9986
MELBOURNE	PM/011	7			319221.318	5809763.008	0	0		D	MMBW 800':1" B	800':1"	7	20020617	MRR - Andrew Mullen			12525
MELBOURNE	PM/011	9			319250.961	5809728.465	0	0		D	MMBW 800':1" B	800':1"	9	20020617	MRR - Andrew Mullen			12526
MELBOURNE	PM/011	2			319066.881	5809800.57	2.5	0	19990101	G			0	0				171073
MELBOURNE	PM/011	8			319251.877	5809748.571	1.4	0	19990101	G			0	0				171077
MELBOURNE	PM/011	1			319102.717	5809756.159	0	0		D	MMBW 800':1" B	800':1"	1	20020526	MRR - Andrew Mullen			9987
MELBOURNE	PM/011	8			319323.327	5809774.715	0	0		D	MMBW 800':1" B	800':1"	8	20020617	MRR - Andrew Mullen			12524

LIST_TITLE	LIST_NUMBE	BOREHOLE_N	MW_ASSET_I	REPORT_NUM	EASTING	NORTHING	SRL	BOREHOLE_D	DRILLED_DA	LOG	SOURCE_PLA	SOURCE_P_1	BOREHOLE_1	DATE_CAPTU	CAPTURED_B	DATE_LAST_	UPDATED_BY	MI_PRINX
MELBOURNE	PM/011	1			319120.875	5809763.568	2.6	0	19990101	G			0	0				171072
SOUTH MELBO	SM/009	1			319052.533	5811196.831	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Scott Black			21726
SOUTH MELBO	SM/009	3			319072.743	5811304.819	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Scott Black			21727
SOUTH MELBO	SM/009	2			319063.953	5811247.861	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Scott Black			21728
SOUTH MELBO	SM/009	4			319088.056	5811371.286	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Scott Black			18796
SOUTH MELBO	SM/015	1			319660.221	5811708.679	0	0		D	MMBW 800':1" B	800':1"	1	20020617	MRR - Andrew Mullen			9672
SOUTH MELBO	SM/015	2			319681.833	5811649.171	0	0		D	MMBW 800':1" B	800':1"	2	20020617	MRR - Andrew Mullen			9673
SOUTH MELBO	SM/015	3			319713.134	5811586.653	0	0		D	MMBW 800':1" B	800':1"	3	20020617	MRR - Andrew Mullen			9674
SOUTH MELBO	SM/015	4			319740.14	5811522.196	0	0		D	MMBW 800':1" B	800':1"	4	20020617	MRR - Andrew Mullen			9675
SOUTH MELBO	SM/018	3			320036.571	5811278.515	0	0		D	MMBW 800':1" B	800':1"	3	20020617	MRR - Andrew Mullen			11001
SOUTH MELBO	SM/018	4			319429.163	5811385.233	0	0		D	MMBW 800':1" B	800':1"	4	20020617	MRR - Andrew Mullen			9676
MELBOURNE	SM/018	5			319380.817	5811639.703	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10554
MELBOURNE	SM/018	6			319395.132	5811773.506	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10555
MELBOURNE	SM/021	0			319340.685	5811652.14	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10498
SOUTH MELBO	SM/068	14			320122.229	5811130.664	0	0		D	MMBW 800':1" B	800':1"	14	20020617	MRR - Andrew Mullen			11417
SOUTH MELBO	SM/068	4			319321.695	5809891.452	0	0		D	MMBW 800':1" B	800':1"	4	20020617	MRR - Andrew Mullen			11784
SOUTH MELBO	SM/068	19			319348.659	5809950.44	0	0		D	MMBW 800':1" B	800':1"	19	20020617	MRR - Andrew Mullen			11786
SOUTH MELBO	SM/068	5			319376.332	5810041.322	0	0		D	MMBW 800':1" B	800':1"	5	20020617	MRR - Andrew Mullen			11787
SOUTH MELBO	SM/068	20			319458.7	5810271.566	0	0		D	MMBW 800':1" B	800':1"	20	20020617	MRR - Andrew Mullen			11789
SOUTH MELBO	SM/068	7			319481.112	5810340.432	0	0		D	MMBW 800':1" B	800':1"	7	20020617	MRR - Andrew Mullen			11790
SOUTH MELBO	SM/068	8			319532.888	5810472.246	0	0		D	MMBW 800':1" B	800':1"	8	20020617	MRR - Andrew Mullen			11791
SOUTH MELBO	SM/068	21			319559.926	5810565.447	0	0		D	MMBW 800':1" B	800':1"	21	20020617	MRR - Andrew Mullen			11792
SOUTH MELBO	SM/068	9			319584.598	5810629.924	0	0		D	MMBW 800':1" B	800':1"	9	20020617	MRR - Andrew Mullen			11793
SOUTH MELBO	SM/068	10			319717.777	5810712.188	0	0		D	MMBW 800':1" B	800':1"	10	20020617	MRR - Andrew Mullen			11794
SOUTH MELBO	SM/068	11			319846.429	5810816.907	0	0		D	MMBW 800':1" B	800':1"	11	20020617	MRR - Andrew Mullen			11795
SOUTH MELBO	SM/068	12			319913.6	5810893.932	0	0		D	MMBW 800':1" B	800':1"	12	20020617	MRR - Andrew Mullen			11796
SOUTH MELBO	SM/068	13			320028.993	5811026.125	0	0		D	MMBW 800':1" B	800':1"	13	20020617	MRR - Andrew Mullen			11797
SOUTH MELBO	SM/068	15			320242.132	5811204.69	0	0		D	MMBW 800':1" B	800':1"	15	20020617	MRR - Andrew Mullen			11798
SOUTH MELBO	SM/068	0			319686.921	5810670.146	0	0		D	MMBW 800':1" B	800':1"	8	20020617	MRR - Andrew Mullen			11804
SOUTH MELBO	SM/068	3			319282.848	5809760.738	0	0		D	MMBW 800':1" B	800':1"	3	20020617	MRR - Andrew Mullen			11783
SOUTH MELBO	SM/068	6			319434.745	5810185.763	0	0		D	MMBW 800':1" B	800':1"	6	20020617	MRR - Andrew Mullen			11788
HOBSONS BAY	HOBSONS BAY MAIN	49			318210.192	5810220.876	0	0		D	MMBW 800':1" B	800':1"	49	20020525	MRR - Andrew Mullen			10207
HOBSONS BAY	HOBSONS BAY MAIN	48			318105.172	5810255.269	0	0		D	MMBW 800':1" B	800':1"	48	20020525	MRR - Andrew Mullen			10208
HOBSONS BAY	HOBSONS BAY MAIN	50			318354.214	5810173.456	0	0		D	MMBW 800':1" B	800':1"	50	20020525	MRR - Andrew Mullen			10209
HOBSONS BAY	HOBSONS BAY MAIN	46			317909.201	5810287.483	0	0		D	MMBW 800':1" B	800':1"	46	20020525	MRR - Andrew Mullen			10211
HOBSONS BAY	HOBSONS BAY MAIN	45			317870.619	5810289.582	0	0		D	MMBW 800':1" B	800':1"	45	20020525	MRR - Andrew Mullen			10212
HOBSONS BAY	HOBSONS BAY MAIN	44			317850.062	5810290.532	0	0		D	MMBW 800':1" B	800':1"	44	20020525	MRR - Andrew Mullen			10213
HOBSONS BAY	HOBSONS BAY MAIN	43			317830.676	5810292.862	0	0		D	MMBW 800':1" B	800':1"	43	20020525	MRR - Andrew Mullen			10214
HOBSONS BAY	HOBSONS BAY MAIN	41			317704.242	5810300.96	0	0		D	MMBW 800':1" B	800':1"	41	20020525	MRR - Andrew Mullen			10216
HOBSONS BAY	HOBSONS BAY MAIN	40			317597.581	5810307.189	0	0		D	MMBW 800':1" B	800':1"	40	20020525	MRR - Andrew Mullen			10217
HOBSONS BAY	HOBSONS BAY MAIN	39			317494.071	5810316.997	0	0		D	MMBW 800':1" B	800':1"	39	20020525	MRR - Andrew Mullen			10218
HOBSONS BAY	HOBSONS BAY MAIN	38			317394.898	5810323.236	0	0		D	MMBW 800':1" B	800':1"	38	20020525	MRR - Andrew Mullen			10219
HOBSONS BAY	HOBSONS BAY MAIN	36			317203.791	5810335.963	0	0		D	MMBW 800':1" B	800':1"	36	20020525	MRR - Andrew Mullen			10221
HOBSONS BAY	HOBSONS BAY MAIN	35			317107.933	5810341.422	0	0		D	MMBW 800':1" B	800':1"	35	20020525	MRR - Andrew Mullen			10222
HOBSONS BAY	HOBSONS BAY MAIN	34			317008.331	5810350.36	0	0		D	MMBW 800':1" B	800':1"	34	20020525	MRR - Andrew Mullen			10223
HOBSONS BAY	HOBSONS BAY MAIN	33			316987.477	5810352.48	0	0		D	MMBW 800':1" B	800':1"	33	20020525	MRR - Andrew Mullen			10224
HOBSONS BAY	HOBSONS BAY MAIN	32			316953.85	5810354.959	0	0		D	MMBW 800':1" B	800':1"	32	20020525	MRR - Andrew Mullen			10225
HOBSONS BAY	HOBSONS BAY MAIN	31			316926.804	5810358.949	0	0		D	MMBW 800':1" B	800':1"	31	20020525	MRR - Andrew Mullen			10226
HOBSONS BAY	HOBSONS BAY MAIN	30			316905.942	5810361.078	0	0		D	MMBW 800':1" B	800':1"	30	20020525	MRR - Andrew Mullen			10227
HOBSONS BAY	HOBSONS BAY MAIN	29			316879.555	5810364.238	0	0		D	MMBW 800':1" B	800':1"	29	20020525	MRR - Andrew Mullen			10228
HOBSONS BAY	HOBSONS BAY MAIN	28			316857.621	5810366.867	0	0		D	MMBW 800':1" B	800':1"	28	20020525	MRR - Andrew Mullen			10229
HOBSONS BAY	HOBSONS BAY MAIN	27			316803.248	5810375.645	0	0		D	MMBW 800':1" B	800':1"	27	20020525	MRR - Andrew Mullen			10230
HOBSONS BAY	HOBSONS BAY MAIN	26			316719.338	5810386.453	0	0		D	MMBW 800':1" B	800':1"	26	20020525	MRR - Andrew Mullen			10231
HOBSONS BAY	HOBSONS BAY MAIN	25			316701.502	5810388.603	0	0		D	MMBW 800':1" B	800':1"	25	20020525	MRR - Andrew Mullen			10232
HOBSONS BAY	HOBSONS BAY MAIN	24			316682.883	5810390.482	0	0		D	MMBW 800':1" B	800':1"	24	20020525	MRR - Andrew Mullen			10233
HOBSONS BAY	HOBSONS BAY MAIN	23			316662.243	5810394.462	0	0		D	MMBW 800':1" B	800':1"	23	20020525	MRR - Andrew Mullen			10234
HOBSONS BAY	HOBSONS BAY MAIN	22			316604.827	5810399.83	0	0		D	MMBW 800':1" B	800':1"	22	20020525	MRR - Andrew Mullen			10235
HOBSONS BAY	HOBSONS BAY MAIN	21			316564.777	5810405.379	0	0		D	MMBW 800':1" B	800':1"	21	20020525	MRR - Andrew Mullen			10236
HOBSONS BAY	HOBSONS BAY MAIN	20			316505.11	5810414.038	0	0		D	MMBW 800':1" B	800':1"	20	20020525	MRR - Andrew Mullen			10237
HOBSONS BAY	HOBSONS BAY MAIN	47			318013.75	5810280.484	0	0		D	MMBW 800':1" B	800':1"	47	20020525	MRR - Andrew Mullen			10210
HOBSONS BAY	HOBSONS BAY MAIN	42			317810.613	5810293.752	0	0		D	MMBW 800':1" B	800':1"	42	20020525	MRR - Andrew Mullen			10215
HOBSONS BAY	HOBSONS BAY MAIN	37			317300.375	5810330.424	0	0		D	MMBW 800':1" B	800':1"	37	20020525	MRR - Andrew Mullen			10220
MELBOURNE	ME/024	2			317950.232	5810535.483	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10451
MELBOURNE	ME/024	3			317959.864	5810477.385	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10452
MELBOURNE	ME/024	6			318025.831	5810405.949	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10454
MELBOURNE	ME/024	7			317983.158	5810375.025	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10455
MELBOURNE	ME/024	8			318037.87	5810305.989	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10456
MELBOURNE	ME/024	4			318110.252	5810532.754	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10457
MELBOURNE	ME/024	5			318046.561	5810470.506	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10453
MELBOURNE	ME/024	1			318055.631	5810594.811	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10458
MELBOURNE	ME/027	6			317709.42	5810496.651	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10377
MELBOURNE	ME/027	3			317645.638	5810489.053	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10378
MELBOURNE	ME/027	7			317773.243	5810502.42	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10379
MELBOURNE	ME/027	5			317735.081	5810400.42	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10380
MELBOURNE	ME/027	2			317637.854	5810407.519	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10381
MELBOURNE	ME/027	1			317630.73	5810335.453	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10382
MELBOURNE	ME/027	4			317721.22	5810329.175	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10383
MELBOURNE	ME/027	9			317822.463	5810323.876	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10384
MELBOURNE	ME/027	10			317928.587	5810314.947	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10385
MELBOURNE	ME/027	11			317926.798	5810388.832	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10386
MELBOURNE	ME/027	8			317834.642	5810393.802	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10387
MELBOURNE	ME/027	12			317988.155	5810329.834	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10388
MELBOURNE	ME/034	4			318200.569	5810478.585	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10322
MELBOURNE	ME/034	5			318053.38	5810652.01	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10323
MELBOURNE	ME/034	6			317879.837	5810693.062	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10324
MELBOURNE	ME/034	7			317683.709	5810716.077	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10325
MELBOURNE	ME/034	8			317473.58	5810741.262	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10326
MELBOURNE	ME/034	9			317282.457	5810763.178	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10327
MELBOURNE	ME/034	10			317082.263	5810788.582	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10328
MELBOURNE	ME/034	11			316881.641	5810811.938	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10329
MELBOURNE	ME/034	13			316478.748	5810859.519	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10330
MELBOURNE	ME/035	21			318247.933	5809786.363	0	0		D	MMBW 800':1" B	800':1"	21	20020525	MRR - Andrew Mullen			10271
MELBOURNE	ME/035	22			318127.23	5809833.334	0	0		D	MMBW 800':1" B	800':1"	22	20020525	MRR - Andrew Mullen			10272
MELBOURNE	ME/035	23			318113.196	5809835.983	0	0		D	MMBW 800':1" B	800':1"	23	20020525	MRR - Andrew Mullen			10273
MELBOURNE	ME/035	24			317930.879	5809861.208	0	0		D	MMBW 800':1" B	800':1"	24	20020525	MRR - Andrew Mullen			10274
MELBOURNE	ME/035	26			317789.768	5809889.593	0	0		D	MMBW 800':1" B	800':1"	26	20020525	MRR - Andrew Mullen			10275
MELBOURNE	ME/035	25			317842.904	5810063.207	0	0		D	MMBW 800':1" B	800':1"	25	20020525	MRR - Andrew Mullen			10276
MELBOURNE	ME/035	27			317578.847	5809938.493	0	0		D	MMBW 800':1" B	800':1"	27	20020525	MRR - Andrew Mullen			10277
MELBOURNE	ME/035	28			317273.634	5809970.536	0	0		D	MMBW 800':1" B	800':1"	28	20020525	MRR - Andrew Mullen			10278
MELBOURNE	ME/046	9			316891.982	5811156.169	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10186
MELBOURNE	ME/046	8			317014.911	5811188.793	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10187
MELBOURNE	ME/046	7			317136.612	5811221.836	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10188
MELBOURNE	ME/046	3			317272.958	5810941.042	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10446
MELBOURNE	ME/046	4			317222.946	5811113.457	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10447
MELBOURNE	ME/046	2			317331.899	5810697.211	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10449
MELBOURNE	ME/046	1			317386.462	5810502.45	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10450
MELBOURNE	ME/046	5			317184.422	5811241.762	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10448
MELBOURNE	ME/054	2			317131.17	5810270.096	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10573
MELBOURNE	ME/054	8			317155.808	5810052.349	0	0		D	MMBW 800':1" B	800':1"	8	20020525	MRR - Andrew Mullen			10574
MELBOURNE	ME/054	9			317053.329	5810057.379	0	0		D	MMBW 800':1" B	800':1"	9	20020525	MRR - Andrew Mullen			10575
MELBOURNE	ME/054	10			317094.121	5810128.915	0	0		D	MMBW 800':1" B	800':1"	10	20020525	MRR - Andrew Mullen			10576
MELBOURNE	ME/054	11			317026.241	5810194.182	0	0		D	MMBW 800':1" B	800':1"	11	20020525	MRR - Andrew Mullen			10577
MELBOURNE	ME/054	1			316978.827	5810309.269	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10578
MELBOURNE	ME/054	22			316874.039	5810281.604	0	0		D	MMBW 800':1" B	800':1"	22	20020525	MRR - Andrew Mullen			10579
MELBOURNE	ME/054	12			316922.228	5810206.639	0	0		D	MMBW 800':1" B	800':1"	12	20020525	MRR - Andrew Mullen			10580
MELBOURNE	ME/054	15			316836.182	5810049.421	0	0		D	MMBW 800':1" B	800':1"	15	20020525	MRR - Andrew Mullen			10581
MELBOURNE	ME/054	13			316840.659	5810157.689	0	0		D	MMBW 800':1" B	800':1"	13	20020525	MRR - Andrew Mullen			10582
MELBOURNE	ME/054	21			316752.387	5810250.44	0	0		D	MMBW 800':1" B	800':1"	21	20020525	MRR - Andrew Mullen			10583
MELBOURNE	ME/054	20			316639.732	5810221.106	0	0		D	MMBW 800':1" B	800':1"	20	20020525	MRR - Andrew Mullen			10584
MELBOURNE	ME/054	19			316670.077	5810155.379	0	0		D	MMBW 800':1" B	800':1"	19	20020525	MRR - Andrew Mullen			10585
MELBOURNE	ME/054	18			316678.191	5810094.821	0	0		D	MMBW 800':1" B	800':1"	18	20020525	MRR - Andrew Mullen			10586
MELBOURNE	ME/054	17			316615.267	5810008.899	0	0		D	MMBW 800':1" B	800':1"	17	20020525	MRR - Andrew Mullen			10587
MELBOURNE	ME/054	14			316890.91	5810105.329	0	0		D	MMBW 800':1" B	800':1"	14	20020525	MRR - Andrew Mullen			10589
MELBOURNE	ME/054	0			317473.522	5810231.644	0	0		D	MMBW 800':1" B	800':1"	0	20020525	MRR - Andrew Mullen			10568
MELBOURNE	ME/054	4			317388.787	5810246.671	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10569
MELBOURNE	ME/054	6			317369.657	5810146.441	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10570
MELBOURNE	ME/054	7			317271.663	5810071.436	0	0		D	MMBW 800':1" B	800':1"	7	20020525	MRR - Andrew Mullen			10571
MELBOURNE	ME/054	3			317249.861	5810259.089	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10572
MELBOURNE	ME/054	16			316749.064	5810035.703	0	0		D	MMBW 800':1" B	800':1"	16	20020525	MRR - Andrew Mullen			10588
MELBOURNE	ME/070	1	3010		318250.201	5810253.3	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10206
MELBOURNE	ME/076	1			317461.087	5810380.854	0	0		D	MMBW 800':1" B	800':1"	1	20020529	MRR - Andrew Mullen			9976
MELBOURNE	ME/076	3			317435.467	5810478.305	0	0		D	MMBW 800':1" B	800':1"	3	20020529	MRR - Andrew Mullen			9978
MELBOURNE	ME/076	4			317379.799	5810538.093	0	0		D	MMBW 800':1" B	800':1"	4	20020529	MRR - Andrew Mullen			9979
MELBOURNE	ME/076	5			317360.644	5810591.422	0	0		D	MMBW 800':1" B	800':1"	5	20020529	MRR - Andrew Mullen			9980
MELBOURNE	ME/076	9			317243.998	5810672.296	0	0		D	MMBW 800':1" B	800':1"	9	20020529	MRR - Andrew Mullen			9981
MELBOURNE	ME/076	7			317156.204	5810533.154	0	0		D	MMBW 800':1" B	800':1"	7	20020529	MRR - Andrew Mullen			9983
MELBOURNE	ME/076	6			317255.979	5810559.139	0	0		D	MMBW 800':1" B	800':1"	6	20020529	MRR - Andrew Mullen			9984
MELBOURNE	ME/076	8			317304.952	5810691.212	0	0		D	MMBW 800':1" B	800':1"	8	20020529	MRR - Andrew Mullen			9985
MELBOURNE	ME/076	2			317448.537	5810423.016	0	0		D	MMBW 800':1" B	800':1"	2	20020529	MRR - Andrew Mullen			9977
MELBOURNE	ME/076	10			317185.848	5810653.76	0	0		D	MMBW 800':1" B	800':1"	10	20020529	MRR - Andrew Mullen			9982
MELBOURNE	PM/003	7			317956.194	5811078.235	0	0		D	MMBW 800':1" B	800':1"	7	20020529	MRR - Andrew Mullen			9971
MELBOURNE	PM/003	6			317971.927	5811014.328	0	0		D	MMBW 800':1" B	800':1"	6	20020529	MRR - Andrew Mullen			9972
MELBOURNE	PM/003	5			317986.465	5810947.351	0	0		D	MMBW 800':1" B	800':1"	5	20020529	MRR - Andrew Mullen			9973
MELBOURNE	PM/007	4			317398.567	5811218.017	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Andrew Mullen			10562
MELBOURNE	PM/007	2			317230.038	5811156.779	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Andrew Mullen			10563
MELBOURNE	PM/007	3			317218.568	5811184.684	0	0		D	MMBW 800':1" B	800':1"	3	20020525	MRR - Andrew Mullen			10564
MELBOURNE	PM/007	1			317198.794	5811138.313	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Andrew Mullen			10565
MELBOURNE	PM/007	5			317544.28	5811247.681	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Andrew Mullen			10566
MELBOURNE	PM/007	6			317614.287	5811270.256	0	0		D	MMBW 800':1" B	800':1"	6	20020525	MRR - Andrew Mullen			10567
MELBOURNE	PM/008	5			318255.66	5809771.316	0	0		D	MMBW 800':1" B	800':1"	5	20020525	MRR - Scott Black			21724
MELBOURNE	PM/008	4			318241.889	5809749.88	0	0		D	MMBW 800':1" B	800':1"	4	20020525	MRR - Scott Black			21723
MELBOURNE	PM/009	1			317823.32	5810499.281	0	0		D	MMBW 800':1" B	800':1"	1	20020525	MRR - Scott Black			21713
MELBOURNE	PM/009	2			317807.323	5810594.512	0	0		D	MMBW 800':1" B	800':1"	2	20020525	MRR - Scott Black			21714

bore_id	bore_code	parish_nam	parish_cod	bore_autho	bore_aut_1	rigno	monitoring	monitori_1	zone	longitude	latitude_g	mga_eastin	mga_northi	datecomp	constructe	rlns	boretype	uses1	uses2	uses3	driller	drillmth	initial_sw	initial_ec	land_use	site_desc	casing_sta	headworks_	collar	initial_td	source	digitised_	bore_licen	alt_source	bore_comme	local_bore	location_a	oldid
4021794	129510							N	55	144.937	-37.823	318426.17	5811792.16	6/12/1996	5		Groundwater		Groundwat		NOT KNOWN	Hand Auger						0				1.97						
4107239	78466							N	55	144.913	-37.824	316363.167	5811644.16	31/12/1983	40		Groundwater				TROSHEN R F	Rotary						0				2.31						
4107241	78468							N	55	144.917	-37.825	316713.167	5811554.16	17/05/1983	42		Groundwater				TURNBULL L A	Rotary Mud						0				3.34						
4107242	78469							N	55	144.927	-37.839	317633.167	5810004.16	31/05/1988	9999.99		Groundwater				TROSHEN R F	Not Known						0				1.96						
4107249	78475							N	55	144.92	-37.839	316933.166	5810044.16	28/02/1990	20		Groundwater				AQUA DRILLING	Cable Tool, Percussion						0				2.06						
4107250	78476							N	55	144.938	-37.837	318538.169	5810264.16	18/02/1990	15		Groundwater				AQUA DRILLING	Cable Tool, Percussion						0				1.84						
4107251	78477							N	55	144.927	-37.835	317593.168	5810519.16	17/02/1990	14		Groundwater				AQUA DRILLING	Cable Tool, Percussion						0				2.81						
4107305	78526							N	55	144.942	-37.836	318895.169	5810394.16	1/01/1988	4.1		Groundwater				NOT KNOWN	Not Known						0				2.25						
4133977	0							N	55	144.924	-37.837	317362.167	5810285.16	<Null>	8		Groundwater				NOT KNOWN							0				2.37						
4136131	0							N	55	144.95	-37.826	319560	5811510	<Null>	20		Groundwater				NOT KNOWN							0				2.3						
4136132	0							N	55	144.95	-37.826	319610	5811495	<Null>	20		Groundwater				NOT KNOWN							0				2.33						
4136133	0							N	55	144.951	-37.826	319660	5811480	<Null>	20		Groundwater				NOT KNOWN							0				0.39						
4136245	0							N	55	144.946	-37.829	319237	5811204	15/12/2006	25		Groundwater				UNKNOWN							0				2.01						
4136246	0							N	55	144.947	-37.829	319353	5811184	15/12/2006	25		Groundwater				UNKNOWN							0				2.01						
4136247	0							N	55	144.947	-37.829	319301	5811193	15/12/2006	25		Groundwater				UNKNOWN							0				2						
4136248	0							N	55	144.946	-37.829	319254	5811147	15/12/2006	25		Groundwater				UNKNOWN							0				2.17						
4136249	0							N	55	144.946	-37.83	319280	5811103	15/12/2006	25		Groundwater				UNKNOWN							0				2.33						
4136250	0							N	55	144.947	-37.83	319297	5811078	15/12/2006	25		Groundwater				UNKNOWN							0				2.4						
4136251	0							N	55	144.947	-37.829	319343	5811122	15/12/2006	25		Groundwater				UNKNOWN							0				2.19						
4136252	0							N	55	144.947	-37.829	319304	5811141	15/12/2006	25		Groundwater				UNKNOWN							0				2.15						
4136253	0							N	55	144.947	-37.83	319295	5811114	15/12/2006	25		Groundwater				UNKNOWN							0				2.23						
4136254	0							N	55	144.947	-37.829	319348	5811150	15/12/2006	25		Groundwater				UNKNOWN							0				2.06						
4136918	0							N	55	144.933	-37.839	318151	5810012	<Null>	25		Groundwater				NOT KNOWN							0				2.73						
4137543	0							N	55	144.939	-37.835	318645	5810478	<Null>	25		Groundwater				NOT KNOWN							0				2.47						
4137646	0							N	55	144.937	-37.84	318485	5809979	<Null>	25		Groundwater				NOT KNOWN							0				3.21						
4137669	0							N	55	144.934	-37.834	318217	5810578	<Null>	25		Groundwater				NOT KNOWN							0				2.69						
4138089	0							N	55	144.936	-37.842	318394	5809724	<Null>	25		Groundwater				NOT KNOWN							0				2.61						
4138517	0							N	55	144.936	-37.824	318309	5811692	<Null>	25		Groundwater				NOT KNOWN							0				2.46						
4139141	0							N	55	144.925	-37.827	317400	5811396	<Null>	30		Groundwater				NOT KNOWN							0				3.45						
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4144131	0							N	55	144.915	-37.827	316460	5811340	9/07/2009	6		Groundwater				MERARI MIKE	Mechanical Auger						0				3.36						
4144173	0							N	55	144.915	-37.833	316528	5810667	<Null>	25		Groundwater				NOT KNOWN							0				3.02						
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4107220	78447							N	55	144.932	-37.84	318013.168	5809939.16	19/04/1973	5.48		Groundwater	Domestic	Stock		LITTLECHILD W A	Not Known						0				2.23						
4107230	78458							N	55	144.927	-37.835	317587.168	5810429.16	6/04/2005	4		Groundwater	Domestic	Stock		BARWALD SIMON	Jet Cable Tool, Percussion						0				2.91						
4107231	78459							N	55	144.934	-37.834	318223.169	5810558.16	4/03/1983	5		Groundwater	Domestic			AUSTEN R E M	Mechanical Auger						0				2.42						
4107234	78461							N	55	144.936	-37.841	318406.168	5809820.16	18/02/1983	6.71		Groundwater	Domestic			PALMER G T	Hand Auger						0				3.71						
4107236	78463							N	55	144.926	-37.837	317467.167	5810223.16	24/01/1983	3		Groundwater	Domestic			DONCHI R P	Hand Auger						0				2.55						
4107237	78464							N	55	144.939	-37.838	318639.169	5810138.16	24/11/1982	6		Groundwater	Domestic	Stock		TROSHEN R F	Hand Auger						0				2.52						
4107240	78467							N	55	144.929	-37.835	317723.168	5810424.16	25/03/1986	4		Groundwater	Domestic			FRANCIS D	Jet Cable Tool, Percussion						0				2.4						
4107248	78474							N	55	144.938	-37.834	318523.169	5810654.16	10/08/1987	8.5		Groundwater	Domestic			MARRA A P	Rotary						0				2.08						
4154662	0							N	55	144.934	-37.838	318196	5810109	15/05/2007	6		SPN	Domestic and Stock	Irrigation		NOT KNOWN	Mechanical Auger						0				2						
4135390	0							N	55	144.936	-37.834	318346	5810634	11/04/2006	5		Groundwater	Domestic and Stock			NOT KNOWN	Mechanical Auger						0				2.34						
4135539	0							N	55	144.947	-37.823	319282	5811806	14/07/2006	10		Groundwater	Domestic and Stock			STRUTTON LEE	Mechanical Auger						0				0.4						
4135793	0							N	55	144.957	-37.826	320184	5811498	5/09/2006	4		Groundwater	Domestic and Stock			SING BRIAN	Mechanical Auger						0				0.77						
4135794	0							N	55	144.957	-37.826	320184	5811498	5/09/2006	4		Groundwater	Domestic and Stock			SING BRIAN	Mechanical Auger						0				0.77						
4136314	0							N	55	144.947	-37.82	319343	5812122	4/12/2006	5		Groundwater	Domestic and Stock			JEREMY NG	Mechanical Auger						0				2.27						
4136315	0							N	55	144.947	-37.82	319343	5812122	4/12/2006	5		Groundwater	Domestic and Stock			JEREMY NG	Mechanical Auger						0				2.27						
4138979	0							N	55	144.939	-37.84	318623	5809904	25/07/2007	7		Groundwater	Domestic and Stock			NOT KNOWN	Mechanical Auger						0				3.05						
4138980	0							N	55	144.939	-37.84	318623	5809904	25/07/2007	7		Groundwater	Domestic and Stock			NOT KNOWN	Mechanical Auger						0				3.05						
4140488	0							N	55	144.928	-37.839	317720	5810065	3/06/2008	9		Groundwater	Domestic and Stock			NOT KNOWN	Cable Tool, Percussion						0				3.04						
4141209	0							N	55	144.933	-37.84	318154	5809977	29/05/2008	9		Groundwater	Domestic and Stock			NOT KNOWN	Not Known						0				2.88						
4012957	115493							N	55	144.951	-37.831	319705.171	5810924.16	11/01/1993	5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				2.25						
4012958	115494							N	55	144.952	-37.832	319728.171	5810886.16	11/01/1993	5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				1.97						
4012959	115495							N	55	144.951	-37.832	319713.171	5810902.16	11/01/1993	5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				2.18						
4013238	115822							N	55	144.951	-37.832	319714.171	5810899.16	20/02/1993	5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				2.17						
4013239	115823							N	55	144.951	-37.831	319705.171	5810919.16	20/02/1993	5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				2.23						
4013240	115824							N	55	144.951	-37.832	319726.171	5810884.16	20/02/1993	5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				1.97						
4013260	115846							N	55	144.92	-37.828	316908.167	5811174.16	31/05/1993	4.5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				3.68						
4013261	115847							N	55	144.919	-37.829	316887.167	5811171.16	31/05/1993	4.5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				3.84						
4013262	115848							N	55	144.919	-37.828	316899.167	5811178.16	31/05/1993	4.5		Groundwater	Groundwater Investigation			WEBB G C	Mechanical Auger						0				3.66						
4016158	119966							N	55	144.938	-37.831	318533.169	5810924.16	11/06/1992	6		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				3						
4016534	120507							N	55	144.957	-37.829	320213.172	5811224.16	12/11/1993	4		Groundwater	Groundwater Investigation			TURNBULL L A	Hand Auger						0				2.74						
4016535	120508							N	55	144.957	-37.829	320218.172	5811209.16	12/11/1993	4		Groundwater	Groundwater Investigation			TURNBULL L A	Hand Auger						0				3.44						

bore_id	bore_code	parish_nam	parish_cod	bore_autho	bore_aut_1	rigno	monitoring	monitori_1	zone	longitude	latitude_g	mga_eastin	mga_northi	datecomp	constructe	rlns	boretype	uses1	uses2	uses3	driller	drillmth	initial_sw	initial_ec	land_use	site_desc	casing_sta	headworks_	collar	initial_td	source	digitised	bore_licen	alt_source	bore_comme	local_bore	location_a	oldid
4016536	120509							N	55	144.957	-37.829	320193.172	5811204.16	12/11/1993	6		Groundwater	Groundwater Investigation			TURNBULL L A	Hand Auger						0				2.7						
4017233	121463							N	55	144.955	-37.826	319993.172	5811564.16	21/02/1994	6		Groundwater	Groundwater Investigation			RULE MARK	Hand Auger						0				3.92						
4017234	121464							N	55	144.954	-37.825	319963.172	5811664.16	21/02/1994	2.7		Groundwater	Groundwater Investigation			RULE MARK	Hand Auger						0				2.72						
4017235	121465							N	55	144.954	-37.826	319893.172	5811499.16	21/02/1994	2.5		Groundwater	Groundwater Investigation			RULE MARK	Hand Auger						0				3.74						
4019396	125097							N	55	144.941	-37.836	318848.169	5810344.16	2/12/1994	9		Groundwater	Groundwater Investigation			WAGER J	Mechanical Auger						0				2.35						
4019397	125098							N	55	144.942	-37.836	318923.17	5810374.16	2/12/1994	9		Groundwater	Groundwater Investigation			WAGER J	Mechanical Auger						0				2.36						
4019398	125099							N	55	144.942	-37.837	318893.169	5810314.16	2/12/1994	9		Groundwater	Groundwater Investigation			WAGER J	Mechanical Auger						0				2.15						
4019498	125468							N	55	144.95	-37.83	319583.171	5811044.16	25/08/1994	4		Groundwater	Groundwater Investigation			BARTLETT W L	Mechanical Auger						0				1.39						
4019499	125469							N	55	144.95	-37.83	319558.171	5811024.16	25/08/1994	4		Groundwater	Groundwater Investigation			BARTLETT W L	Mechanical Auger						0				1.26						
4019500	125470							N	55	144.949	-37.831	319513.171	5810984.16	25/08/1994	4		Groundwater	Groundwater Investigation			BARTLETT W L	Mechanical Auger						0				1.68						
4019501	125471							N	55	144.95	-37.831	319618.171	5810934.16	25/08/1994	5		Groundwater	Groundwater Investigation			BARTLETT W L	Mechanical Auger						0				1.74						
4019912	126320							N	55	144.958	-37.823	320238.172	5811814.16	5/11/1993	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				2.2						
4019913	126321							N	55	144.958	-37.823	320238.172	5811814.16	5/11/1993	6		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				2.2						
4019914	126322							N	55	144.959	-37.823	320323.172	5811864.16	5/11/1993	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				2.51						
4019915	126323							N	55	144.959	-37.823	320323.172	5811864.16	5/11/1993	5.9		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				2.51						
4019916	126324							N	55	144.958	-37.825	320258.172	5811659.16	5/11/1993	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				0.76						
4019917	126325							N	55	144.958	-37.825	320258.172	5811659.16	5/11/1993	6.1		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				0.76						
4019918	126326							N	55	144.959	-37.824	320358.172	5811759.16	5/11/1993	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.2						
4019919	126327							N	55	144.959	-37.824	320358.172	5811759.16	5/11/1993	6.05		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.2						
4019922	126330							N	55	144.957	-37.826	320153.172	5811574.16	4/11/1993	10.17		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.31						
4019923	126331							N	55	144.957	-37.825	320163.172	5811622.16	4/11/1993	26.45		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.14						
4019924	126332							N	55	144.957	-37.825	320163.172	5811624.16	4/11/1993	8.5		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.12						
4019925	126333							N	55	144.959	-37.824	320355.172	5811716.16	4/11/1993	25.95		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.09						
4019926	126334							N	55	144.959	-37.824	320353.172	5811719.16	4/11/1993	8.6		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				1.16						
4019927	126335							N	55	144.959	-37.825	320373.172	5811694.16	4/11/1993	8.5		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				0.78						
4019931	126339							N	55	144.958	-37.823	320243.172	5811809.16	<Null>	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				2.11						
4019932	126340							N	55	144.959	-37.823	320328.172	5811854.16	<Null>	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				2.41						
4019933	126341							N	55	144.958	-37.825	320253.172	5811654.16	<Null>	15		Groundwater	Groundwater Investigation			WEBB G C	Rotary						0				0.82						
4021791	129507							N	55	144.936	-37.824	318308.17	5811687.16	6/12/1996	5		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				2.44						
4021792	129508							N	55	144.937	-37.824	318411.17	5811692.16	6/12/1996	5		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				2.24						
4021793	129509							N	55	144.935	-37.823	318268.17	5811786.16	6/12/1996	5		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				3.14						
4021795	129511							N	55	144.936	-37.823	318373.17	5811819.16	17/12/1996	4.5		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				2.22						
4027482	140099							N	55	144.956	-37.827	320097.172	5811435.16	19/07/1999	4		Groundwater	Groundwater Investigation			SCOFFERN D	Rotary Air						0				1.15						
4027484	140100							N	55	144.956	-37.827	320086.172	5811393.16	17/08/1999	4		Groundwater	Groundwater Investigation			DAMON SCOFFERN	Not Known						0				1.4						
4027485	140101							N	55	144.942	-37.839	318881.169	5810029.16	29/08/1999	4		Groundwater	Groundwater Investigation			DAMON SCOFFERN	Not Known						0				2.25						
4027486	140102							N	55	144.942	-37.839	318916.169	5810064.16	29/08/1999	4		Groundwater	Groundwater Investigation			DAMON SCOFFERN	Not Known						0				2.4						
4027487	140103							N	55	144.942	-37.839	318886.169	5810051.16	29/08/1999	4		Groundwater	Groundwater Investigation			DAMON SCOFFERN	Not Known						0				2.54						
4029239	142502							N	55	144.949	-37.821	319463.172	5812024.16	30/05/1997	6		Groundwater	Groundwater Investigation			FRY I G	Hand Auger						0				2.99						
4029240	142503							N	55	144.949	-37.822	319483.171	5811944.16	30/05/1997	6		Groundwater	Groundwater Investigation			FRY I G	Hand Auger						0				1.96						
4029241	142504							N	55	144.949	-37.821	319513.172	5812054.16	30/05/1997	6		Groundwater	Groundwater Investigation			FRY I G	Hand Auger						0				2.49						
4029252	142515							N	55	144.947	-37.841	319363.17	5809794.16	27/08/1997	6		Groundwater	Groundwater Investigation			HANNAKER CHRIS A	Hand Auger						0				1.68						
4029253	142516							N	55	144.947	-37.841	319363.17	5809794.16	27/08/1997	6		Groundwater	Groundwater Investigation			HANNAKER CHRIS A	Hand Auger						0				1.68						
4029254	142517							N	55	144.947	-37.841	319363.17	5809794.16	27/08/1997	6		Groundwater	Groundwater Investigation			HANNAKER CHRIS A	Hand Auger						0				1.68						
4029347	142622							N	55	144.909	-37.829	316001.166	5811066.16	18/03/1998	8		Groundwater	Groundwater Investigation			BARNES S	Hand Auger						0				3.62						
4029348	142623							N	55	144.908	-37.828	315933.166	5811153.16	18/03/1998	8		Groundwater	Groundwater Investigation			BARNES S	Hand Auger						0				3.77						
4029349	142624							N	55	144.911	-37.827	316137.166	5811295.16	19/03/1998	7.5		Groundwater	Groundwater Investigation			BARNES S	Hand Auger						0				3.86						
4029350	142625							N	55	144.911	-37.829	316132.166	5811067.16	19/03/1998	7.5		Groundwater	Groundwater Investigation			BARNES S	Hand Auger						0				3.4						
4029351	142626							N	55	144.911	-37.828	316195.166	5811003.16	20/03/1998	7.5		Groundwater	Groundwater Investigation			BARNES S	Hand Auger						0				3.44						
4029958	143602							N	55	144.935	-37.823	318273.17	5811798.16	18/01/2001	5		Groundwater	Groundwater Investigation			HANNAKER CHRIS A	Down-Hole Hammer Percu						0				3.21						
4029959	143604							N	55	144.935	-37.823	318277.17	5811789.16	18/01/2001	5		Groundwater	Groundwater Investigation			HANNAKER CHRIS A	Down-Hole Hammer Percu						0				3.15						
4107202	78208					3/89/1		N	55	144.934	-37.825	318173.169	5811644.16	1/02/1989	36		Groundwater	Groundwater Investigation			CLARK B	Rotary						0				3.4						
4107252	78478							N	55	144.925	-37.839	317388.167	5810007.16	24/04/1990	9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.8						
4107253	78479							N	55	144.926	-37.838	317478.167	5810114.16	26/04/1990	9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.76						
4107255	78480							N	55	144.927	-37.837	317588.167	5810204.16	26/04/1990	9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.79						
4107256	78481							N	55	144.929	-37.837	317763.168	5810294.16	24/04/1990	8.5		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.52						
4107257	78482							N	55	144.93	-37.837	317858.168	5810234.16	20/04/1990	8		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.25						
4107258	78483							N	55	144.931	-37.837	317963.168	5810219.16	19/04/1990	9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.51						
4107259	78484							N	55	144.932	-37.838	318063.168	5810139.16	18/04/1990	9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.64						
4107260	78485							N	55	144.931	-37.839	317947.168	5810034.16	11/04/1990	10		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.82						
4107261	78486							N	55	144.931	-37.84	317943.168	5809914.16	23/04/1990	6		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.84						
4107262	78487							N	55	144.93	-37.84	317863.168	5809889.16	23/04/1990	7		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				4.44						
4107263	78488							N	55	144.912	-37.831	316205.166	5810916.16	12/08/1986	5.1		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.51						
4107264	78489							N	55	144.912	-37.831	316205.166	5810914.16	12/08/1986	7.1		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.46						
4107266	78490							N	55	144.91	-37.833	316091.166	5810612.16	13/08/1986	4.2		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				2.2						
4107267	78491							N	55	144.91	-37.833	316093.166	5810612.16	13/08/1986	6.5		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				2.2						
4107268	78492							N	55	144.909	-37.832	315945.166	5810777.16	8/08/1986	5		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.26						
4107269	78493							N	55	144.908	-37.832	315943.166	5810775.16	8/08/1986	7		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.32						
4107270	78494							N	55	144.908	-37.832	315942.166	5810774.16	13/08/1986	8.5		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.28						
4107271	78495							N	55	144.908	-37.832	315940.166	5810773.16	13/08/1986	8.5		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.22						
4107272	78496							N	55	144.908	-37.833	315887.165	5810604.16	12/08/1986	3.8		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				1.71						
4107273	78497							N	55	144.905	-37.833	315613.165	5810679.16	6/08/1986	5.5		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.37						
4107274	78498							N	55	144.905	-37.833	315615.165	5810678.16	6/08/1986	8		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.4						
4107275	78499							N	55	144.906	-37.831	315701.165	5810874.16	6/08/1986	6.2		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.73						
4107277	78500							N	55	144.906	-37.831	315700.165	5810871.16	7/08/1986	7.5		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.68						
4107278	78501							N	55	144.906	-37.831	315699.165	5810871.16	7/08/1986	9		Groundwater	Groundwater Investigation			TURNBULL L A	Cable Tool, Percussion						0				3.6						
4107279	78502							N	55	144.927	-37.839	317565.167	5809973.16	29/05/1990	3.5		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.27						
4107281	78504							N	55	144.927	-37.84	317603.167	5809953.16	31/05/1990	4		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				4.33						
4107282	78505							N	55	144.928	-37.839	317643.167	5810001.16	31/05/1990	4		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.87						
4107283	78506							N	55	144.927	-37.839	317592.167	5810001.16	31/05/1990	4.5		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.23						
4107284	78507							N	55	144.927	-37.839	317563.167	5810034.16	1/06/1990	3.7		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.49						
4107285	78508							N	55	144.927	-37.838	317593.167	5810087.16	1/06/1990	3.6		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.89						
4107286	78509							N	55	144.928	-37.839	317642.167	5810055.16	1/06/1990	4		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.58						
4107288	78510							N	55	144.928	-37.839	317704.167	5810034.16	4/06/1990	4.5		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.68						
4107289	78511							N	55	144.928	-37.839	317683.167	5809984.16	4/06/1990	4.2		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.38						
4107290	78512							N	55	144.928	-37.838	317653.167	5810097.16	5/06/1990	3.6		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.69						
4107291	78513							N	55	144.927	-37.838	317544.167	5810084.16	5/05/1990	3.4		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.86						
4107292	78514							N	55	144.927	-37.838	317582.167	5810144.16	8/06/1990	3		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				3.03						
4107293	78515							N	55	144.929	-37.837	317758.168	5810203.16	8/08/1990	3.5		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				3.06						
4107294	78516							N	55	144.93	-37.84	317815.168	5809933.16	8/08/1990	4.1		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.45						
4107295	78517							N	55	144.929	-37.839	317765.167	5809976.16	13/06/1990	3.9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.08						
4107296	78518							N	55	144.929	-37.839	317734.167	5809985.16	13/06/1990	4.2		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.5						
4107297	78519							N	55	144.929	-37.839	317807.168	5810000.16	13/06/1990	3.5		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.48						
4107299	78520							N	55	144.93	-37.839	317814.168	5810046.16	14/06/1990	3.6		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.91						
4107300	78521							N	55	144.929	-37.839	317764.168	5810065.16	14/06/1990	3.4		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.35						
4107301	78522							N	55	144.93	-37.838	317841.168	5810096.16	14/06/1990	4.2		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				2.08						
4107302	78523							N	55	144.928	-37.84	317662.167	5809944.16	15/06/1990	3.9		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				3.48						
4107303	78524							N	55	144.929	-37.84	317774.167	5809939.16	15/06/1990	4.1		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				1.57						
4107304	78525							N	55	144.929	-37.84	317743.167	5809914.16	15/06/1990	4.2		Groundwater	Groundwater Investigation			TURNBULL L A	Mechanical Auger						0				4.39						
4132108	0							N	55	144.906	-37.828	315707.23	5811201.49	29/08/2003	8.5		Not Known	Groundwater Investigation			NOT KNOWN	Not Known						0				2.48						
4132109	0							N	55	144.905	-37.829	315633.26	5811106.68	29/08/2003	8.5		Not Known	Groundwater Investigation			NOT KNOWN	Not Known						0				2.36						
4132110	0							N	55	144.905	-37.83	315595.22	5811011.58	29/08/2003	8		Not Known	Groundwater Investigation			NOT KNOWN	Not Known						0				2.23						
4132111	0							N	55	144.906	-37.83	315746.25	5810994.51	29/08/2003	12.7		Not Known	Groundwater Investigation			NOT KNOWN	Not Known						0				2.11						
4140967	0							N	55	144.908	-37.837	315888	5810251	2/10/2008	11		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				3.82						
4141246	0							N	55	144.908	-37.837	315888	5810251	26/11/2008	4		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				3.82						
4141467	0							N	55	144.945	-37.821	319097	5812105	24/08/2008	7		Groundwater	Groundwater Investigation			NOT KNOWN	Hand Auger						0				1.53						
4141578	0							N	55	144.957	-37.828	320219	5811288	25/09/2008	6		Groundwater	Groundwater Investigation			JEREMY NG	Mechanical Auger						0				2.39						
4141905	0							N	55	144.908	-37.837	315900	5810260	21/10/2008	7		Groundwater	Groundwater Investigation			BOYD JASON	Hand Auger						0				3.88						
4142571	0							N	55	144.959	-37.827	320365	5811392	1/01/1950	5		Groundwater	Groundwater Investigation			PELKA IGOR	Mechanical Auger						0				1.29						
4142948	0							N	55	144.936	-37.837	318408	5810262	8/07/2009	20		Groundwater	Groundwater Investigation			NOT KNOWN	Mechanical Auger						0				2.3						
4152640	0							N	55	144.942	-37.836	318893.169	5810384.16	31/12/1967	6.1		Groundwater	Irrigation			ACHTER E	Hand Auger						0				2.6						
4152641	0							N	55	144.942	-37.83	318875.17	5811009.16	31/12/1970	6		Groundwater	Irrigation			NOT KNOWN	Drivers						0				1.78						
4152642	0							N	55	144.94	-37.831	318741.17	5810981.16	31/12/1970	6		Groundwater	Irrigation			NOT KNOWN	Drivers						0				2.72						
4152643	0							N	55	144.941	-37.831	318832.17	5810948.16	31/12/1970	6		Groundwater	Irrigation			NOT KNOWN	Drivers						0				1.62						
4152644	0							N	55	144.945	-37.835	319174.17	5810476.16	8/01/1973	6		Groundwater	Irrigation			CITY OF PORT MELBOU	Not Known						0				2.08						
4152645	0							N	55	144.944	-37.835	319112.17	5810508.16	8/01/1973	6		Groundwater	Irrigation			CITY OF PORT MELBOU	Not Known						0				2.02						
4107222	78450							N	55	144.912	-37.837	316293.166	5810184.16	3/07/1975	13.07		Groundwater	Miscellaneous			TURNBULL L A	Cable Tool, Percussion						0				2.24						
4107223	78451							N	55	144.91	-37.837	316053.165	5810244.16	8/07/1975	9.14		Groundwater	Miscellaneous			TURNBULL L A	Cable Tool, Percussion						0				4.2						
4107224	78452							N	55	144.912	-37.837	316253.166	5810204.16	9/07/1975	10.6		Groundwater	Miscellaneous			TURNBULL L A	Cable Tool, Percussion						0				2.64						
4156459	0							N	55	144.959	-37.83	320386	5811119	20/10/2009	15		Groundwater	Observation			NOT KNOWN	Hand Auger						0				6.23						
4156632	0							N	55	144.948	-37.822	319402	5811904	4/12/2009	8		Groundwater	Observation			NOT KNOWN	Hand Auger						0				1.45						
4156790	0							N	55	144.939	-37.84	318653	5809917	22/12/2009	8		Groundwater	Observation			JEREMY NG	Hand Auger						0				2.75						
4156821	0							N	55	144.945	-37.821	319099	5812019	19/02/2010	5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				1.25						
4156822	0							N	55	144.944	-37.821	319025	5812025	18/02/2010	10		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				1.32						
4158203	0							N	55	144.943	-37.839	318970	5810053	1/07/2010	8		Groundwater	Observation			NOT KNOWN							0				2.05						

bore_id	bore_code	parish_nam	parish_cod	bore_autho	bore_aut_1	rigno	monitoring	monitori_1	zone	longitude	latitude_g	mga_eastin	mga_northi	datecomp	constructe	rlns	boretype	uses1	uses2	uses3	driller	drillmth	initial_sw	initial_ec	land_use	site_desc	casing_sta	headworks_	collar	initial_td	source	digitised_	bore_licen	alt_source	bore_comme	local_bore	location_a	oldid
4158204	0							N	55	144.943	-37.839	318975	5810053	1/07/2010	8		Groundwater	Observation			NOT KNOWN							0				2.01						
4158205	0							N	55	144.943	-37.839	318970	5810058	1/07/2010	8		Groundwater	Observation			NOT KNOWN							0				2.07						
4158334	0							N	55	144.94	-37.841	318710	5809838	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				2.72						
4158335	0							N	55	144.939	-37.841	318656	5809876	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				2.84						
4158336	0							N	55	144.939	-37.84	318677	5809903	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				3.21						
4158532	0							N	55	144.956	-37.829	320096	5811146	6/09/2010	6		Groundwater	Observation			NOT KNOWN	Hand Auger						0				2.42						
4158582	0							N	55	144.949	-37.821	319500	5812072	10/11/2010	4.5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				2.59						
4158583	0							N	55	144.949	-37.821	319500	5812072	10/11/2010	10		Groundwater	Observation			NOT KNOWN							0				2.59						
4158584	0							N	55	144.949	-37.821	319505	5812072	10/11/2010	4		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				2.5						
4158647	0							N	55	144.945	-37.832	319141	5810835	1/09/2010	25		Groundwater	Observation			NOT KNOWN							0				2.17						
4158648	0							N	55	144.936	-37.838	318381	5810204	1/09/2010	25		Groundwater	Observation			NOT KNOWN							0				2.57						
4158649	0							N	55	144.937	-37.841	318483	5809838	1/09/2010	25		Groundwater	Observation			NOT KNOWN							0				3.26						
4158650	0							N	55	144.942	-37.839	318942	5810009	1/09/2010	25		Groundwater	Observation			NOT KNOWN							0				2.59						
4158652	0							N	55	144.943	-37.839	318966	5810045	1/09/2010	25		Groundwater	Observation			NOT KNOWN							0				2.12						
4158653	0							N	55	144.943	-37.839	318959	5810020	1/09/2010	25		Groundwater	Observation			NOT KNOWN							0				2.44						
4158733	0							N	55	144.912	-37.842	316306	5809639	8/10/2010	4		Groundwater	Observation			NOT KNOWN	Hand Auger						0				2.48						
4158734	0							N	55	144.912	-37.842	316316	5809628	8/10/2010	4		Groundwater	Observation			NOT KNOWN							0				2.38						
4158735	0							N	55	144.912	-37.842	316316	5809628	8/10/2010	4		Groundwater	Observation			NOT KNOWN							0				2.38						
4158936	0							N	55	144.94	-37.84	318715	5809887	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				2.87						
4158937	0							N	55	144.94	-37.841	318705	5809864	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				2.91						
4158938	0							N	55	144.94	-37.841	318724	5809850	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				2.86						
4158939	0							N	55	144.94	-37.841	318732	5809846	1/11/2010	7		Groundwater	Observation			NOT KNOWN							0				2.86						
4158940	0							N	55	144.916	-37.831	316627	5810927	19/11/2010	8.5		Groundwater	Observation			NOT KNOWN							0				4.62						
4158941	0							N	55	144.917	-37.83	316727	5811023	19/11/2010	8.5		Groundwater	Observation			NOT KNOWN							0				5.19						
4158942	0							N	55	144.918	-37.83	316746	5811059	1/11/2010	8.5		Groundwater	Observation			NOT KNOWN							0				5.11						
4159402	0							N	55	144.923	-37.822	317233	5811896	23/12/2010	4		Groundwater	Observation			JEREMY NG	Mechanical Auger						0				0						
4159403	0							N	55	144.923	-37.822	317233	5811896	23/12/2010	4		Groundwater	Observation			JEREMY NG	Mechanical Auger						0				0						
4159404	0							N	55	144.923	-37.822	317220	5811894	23/12/2010	4		Groundwater	Observation			JEREMY NG							0				0						
4159428	0							N	55	144.937	-37.842	318464	5809726	7/01/2011	5		Groundwater	Observation			JEREMY NG	Mechanical Auger						0				0						
4159530	0							N	55	144.92	-37.824	316894	5811642	17/02/2011	4.2		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4159531	0							N	55	144.92	-37.824	316895	5811643	17/02/2011	4.2		Groundwater	Observation			NOT KNOWN							0				0						
4159532	0							N	55	144.92	-37.824	316894	5811643	17/02/2011	3.5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4159533	0							N	55	144.92	-37.824	316900	5811650	5/07/2011	5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4159534	0							N	55	144.92	-37.824	316894	5811642	1/07/2011	5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4159536	0							N	55	144.92	-37.824	316895	5811650	5/07/2011	4		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4159639	0							N	55	144.947	-37.842	319319	5809724	1/03/2011	11		Groundwater	Observation			HUGHES P L	Mechanical Auger						0				0						
4159685	0							N	55	144.912	-37.842	316316	5809628	25/02/2011	3		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4159686	0							N	55	144.912	-37.842	316316	5809628	25/02/2011	3		Groundwater	Observation			NOT KNOWN							0				0						
4159687	0							N	55	144.912	-37.842	316316	5809628	25/02/2011	3		Groundwater	Observation			NOT KNOWN							0				0						
4159688	0							N	55	144.912	-37.842	316316	5809628	25/02/2011	3		Groundwater	Observation			NOT KNOWN							0				0						
4159853	0							N	55	144.959	-37.825	320365	5811630	27/03/2011	6		Groundwater	Observation			TURNER B							0				0						
4159975	0							N	55	144.913	-37.835	316378	5810450	1/10/2010	35		Groundwater	Observation			NOT KNOWN							0				0						
4159976	0							N	55	144.912	-37.837	316260	5810209	8/04/2010	38		Groundwater	Observation			NOT KNOWN							0				0						
4159977	0							N	55	144.914	-37.837	316459	5810241	1/10/2012	35		Groundwater	Observation			NOT KNOWN							0				0						
4160156	0							N	55	144.915	-37.826	316539	5811487	16/06/2011	4.5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4160877	0							N	55	144.958	-37.829	320323	5811163	2/02/2011	15		Groundwater	Observation			NOT KNOWN							0				0						
4160878	0							N	55	144.958	-37.829	320325	5811165	2/02/2011	15		Groundwater	Observation			NOT KNOWN							0				0						
4160898	0							N	55	144.906	-37.83	315686	5810990	1/01/2011	6.5		Groundwater	Observation			NOT KNOWN							0				0						
4161548	0							N	55	144.948	-37.818	319400	5812400	28/03/2012	5.5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4161549	0							N	55	144.948	-37.818	319400	5812400	23/03/2012	6.2		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4161590	0							N	55	144.92	-37.833	316995	5810635	4/04/2012	4		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4161731	0							N	55	144.918	-37.831	316782	5810862	16/05/2012	5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4161732	0							N	55	144.918	-37.831	316782	5810862	16/05/2012	5		Groundwater	Observation			NOT KNOWN							0				0						
4161733	0							N	55	144.918	-37.831	316785	5810863	16/05/2012	5		Groundwater	Observation			NOT KNOWN							0				0						
4162109	0							N	55	144.938	-37.842	318520	5809750	24/08/2012	5.5		Groundwater	Observation			NOT KNOWN	Hand Auger						0				0						
4162110	0							N	55	144.938	-37.842	318520	5809750	24/08/2012	5.5		Groundwater	Observation			NOT KNOWN							0				0						
4162111	0							N	55	144.938	-37.842	318525	5809755	24/08/2012	5.5		Groundwater	Observation			NOT KNOWN							0				0						
4162119	0							N	55	144.928	-37.832	317697	5810846	29/08/2012	5		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4162120	0							N	55	144.928	-37.833	317697	5810746	29/08/2012	5		Groundwater	Observation			NOT KNOWN							0				0						
4162121	0							N	55	144.928	-37.832	317700	5810850	29/08/2012	4.5		Groundwater	Observation			NOT KNOWN							0				0						
4162122	0							N	55	144.928	-37.832	317697	5810850	29/08/2012	5		Groundwater	Observation			NOT KNOWN							0				0						
4162123	0							N	55	144.928	-37.832	317699	5810846	30/08/2012	4.5		Groundwater	Observation			NOT KNOWN							0				0						
4162403	0							N	55	144.911	-37.833	316192	5810687	1/11/2012	15		Groundwater	Observation			NOT KNOWN							0				0						
4162404	0							N	55	144.911	-37.833	316192	5810687	1/11/2012	15		Groundwater	Observation			NOT KNOWN							0				0						
4162405	0							N	55	144.911	-37.833	316192	5810687	1/11/2012	15		Groundwater	Observation			NOT KNOWN							0				0						
4162606	0							N	55	144.904	-37.829	315528	5811113	2/01/2013	8.3		Groundwater	Observation			NOT KNOWN	Drivers						0				0						
4162607	0							N	55	144.904	-37.829	315530	5811115	2/01/2013	6.8		Groundwater	Observation			NOT KNOWN							0				0						
4162697	0							N	55	144.904	-37.829	315528	5811113	25/02/2013	6.8		Groundwater	Observation			NOT KNOWN	Mechanical Auger						0				0						
4162698	0							N	55	144.904	-37.829	315529	5811113	25/02/2013	5.8		Groundwater	Observation			NOT KNOWN							0				0						
4162699	0							N	55	144.904	-37.829	315530	5811115	25/02/2013	5.7		Groundwater	Observation			NOT KNOWN							0				0						
4162700	0							N	55	144.904	-37.829	315535	5811120	26/02/2013	6.1		Groundwater	Observation			NOT KNOWN							0				0						
4144175	0							N	55	144.919	-37.829	316845	5811065	4/12/2009	6		Groundwater	Observation			HEPWORTH BRAD	Hand Auger						0				4.97						
4054519	319654							N	55	144.904	-37.838	315580.165	5810050.16	26/06/1964	1.98		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054520	319655							N	55	144.904	-37.838	315580.165	5810050.16	2/07/1964	4.57		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054521	319656							N	55	144.904	-37.838	315580.165	5810050.16	20/01/1967	46.86		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054522	319657							N	55	144.904	-37.838	315580.165	5810050.16	20/01/1967	36.96		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054523	319658							N	55	144.904	-37.838	315580.165	5810050.16	20/01/1967	39.62		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054524	319659							N	55	144.904	-37.838	315580.165	5810050.16	20/01/1967	25.53		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054525	319660							N	55	144.904	-37.838	315580.165	5810050.16	20/01/1967	24		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054526	319661							N	55	144.904	-37.838	315580.165	5810050.16	5/01/1967	17.91		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054527	319662							N	55	144.904	-37.838	315580.165	5810050.16	5/01/1967	19.05		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054528	319663							N	55	144.904	-37.838	315580.165	5810050.16	5/01/1967	16		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054529	319664							N	55	144.904	-37.838	315580.165	5810050.16	5/01/1967	17.53		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				0.49						
4054530	319665							N	55	144.904	-37.838	315580.165	5810050.16	13/02/1964	49.99		Groundwater	SEC Bores (Use unidentified)			W L SIDES & SONS PTY							0				0.49						
4054531	319666							N	55	144.904	-37.838	315580.165	5810050.16	30/01/1964	67.06		Groundwater	SEC Bores (Use unidentified)			W L SIDES & SONS PTY							0				0.49						
4054532	319667							N	55	144.904	-37.838	315580.165	5810050.16	8/01/1964	58.83		Groundwater	SEC Bores (Use unidentified)			W L SIDES & SONS PTY							0				0.49						
4054533	319668							N	55	144.904	-37.838	315580.165	5810050.16	27/04/1964	60.35		Groundwater	SEC Bores (Use unidentified)			W L SIDES & SONS PTY							0				0.49						
4054534	319669							N	55	144.928	-37.826	317680.169	5811476.16	21/06/1983	50		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				3.31						
4054535	319670							N	55	144.928	-37.825	317684.169	5811528.16	11/07/1983	63		Groundwater	SEC Bores (Use unidentified)			NOT KNOWN							0				3.02						

Appendix C

Summary of Audit Reports within 1km of the Site

SON / CARMs No.	Latitude	Longitude	Address	Date	GW investigation (Y/N)	Average Depth to GW (m)	Groundwater flow direction	TDS (mg/L)	CUTEP (Y/N)	Reason for Audit	Site Area (m^2)	No. of Wells	Current / Historical Use	Primary Source	Further Review Required (Y/N)
Wirraway Precinct															
32409-1	-37.829166	144.904368	Asta Facility, Lorimer Street, Fishermans Bend	25/03/1998	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Aircraft manufacturing	Fill material, fuel storage tanks	N
37104-1	-37.836081	144.915611	Corner Todd Rd and Williamstown Rd	5/11/1999									Municipal Landfill		Y
38456-3	-37.831986	144.923705	69-119 Salmon Street, Port Melbourne	10/11/1999									Quarry, municipal landfill		Y
17562-1	-37.825484	144.984707	30-42 Lorimer Street, Port Melbourne	28/05/1993											N
Sandridge Precinct															
8003045 / 68644-1	-37.841906	144.937089	19-25 Nott Street, Port Melbourne	11/03/2014	N	-	-	-	-	-	710	1	-	-	N
8004492 / 73247-1	-37.841547	144.937521	45-47 Nott Street, Port Melbourne	20/02/2015	N	-	-	-	-	Planning requirement and environmental audit overlay	300	-	-	-	N
8004116 / 72440-1	-37.840301	144.939471	74 Nott Street, Port Melbourne	3/03/2014	N	-	-	-	-	-	-	-	-	-	N
71117-1	-37.841525	144.937347	41 Nott Street, Port Melbourne	13/12/2012	Y	3.3	NE	3000	Y	Environmental Audit Overlay	775	3	Residential, engineering workshop	Damaged sewer connection	N
67368-1	-37.839135	144.942665	121 Liardet Street, Port Melbourne	15/02/2011	Y	8	SSW	3400	N	Environmental Audit Overlay for change in land use	901	3	Rubber factory (inferred from site ownership)	Fill material, UST	N
64370-2	-37.840638	144.938158	77 Nott Street, Port Melbourne	28/09/2010	Y	4	NNE	1000	N	Environmental audit overlay	1100	3	Dairy farm, pig farm, munitions storage	Fill material, metalworks operations	N
62287-1	-37.840917	144.938028	216 Rouse Street, Port Melbourne	19/08/2009	Y	5	SW	3500-30000	N	Planning requirement	1497	3	Residential, wood veneer storage	Fill material	N
51126-2	-37.840238	144.938566	105 Nott Street, Port Melbourne	24/06/2009	Y	4.8	NE	800	N	Planning requirement and environmental audit overlay	976	4	Bottle factory, storage, plastics factory, press, sailmakers	Fill material, general operations	N
57849-1	-37.841786	144.936158	71 Beach Street, Port Melbourne	15/06/2009	Y	4	SSW	1000	N	Planning requirement	460	1	Hotel	Fill material, fuel storage on neighbouring properties	N
64661-1	-37.840783	144.937819	222-224 Rouse Street, Port Melbourne	26/02/2009	N	3.5	SW	-	-	-	-	-	Residential, warehouses	Fuel storage tanks, storage facilities	N
62298-1	-37.839696	144.937491	97 Stokes Street, Port Melbourne	16/02/2009	Y	4.5	NE	820-30000	N	Due diligence	5244	6	Blacksmith, laundry, bread factory, paint factory, school	Fill material, laundry, off site service station	Y
64157-1	-37.840625	144.937569	226 Rouse Street, Port Melbourne	2/02/2009	Y	4.5	NNE		Y	Planning permit requirement	220	5	Residential, commercial, storage	Adjacent sewer line, fill material	N
52835-1	-37.840436	144.93835	95 Nott Street, Port Melborne	19/03/2004	N	-	-	-	-	-	-	-	-	-	N
51996-1	-37.840796	144.939055	54 Nott Street, Port Melbourne	26/02/2003	Y	5.0	SW	1000		Environmental audit overlay	-	1	-	Fill material	N
44896-1	-37.832348	144.94019	518 Williamstown Road, Port Melbourne	28/09/2001	Y	3	SW	800		Planning permit requirement	439	3	Storage of building materials	Fill material, neighbouring foundry and service station	N
33458-8	-37.842523	144.947097	Gasworks Arts Park, Albert Park	11/08/2008	Y	6-10	NNE	1500-6900	Y	Planning permit condition	813	8	Maintenance of gas meters	Fill material, gasworks effluent pipe, waste disposal area	N
43358-1	-37.840216	144.939517	78 Bay Street, Port Melbourne	6/02/2001	N	-	-	-	-	-	-	-	-	-	N
35795-2	-37.839478	144.942261	200-202 Bay Street, Port Melbourne	31/10/2000	Y	4.5	Not available	2400	N	Not available	221	4	Flour manufacturer, service station	Fill material, on-site UST's	N
26919-1	-37.832171	144.940601	Corner Durham Street and Williamstown Rd	22/12/1995											Y
68702-1	-37.82865	144.941978	14 Woodruff Street, Port Melbourne	7/01/2014	Y	2	SW	420-10000	N	Pollution Abatement Notice	39000	11	Chemical factory and storage facility	Chemical storage tanks (above and below ground), chemical spills, fill material	Y
Montague Precinct															
67827-1	-37.83391	144.947602	68 Ingles Street, Port Melbourne	19/12/2013	Y	2	N		N	Planning requirement to allow for redevelopment	255	1	Shop dwelling, electrical engineer, garage, automotive detailing	Fill material	Y
41800-2	-37.83774	144.947095	97 Cruikshank Street, Port Melbourne	20/03/2002	Y	2-3.5	E	200-2400	N	Planning zone change		5	Transport depot, dairy farm	Fill material, on site UST's	N
50667-1	-37.830139	144.949194	82 Montague Street, South Melbourne	20/05/2011	Y		(towards sewer)	1760	Y	EPA issued cleanup notice	200	8	Chrome plating	Chroming baths	Y
48129-1	-37.833886	144.955941	306 Dorcas Street, South Melbourne	17/10/2004	N	>4.2	-	1500	-	-	-	-	-	-	N
52192-1	-37.833396	144.956238	333 Coventry Street, South Melbourne	17/05/2004	N	-	-	-	-	-	2308	-	-	-	N

SON / CARMs No.	Latitude	Longitude	Address	Date	GW investigation (Y/N)	Average Depth to GW (m)	Groundwater flow direction	TDS (mg/L)	CUTEP (Y/N)	Reason for Audit	Site Area (m^2)	No. of Wells	Current / Historical Use	Primary Source	Further Review Required (Y/N)
70034-1	-37.826228	144.959065	33 Clarke Street, Southbank	18/03/2013	N	-	-	-	-	-	300	-	Disinfectant manufacturer, ventilation engineering, commercial offices	Above ground tanks, UST's, chemical spills	N
70018-1	-37.829389	144.958572	144 Clarendon Street, Southbank	17/05/2012	Y	7	N	1950	Y	Planning requirement to allow for redevelopment	1040	3	Dairy farm, brass foundry	Fill material, UST's	N
68727-1	-37.829851	144.968097	63 Coventry Street, Southbank	24/08/2011	Y	1.5	N	1800-5000	N	Voluntary - change of land use		16	Felt mill, panel beater, refrigeration company	Fill material, UST's, fuel and oil spills	N
61183-2	37.826059	144.956819	63-67 Whiteman Street, Southbank	9/09/2009	Y	1.5	NNW	2000-26000	Y	Due diligence	2102	4	Seed merchant, metalworks, motor trimmers, cordial manufacturer, commercial	Fill material, spills from operations	Y
62450-1	37.823803	144.961903	174 City Road, Southbank	5/06/2009	Y	1.6-2	SW	680-6400	Y	Due diligence	2656	19	Taxi depot	Fill material, fuel storage containers	N
47089-5	-37.82228	144.96219	28 Freshwater Place, Southbank	21/02/2008	Y	1	N	570-27000	Y	Due diligence	600	6	Kerosene store, timber yard	Fill material, UST's	N
47089-3	-37.825007	144.960581	127 Queensbridge Street, Southbank	25/09/2003	Y	1.2	N	2000	Y	Planning requirement to allow for redevelopment	500	13	Varnish factory, kerosene store, asphalt works, brass foundry, carpark	Fill material, spills from operations	N
39097-2B	-37.827365	144.955621	99 Whiteman Street, Southbank	3/08/2002	Y	0.5-2.8	W (i.e. north of the site towards	400-1400	N	Due diligence		5	Industrial / commercial	Fill material, off-site UST's	N
39097-1	-37.826963	144.955949	83 Whiteman Street, Southbank	6/04/2001	Y	1	NNE	-	N	Due diligence		3	Landfill, industrial / commercial	Fill material, off-site UST's	N
37818-1	-37.82656	144.956259	73 Whiteman Street, Southbank	1/12/2000	Y	1	N	-	N	Planning requirement to allow for redevelopment	2400	3	Vinegar works, cordial manufacturing, storage warehouse	Fill material, above and below ground fuel storage	N
36172-1	-37.83925	144.95828	341 Ferrars Street, Albert Park	6/04/1999	N	>14.5		<1000		Planning requirement to allow for redevelopment	532	2	Service station	On site UST's	N
32350-1	-37.831838	144.94425	380 Ross Street, Port Melbourne	22/08/1997											N
38999-1	-37.833485	144.948481	52 Garton Street, South Melbourne	9/12/1999	Y	3.5	N	2000							N
71587-2	-37.830162	144.958201	79-83 Market Street, South Melbourne	20/11/2014	Y			2100-2500			849				Y
38787-3	-37.830838	144.968328	47-71 Dorcas Street, South Melbourne	23/03/2001											N
35209-1	-37.832749	144.958958	7-11 Francis Street, South Melbourne	20/05/1998											N
22683-1	-37.832948	144.955155	217 Ferrars Street, South Melbourne	14/06/1994											N
Lorimer Precinct															
49997-1	-37.822582	144.93231	844 Lorimer Street, Port Melbourne	11/07/2006	Y	2.5	N	400	N	EPA issued clean up notice	1700	9	Golf course, Service station	Fuel UST's on site	Y
42748-2	-37.821897	144.929444	770 Lorimer Street, Port Melbourne	27/11/2003	Y	1.5-2.4	NW	-	N	Due diligence	4565	7	Car park, foundry, car workshop	Fill material, UST's off site	N
45435-1	-37.824345	144.933872	349 Ingles Street, Port Melbourne	9/03/2001	Y	2.5	N	1200	N	Due diligence	33000	4	Chemical manufacture, oil storage, joinery	Fill material, warehouse operations, car park	Y
33298-9	-37.827911	144.929682	Melbourne Citylink Lorimer Off Ramp	22/03/1999									Abbatoir, chemical works, soap factory, Kraft factory, quarry		

Carms No.	Address	Date	Certificate or Statement	Land use	Summary	Hydrogeology description	Works to date		Background Groundwater Quality	Ambient GW Conditions	Point sources: on site and off site	CoPC's	Groundwater Assessment	Soil assessment	Registered Local Groundwater uses (within 500m)	Conclusions
49997-1	844 Lorimer Street, Port Melbourne	11/07/2006	Statement	Service station	An EPA clean up order was issued to remove risks associated with stockpiled contaminated spoil material excavated during removal of four on-site UST's.		Four UST's located on site were removed prior to the commencement of the audit report, with some excavation of contaminated soil occurring simultaneously. One UST remains in place and contaminated soil remained stockpiled on site posing a secondary contamination source risk.	Groundwater from all five monitoring wells was found to have high turbidity, however this is said to be representative of the regional groundwater conditions and no significant source for groundwater impact was found to be present on site.	Samples from wells up-gradient of the site were used to evaluate background groundwater conditions.	Expected TDS conditions based on the groundwater information system were 2400 - 11000 mg/L, however the average measured TDS during the sampling program was 224 - 519 mg/L.	Stockpiled contaminated material	Petroleum hydrocarbons	Five groundwater monitoring wells were positioned down hydraulic gradient from the point sources; with low concentrations of site specific contaminants reported at these downgradient locations. Thus groundwater quality is considered to be consistent with regional conditions when compared with up gradient wells. It is likely that contaminants in soil at the excavation sites have leached into groundwater; however this is considered to be localised and not compromise beneficial uses at the site. Elevated concentrations of VHC's were found near the primary point sources	14 test pits were drilled and sampled. Spoil from the five drilled wells and the base of excavated UST pits were also included in the soil sampling program. Some exceedences of the adopted Dutch criteria for VHC's were found from samples taken at excavation sites. The majority of soil contaminated by the primary sources was found to be fill material.		Considering the low concentration of residual contaminants at the site and the difficulty in further excavation works due to the proximity of electical cables and building footings, no further remediation is necessary at the site. It is also noted that new fill material and /or paving will be laid down on site to cover existing exposed ground.
50667-1	82 Montague Street, South Melbourne	20/05/2011	Statement		The site was primarily used as a chrome electroplating facility from 1950-1994. The Victorian Railway Commission and VicTrack have owned the site since 1913, however uses outside of the period of operation of the chrome electoplating business are unknown.	Local groundwater flows are influenced by the sewer network running along property boundaries. Hydraulic head fluctuations around the sewer cause it to change between a sink and source in the local system.	Chrome electroplating building has been decomissioned, exposing the contaminated floor to rainfall and increasing the risks of contaminant infiltration.		High TDS and salinity concentrations were seen across the site due to high background conditions.	Expected TDS conditions based on the groundwater information system were 1000 - 3500 mg/L	On site sources include spills and leakages from chroming baths	Organic solvents, alkaline cleaning agents, chromic acid, sulphuric acid			Investigation wells: 10; Unknown wells: 16	
45435-1	349 Ingles Street, Port Melbourne	9/03/2001	Statement	Vehicle parking, office / warehouse buildings, chemical storage, disinfectant manufacturer	Local groundwater flows are generally north towards the Yarra River.					TDS was measured at approximately 1200 mg/L		Metals, TPH, VHC's, MAH, PCB's, OC's			Stock & domestic bores: 7	
26919-1	W CNR WILLIAMSTOWN ROAD & DERHAM STREET FORMER ADI MARIBYRNONG FACILITY	22/12/1995														
38456-3	1B ,69-119 SALMON ST	11/10/1999	Statement	Landfill								Metals, asbestos, TPH, lead, BTEX				
37104-1	Corner Todd Rd and Williamstown Rd	5/11/1999	Statement	Sand mine, landfill for household, industrial, council waste	Sand was mined at this site to a depth of 8m, before filling with domestic and industrial rubbish. Exceedences of some heavy metals and PAH were noted at the site in soil and groundwater. The site has been certified for use as a primary or secondary playing field, provided that direct contact between future users and contaminated fill material is avoided.		Most of the site is capped with 0.5m fill, however there are some areas where rubbish is still visible.		Whilst a detailed discussion of background or ambient groundwater quality is not available, it is noted that adjacent waste disposal and industrial facilities are likely to have contributed to the measured contamination as well as the activities on the site itself. The auditor states that "groundwater contamination is extensive in the area and contributed to by a number of sources"							
62298-1	97 Stokes Street, Port Melbourne	16/02/2009	Statement	Primary School, blacksmith, laundry, bread factory, paint factory	The contaminants observed at the site are thought to be unrelated to site activities, and are instead representative of regional conditions. Key contaminants in the soil are not present in the groundwater, and immovability is confirmed by leachate results. These contaminants are attributed to fill material across the site.	A brick sewer main to the north of the site draws local groundwater flows, which were initially thought to flow south towards Port Phillip Bay. Measured TDS varied greatly across the site, ranging from 820 mg/L in the east to 30,000 mg/L in the west of the site.			Due to the proximity of this site to the coast, the assessor states that tidal interactions with local groundwater have notable impacts when comparing groundwater data in the south western section of the site with other wells across the site. Concentrations of sulphate, calcium, sodium, chloride, magnesium, potassium all indicate this.		Fill material	Lead, PAH, BaP			Irrigation, stock and domestic, investigation	A small area of the site was found to pose an unnacceptable risk to health of future residents. The auditor stated that a capping of the contaminated soil at this area would be sufficient to block exposure pathways to future residents. The assessor instead chose to recommend excavation of the contaminated material in addition to importing new fill.

Appendix D

Potentially Complete Regional Source-Pathway-Receptor Linkages

Preliminary Regional Conceptual Site Model