AGL

PROJECT APPLICATION AND PRELIMINARY ENVIRONMENTAL ASSESSMENT

PROPOSED REMEDIATION OF CONTAMINATED LAND

FORMER NEWCASTLE GASWORKS

PARSONS BRINCKERHOFF
100 YEARS

Former Newcastle Gasworks Clyde Street, Hamilton

Proposed Remediation of Contaminated Land

Project Application and Preliminary Environmental Assessment

September 2006

The Australian Gas Light Company

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Introduction

This document:

- *supports an application under Section 75E of the* Environmental Planning and Assessment Act 1979 *(EP&A Act) for Ministerial approval to carry out the proposed remediation of contaminated land at the former Newcastle Gasworks site at Clyde Street, Hamilton (the Proposal) under Part 3A of the EP&A Act*
- *describes the Proposal, identifies its likely impacts and the mitigation measures proposed to be adopted in response*
- *seeks environmental assessment requirements under Section 75F(3) for the purposes of any additional environmental assessment which may be required under Sections 75F(5) and 75H(1).*

The proposed Newcastle Gasworks Remediation Project (the Proposal)

The Proposal comprises:

- *removing and off-site disposal of existing large loose materials including building rubble from the site's surface area*
- *establishment of a thermal desorption treatment plant on-site*
- *treatment of contaminated groundwater on-site*
- *treatment of hydrocarbon-contaminated soils on-site using thermal desorption technology*
- *containment of materials with low levels of contamination in selected areas*
- *removal of other contaminated materials off-site, reinstatement of topsoil, and surface works to prepare the site for future land use.*

Key environmental issues for further investigation

The preliminary environmental investigations presented in this report indicate the following issues would require detailed consideration as part of the environmental assessment of the Newcastle Gasworks remediation:

- *odour and air quality*
- *groundwater*
- *noise.*

It is proposed that these issues would form the focus of the environmental assessment. AGL would prepare a draft Statement of Commitments to describe how these issues would be managed during the Proposal's implementation.

Other environmental issues

The preliminary environmental investigations suggest that the following issues are unlikely to significantly affect the environment, and could be readily managed by the construction contractor's preparation and implementation of Construction Environmental Management Subplans:

- *ecology*
- *visual amenity*
- *land use and socioeconomic impacts*
- *traffic*
- *heritage*
- *utilities and services*
- *hydrology*
- *hazard and risks*
- *waste management*
- *cumulative impacts.*

It is proposed that these issues be addressed and managed through AGL's Statement of Commitments and the Conditions of Approval for the Proposal, which would determine the requirements of the Construction Environmental Management Plan.

1. Introduction

1.1 Purpose and scope of this document

This document:

- supports an application under Section 75E of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for Ministerial approval to carry out the Newcastle Gasworks (Clyde Street) Remediation Project (the Proposal) under Part 3A of the EP&A Act
- describes the Proposal, and identifies its likely impacts and the proposed mitigation measures
- seeks environmental assessment requirements under Section 75F(3) for the purposes of any additional environmental assessment that may be required under Sections 75F(5) and 75H(1).

1.2 Background to the Proposal

The former Newcastle Gasworks is located at Clyde Street, Hamilton North, New South Wales. The former gasworks operated between 1913 and the early 1980s, producing 'town gas' as well as by-products that included ammonia liquors, coal tars and spent oxides. Over time these by-products accumulated in the soil. Other solid materials, including concrete, asphalt and building materials, are scattered throughout the site.

An Elgas LPG gas storage facility located along the site's southern boundary is the only activity occurring at the site. The majority of the site is currently vacant.

In June 1988, the Environment Protection Authority issued a remediation notice under Section 35 of the *Environmentally Hazardous Chemicals Act 1985* to AGL, the owner of the land and the proponent. The notice outlined requirements for approval for a remediation process. The notice stipulates that AGL (the owner) is directed to take the following remedial action:

> *"Before any work is undertaken with the intention, or having the effect, of -*
>
> *a) reducing the contamination of the premises;*
>
> *b) restoring or rehabilitating the premises; or*
>
> *c) removing from the premises, and disposing of, any contaminated material or any soil, sand, rock, water or other solid or liquid material of whatever kind, which would result in any disturbance of the surface of, or any structure on, the nominated premises,*
>
> *The occupier shall submit to the Commission, in writing, details of the proposed work, and shall not commence such work until it has received the written consent of*

the Commission setting out its requirements for the carrying out of the proposed work."

To satisfy the remediation notice, Parsons Brinckerhoff was commissioned by AGL in April 2006 to prepare a Remediation Action Plan (RAP) for remediation and validation works at the site. The RAP develops a preferred remedial strategy for the site (the Proposal), which would utilise a combination of thermal treatment (for the most contaminated materials), on-site containment, bioremediation and monitoring for the less contaminated material, and off-site disposal or treatment for specific waste materials such as building wastes.

This RAP will form part of a submission to the Department of Environment and Conservation for approval of remediation under Section 35 of the *Contaminated Lands Management Act 1997.*

Approval is required under Part 3A of the EP&A Act to undertake the proposed remediation works. The preliminary assessment report supports an application for the approval under Part 3A.

1.3 The proponent

The Australian Gas Light Company (AGL) is a publicly listed retailer of gas and electricity in Australia, with an extensive portfolio of investments in the energy industry. AGL was established in New South Wales in 1837. The company operates electricity and natural gas supply systems throughout NSW and Victoria and a number of electricity generation plants throughout southern Australia.

Environmental management is a key part of AGL's business. As legislative requirements and public expectations of environmental management have changed, AGL has developed a comprehensive environmental reform program to update its environmental management systems, improve performance and address its responsibility to the community. Cleaning up its gasworks sites throughout New South Wales is an integral part of this commitment.

1.4 Key environmental issues

A preliminary assessment of environmental issues has been carried out to identify the key environmental issues associated with the Proposal. The key issues which have been identified are:

- odour and air quality
- groundwater
- noise.

It is proposed that the environmental assessment under Section 75H of the EP&A Act should consider only these key issues. Environmental assessments of other environmental issues are presented in *Section 5* and demonstrate that, provided appropriate management measures are implemented, the Proposal would not have, or be likely to have, a significant effect on the environment.

Preliminary assessment of the key issues is also presented in *Section 5*.

2. Description of the Proposal

The former Newcastle Gasworks site is located at Clyde Street, Hamilton North, in the city of Newcastle. The site comprises two parcels of land — Lot 1 DP 79057 and Lot 270 DP 812689.

Approximately 7.4 hectares in area, the site is bordered by the Great Northern Railway to the north, a lined stormwater channel (Styx Creek) and the Shell Newcastle bulk fuel terminal to the south and east, and residential and commercial properties beyond Chatham Road and Clyde Streets to the west. *Figure 2.1* shows the location of the site and *Figure 2.2* shows the layout of the former gasworks, the Elgas LPG storage facility and remnant buildings and structures.

2.1 Site history and existing conditions

2.1.1 History

The Newcastle Gasworks operated between 1913 and the early 1980s to produce 'town gas', which was used for heating, lighting and cooking. Town gas was produced through the coal carbonisation process in which crushed coal was heated in a sealed oxygen-deficient chamber. This process resulted in three main by-products:

- *ammonia liquors*: highly toxic liquid containing ammonia, phenols, cyanides and sulfates
- *coal tars*: a mixture of polycyclic aromatic hydrocarbons, monoaromatic hydrocarbons, phenolics and aliphatic hydrocarbon compounds
- *spent oxides*: a residue of sulfur and cyanide on iron oxide, which contains large concentrations of free sulfur and cyanides.

Operation of the former gasworks contaminated large areas of soil at the Clyde Street site. Since the gasworks' closure, a number of environmental studies have been undertaken at the site to define the extent and type of contamination. These studies are:

- *Initial Soil Assessment*, Stuart Miller and Associates (1987)
- *Initial Groundwater Assessment*, Australian Groundwater Consultants (1988)
- *Supplementary Groundwater Assessment*, Groundwater Technology Inc. (1988)
- *Soil Investigation*, Stuart Miller and Associates (1990)
- *Supplementary Soil and Groundwater Assessment*, Environmental Geochemistry International (formerly Stuart Miller and Associates) (1992)
- *Clyde St Gasworks Soil and Groundwater Remediation Study*, Mackie Martin and Associates Pty Ltd (1993)

Fig 2.1 Site location

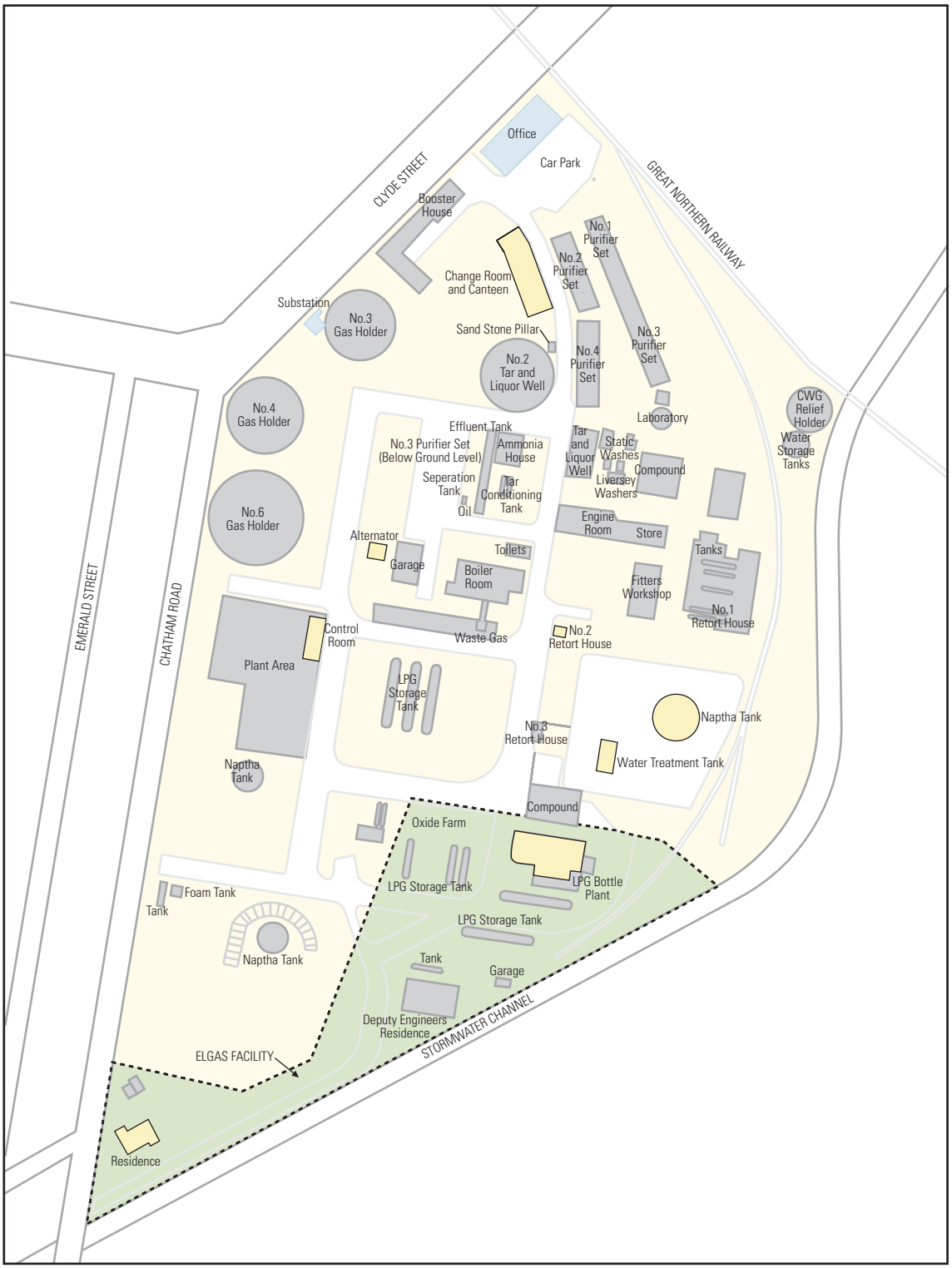

Fig 2.2 Former layout of the Newcastle gasworks and remaining structures

- *Environmental Audit of AGL Newcastle Gasworks*, ERM Mitchell McCotter Pty Ltd (1997)
- *Groundwater Status Report*, ERM Mitchell McCotter Pty Ltd (1998a)
- *Suitability of Elgas Facility for Continued Operations*, ERM Mitchell McCotter Pty Ltd (1998b)
- *Remedial Strategy for AGL Newcastle Gasworks — Clyde St, Newcastle*, ERM Mitchell McCotter Pty Ltd (1999)
- *Final Report, Supplementary Soil Investigation and Calculation of Remediation Volumes, Clyde St, Newcastle,* URS Australia Pty Ltd (2004a)
- *Addendum to the URS Australia Pty Ltd (2004) Report 'Supplementary Soil Investigation and Calculation of Remediation Volumes, Clyde St, Newcastle'*, URS Australia Pty Ltd (2004b)
- *Remediation Trial – AGL Clyde St Gasworks*, URS Australia Pty Ltd (2005a)
- *Review of Soil Volumes for Remediation Based on Observations from the Pilot Scale Remediation Trial*, URS Australia Pty Ltd (2005b).

Due to the apparent level of contamination, the site cannot be re-used for industrial purposes or redeveloped for other purposes without significant remediation. On 10 June 1988 a remediation order for the site was issued under Section 35 of the *Environmentally Hazardous Chemicals Act 1985* by the Environment Protection Authority. The order stated:

> …before any work is undertaken with the intention, or having the effect, of
>
> a) reducing the contamination of the premises
>
> b) restoring or rehabilitating the premises; or
>
> c) removing from the premises, and disposing of, any contaminated material or any soil, sand, rock, water or other solid or liquid material of whatever kind, which would results in any disturbance of the surface of, or any structure on, the nominated premises,
>
> the occupier shall submit to the Commission, in writing, details of the proposed work, and shall not commence such work until it has received the written consent of the Commission setting out its requirements for the carrying out of proposed work.

In April 2006, to satisfy the remediation order, Parsons Brinckerhoff was commissioned by AGL to prepare a Remediation Action Plan (RAP) for remediation and validation works at the site. The RAP develops a preferred remedial strategy for the site (the Proposal), which would utilise a combination of thermal treatment (for the most contaminated materials), on-site containment, bioremediation and monitoring for the less contaminated material, and off-site disposal or treatment for specific waste materials such as building wastes. Details of these processes are outlined in *Section 2.3*.

AGL is currently seeking approval from the Department of Environment and Conservation (under Section 35 of the *Contaminated Lands Management Act 1997*) and approval from the Department of Planning (under Part 3A of the EP&A Act).

2.1.2 Current use and condition

The majority of the site is vacant and contains remnants of the former gasworks, including a naptha tank, alternator, retort house, amenities block, office building and an electrical substation. Stockpiles of various materials occur throughout the site, some containing tar, coal, bitumen and other contaminating substances. Photographs of the site are provided in *Photographs 2.1* and *2.2*.

Note: The white naptha tank on the left is part of the former Newcastle Gasworks site. Tanks on the right are located within the adjacent Shell Oil Company site.

Photograph 2.1 View to the west from near the centre of the site

Photograph 2.2 View to the north from near the centre of the site

A facility operated by Elgas (a subsidiary of AGL), which consists of an LPG bottle plant and residence, stands in the southern part of the site. Access to this facility is from Chatham Road. The Elgas facility would be decommissioned prior to the commencement of remediation.

It estimated that the following amount of contaminated or waste materials exist at the site:

- 92,000 cubic metres of soil contaminated with aliphatic hydrocarbons, monoaromatic hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), phenolic compounds, metals and complex cyanide compounds, with concentrations that exceeded threshold concentrations for residential land uses. This type of soil generally shows visible tar with a strong odour or blue-green stains with no odour.
- 59,000 cubic metres of soil contaminated with polycyclic aromatic hydrocarbon compounds with concentrations that exceed threshold concentrations for commercial and industrial land uses. This type of soil generally shows a visible oily liquid or oily sheen with a strong odour or black stains, sometimes with visible tar and no odour.
- 34,000 cubic metres of building rubble including metals, timber, bricks, concrete, glass, plastic, tiles and possibly asbestos.
- 14,000 cubic meters of fill material containing coke (residue of burnt coal). This material, although not expected to exceed threshold levels for residential, commercial or industrial land uses, would not be suitable for residential use for aesthetic reasons.

2.1.3 Existing buildings and structures

Remnant buildings and structures on this site include a naptha tank, alternator, retort house, amenities block, office building (see *Photograph 2.3*) and an electrical substation. Some structures also exist at the Elgas site (see *Section 2.1.2.*), including a residence and LPG storage facilities.

Three heritage items on the site are listed in the *Newcastle Local Environment Plan 2003*, including remnant gardens, a pump house and fence, and the Newcastle Gas Co. office building at the Clyde Street entrance (see *Photograph 2.3*). This building is also listed on the State Heritage Register.

Photograph 2.3 Newcastle Gas Co. office on Clyde Street

2.2 Remediation trial

Innova Soil Technology undertook a trial remediation of 500 tonnes of contaminated soil from the former gasworks site between 25 February 2005 and 3 March 2005. The trial involved excavating contaminated soil from the gasworks site, transporting it to the former BHP Steelworks site at Mayfield, Newcastle, and treating the soil through a thermal desorption unit before returning it to the gasworks site for use in reinstating excavated areas.

The trial confirmed that thermal desorption would be an appropriate method to remediate contaminated soils at the site. The trial also confirmed that emissions of waste products from the thermal desorption plant (such as volatile organic compounds and particulate matter) are unlikely to exceed the limits recommended by the Environment Protection Authority (Department of Environment and Conservation 2005).

2.3 The Proposal

The scope of works for the Proposal is as follows:

- demolish the remaining foundations of former tar and liquor wells and remove tar well contents
- remediate contaminated soil within the former Newcastle Gasworks site to the levels specified in the adopted remediation and validation criteria
- treat and monitor contaminated groundwater
- validate the site in accordance with Department of Environment and Conservation requirements
- remove demolition waste, general waste, by-products from the remediation process and possible asbestos waste from the site and dispose of in accordance with NSW Environment Protection Authority (1999) *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes*
- replace excavations with treated soil and restore the site to a uniform ground level
- ensure that all works at the site are undertaken in a safe manner, and with no significant impact on the site and its surrounding environment.

2.3.1 Site preparation works

Figure 2.3 shows the site layout of the proposed remediation and validation works.

The primary access route to the site would be through the existing access point for the gasworks on Clyde Street, adjacent to the Newcastle Gasworks Co. offices. An access point on Chatham Road, currently used by the Elgas facility, may also be used. A one-way system may be employed, minimising the area required for turnarounds.

Prior to the commencement of works, signage would be erected at the site, detailing directions to key areas and relevant traffic restrictions. Signage at the main access points would include after-hours contact details.

Perimeter security fencing would be inspected and repaired as required. Shadecloth would by installed on perimeter fences and hoardings for areas where demolition work would be carried out near the boundary. Work areas and exclusion zones would be fenced as required. The boundary of all exclusion zones would be defined by construction of a tape fence comprising warning tape attached to pickets. Safety signs would also be erected at regular intervals around each exclusion zone, to warn on-site personnel of the boundary of the exclusion zone, the nature of the hazard associated with the zone and access restrictions that apply to entry into the zone.

Temporary site services would be installed, such as electricity, water, sewerage and telecommunications services, after consultation with the relevant service providers has been undertaken and approval for the installations has been obtained.

Any existing services located within material requiring excavation would be identified and temporarily bypassed or removed. These services would be re-established in their original positions during the restoration phase of the project.

The following accommodation facilities would be established at the site:

- site offices, stores, work sheds, lunchrooms and changing areas
- temporary site sheds, ablution blocks and decontamination units
- bins for domestic rubbish
- additional site facilities to facilitate work in more remote areas of the site, or in areas requiring additional safety measures.

A parking area for private, pick-up and delivery, and site vehicles would be established close to the thermal treatment area enclosure or heritage-listed office building.

Haul roads suitable for site traffic would be established as required. These roads would be designed to provide all-weather access for construction plant and road vehicles and to minimise impacts. Where possible, the roads would be constructed using existing site materials that had an acceptable level of contamination. Barriers or marker posts would be erected along haul road margins as required, for safety and erosion control.

A thermal desorption remediation plant and ancillary plant equipment would be installed adjacent to the proposed car park area, between the Great Northern Railway and the Newcastle Gas Company offices. The approximate location of this plant is shown in *Figure 2.3*.

Shoring is likely to be required along the boundaries of the Great Northern Railway and stormwater channel, as shown in *Figure 2.3*.

Prior to excavation works, external surfaces such as bitumen and vegetation would be removed and these materials would be segregated and stockpiled for use in the remediation process. Discarded equipment, rubbish and potentially hazardous material such as asbestos would be removed from the site for disposal in accordance with relevant legislation and environmental guidelines (refer to *Section 5.2* for more detail).

Existing site structures, other than those shown on *Figure 2.2* to be retained, would be demolished in accordance with the demolition methodology outlined in the proposed Remediation Action Plan for the site.

Any waste concrete, brick or other masonry would be crushed and re-used on site. It is proposed that any waste tar material would be treated by the thermal desorption process unless there is an unconditional opportunity to beneficially reuse the material a fuel in a power generating facility, cement kiln or coke works.

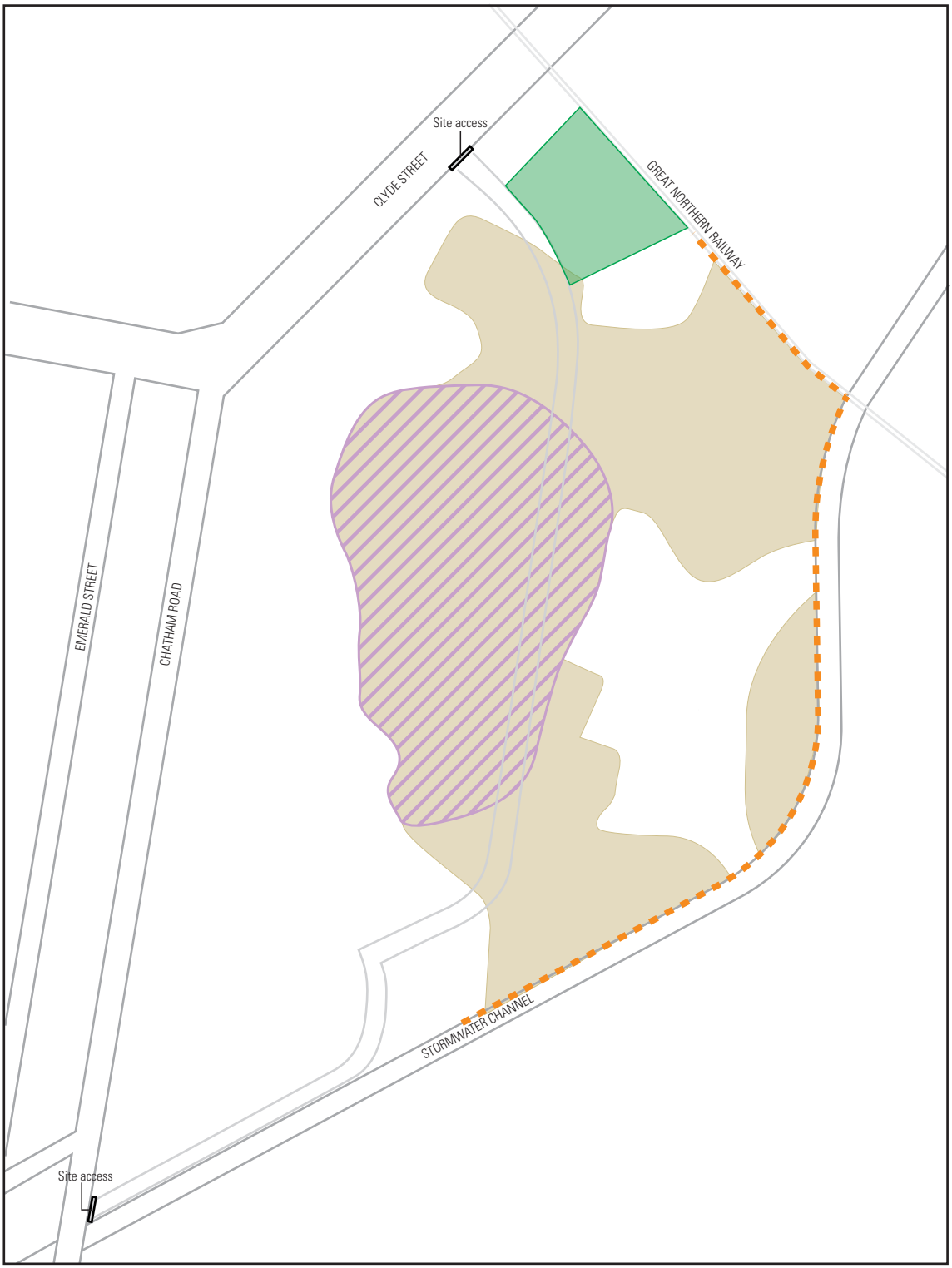

Fig 2.3 Layout of proposed remediation and validation works

Approximate extent of shoring

Approximate boundary of the most contaminated area within site

Approximate boundaries of moderately contaminated areas within site

Area within which thermal desorption unit to be located

2.3.2 Soil treatment process

Thermal desorption has been determined as the most appropriate treatment method for the site (ERM Mitchell McCotter 1997). Thermal desorption oxidises contaminants in a chamber heated to above 1050^0C, producing carbon dioxide and water.

A direct thermal desorption unit would treat contaminated soil on the site. This unit removes contaminants from a physical or chemical matrix and subsequently destroys the contaminants while they are in a gaseous state. A trial was recently undertaken at the site on 500 cubic metres of material using a direct thermal desorption unit (refer to *Section 2.2*).

The information provided below has been extracted from documentation published by Innova, a local operator of the direct-thermal desorption unit. This information is specific to the Innova unit and may vary from one operator to another.

Typically, a direct thermal desorption unit consists of the following components:

- soil feed system
- direct-heated rotary desorption unit
- clean-product discharge and cooling system
- conversion chamber
- grit arrestor and sluice
- energy recovery exchangers
- dry-gas quencher
- wet-gas scrubber with wetted fan
- soil-cooling unit.

Details of the excavation and treatment process are given below.

Excavation and pre-treatment

Excavations and soil treatment would occur in the areas marked on *Figure 2*.3. Soils would be excavated using hydraulic excavators and stockpiled in the designated treatment area shown on *Figure 2.3.* Soils identified as likely to be clean would be stockpiled for potential later use as clean backfill, pending tests for contamination.

A segregation procedure has been developed as part of the proposed Remediation Action Plan and would be implemented during any excavation activity. Excavated material would be segregated on-site based on odours and visual observations. *Table 2.1* shows the material segregation categories and treatment methods that would be used for the Proposal.

Table 2.1: Material segregation categories and proposed treatment methods

Category	Material description	Proposed treatment
1	Tar and natural sands with strong odour	Thermal desorption
2	Blue-green stained materials	Blending with Category 1 material, then thermal desorption
3	Natural sands with visible oily liquid/sheen and strong odour	Thermal desorption
4	Natural sands with a slight to moderate tar/oil odour	Thermal desorption or reinstatement at depth with ongoing monitoring
5	Building rubble including metals, wood, bricks, concrete, glass, plastic, tiles	Screening, then reuse of fine fraction for reinstatement at depth, and recycling or disposal of coarse fraction
6	Coke/sand mixture	Screening, then reuse of fine fraction for reinstatement at depth, and recycling or disposal of coarse fraction
7	Natural sands, visibly clean and odourless or with a very slight tar/oil odour	Source removal and in situ natural attenuation
8	Green waste	Disposal as green waste
9	Bitumen	Disposal as inert waste
10	Concrete	Crushing and recycling on or off-site
11	Asbestos-contaminated material	Disposal as asbestos waste

Excavations would remain uncovered for the shortest period of time to allow for analysis or validation against the contaminants of concern. During this time excavations would be barricaded with orange mesh netting between metal stakes (e.g. star pickets), fence panels or barriers.

Excavation support may be required at certain locations, particularly adjacent to the Newcastle Gas Company offices and along site boundaries, where fill material has been identified during the previous investigations.

Excavated material to be treated in the thermal desorption plant would undergo a series of pre-treatments to ensure material inputs into the thermal desorption plant are as homogenous as possible.

Pre-treatment activities would involve the following processes in this order:

1. drying
2. screening, segregation, consolidation
3. crushing
4. liming
5. mechanical mixing.

As pre-treatment activities may release volatile compounds and generate dust, the pre-treatment area would be constructed and operated to:

- control air emissions from the receiving, stockpiling and pre-treatment operations
- prevent rainwater from contacting the soil stockpiles and the pre-treatment equipment
- limit the visual exposure of the remediation operations.

To ensure that the above conditions are adhered to, soil stockpiles and pre-treatment equipment would be covered with waterproof materials such as tarpaulins. The pre-treatment area would also be graded and compacted or where available use the existing site pavements and would be designed to allow material segregation, stockpile management and materials handling with various plant such as loaders and trucks.

Any free liquids or wastewater generated would be managed to prevent contact with subsurface soils. Sumps, trenches, or dyked pads that collect potentially contaminated liquids would be constructed from materials that would prevent migration of liquids to subsurface soils. Run-on would be prevented from entering the facility and contacting the stockpiled feed soils by the use of berms or ditches located at the perimeter of the pre-treatment area.

At this stage, it is anticipated that the pre-treatment area would be located for the duration of the project at the southern end of the site, as shown in *Figure 2.3*.

Soil processing and feed

Before being placed into the thermal desorption unit, contaminated soils would be pulverised until particles are less than 50 millimetres in diameter. The soil would be conveyed to a feed hopper by a front-end loader; there it would undergo a final screening process prior to entering the soil feed system of the desorption unit. A screw feeder in the base of the feed hopper would then transfer material from the feed hopper to the soil feed system of the desorption unit. This unit would ensure that a steady feed is maintained to the rotary dryer and that an atmospheric seal is maintained within the dryer.

Rotary drying and product management

Once inside the rotary dryer, the contaminated soils would be progressively heated through radiation and convective heat transferred from a liquid-fuelled flame. Contaminants would be removed at this stage through vaporisation and mass transfer processes. Processed material would then be fed to a pug-mill for cooling. A pug-mill consists of a cooling chamber, into which cooling water is sprayed, and a screw feeder, which transfers the cooled processed material to a stockpile area along a product conveyor.

Gas treatment

Contaminant-laden gases would be removed from the rotary dryer (at approximately 850^0C) and would be transferred to the primary combustion chamber in the conversion chamber, where additional burners would increase the gas temperature to up to $1,200^0$C, as required. Fines would be transported through the chamber. A minimum residence time of 3 to 4 seconds would ensure complete contamination conversion of the gas product from hydrocarbon to carbon dioxide and water. This carbon dioxide would then pass through a grit arrestor, which would collect initial fines. Flue gases would then be cooled to 820^0C through an energy recovery (heat exchange) system which would indirectly heat the incoming combustion air. A rapid quench (heat exchange) system would then dry and cool the flue gases from 820^0C to 175^0C in less than 30 milliseconds, preventing formation of persistent organic chemicals. The cooled gases would then be scrubbed via a large-capacity, high-efficiency, industrial spray scrubber, with wetted fan polishing, which would further collect fines. Water products from the sluice collection and wet scrubber would be used to cool the soil and reconstitute the dust of the processed product.

Ancillary systems

Cooling water for the rapid-quench system would be provided by a closed-loop system containing a water tank, circulation pumps and fan coolers. The burner systems used in the conversion chamber would be fuelled by diesel. These systems would consist of a tank and fuel pump, which would deliver fuel to a ring main pipe system from which the burner fuel supply would be drawn. A pilot flame system would be installed, which would operate from an LPG supply cylinder.

Emergency procedures and maintenance

In the event of a power loss or malfunction in the thermal desorption plant, the following measures would be implemented:

- A back-up generator would maintain power to critical plant components during mains power failure, allowing a safe and controlled shutdown of the plant without the risk of adverse emissions.
- The plant would be monitored by a computer system that observes all plant components. Any malfunction that could result in adverse emissions would be immediately identified by the system and immediate action would be taken.
- Regular inspections and maintenance works would be undertaken for the plant to ensure efficient operation. A maintenance day is scheduled once per week. This is usually during the working week, to ensure access to spare parts if required.

Soil validation

Before the treated soil is transported to an appropriate area on the site for infilling, it would be tested and validated or certified by an accredited auditor in accordance with the adopted assessment criteria for the project (see *Section 2.3.2*).

Treated soil management

Treated soil would be temporarily stockpiled on an impervious surface and surrounded by temporary bunding, which would be located away from the contaminated-soil holding area. Tarpaulins would be used to cover the treated soil prior to its reuse on site.

2.3.3 Site remediation and clean up

Low concentrations of soil contaminants would be left in sections of the site where thermal treatment is not considered necessary. To ensure residual contamination meets the requirements of the remediation action plan, the lateral and vertical extent of this contamination would be confirmed using existing site assessment data and field observations during the actual excavation works.

Treated soil would be used to fill in excavations, and the surface of the site would be levelled. If additional soil is required to achieve a level ground surface at the site, clean fill would be required. It is likely that any imported fill would be classified as Virgin Excavated Natural Material; however, recycled aggregate or validated clean fill may also be appropriate. Fill material would be certified suitable for use at the site by an appropriately qualified consultant.

Any residual low level contamination that remains on site would be located in areas to be protective of human and environmental health including any potential impact to the groundwater.

2.4 Capital investment value

The capital cost of the Proposal is estimated to be approximately $7-8 million.

Indicative average workforce numbers at any time during the remediation and validation of the former Newcastle Gasworks site would be approximately 10 employees. Actual numbers would vary according to the activities occurring at the site; however, it is anticipated that up to a maximum of 25 employees would be present at any one time.

2.5 Indicative remediation timetable

The remediation and validation works at the former Newcastle Gasworks site are expected to be carried out over a 12 month period.

3. Statutory and policy context

3.1 Commonwealth legislation

3.1.1 Environment Protection and Biodiversity Conservation Act 1999

A search of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* Protected Matters (National Environmental Significance) database (refer to *Appendix A*) shows no matters of National Environmental Significance would apply to the proposal.

Therefore, the Proposal does not need to be referred to the Commonwealth Minister for the Environment.

3.2 State legislation

3.2.1 Environmental Planning and Assessment Act 1979

The remediation and validation of the former Newcastle Gasworks is a project to which Part 3A of the New South Wales *Environmental Planning and Assessment Act 1979* (EP&A Act) applies.

Clause 6 of *State Environmental Planning Policy (Major Projects) 2005* provides that:

> …development that, in the opinion of the Minister, is development of a kind:
>
> (a) that is described in Schedule 1 or 2, …
>
> is declared to be a project to which Part 3A of the Act applies.

Clause 28 of Schedule 1 of the *State Environmental Planning Policy (Major Projects) 2005* identifies a project to which Part 3A applies as being: *"development for the purposes of remediation of land on premises subject to a notice requiring prescribed remedial action to be taken under Section 35 or Section 36 of the Environmentally Hazardous Chemicals Act 1985".*

The former Newcastle Gasworks site is subject to a notice requiring remedial action to be taken under Section 35 of the *Environmentally Hazardous Chemicals Act 1985*.

3.2.2 Other legislation

Table 3.1 outlines approvals and licences required for the proposed remediation and validation works at the former Newcastle Gasworks site.

Table 3.1: Licences and approvals under New South Wales legislation

Legislation	Key requirements	Relevance to this Proposal
Protection of the Environment Operations Act 1997	Environment Protection Licences regulate water, air and noise pollution and waste. Under this Act, the Department of Environment and Conservation requires them for 'scheduled activities' and 'scheduled development work', to regulate water pollution.	Schedule 1 of this Act lists *'contaminated soil treatment works for on-site treatment that handle contaminated soil originating exclusively from the site on which the works are located and incinerate more than 1,000 cubic metres per year of contaminated soil'.* Therefore, the Proposal would require a licence.
Roads Act 1993	Development that affects a public road, Crown road, highway, main road, freeway or tollway requires approval from the NSW Roads and Traffic Authority or the local Council under this Act [s.138].	The Proposal would not affect any roads, so approval would not be required under this Act.
Rivers and Foreshores Improvements Act 1948	Under this Act, approval is required from the relevant Catchment Management Authority (CMA) (in this case the Hunter/Central River CMA) for development within 40 metres of a declared waterway.	The Proposal would be located within 40 metres of Styx Creek and would therefore require approval under this Act. However, clause 1(f) of Section 75U of the *Environmental Planning and Assessment Act 1979* states that approval is not required for projects being assessed under Part 3A of that Act. Therefore approval under this Act is not required.
Water Management Act 2000	Under this Act, approval is required from the relevant Catchment Management Authority (in this case the Hunter/Central River CMA) for development that could significantly interfere with a water source or aquifer.	The Proposal would involve large excavation works which could interfere with groundwater at the site and would therefore require approval. However, clause 1(h) of Section 75U of the *Environmental Planning and Assessment Act 1979* states that approval is not required for projects being assessed under Part 3a of that act. Therefore, approval under this Act is not required.

3.2.3 State Environmental Planning Policies

Hunter Regional Environmental Planning Policy 1989

The *Hunter Regional Environmental Planning Policy 1989* applies to all land within the Newcastle local government area. The policy aims to balance development in the Hunter region by co-ordinating development assessment activities and by creating a framework for the development of local planning instruments.

The *Hunter Regional Environmental Planning Policy 1989* prescribes mechanisms that relate to the preparation of local environmental plans and development controls and as such it does not apply to the Proposal.

State Environmental Planning Policy No. 55 — Remediation of Land

State Environmental Planning Policy No. 55 – Remediation of Land sets the regulatory framework for contaminated land and remediation works within New South Wales. *State Environmental Planning Policy No. 55* classifies the remediation of the former Newcastle Gasworks as Category 1 remediation work.

Category 1 work requires consent from the relevant local government authority (which in this case in the Newcastle City Council). As the project is deemed a major project in accordance with the Major Project SEPP, consent is not required from Newcastle Council.

3.3 Local and regional planning instruments

3.3.1 Newcastle Local Environment Plan 2003

The subject site is zoned 4(a) Urban Services under the *Newcastle Local Environment Plan 2003.* In accordance with this zoning, the Proposal is permissible with development consent.

As the Proposal is deemed to be a major project in accordance with the Major Projects State Environmental Planning Policy (SEPP), consent is not required from Newcastle City Council.

4. Consultation

4.1 Approach

Recognising the importance of the former Newcastle Gasworks site and the key issues associated with its remediation, AGL commissioned FordComm Consulting Pty Limited to identify stakeholders and develop a communications strategy during the recent on-site trial of the remediation process (refer to *Section 2.2*).

Details of the stakeholders and the communications strategy implemented during the remediation trial are given in *Section 4.2*. It is proposed to carry out a comprehensive community consultation program which builds on the communications strategy developed by FordComm (2005) during the environmental assessment process, pending endorsement of this project application.

4.2 Activities

4.2.1 Community

FordComm undertook a comprehensive community consultation process prior to the remediation trial in 2005. The consultation included the following activities:

- establishment of a 1800 information phone line
- development of a dedicated Internet page for the project; the page was displayed on the Innova Soil Technology website (http://www.innovasoil.com.au) and provided a contact mechanism for questions via email
- briefings with relevant councillors, council officers, parliamentarians and government departments
- consultation with relevant community and environment groups
- providing through letterbox drops a newsletter outlining the project to local residents
- holding a media briefing at the former Newcastle Gasworks offices to inform local media of the project
- providing at the former Newcastle gasworks offices a display outlining the project; the display opened on Fridays and Saturdays
- staging a Community Information Day at the former Newcastle Gasworks offices.

4.2.2 Stakeholders

Stakeholders identified by FordComm (2005) as likely to be affected by or interested in the remediation trial included:

- residents in Hamilton North, including the residents of Chatham and Orient roads and Clyde, Emerald, Bates and Newcastle streets
- residents in Islington, including the residents of Girling, Price, Bentley, Chin Chen and Hubbard streets
- community groups such as the Mayfield Residents Group and Hamilton Community Association
- environmental groups such as the Citizens and Kooragang Alliance (CAKA)
- Hunter Institute of Technology (TAFE)
- Shell Australia
- Newcastle City Council
- Department of Planning
- Department of Environment and Conservation
- Roads and Traffic Authority
- Regional Lands Management Corporation
- State and federal political representatives.

A meeting and site visit was held for key government agencies at the former Newcastle Gasworks site on 26 June 2006. The meeting was attended by representatives of AGL, Parsons Brinckerhoff, the Department of Planning and the Department of Environment and Conservation.

Key issues raised during the meeting included odour and noise impacts to local residents and the potential for groundwater contamination. Details of the treatment process were discussed and the approvals requirements were confirmed with the relevant representatives from the Department of Environment and Conservation and the Department of Planning.

4.3 Outcomes

Key concerns expressed by the local community and stakeholder agencies related to potential impacts on local residential amenity and impacts on the receiving environment during remediation works.

5. Preliminary environmental assessment

The following key environmental issues have been identified in relation to the Proposal:

- odour and air quality
- groundwater
- noise.

Section 5.1 provides preliminary assessment and the scope of proposed investigations for these key issues.

A number of additional environmental issues have also been considered for the purposes of this preliminary environmental assessment. The potential impact of these additional issues is considered minor, and actions to mitigate these impacts during construction and/or operation have been proposed. *Section 5.2* assesses these issues.

5.1 Key environmental issues

5.1.1 Odour and air quality

Existing environment

Odour and air quality at the former gasworks site is variable and influenced by a number of permanent and temporary sources, such as transportation operations, construction activities, industrial activities and regional polluting processes such as bushfires and dust storms.

Some of the contaminated material found at the site emits offensive odours (URS, 2005a). However, it is unlikely that these odours would be detectable away from the site.

The Elgas LPG bottling facility on the southern boundary of the site contributes to existing odours. The chemical *ethyl mecaptan* that is added to LPG gas as a tracer was detected throughout the site during an inspection on 26 June 2006. This odour escapes during routine filling of LPG gas bottles.

The Shell bulk fuel terminal to the east would also contribute to the existing odour environment.

Low vegetation (mostly weeds) covers most of the site, preventing soil exposure and dust generation.

Key issues

The Proposal would excavate soils that are highly contaminated with a variety of volatile organic compounds. Exposing these soils to the air through excavation and treatment works could result in odour or air quality impacts to the local area when these contaminants vaporise. Dust could also be generated from the excavated material, leading to amenity impacts for nearby residents.

Based on experience at similar remediation projects, it is anticipated that the thermal desorption plant would emit less volatile emissions than those from freshly stockpiled excavated material. Emissions from the stack would consist almost entirely of carbon dioxide and water. Provided the period that stockpiles are exposed is minimised and that the transfer of contaminated soils between areas of the site is done so in a controlled manner, impacts on odour and air quality can be minimised.

The proposed remediation activities would be located several hundred metres away from nearby residential and commercial receivers. Therefore, it is unlikely that odour or volatile organic compound emissions would create impacts outside the site. It is possible, however, that the ambient air concentration of volatile organic compounds could exceed relevant safe work limits in the areas where remediation occurs.

All open excavations and treated soils would be monitored during the remediation works with a photo-ionisation detector, to ensure ambient air concentrations of volatile organic compounds are within acceptable safe work limits. Other mitigation measures may be required to reduce impacts caused by dust and the thermal desorption plant emissions.

The proposed remediation and validation works has the potential to pose health risks to workers in the immediate vicinity of any contaminated soils. Mitigation measures, including monitoring of ambient air conditions for volatile organic compounds, would be necessary to minimise the potential impacts.

The Proposal could also generate dust impacts for nearby residents, so mitigation measures, such as covering excavated materials, would be required.

Proposed assessment

An odour and air quality assessment would be undertaken as part of the Environmental Assessment, addressing the following issues:

- impacts due to dust (including contaminants) from excavation
- impacts from volatile organic compound emissions during excavation
- impacts on odour environment (using odour sampling and analysis)
- the total cumulative impact of all activities, including health risks due to airborne contaminants.

The following tasks would be undertaken as part of the odour and air quality assessment:

- site inspection
- preparation of an emissions inventory
- preparation of a meteorological data file
- modelling of air emissions in accordance with Department of Environment and Conservation guidelines (Department of Environment and Conservation 2005)
- preparation of a health risk assessment in accordance with Department of Environment and Conservation guidelines (Department of Environment and Conservation 2005)
- preparation of an odour and air quality assessment report, to be included as an appendix in the Environmental Assessment.

5.1.2 Groundwater

Existing environment

A review of previous groundwater investigations at the former Newcastle gasworks site found the following:

- generally, groundwater at the site is encountered at between two and six metres depth
- at the most contaminated part of the site, groundwater was encountered at approximately 3.4 metres depth
- soil is contaminated to approximately 9 metres in depth in some locations (below the water table)
- groundwater generally flows towards the south-east, in the direction of the stormwater channel (Styx Creek) located along the boundary of the site
- there is a low probability of acid sulfate soils occurring at the site at three metres depth or below.

The majority of contaminants at the site are polycyclic aromatic hydrocarbons, which are highly insoluble and immobile in the soil and are therefore unlikely to have contaminated the local groundwater system. However, other contaminants that exist on the site such as monocyclic aromatic compounds, petroleum hydrocarbons and phenols have the potential to transport through the soil and the groundwater system.

A groundwater assessment undertaken by ERM Mitchell McCotter (1997) found:

- groundwater at the centre of the site and the eastern and southern margins is contaminated by hydrocarbon compounds
- groundwater at the central, northern and southern areas of the site is contaminated with metals

- cyanide contamination occurs in groundwater throughout the site and was detected at all site boundaries, except the Clyde Street boundary, where no groundwater testing was undertaken.

A groundwater capture network was established on the site in 1994 to prevent any movement of groundwater into the stormwater channel (Styx Creek). The network consists of three pumping bores located on the southern and eastern boundaries of the site. These bores pump to a two mega-litre (ML) storage tank which feeds into a package treatment plant (refer to *Figure 2.2* for the location of these structures). The package treatment plant reduces contaminants in the collected groundwater to acceptable levels for discharge to the sewer. The treated groundwater is then discharged to Hunter Water's reticulated sewerage network through a connection to the south of the site.

Key issues

The excavation process could cause contaminated soils to come in contact with the local groundwater system. This could increase contaminants to levels higher than the groundwater treatment plant can manage or cause contamination of groundwater in areas that were previously unaffected. Mitigation measures would be required to ensure the groundwater system is not impacted during the remediation process.

A Soil and Water Management Plan would be prepared as part of the Construction Environmental Management Plan for the Proposal. This would detail how soil- and water-related mitigation measures would be implemented during both site preparation and remediation activities. The plan would also outline how soil would be contained during the restoration period and once the project was complete.

The proposed remediation and validation works have the potential to cause impacts to local waterways and groundwater systems if not managed properly. Mitigation measures would be required to prevent and minimise such impacts.

Proposed assessment

A series of monitoring wells would be established along the boundaries of the site in areas that would not be excavated during the remediation works. Groundwater samples would be taken from these wells and analysed for any contaminants that may have entered the local groundwater system. Monitoring would continue after the remediation of the site, to identify if further groundwater remediation is required. Details of the proposed groundwater assessment process will be outlined in the Remediation Action Plan, which will accompany the Environmental Assessment.

5.1.3 Noise

Existing environment

Although located within predominantly industrial environs, the Newcastle Gasworks is close to residential receivers. The area is also an employment zone, with several large commercial premises located adjacent to the site.

No ambient noise monitoring has been undertaken at the site. The existing local noise environment at the site is consistent with the mix of land uses in the area, which includes residential, commercial, industrial and transport (including heavy rail) uses. The ambient noise environment for the area is influenced by road traffic noise, and noise generated from various industrial operations nearby (including the Elgas site). A railway crossing at Clyde Street is operated frequently by passing commuter and freight trains.

Key issues

The following activities are likely to influence the noise environment during the Proposal:

- clearing, demolition and excavation works associated with preparation of the site
- vehicular movements associated with the movement of cleared, demolished or excavated materials
- materials transfer and operation of the thermal desorption plant
- vehicular movements associated with the movement of treated soils.

The proposed treatment plant would operate for a maximum of 24 hours a day for 6 days a week. One day each week (usually mid-week) would be used as a routine maintenance period. The approximate noise output of the direct thermal desorption plant is 70 dBA.

To reduce noise impacts, AGL proposes to locate the main treatment area, including the thermal desorption unit and stockpile areas, to the south of the former gasworks site, where fewer sensitive receivers are located as shown in *Figure 2.3*.

Some site clearing and excavation activities may occur closer, but would be unlikely to exceed noise criteria as they would occur during normal working hours.

Noise generated at the proposed former Newcastle Gasworks remediation site would potentially affect surrounding commercial and residential land uses. Some noise controls may be required to minimise the potential impacts.

Proposed assessment

A noise impact assessment would be conducted in accordance with the NSW Department of Environment and Conservation's *Industrial Noise Policy* (2000), *Environmental Criteria for Traffic Noise* (2001), and *Environmental Noise Control Manual* (1994). The Department of Environment and Conservation is currently developing new construction noise guidelines and these guidelines would be used in the noise impact assessment if released prior to the completion of the noise assessment.

The noise impact assessment would comprise the following activities:

- site inspection and identification of sensitive receivers
- attended measurement of background noise for all identified sensitive receivers and unattended background noise monitoring at two locations for a minimum of seven days

- calculation of existing background (L_{A90}) and existing industrial noise (L_{Aeq}) and determination of operational, construction and traffic noise criteria
- development of an inventory of the sound power levels (dBA) for equipment likely to be used during the Proposal
- modelling of noise levels generated during remediation from demolition, earthworks and the desorption plant and comparison of predicted noise levels with the project noise criteria
- modelling of traffic noise levels due to truck movements at the site and comparison of predicted noise levels with the project noise criteria
- preparation of a noise assessment report, to be included as an appendix in the Environmental Assessment.

5.2 Other environmental issues

Table 5.1: Other environmental issues

Issue	Impacts	Conclusion
Ecology The Proposal would require vegetation clearing throughout the site. The site is highly disturbed and contaminated, and has been cleared of all native vegetation. Some native plant species and a number of exotic species were observed on the site as regrowth vegetation. *Photographs 2.1* and *2.2* show vegetation typical to the site. This assessment was based on a walkover survey of the former gasworks site to identify the presence of any native vegetation or animal species.	The Proposal would require the clearing of existing vegetation. Native regrowth vegetation was observed sporadically throughout the site, although the vast majority of species growing on the site were observed to be grass species and exotic weed species, such as camphor laurel, lantana and Patterson's Curse. The majority of tree species identified on the site were camphor laurel, date palm and umbrella tree species. However, several mature eucalypts were identified near the Clyde Street entrance. It is unlikely that these trees would be impacted by the Proposal, as excavation activities would not occur at that part of the site. Due to the highly disturbed and contaminated nature of the entire site, and the fact no natural native vegetation was observed there, the site represents poor habitat for animal species. It is therefore unlikely that threatened, endangered or migratory species would use the site and impacts to such species are not anticipated.	The Proposal would require the removal of some native vegetation regrowth. However, this should not cause significant impacts to any ecological value or threatened or endangered species. The Proposal constitutes a considerable environmental improvement for the site, allowing it to be developed for more sustainable purposes.
Visual amenity The Proposal involves a range of excavation, demolition and treatment activities that would temporarily affect visual amenity. The remediation of the site will allow for site improvement and thus an improvement in visual amenity.	Works that would result in visual impact during site preparation and remediation works include: ▪ construction hoardings and fences around work areas and treatment compounds ▪ demolition of existing site structures ▪ site structures such as the thermal desorption plant, pre-treatment building, site offices, ablutions blocks etc. On completion of the remediation works the site would have substantial visual changes. With the exception of the former Newcastle Gas Co. offices, existing site structures would be removed, including building rubble and wastes.	The Proposal would have a temporary impact on visual amenity; however, the clean-up of the site will significantly improve its visual amenity. The following mitigation measures would be implemented to minimise visual impacts: ▪ Hoardings and fences would be painted to a consistent, harmonious colour scheme. ▪ Work sites and the surrounding areas would be maintained in a clean and tidy condition.

Issue	Impacts	Conclusion
Hydrology A lined stormwater channel (Styx Creek), which is a major tributary of Throsby Creek, runs along the south-eastern boundary of the site. Surface water run-off from the site would either flow directly into this channel or into the local underground stormwater system, which eventually drains to the channel.	Impacts on the stormwater channel to the south-east of the site could occur if excavated contaminated material is carried into it through surface water run-off.	Water quality in the stormwater channel would be highly variable and would be influenced by rainfall, sewage overflows and land uses within the catchments. The Proposal could cause some water quality impacts to the stormwater channel. Mitigation measures would be necessary to ensure impacts to local water quality are minimised during the remediation works. A Soil and Water Management Plan would be developed and incorporated into the Construction Environmental Management Plan.
Traffic Access to the former gasworks site would occur through the existing gate on Clyde Street and the existing access point for the Elgas facility. Traffic movements in the area would increase during the site preparation and treatment phases of the Proposal.	It is estimated that there will be a slight increase in vehicle traffic during the establishment phase for the thermal desorption equipment. During the remediation phase the traffic movements are likely to be restricted to normal operational traffic to operate and maintain the thermal desorption unit and site workers personal vehicles A Traffic Management Plan would be prepared to mitigate any traffic impacts. This plan would be implemented before site preparation and treatment activities commence, and the contractors' compliance with this plan would be monitored by AGL. To minimise traffic impacts on Clyde Street and Chatham Road, one gate may be used as an entrance and the other as an exit.	The Proposal would have a minor impact on traffic movements on local streets. A Traffic Management Plan would be developed and incorporated into the Construction Environmental Management Plan.
Heritage The former gasworks site contains three heritage items listed on the *Newcastle Local Environment Plan 2003;* these are: ▪ Newcastle Gas Company offices (also listed on the State Heritage Register), located on Clyde Street (see *Photograph 2.3*) ▪ Gas Company Site Remnant gardens, located along the stormwater channel (Styx Creek) at	Site preparation and remediation works would not affect the Newcastle Gas Company offices or Gas Company Site Remnant Gardens. Although other buildings would be demolished on the site as part of the Proposal, the Newcastle Gas Company offices would remain. The gardens are unlikely to be affected as they are located at the edge of the site, in an area that would not be excavated. Existing access roads that would be used for the Proposal do not impact on these gardens. Although unlikely given the highly disturbed nature of the site, the proposed excavation work could uncover a heritage relic, as defined by the *Heritage Act 1977*, or an item of Aboriginal heritage. If such an item is uncovered, work in that area would stop until the item could be assessed and appropriate action taken.	The Proposal would not result in any impacts to known heritage items. Mitigation measures would be required to ensure damage to potential heritage items does not occur during excavation works. An assessment of Aboriginal heritage would be undertaken for the site through a search of the National Parks and Wildlife Service's Aboriginal Heritage Information Management System.

Issue	Impacts	Conclusion
the entrance to the Elgas facility ▪ pump house and fence. Correspondence with Newcastle City Council's Heritage Officer and a detailed inspection of the site failed to identify the location of this structure. Further investigation of this heritage item will be conducted for the environmental assessment. It is unknown if any items of Aboriginal heritage are located at the site.		
Land use and socioeconomic impacts The former gasworks is located in a highly developed urban area. Current Newcastle City Council policy seeks to maintain employment land in key employment precincts such as Hamilton North.	The Proposal is likely to impact residential amenity during the site preparation and treatment phases, due to increased noise, dust and transport movements. Improving the health and safety of the gasworks site will have health and safety benefits for the local community and the visual amenity of the site would be vastly improved. The capital cost of the Proposal has been estimated to be over $7-8 million.	The various components of the Proposal are unlikely to significantly affect surrounding land uses and would permit future development of the site. Therefore, any land use or socioeconomic impacts would be positive. Utilising the communications strategy provided by FordComm (refer to *Section 4.2*), consultation with any residents or businesses in the vicinity of the site would be undertaken to ensure they are fully advised of the nature and duration of the Proposal.
Utilities and services The exact nature of utilities and services located at the former gasworks site is currently unknown. The proposed excavation and demolition activities could disturb or damage existing utilities on the site.	The exact location and nature of utilities and services on the site is unknown. Impacts to utilities and services could occur through physical damage or safety risks, such as the risk of remediation works affecting a nearby service. A review of existing utilities would occur prior to implementation of the Proposal, which would include utility mapping and consultation with service providers. An Incident Management Plan would be prepared which would include procedures for managing damage to, or disruption of, utilities or services.	Implementing the Proposal could cause damage or disruption to utilities and services that exist on the former gasworks site. Identification of existing utilities, including consultation with relevant service providers, would occur prior to any site preparation or treatment works. Other mitigation measures would be implemented to ensure impacts to utilities or services are minimised.

Issue	Impacts	Conclusion
Hazards and risks Sections of the former Newcastle Gasworks site have been identified as contaminated with various hazardous chemicals, with concentrations greater than current health guidelines. The site also currently contains a number of hazardous structures and features, including open excavations, derelict buildings and structures such as a naptha tank. The hazards commonly associated with site remediation include: ▪ exposure of site workers and nearby residents to potentially hazardous chemicals ▪ unauthorised public access to the site ▪ potential accidents for on-site workers, relating to unsafe structures/site features ▪ potential for hazardous materials to be transported from the site to the local environment through surface water run-off, vaporisation or site vehicles ▪ impacts to utilities and services on and near the site.	The Proposal would increase the potential exposure to hazards associated with the site. This may increase the risk due to the number of people working on and visiting the site, and the excavation and remediation of the contaminated soil and groundwater.	Hazards and risks associated with the Proposal would be routinely managed through the development of risk management planning and the implementation of the health and safety requirements outlined in the proposed Remediation Action Plan developed for the site. The Proposal would result in a long term reduction in hazards and risks to human health and the environment, associated with the site.

Issue	Impacts	Conclusion
Waste management The site contains large quantities of contaminated soil and waste materials. Soils contaminated with hydrocarbons would be treated on site in a thermal desorption unit and used to restore any excavated areas. Soils contaminated with other chemicals may either be treated through the thermal desorption unit or removed from the site for disposal.	Materials to be disposed of off-site may contain hazardous or contaminating materials that could be dispersed into the environment if inappropriate disposal techniques are used. Validation testing of any treated or waste materials would be required prior to their off-site disposal. All waste materials and disposal activities would be in accordance with relevant legislation and environmental guidelines, including the *Protection of the Environment Operations Act 1997,* the *Waste Avoidance and Resource Recovery Act 2001* and the Department of Environment and Conservation's (1999) *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes*.	The Proposal could cause environmental impacts if waste materials are disposed of incorrectly. Environmental impacts would be avoided through ensuring that waste disposal is in accordance with relevant legislation and environmental guidelines.
Cumulative impacts The construction and operation of other major developments in the area surrounding the former gasworks site could result in cumulative impacts. Key areas of concern include: ▪ traffic ▪ noise and vibration ▪ waste disposal.	There are no other major activities/developments that are known to be occurring in the local area at the time of the site preparation and remediation works. A number of small/medium businesses, including light industrial activities, operate in the area surrounding the site. However, implementing the Proposal would not cause any cumulative impacts in relation to these operations.	Implementing the Proposal would not coincide with any other major projects in the area. No cumulative impacts would be expected in relation to the Proposal.

6. Conclusions

6.1 Environmental issues to be assessed in more detail

The preliminary environmental investigations presented in this report indicate the following issues would require detailed consideration as part of the environmental assessment of the Newcastle Gasworks (Clyde Street) Remediation:

- odour and air quality
- groundwater
- noise.

It is proposed that these issues would form the focus of the environmental assessment. AGL would prepare a draft Statement of Commitments to describe how these issues would be managed throughout the implementation of the Proposal.

6.2 Other environmental issues

The preliminary environmental investigations suggest that the following issues are unlikely to significantly affect the environment, and could be readily managed through the preparation and implementation of a Construction Environmental Management Subplans by the selected contractor:

- ecology
- visual amenity
- land use and socioeconomic impacts
- traffic
- heritage
- utilities and services
- hydrology
- hazard and risks
- waste management
- cumulative impacts.

It is proposed that these issues be addressed and managed through AGL's Statement of Commitments and the Conditions of Approval for the Proposal, which would determine the requirements of the Construction Environmental Management Plan.

References

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URS Australia Pty Ltd 2004a, *Final report, Supplementary Soil Investigation and Calculation of Remediation Volumes, Clyde St, Newcastle*

URS Australia Pty Ltd 2004b, *Addendum to the URS Australia Pty Ltd (2004) report "Supplementary Soil Investigation and Calculation of Remediation Volumes, Clyde St, Newcastle"*

URS Australia Pty Ltd 2005a, *Remediation trial – AGL Clyde St gasworks*

URS Australia Pty Ltd 2005b, *Review of soil volumes for remediation based on observations from the pilot scale remediation trial* (Newcastle Gasworks)

Appendix A

Matters of National Environmental Significance

Australian Government
Department of the Environment and Heritage

Protected Matters Search Tool

You are here: DEH Home > EPBC Act > Search

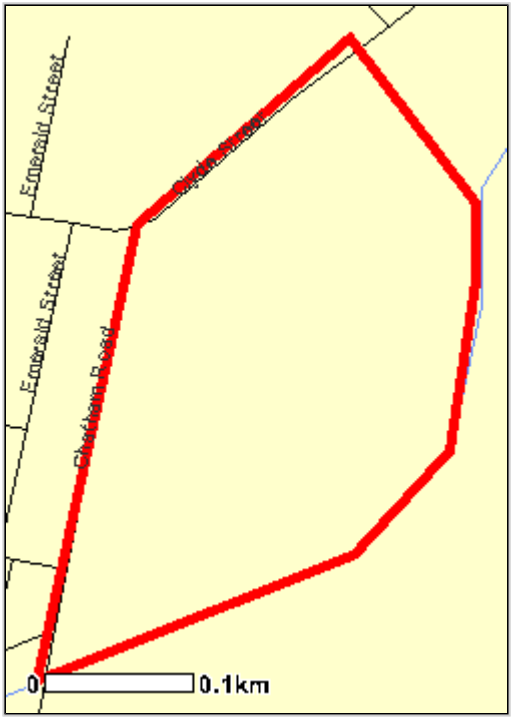
17 July 2006 15:22

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.deh.gov.au/epbc/assessmentsapprovals/index.html



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Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.deh.gov.au/epbc/assessmentsapprovals/guidelines/index.html.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance: (Ramsar Sites)	1
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	10
Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.deh.gov.au/heritage/index.html.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species,

whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.deh.gov.au/epbc/permits/index.html.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Places on the RNE:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Other Commonwealth Reserves:	None
Regional Forest Agreements:	1

Details

Matters of National Environmental Significance

Wetlands of International Significance [Dataset Information]
(Ramsar Sites)

HUNTER ESTUARY WETLANDS	Within 10 km of Ramsar site

Threatened Species [Dataset Information]	Status	Type of Presence
Birds		
Lathamus discolor * Swift Parrot	Endangered	Species or species habitat may occur within area
Xanthomyza phrygia * Regent Honeyeater	Endangered	Species or species habitat likely to occur within area
Frogs		
Litoria aurea * Green and Golden Bell Frog	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri * Large-eared Pied Bat, Large Pied Bat	Vulnerable	Species or species habitat may occur within area
*Dasyurus maculatus maculatus (SE mainland population)** Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	Species or species habitat likely to occur within area
*Potorous tridactylus tridactylus** Long-nosed Potoroo (SE mainland)	Vulnerable	Species or species habitat may occur within area

Pteropus poliocephalus * Grey-headed Flying-fox	Vulnerable	Species or species habitat likely to occur within area
Plants		
Cryptostylis hunteriana * Leafless Tongue-orchid	Vulnerable	Species or species habitat may occur within area
Eucalyptus camfieldii * Camfield's Stringybark	Vulnerable	Species or species habitat likely to occur within area
Tetratheca juncea *	Vulnerable	Species or species habitat likely to occur within area
Migratory Species [Dataset Information]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Migratory	Breeding may occur within area
Myiagra cyanoleuca Satin Flycatcher	Migratory	Breeding likely to occur within area
Rhipidura rufifrons Rufous Fantail	Migratory	Breeding may occur within area
Xanthomyza phrygia Regent Honeyeater	Migratory	Species or species habitat likely to occur within area
Migratory Wetland Species		
Birds		
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]	Status	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Breeding likely to occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Breeding likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area

Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Lathamus discolor Swift Parrot	Listed - overfly marine area	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Listed - overfly marine area	Breeding may occur within area
Myiagra cyanoleuca Satin Flycatcher	Listed - overfly marine area	Breeding likely to occur within area
Rhipidura rufifrons Rufous Fantail	Listed - overfly marine area	Breeding may occur within area

Extra Information

Regional Forest Agreements [Dataset Information]
Note that all RFA areas including those still under consideration have been included.

Lower North East NSW RFA, New South Wales

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where

threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the migratory and marine provisions of the Act have been mapped.

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgments

This database has been compiled from a range of data sources. Environment Australia acknowledges the following custodians who have contributed valuable data and advice:

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia

- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCLIM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution.
Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Last updated:

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